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Director's Message

Dr Shadrack Moephuli (*Director*)

Published: 20th May 2024

Greetings to all our growers and readers of this issue of the Link. I would like to begin by

acknowledging and appreciating the contributions and leadership of my predecessor, Dr Terry Stanger, who has recently retired. His leadership ensured good stewardship of the organisation with a focus on grower needs and expectations, while also encouraging good performance of researchers, scientists and extension personnel for sustainable sugarcane production.

RD&E Workshops

To identify and understand the needs of growers, SASRI conducts Research, Development and Extension Workshops annually. This year saw an extended intervention, with Scientists and Extension Specialists conducting workshops in all the sugarcane growing regions (the Lowveld, Pongola, Umfolozi and Zululand, North Coast and Midlands North as well as the South Coast and Midlands South). Participants comprised a range of key stakeholders such as small-scale growers (SSG), large-scale growers (LSG), grower associations, miller-cum planters, government representatives and others. These consultative workshops discussed matters that related to a) Pest, Disease and Weed management; b) Crop Nutrition and Soil Health; c) Crop Improvement (Varieties); and d) Crop Management and Digital Agriculture. Overall participation was positive to **excellent** with insightful observations and suggestions. We are in the process of conducting a detailed analysis of the outcomes of these workshops to inform our programme of work.

Welcome SAFDA

In March the Minister of Trade, Industry and Competition approved, and through a government gazette, published amendments to the Sugar Industry Agreement. The gazette formally authorised the South African Farmer Development Association (SAFDA) as a full and incorporated member of the South African Sugar Association (SASA), in partnership with the SA Cane Growers and SA Sugar Millers. On behalf of SASRI we welcome the good news.

SSG Sustainability

It is important to highlight that SASA and SASRI have been providing scientific and other support to SSG and land reform farmers for many years. SASRI's dedicated scientific support to SSG continues to be complemented by additional extension personnel from the KwaZulu-Natal Department of Agriculture.

As my predecessor once said, "small-scale grower sustainability is key to the sugar industry". Therefore, it's imperative for SASRI to provide the best scientific solutions, technology and information for the sustainable growth of SSG's. Similar scientific support must remain assured for large – scale growers to ensure the sugar industry remains sustainable and competitive.

Digital Agriculture

SASRI has identified 'Smart-Agriculture' as a critical success factor for both the organisation and sustainable growth of the sugar industry, particularly for growers. Accordingly, SASRI has been conducting several projects, among these are to investigate the use of hyperspectral and satellite data for developing scientific insights on plant growth response and soil health spectra. Lessons from such studies could provide information on leaf nutrient concentrations, sugarcane crop assessments and soil health among others. In the meantime, it is also important for growers to gain appreciation of available digital technologies, including how to utilise them in their decision – making on farms. This publication contains an article to enable readers to understand the multifaceted uses of digital agriculture tools, data, and information. SASRI therefore, encourages growers to embrace digital agriculture and incorporate it into their decision making.

The Link is a short newsletter that provides advice on key aspects for sustainable sugarcane production and productivity. Accordingly, this edition provides advice on variety selection using our web-based variety guide; recommendations for controlling giant *Panicum maximum* (uBabe grass); and some stewardship guidelines for storage and management of agrochemicals.

We hope that you enjoy reading the articles and that you gain valuable insights which inform your farming practices.



Topical Tips

Rowan Stranack (*Extension and Biorisk Manager*)

Published: 20th May 2024

The golden rules to win under the RV payment system: Deliver cane that is the most MATURE, FRESH and CLEAN. Applying these basic rules will ensure optimum yield and quality. Your CTS report contains a wealth of useful information and can help with troubleshooting in instances of poor or variable quality.

In the Midlands and parts of the coastal belt, there is likely to be some old cane still around. It is highly likely that eldana populations have built up in these fields. Don't wait for the Pest and Disease teams. Scout and prioritise for harvest any fields with high levels of eldana damage.

Continue scouting for yellow sugarcane aphid (YSA) throughout the coming winter. It is likely that numbers will start to decline as temperatures cool down but keep scouting and be ready to deal with outbreaks should they occur in Spring.

Fields for replanting must be tested for RSD prior to harvest. If a field is found positive, then it must be long fallowed, and all volunteers removed.

Replanting with certified or approved seedcane should only take place after six months has elapsed with the field totally free of regrowth. Some LPD&VCCs have strict rules concerning RSD, so make sure that you are aware of your obligations in the event of a positive RSD field.





Seedcane and programme planning

This is the time when orders for next season's certified seedcane requirements need to be placed with your local seedcane scheme or co-operator. This simple planning step will ensure that you get the best possible disease-free, true-to-type seedcane of the varieties you want, when you need it.

With the new season already underway, you should now have a comprehensive operations programme for the coming year. Ask your SASRI Extension Specialist for a programme planning sheet to help you. Maintenance of roads and conservation structures is an important but neglected item that should be incorporated in your programme plan. Pay special attention to road drainage which often is the cause of erosion if not effectively managed.

Soil conservation and surface water management

Take soil samples as soon as possible after harvest. With an improved cane price, it is now essential to correct soil health issues such as subsoil acidity and fertilise for optimum yields. In the southern rainfed regions, subsoil acidity is a limiting factor on some soils and this problem can only be confirmed by taking subsoil samples. Speak to your local SASRI Extension Specialist for advice on taking these samples.

In the irrigated regions, recently excessive water in the soil has been an issue, highlighting the

need for efficient drainage, a factor which is not often considered.

Speak to your local SASRI Extension Specialist for advice on how to ensure good drainage of your soils

Due to its lack of mobility in the soil, generally the phosphorous requirements for the plant crop and subsequent ratoons should be applied at planting. Take soil samples to ensure you apply the correct amounts of this expensive element.

With winter approaching, check all your firebreaks to ensure that they are adequate and safe. Also take care to abide by the local burning code of practice. Visit our [eLibrary](#) for information on all aspects of sugarcane production as well as access to several decision support tools (DSPs) designed to help you farm better and more profitably. Check out the [SASRI Variety Guide](#), which is a new addition to the SASRI website and read the article in this edition on how to use it in your variety choice deliberations.

Identification and management of low yields

Extension is often asked for their opinion where poor yields are obtained. Sometimes the reasons are obvious: too much or too little rainfall, or interrupted irrigation. Perhaps because of this the temptation is often to try to identify a single cause for poor yields. Factors such as nutrition or variety performance are often cited. Experience has shown however that the problem is seldom due to a single cause alone.

Start by looking back over the life of the crop. It is important not only to consider total rainfall but also the distribution thereof, as well as other related climatic factors such as solar radiation, heat units and cloud cover. The SASRI WeatherWeb is an excellent tool to help you to do this. Very often a pattern will emerge. Link this to soil type, bringing in other management factors such as irrigation, variety, nutrition and weed pressure. A bigger picture will emerge, which could provide useful knowledge for future management decisions.

For the same reasons it is also good to look at instances where yields are above average or estimated yields.





Digital Agriculture at SASRI

Nitesh Poona (*Crop Scientist: Digital Agriculture*)

Published: 20th May 2024

Agriculture for potential adoption within the sugar industry. The term Digital Agriculture refers to the use of multiple technologies to enhance planning, monitoring, and managing operational and strategic activities on the farm. Technologies include field sensors, remote sensors, UAVs (drones), global positioning systems (GPS), digital mapping, internet and connectivity, cloud computing, big data, machine learning, as well as deep learning, mobile applications and digital platforms.

Remote Sensing

Remote sensing, a key component of Digital Agriculture, utilises several platforms: satellite, aerial (e.g. manned aircraft, helicopters, and drones), and terrestrial (e.g. meteorological stations and soils sensors). Satellite and aerial platforms are deployed with specialised sensors (cameras) that capture images across various regions of the electromagnetic spectrum. Spatial resolution is a key consideration in remote sensing of agriculture. For field-level applications, e.g. yield mapping, a spatial resolution of 1 m up to 10 m may be suitable. However, for more precise applications such as stress detection and nutrient mapping, a spatial resolution of 5 cm up to 50 cm may be required. High spatial resolution imagery from satellites, manned aircraft, and drones are necessary for the implementation of precision agriculture.

Precision agriculture

Precision agriculture involves the implementation of tailored crop management strategies to suit the variability within and between fields. Georeferenced data, acquired via remote sensing and global positioning system (GPS), are fundamental to the implementation of precision agriculture. These can be integrated with biophysical (soil, plant, and landscape) and climate data to develop a crop management strategy. Georeferenced data is often analysed in a Geographic Information system (GIS) to produce digital maps. Integrating remote sensing with GIS and advanced analytical tools such as machine learning provides a powerful framework and suite of tools to optimise sugarcane production.

Current Projects

At SASRI, various digital technologies such as drones, GPS, and satellites are being evaluated within applications such as crop health monitoring and harvest scheduling. Key research projects within SASRI's current programme of work include:

- rapid collection of biosecurity data to enable the development of a biosecurity operational dashboard
- precision sugarcane quality management via UAVs
- detecting nitrogen deficiency to assist with optimising fertiliser application
- identifying the digital fingerprint for yellow sugarcane aphid (YSA) to enable remote detection and monitoring via UAVs and/or satellites

- an early warning system for YSA (i.e. detection prior to crop symptom expression) using satellite and biophysical data
- sugarcane monitoring and yield estimation
- sugarcane quality and yield traits for indirect selection during early stages of the breeding programme.

SASRI's research in this area is focussed on developing and testing innovative solutions, proving that these digital tools can work in real-world farming scenarios. While we may not directly provide services to growers, their successful proof of concept paves the way for commercial applications that can eventually benefit agricultural practices.





Control of giant *Panicum maximum*

Anushka Gokul (Agrochemical Scientist)

Published: 20th May 2024

In the South Coast and Midlands South regions of KwaZulu-Natal, a significant weed challenge has emerged in the form of giant *Panicum maximum*, also known as Guinea grass, Barbi grass, or uBabe. This invasive species poses a substantial threat to sugarcane agriculture, thriving in disturbed environments such as roadsides and neglected areas.

Characterised by its perennial tufted growth pattern and robust root system, the giant *Panicum maximum* shares the same genus and species with the common *P. maximum*, yet they are phenotypically larger in size.

The stems of this robust grass can reach a height of up to 3.5 m with stems of 5 mm to 10 mm diameter. As the stems bend and nodes touch the ground, roots and new plants are formed. The leaf blades are up to 35mm and remains green till late in winter and flowers from September to March, producing large seed heads which are green to purple and are widely dispersed by wind, birds, and farm machinery.



Management strategies to control the weed

An effective and sustainable integrated weed management strategy should be applied, which combines herbicides and farm hygiene to minimise weed seed proliferation and spread.

1. **Reduce seed bank in the soil.**

Management of this weed is difficult. It is recommended that young giant *Panicum maximum* should be removed before it matures, thus preventing seed development and the dispersal of the seed.

Mature plants should be excavated, this is an intense and lengthy process.

2. **Minimise soil seed reserves.**

Weed seedling cycles can be broken by implementing a fallow period on fields with high giant *Panicum maximum*.

3. **Good Farm hygiene.**

Farm machinery and vehicles should be cleaned between fields to prevent the transportation of seeds from one area to another.

4. **Herbicide application.**

There are no herbicide products specifically registered for giant *Panicum maximum*, however the following active ingredients are registered for the control of common *Panicum maximum*:

Active ingredients registered for <i>Panicum maximum</i>			
1	acetochlor	19	diuron + hexazinone
2	acetochlor + ametryn	20	diuron + metribuzin
3	acetochlor + benoxacor	21	diuron + sulcotrione
4	acetochlor + dichlormid	22	glufosinate-ammonium
5	alachlor	23	glyphosate
6	ametryn	24	haloxyfop-R-methyl ester
7	ametryn + triazines	25	imazapyr
8	amicarbazone	26	indaziflam + isoxaflutole
9	atrazine + s-metolachlor	27	isoxaflutole
10	atrazine + sulcotrione + triazines	28	mesotrione
11	benoxacor + metolachlor	29	mesotrione + s-metolachlor + terbuthylazine
12	chlorimuron-ethyl	30	metazachlor
13	chlorimuron-ethyl + metribuzin	31	metribuzin
14	chlorimuron-ethyl + metribuzin + pendimethalin	32	MSMA
15	clomazone	33	pendimethalin
16	clomazone + hexazinone	34	s-metolachlor
17	dimethenamid-P + saflufenacil	35	sulfentrazone
18	diuron	36	tebuthiuron

Always use registered combination of herbicides and follow label recommendations.

Herbicides should be applied timeously.

Herbicides with different modes of actions should be rotated to reduce developing herbicide resistance.



Guidelines for constructing and managing a pesticide storage facility

Silicia Govindasamy (*Agrochemical intern*)
and Anushka Gokul (*Agrochemical Scientist*)

Published: 20th May 2024

Pesticides play a vital role in agriculture, aiding growers in controlling pests, enhancing crop yields, and bolstering food security. However, their usage requires careful attention to minimise adverse effects on the environment, human health, and animal well-being.

Construction of a pesticide storage facility will aid in safeguarding pesticides, preventing accidents that could lead to property or environmental harm, and promote sustainable agricultural practices.

Construction of a pesticide storage facility

It is important to consult the *South African National Standard (SANS) and Regulations 10206* before designing, planning or constructing a pesticide storage facility.

- Ensure the storage facility is cool, dry, and protected from unauthorised access.
- Locate the building at least 500 meters away from water sources like irrigation facilities, rivers, dams, and boreholes, and above the 100-year flood line.
- Choose a secure and easily accessible location for dispatch, delivery, and emergency escapes, away from dwellings, clinics, and schools.
- Raise the base of the entrance 200 mm high and 110 mm wide to prevent spills from leaking.
- Construct the building with non-combustible, fire-resistant materials like concrete and brick.
- Install stable, durable, non-porous shelves level to the wall.
- Provide a water supply, basin, and outdoor shower for rinsing off spills and washing hands.
- Ensure adequate ventilation with natural (e.g. airbricks) and mechanical (e.g. extractor fan) systems to prevent the accumulation of fumes.
- Illuminate the storage facility properly.
- Secure the building with steel doors, locks, alarm systems, and burglar bars on windows.
- Ensure that an appropriate fire-retardant system is selected and installed, dependent on the requirement stated on the Safety Data Sheets for the chemicals being stored.

Managing the pesticide storage facility

Maintenance of pesticide storage facilities is as crucial as safe handling and storage of pesticides.

- Always retain original packaging of chemicals for vital handling information and warnings.
- Maintain an up-to-date record of all stock in the facility, whether in printed or electronic form.

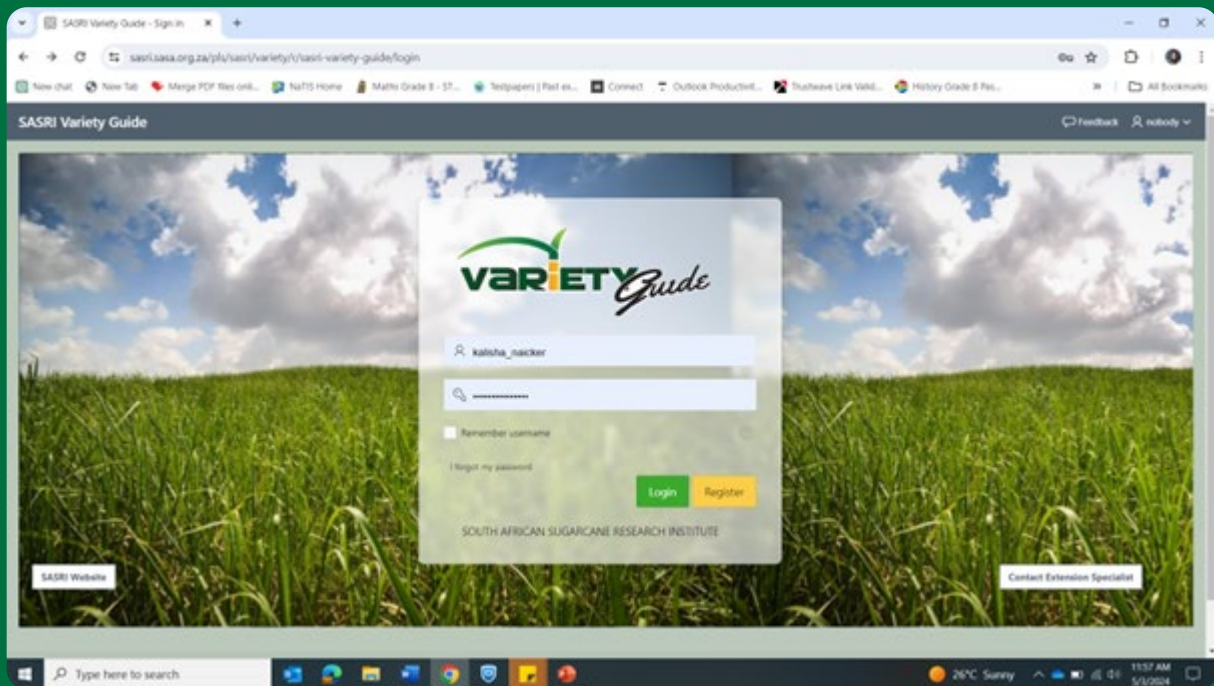
- Inspect pesticide containers for damage and leaks upon receipt; reject unlabeled containers.
- Store newly arrived pesticide containers behind older stock to ensure use before expiration.
- Stack pesticide containers on pallets to prevent ground storage and potential environmental harm. Use secure shelving for smaller containers.
- Separate liquid and solid pesticide formulations; position liquid formulations lower on shelves to prevent spills onto solid pesticides.
- Avoid stacking herbicide containers on top of fungicide or insecticide containers to prevent cross-contamination and crop harm.
- Confine highly dangerous chemicals with GHS Acute Toxicity Category 1 classification in a designated labeled cage within the storage facility.
- Prohibit storage of flammable materials, food, feed, fertiliser, or other goods in the pesticide storage facility.



In facilities where pesticides are stored, ensuring safety measures are in place is crucial. Operators should fully grasp the risks associated with pesticide use and the critical need for wearing appropriate personal protective equipment (PPE). Adhering to specifications outlined in the pesticide's Safety Data Sheet (SDS) or label is imperative for PPE selection.

At least one staff member should be equipped with basic first aid training, with clear instructions on first-aid protocols prominently displayed. A readily accessible spill kit should be on-site to swiftly manage any chemical spills. Regular monitoring of the storage facility is also crucial to uphold safety standards.

These proactive measures not only safeguard personnel but also mitigate potential environmental and health hazards associated with pesticide storage and handling.



A step-by-step guide to utilising the SASRI Variety Guide

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Selecting the correct variety of cane for your specific agronomic conditions and pest, disease and climatic pressures, is crucial for agricultural success. In the realm of sugarcane farming, the SASRI Variety Guide stands out as an invaluable tool to aid in making informed decisions

on sugarcane variety choice. This simple, user-friendly and interactive Decision Support Tool (DST) provides concise information on all N-varieties in a format that allows growers to compare them.

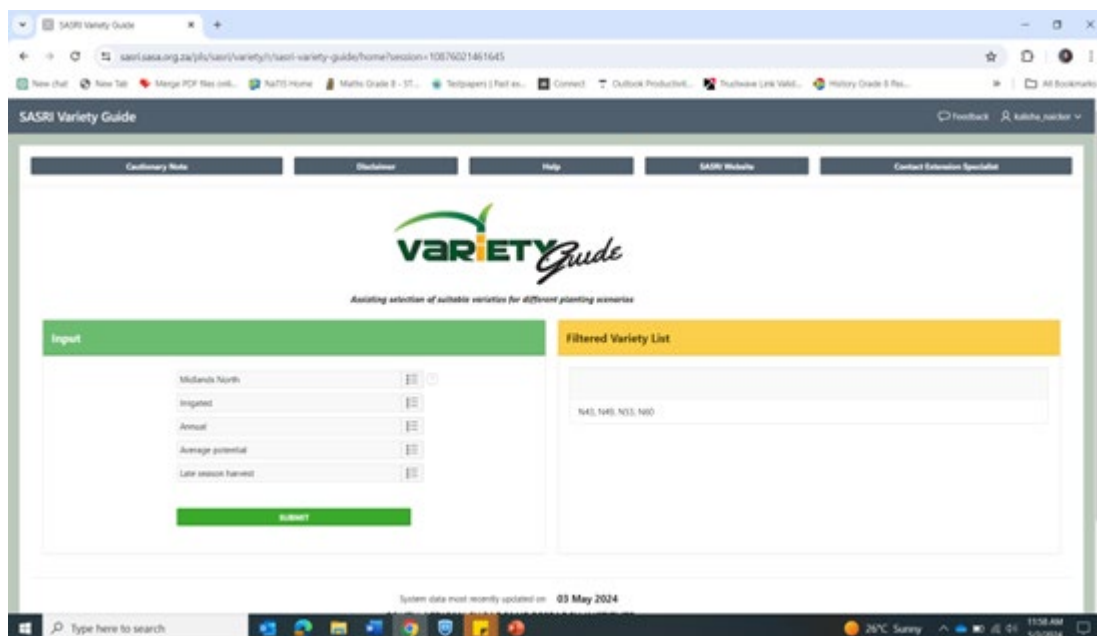
Here's a step-by-step approach to effectively utilise the SASRI Variety Guide:

1. Access the Guide: The SASRI Variety Guide is available online through the [SASRI website](#). First time users are required to register.

2. Describe your scenario: To begin, you need to provide information on the following factors:

- **Area / Local Pest, Disease and Variety Control (LPD&VCC) Region:** Farmers can select from twelve LPD&VCC areas within the South African sugar industry, as well as an option for the SADC Region in Africa.
- **Rainfed / Irrigated:** Depending on the common practice in the area, farmers can choose between rainfed or irrigated cultivation.
- **Harvesting Cycle:** Farmers select the harvesting cycle duration, ranging from annual to 18-24 months.
- **Soil Potential:** Choices include low, average, or high potential soil categories.
- **Time of Harvest:** This option is available only when the annual harvesting cycle is selected and allows farmers to choose between early, mid, or late season harvesting.

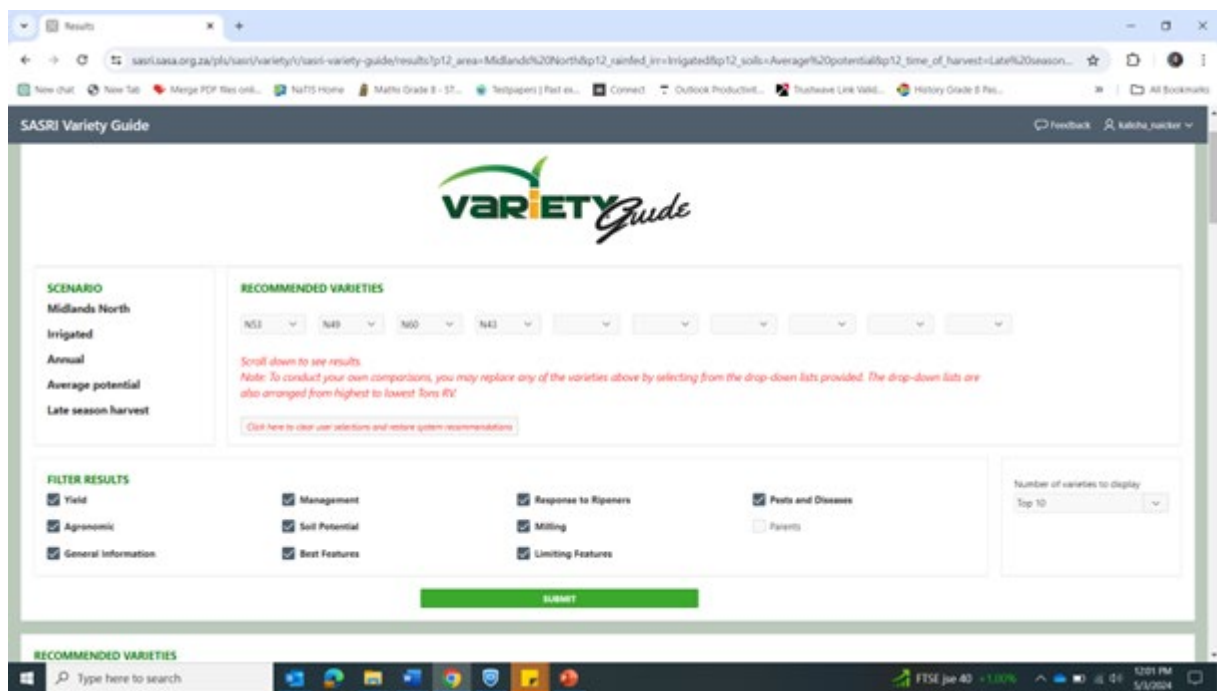
As farmers make selections in these dropdown lists, the guide dynamically adjusts the list of recommended varieties based on the specified planting scenario.



3. Navigating the Results Page: Upon submitting the selected criteria, farmers are directed

to the results page, which provides a comprehensive overview of the top varieties based on relative Tons RV value for the selected soil potential. It's important to note that newer varieties typically rank higher due to their superior tons RV. Because these varieties are new, there may be limited information for your area on their actual performance, agronomic characteristics and pest and disease reactions. Farmers are advised to consult with Extension Specialists to confirm performance data for their specific area.

The results page also offers the flexibility to filter variety characteristics based on specific criteria such as yield, management factors, response to ripeners, pests and diseases, agronomic traits, soil potential, milling quality, and general information. Farmers can customise the display to focus on traits that are most relevant to their needs.



4. Utilising Variety Traits: Variety traits are displayed using word descriptors and color-coded to indicate their significance:

Dark green: Indicating positive traits such as “Yes,” “Good,” “Highly recommended,” “Resistant,” and “Highly Resistant.”

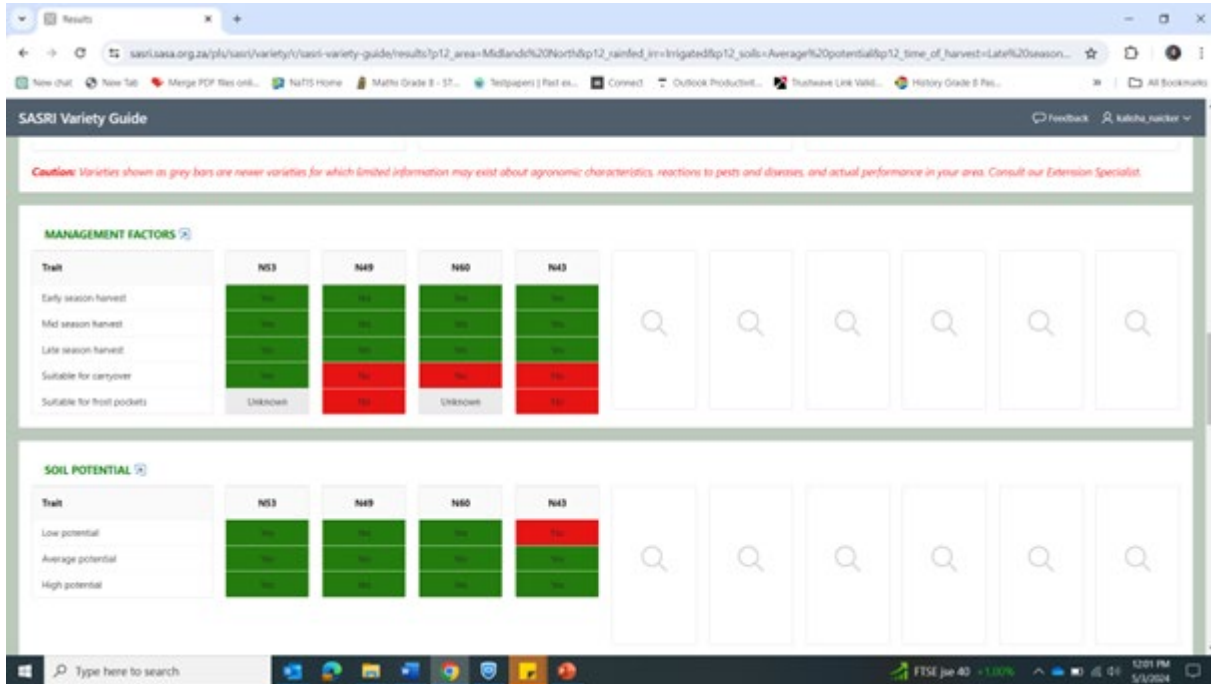
Green: Signifying moderate traits such as “Yes,” “Moderate,” “Acceptable,” and “Intermediate Resistant.”

Yellow: Denoting traits that are still in testing or have intermediate characteristics.

Orange: Warning of potential limitations or restrictions, such as limited availability

Red: Signaling negative traits such as “No,” “Poor,” “Not recommended,” “Susceptible,” and “Highly Susceptible.”

White: Used when a rating is unknown.



Additional Features

The SASRI Variety Guide offers additional features such as the ability to export data and print selected scenarios as PDFs. Farmers can also print pest and disease graphs for further analysis and record-keeping.

Note: While the guide provides valuable information for variety choice, the suitability of the recommended varieties for your specific area and conditions must be confirmed with your Extension Specialist.



Weather

Phillemon Sithole (Agrometeorologist)

Published: 16th May 2024

Review

Rainfall in the rainfed parts of the industry in KwaZulu-Natal was generally above normal during the second half of the 2023/24 summer season (Dec 2023 to February 2024), despite

well below average rainfall being recorded in February. Average early autumn (March and April) rainfall was normal, except for the Midlands region where below normal was recorded from February to April (Figure 1). In the northern irrigated areas, above normal rainfall was recorded over the review period except for January and February when well below normal rainfall was received. In March, heavy rainfall associated with tropical storm, *Filipo*, was recorded in parts of Mpumalanga and northern Zululand. Overall, the industry received near-normal rainfall over the review period.

Irrigation water sources remain well replenished while load-shedding has drastically reduced since March, which bodes well for the irrigated crop.

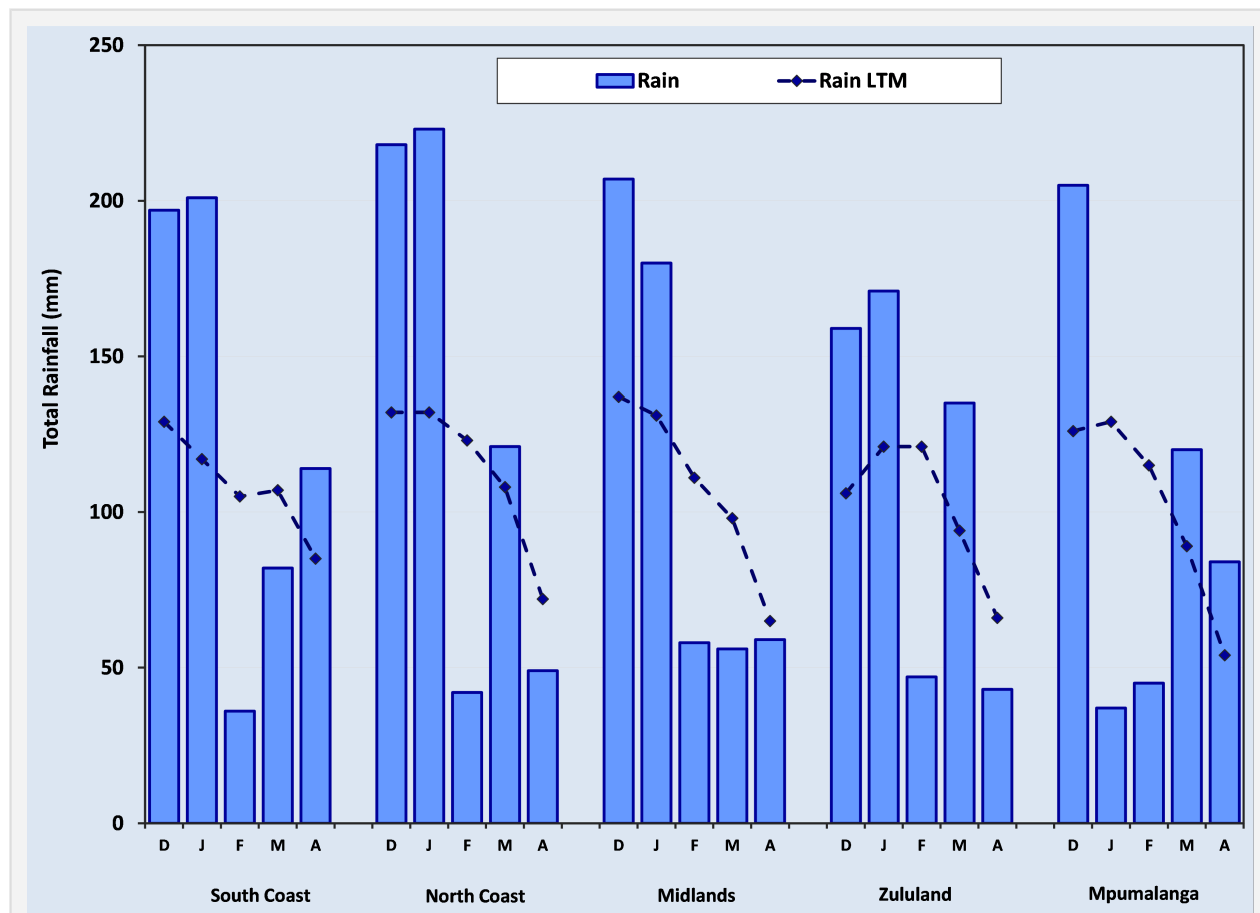


Figure 1: Regional average monthly total rainfall for December 2023 to April 2024 compared to the corresponding long-term means (LTM).

Outlook

The El Niño has weakened substantially and the El Niño-Southern Oscillation (ENSO) is expected to transition towards neutral conditions during winter 2024. La Niña is the likely category in the coming (2024/25) summer season (Figure 2).

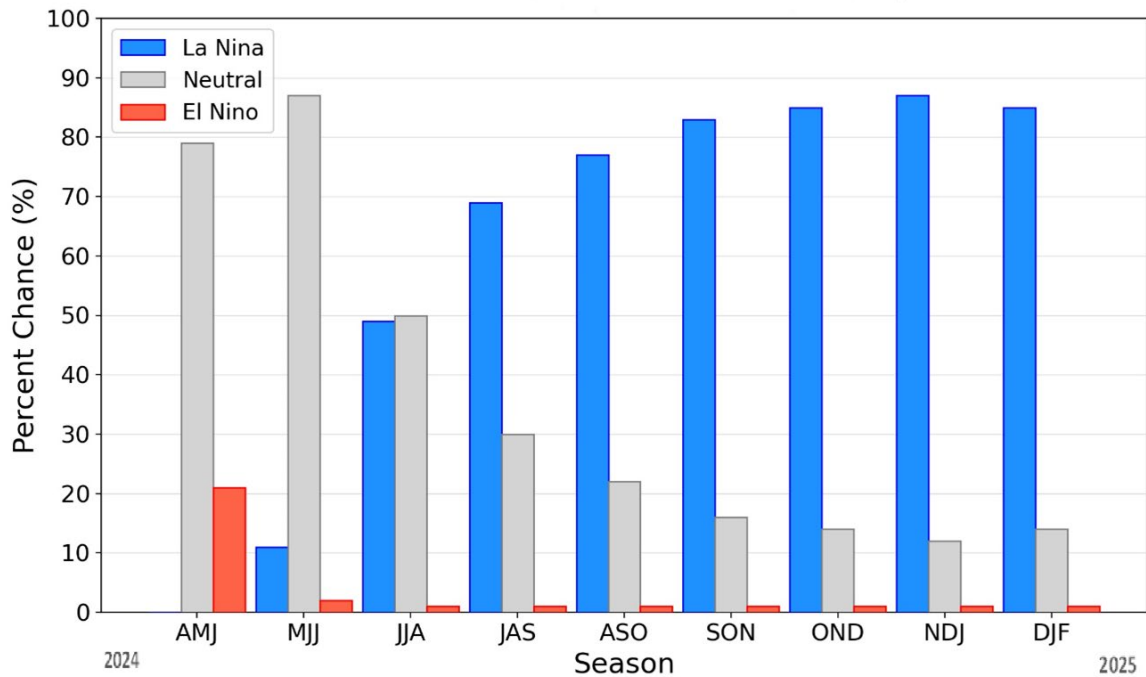


Figure2: ENSO probabilities for the rest of 2024 (issued in May 2024) for each of the three possible categories.

Source: [NOAA Climate.gov](https://www.noaa.gov/)

The *South African Weather Service* predicts slightly below normal rainfall during the 2024 winter season while the *International Research Institute for Climate and Society* and the *European Centre for Medium-Range Weather Forecasts* both predict near normal winter rainfall for most of the industry. Above average minimum temperatures are expected.

Please visit the SASRI WeatherWeb <https://sasri.sasa.org.za/weatherweb> for the latest industry weather reports and links to up-to-date seasonal climate forecasts.