

THE LiNK

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Conservation Conscious

Growers, Conrad and Henning Klipp, share their farming philosophies that have led to their farm's success for several years while still preserving the environment. Some of their key focus areas include the implementation of 'Conservation Agriculture' and following SASRI best management practices. Their principles are based strongly on preserving environmental resources and improving soil health (page 16).

In this issue...

On-farm product testing

There are a wide range of new agricultural products that are being developed and marketed to growers. To assist with evaluating whether or not the products deliver on expectations, a few important guidelines are recommended (page 14).



Water quality

Poor irrigation water quality can cause soil degradation and induce crop stress. Growers are encouraged to regularly sample water sources and monitor water quality to ensure soil health is maintained and crop yield losses are avoided (page 20).



Alien weeds

Plants classified as 'alien' or 'invasive' pose a major threat to indigenous plants and biodiversity. Growers are warned against propagating these plants without following the correct guidelines or obtaining the necessary permits (page 8).





DIRECTOR'S

Dr Carolyn Baker (SASRI Director)

A dedicated RESEARCH INSTITUTE that delivers scientifically rigorous and independent advice.

One of the key motivations behind SASRI's change of name in 2004, from the South African Sugar Association Experiment Station (SASEX), was the recognition that the name no longer reflected the kind of work that was carried out in the research institute. Rather than conducting a series of 'experiments' largely associated with a single discipline, it was understood that 'modern' research entailed systematic, interdisciplinary investigations that were aligned with an agreed strategy. In our particular context, this research served to enhance the productivity and profitability of the South African sugar industry. Hence the change from 'experiment station' to 'research institute'. However, the name South African Sugarcane Research Institute also signified a shift from 'sugar' to 'sugarcane', to acknowledge that the value of sugarcane extended way beyond just sugar production. Now in 2019, when our sugar industry is under significant threat, considerable emphasis is being placed on the need to explore a far wider diversity of products from sugarcane. In so doing, the industry acknowledges and

accentuates the significant role that research and innovation will play in facilitating development of new technologies and in exploring alternatives. SASRI's role in this regard will be as 'an enabler' – mainly through its focus on developing appropriate feedstocks for a diversified range of products. The longstanding plant breeding programme has to date delivered some exceptional high sucrose varieties to enhance sugar production. These varieties are also assessed for their fibre content – a feature that is likely to become increasingly important in the future. Newly approved rainfed and high altitude variety N74, that will be going into bulking, is a good example. Not only does it demonstrate considerably improved RV content when compared with reference varieties, it also has a higher fibre content.

Specialist knowledge

As a research institute dedicated to sugarcane, SASRI has been able to attract scientists with specialist knowledge in sugarcane. In many



MESSAGE

cases this expert knowledge has developed over many years, and has enabled the institute to deliver tailored solutions to all sugarcane growers to enhance their productivity. While developing this depth of knowledge in one crop has been extremely valuable in enabling innovations specifically attuned to sugarcane, our mandate has prevented our specialists from devoting time to fully understand other crops and their requirements. In view of the increasing trend towards diversification of operations on farms in our existing industry, and the likely future demands on the research institute, the importance for our specialists to become more informed about some of the alternative crops, would be beneficial. While our specialists certainly have the necessary background to achieve this, such a shift will take time since building a body of expert knowledge cannot be accomplished overnight.

An enduring feature of the outcomes of SASRI's research and expertise is the importance that is placed on converting the outcomes of projects

into recommendations that improve productivity, and that are reliable, independent and thoroughly researched. It is this scientific rigour and dedication to serving our growers that differentiates SASRI as an unbiased service provider and that contributes to its value.

Enabling technologies for all growers

Looking forward into the new season, SASRI has developed a programme of work that strives to serve all growers, and in particular that seeks to identify specific technologies that are required by them, with the intention of tailoring them to meet their needs. This process will be an interactive one that seeks to learn and understand more fully, the circumstances associated with each of the grower groups. This is neither a quick or easy process, but it is essential if we are to address the research and innovation needs of all growers in a changing landscape.



Latest Update

NEW Feature!

A spray date guide* calculator has been developed to assist users in determining spray dates for the various chemical ripening and late-season quality maintenance treatments.

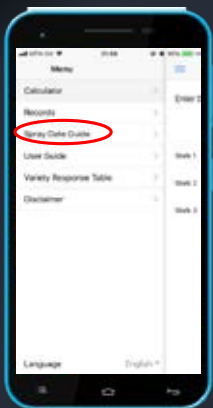
*The optimal timing of application might very well vary depending on crop growth vigour, which is influenced by many factors including location, climate, variety, crop maturity and management. For precision-agriculture purposes, timing may be adjusted based on information gleaned from hand-held refractometer measurements, recorded at intervals between spraying and the planned harvest date. Refer to SASRI Information Sheet 12.2 for more information on the measuring method and interpretation of refractometer readings for this purpose.



PLEASE DOWNLOAD THE LATEST VERSION OF THE APP AVAILABLE IN ENGLISH, isiZULU AND AFRIKAANS!



① Access spray date guide under main menu



② Enter planned harvest date

③ Select required treatment option



④ Spray date results display



NEW VARIETIES

Four new varieties have just been gazetted for the rainfed and irrigated areas of the industry. There are four new variety information sheets detailing the characteristics of each of these new varieties. Information sheets will be posted to growers shortly. These are also available on our website at: www.sasri.org.za.

N69 (Rainfed)

Best features

- Good eldana and smut ratings.
- High cane and RV yields in humic and sandy soils.
- Less prone to lodging.
- Good canopy formation.
- Good ratooning ability.



N70 (Irrigated)

Best features

- High RV yields in irrigated late season trials.
- Good pest and disease ratings.



N71 (Irrigated)

Best features

- High RV yields in late season crops.
- Good ratooning ability.
- Resistant to smut and mosaic.



N72 (Rainfed)

- High RV yields on average and high potential soils.
- Good ratooning ability.
- Good pest and disease resistance.



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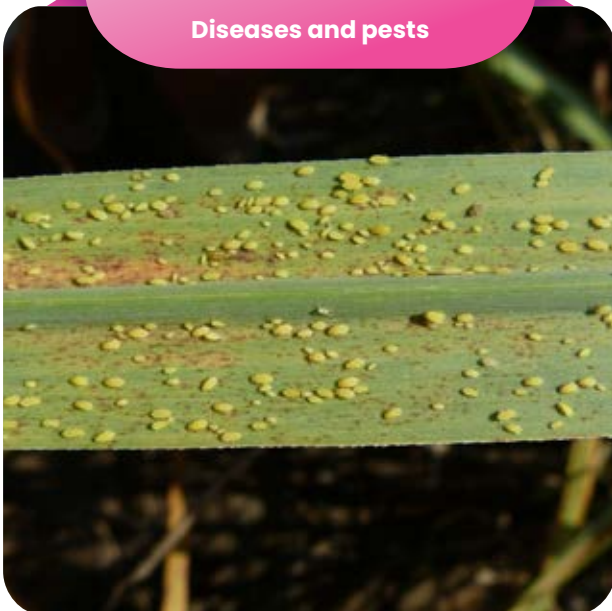
Rowan Stranack (Extension & Biosecurity Manager)

allowed. Plan to sample all fields to be re-established this year. Speak to your SASRI Extension Specialist or Biosecurity Officer.

Pay attention to roguing for mosaic particularly on susceptible varieties such as NCo376, N19 and N57. Keep grass on verges and open areas close to fields short to limit aphids from entering the fields. Popular and intermediate mosaic susceptible varieties such as N12, N36 and N41 should also be closely monitored.

Outbreaks of yellow sugarcane aphid are likely to occur in summer and autumn. Regular scouting (*The Link September 2019 has advice on scouting methods*) will provide early warning of an outbreak. Often the pest reappears in the same spot each year and these areas should be checked carefully. Spraying of insecticide should be carefully considered as the pest can be elusive and natural enemies are also often present to provide a measure of control. Ask your SASRI Extension Specialist or Biosecurity Officer for advice.

Diseases and pests



Smut has been problematic this summer after the dry conditions of last year. In the irrigated areas, pay attention to roguing fields of N19, N25, N36, N41 and N43. In the rainfed areas, N48 and N54 need monitoring and roguing to make sure smut is controlled. When roguing diseased plants, make sure the entire stool is removed (including the roots) to prevent regrowth. Chemical roguing of smut, mosaic and off-types is an option (*see Link September 2018*).

RSD is a serious problem. Trials have shown that RSD can reduce yields from between 12–50%. Therefore, it makes good sense to know if your fields are infected and if so, to sacrifice some crop growth by fallowing these fields until all traces of the previous crop are removed. This could take up to six months, and a minimum of four months fallow should be

Soil conservation



It is important to ensure that, during the rainy season, all contour structures are flowing properly and that any sediment or other material which is affecting the flow of water in these structures is removed. Blockages can cause over-topping of

contours and result in erosion in fields. Similarly, smaller drains and culverts need to be kept clear as blockages can cause problems. The off-crop is also an ideal time to carry out routine maintenance of roads and structures in preparation for the coming season.

The protection of wetlands and watercourses is also essential to prevent excessive soil loss and to maximise water retention on your farm. Should signs of erosion appear in these areas, ask your SASRI Extension Specialist for advice. Much work has been done in the past on ways to protect the banks of streams and how to encourage the rehabilitation of wetlands. Ask your SASRI Extension Specialist for available information.

Weed control



Summer is the time to be working hard at controlling creeping grasses. Repeated under-canopy applications of glyphosate, and verge control with imazypr (Arsenal®) are essential to keep these grasses under control. Some growers flag problem spots within fields to keep track of these areas as the cane matures. Large areas where grasses have taken over will require re-establishment. It is important to target the source of creeping grass problems. Verges and small patches of grass inside fields MUST be treated with herbicide. Hand hoeing is not recommended as it is not effective and could encourage the spread of these grasses.

Alien weed encroachment can be a problem on some farms. The off-season is an ideal time to start an alien plant control programme as there is less

pressure from other operations and herbicides generally work better in the warm wet conditions. Start by tackling a small, manageable area that is not too overrun with undesirable vegetation. This way, you will see meaningful results in a short space of time. If you are unsure about the identification of weed species, contact your SASRI Extension Specialist who can get the problem plants identified. See *article on page 8 for more info.*

Early-season ripening



Ripener application programmes should be well under way in most areas. Chemical ripening is an option across all areas of the industry. Use the PurEst® mobile application to assist with deciding when to apply ripeners and which treatment to use. Ask your SASRI Extension Specialist for assistance.

In the irrigated areas, it is important not to ripen carry-over fields (any field older than 12 months at mid-December) with the piggyback ripener programme due to the risk of eldana damage and over-ageing (deterioration of quality).

Adhere as close as possible to the spray-to-harvest interval. Increasing the rates of chemical ripener **does not** compensate for the reduced interval due to applying after the recommended time.

In the rainfed areas, older carry-over cane as well as annual cane can be ripened provided growing conditions have been good. However, always check suitability for ripening with the PurEst® app.

Crop management



Although regarded as the so-called 'quiet time' of the season, in fact January, February and March is when maximum growth takes place and maximum income is generated. Growers with irrigation should be on full-alert to ensure minimal disruption to water supply. Make sure growth is not lost to unnecessary weed competition and ineffective irrigation scheduling.

Planning your harvesting and replant programme for the coming season should be well under way by now. An accurate crop estimate is essential in the planning process. Visit the SASRI website to access the various yield benchmarking and crop estimating tools available (www.sasri.org.za). Weather details are also an important aid to estimating and here the SASRI WeatherWeb is useful in providing details of the important climatic crop growth factors and indicators.

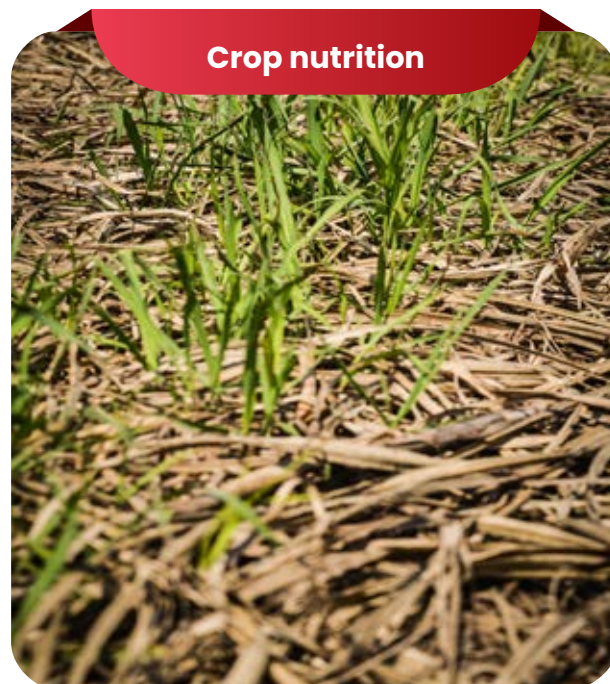
Drawing up a programme plan of operations for all fields on the farm is the next step once a harvesting and replant plan has been drawn up. A good idea when doing this is to first visit each field and make a note of all the necessary operations required to ensure the field will produce an optimum yield. A programme planning chart can be used to visually schedule all the necessary operations for the season ahead. At this stage, once all field inputs and operations are decided, a budget for the farm can be developed for the coming season.

Good management decisions can only be made based on good accurate records. Consider implementing a field record system this coming

season. Consult your Extension Specialist to discuss the options available.

The quieter times during the off-season are an opportunity to train staff without much disruption to important operations. Some courses that could be appropriate at this time are; disease, pest and variety identification, planting, Junior or Senior Supervisor, tractor care, basic workshop skills and welding. Cane cutter courses could also be scheduled for the start of the season. Contact the Shukela Training Centre on 031 508 7700 or your local Extension office.

Crop nutrition



It is not too late to take leaf samples provided that the crop has not undergone any stress during the last two months and the cane is the correct age for sampling. The results from leaf samples can indicate changes that might be necessary in the coming season's fertiliser programme.

Plan to sample soils as early as possible in order that lime application and the planting of green manure crops can be done timeously. Green manures for winter fallows need to be planned. Although not a legume, planting oats can be especially useful in fields where creeping grasses are a problem.

Quite often at this time of the year some fields will appear yellow and poorly grown. This generally indicates a lack of nitrogen, either as a result of not enough fertiliser being applied or nitrogen lost as a result of heavy rainfall. Take care though, as yellow, nutrient-deficient patches can also be attributed to other factors like sugarcane yellow leaf virus, yellow sugarcane aphid, white grub or nematodes. Consult your SASRI Extension Specialist if in doubt.

Managing alien and invasive vegetation!

*Dr Peta Campbell (Weed Scientist) and
Dr Des Conlong (Senior Entomologist)*

Alien and invasive plants threaten biodiversity, deplete water supplies and pose a massive threat to indigenous plants due to their ability to spread rapidly. Regulations published under the Conservation of Agricultural Resources Act (43 of 1983) separate these into three categories:

Category 1 plants



Bugweed

Declared weeds are known as Category 1 plants and may not occur on any land or inland water surface. These must be controlled, or eradicated where possible, except in biological control reserves.

Examples in or near sugarcane include:

Madeira vine, Mexican Poppy, Giant Reed, Balloon vine, chromolaena, camphor tree, thorn apple, morning glory, lantana (poisonous), tree daisy, parrot's feather, oleander (poisonous→lethal), famine weed (severe irritant), pereskia, water lettuce, kudzu vine, Kariba weed, Brazilian pepper tree, sesbania, bugweed, Mexican sunflower, cocklebur and several cactus species.

Most Category 1 plants found in the industry are alien species that have escaped control and pose a serious threat to the environment.

Category 2 plants



Guava

Category 2 plants are allowed only in demarcated areas under controlled conditions. The area in which Category 2 plants are permitted contain most of the commercial tree species. No land user may allow Category 2 plants to occur within 30 m of the 1:50 year flood line of a water resource (river, stream, spring, lake, dam or wetland) unless authorised in terms of the National Water Act.

Examples in or near sugarcane include:

Black wattle, sisal, gum trees (several species), pine trees (several species), guava, poplar, castor oil (a host for shot-hole borer), weeping willow, Johnson grass (very difficult to control).

Growers are obliged by law to control plants in Categories 1 and 2. While there has been little law enforcement until now, this is about to change as these species become more troublesome.

Category 3 plants



Mulberry

Category 3 plants These are not permitted to occur on any land or water surface, but as they are the most benign of the three categories, plants in existence at the time of the commencement of the regulations (30 March 2001) are not required to be removed. However, if they occur within 30 m of the 1:50 year flood line of a river, stream, spring, lake, dam or wetland, then they must be removed. No Category 3 plants may be established, propagated, sold or acquired.

Examples in or near sugarcane include: loquat (an alternative host for fruit flies), Australian silky oak, morning glory (a deep germinator becoming troublesome), jacaranda, syringa (can spread very well), common/white mulberry, peanut butter cassia (poisonous leaves).

The National Environmental Management: Biodiversity Act, 10 of 2004 regulates both alien and invasive plant and animal species through the publication of regulations and lists of alien and invasive species. These regulations were amended in July 2016.

Specific information on a particular species, e.g. black wattle or chromolaena, can be found in newsletters produced by SAPIA (Southern African Plant Invaders Atlas). These are available at: <http://www.arc.agric.za/>

Growers are encouraged to introduce control measures early to reduce costs and before legislation is enforced. Control of alien species is a matter of priority and commitment.

Managing alien and invasive species through biocontrol agents

Apart from chemical and mechanical control of these plants, SASRI mass rears alien weed biocontrol agents effective against a number of alien plants. These include:

- Waterweeds such as water hyacinth, water lettuce and kariba weed.
- *Triffid Weed (Chromolaena odorata)*
- *A climbing cactus (Pereskia aculeata)*
- *Famine Weed (Parthenium hysterophorus)*

Through SASRI, agents against both Lantana and Bugweed can also be sourced.



For more information, or to place an order for agents contact our weed biocontrol specialists:

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Ideal harvesting or planting season for varieties in the Irrigated North

Marius Adendorff (Komatipoort Extension Specialist)

Variety choice and the management of varieties can make a huge contribution towards the profitability and sustainability of sugarcane agriculture. Variety choice is not only important to ensure good RV-yield but also in risk management, especially in the case of pests and diseases. When choosing the correct varieties for your farm, an important aspect to consider is the month in which each variety is planted and harvested. The most important factors to consider in the choice of varieties and plant/harvest dates, include:

RV-yield (ton RV/ha) - RV-yield is the product of cane yield (tons cane/ha) and the quality of the cane (RV%).

- The highest RV-yield can be achieved by maximising cane yield, within economic limits, and optimising RV%. In most cases, cane yield will be sacrificed if excessively high RV% is targeted.
- An advantage of higher RV% is offsetting of transport costs where haulage distances are high.
- Due to the genetic characteristics of sugarcane, there is an opposing relationship between cane yield and quality. In most cases, varieties with high cane yield will have poor RV% and varieties with inherently high RV% will have poorer cane yield.

- Fortunately, RV% can be manipulated by applying chemical ripeners or by drying fields off before harvest.
- Where sugarcane is ripened, growers must remember that the final RV% achieved will be dependent on the RV% prior to ripening. Growers must be aware that ripening of cane with very low cane quality will most likely not increase RV% to the same level of ripening cane with better cane quality.

Ideal harvest season - Just like other agricultural crops, there will be differences in the ideal harvest season for each variety.

- Due to naturally high quality (RV%) during the middle of the harvest period (July to September), this will be the ideal time to harvest all varieties.
- Some varieties (such as N40) will give a better RV-yield than others during the early-season (March to June) and some varieties (such as N25 and N53) will give better RV-yields during the late-season (October to December). There are also varieties (such as N49 and to lesser extent N19 and N36) that can give a good RV-yield throughout the year.

- Therefore, RV-yield can be improved by harvesting varieties during the ideal season.

Pests and disease susceptibility – This is one of the most important factors to consider during the choice of varieties, especially in the case of the seasonal presence of diseases. Where possible, select varieties with resistance to diseases. It is however possible, to grow more susceptible varieties by harvesting them during the right time of the year.

- The risk of smut and mosaic infection is very high during germination and when sugarcane is very young.
- Due to smut and mosaic prevalence during spring and summer, ensure susceptible varieties are not planted or harvested during this period (September to February).
- In this way, valuable varieties can still be grown without increasing the risk of diseases and the accompanying management costs (such as roguing).

Flowering – This factor must be carefully managed due to its effect on cane quality and yield.

- From May to August, flowering will have a “ripening” effect on sugarcane and the RV% will improve.
- Growers must, realise that after a stalk has flowered, no further growth can take place and the yield will therefore **not** increase. Yield will therefore be sacrificed if flowered cane is harvested after August.
- Cane quality can also deteriorate if flowered cane is harvested too late.
- To prevent problems, varieties prone to flowering (such as N23 and N36) must be harvested before late August.

Based on the above, growers are strongly advised **not to plant or harvest the following varieties during the period of September to end of February:**

- N19, N25, N41 and N57 to limit infection with smut and mosaic.
- N23, N36 and N40 to limit problems with yield and quality due to flowering.

Recommended best harvest times for the varieties in the Irrigated North.

Variety	Ideal harvest season										Ideal Plant Season	Notes
	Early-season				Mid-season			Late-season				
	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec		
N19	YES	YES	YES	YES	yes	yes		Smut & Mosaic			Feb – May	Smut and mosaic susceptible
N36	YES	YES	YES	YES	YES	YES	YES	yes	Flowering		Feb – May	Flowers heavily
N40	YES	YES	YES	YES	yes	yes	yes		Flowering		Feb – May	Can flower heavily & Poor yield in late-season
N23	yes	YES	YES	YES	YES	YES	YES	yes	Flowering		Feb – May	Flowers heavily
N25		yes	yes	YES	YES	YES		Smut			Feb – May	Smut susceptible & Poor RV% in early-season
N41		yes	yes	YES	YES	YES		Smut			Feb – May	Smut susceptible
N57			yes	yes	YES	YES	YES	Mosaic			Feb – May	Mosaic susceptible & Poor RV% in early-season
N49	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	Feb – May Aug – Nov	
N46								YES	YES	yes	Aug – Nov	Susceptible to eldana if older than 12 months
N53	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	Feb – May Aug – Nov	Best results during mid to late-season

YES
yes
RV yield
Flowering
Smut/Mosaic

- Ideal months to harvest
- Less ideal months to harvest
- Avoid harvesting during these months due to low RV yield
- Do not harvest during these months due to the danger of flowering
- Do not harvest during these months due to disease susceptibility

Ideale oes- en plantseisoen vir variëteite in die Besproeide Noorde

Marius Adendorff (Komatipoort Voorligtingspesialis)

Die keuse en bestuur van variëteite kan 'n groot bydrae maak tot die winsgewendheid en volhoubaarheid van suikerrietverbouing. Variëteitskeuse is nie net belangrik om goeie RV-opbrengs te verseker nie, maar ook in risikobestuur, veral ten opsigte van plaag- en siektebeheer. Dit is egter nie net die keuse van variëteite wat belangrik is nie, maar ook die tyd van die jaar waarin elke variëteit geplant en geoes word. Die belangrikste faktore om in ag te neem in die keuse van variëteite en hul plant-/oesdatum sluit in:

RV-opbrengs (ton RV/ha) - RV-opbrengs is die produk van riet opbrengs (ton riet/ha) en kwaliteit (RV%).

- Die hoogste RV-opbrengs kan verkry word deur riet opbrengs, binne ekonomiese perke, te maksimaliseer en RV% te optimaliseer. In die meeste gevalle sal riet opbrengs ingeboet word indien uitermatig hoë RV% nagejaag word.
- In die geval van groot vervoer afstande sal hoër RV% help om vervoerkoste te verbeter.
- Vanweë die genetiese eienskappe van suikerriet is daar 'n opponerende verband tussen riet opbrengs en kwaliteit. In die meeste gevalle sal variëteite met goeie riet opbrengs lae RV% lewer en variëteite met inherente goeie RV% sal swakker riet opbrengs lewer.

- Gelukkig kan die RV% wel gemanipuleer word deur chemiese rypmakers toe te dien of deur lande voor oes af te droog.
- Waar suikerriet ryppgemaak word moet kwekers onthou dat die finale RV% wat bereik word sal afhang van die RV% voor rypmaking. Kwekers moet onthou dat rypmaking van riet teen baie lae kwaliteit die RV% heel waarskynlik nie tot dieselfde vlak sal verhoog as rypmaking van riet teen 'n hoër kwaliteit nie.

Ideale oes-seisoen - Soos in die geval met ander landbougewasse is daar verskille in die ideale oes-seisoen van elke variëteit.

- Omdat die kwaliteit (RV%) natuurlik hoog is gedurende die middel van die oes-jaar (Julie tot September), sal hierdie periode die ideale oestyd vir alle variëteite wees.
- Sommige variëteite (soos N40) sal beter RV-opbrengs lewer gedurende die vroeë-seisoen (Maart tot Junie) en ander variëteite (soos N25 en N53) sal beter RV-opbrengs lewer gedurende die laat-seisoen (Oktober tot Desember). Daar is egter ook enkele variëteite (soos N49 en tot 'n mindere mate N19 en N36) wat reg deur die jaar goeie RV-opbrengs lewer.

- RV-opbrengs kan derhalwe verbeter word deur variëteite gedurende hul ideale oes-seisoen te oes.

Plaag en siekte vatbaarheid - Dit is een van die belangrikste faktore om in ag te neem in die keuse van variëteite, veral in die geval met die seisoenale voorkoms van siektes. Waar moontlik kies variëteite met weerstand teen siektes. Dit is egter moontlik om meer vatbare variëteite te verbou deur hulle gedurende die regte tyd van die jaar te oes.

- Die risiko vir besmetting met smut en mosaïek is baie hoog tydens ontkiëming en wanneer die suikerriet baie jonk is.
- Weens die teenwoordigheid van smut en mosaïek gedurende die lente en somer (September tot Februarie) is dit raadsaam om vatbare variëteite nie gedurende die periode te plant of te oes nie.
- Op die manier kan talle waardevolle variëteite steeds suksesvol verbou word sonder om siekte risiko en die gepaardgaande bestuurskoste (soos "roguing") te verhoog.

Blomvorming - Hierdie faktor moet versigtig bestuur word weens die effek op kwaliteit en opbrengs.

- Vanaf Mei tot Augustus sal blomvorming 'n "rypmakende" effek op suikerriet hê en die RV% sal verbeter.
- Kwekers moet egter beseft dat stronke nie verder kan groei nadat dit geblom het nie en derhalwe sal die riet opbrengs nie verder toeneem nie. Riet opbrengs sal derhalwe ingeboet word indien riet met blomme na Augustus geoes word.
- Rietkwaliteit kan agteruitgaan indien riet met blomme te laat geoes word.
- Om probleme te verhoed moet variëteite wat geneig is om te blom (soos N23 en N36) voor laat Augustus geoes word.

Op grond van die bogenoemde word kwekers sterk aanbeveel om **nie die volgende variëteite gedurende die periode van September tot einde Februarie te plant of te oes nie:**

- **N19, N25, N41 en N57 om besmetting met smut en mosaïek te beperk**
- **N23, N36 en N40 om probleme met opbrengs en kwaliteit weens blomvorming te beperk**

Voorgestelde beste oesperiodes vir die variëteit in die Besproeide Noorde

Variëteit	Ideale oesperiodes										Ideale plant-seisoen	Notas
	Vroeg-seisoen				Middel-seisoen			Laat-seisoen				
	Mar	Apr	Mei	Jun	Jul	Aug	Sept	Okt	Nov	Des		
N19	JA	JA	JA	JA	ja	ja		Smut & Mosaïek			Feb - Mei	Vatbaar vir smut en mosaïek
N36	JA	JA	JA	JA	JA	JA	JA	ja	Blom		Feb - Mei	Blom swaar
N40	JA	JA	JA	JA	ja	ja	ja		Blom		Feb - Mei	Kan swaar blom & swak opbrengs later in seisoen
N23	ja	JA	JA	JA	JA	JA	JA	ja	Blom		Feb - Mei	Blom swaar
N25		ja	ja	JA	JA	JA	Smut				Feb - Mei	Vatbaar vir smut & swak RV% in vroeg-seisoen
N41		ja	ja	JA	JA	JA	Smut				Feb - Mei	Vatbaar vir smut
N57			ja	ja	JA	JA	JA	Mosaïek			Feb - Mei	Vatbaar vir mosaïek & swak RV% in vroeg-seisoen
N49	JA	JA	JA	JA	JA	JA	JA	JA	JA	JA	Feb - Mei Aug - Nov	-
N46								JA	JA	ja	Aug - Nov	Vatbaar vir eldana as ouer as 12 maande
N53	JA	JA	JA	JA	JA	JA	JA	JA	JA	JA	Feb - Mei Aug - Nov	Beste resultate gedurende middel- tot laat-seisoen

JA
ja
RV-opbrengs
Blom
Smut/Mosaïek

- Ideale maande om te oes
- Minder geskikte maande om te oes
- Vermoed oes gedurende die maande as gevolg van lae RV-opbrengs
- Moet nie gedurende die maande oes weens die gevaar van blomvorming
- Moet nie gedurende die maande oes weens vatbaarheid vir siektes

On-farm agricultural product testing: why growers should be cautious

Dr Malcolm Keeping (Senior Entomologist) & SAR Panel



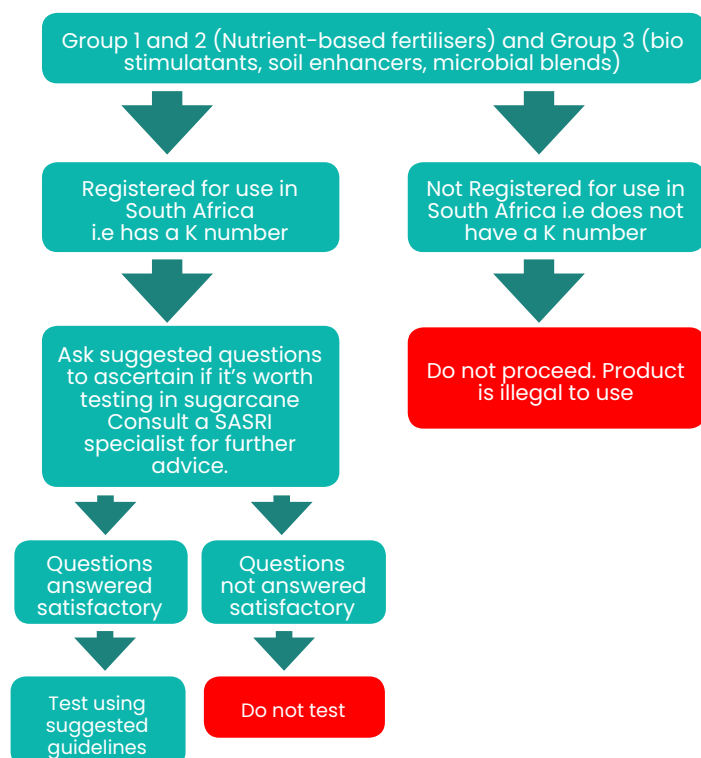
SASRI is aware of the wide range of new agricultural products that are being developed and marketed to growers. Often, representatives of the manufacturing companies or their agents either request SASRI (sometimes via regional Extension) to test these products on sugarcane, or they directly approach growers. It is important to note that SASRI must remain impartial when it comes to any commercial products and cannot promote one product or brand over another. SASRI also does not have the resources, including specialists' time, to test all newly available products and can only consider trial work with such products if they are likely to benefit the industry and have a good chance of adoption by growers. To assist growers with evaluating whether or not the products deliver on expectations, the following guidelines are recommended.

When approached by a sales representative, the first thing to ascertain is whether the product is registered in South Africa under Act 36 of 1947. Registered products will have either a "K" number or a "L" number. Even though they are governed under the same Act, the registration requirements for these products are very different.

Products with a "L" registration number must be registered for use in a particular crop and (where applicable) against a specific target pest, disease or weed. Such products undergo a rigorous testing process (over a number of bioclimatic zones, soil types and seasons) and must be shown to be safe to use in that particular crop and if applicable, significantly impact the target organism. If a grower would like to further test these registered products, guidelines are available for this.

Products with a “K” number are not specific to a particular crop. Furthermore, the registration process for these products is currently less rigorous and although these requirements have been revised, they have not yet been implemented. As the criteria for registration of these products are less stringent, it is important that these types of products are tested on farm by a grower to verify efficacy. If approached by a representative, the process described below can be used to reach a decision on whether the product under consideration should be tested or not.

Agricultural products are generally sold under one of three groups. Groups 1 and 2 represent nutrient-based fertilisers, while Group 3 comprise of bio stimulatants, soil enhancers and microbial blends.



The following factors should be considered by growers before investing in any agricultural products offered by companies:

1. If the product is not registered for use in South Africa, growers cannot do the testing themselves NB. If targeted at a pest/disease/weed it must be registered for use in sugarcane AND against that particular pest/disease/weed.
2. Can the salesperson provide independently validated results from trials that demonstrate its efficacy and economic benefits, either in sugarcane or other crops?
3. What is the application cost of the product (cost per kg / cost per litre / cost on a per hectare basis)?
4. Will the purveyor supply their product/s free of charge if they wish the grower to test them on their farm?
5. Do NOT accept or use the product without **first** getting detailed information on it from the supplier and doing some background research.
6. Ask the salesperson for the product label, material safety data sheet (MSDS) if applicable, and a brochure on the product.

Where it is legally permissible and where growers wish to pursue their own testing of the product on their farm, they can conduct an observation trial under the guidance of their Extension Specialist. Guidelines for the initial assessment of a product and on-farm observation trials are available from SASRI in a separate document. Consult your local Extension Specialist for more information.

Conservation conscious

Farming philosophies from the Klipps

Kerisha Raghunandan (Publications Officer) and Dr Rian van Antwerpen (Senior Soil Scientist)



Climate change. While the governments of the world argue with scientists over this phenomenon, it is the farmer who is really faced with tackling the issue. The realities of intense erratic rainfall, increasing temperatures and wild fires have never been more evident than the last five years. In South Africa, this has been especially apparent by the successive droughts in 2014 –2015 in Kwa-Zulu Natal and 2015 – 2017 in the Western Cape. An ongoing study by the University of Cape Town has recently revealed the implications of rainfall shifts and its contribution to creating a warmer, drier climate; particularly in the Cape. Later rainfall also results in a longer dry period and can have serious effects on water management agronomically and financially.

Never before has water conservation and awareness become more important, especially for farmers growing crops through the drier winter seasons. A recent trend in South African agriculture called “*conservation (or regenerative) agriculture*” hopes to readapt farming techniques to ease these effects. Conservation agriculture involves environmental awareness and implementing practices that improve/sustain soil health and ensure soil moisture is retained and effectively utilised. Some of these practices include

minimum tillage, reducing burning at harvest to maintain crop residues for mulching and the maintenance of a mulch layer on soils to increase organic matter.

The Klipp Brothers, Conrad and Henning Klipp, who own White Thorn Farms in the Schroeders/Dalton area, are two growers who understand the value of maximising water use and have implemented many of the principles used in conservation agriculture. Using these principles, the farm managed to beat the UCL mill average by an astounding 20 tons/ha in 2018!

“The single most limiting resource is water.”

To maximise on rainfall, the Klipp Brothers precisely construct their contours and waterways according to the farm’s terrain, also ensuring drainage. Most importantly, they pay careful attention to soil health. A healthy soil with a good ‘crumb’ structure is a premium requirement to ensure water infiltration to the root of the crop. Conrad Klipp describes this as “three-dimensional water infiltration into the soil” indicating that the soil structure is porous to substantial depths for sufficient water infiltration and availability to the roots. Continuous permeation of water to the roots results in an **actively growing crop.**

Farm Profile

White Thorn Farms

Location:

Schroeder’s (Doornkop) and Dalton area (Witte Mountain) (UCL Mill)

Average rainfall:

750 – 900 mm

Minimum temperature:

-5°C

Total farm area:

1 542 ha

Area under sugarcane:

866 ha

Varieties:

N12, N48, N37, N31, N52, N54, N61

Average RV%:

12.53%

Highest yield to date:

250 tons/ha

Area under other crops:

71 ha Wattle, 15 ha Pine and Gum, 20 ha Pecans to expand to 90 ha, 573 ha open field – future cattle enterprise



Examples of waterways on the farm. These waterways were tested recently when the farm experienced a three-hour downpour of over 100 mm of rain with no erosion damage! Surface water control is of the utmost importance. Waterways are well-planned, grassed and maintained to conduct excess water off the farm.

“Feed your soil biota, they are your best friends.”

To create a good crumb structure in the soil, the Klipp Brothers encourage a rich soil biota. By increasing soil moisture, organic matter and avoiding extreme soil temperatures they have managed to create a soil that is teeming with life. One of the major contributors to this crumb structure is the presence of earthworms. These little soil saviours are known for their chemical, biological and physical benefits. Earthworms also contribute to aeration of the soil, movement of organic

matter further down the soil profile and their casts are rich in nutrients. Together with other bacteria and fungi, earthworms have aided with improving moisture absorbance into the soil and raising organic matter (OM%). Consequently, this has assisted the farm in the drier months. The Klipp Brothers are of the opinion that growers should regularly sample soils, paying close attention to OM% and nutrient levels. According to their own farming experiences, raising OM by as little as 1% can increase the soil's Total Available Water (TAW) by as much as 17 mm.



Henning Klipp illustrates the ability of the soil to absorb significant amounts of water, a 2 L water bottle was emptied on one spot with all the water entering the soil as fast as it was poured!

On the farm, plant fields are sampled at 20, 40, 60 and 80 cm depths and ameliorants are added according to FAS recommendations. The sample results also assist with assessing soil pH. Before planting, the fields are covered with 60 t/ha of fly ash from the mill. The contents of the flyash include silicon, phosphorus, potassium and is estimated to be the equivalent of approximately 2.1 tons of lime. Around 15 tons of kraal manure from a local feedlot is also added to the soil followed by MAP in the furrow at planting. LAN nitrogen fertiliser is added in a split application to reduce volatilisation and to increase nitrogen use efficiency. Urea-based fertilisers are not used on their farms. To further supplement soil health, green manuring is also practised. Ploughing is done with a mouldboard to reduce the emergence of weeds and ensure thorough mixing.



“Don’t shoot your bush pigs.”

One of the more interesting strategies implemented in the farm’s Integrated Pest Management plan for eldana control, is allowing bush pigs to forage through their sugarcane fields. These brawny animals have an appetite for eldana and assist by eating larvae in the cane. The farm also scouts regularly for eldana outbreaks and ensures an IRAC (Insecticide Resistance Action Committee) spray programme is followed.

Concerning other pests, weeds and diseases, the Klipp brothers advise always keeping a close eye on these factors as these can easily escape management. In the case of weeds, mistakes such as double spraying between rows are avoided by using modern technology sprayers with variable application, guidance and swath control. Due to decreasing margins in times of drought, such errors can lead to unnecessary expenditure and yield losses.

“Choose the right variety.”

A key success factor to sugarcane farming is the correct selection of varieties to suit the farm’s soil type, climate and harvesting period. Being on a frost belt, White Thorn Farm is prone to frost events in certain fields. This can have a major impact on yields.

Therefore planning of varieties at plant is vital to ensure that all these factors are considered.

“You are not a lemming! – What is popular is not always right and what is right is not always popular (because of too much effort).”

This is a farming philosophy equally shared by the Klipp Brothers. Their years of experimenting with different management approaches on their farm have led them to the realisation of there being no ‘silver bullet’ solutions. Instead, implementing SASRI best management practices learned through almost a century of research has proven to be the most effective, sustainable and profitable means of farming. “Listen to the experts”, is their advice to all growers in the sugar industry.

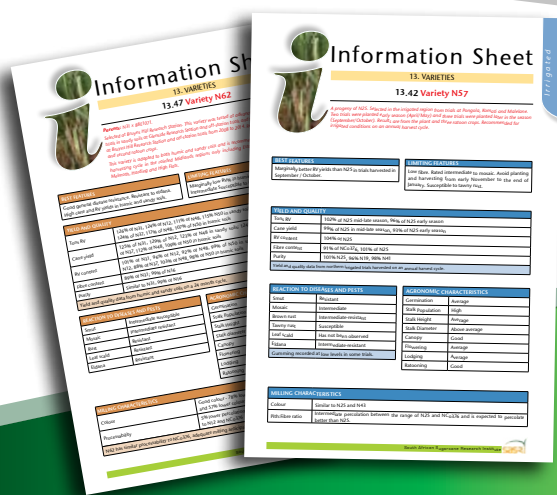


The Klipp brothers farming philosophy was demonstrated during a recent field visit where visitors were shown many aspects of their farm. Most outstanding was the effectiveness of their road construction method. This was linked with a well-designed contour system resulting in hardly any erosion despite being on sandy soils on a slope.



Conrad (far left) and Henning Klipp (middle right) also took attendees of the field visit to their pecan nut orchard, where they are replacing low margin cane areas, due to climate and soil limitations for cane production. In their opinion, growers should embrace diversification of crops and consider breaking the monoculture to ensure maximum return on agricultural enterprises.

What's new on the SASRI website?



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WATER quality

for **SOIL** health

*Dr Louis Titshall (Senior Soil Scientist)
& SASRI Irrigation Working Group*

Poor irrigation water quality, particularly salt affected sources, can cause soil degradation and induce crop stress, resulting in a decline in crop yield. Most commonly, water quality is classed on its potential to lead to saline and sodic conditions in the soil. Excessive amounts of soluble salts (salinity) in water can cause an increase in soil salt content and increase crop water stress, while unfavourable Na levels can also lead to sodic soil conditions that lead to poor soil physical conditions. Remediation of salt affected soils can be costly and should be prevented from occurring. **An essential requirement to prevent the buildup of salts in soil is good drainage and periodic flushing with good quality water.**

To better manage potential negative impacts, it is good practice to monitor irrigation water quality on a regular basis. Ideally, water sampling should occur in each season to gain an understanding of seasonal shifts in water quality and guide practice to improve scheduling and use of the irrigation water throughout the year. Where this is not possible, attempt to get at least a wet and dry season water sample analysed. Essential parameters, as assessed by SASRI FAS, are given in Table 1. The water quality is classed according to

the relationship given in Figure 1. It is important to note that the SASRI classification is based on the **EEC** and **ASAR** that account for effects of rainfall dilution and residual alkalinity, respectively, on the effective water quality. Depending on your soil type and water quality class, the water may be used with certain limitations (**see Figure 1 and Information box**).

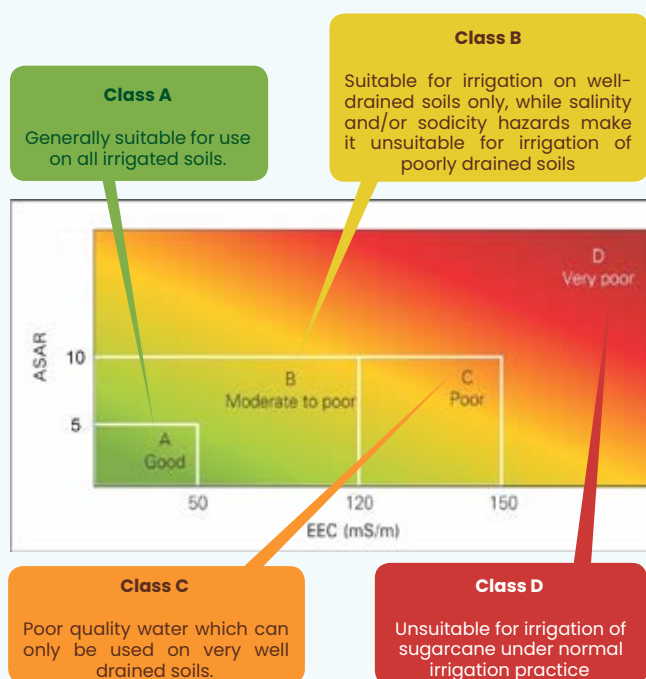


Figure 1: The relationship between the Adjusted Sodium Adsorption Ratio (ASAR) and Effective Electrical Conductivity (EEC) on suitability of water for irrigation. The suitability for different soil types and conditions is determined by the quality class. The white lines in the graph define the assigned water quality class for reporting purposes, while the green-yellow-red gradient transitions highlight the increasing risk gradient across these categories (**see Information box**).

Further information and guidance on managing irrigation water quality and salt affected soils is available in Information Sheet 5.12 (Water quality for Soil Health) and 5.11 (Soil Salinity and Sodicity) (available from sasri.org.za/knowledge-hub) or visit the SASRI-FAS website for sampling guidelines and submission forms www.fasagrilab.co.za.

Table 1: Water parameter assessed by SASRI-FAS

Parameter measured	Description
Water pH	This is an indicator of the acidity or alkalinity of the water. Ideally good irrigation water will have a pH of 6.5 to 7.
Soluble base cations	The concentration of Ca, Mg and Na in the water is used to determine the sodium adsorption ratio (SAR).
Alkalinity (HCO ₃)	Excessive alkalinity is used to adjust the SAR value for the impact of the excess bicarbonate in solution.
Electrical conductivity (EC)	An indicator of the amount of total dissolved salt of water.
Effective EC (EEC)	This is an adjusted EC to account for the diluting effect of rainfall received in conjunction with the irrigation amounts.
Sodium adsorption ratio (SAR)	High SAR values indicate a sodicity impact risk of using this water.
Adjusted SAR (ASAR)	This accounts for the alkaline ions present that can precipitate Ca and Mg, effectively increasing the SAR.



Important considerations when interpreting the water class:

When a water sample is classified it is assigned to one of the water quality classes based on the discrete categories shown in Figure 1. However, this can lead to confusion as to the suitability of the water for irrigation under different conditions, especially where samples lie near category class borders. To better guide the suitability and risk associated with using the water it is useful to evaluate where the sample lies relative to the colour gradients shown in Figure 1. Samples in the darker green regions indicate low risk except in very dispersive clay soils. Samples in the light green to yellow indicate increasing risk to all dispersive and poorly drained soils (and drainage is advised). The orange to red transition indicates very high risk to soil quality and the water should not be used for irrigation purposes without treatment.

WATER kwaliteit

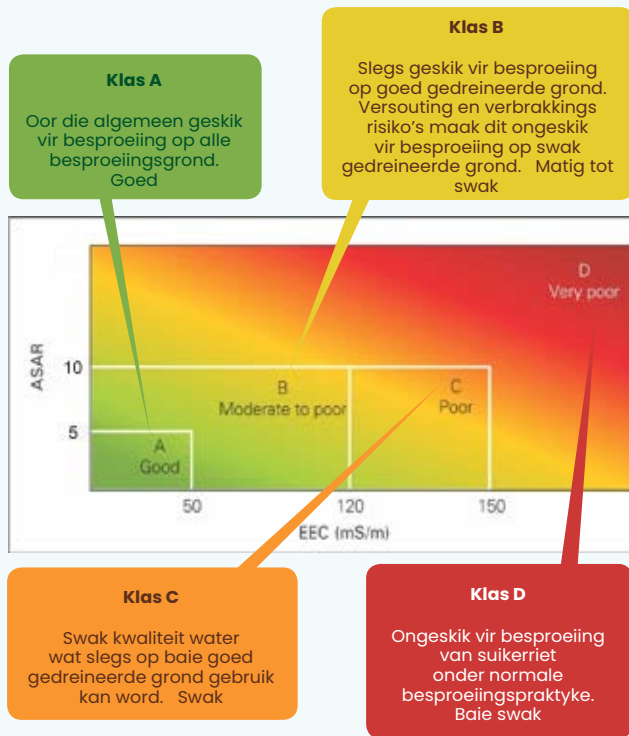
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GRONDGESONDHEID

Swak kwaliteit besproeiingswater, meer spesifiek versoute bronne, kan grondverbrokkeling en gewas stres veroorsaak en gevolglik 'n afname in oesopbrengste veroorsaak. Meer algemeen word water kwaliteit geklassifiseer op die potensiaal wat sal ly tot witbrak en swartbrak (Natrium-verbrakking) van grondtoestande. Oormatige hoeveelhede oplosbare soute (witbrak) in water kan 'n toename in grondsout inhoud hê wat tot verhoogde gewas waterstres vlakke sal ly. Ongunstige Na vlakke kan ook tot swarbrak in grond lei wat sal lei tot swak fisiese grondtoestande. Korreksie van sout geaffekteerde grond kan duur wees en moet dus te alle tye verhoed word. **'n Vereiste om opbou van soute in grond te voorkom is deur te verseker dat die grond goed gedreineer is en deur gereelde uitloging van soute met goeie kwaliteit besproeiingswater.**

Om die potensiële negatiewe invloed beter te bestuur, is dit goeie praktyk om besproeiingswaterkwaliteit gereeld te monitor. Ideaal moet waterkwaliteit elke seisoen ontleed word om 'n beter omvang van seisoendale skuiwe in besproeiingswaterkwaliteit te kan waarneem en verstaan gedurende die jaar. Dit sal lei tot beter toepassing en bestuur van besproeiingskedulering gedurende die jaar. Indien dit nie moontlik is nie moet daar gepoog word om ten minste 'n nat- en droë seisoen besproeiingswaterontleding te doen. Belangrike ontledingsvlakke, soos bepaal deur SASRI FAS,

word aangedui in Tabel 1. Die waterkwaliteit word geklassifiseer na aanleiding van die verhoudings aangedui in Figuur 1. Dit is belangrik om te weet dat SASRI klassifikasie gebaseer word op die **EEC** en **ASAR** wat die effek van reënval verdunning en die residu alkaliniteit onderskeidelik, op die effektiewe waterkwaliteit teweeg bring, in ag neem. Afhangende van die grondtipe en waterkwaliteit klas, mag die water vir besproeiing gebruik word binne sekere beperkings (**sien Figuur 1 en Informasie nota**).



Figuur 1: Die verhouding tussen Aangepaste Natrium Adsorpsie Verhouding (ASAR) en Effektiewe Elektriese Konduktiwiteit (EEC) op die geskiktheid van water vir besproeiing. Die bruikbaarheid vir verskillende grondtipes en toestande word bepaal deur die kwaliteitsklas. Die wit lyne in die figuur dui die gedefinieerde klas grense aan vir rapporterings doeleindes, terwyl die groen-geel-rooi gradient, oorsakeling uitlig met toenemende risiko oor al die kategorieë. **(sien Invormasie nota).**

Verdere inligting en leiding ten opsigte van bestuur van besproeiingswaterkwaliteit en sout-geaffecteerde grond is beskikbaar op informasieblad 5.12 (Water kwaliteit vir Grondgesondheid) en 5.11 (Grond Versouting en Verbrakking), beskikbaar by sasri.org.za/knowledge-hub, of besoek die SASRI-FAS webtuiste oor grond monsterneming aanwysings en toelatingsvorme by www.fasagrilab.co.za.

Tabel 1: Water verwysings ontleed deur SASRI-FAS

Verwysing gemeet	Beskrywing
Water pH	Dit is 'n aanduiding van die suur of alkaliniteit van die water. Goeie besproeiingswater sal ideaal 'n pH van 6.5 tot 7.0 hê.
Oplosbare basis katione	Die konsentrasie Ca, Mg en Na in die water word gebruik om die Natrium adsorpsie verhouding te bepaal (SAR).
Alkaliniteit (HCO_3)	Oormatige alkaliniteit word gebruik om die SAR-waarde aan te pas vir die impak van oormatig bikarbonaat in oplossing.
Elektriese konduktiwiteit (EC)	Indikator van die hoeveelheid totale opgeloste soute in die water.
Effektiewe EC (EEC)	Dit is die aangepaste EC om voorsiening te maak vir die verdunnings effek van reënval ontvang in samewerking met besproeiingshoeveelhede.
Natrium absorpsie verhouding (SAR)	Hoë SAR waarde dui aan op 'n verhoogde verbrakings risiko met gebruik van hierdie water.
Aangepaste SAR (ASAR)	Dit is aanspreeklik vir die alkaliese ione teenwoordig wat kan lei tot uitpresipitering van Ca en Mg, wat 'n verhoging in SAR teweeg bring.



Belangrike oorwegings tydens die interpretasie van water klasse:

Wanneer 'n watermonster geklassifiseer word, word dit diskreet verwys na die klassifikasievlakke soos aangedui in figuur 1. Dit kan egter lei tot verwarring na gelang van die geskiktheid van die water vir besproeiing onder verskillende toestande, veral wanneer monsters naby aan klassifikasie grense lê. Om beter leiding te kry ten opsigte van die geskiktheid en risiko van gebruik van water as besproeiingswater is dit handig om te bepaal waar die monster in die kleurspektrum soos aangedui in figuur 1 lê. Monsters in die donkergroen area dui op lae risiko behalwe in die geval van donker kleigrond. Monsters in die liggroen tot geel areas dui op verhoogde risiko op alle donker kleigrond en swak gedreineerde grond, terwyl die oranje tot rooi oorgang dui op baie hoë risiko tot grondkwaliteit en die water moet liefers nie gebruik word vir besproeiing sonder behandeling

WEATHER

 **Phillemon Sithole (Agrometeorologist)**

Review

The period from May to October 2019 was characterised by well below normal rainfall for most parts of the South African sugar industry, reminiscent of past extreme droughts in 1992 and 2010. However, there was welcome relief at the onset of summer, with exceptional rainfall in November and December across most parts of the industry (Fig 1) which enabled good crop recovery in the rainfed areas. Irrigation water supply over the review period was generally stable, except for the Umhlatuze and Crocodile systems in Zululand and Mpumalanga respectively, where high restrictions were in place.

Outlook

The El Niño–Southern Oscillation (ENSO) is currently bordering between neutral and weak El Niño states and expectations are that it will remain in the borderline for the rest of this 2019/20 summer season. The shift from neutral to borderline weak El Niño conditions has enhanced the chances of below normal late summer (January to March) and early autumn (February to April) rainfall for the industry. The *South African Weather Service, European Centre for Medium-Range Weather Forecasts and International Research Institute for Climate and Society* all predict below normal rainfall during the late summer and early autumn months of 2020. Above average temperatures are expected.

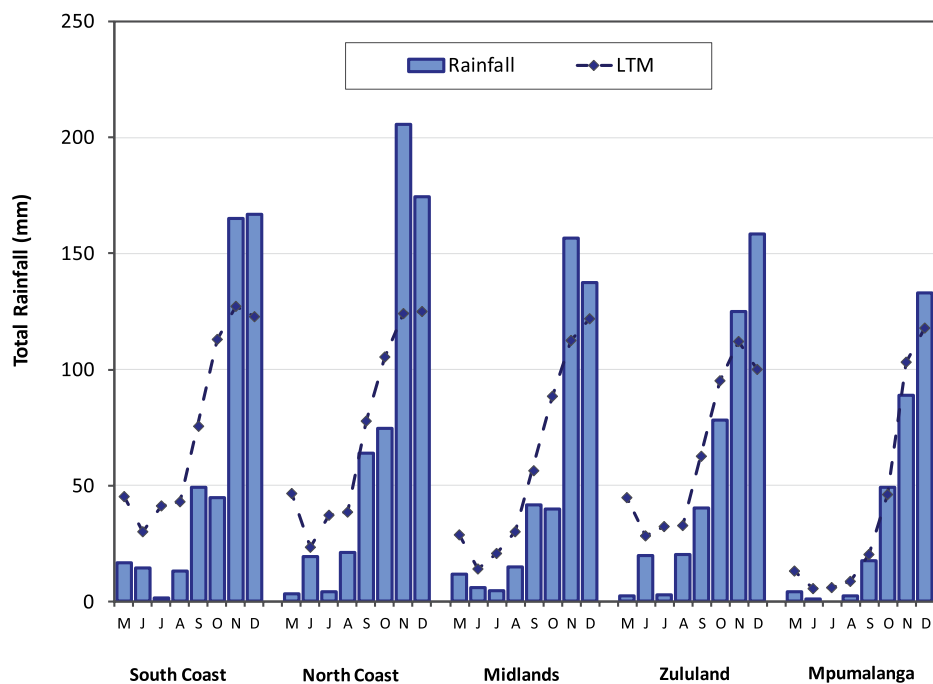


Figure 1: Regional average monthly total rainfall for May to December 2019, compared to the monthly long term mean (LTM).

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

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