Published by the South African Sugarcane Research Institute

THE LINK

September 2017
Volume 26, Number 3

THREE NEW APPLICATIONS FROM SASRI!

Two smartphone apps (RustCalc and FertiCalc) and a desktop web application (StalkGro) have just been launched. For more information see pages 3 and 6.

In this issue...

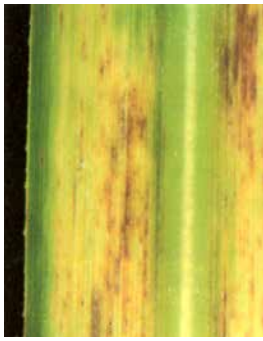
Yellow Sugarcane Aphid

Effective control of YSA requires early scouting, judicious use of insecticides and selection of varieties that exhibit lower levels of leaf damage *(page 7).*

Rypmaker

Resultate wat die afgelope vier jaar van veldproewe op Pongola verkry is, het gelei tot nuwe chemiese rypmaker aanbevelings vir besproeiings-variëteite N49, N53 en N57 *(bladsy 16).*

Zinc deficiency



Amongst the micronutrients, zinc is the one most frequently deficient in sugarcane soils. Regularly test your soil to know the status of the micronutrients available to the plant *(page 12).*

SASRI
Unlocking the potential of sugarcane

DIRECTOR'S MESSAGE

CAROLYN BAKER

The longhorn beetle incursion represents one of the most potentially devastating pests to impact the industry since eldana gained a foothold in sugarcane in the 1970s. In the January edition of The Link, growers were alerted to this new and previously little-known cerambycid that now seems to have established itself in sugarcane. A brief account of the information known at that stage was also presented. Now, six months later the industry has recognised the extent of the threat and committed to an unprecedented course of action. This is an attempt to curtail the spread and suppress the existing population in the Entumeni area. SASA Council established a capped containment fund in June, aimed at enabling the affected growers to work with the industry to contain the pest to the limited area where it currently exists in sugarcane.

The fact is, that with so little known about the biology and extent of the lifecycle, the scramble to establish a reliable suite of remedial actions has been very difficult. Although everyone would like to find a simple solution, the complexity of the pest's ecology has made that impossible. Identifying promising chemistries that have a limited effect on each of the lifecycle stages was relatively easy. However, achieving support and generating interest from chemical companies to promote further investment in emergency registration of products was not. Nevertheless, two products have received emergency registration, and further trials on others are in progress. While this is a step in the right direction, it is very clear that effective containment of the pest can only be achieved through a combination of several remedial measures. These include mechanical, agronomic and chemical approaches.

Of concern is the approaching spring and summer during which time the adult beetles will emerge. These beetles will commence flying in search of mates and then disperse to lay their eggs. Hence, implementation of effective methods for containing this spread has been the focus of considerable attention amongst the affected growers and SASRI specialists. Hopefully, an agreed approach to deal with this emergence will prevent dispersal out of the containment area.

Due to lack of knowledge about its biology, there is uncertainty around the delivery of definitive recommendations for eradicating and controlling the pest. For this reason, SASRI has received approval from the industry to fast-track research about the beetle's lifecycle and behaviour. Only with this knowledge will it be feasible to develop a robust and reliable set of control measures for recommendation to the industry with confidence. In the interim, the SASRI team dedicated to supporting the containment effort continue to work to identify, consider and recommend any feasible and pragmatic practices.

And even though the longhorn beetle has attracted a significant amount of attention from crop protection specialists and engineers in particular, the extent of SASRI's research efforts have recently been documented in two important reports: (1) the booklet that contains the outcomes of all closed out research projects; and (2) the RD&E Communiqués that represent the feedback on all issues raised by representatives of the regional RD&E Committees. - both worth delving into!

Another smartphone app from SASRI...

FertiCalc

Helping you calculate fertiliser distances* at the touch of a button!

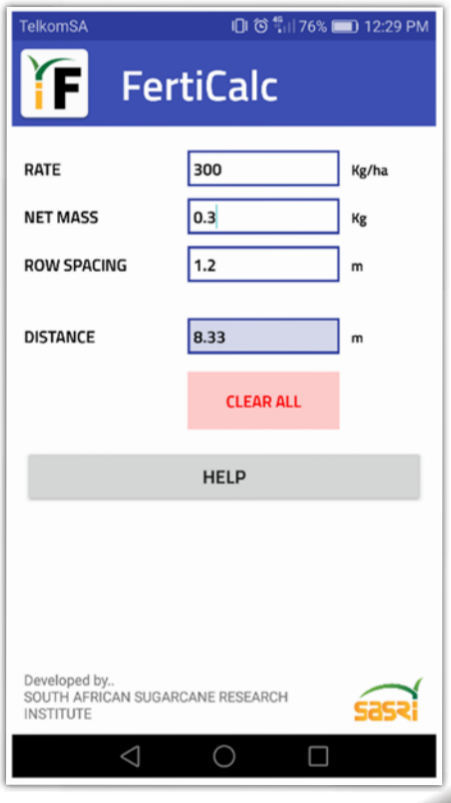
**Fertiliser distance = the distance that a given amount of fertiliser must cover to achieve the recommended rate per hectare.*

Whether you use the tin-and-string method, calibrate the flow-rate of a knapsack fertiliser applicator or some other application equipment, FertiCalc will simplify the process.

How to use the calculator

1. **Weigh the fertiliser in the container being used for application - or for calibrating application equipment.**
2. **Enter this net mass into the calculator, together with the recommended fertiliser rate and your row spacing.**
3. **The calculator will provide you with the fertiliser distance. This calculator will work for containers of any size.**

FertiCalc replaces the fertiliser distance tables previously published by SASRI. Those tables grouped fertilisers into bulk density categories, a practice now deemed unreliable as bulk densities of the same fertiliser can vary from time to time, depending on the carrier being used.



FREE DOWNLOAD

FROM

Google play

OR

iStore

RustCalc

RustCalc gives a quick indication of the economics of fungicide application for rust control.

Growers often comment that they require a certain tonnage or percent increase in tons cane to cover the cost of fungicide application. This tool provides this information, taking into account the cost and application rates of the three fungicides registered for use against the different rusts that occur in our industry.

To ensure the app remains current, the user will need to enter the latest costs for the fungicide and application method they intend to use along with relevant crop information. Outputs include total cost for the area being treated and yield increases required to break even.

When applying foliar fungicides, it is worthwhile leaving a small strip of cane untreated for comparison.

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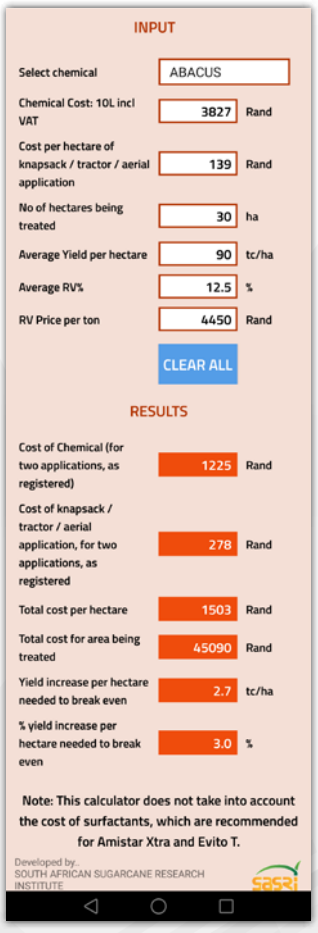
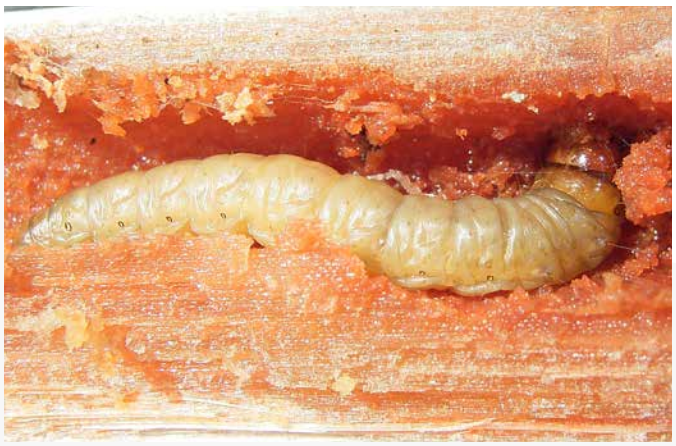


TOPICAL TIPS

Pests and diseases

- In eldana-prone areas your insecticide spray programme on carry-over cane should be well under way. Even in areas where eldana is not considered a problem, such as parts of the Midlands, growers should regularly scout their cane to be proactive and spray if necessary. Your local Biosecurity Officer or SASRI Extension Specialist can help interpret results and advise if spraying is necessary. Do not attempt to carry over cane that is already heavily infested with eldana.
- Spring and summer are when important diseases such as smut and mosaic become visible. Plan a regular roguing programme and continue this throughout the summer season. It's important to start roguing when the cane is young to be able to easily see the diseases and therefore make the practice most effective.
- Yellow sugarcane aphid can be very problematic in some fields. Thorough and careful scouting followed by prompt spraying is probably the only effective way of keeping this pest in check. In most instances, spraying is done too late and therefore not effective. For more information, see article on page 7.
- Nematodes are generally a problem on sandy soils and treatment with a nematicide can be economically rewarding. SASRI can undertake an analysis of your soils to see if problem nematodes are present.



Irrigation

- The recent drought highlighted the considerable benefits of well-planned and maintained water-efficient irrigation systems such as drip and centre-pivot irrigation. Although expensive to establish, the long-term benefits in terms of increased yields, power and other savings, should make these systems a serious consideration for growers considering a long-term future in irrigated sugarcane.

Tillage

- Chemical minimum tillage remains the safest and cheapest method of crop eradication. Wherever possible, this method must be used. Remember, minimum tillage is obligatory on erodible soils.

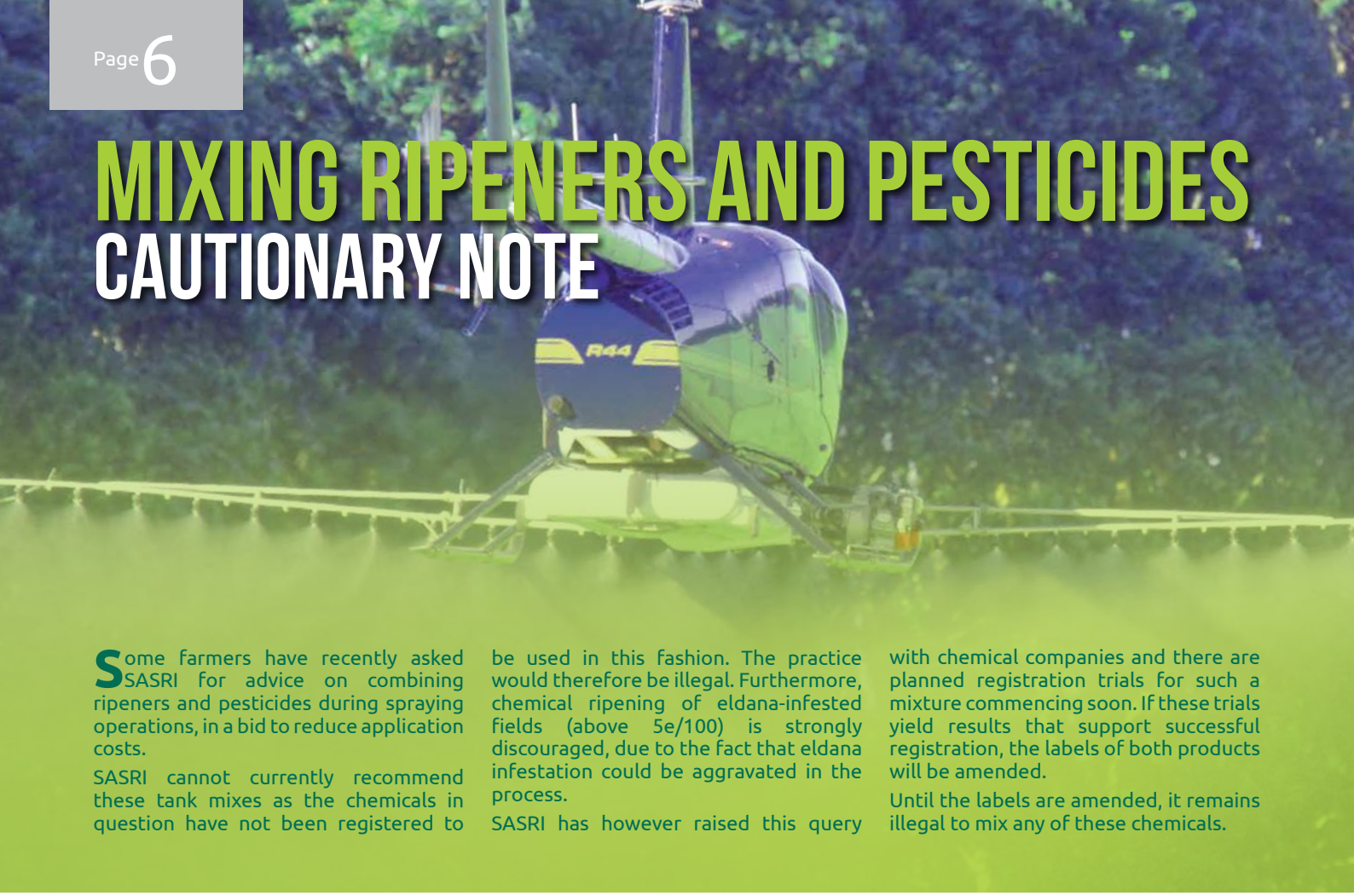
Rowan Stranack
(Extension and Biosecurity Manager)

Weeds

- The timing of herbicide application is critical. In particular, catching grass weeds when they are very small is crucial if you want to avoid problems later on in summer. Rather spray before you can see flushes of weeds. Ensure that you have sufficient spray capacity to get around the farm in a couple of weeks.
- Public enemy number one, in many parts of the industry, is *Cynodon dactylon*. This aggressive creeping grass, if left unchecked, will eventually smother the cane, forcing an early replant. Small patches of this grass, and encroachments from the field edges must be controlled. Repeated sprays of glyphosate are the only effective means of control at this stage. If Cynodon is out of control, fields may need to be replanted and longer term herbicide treatments are then necessary. Consult your SASRI Extension Specialist for advice on the procedure to be followed.

Nutrition

- On sandy soils and those prone to periodic waterlogging, split applications of nitrogen fertiliser are essential.
- Leaf samples can be taken from November onwards. The efficiency of nutrient uptake is best measured by leaf samples, enabling either top-up applications to be made or revised applications the following season.
- The recent drought period emphasised once again the importance of moisture conservation. Mulching is the most effective way to conserve moisture on rainfed sugarcane. A good thick mulch will also suppress weeds, particularly creeping grasses.
- Green manuring arrests soil degradation. Plan to incorporate an appropriate green manure crop in the summer fallow period. Consult your SASRI Extension Specialist to select and source an appropriate crop.



MIXING RIPENERS AND PESTICIDES
CAUTIONARY NOTE

Some farmers have recently asked SASRI for advice on combining ripeners and pesticides during spraying operations, in a bid to reduce application costs.

SASRI cannot currently recommend these tank mixes as the chemicals in question have not been registered to be used in this fashion. The practice would therefore be illegal. Furthermore, chemical ripening of eldana-infested fields (above 5e/100) is strongly discouraged, due to the fact that eldana infestation could be aggravated in the process.

SASRI has however raised this query with chemical companies and there are planned registration trials for such a mixture commencing soon. If these trials yield results that support successful registration, the labels of both products will be amended.

Until the labels are amended, it remains illegal to mix any of these chemicals.

STALK GRO!

SASRI has developed an easy-to-use web application which estimates monthly cane and sucrose yield increments for the various homogenous climate zones in the South African sugar industry. *StalkGro* uses information about the crop's irrigation status, total available water (TAW), crop cycle and harvest month and then selects matching results from a pre-generated dataset that was compiled using the DSSAT v4.5 Canegro Sugarcane model. This information is useful when conducting sugarcane yield estimation, mill planning, harvest scheduling, carryover field selection or chemical ripening. *StalkGro* is available on the SASRI website at www.sugar.org.za/sasri.

YELLOW SUGARCANE APHID

The most effective approach to managing yellow sugarcane aphid (YSA) is through early scouting and the use of an integrated pest management plan (IPM).

Scouting advice

Growers are advised to scout for aphids on the underside of green leaves (lower parts more favoured). Early detection is crucial if infestations are to be treated before they cause significant damage. Aphid numbers build up rapidly before symptoms become clearly visible; hence, looking only for symptoms of YSA leaf damage (i.e. yellowing, reddening and dying of leaves) is not sufficient. By the time symptoms are obvious, the damage has been done and the aphids may have disappeared or moved to other fields.

Scouting should be focused on areas of stressed cane. This may be caused by water stress or soil factors such as aluminium toxicity and poor root growth. YSA is attracted to this cane and measures can be taken to determine why the cane is stressed (e.g. leaf samples to determine if there is nutrient stress or soil samples to test for aluminium toxicity or presence of pathogenic nematodes).

Varieties that are susceptible to rust (e.g. N42) will also become stressed and may attract aphids. Therefore look out for the presence of disease symptoms. Identifying and treating the cause of stress will assist in reducing the risk of YSA infestations, as well as improve cane growth. Treating with insecticides under such circumstances is wasteful and ineffective, and will impact negatively on the natural enemies (i.e. predators such as ladybird beetles) of YSA. Insecticides should only be used where absolutely necessary.

Insecticides

Where insecticides are applied, imidacloprid should be used in the furrow at planting and acetamiprid on ratoon cane at the registered rates. Imidacloprid is rapidly broken down by ultraviolet light; therefore the furrow must be closed immediately after application. Acetamiprid (registered for ratoon crops) is much more UV tolerant and will also be effective on a young crop due to the more targeted spray applied as a full cover.

A combination product (L-cyhalothrin + chlorantraniliprole) has also been registered. New, longer-lasting chemical formulations for YSA control on both plant and ratoon crops are awaiting registration or are approaching submission for registration. The most cost effective and environmentally-friendly method of treating YSA is early detection and the treatment of patchy infestations to prevent the spread to neighbouring rows or fields.

Varieties

A recently completed project has generated YSA leaf damage categories for all commercial varieties. This will allow growers to choose more 'resistant' varieties (i.e. varieties that suffer lower levels of leaf damage) as part of an IPM plan.

Yellow sugarcane aphid leaf damage categories of commercial varieties

Low	Low-intermediate	Intermediate	Severe
N14	N12	NCo376	N16
N40	N41	N17	N19
N46	N47	N25	N36
N49		N27	N37
N53		N31	N42
N57		N35	N54
		N39	N61
		N44	
		N45	
		N48	
		N50	
		N51	
		N52	
		N55	
		N56	
		N58	
		N59	
		N62	

Note: Consult the relevant Variety Information Sheets to determine which of these varieties are recommended for early or late season planting.

Growers are strongly encouraged to adopt an IPM approach in managing YSA, with scouting for aphids being essential for early detection and control.

Malcolm Keeping
(Senior Entomologist)
Stuart Rutherford
(Principal Scientist: Integrated Pest Management)

INTEGRATED WEED MANAGEMENT OF *PARTHENIUM HYSTEROPHORUS*

Parthenium (famine weed) is a biosecurity hazard in the sugar industry, posing health risks for humans and livestock. In South Africa, it is considered so serious a threat due to its impacts on health, crop production and yield, grazing, and biodiversity conservation, that it was the first weed for which Provincial and National management strategies were developed. Implementation is undertaken by the Department of Environmental Affairs Natural Resources Management Programmes.

An Integrated Weed Management (IWM) approach for control of parthenium is the most suitable and effective approach. An IWM programme uses appropriate combinations of weed control measures, including cultural, mechanical, biological, and chemical options, for different weed and cane growth situations.

Non-chemical control measures

1. **Avoid overgrazing.** Overgrazed and degraded areas aggravate and accelerate invasion by parthenium.
2. **Revegetate to stabilise degraded areas.** Plant a competitive grass cover to prevent parthenium seeds establishing on degraded land and roadsides outside of sugarcane fields.
3. **Plant sunflower seed and use the plants as a cash crop and a green manure.** This has proven effective in inhibiting growth of parthenium in Australia.
4. **Protect verge grass cover from hot burns.** Aim to apply a controlled and cooler burn. Burning accelerates the colonisation of parthenium. During harvest, burning can kill grass cover on verges and opens up the area for parthenium. The effect of burning results in loss of diversity and gradual replacement of local species by noxious weed species such as *Lantana camara* and parthenium.
5. **Implement husbandry practices.** A combination of hand hoeing twice and growing a smother crop e.g. cowpea, can suppress parthenium. Sunflower crops also suppress the weed population through competition. The weed should be ploughed under or removed manually before setting of flowers.

Biological control measures

Biological control efforts to control this weed are well advanced in South Africa. A national biocontrol research and implementation programme funded by the DEA: NRMP is led by the ARC-PPRI Weeds Research Programme at Cedara (Lorraine Strathie, StrathieL@arc.agric.za) and Stellenbosch (Alana den Breeÿen, DenBreeyenA@arc.agric.za).

All four of the host-specific biological control agents (see photos) have established in both Mpumalanga and KwaZulu-Natal. The larval stage of each insect agent causes damage through feeding on the leaves, stems or seeds. Mass rearing of biocontrol agents is undertaken by the ARC-PPRI and the SASRI Weed Biocontrol Unit (Des Conlong, Des.Conlong@sugar.org.za). Two further agents, a root-crown boring moth and a stem-galling moth are being assessed by the ARC-PPRI for their suitability for release in South Africa.

Listronotus
Stem boring weevil

Smicronyx
Seed feeding weevil

Zygogramma
Leaf feeding beetle

Puccinia xanthii
Fungus leaf pathogen

Photo credit: L. Strathie and A. den Breeÿen, ARC-PPRI.

Chemical control measures

Post-emergence

Controlling early stages of growth (rosette stage) is easier than older plants (bolted plants) and flowering plants. Flowering can start within four weeks of seedling emergence. An additional advantage of early control is that seeds are not formed to enter the soil seedbank.

Late post-emergence growth stage

This is a crisis management situation and means yields are likely to have been lost. Where possible, slash plants before spraying herbicides on shorter regrowth. Options to control large parthenium plants include:

- Glyphosate application: suitable for dense parthenium growing on degraded verges and roadsides prior to planting competitive grasses. It will kill grasses so direct sprays away from sugarcane. All spot-spray applications should be shielded to protect established grasses. Glyphosate has no residual action so will not affect seeds in soil. This method is proving very successful for dense parthenium on the Makhathini Flats, where good results have been observed on verges.

- There is at present one registered metsulfuron-methyl product for parthenium control in areas outside cane fields. This will not harm established grass cover when used correctly.

- If growers are planting vegetables e.g. cabbages, they could consider using dribble bar application with glyphosate to the rosette stage of parthenium at 21 days after planting vegetable seedlings. The dribble bar has proved effective for the rosette growth stage of parthenium. NB: training is required for correct application and protection of vegetables.

Agrochemical companies are also actively involved with their new product combinations. Two current SASRI trials in progress at Pongola involve five new product combinations for residual control in cane fields. A SASRI awareness campaign was initiated in 2010 with the preparation of posters and information for growers on parthenium. Posters are available from the SASRI library (library@sugar.org.za).

More about parthenium

A major problem is the rapid growth and flowering of this weed, with a very high output of seed, around 15 000 per plant, especially under warm, wet conditions. It is spread via water, animals, vehicles, machinery and seeds can survive at least six years buried in soil.

Approximately 85% of Mpumalanga is at threat of invasion and the only areas in southern Africa unlikely to be invaded are those with less than 400 mm of rain per annum.

Peta Campbell
(Weed Scientist)

Lorraine Strathie
(ARC-PPRI)

THRIPS

SASRI advocates the use of integrated pest management (IPM) to manage sugarcane thrips in the industry. At present, this includes:-

- using more 'resistant' varieties (i.e. varieties that show lower levels of leaf damage from thrips feeding),
- planting or ratooning cane several months before or after those months characterised by high thrips population numbers during summer, and
- the use of insecticides when necessary.

A recently completed project has generated thrips leaf damage categories for all commercial varieties.

Leaf damage categories

Varieties which are susceptible (intermediate to severe leaf damage) to thrips can be planted or ratooned in late summer (February/March), autumn, or in early August. This will ensure young crops (1-3 months) are not present over the thrips peak from November to January. Young plant crops of susceptible varieties are especially vulnerable during this period.

Sugarcane thrips leaf damage categories of commercial varieties.

Low	Intermediate	Severe
N12	N17	N16
N14	N19	N21
N27	N25	N23
N39	N28	N26
N40	N31	N30
N41	N36	N32
N46	N37	N33
N47	N42	N34
N49	N43	N35
N52	N44	
N53	N45	
N55	N48	
N56	N50	
N57	N51	
N58	N59	
NCo376		

Note: Consult the relevant Variety Information Sheets to determine which of these varieties are recommended for early or late season planting. N54, N61 and N62 are awaiting trial results.

Available insecticides

Where young crops will be growing over summer, an insecticide (imidacloprid, at planting in the furrow, or acetamiprid on ratoon crop canopies) can be applied at recommended rates to protect the crop. This is especially relevant to susceptible varieties. Varieties that suffer less leaf damage can also be treated if the crop will be in the early growth stages over summer. It is extremely important to immediately close the furrow after applying imidacloprid to prevent the rapid breakdown by ultraviolet light. If this is not done, the insecticide will lose its effectiveness and its application will be wasted. Acetamiprid (registered for ratoon crops) is more UV tolerant and is most effective on a young crop when a targeted spray is applied to the leaf spindle and youngest leaves where thrips reside. New, longer-lasting chemical formulations on both plant and ratoon crops are awaiting registration or are approaching submission for registration.

Rainfed field trials have shown yield increases of between 18.0 and 26.8% in tons cane/ha, and between 16.2 and 24.0% in tons sucrose/ha from insecticide application. However, due to the plant physiological growth promoting properties of imidacloprid, in the absence of pests, the actual impact of thrips can be overestimated. Nonetheless growers are encouraged to adhere to these principles as part of an IPM plan.

Malcolm Keeping
(Senior Entomologist)

Stuart Rutherford
(Principal Scientist: Integrated Pest Management)

TIPS FOR GROWING LUCERNE AS A GREEN MANURE!

Sugarcane growers recently asked about the potential use of Lucerne as a promising green manure crop during a sugarcane fallow. Here are some tips and contacts related to this subject:

Characteristics

- Lucerne *(Medicago sativa)* is a deep-rooted, perennial pasture legume.
- Once established, lucerne has good drought tolerance and is well suited to irregular rainfall patterns, but it will appear to go dormant during extended dry periods. It can grow in areas receiving as little as 325 mm annual rainfall.

Production Conditions

- Presence of soil moisture is essential for establishment (end of March - early April).
- Acid soils are unsuitable; sub-soil acidity will limit rooting depth and drought tolerance.
- Humid environments are unfavourable due to fungal diseases.

Lucerne Husbandry

- Good seedbed preparation and stringent weed control programmes are essential.
- Water availability, ambient temperature and cultivar choice greatly influence crop establishment, survival and productivity.
- Cutting schedules must be guided by active growth-stage monitoring.
- Hay production must be guided by precise quality monitoring.

Resources available

- **National Lucerne Trust at** www.lusern.org
- **Cedara**: The grassland science section at Cedara have/are conducting various trials on Lucerne production in KwaZulu-Natal and are able to provide specialist advice as required. The contact person is Mrs Derran Nash on 033 3559256.
- **KZNDAE**: A presentation on lucerne production and associated economics is available from Ntokozo Mdlalose (Agricultural Econonmist and uThungulu Agricultural Advisor) at ntokozo.mdlalose@kzndae.gov.za
- **Grootfontein Agricultural Development Institute at** http://gadi.agric.za/articles/Agric/lucerne.php
- **A comprehensive summary of information** from The National Lucern Trust is available in SASRI's 2017 RD&E Communiqué document available from your Extension Specialist or RD&E Committee.

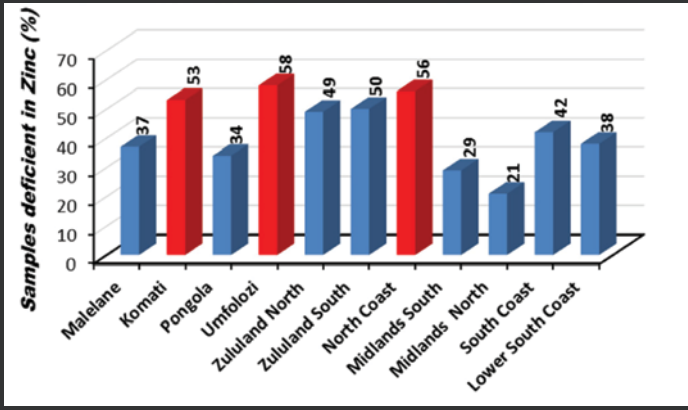
ZINC DEFICIENCIES:

OCCURRENCES, CAUSES AND REMEDIAL MEASURES

Sandile Mthimkhulu *(Assistant Research Officer)*
Neil Miles *(Senior Soil Sceintist)*

Zinc (Zn) is an essential micronutrient for all crops; it regulates plant growth and the activity of various enzymes. Inadequate supplies of this nutrient hinder protein synthesis in plants leading to reduced crop growth and yields.

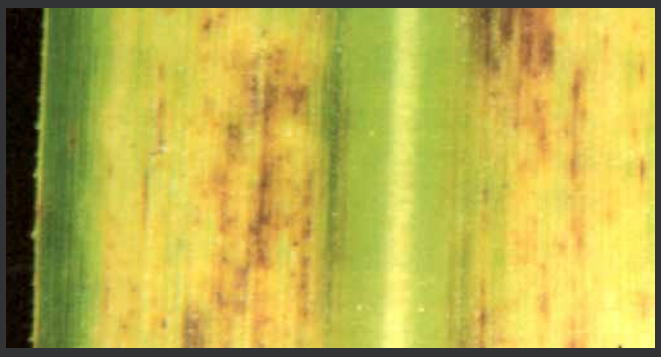
Amongst the micronutrients, Zn is the one most frequently deficient in sugarcane soils. Zinc deficiencies in the South African sugar industry were first discovered in the early 1960s, and they were mainly limited to sandy soils as well as the inherently acidic soils of the Natal Midlands and Eshowe areas. However, recent investigations show that Zn deficiencies are widespread. A recent study looked at Zinc deficiencies in samples submitted to FAS from all sugarcane-growing regions over the last few years. The highest incidences were recorded at Umfolozi (58%), Komati (53%) and on the North Coast (56%). These findings suggest that Zn deficiencies are likely to be impacting yields on a wide scale in the industry.



Above: The percentage of soil samples with zinc deficiencies.

The solubility (and hence plant-availability) of Zn in soil decreases sharply with increasing soil pH. Thus, excessive applications of lime may induce Zn deficiencies on initially acid soils, while the neutral to alkaline soil pH's in the northern irrigated regions account largely for the widespread deficiencies of the nutrient in those areas. Furthermore, "blanket" applications of high rates of P fertilisers tend to induce Zn deficiencies through the precipitation in the soil of Zn-phosphate compounds of low solubility. Continuous use of high grade fertilisers containing little or no Zn, coupled with the removal of organic matter (cane-tops or trash) contribute to the development of Zn deficiencies.

In the sugarcane crop, deficiency symptoms generally appear in the younger leaves and may take the form of: (a) a band of yellowing that normally occurs in the margins of the leaf, (b) reduced tillering, shorter internodes and thinner stalks, and (c) red lesions associated with fungus that tends to proliferate on the Zn deficient leaves. Importantly, symptoms of Zn deficiency in the crop become apparent only where the nutrient is severely deficient, and under this condition, the lost yield can no longer be recovered in a particular season. It is thus necessary for growers to constantly monitor the Zn nutritional status through regular soil and leaf testing, and to correct deficiencies before they impact production.



Above: Leaf symptoms of Zn deficiency.

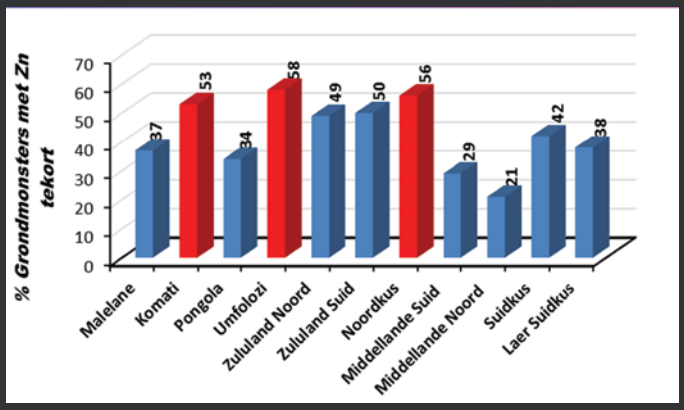
Zinc deficiencies can be addressed by the application of NPK or compound fertilisers containing added zinc. However, a higher concentration than the normal 0.5% generally contained in these products is usually necessary to effectively correct deficiencies. The blends of fertiliser with higher Zn concentrations are normally available on request. Alternatively, the direct application of a Zn product such as zinc sulphate may be necessary. It is worth noting that organic materials such as manures, filtercake, fly ash, etc. contain large reserves of Zn, and are effective in improving plant-available supplies of Zn in the soil. Since Zn is highly immobile in soil, surface applications of Zn are often not well utilised by the crop; incorporation into the soil at planting of adequate amounts of Zn is thus a best management practice.

SINK TEKORT:

VOORKOMS, OORSAKE EN REGSTELLENDE MAATREËLS

Sink (Zn) is 'n noodsaaklike mikro-element vir alle gewasse aangesien dit plantgroei asook die aktiwiteit van verskeie ensieme in plante reguleer. Onvoldoende voorsiening van hierdie voedingstof belemmer proteïensintese in plante wat gewasgroei en opbrengs verminder.

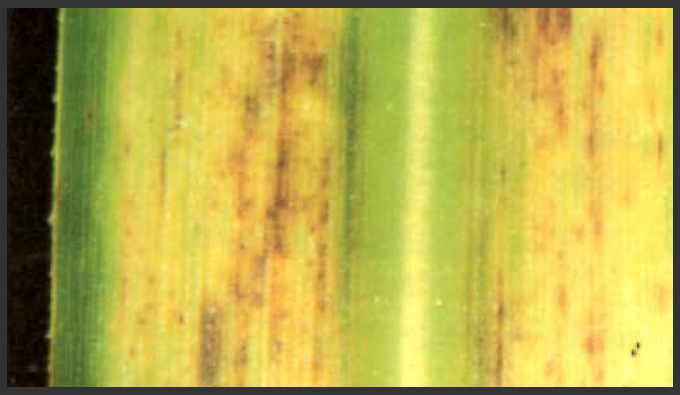
Inagname alle mikro-nutriente in grond is Zn die mikro-element wat die meeste van die tyd tekorte toon. Zn tekorte in die Suid Afrikaanse suikerindustrie is vir die eerste keer in die vroeë 1960's hoofsaaklik in sanderige- en die inherente suur grond van die Natal Middellande en Eshowe gebied waargeneem. Onlangse ondersoeke toon egter dat Zn tekorte redelik wyd verspreid voorkom. 'n Onlangse studie waar daar gekyk is na Zn tekorte in alle grond monsters wat na SASRI se Fertilizer Advisory Services laboratorium (FAS) gestuur is vir die afgelope paar jare, dui aan dat die hoogste voorkoms van Zn tekorte in Umfolozi (58%), Komati (53%) en op die Noordkus (56%) voorkom. Hierdie bevindinge dui daarop dat Zn tekorte in die toekoms waarskynlik 'n grootskaalse invloed op oes opbrengste in die suikerindustrie gaan hê.



Persentasie van grond monsters met sink tekorte in verskillende areas van die suikerindustrie.

Die oplosbaarheid (en dus plantbeskikbaarheid) van Zn in die grond daal skerp met die toename in grond pH. Oormatige toediening van kalk kan Zn tekorte op aanvanklike suur gronde veroorsaak, terwyl die neutrale tot alkaliese grond pH in die noordelike besproeiingsgebiede grootliks vir die wydverspreide tekorte van die voedingstof in daardie gebiede verantwoordelik is. Daarbenewens is die toepassing van 'n "kombers" -toediening van hoë dosisse P-bemestingstowwe geneig om Zn tekorte te veroorsaak deur presipitasie in die grond van Zn-fosfaatverbindings met lae oplosbaarheid. Deurlopende gebruik van hoëgraadse kunsmisstowwe wat min of geen Zn bevat nie, tesame met die verwydering van organiese materiaal (suikerriet toppe of droë plant materiaal) dra by tot die ontwikkeling van Zn tekorte.

In suikerriet kom die simptome van voedingstekorte meestal voor in die jonger blare en tekens hiervan kan die volgende vorms aanneem: (a) 'n geel strook wat normaalweg op die blaar lamina weerskante van die midrib voorkom, (b) afname in die hoeveelheid systingels (tillers) wat gevorm word, korter internodes en dunner stokke, en (c) rooi letsels wat met 'n swam infeksie geassosieer word en wat veral op die blare met die Zn tekorte groei. Zn tekort simptome raak erger waar voedingstowwe baie laag is. Onder hierdie toestande kan die opbrengs wat alreeds verlore is, nie meer in 'n bepaalde seisoen herwin word nie. Dit is dus noodsaaklik dat boere die sink vlakke gereeld monitor deur gereeld grond- en blaarmonsters te neem voordat dit produksie beïnvloed.



Suikerriet met 'n Zn tekort.

Zn tekorte kan aangespreek word met die toediening van NPK of saamgestelde bemestingstowwe wat ekstra Zn bevat. 'n Hoër konsentrasie as die normale 0.5% wat gewoonlik in hierdie produkte voorkom is nodig om die tekorte effektief reg te stel. Mengsels van bemestingstowwe met 'n hoër konsentrasie Zn is normaalweg op aanvraag beskikbaar. Alternatiewelik is die direkte aanwending van 'n sinkproduk soos sinksulfaat nodig. Organiese materiale soos mis, filterkoek en vliegas wat hoë sinkreserwes bevat, is effektief in die verbetering van die plantbeskikbare voorrade van Zn in die grond. Aangesien Zn hoogs onbeweeglik in grond is, word oppervlak toepassings van Zn nie goed deur plante opgeneem nie. Inkorporering van genoegsame hoeveelhede Zn in die grond wanneer daar geplant word, is dus 'n beter bestuurspraktyk.

CHEMICAL RIPENER RECOMMENDATIONS
FOR IRRIGATED VARIETIES N49, N53 AND N57

Field trials conducted at the SASRI research station in Pongola over the last four years have resulted in the formulation of chemical ripener recommendations for irrigated varieties N49, N53 and N57.

The response of these varieties to ETHEPHON, FUSILADE FORTE and the combination ("piggy-back") treatments were evaluated against an unsprayed control in four successive ratoon crops cultivated under surface drip irrigation and harvested at a crop age of 12 months on an April cutting cycle. Variety N36 was included in the trial as a reference with a known positive response to the combination treatment.

The ETHEPHON, FUSILADE FORTE and combination treatments were applied at 12 and 6 week intervals prior to harvest. At the time of ETHEPHON and FUSILADE FORTE application whole-stalk juice purities ranged between 51 – 65% and 76 – 79% respectively, which were well below the recommended upper threshold limits of 75% (ETHEPHON) and 85% (FUSILADE FORTE). The effects of these treatments on cane quality (RV%) and yield (cane and RV) were statistically analysed and the data used to estimate gross margin monetary returns (R/ha) in comparison with the untreated control.

Product and aerial application costs (R/ha), including the miller subsidy, together with the SA Cane Growers' general regional costs (R/ton) for manual cane harvesting, cane extraction from the field, and transport to the mill were used to estimate gross margin returns at an RV price of R4 995/ton.

The main findings obtained across the four ratoons, in comparison to the untreated control, were:

- In the reference variety N36, gross margin returns in the ETHEPHON, FUSILADE FORTE and combination treatments were R7 170/ha, R10 958/ha and R14 953/ha respectively, which is in agreement with its known positive response to the combination treatment.
- Cane quality (RV%) in varieties N49, N53 and N57 was significantly increased in all ripener treatments by between 0.9 and 3.4 percentage points.
- Cane yield was not significantly decreased by the ripener treatments, except in two cases. In varieties N49 and N53 the combination treatment resulted in cane yields that were 13.2 and 12.1 t/ha lower than the control.

- Estimation of gross margin returns revealed the highly profitable nature of chemical ripening in all varieties. Gross margin returns in varieties N49, N53 and N57 ranged between R2 690 – R17 094 /ha depending on treatment.
- In varieties N49 and N53, gross margin returns achieved with the best single treatment exceeded those achieved with the combination treatment (due to above mentioned cane yield reduction) by between R1 874 – R3 600/ha. However in variety N57 the combination treatment resulted in a gross margin return that exceeded the best single treatment by R4 377/ha.

These findings were used to formulate a table of ripener recommendations for varieties N49, N53 and N57 (below).

The reaction of varieties to the new ripener, MODDUS, is currently being investigated in field trials and recommendations will be communicated to growers as they become available.

Riekert van Heerden
(Senior Scientist: Sugarcane Physiology)

Recommended ripener treatment choices, based on RV% responses and gross margin returns, for varieties N49, N53 and N57

Variety	Treatment choice		
	ETHEPHON	FUSILADE FORTE	Combination
N49	Yes	Yes	No
N53	Yes	Yes	No
N57	Yes	Yes	Yes*

*Exceptional response to combination treatment.

Veldproewe by die SASRI proefplaas te Pongola gedurende die afgelope vier jaar het gelei tot die formulering van chemiese rypmaker aanbevelings vir besproeiings-variëteite N49, N53 en N57.

Die reaksie van hierdie variëteite op ETHEPHON, FUSILADE FORTE en die kombinasie ("piggy-back") behandeling, teenoor 'n onbehandelde kontrole, is in vier opeenvolgende 12-maande ratoon gewasse ondersoek wat op 'n April kapsiklus onder oppervlak drupbesproeiing verbou is. Variëteit N36, met sy bekende positiewe reaksie op die kombinasiebehandeling, is in die proewe as 'n standaard ingesluit.

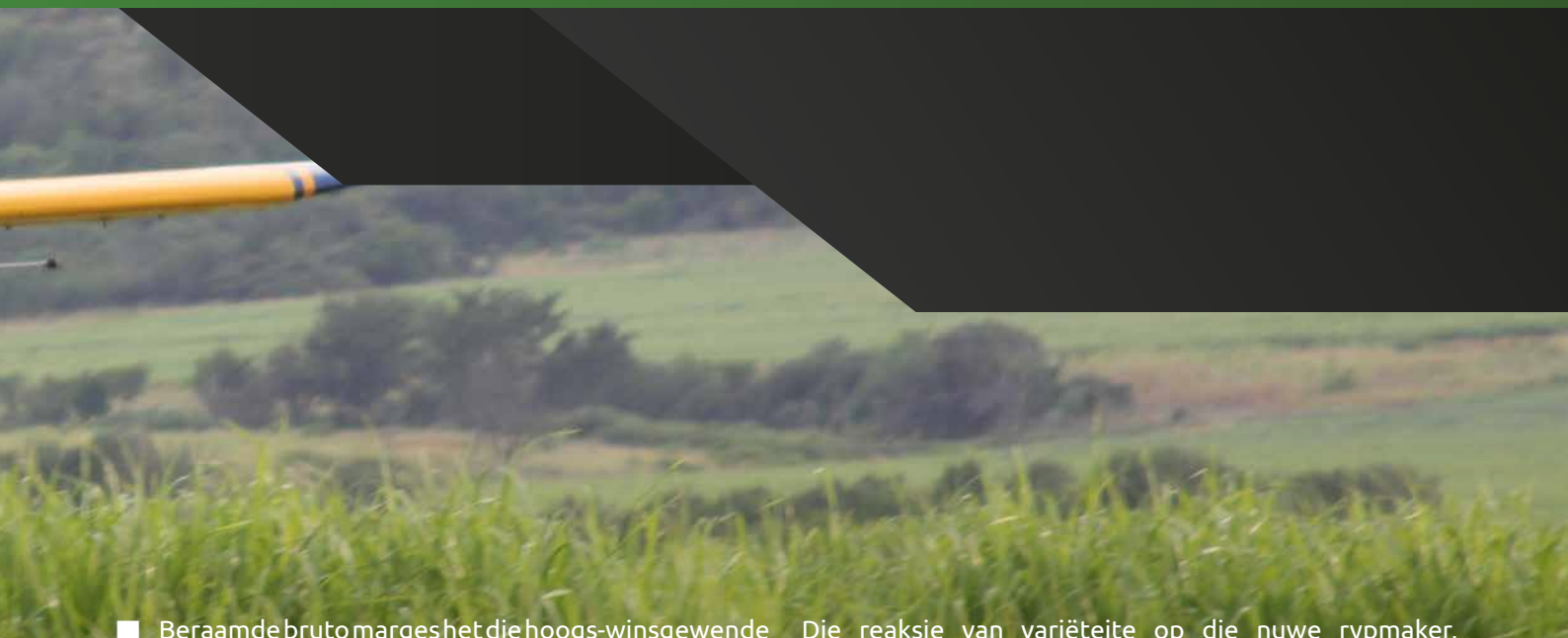
Die ETHEPHON, FUSILADE FORTE en kombinasie behandeling is onderskeidelik teen 'n 12 en 6 week spuit-tot-oes interval voor die kapdatums toegedien. By toediening van ETHEPHON en FUSILADE FORTE het die heelstronk sapsuiwerheid van die riet gewissel tussen 51 – 65% en 76 – 79% onderskeidelik, wat heelwat laer is as die aanbevole boonste limietwaardes van 75% (ETHEPHON) en 85% (FUSILADE FORTE). Die effek van hierdie behandelings op stronkkwaliteit (RV%) en opbrengs (stronk en RV) is statisties ontleed en die data gebruik om bruto marge wins (R/ha), relatief tot die onbehandelde kontrole, te beraam.

Produk- en toedieningskoste (R/ha), insluitend die meulenaarsubsidie, tesame met die SA Rietkwekers Vereniging se algemene streekskostes (R/ton) vir kap, rietekstraksie uit land, en vervoer na die meul is gebruik om bruto marge wins teen 'n RV prys van R4 995/ton te beraam.

Die hoofbevindinge, saamgevat oor al vier ratoene, in vergelyking met die onbehandelde kontrole was:

- In die standaard-variëteit N36 was bruto marge wins in die ETHEPHON, FUSILADE FORTE en kombinasiebehandeling onderskeidelik R7 170/ha, R10 958/ha en R14 953/ha, wat die bekende positiewe reaksie van hierdie variëteit teenoor die kombinasiebehandeling bevestig.
- Stronkkwaliteit (RV%) in variëteite N49, N53 en N57 was betekenisvol verhoog deur alle rypmakerbehandelings met tussen 0.9 en 3.4 persentasiepunte.
- Stronkopbrengs was nie betekenisvol deur rypmakerbehandeling verlaag nie, behalwe in twee gevalle. In variëteite N49 en N53 het die kombinasiebehandeling tot 'n verlaging in stronkopbrengs van onderskeidelik 13.2 en 12.1 t/ha, relatief tot die kontrole, aanleiding gegee.

CHEMIESE RYPMAKER AANBEVELINGS
VIR BESPROEIINGS-VARIËTEITE N49, N53 EN N57



- Beraamde bruto marges het die hoogs-winsgewende aard van chemiese rypmaking in al die variëteite aangetoon. Bruto marge wins in variëteite N49, N53 en N57 het tussen R2 690 – R17 094 R/ha gewissel, afhangende van die behandeling.
- In variëteite N49 en N53 was bruto marge wins met die beste enkelbehandelings tussen R1 874 – R3 600/ha meer gewees as met die kombinasiebehandeling (a.g.v. bogenoemde vermindering in stronkopbrengs). In variëteit N57 egter was bruto marge wins met die kombinasiebehandeling R4 377/ha meer gewees as met die beste enkelbehandeling.

Bogenoemde bevindinge is aangewend om die volgende rypmaker aanbevelings vir variëteite N49, N53 en N57 te formuleer:

Die reaksie van variëteite op die nuwe rypmaker, MODDUS, word tans in veldproewe ondersoek en aanbevelings sal aan kwekers gekommunikeer word soos wat dit beskikbaar word.

Riekert van Heerden
(Senior Scientist: Sugarcane Physiology)

Aanbeveelde rypmakerbehandeling keuses, gebaseer op RV% reaksie en bruto marge wins, vir variëteite N49, N53 en N57.

Variëteit	Behandeling keuse		
	ETHEPHON	FUSILADE FORTE	Kombinasie
N49	Ja	Ja	Nee
N53	Ja	Ja	Nee
N57	Ja	Ja	Ja*

*Uitsonderlike reaksie op die kombinasiebehandeling.

THE EFFECT OF
HERBICIDE RESIDUES ON COVER CROPS

Growers can experience poor growth of cover crops in some fallowed fields. In some instances, this may be attributed to residual effects of herbicides used during the previous crop.

Reasons why herbicides damage cover crops in some fields include the following:

- Broadleaf herbicides can harm broadleaf crops whereas grass killers harm monocotyledon crops like maize, especially if these are planted too soon after herbicide application.
- An impermeable layer can prevent normal leaching of a product, and during dry conditions some products can rise upwards again due to capillary action and reach crop roots.
- Water-logging or poor drainage in some areas of fields can lead to low oxygen levels. This will slow down or halt normal aerobic microbial degradation of the product. In addition, if soil is waterlogged there may be an abnormal or uneven distribution of pre-emergent products.
- Herbicides can persist in a drought year when compared with wet years, delaying the potential planting date of crops.
- Over-application will occur where directions on herbicide labels that stipulate no overlapping spray swaths, were not followed. In addition, the spray operator might have over-sprayed after refilling the knapsack, resulting in localised over-dosage and crop damage.
- In some cases, the re-application of pre-emergence products like hexazinone, tebuthiuron, isoxaflutole, amicarbazone, Dropzone or diuron too soon under some conditions might result in an over-dosage, especially in poorly drained clay soils where the first application has not leached or undergone normal microbial degradation.
- The product can be lost when there is surface soil loss. Soil erosion will result in the product being carried away from the target site. Where it settles acquires an over-dosage that can affect the crop.
- Recent liming can desorb some products from soil particles and product can become more available for root uptake by the crop.
- Soil crusting can lead to areas of herbicide accumulation.

Testing for herbicide residues in an accredited analytical laboratory is time-consuming and expensive. An alternative is to keep good field records of applied herbicide programmes. In addition, follow label Use Restrictions regarding any waiting periods for planting following crops (or harvest or grazing).

Selecting legumes after herbicide application

Legumes are popular green manures. These plants will contribute nitrogen and organic matter to the soil to improve soil health by increasing soil microbe populations, earthworm activity, and water holding capacity. They assist in suppressing weeds, allow selective grass killing products to be used and reduce the amount of inorganic fertiliser required, thereby saving costs.

There are however, some important points to consider:

- Legumes are highly sensitive to soil acidity so remedial treatment with gypsum and lime are highly beneficial to their growth.
- Recent liming can desorb some products and harm cover crops. Follow label recommendations and consult your local agricultural consultants.
- Not all legumes are equally tolerant to herbicide.
- Plant for optimum growth e.g. season, soil types, for best organic material production, root nodule formation and weed suppression.
- Any selected summer and winter crops should be non-invasive for the following crop e.g the recommendation might be to harvest before seed production. Refer to the SASRI Green Manure manual.

It is important to know which herbicides affect legumes and how long to wait before planting. Refer to the following table for legume cash crops.

Waiting time (months) after last herbicide application and before growing legumes

Information Source	Herbicide	Beans		
		dry	sugar	soya
Acetochlor 900 EC (Villa)	Acetochlor 900	0	0	0
Lasso EC (Monsanto)	Alachlor	0	0	0
AVCASA 2015	Ametryn 500	3	3	3
Direction 700 WDG	Amicarbazone	12	12	12
Atrazine 500 SC (GAP)	Atrazine	18	-	18
Elegance Super	Chlorimuron-ethyl	18	18	18
AVCASA 2015	chlorimuron-ethyl/metribuzin	18	18	18
Various labels	Diuron	Legumes not listed. Look at partner product.		
EPTC S EC (Meridian)	EPTC	Initial retardation may occur but plants will develop normally.		
Fusilade Forte	Fluazifpop-butyl	0	0	0
Bound (Villa)	Glufosinate ammonium	0	0	0
AVCASA 2015	Glyphosate (e.g. Roundup)	3-21 days for transplants and seedlings.		
AVCASA 2015	Halosulfuron	3	3	3
AVCASA 2015	Hexazinone (e.g. Velpar)	12	12	12
Dropzone	Hexazinone + clomazone	12	12	12
BOBCAT COMBI 600 WG	Hexazinone + diuron	At least 12 months.		
SASRI	Imazapyr	Under investigation by SASRI.		
AVCASA 2015	Isoxaflutole	12	12	12
SASRI Herbicide Guide	MCPA	Beware drift. A non-residual broadleaf killer (5-6 weeks). Look at partner product.		
AVCASA 2015	Mesotrione	9	-	9
AVCASA 2015	Mesotrione+S-metolachlor+terbuthylazine	9	-	-
Claw	Metazachlor	Used for pre-emergence weed control in dry beans. Read label use restrictions.		
Platinum (Villa)	Metolachlor	Damages dry beans in some soils and weather conditions. Read label use restrictions.		
AVCASA 2015	Metribuzin	12	12	6
Metrad (Arysta)	Metribuzin + diuron	12	12	12
SASRI Herbicide Guide	MSMA	Beware drift. Non-residual post-emergence grass killer (5-6 weeks). Look at partner product.		
SASRI Herbicide Guide	Paraquat	Beware health and safety. Non-residual post-emergence product (5-6 weeks). Look at partner product.		
Farmuron	Paraquat + diuron	Legumes not listed. Look at partner product.		
AVCASA 2015	Pendimethalin	0 (Phaseolus species)	0 (Phaseolus species)	0
Armadillo	Sulcotrione + atrazine	3	-	3
Avon 750 WDG	Sulfentrazone WDG	24	24	24
AVCASA 2015	Tebuthiuron	24	24	24
Garlon 480 EC	Triclopyr	Do not apply to areas that may be rotated to any broadleaf crop.		

The table was derived from stated herbicide labels, and Appendix E, pages 130-138 in van Zyl K (2015). A Guide for the control of weeds in South Africa. Published by AVCASA.

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Review

The industry has had mixed monthly rainfall patterns thus far this year. January rainfall was near normal, with the exception of South Coast (below normal) and Mpumalanga (above normal). In February and May, rainfall was well above normal across the industry (Fig. 1). The rest of the months (March, April, June and July) were predominantly very dry. Overall, the industry average total rainfall from January to July was 116% of the long term mean.

The good rains in February and May significantly improved the irrigation water supplies in Pongola and Mpumalanga. However, dam levels in Zululand remained very low and severe irrigation water restrictions are still in place in the affected areas.

Outlook

The El Niño-Southern Oscillation (ENSO) system is currently in a neutral phase, and is projected to remain in this phase during this spring and into the 2017/18 summer. A neutral ENSO is generally associated with normal summer rainfall for the industry.

T***he South African Weather Service (SAWS), International Research Institute for Climate and Society and European Centre for Medium-Range Weather Forecasts*** all predict near normal spring and early summer (October to December) rainfall.

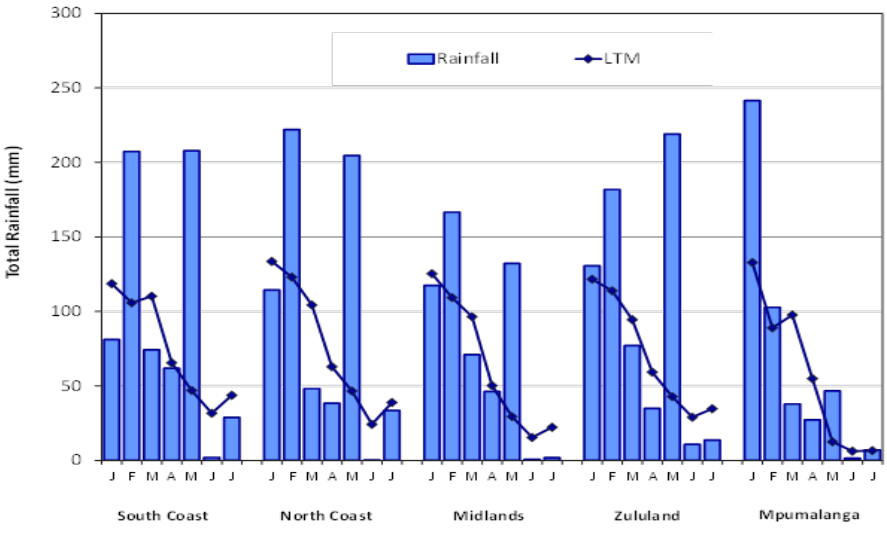

Figure 1: Regional average monthly total rainfall from January to July, 2017 compared to the monthly long term mean (LTM).

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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Layout & Design: *Wayne Mthembu*

Afrikaans translation: *Abraham Singels, Marius Adendorff, Adrean Naude & Tania van Antwerpen*
Publication Details: *Published three times a year, usually January, May & September*

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