

# THE Link

Published by the South African Sugarcane Research Institute

May  
2013

Volume 22, Number 2

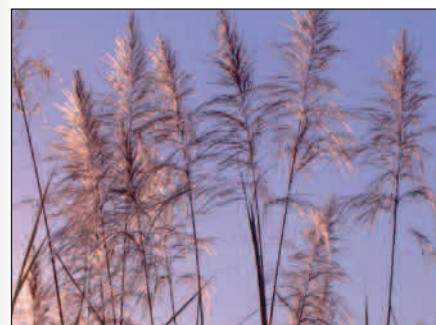
## SUSFARMS®

Sustainable Sugarcane  
Farm Management System



**Page 2:** There is an increasing demand from consumers and major purchasers that sugar producers conform to environmentally and socially accepted principles. In order to safeguard our markets, the industry must be able to demonstrate that it is adhering to sustainable farming and factory practices. SUSFARMS®, the South African sugar industry's farm management system, is the ideal tool for implementing and monitoring best practices related to environmental, social and financial issues.

### Also in this issue...



**Page 6:** Cane that flowers profusely should be harvested before October in the year that it flowers.



**Page 8:** The eldana factor features prominently in decisions about which fields to carry over.



**Page 10:** A healthy root system is necessary for a healthy crop. Unfortunately, the problem of poor root systems seems to be widespread in the SA sugar industry.



Unlocking the potential of sugarcane

# SUSTAINABLE SUGAR

## From Farm to Fork



**Dr. Marilyn Govender**

*Natural Resources Manager: External Affairs Division (SASA)*

Globally, brands and companies are making commitments to sustainable sourcing of their goods and products, including sugar. This comes from a realisation that behind many products is the story of a farm somewhere in the world where natural resources such as soil, water and air are being used to bring these products to life.

Endurance of these farms and the long-term supply of quality products is a growing concern for the companies that make use of these products. This includes making sure that the natural and human resources are managed in a responsible manner thereby ensuring that the needs of today are met, while being mindful of tomorrow.

### Sustainability focus

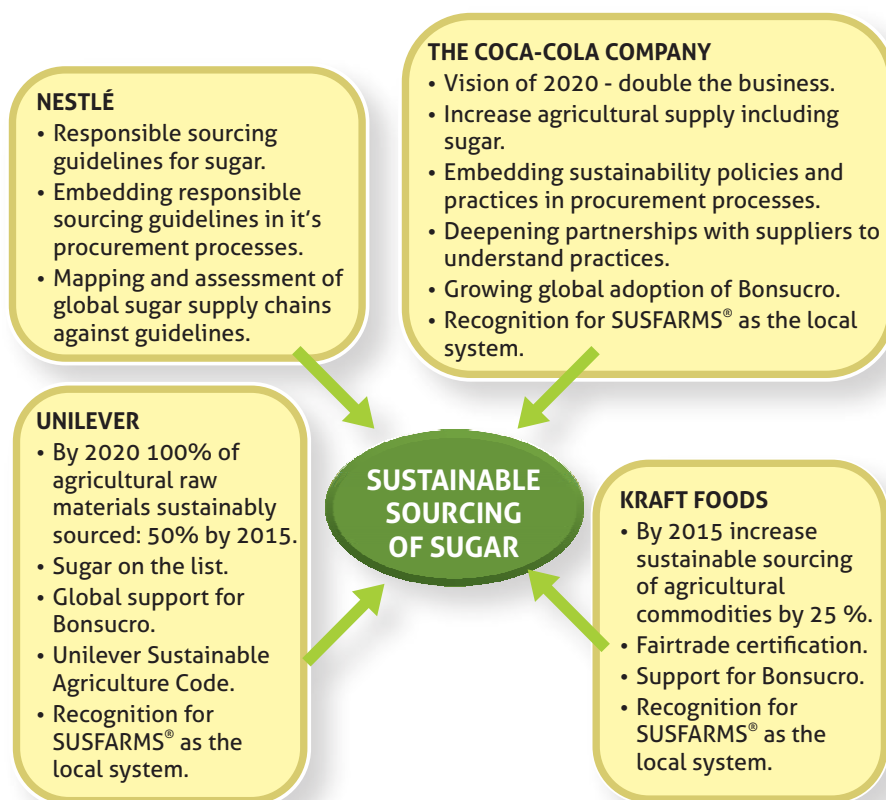
Sustainable sourcing of sugar means the ability to demonstrate that sugarcane farming and production of sugar at the mills meet all environmental, social and financial requirements. In this regard, some of the major purchasers of sugar have identified specific targets, as indicated in the diagram below.

### Demonstrating sustainability through SUSFARMS®

SUSFARMS® is an imperative of the South African sugar industry. While many different standards and certification schemes exist, SUSFARMS® has been developed for sugarcane growers to promote the sustainable use of resources. Recognition for SUSFARMS® as the local system is paramount and is growing. It is important to note that SUSFARMS® does not conflict with or contradict other standards but will assist the industry in implementing best management practices thereby responding to market pressures.

SUSFARMS® is here to assist and protect our sugarcane growers - enabling them to be legally compliant, protecting the environment and ensuring sustainable business. Knowing that government is gearing up on regulation, compliance and enforcement with the *blue and green scorpion units*, SUSFARMS® will assist industry to comply.

The good thing is that SUSFARMS® is not new - for many years growers have been implementing environmental, social and financial best management practices on their farms. SUSFARMS® packages these BMPs in a fashion that helps the sugarcane farmer to implement them, monitor progress and provide evidence of compliance to legal and recommended standards. This system will assist in demonstrating to our major consumers our commitment to sustainable sugar production.





# Message from the DIRECTOR



Dr Carolyn Baker

ning the BMP approach embodied in SUSFARMS® are ones over which SASRI has little influence – but our unambiguous support for the BMP approach lies in the recognition that complying with the law is desirable and implementation of good practice can only lead to improved productivity. The article on the opposite page describes the likely increasing pressures from the markets to produce a sustainable product that will surely have an impact on our practices, and it strongly reflects another reason to take SUSFARMS® seriously.

A significant feature underpinning SUSFARMS® is the requirement for an up to date land-use plan. This issue is one that has been hotly debated in the industry, and in the absence of any external service provider, SASRI has through an internship programme, developed limited capacity to assist growers. The reasons for each farm having a land-use plan are sound and are amply described in the article on Land Use Plans.

Finally, much of SASRI's value lies in its considerable wealth of data that have been accumulated over the years. Work that delves into these data repositories to establish trends and enable analysis of specific issues is illustrated in the articles on the development of a drought tolerance index and the flowering index.

With the prospect of a good crop in the current season, attention is firmly focused on maximising yields and making sure that all fields scheduled for harvest are cut in time to get to the mill. The response to SASRI's ripener recommendations has been exciting and it is expected that the impact will be significant, particularly in some regions. These immediate and day-to-day demands are balanced by longer term strategic issues that demand our attention.

At SASRI, significant effort is placed on looking to the future and ensuring that the industry is well protected from pest and disease incursions. The short piece in this edition of the Link that shows the alertness and awareness of our people in the field is just one way of demonstrating how seriously our industry views its biosecurity, and that together with our

suite of crop protection research projects SASRI strives to address all P&D issues to give growers 'peace of mind'.

Ensuring that our industry remains sustainable in the long term and that our farming practices conform to acceptable standards is at the core of the SUSFARMS® approach – an approach that SASRI wholeheartedly endorses because it encourages better management practices (BMPs). The fact that there is a legislative basis to the good practices only serves to underline how important it is that all growers engage with SUSFARMS® for the benefit of their own operations. The laws underpin-



# Topical T

## May - August 2013

### Pest and disease control

- Survey potential carry-over cane in July to see if Fastac® is needed to control Eldana. Do your own surveys or get your Local Pest, Disease and Variety Committee to check carryover fields for eldana.
- Start Fastac® applications in your carryover fields to control eldana in August.
- Sample your seedcane nursery for ratoon stunting disease (RSD) in July. RSD can cause severe yield loss. Between 12 and 50 % reduction in yield has been recorded in trials.
- Start roguing fields of smut-susceptible varieties in August. Place the diseased material in a bag, remove from the field and burn. Train your staff to identify smut **before** the whips emerge.
- 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 P&D Officer if you find something you do not recognise.



### Weed control

- With good late summer rains, winter weeds will have plenty of opportunity to become problematic during the winter months so 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.
- Mow verges and breaks.



### Planting

- Start spring planting in August if conditions are suitable. In order to control soil borne disease such as pineapple sett rot, which affects germination, apply a fungicide to protect the setts, and adequately cover and compact the soil over the setts.



### Nutrition

- Start soil sampling in all your ratoon fields in May.
- 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 on the coast can begin in August, if conditions are suitable. It would be preferable to use enhanced urea or LAN based blends.



### Land use planning

- May to August is the period to maintain waterways, drains and conservation structures due to the reduced possibility of heavy and intense rainfall.



# ips

- If you intend implementing your land use plan, the winter period is the best time to begin construction of new field layouts. Ensure that you have completed these layouts before the end of winter to avoid soil erosion.
- Review the field layout in all your plough out fields, including contour banks and waterways.
- Speak to your local SASRI Extension Specialist about the possibility of having a land use plan drafted using the latest computer technology.
- 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.



## 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 your local Fire Protection Association. Especially regarding the clearing of firebreaks and burning cane for harvest.
- This is the time to plan and order certified and other seed-cane requirements for next season.
- Keep an eye out for early frost damage during May if you are farming in the midlands. Continually inspect for frost damage throughout the winter period as badly frosted cane will need to get to the mill quickly to avoid losses.
- Start to service and calibrate fertiliser and herbicide 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 package. There are many available for use with a personal computer, however even basic manual records are good enough provided the correct data is recorded.



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



**The SASRI Extension Team**



# Predicting Sugarcane Flowering via the SASRI Weather Web

Flowering in sugarcane causes stalk elongation to decline and eventually cease. It has short term benefits of increased sucrose accumulation but this is later replaced by deterioration in cane quality (low sucrose content and pithing) as a result of side shooting. Therefore SASRI recommends that cane showing 20% or more flowering should be harvested before October of the year in which flowering occurs.

Flowering may be induced in a susceptible crop under favourable conditions during a three week period in March when day length drops below 12.5 hours. These conditions include night temperatures of above 18°C and adequate soil water.

Flowers will only emerge in winter and flowering may be weak, moderate or strong depending on how favourable the conditions were during the initiation period and the degree of susceptibility of the variety.

Based on this information a tool has been developed to predict flowering immediately after the initiation period in March. The expected extent of flowering is quantified using a flowering index that ranges from zero (no flowering) to one (extensive flowering for most varieties). The information is contained in flowering



reports, available for individual weather stations, accessible from the **SASRI WeatherWeb**. You can access the WeatherWeb by visiting SASRI's home page ([www.sugar.org.za/sasri](http://www.sugar.org.za/sasri)) and selecting WeatherWeb from the menu. On the Flowering Index page the desired station can either be selected from the drop down list or from the map (see Figure 2).

An example of a flowering report is shown in Figure 3. The 'IRRIGATED' column shows the calculated flowering index under irrigated conditions (assumes no water stress during the initiation period), while the other three columns show values for rainfed conditions for three soil types. Information on the flowering propensity of varieties is also provided.

In the example shown in Figure 3, the data suggest that little or no flowering will be expected in 2013 for any variety grown in the vicinity of the chosen weather station, Coopersdal near Komatipoort. In contrast, conditions seemed more favourable for flowering in 2010 and 2011. The report suggests that varieties with a high and medium propensity were likely to flower in 2010, while only varieties with a high propensity would have flowered in 2011. The report further suggests that 2003 was the worst case on record with most varieties likely to have flowered.

The relevance of the information depends on how close actual conditions are to the assumptions made regarding weather, soil and crop conditions and serves only as a general indication. The information will assist growers to minimise the negative impacts of flowering by allowing them to adjust their harvesting schedule timeously.



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

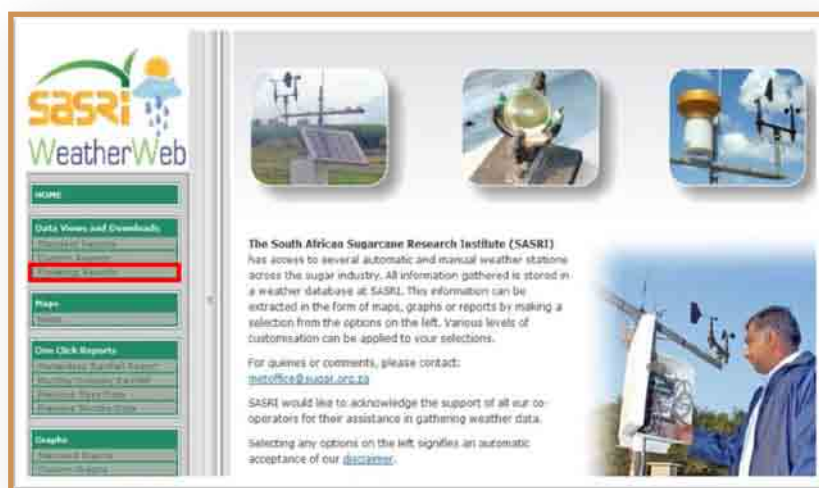


Figure 1. SASRI WeatherWeb home page with the 'Flowering Reports' option highlighted.



Figure 2. Flowering Index menu from which to select a desired station.

ID	STATION_NAME	YEAR	IRRIGATED	TAM00	TAM100	TAM140
474	Coopersdal - SASRI	2002	78	.00	.00	.00
474	Coopersdal - SASRI	2003	84	.00	.00	.00
474	Coopersdal - SASRI	2004	60	.28	.57	.60
474	Coopersdal - SASRI	2005	38	.00	.00	.00
474	Coopersdal - SASRI	2006	44	.44	.44	.44
474	Coopersdal - SASRI	2007	82	.00	.00	.00
474	Coopersdal - SASRI	2008	60	.00	.00	.00
474	Coopersdal - SASRI	2009	27	.00	.00	.00
474	Coopersdal - SASRI	2010	60	.00	.00	.00
474	Coopersdal - SASRI	2011	82	.00	.00	.00
474	Coopersdal - SASRI	2012	27	.00	.00	.00
474	Coopersdal - SASRI	2013	19	.00	.00	.00

KEY	
INDEX	EXTENT OF FLOWERING
0.00 - 0.2	No flowering
0.20 - 0.60	High propensity varieties
0.60 - 0.80	High and medium propensity varieties
>0.80	High, medium and low propensity varieties

Figure 3. An example of a flowering report for a selected weather station and key for interpretation.





# CARRY-OVER CANE & ELDANA CONTROL

It is now time for you to identify fields for carrying over. It is important to have some carry-over cane with which to start the season, but it is equally important that eldana levels in such cane are low. Summer is a time when eldana numbers can grow rapidly and, under suitable conditions, can negate the economic value of carrying over a crop. Studies have shown that eldana damage in April is typically three times that of the previous August carry-over cane.

There is an estimated 1.0 to 1.5% loss in RV% for every 1% stalk length red. The implications for carryover cane can be illustrated as follows. The loss in RV% in a field with 4% stalk length red in August equates to 6% (6% of the RV%). This could increase threefold to 18% loss of RV% if the field is carried over to April. In this example an RV% of 12% in April could reduce to 9.8%.

So, what can be done to minimise eldana in your carry-over cane? The following points need to be taken into account when considering which fields to carry over:

Check the resistance category of the variety. This will give you a guide to the likely risk of eldana damage (see Table on the right).

**Table 1. Varieties and eldana risk.**

VARIETY	ELDANA RISK CATEGORY
N12, N21, N29, N33, N39, N41, N42, N53	LOW RISK of economically damaging infestations, provided cane is not stressed. May be aged or carried over.
N14, N16, N17, N18, N19, N22, N23, N24, N25, N27, N28, N31, N32, N35, N36, N37, N40, NCo376, N43, N45, N46, N47, N48, N49, N50, N51, N52	MODERATE RISK of economically damaging infestations, provided cane is not stressed. May be aged slightly, but carry-over with caution. Carry-over in coastal region not recommended.
N26, N30	HIGH RISK of economically damaging infestations. Do not carry-over.



Eldana infestations are known to increase enormously when the cane is stressed. Low rainfall in conjunction with shallow soils, high levels of available N and susceptible varieties, will result in runaway infestations in carry-over cane. Assess each field according to these criteria.

The current and historical levels of eldana in the field are most important. You must know your levels from LPD&VCC surveys, as well as from your own surveys and make decisions accordingly. Adhere to eldana threshold levels set by your LPD&VC Committees.

Consider using Fastac® to reduce the impact of eldana on carry-over cane. The greatest benefit can be in situations where there is a good likelihood of severe eldana infestation developing. Currently, our recommendation is that that Fastac® be applied eight times at a rate of 200ml product in 350 litres of water per hectare once every two weeks over the period August to November. The product can be effectively applied by air or ground. With aerial application, precautions against possible drift need to be considered. Remember however, that Fastac® will not eliminate eldana, but will suppress populations, so reducing the risk of runaway infestations.

By considering the above options where eldana is a problem, you will be better able to manage the threat that this pest poses to your farming operations.

Please contact your local Extension Specialist regarding variety suitability and possible LPD&VCC restrictions regarding carry over cane.



**Graeme Leslie**  
(Principal Entomologist)

# Drought tolerance of coastal varieties

In the rainfed areas of the industry the unpredictability of rainfall is of major concern for growers. Currently, information about the drought tolerance of varieties is very limited due to the complexity of this research. More knowledge of the drought tolerance potential of released varieties would allow for more informed variety selection decisions.

As a first step towards gaining more knowledge, a data mining (desktop) study was conducted to determine the drought tolerance potential of released coastal varieties. Historical cane yield data from 416 plant breeding trials conducted in the rainfed Coastal region was extracted from SASRI's database. A drought stress index (DSI) for each trial was developed, using the Canesim crop model and historical weather data. The DSI quantified the degree of drought stress experienced by the varieties in the trial. The DSI was estimated as the ratio of Canesim simulated rainfed yield (using historic weather data) to Canesim simulated irrigated yield (assuming full irrigation for the trial). The exercise used Variety N12 as a reference variety because it is known to possess intermediate tolerance to drought stress.

The model has enabled SASRI to establish a drought tolerance rating for several coastal varieties. The accuracy of these findings is currently being evaluated. Once validated, these drought stress tolerance indices will be included in SASRI's Variety Information Sheets to further assist growers with variety choice decisions.



By **Nikki Sewpersad** (Biometrician), **Riekert van Heerden** (Sugarcane Physiologist), **Willem Botes** (University of Stellenbosch) and **Marvellous Zhou** (Senior Plant Breeder)



# Getting to the root of the problem!



**Tania van Antwerpen** (*Plant Pathologist*)

It is obvious that a healthy root system is necessary in order to have a healthy crop: good root distribution and healthy roots will lead to superior uptake of water and nutrients, and hence improved growth and yield. In the SA sugar industry, however, the phenomenon of stunted root growth seems to be widespread. Soil pits opened in numerous rainfed areas have revealed, almost without exception, very poor root systems. Roots have been found to be sparse, often blackened, and mostly confined to the top 30 cm even where there is good soil depth. Poor root systems have a profound impact on crop growth and performance and lead to reduced productivity and reduced vigour in plant growth. A healthy root system will normally be whitish to light brown in colour and has the potential to penetrate a depth of about two metres, depending on soil type.

SASRI has embarked on a project to investigate this problem further. The project involves a multi-disciplinary team of soil chemists, soil physicists, plant pathologists, nematologists, agronomists and entomologists. The first part of this

two-phase project is an extensive information-gathering exercise. The approach will be to sample roots and soil from pits in affected fields as well as from fields with healthy rooting systems. Sites will be selected throughout the industry and will encompass a range of soil types, varieties, histories of herbicide use and other management practices.

Because the extent and severity of the rooting problems in the industry are, quite literally, hidden underground, this exercise will give a good indication of how widespread the rooting problem is in the SA sugar industry. It will also serve to enlighten researchers, extension specialists and growers as to the visible characteristics of both good and poor root systems in sugarcane, and the possible consequences of poor rooting in terms of yield and ratoon longevity losses.

Once all the root, chemical, physical and biological data from pits representing good and poor root distribution have been collected, common factors that are associated with healthy and bad root systems will be identified. These factors will be used in phase two of the

project which will involve scientific, replicated trials to establish practices to ameliorate root stunting. When results materialise, clarifying the factors responsible for poor rooting and identifying management activities which promote healthy rooting, demonstration plots will be established to illustrate to growers the effect of good management on root development and yields.



**Poor root systems (above) and ideal root systems (right).**



# The use of unregistered agrochemicals in the sugar industry

For agrochemicals to be legally used in the sugar industry they must be registered in terms of the Fertilisers, Farm feeds, Agricultural remedies and Stock remedies Act 36 of 1947. The Act states:

"No person shall for reward or in the course of any industry, trade or business use, or recommend the use of, any agricultural remedy or stock remedy for a purpose or in a manner other than that specified on the label on a container thereof or described on such container"

It is thus illegal for a product to be used in any way other than what is specified on the label.

While a product may well be registered in terms of the Act, unless its use on sugarcane is specified on the label, it cannot be used on sugarcane.

When using a registered product, the end user has confidence in knowing that the product has been shown to be able to do what it says on the label, and the product will have the backing of the company that produced it.



**Graeme Leslie**  
(Principal Entomologist)



# Variable Speed Drives

## The answer to high electricity bills?

Substantial increases in the cost of electricity have forced irrigators to look at ways to reduce active energy consumption. Variable Speed Drives (VSDs) have been introduced to many industries, including agriculture, resulting in marked energy savings. However, although VSDs are beneficial to most systems through energy savings, reduced component wear and programmable control, the economic feasibility of this technology needs to be carefully assessed for each specific scenario.

### *What are VSDs and what do they do?*

Typically, fixed speed centrifugal pumps are used for irrigation. Throttle valves or pressure reducing valves are used to manage flow and pressure depending on the irrigation requirement (i.e. number and type of blocks being irrigated simultaneously). This means that the same amount of power is always being used to drive the pump, even when irrigation demands are reduced. The power

requirement is increased even further by the fact that these pumps and electrical motors are usually over-designed with a 5 to 10% safety factor, to ensure the system's minimum flow and pressure requirements are met and to make provision for reduced performance with age.

A VSD, however, is an electrical control system which reduces the motor speed in order to match the pre-determined operational requirements (pressure and flow) of the irrigation system. Pressure and flow sensors in the main line are used to inform the VSD. The electricity savings are realised when the motor runs at a reduced speed, drawing less power.

### *How are the benefits derived?*

The economic benefits of VSDs can vary and each scenario needs to be analysed individually. For example, greater benefits can be realised in systems with large variations in pressures and flows. Pressure and flow demands can change drastically as a result of, for example, the size of blocks irrigated simultane-





ously, the position of the blocks, slope variation within and in between irrigation blocks and non-irrigation of dry off or fallow blocks.

VSDs can also be installed for constant pressure and flow rate applications, such as pumping from a water source to a holding dam. The benefit in such applications is related to the gradual start-up of electric motors which increases the life span of the system by reducing mechanical stress. Gradual start-ups also reduce the start-up current requirements and the energy costs if operating on the Nightsave Rural Tariff option. Other additional benefits of VSDs include automatic start up after power dips which help reduce water hammer issues associated with sudden shut-offs, programmable pump starts and stops to cater for Ruraflex and Nightsave off-peak pumping, as well as continuous logging ability to record internal data such as power consumed or flow rate and pressure data from external sensors. With the VSD taking over the functions of certain types of hydraulic control valves and electric starters, these accessories are no longer included in the design of new pump stations.

### **Economic viability – what to consider**

Estimating the economic viability of VSDs is a matter of weighing the capital costs of the systems against the benefits derived from either reduced energy consumption, improved system protection resulting in less maintenance costs or the added value of programmable stop and starts and continuous logging abilities. Capital and installation costs for VSDs are currently estimated to be in the region of R 1,000 per rated kilowatt. Intuition suggests that the potential to realise savings from energy consumption are greater in irrigation systems with variable motor loads. The benefits associated with gradual start-up, reduced maintenance costs, programmable control systems and continuous logging is available, irrespective of variable or constant motor loads in the system.

### **Summary and Recommendations**

VSDs are more than just an energy saving device. From a management perspective, programmable control and logging capabilities aid in system automation and monitoring of irrigation events. Reduced operating speeds and soft starts decrease the wear and subsequent maintenance costs for both the motors and pumps. There are, however, a few points to consider before investing in this technology.

- The economic benefit of VSDs can vary. To maximise the potential of a VSD, changes in irrigation practices may be necessary. Consult your Extension Specialist or a qualified irrigation advisor.
- VSDs are sophisticated and expensive. One should not use a VSD to compensate for poor irrigation design or operation. Replacing the old, over-sized, motors with smaller

energy efficient motors or re-scheduling the blocks to be irrigated simultaneously may still be a cheaper option.

- Consider also your tariff plan, time of use (peak or off-peak), the condition and maintenance of all equipment as well as alternative technology such as soft starters. In the case of simple, fixed load pumping systems the use of a correctly sized energy efficient motor and a soft starter will be as effective as a VSD and usually cheaper.

*Acknowledgements: Isobel van der Stoep*

*SABI Chief Technical Officer for reviewing the article*



**By Darran Boote (Assistant Research Engineer)  
and Ashiel Jumman (Agricultural Engineer)**

## BIOSECURITY AWARENESS

*People working in the sugarcane fields have the opportunity to look out for anything unusual that may pose a potential biosecurity risk. Recently some material was sent by a LPD&VC team to specialists at SASRI for identification. The sample consisted of an empty pupal case belonging to *Sesamia calamistis*, and a mixture of different types of fungi with mites feeding on this food source. Although none of these organisms are known biosecurity hazards, the proactive action taken by this field team was appropriate and commendable.*

*This demonstrates the LPD&VC teams' high level of awareness about threats from invasive pests, diseases or weed species. Furthermore, these teams represent the eyes of the industry and play a pivotal role in protecting the crop, thereby ensuring long-term sustainability.*



**Material sent by LPD&VC team to SASRI for identification.**



**By Mike Way (Entomologist) and  
Stuart Rutherford (Senior Pathologist)**



# Land Use Plans

## Planning for optimum yields



Every farm needs a land use plan (LUP). An LUP is a visual illustration of the farm which facilitates proper siting of cane extraction and infield roads, soil conservation structures and crop management practices such as strip cropping, areas of minimum tillage and trashing. They are designed and prepared according to standards recommended by SASRI and the DAEA KZN. They provide details of (among others):

- Management practices such as strip cropping, minimum tillage, trashing
- Area suitable for total mechanisation
- Roads
- Terraces (contour banks)
- Waterways

### Management practices

In order to obtain maximum economic crop production, it is necessary to relate agronomic practices and mechanisation to the climate and topography of a farm

unit. The optimum cane yields obtainable on different soil types and from different land use classes are seldom the same. For example, strong, deep dolerite soil will have a better potential for crop growth than a shallow granite soil and valley bottom areas with deep wet soils produce more cane than areas of shallow soil on hilltops. Different parts of a farm therefore require different types of management. These need to be integrated into a balanced working plan, whereby each unit of land produces its economically optimum yield – An LUP is such a plan.

### Cane extraction networks

LUPs assist in proper siting of roads for cane extraction and infield works. In developing an LUP, suitable areas for constructing farm roads and loading zones are identified and these are drawn in as part of the overall LUP to provide access to all cane areas. This includes crest

roads, diagonal roads, valley bottom cut-off roads and boundary roads constructed according to the correct gradient and with proper drainage.

### Soil conservation

Waterways and terraces are constructed with a primary purpose of gathering water flowing over the surface of the land before it can cause serious damage, and to conduct this water at a safe velocity off the land – thereby minimising soil erosion. Waterways are constructed according to specifications which are based on the size of a catchment area contributing water to that specific waterway. Terraces are spaced and constructed based on soil erodibility, slope percentage as well as crop management practices.

Strip planting is recommended especially on steep slope for the overall protection of the hillside during excessive



run-off which could result in soil loss. Implementing trashing and minimum tillage also improve soil protection against rainfall. Minimum tillage is also compulsory on certain slopes especially where soils are weak.

### Legal requirements

The Conservation of Agricultural Resources Act 43 of 1983 (CARA) provides for the conservation of the natural agricultural resources on the farm. It is compulsory for all land users to ensure that all cultivated land is effectively protected against excessive soil loss as a result of erosion. CARA states that no land user shall, without written permission, cultivate virgin land (land out of cultivation for 10 years or more) or land with a slope greater than 20%. CARA recognises the following protection methods in sugarcane:

- Suitable earth structures above the lands such as storm drains.
- Cultivation or layout which reduces the runoff water velocity such as terrace banks, contour ploughing, conservation tillage and reduced tillage (minimum tillage).
- Alternate strips on which a cover crop occurs such as strip cropping.
- Crop residues or plant material left on the soil surface to form a mulch such as trashing.

Further to this, the KwaZulu-Natal Department of Agriculture and Environmental Affairs, when issuing permits to cultivate, requires that all sugarcane growers have a Land Use Plan (LUP) drafted according to SASRI standards.

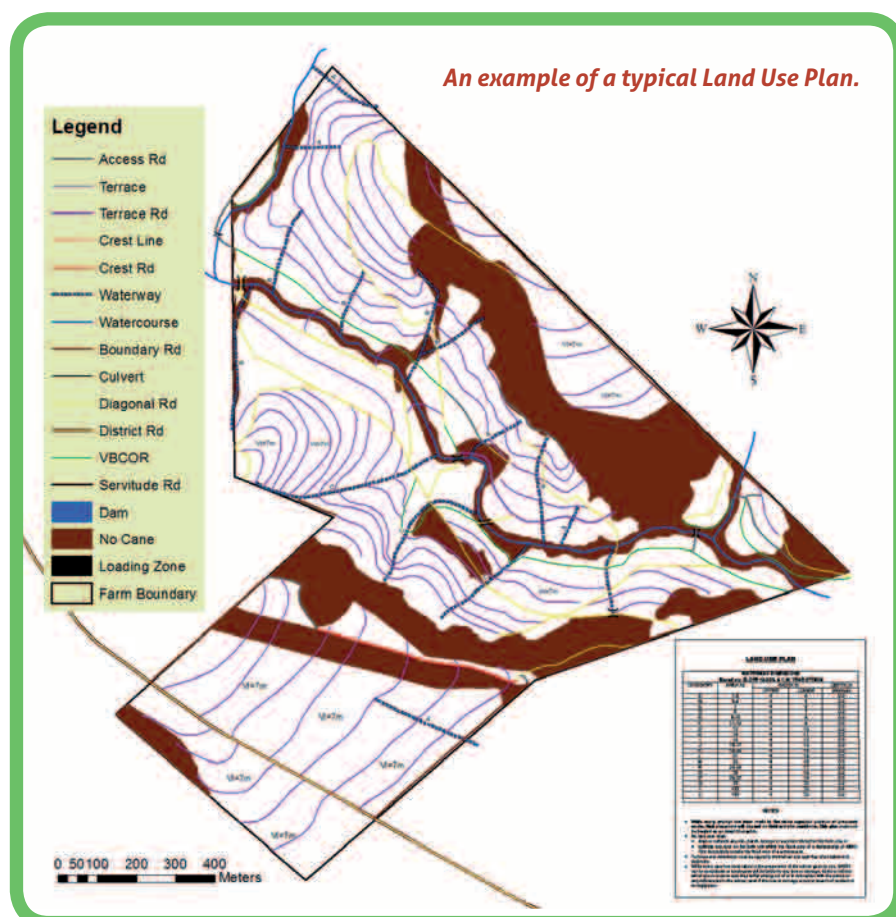
In addition to these legal issues, the farm management system SUSFARMS®, which was developed by growers, for growers also requires every farm to have an LUP.

### Addressing the need for LUPs

Growers should consult their local SASRI Extension Specialist if they require an LUP. SASRI has access to electronic base information such as aerial and satellite

photography, contours and soil parent material maps. SASRI has developed some capacity to produce LUPs through an internship programme. However, this is limited and SASRI is exploring avenues to meet the increasing and on-going demand to ensure the long term sustainability of this service.

Upon obtaining an LUP, a grower can implement the plan on the farm over a phased period. This will ultimately lead to a more productive farming operation which also takes into account proper management of natural resources.



## Benefits of implementing a Land Use Plan

- Proper location of cane extraction networks for transport and infield work efficiency;
- LUPs provide a basis for construction of all soil conservation works necessary on the farm;
- Protection and conservation of natural resources e.g. soil, water and wetlands;
- Identifying and rehabilitation of areas that have been neglected on the farm e.g. riparian areas and wetlands;
- Ensuring long term sustainability of the farm.



By Bongiwe Khumalo & Nqobile Nxumalo  
(Research Interns, Extension)



# Weather

## Review

Generally, the industry experienced good rainfall over the review period. Most regions received above average rainfall in December 2012 and in January and March of 2013 (Figure 1). Although February rainfall was below average across the industry, the overall distribution of summer rainfall was good enough to maintain excellent crop growth, except on marginal soils. Cane yields should therefore be high but early season cane quality could be poor due to the excellent growing conditions.

Temperatures over the review period were generally close to normal.

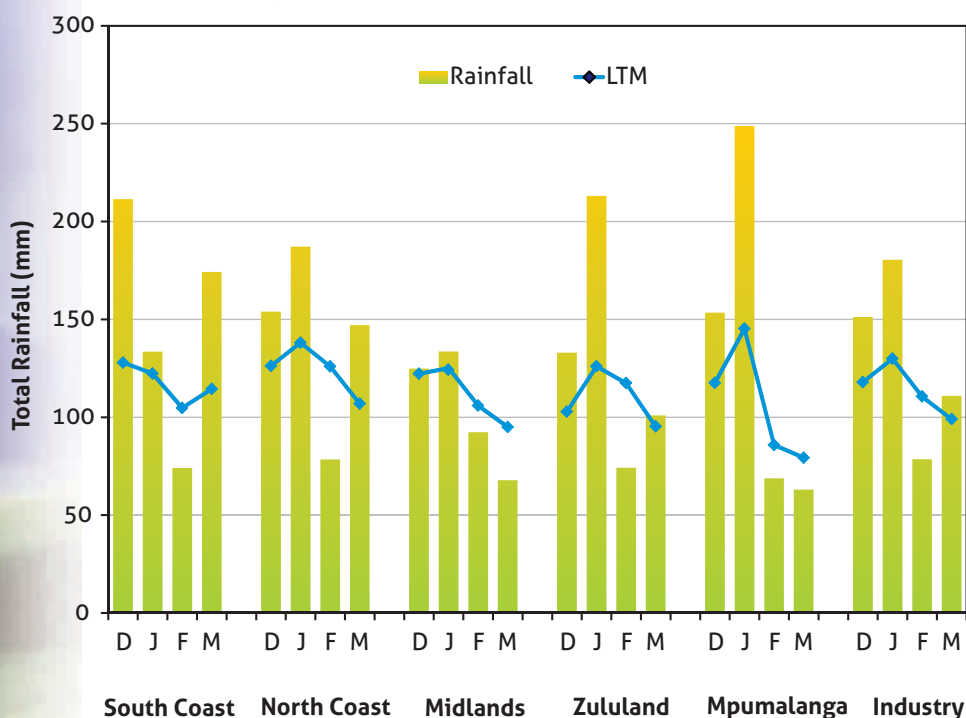
## Outlook

The ENSO phenomenon is currently in the neutral phase and is projected to stay in this phase throughout the 2013 winter season. The South African Weather Service predicts enhanced chances of above average rainfall for May to July with increased chances of drier conditions towards late winter. The European Center for Medium-Range Weather Forecasts and the International Research Institute for Climate Society both predict near normal winter rainfall. Cool daily maximum temperatures are expected for early winter (May to June) with enhanced chances of above average figures from mid to late winter. Daily minimum temperatures in winter are expected to be generally above average.

Please visit the SASRI WeatherWeb at <http://portal.sasa.org.za/weatherweb/> for links to up-to-date seasonal climate forecasts and also for the latest rainfall and other weather data.



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



**Figure 1. Regional and industry average monthly total rainfall and the monthly long term means (LTM) for December 2012 to March 2013.**

**Editorial Team:** Poovie Govender, Ruth Rhodes, Michelle Binedell, Bongzi Bhengu, Sharon McFarlane, Graeme Leslie, Geoff Maher, Deborah Sweby, Aimee Koch & Sifiso Hlela.

**Layout & Design:** Sagie Doorsamy **Publication Details:** Published three times a year, usually January, May & September

**Suggestions & Enquiries:** Michelle Binedell: 031-508 7567 **Website:** [www.sugar.org.za](http://www.sugar.org.za) **Email:** [michelle.binedell@sugar.org.za](mailto:michelle.binedell@sugar.org.za)

Copyright subsists in this work. No part of this work may be reproduced in any form or by any means without the publisher's written permission. Whilst every effort has been made to ensure that the information published in this work is accurate, SASRI takes no responsibility for any loss or damage suffered by any person as a result of the reliance upon the information contained therein. The use of proprietary names in this publication should not be considered as an endorsement for their use.