

# THE Link

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## Pest, Disease and Variety Control

Also in this issue...

### Suikerriet kwaliteit

Daar is verskeie belangrike agronomiese praktyke wat uitgevoer moet word terwyl die riet in die land geproduseer word om te verseker dat die suikerriet altyd die beste optimim RV waarde sal bevat wanneer dit na die meul geneem word. (Page 10).



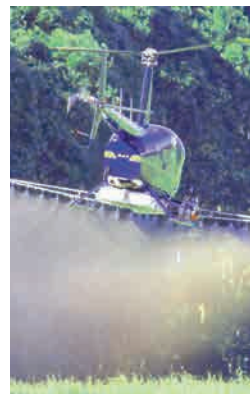
### Seedcane

Establishing a seedcane nursery and synchronising its outputs with the farm's requirements can be a complex process. Seedcane production should therefore be regarded as a core component of all sugarcane production planning (Page 12).



### Ripeners

Research results show that there are no negative residual effects in the subsequent ratoon crops where Fusilade Forte (and generics like Volley and Fluazifop) are used in accordance with label instructions (Page 18).



*Since the beginning of April, the industry's Pest, Disease and Variety Control function has been incorporated into SASRI's operations. This new centralised service has several advantages. While these changes are largely at an administrative and operational level, the committees in the region will continue to function as before. For more information read the article on page 14.*



Unlocking the potential of sugarcane



# Message from the... DIRECTOR

In 1925, the foresight of the sugar industry leaders led to the establishment of the Experiment Station which was aimed at providing technology solutions tailor-made for sugarcane growers. Now in its 90th year, SASRI has a remarkable history of serving the industry and developing innovative and useful solutions for all aspects of sugarcane agriculture. During this time SASRI has made a number of significant breakthroughs, the most notable being the development of a system for plant breeders worldwide, that enabled production of viable pollen under controlled conditions of light and temperature. This system facilitated production of improved varieties for the South African industry, with superior pest and disease resistance characteristics and enhanced yield potential. Since then, a number of additional innovative R&D achievements have allowed SASRI to continue

serving the industry and be responsive to its technological needs, simultaneously ensuring that it retains its world class position amongst sugarcane research institutes.

However, the landscape in which SASRI operates has changed dramatically since 1925, requiring SASRI to adapt its research and responsiveness to ensure that it remains relevant in the delivery of advice, technologies and recommendations. Things have changed from the early years where yields steadily increased in response to every small recommendation and improvement in technology. In the past decade, smaller and smaller gains have been evident despite the significant number of new outputs from SASRI. This is not unique to sugarcane or to South Africa, and is a common characteristic of mature industries.



*Dr Carolyn Baker*

Of course, climate plays a significant role in enabling productivity, but it is the agronomic conditions that have changed as a consequence of continual production from the land. Innovative research that is linked to a far deeper understanding of the crop itself is now required to enable step-change improvements in yield.

Nevertheless, the solution to improving yields and enhancing productivity does not lie exclusively within the nature of the new technologies that are applied and implemented, but demands that closer attention be paid to the environment in which the crop is grown. It is well known that with continuous cropping the soils take a beating and require







“Application of new technologies will only reach their full potential if the basics are right: correct soil management, appropriate variety choice, good quality seedcane and sound agronomic practices.”

the balance to be restored. Hence with the best will in the world, application of new technologies will only reach their full potential if the basics are right: correct soil management, appropriate variety choice, good quality seedcane and sound agronomic practices. Therefore, the role and responsibility of each grower cannot be emphasised enough. Every farming operation is unique; identifying and engaging with the key practices that limit production is the first step that growers should take if they are to achieve improved yields.

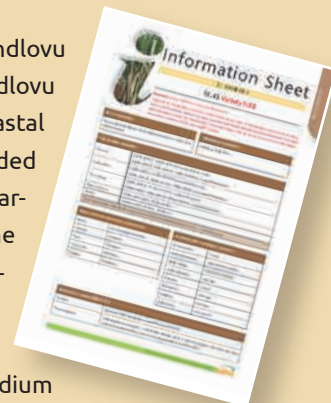
While sugarcane is a very resilient crop, gone are the days when good yields could be achieved with little attention to detail. I will never forget a comment from a grower a few years back: “If I have to pay that much attention to detail, I might just as well grow maize”. The fact that sugarcane yield improvement is only going to be attained through at least some attention to detail was amply described in a recent talk by a North Coast grower who described the secrets to his success at SASRI’s annual RD&E workshop. His account of grower-led thinking and innovation in collaboration with SASRI expertise demonstrated that, even in the exceptionally tough conditions the industry is facing at present, identification of the key limiting factors and adherence to good practices has enabled his survival. The lessons learned from such interaction speak volumes about the knowledge and experience of growers and their thinking that should influence the nature of the R&D conducted at SASRI.

Of course it would be ideal if there were to be another breakthrough in sugarcane agriculture that enabled a step change improvement in yield. That would be an easy solution to a very complex problem. Whether or not introduction of a GM variety for example, would achieve that is debatable and the danger in such an approach lies in the ‘silver bullet’ thinking that underlies such a philosophy. It is far more likely that improvement in yield will be achieved through correct implementation of the entire complex of practices and technologies open to growers.

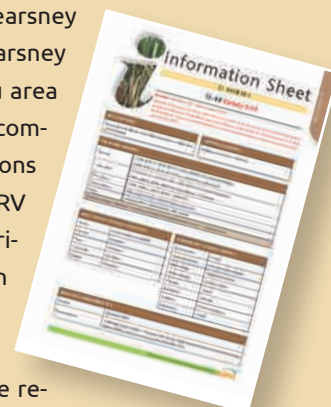
# New Varieties

This year sees the release of two new varieties for the rainfed regions of the industry.

**Variety N58** was selected at Gingindlovu research station from trials at Gingindlovu (coastal long cycle) and Kearsney (coastal hinterland). This variety is recommended for the coastal long cycle (18 month harvest cycle) where it produced high cane and RV yields. It is a high population variety with medium to thick stalks, and an erect growing habit. It has a good canopy with fairly erect leaves of medium width. N58 has good general disease and eldana resistance and high cane and RV yields. However, this variety has shown a tendency to lodge and to have a high fibre content.



**Variety N59** was selected at Kearsney research station from trials at Kearsney (coastal hinterland) and Gingindlovu area (coastal long cycle). This variety is recommended for coastal hinterland regions where it produced high cane and RV yield. It is an average population variety with medium to thick stalks, with an erect growing habit. It has a good canopy with erect leaves of medium width. N59 has good general disease resistance, except for its low resistance to smut. It does have good eldana resistance and high cane and RV yields. This variety is prone to lodging.



# Topical Tips

## May - August 2015

*Due to the lack of adequate summer rainfall, the 2015 crop has been placed under considerable stress in rainfed areas. Although the crop does appear green in many parts of the industry, there has been very little stick elongation. To ensure minimal yield losses, you are encouraged to pay attention to tips on pest and disease control, nutrition, weed control and harvesting/cane quality.*

### Pest and disease management

*With the recent integration of the Local Pest Disease and Variety Control into the biosecurity function at SASRI, there have been some structural changes. See article on page 14 for more information about these changes. Your Extension Specialist will also be able to answer any queries you have in this regard.*

- Survey potential carry-over cane in July to see if Fastac® is needed to control eldana. To help spread the load, it would be advisable to train your staff to do your own surveys. Please note that three more chemicals have now been registered for use against eldana. The article on page 7 has all the details.
- Ensure you start chemical applications in eligible carry-over fields to control eldana in August.
- Make use of your own trained staff for scouting for other pests and diseases. Contact your Biosecurity Officer or Extension Specialist to arrange for on-farm training of farm staff.
- Keep your eyes open for any unusual pest or disease symptoms; remember you are the first line of defence. Notify your local Extension Specialist or Biosecurity Officer if you find something you do not recognise.
- Sample your seedcane nursery and plough-out fields for ratoon stunt (RSD). Do not underestimate RSD, as it can cause severe yield loss. Losses of between 12 and 50% have been



recorded in SASRI trials depending on variety and environmental conditions.

- Start inspecting and roguing fields for smut in August, paying particular attention to smut-susceptible varieties. Place the diseased material in a bag, remove from the field and burn. Train your staff to identify smut before the whips emerge.
- Do you still have fields of N44? Remember they should have been eradicated by March 2015 due to the risk of maize streak virus (MSV).
- Consider spraying a fungicide when brown and tawny rust symptoms are observed after winter. Amistar® Xtra is registered against brown rust and orange rust (which is not in SA yet, but worth monitoring for biosecurity purposes), Abacus® is registered against brown and tawny rust.
- Disinfect all cane knives with a 10% Jeyes fluid or 75% methylated spirits solution to limit the spread of diseases such as RSD. This is particularly important when moving from one field to another and at the end of each day. Refer to SASRI Information Sheet 2.1.

### Weed control

- Since summer rainfall is expected in the rainfed areas, there is a high expectancy of winter weeds becoming problematic. Ensure you keep them under control. Maintaining your weed control programme during this period is important if you want to avoid yield losses.
- Keep an eye on the creeping grasses especially if there is a warm wet winter, as they can cause severe yield losses in sugarcane.
- Mow verges and breaks.





## Planting

*Only plant varieties that have been gazetted for your region. Prior to adopting a new variety, you are encouraged to test its suitability to local conditions by planting it on a moderately sized area. This should preferably be done over a couple of seasons.*

- Calculate your optimum annual replant target hectares so that you implement the correct annual replant programme for the farm based on your age at harvest, number of crops and crop cycle. A rule of thumb is at least a 10% replant annually. Consider starting your spring planting in August should the climatic conditions be suitable.
- Variety selection should be based on your gazetted control area, harvest cycle (12 or 24 months), soil type, aspect and elevation, time of year of harvest and the distance from the mill.
- This is the time to plan and order seedcane requirements for next season.
- Ensure your seedcane is of sufficient quality, preferably certified, disease- and pest-free, not too old (10-14 months on the coast, 14-16 months in the midlands). Control soil-borne diseases (e.g. pineapple sett rot which affect germination) by applying a fungicide to protect the setts, adequately cover and compact the soil over the setts. See seedcane article on page 12.



## Land use planning

- May to August is the ideal time to maintain your waterways and soil conservation structures due to the reduced possibility of heavy and intense rainfall. New waterways can be sown with black oats to provide soil protection in the event of an untimely winter rainfall.
- If you intend implementing a land use plan, the winter period is the best time to begin construction of new structures and field layouts. Ensure that you have completed these layouts before the end of winter to avoid unnecessary soil erosion.
- Check on the soil conservation structures in all your plough out fields, including contour banks and waterways, to see if they need upgrading.
- Maintain and repair farm roads.



## Irrigation

- Don't forget to schedule your irrigation for the cooler winter months.
- This is also a good time to plan the evaluation of the irrigation systems on the farm.
- Keeping up with the repair and maintenance of your irrigation system equipment will help to reduce costs in the long-term.



## Nutrition

- May is the time to start soil sampling in all your ratoon fields in preparation for your fertiliser application programme in spring. Allow at least a two weeks for FAS results.
- Order your fertiliser and develop an application plan for all fields needing fertiliser in June. Lime and gypsum can be applied to fields in June.
- Fertiliser application can begin in August, if conditions are suitable. It would be preferable to use enhanced urea or LAN based blends.





## Management

- Ensure you abide by the burning codes of practice by becoming familiar with the National Veld and Forest Fire Act 32 of 1998 and with your local Fire Protection Association. When clearing firebreaks and burning cane for harvest, ensure you abide by the burning laws.
- Check your seedbeds to be planted in spring for volunteers – off-types are still a big problem in the industry.
- Growers in the midlands are reminded to keep an eye out for early frost damage during May. Continually inspect for frost damage throughout the winter period as badly frosted cane will need to get to the mill quickly to avoid losses. Speak to your local Extension Specialist before cutting back cane. For further information on managing frosted cane, refer to SASRI Information Sheet 4.6.
- Start servicing and calibrating agro-chemical applicators during the winter period in preparation for spring.
- Analyse individual field performance to assist in replant decisions such as variety selection, seedcane requirement and appropriate green manure crops.
- You can only manage effectively if you have good accurate information at your disposal. If you are not using a field record system, think seriously about buying a suitable software package. There are many available for use. Even basic manual records are good enough provided the correct data is recorded.



## Harvesting

- Pay particular attention to cane quality. Fibre % and non-sucrose % play important roles in the RV formula. The higher the fibre % the lower the brix %, resulting in a lower sucrose %; and the higher the non-sucrose % the lower the sucrose %. See the Cane Quality article on page 8 for more information.
  - Study your CTS daily and weekly returns, which give you sucrose %, non-sucrose %, fibre % and purity %. Calculate your Dry Matter (DM) % and Brix % DM.
- Dry matter % = sucrose % + fibre % + non-sucrose %  
 Brix % DM = sucrose % + non-sucrose % divided by DM % x 100
- DM % ideally should be around 31%. Brix % DM should ideally be around 51%. Purity % greater than 85%.
  - Harvest the more mature cane first. In order to determine this, you must calculate the relative maturity. Relative maturity is the difference in purity or sucrose between the top, middle and bottom of the cane stalk. It can be measured using a hand refractometer: the bigger the difference, the less mature the cane.
  - Harvest young cane in the optimum sucrose period (September – October).

- Harvest older cane at the beginning and end of the season.
- Harvest varieties at their best relative sucrose period.
- Send fresh cane to the mill. Do not to burn more cane than you can harvest within two days.
- Top unripened cane lower at the beginning and end of the season, when young and immature and when transporting long distances to the mill. As a rule of thumb, top 100 mm below breaking point. Preferably top in the air, but if you top using windrows, align tops on the ground and then top.
- Send clean cane to the mill. Cut flush to the ground and don't bring up roots. Make bundles instead of windrows. Don't let loaders drive over loose cane. Stay out of fields in wet conditions.



*Contact your local SASRI Extension Specialist should you require help with any of the above.*



**By SASRI Extension & Biosecurity Team**

# New insecticides for eldana control

The recent devastating drought has had a serious effect on crop development with the increasing possibility of eldana infestations developing in large areas of carry-over cane. With the need to suppress eldana, there was a real danger of widespread use of the single registered insecticide – Fastac®. Such widespread use of a single active ingredient was cause for concern. SASRI has been conducting research on a number of alternative insecticides for eldana control and results showed them to be as effective as Fastac®. With the urgent need for alternatives, the Registrar was asked to consider emergency registration of the most promising products. The products in question were two DuPont insecticides Coragen® (active ingredient chlorantraniliprole) and Steward® (active ingredient indoxacarb). In addition, the Syngenta product Ampligo® (a mixture of the active ingredients lambda-cyhalothrin and chlorantraniliprole) was also considered for emergency registration.

These products have now been registered for use against eldana in sugarcane. The registered rates and application frequency are summarised in the table below, but please read the labels for full details about the conditions for their use.

These registrations represent a significant advance in the development of insecticide use for eldana control as each product now registered comprises

different chemistries or chemistry combinations. They can now be used rotationally within or between seasons to effectively suppress eldana infestations in carry-over crops. In doing so, the risk of eldana developing resistance to any single active ingredient is very small. However, please remember that insecticides must be used in conjunction with other IPM practices to reduce the risk of eldana in your crops.

By Graeme Leslie (Principal Entomologist)

**Details of new and existing registrations for eldana control.**

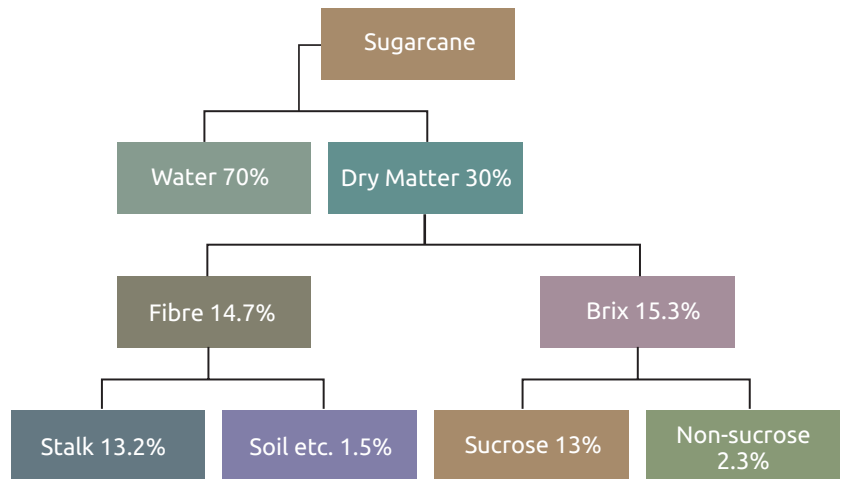
Product	Active ingredient	Label colour code	Rate applied (ml/ha)	Number of applications	Time of first application	Application frequency	Application method
Coragen®	Chlorantraniliprole	Blue	200	4	August	Every two months	Ground
			250	4	August	Every two months	Air
Steward®	Indoxacarb	Yellow	300	4	August	Monthly	Ground
			360	4	August	Monthly	Air
Ampligo®	Lambda-cyhalothrin + Chlorantraniliprole	Yellow	150	4	August	Monthly	Ground or air
Fastac®	Alpha-cypermethrin	Yellow	200	6-8	August	Every 2 or 3 weeks	Ground or air

# Farming for

## *Agronomic Factors Influencing Cane*

The RV cane payment system rewards growers for good cane quality because sucrose extraction is influenced by cane quality. The miller assesses cane quality simply on the amount of recoverable sugar per ton of cane crushed. The less cane the mill has to crush per ton of sugar produced, and the easier it is to crystallise the sugar from the juice, the better the mill likes it.

To understand the concept of sugarcane payment, it is necessary to first consider the composition of sugarcane. This is illustrated in the adjacent diagram with approximate percentage figures for an average sugarcane stalk delivered to the mill.



### Factors affecting cane quality

The four most important factors contributing to high recovery of sugar are:

- high sucrose
- high purity
- low fibre
- low non-sucrose.

Fibre reduces extraction of sucrose from cane and depends primarily upon sugarcane variety and weather conditions during the growing season. The higher the fibre% the lower the brix %, resulting in a lower sucrose %; and the higher the non-sucrose% the lower the sucrose %.

Sugar production really starts in the field: there are several agricultural practices that have an effect on cane quality. Refer to the adjacent simple guide to assist in farming for maximum cane quality. The idea is to increase sucrose content (%) (and therefore RV payment) by ensuring that mature, high purity (>85%) cane is delivered to the mill with minimal harvest to crush delay. In addition to increasing sucrose content, one should also aim to keep non-sucrose and fibre need as low as possible because high non-sucrose (>2%) and high fibre (>15%) reduce payment on RV.

*Contact your local Extension Specialist for Information Sheets relating to cane quality or the RV payment system.*



**By Alana Eksteen** (Crop Scientist: Agronomy)

### 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.



# Sugar

## Quality

### 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 wind-rows.

#### 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

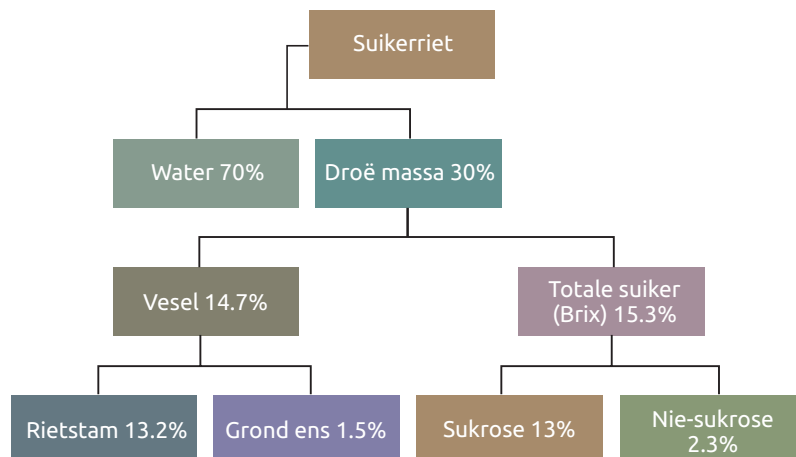
- ✗ Extraneous matter.
- ✗ Immature cane.
- ✗ Eldana damage.
- ✗ Drought.
- ✗ Variety choice.

# Boer vir Sui

## Agronomiese faktore wat riet kwaliteit

Die RV riet betalingskema vergoed produsente vir goeie kwaliteit riet gelewer aangesien suikrose ekstraksie beïnvloed word deur suikerriet kwaliteit. Die meul assesser riet kwaliteit slegs op herwinbare suiker per ton riet geprosesseer. Hoe minder riet die meul hoef te verwerk per ton suiker geproduseer en hoe makliker dit is om suiker van sap te kristalliseer, des te beter vir die meul.

Om die konsep van suikerriet betaling te verstaan is dit noodsaaklik om die samestelling van suikerriet te verstaan. Die samestelling word skematies hier langs aan voorgestel met beraamde persentasie waardes van 'n gemiddelde suikerrietstok gelewer aan die meul.



### Faktore wat riet kwaliteit beïnvloed

Die vier belangrikste faktore wat bydra tot hoë suikerherwinning is:

- hoë suikrose
- hoë suiwerheid
- lae vesel
- lae nie-sukrose

Vesel verlaag suiker ekstraksie van suikerriet. Veselinhoud van suikerriet word bepaal deur die variëteit asook die weersomstandighede gedurende die groei seisoen. Hoe hoër die veselinhoud hoe laer sal die totale suikereinhoud wees. Die gevolge hiervan is 'n laer totale suiker, hoër nie-sukrose inhoud en 'n laer suikrose-inhoud.

Suikerproduksie begin in die suikerrietland. Daar is verskeie landboupraktieke wat die suikerriet kwaliteit kan beïnvloed. Die onderstaande tabel dien as gids om die produsent instaat te stel om maksimum kwaliteit suikerriet te verbou. Die doel is om suikrose-inhoud te verhoog (verhoogde RV betaling) deur te verseker dat ryp, hoë suiwerheid (>85%), kwaliteit suikerriet aan die meul gelewer word met 'n minimum oes tot meul tydsverloop. Addisioneel tot die verhoogde suikrose-inhoud moet daar gepoog word om die nie-sukrose en veselinhoud so laag moontlik te hou. Hoë nie-sukrose (>2%) en hoë veselinhoud (>15%) verlaag die RV betaling.

*Kontak u plaaslike suikerrietvoorligter rakende inligtingsblaaie oor rietkwaliteit en die RV betalingsstelsel.*



**Deur Alana Eksteen** (Gewaswetenskaplike: Agronomie)

### Sukrose % (13% or greater)

#### Faktore wat suikrose verhoog

- ✓ Mees geskikte variëteit vir die area.
- ✓ Korrekte aanplantdatum.
- ✓ Vroeë of laat seisoen rypmaking van groen riet.
- ✓ Brand tot oes vertraging <2 dae.
- ✓ Oes ryp volwasse riet met sap suiwerheid >85%.

#### Faktore wat suikrose verlaag

- ✗ Oes van groen riet met suiwerheid <85%.
- ✗ Top hoogte te laag.
- ✗ Oes tot meul vertraging.



# ker

## beïnvloed

### Nie-sukrose% (minder as 2%)

#### Faktore wat nie-sukrose verlaag

- ✓ Brand tot oes vertraging < 2 dae.
- ✓ Volwasse riet met hoë sap suiwerheid.
- ✓ Top op die korrekte hoogte.

#### Faktore wat nie-sukrose verhoog

- × Top hoogte: hoë top verhoog nie-sukrose.
- × Oortollige N: kan groeiperiode verleng en natuurlike rypwording verhoed. Neem blaar- en grondmonsters.
- × Wanneer oes tot meul vertraging > 2 dae is word sukrose omgeskakel na nie-sukrose.

### Vesel % (minder as 15%)

#### Faktore wat vesel verlaag

- ✓ Min tot geen blaarmassa.
- ✓ Oes onder droë omstandighede.
- ✓ Maak bondels in plaas van windrye.

#### Faktore wat vesel verhoog

- × Oortollige kalium: kan as- en veselinhoud verhoog.
- × Oortollige blare.
- × Oortollige grond en wortels: nat weer en verkeerde oeshoogte.

### Suiwerheid % (groter as 85%)

#### Faktore wat suiwerheid verhoog

- ✓ Ryp volwasse riet.
- ✓ Skoon riet.

#### Faktore wat suiwerheid verlaag

- × Vreemde materiaal.
- × Groen riet.
- × Eldana skade.
- × Droogte.
- × Keuse van variëteit.

# Essential steps for Quality Seedcane

Good quality seedcane produced in a carefully managed nursery is an important step in profitable sugarcane production and is an integral part of farm management. Diseases such as ratoon stunt (RSD), mosaic and smut are systemic, developing throughout infected plants. When this occurs, any infected stalk that is cut and planted will produce a number of new diseased plants. To reduce the risk of these systemic diseases developing in commercial fields, growers need to have access to healthy seedcane, which is best and most easily produced in a seedcane nursery. The benefits of planting this seed into commercial fields, whether it is produced on your own farm or ordered from a certified or approved nursery in the area, are:

- Reduced risk of introducing systemic diseases such as RSD, mosaic and smut
- Varietal purity
- Improved yields under good management
- Prolonged ratooning
- Access to the right quantity of healthy seedcane of the required variety, at the right time.

Growers should ideally establish their own seedcane nursery to produce either certified or approved seedcane (see table for definitions of seedcane classes). All nurseries must be registered with the relevant LPD&VCC, who will inspect the seedcane produced in the nursery and approve its use either on the grower's farm or for sale to other growers.

Growers may opt not to have nurseries on their farms but must then purchase their seedcane for commercial planting from LPD&VCC Certified or Approved nurseries. If certified or approved seedcane is sourced from a grower outside of the LPD&VCC area, permission must be obtained from both the sending and receiving LPD&VCCs.

Establishing a nursery and synchronising its outputs with the seedcane requirements of the farm is a complex process and seedcane production should be regarded as a core component of all sugarcane production management planning. Planning needs to start at least two years before the seedcane is actually required for planting into commercial fields.

Hot water treatment (HWT) is an essential feature of seedcane production, and ensures that seedcane stocks are free of RSD, as well as certain other diseases and pests. The process must be managed with extreme care to be effective. Special attention must also be paid to fallows while regular, intensive pest and disease inspections are required to ensure that levels are below the accepted thresholds of the mill supply area.

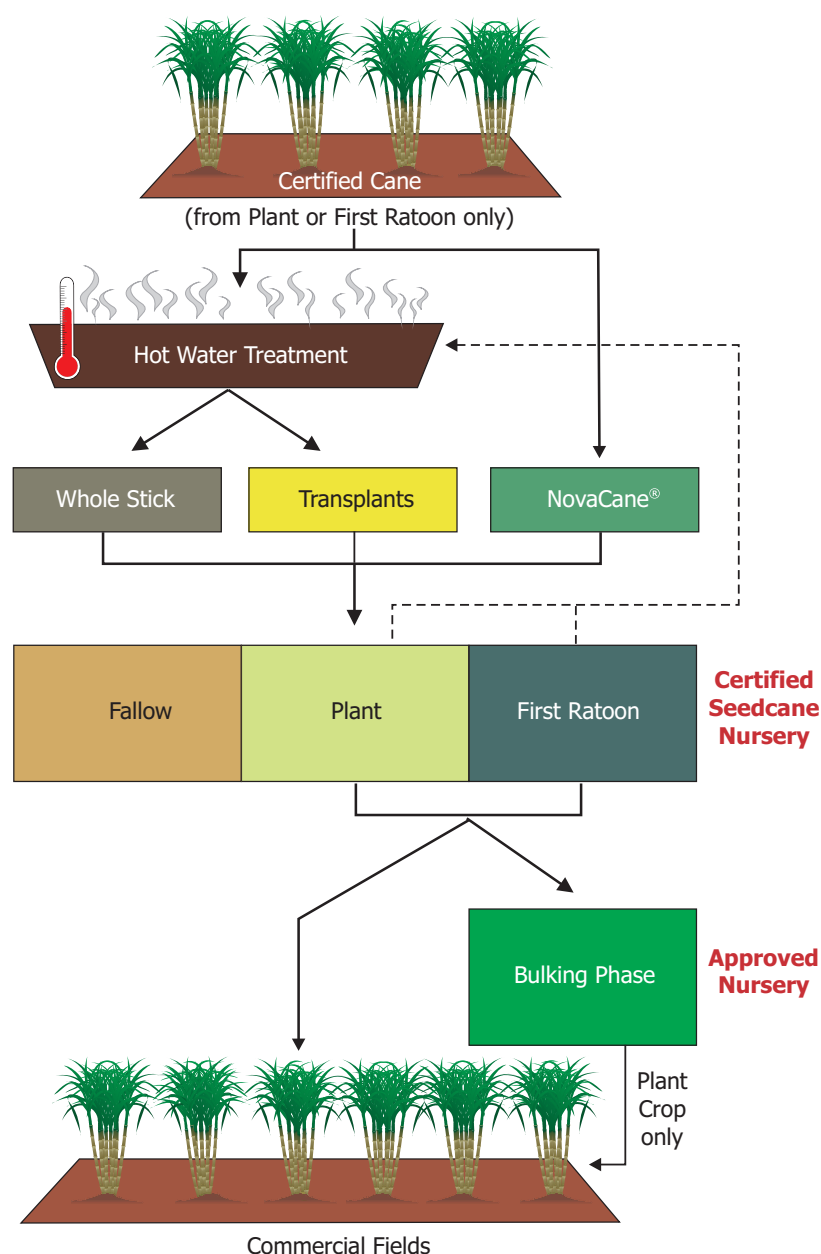
One of the most successful schemes operating in the industry at present is mandatory, and certified seedcane is produced and sold by commercial co-operators for the establishment of on-farm, approved nurseries (see diagram). Two cuts are taken from certified

nurseries and only one cut from approved nurseries. This long-standing and proven system of seedcane production has been accepted as the model to be promoted across the industry. The certified seedcane in such schemes may be either HWT whole stick seedcane, HWT single budded transplants or NovaCane® tissue culture plantlets. However, as some areas have no seedcane schemes at the moment, a time period will be allowed, during which areas will need to scale-up seedcane production to a point where all growers plant only certified or approved seedcane in their commercial fields. Furthermore, as pests and diseases do not respect mill boundaries, it will be necessary to implement the new policy uniformly across the industry in order to protect all growers.

The Local Pest, Disease and Variety Control Committee (LPD&VCC) is a committee of the South African Sugar Association (SASA), created through the provisions of the Sugar Act and the Sugar Industry Agreement 2000. LPD&VCC regulations require that all commercial sugarcane fields be planted with either LPD&VCC certified or approved seedcane. The terms 'certified' and 'approved' refer to the two different classes of nursery (or seedcane) registration described in the regulations, with certified nurseries having to conform to a slightly higher set of standards than approved nurseries.

CLASS OF SEEDCANE	SOURCE TO ESTABLISH NURSERIES
CERTIFIED SEEDCANE AND CERTIFIED SEEDCANE NURSERIES	HWT Certified whole-stick Seedcane OR HWT transplants cut and grown from Certified Seedcane OR NovaCane® plantlets
APPROVED SEEDCANE AND APPROVED SEEDCANE NURSERIES	Certified Seedcane





We have recently updated the booklet on *Seedcane Production*. In the new edition you will find updated procedures for the production of good quality seedcane from whole-stick, single budded sett transplants and NovaCane®. This includes information on nursery establishment and operations, hot water treatment as well as propagating of transplants. If you have not received this publication yet, you may request a copy from the SASRI library ([library@sugar.org.za](mailto:library@sugar.org.za)).



**By Rowan Stranack**  
(Biorisk Manager)  
& **Sharon McFarlane**  
(Plant Pathologist)

### Seedcane classes and required standards.

FALLOW PERIOD	DISEASE, OFF-TYPE AND PEST LIMITS			MAXIMUM AGE AT HARVEST	HARVESTS PERMISSIBLE
	SMUT MOSAIC OFF-TYPES	RSD	ELDANA /100		
Overall the period to be not less than 12 months with a minimum of 6 months totally free of sugarcane.	Less than local area hazard levels when inspected on the last of THREE consecutive LINE BY LINE inspections	NIL when tested at nine months or older	Less than local area hazard levels when inspected at least two months before harvest date	Irrigated North and KZN Coastal <500 m asl: 9-12 months Midlands > 500 m asl: 12-18 months	Plant and 1 <sup>st</sup> ratoon only
Overall the period to be not less than 9 months with a minimum of 6 months totally free of sugarcane	Less than local area hazard levels when inspected on the last of TWO consecutive RANDOM inspections	NIL when tested at nine months or older	Less than local area hazard levels when inspected at least two months before harvest date	Irrigated North and KZN Coastal <500 m asl: 9-12 months Midlands > 500 m asl: 12-18 mnths	Plant crop only

# Pest, Disease and Variety Control

You may well be aware that since 1 April this year, the industry's Local Pest, Disease and Variety Control function has been re-integrated into SASRI. This change is largely at an administrative and operational level and LPD&VCCs will continue to function as before, directing and monitoring the industry's biosecurity programme.

A significant change however, is the funding of the operation which moves from being a grower-funded operation to being core-funded as of 1 April. Also, for some local areas there will be an increase in inspection resources in response to new biosecurity threats, mainly eldana which is now entrenching itself in the Midlands and southern coastal regions. In addition, a new P&D control area with its own committee and inspection team has been created in northern KZN, again in response to threats identified in that area.

Once established and fully operational the new service will provide an increased level of security to the local industry. Some significant advantage of the move to centralisation are:

- Being able to respond to incursions more rapidly & effectively.
- Local staff will have direct access to specialist advice and assistance.
- Uniform standards for surveys and sampling methods will enable more reliable results.
- Regular internal auditing will ensure maintenance of standards.
- Training can be better directed and coordinated centrally.

Pests and diseases do not respect farm or mill boundaries and this is probably the single most significant benefit to centralised management. As a result the new arrangement has come with an emphasis on biosecurity, hence this word being used widely on vehicle and staff logos. Biosecurity implies a wider and more strategic emphasis to pest, disease and variety control, and this is achieved more effectively with a centrally managed field inspectorate.

For the purposes of overall management, the new biosecurity workforce will be integrated into the Extension resource centre at SASRI under the Extension Manager who is assisted by the Biorisk Manager and a dedicated

Resource Manager who will co-ordinate and manage the requirements of both Extension and Biosecurity.

At a local level, field staff will be directed by the current team of Extension Specialists who will also fulfil the statutory role of Pest and Disease Officer. They will be assisted by a number of Biosecurity Officers and Technicians who will take care of the day-to-day management of the field inspection teams. The majority of this staff complement are already in place.



**By Rowan Stranack** (*Biorisk Manager*)





# Plaag, Siekte en Variëteitbeheer

U mag dalk daarvan bewus wees dat die suikerindustrie se Plaaslike Plaag, Siekte en Variëteitbeheer funksie vanaf 1 April 2015 weer by SASRI ingelyf is. Hierdie verandering is hoofsaaklik administratief van aard en komitees sal soos normaalweg voortgaan om die suikerindustrie se biosekuriteitprogram te bestuur en te monitor.

'n Beduidende verandering is dat die befondsing vanaf 1 April 2015 nie meer net deur die produsent sal geskied nie, maar nou ook deur die meulenaar. Ook, vir sommige plaaslike areas sal daar meer inspeksiehulpbronne beskikbaar wees weens biosekuriteitsbedreigings, soos byvoorbeeld eldana wat ook nou in die Middellande en suidelike kusgebied voorkom. In reaksie op bedreigings in die noordelike dele van KwaZulu-Natal,

is 'n nuwe Plaag en Siekte beheer area met sy eie komitee en inspeksiespanne op die been gebring.

Sodra die nuwe diens gevestig en ten volle operasioneel is, sal daar 'n hoër vlak van sekuriteit in die plaaslike industrie wees. Beduidende voordele van sentralisasie sluit die volgende in:

- Om in staat te wees om vinniger en meer doeltreffend op te tree indien daar 'n nuwe plaag of siekte uitbreek.
- Plaaslike personeel sal direkte toegang hê tot spesialis advies en hulp.
- Uniforme standaarde vir opnames en neem van monsters sal meer betroubare resultate verseker.
- Gereelde interne oudits sal verseker dat hoë standaarde gehandhaaf word.
- Opleiding kan sentraal beter bestuur en gekoördineer word.

Plae en siektes respekteer nie plaas- en suikermeulgrense nie, en hierdie feit is waarskynlik die enkele grootste voordeel van 'n gesentraliseerde bestuurswyse. Gevolglik word daar 'n baie groot klem gelê op biosekuriteit, vandaar die wye gebruik van die woord "biosekuriteit" op voertuie asook personeeembleme. Biosekuriteit impliseer 'n wyer en meer strategiese fokus op peste, siektes en variëteitbeheer, wat baie meer effektief bereik kan word deur 'n gesentraliseerde inspektoraat.

Vir algemene bestuur doeleindes sal die nuwe biosekuriteit personeel in die Voorligtings hulpbronsentrum van SASRI geïntegreer word. Die afdeling sal bestuur word deur die Voorligtingbestuurder wat deur die Biosekuriteitbestuurder en 'n toegwyde hulpbronbestuurder bygestaan sal word. Die hulpbronbestuurder sal verantwoordelik wees vir die koördinasie en algemene bestuur van beide die Voorligting en Biosekuriteit hulpbronsentrums.

Op plaaslike vlak sal die veldpersoneel bestuur word deur die huidige span Voorligterspesialiste wat terselfdertyd die statutêre rol van Plaag en Siekte Bestuurder sal vul in hulle onderskeie areas. Hulle sal ondersteun word deur 'n aantal Biosekuriteitsbestuurders en tegnisi wat in beheer sal wees van die dag tot dag bestuur van die inspeksiespanne. Die grootste gedeelte van hierdie personeelkomponent is alreeds in plek.



**Deur Rowan Stranack**  
(Bestuurder: Biosekuriteit)

# What is pithing

## and how is it caused?

Pithiness (or pithing) is a condition that occurs in sugarcane stalks characterised by dry cavities devoid of sugarcane juice. Pithiness is of economic importance because it can affect sucrose extraction during milling, thus affecting calculated RV for the grower. There is very little information on pithiness in sugarcane, although it is thought to be associated with flowering. Heavy flowering in sugarcane ensures a very high chance that pithing will also occur. Flowering and pithiness are genetic traits and the propensity for flowering and pithing depends on sugarcane variety. A recent project on flowering and pithing established that both flowering and pithing did not have any negative effect on final cane yields but they did affect sucrose content.

During the 2015 milling season (particularly in Pongola), a number of growers, researchers and Extension Specialists have reported pithing in sugarcane that was not flowering. To-date the sugarcane varieties reported with pithing (and no flowering) have been N49 and N53. The RV's achieved were low (<10%) because of low juice purity, low sucrose content and high non-sucrose.

Pithiness can be quantified by using the following equation:

$$\text{Pithing (\%)} = \frac{\text{Number of internodes with pithing} \times 100}{\text{Total number of internodes}}$$

*We are appealing to growers with any field data on pithing in sugarcane (without flowering), to please contact their local Extension Specialist or send your data to [alana.eksteen@sugar.org.za](mailto:alana.eksteen@sugar.org.za)*



**By Alana Eksteen**  
(Crop Scientist: Agronomy)





# Wat is pitvormig

Pitvorming is 'n toestand wat in die suikerriet stam voorkom en word gekenmerk deur die middelste deel van die stam wat gevul is met droë, veselrige holtes sonder enige sap (droë murg). Pitvorming is van ekonomiese belang aangesien dit lei tot lae RV waardes, en boonop suikrose ekstraksie gedurende die maalproses nadelig kan beïnvloed. Daar is bitter min inligting beskikbaar oor pitvorming in suikerriet, maar dit word vermoed dat dit met blomvorming verband hou.

Swaar blomvorming lei in meerderheid van gevalle ook tot pitvorming. Blomvorming en pitvorming word ook bepaal deur genetiese faktore en derhalwe sal die geneigdheid tot blom- en pitvorming afhang van die suikerriet variëteit. In 'n onlangse projek is vasgestel dat beide blom- and pitvorming geen negatiewe effek op die finale rietopbrengs gehad het nie, maar dat die suikrose inhoud wel negatief geïmpak was. Gedurende die 2015-maalseisoen (veral in Pongola) het 'n aantal kwekers, navorsers en Voorligtingspesialiste (veral in Pongola) pitvorming gerapporteer op suikerriet wat nie geblom het nie, veral in varieteite N49 en N53. In hierdie gevalle was die RV inhoud laag (<10%) as gevolg van lae suikrose inhoud en hoë nie-suikrose inhoud (lae sapsuiwerheid).

Die mate van pitvorming kan gekwantifiseer word met behulp van die volgende formule:

$$\text{Pitvorming \%} = \frac{\text{Aantal internodes met pitvorming}}{\text{Totale aantal internodes}} \times 100$$

*Ons versoek kwekers wat veld waarnemings van pitvorming sonder blomvorming het, om hulle plaaslike Voorligtingspesialis te kontak of die data te stuur na [alana.eksteen@sugar.org.za](mailto:alana.eksteen@sugar.org.za).*



**By Alana Eksteen**  
(Crop Scientist: Agronomy)



# Do Chemical Ripeners

## have any negative residual effects on ratoon regrowth?

An effective chemical ripener should not only enhance RV yields but should also have no adverse residual effects on the following ratoon crop. Growers occasionally ask whether fluazifop-p-butyl, the active ingredient in Fusilade Forte (and generics like Volley and Fluazifop) cause any negative residual effects in the following ratoon.

Published evidence does not support the occurrence of negative residual effects on ratoon regrowth in crops where fluazifop-p-butyl application occurred at label rates and under climatic and management conditions suitable for the use of chemical ripeners (i.e. conditions conducive to vigorous crop growth). Nevertheless, growers can be assured that fluazifop-p-butyl is carefully evaluated at SASRI for its effects on ratoon regrowth in all newly released varieties.

During the past two seasons, varieties N42, N47 and N51 were evaluated in a field trial conducted at Mount Edgecombe. The second and third ratoon crops were treated with Fusilade Forte according to label instructions (six weeks before harvest). For each variety a control treatment (unripened) was included in the trial design. Both ratoon crops were harvested at a crop age of 12 months in early May of 2013 and 2014. After harvest, frequent measurements of stalk population and stalk height were conducted to quantify any residual effects on ratoon regrowth.

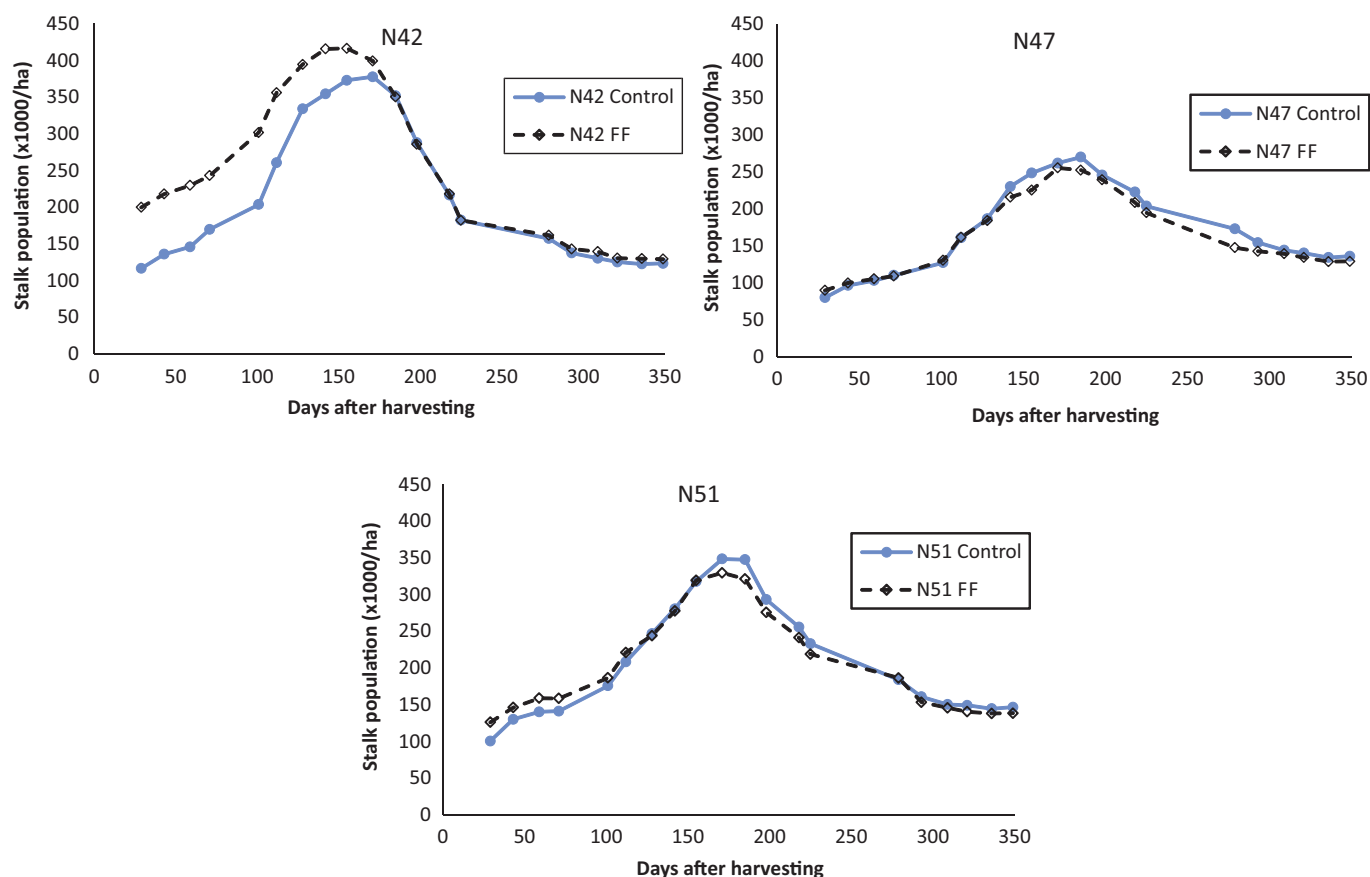




## The results shown in the graphs revealed the following:

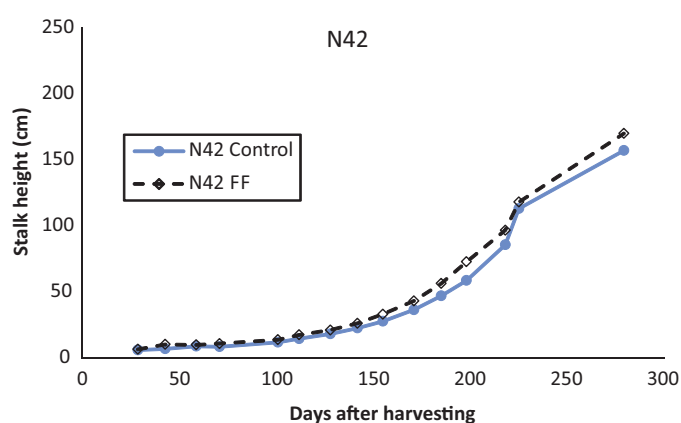
- In variety N42 Fusilade Forte resulted in a temporary increase in tillering in the next ratoon crop, which disappeared with time towards harvest. Increased tillering in response to this chemical has been observed in many other varieties during similar investigations in the past.
- Final stalk population in the next ratoon crop was not affected in any of the varieties following the use of Fusilade Forte. These observations are consistent with those made in all other SASRI varieties to date.

### Residual effects of Fusilade Forte (FF) on stalk population.



- Fusilade Forte did not result in any negative effects on stalk growth in the next ratoon crop. The results observed in variety N42 are provided here as an example. The apparent slight stimulation of stalk growth in the Fusilade Forte treatment was not statistically significant.

### Residual effects of Fusilade Forte (FF) on stalk growth.



In conclusion, based on the research results shown and obtained in numerous similar field trials, chemical ripening with Fusilade Forte (and generics) according to product label instructions does not cause any negative residual effects in the subsequent ratoon crops. Research at SASRI continues to confirm that this is the case for all newly released rainfed and irrigated varieties.



By Riekert van Heerden (*Sugarcane Physiologist*)  
& Sivuyile Ngxaliwe (*Assistant Research Officer*)

# Soil Health

**Neil Miles**  
(Senior Soil Scientist)



## Fertilisers and 'green' agriculture Myths and Facts

Is the widespread use of inorganic fertilisers in agricultural production in keeping with the objectives of sound resource management and the promotion of soil health? Unfortunately, ill-informed opinions by unqualified individuals and groups have generated much confusion on this issue. The all too frequent message has included statements that fertilisers reduce organic matter levels in soils, destroy beneficial soil life such as microbes and earthworms, acidify the soil irreversibly, make crops more vulnerable to diseases and pests, render agricultural produce less nutritious or even harmful, and pollute the environment.

***What then are the facts relating to the effects of fertilisers on soil, plant health and the environment?***

### Organic matter (OM) levels

Detailed research, in particular from long-term field trials, shows that the fertiliser additions required for optimum yields serve to increase the amount of OM in soils. This is because the improved yields following fertiliser applications result in increased returns of organic material to the soil in the form of decaying roots, litter and crop residues.

### Soil life

With organic matter being the source of food for soil organisms, it is hardly surprising that numerous research studies have shown that fertilisation enhances soil biological activity and diversity. In a recent comprehensive review of 64 long-term field trials from around the world, it was found that fertiliser application led to a 15.1% increase in the microbial biomass above the levels in unfertilised control treatments. Earthworm populations have also been widely reported to increase with fertiliser use.

### Soil acidification

Nitrogen fertilisers do acidify soils, particularly when applied in excess of crop requirements for optimum growth. And increasing acidification tends to have a negative effect on soil organisms, as it does on the growth of crops. However, as scores of growers will readily testify, soil acidification is cost-effectively managed by following soil-test-based liming recommendations, which, in addition to enhancing soil biological activity, also supply much-needed calcium and magnesium for crop growth. Other fertilisers, such as potash and phosphates, have essentially no effect in terms of soil acidification.





### Fertilisers and crop diseases and pests.

There is a glut of evidence on the positive effects of fertilisers in reducing diseases in crop plants. Potassium is a prime example: chapters have been written on the beneficial effects of favourable supplies of this nutrient in limiting bacterial and fungal infections and improving stalk strength and thereby resistance to lodging and pests. An example of the positive effects of potassium fertilisation on the incidence of eldana is shown in the figure below. Interestingly, it is also well-established that adequate supplies of potassium improve drought and frost tolerance. Other fertiliser nutrients that improve crop defences to diseases and pests include calcium, boron, manganese, silicon and chloride. (Another favoured myth is that potassium chloride fertilisers are detrimental to soil and plant life).

High nitrogen supply is widely considered to render crops more susceptible to diseases and pests. However, research findings are often inconsistent in this regard, with the effect of nitrogen on eldana being a case in point: recent SASRI research points to moisture stress having a far greater effect on the proliferation of eldana than nitrogen fertilisation practices.

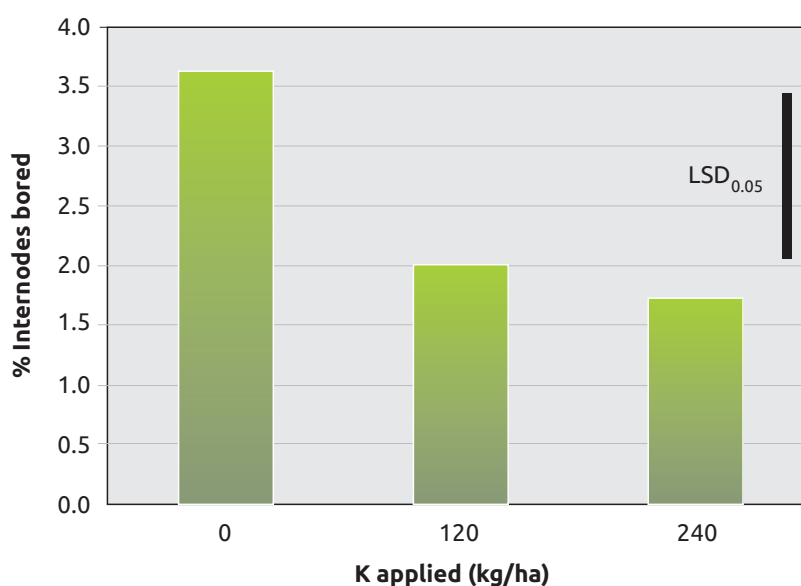
### The nutritive value of crops.

There is no scientific evidence whatsoever to deduce that foods produced without fertilisers are more nutritious than those produced with fertilisers.

### Environmental pollution.

Where fertilisers are applied correctly and at appropriate rates, there is minimal risk in terms of the pollution of underground and surface waters. In fact, scientists have frequently found that there may be more loss of nutrients to the environment from organic farming than from conventional farming, since nitrates and phosphates are readily lost from the organic amendments used by organic producers, while legume rotations may also 'leak' nitrates to the environment.

In conclusion, it must be borne in mind that plants cannot distinguish between organically and inorganically derived nutrients. Fertilisers are and will continue to be a key input in ensuring agricultural sustainability and the production of nutritious food to meet the requirement for global food security.



**Effect of potassium (as potassium chloride) on eldana damage in a plant crop on the Oribi Flats.**

# A practical approach to the integrated control of *Pereskia aculeata*

A small conservation area near Umhlanga Rocks was recently found to be infested with the weed *Pereskia*. The infestation was quite severe, with the weed growing at ground level between trees and in tree canopies. SASRI was asked for guidance in managing this invasive plant. Three approaches (based on how *Pereskia* was growing) were taken to control the infestation in the area. Growers are advised to follow these approaches should they find this weed growing on their farms.

## What is *Pereskia*

*Pereskia aculeata*, also called *Pereskia*, is a 'Category 1' alien plant and is therefore prohibited on any land or water surface in South Africa. It looks superficially like the garden plant bougainvillea, but has edible fruits with viable seeds spread by birds and animals. Thick basal stems of *pereskia* have long, sharp, protective spines. Paired, hooked thorns on young stems allow *pereskia* to climb up trees and spread to neighbouring canopies and if severed, small pieces fall to the ground and can reroot.



## Low growing *Pereskia*

In instances of low-growing *Pereskia* the approach was to first use chemical control and then follow this up with manual control. A directed spray of 0.5% Garlon® + surfactant was applied using a knapsack sprayer with a full/solid cone nozzle.

Always ensure that you use registered chemicals and surfactants. To ensure sufficient spray coverage, the chemical must be applied with the knapsack lance rotated in a circular motion (not linear direction) and at a suitably high application rate. In practice, this means applying to the point of runoff.

The sprayed areas were left to dry out for approximately 3-4 weeks. Thereafter, this dried out top growth was raked into heaps for later inspection and spot-sprayed when required. This exposed the rooted stem material that might have escaped treatment. These rooted pieces were hand-hoed and placed in a separate heap from the raked dried material.

The rooted stem material was collected one week after hoeing, and planted in 120 pots. This pot trial was placed under irrigation to monitor the potential for regrowth. After 6-7 weeks, approximately 55% of *Pereskia* had regenerated, with varying degrees of herbicide damage symptoms on the coppice regrowth. This indicated that although there was partial translocation from the leaves through the long stems to the rooted material, this was incomplete, allowing live material to recover, and requiring further attention.

All uprooted material must be considered as high risk for regrowth and must be dealt with using one of the following three options:-

1. Turning the material over occasionally to dry it out.
2. Surviving material can be spot-sprayed.
3. Burning the material in a safe place.



ta



*Pereskia growing in this tree canopy was cut back at head-height and at ground level. The regrowth seen in the foreground will require spraying.*



*Low growing Pereskia that was sprayed, then left to dry. Rooted systems that escaped spraying are hand-hoed. The regrowth seen here will require spraying when it is about knee-height.*



*A pot trial conducted to monitor regrowth after treatment. More than half the Pereskia regenerated.*

### Pereskia growing over/in tree canopies:

In instances where Pereskia was found to be growing around tree canopies, manual control was initially used, followed by chemical control. Pereskia was slashed at ground level and at head height (for easy access). The cut material was allowed to dry off. A directed spray of 0.5% Garlon® + surfactant was applied to surviving regrowth. A site inspection four-five weeks later showed that regrowth had occurred near the base of trees thus requiring further spraying. Any regrowth occurring under trees would also need re-spraying. Although much of the severed aerial stem material dried out completely, there is a risk of surviving pieces dropping to the ground and re-rooting, requiring repeated spot-spraying for sustained effective control.

It is vital to isolate affected trees to contain Pereskia and prevent spread to neighbouring canopies. In large areas, start on the outer perimeter of infested trees, working progressively inwards with control measures, in order to contain the infested area.

### Pereskia growing in inaccessible areas

In areas of the site where Pereskia was inaccessible, a biological control treatment is being tested. Two biological control agents of Pereskia were released at the site. The first, released a number of years ago, is a flea beetle called *Phenrica guerini*. Both larvae and the adults feed on the plants leaves and growing shoots. It is well established at the site, and is commonly found on the plant.

The second biological control agent was newly introduced a few months ago. It is a stem wilting sap-sucking bug, *Catorhintha schnaffneri*, commonly called the Pereskia stem wilter (or Coreid).

Both biocontrol agents will form an important part of an integrated approach at clearing Pereskia, especially in inaccessible areas. These agents will move onto the newly formed shoots that appear a few weeks after the plant has been cut back as well as any regrowth which was not completely killed by herbicide, and stunt the plants growth.

**By Peta Campbell**

*(Senior Agronomist: Weed Control),  
Des Conlong (Senior Entomologist)  
& Bevin Worlock (Consultant)*





# Weather

## Review

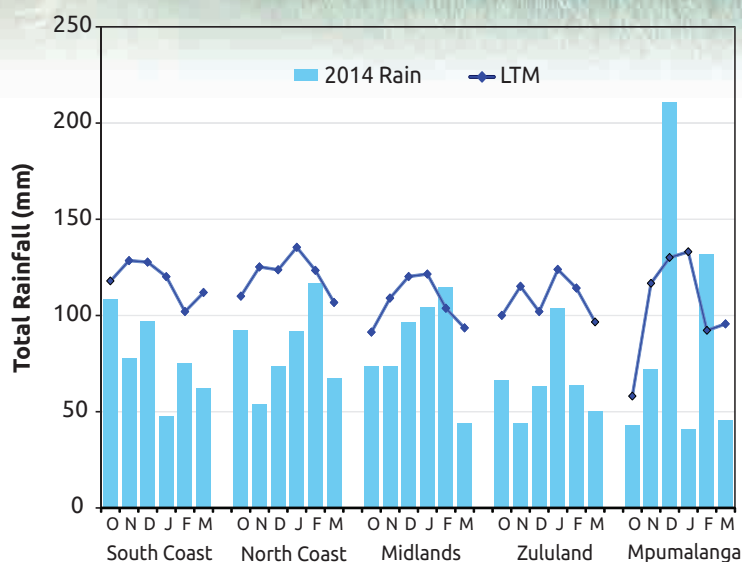
Rainfall across the industry generally remained significantly below average throughout the 2014/15 rainfall season (October 2014 to March 2015). The situation was slightly better in Mpumalanga where above normal rainfall was recorded in December 2014 and again in February 2015 (see graph).

The very low rainfall over the last 12 months (see table) has resulted in a severe drought through most of the rainfed areas of the industry, with devastating effects on cane growth. Irrigation water supply has also decreased drastically and restrictions are in place in Pongola and Felixton due to low water levels in the Bivane and Goedertrouw dams, while the Hluhluwe dam has also reached critically low levels. However, in Mpumalanga cane growth has remained good with adequate irrigation water supply and enabling weather.

## Outlook

The consensus outlook for the ENSO (El Niño- Southern Oscillation) system is that weak El Niño conditions will continue into June that is then likely to strengthen as we move into spring and summer. Although ENSO is not a strong driver for winter rain, the El Niño phase of ENSO is associated with low summer rainfall over eastern parts of South Africa. The South African Weather Service (SAWS) predicts a strong probability of below average winter rainfall (May to July 2015). The International Research Institute for Climate and Society expects normal winter rainfall.

Please visit the SASRI weather web for links to up-to-date seasonal climate forecasts and also for the latest rainfall and other weather data. Go to [www.sugar.org.za/sasri](http://www.sugar.org.za/sasri) and select 'WeatherWeb' from the menu.



**Regional average monthly total rainfall and the monthly long term means (LTM) for October 2014 to March 2015.**

**Regional average total rainfall for the period April 2014 to March 2015 compared to the long term mean (LTM) rainfall for the same period.**

Region	Total Rainfall (mm)	LTM Rainfall (mm)	Percent of LTM
South Coast	614	1009	61
North Coast	602	1017	59
Midlands	578	834	69
Zululand	501	912	55
Mpumalanga	610	739	82



**By Phillemon Sithole (Agrometeorologist)  
& Abraham Singels (Principal Agronomist)**

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