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PULA

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GROWING FOOD • PEOPLE • PROSPERITY

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A WORD FROM... *Phumzile Ngcobo*



A WELL-KNOWN PROVERB SAYS: 'A HEAD START IS THE BEST START.' A SUCCESSFUL HARVEST IS DETERMINED BY SEVERAL FACTORS, INCLUDING GOOD GROWING CONDITIONS THROUGH THE PLANT'S GROWING CYCLE – ESPECIALLY DURING THE PLANT'S CRITICAL GROWTH STAGES.

However, the farmer has no control over this aspect. The timeous implementation of management practices is very much within the farmer's reach and they should aspire to carry out these with due diligence.

Succession planting is a method of growing different crops in the same space right after each other in the same season, with different maturation dates, to extend the harvest. The benefits of the implementation of this management practice have presented overwhelmingly good results for farmers in the eastern production regions.



Succession planting allows for a prolonged planting window, spreading the risk for farmers.



Timing is everything! Succession planting allows for a prolonged planting window, spreading the risk for farmers but also allowing ample time to implement crop management practices such as fertiliser and chemical applications.

Climate variability presents many challenges to farmers, which is affecting the harvest. Many areas have received below optimum rainfall conditions, coupled with excessively hot conditions, adversely affecting the growing crop. The persistence of these conditions will subject farmers to considerable yield losses – and with this we sympathise.

There is hope for conditions that are currently unfavourable to improve, and that every farmer will realise a good harvest and make a good return on investment in the current season.

– *Phumzile Ngcobo is the assistant regional manager at the Dundee office.* ■

PLANTING DATE and FERTILISATION can ensure an optimal sunflower yield

SUNFLOWER OIL IS ONE OF THE MAJOR VEGETABLE OILS USED IN THE FOOD INDUSTRY. MOREOVER, WITH ITS HIGH QUALITY, EDIBILITY AND HIGH PROTEIN CONTENT, IT IS OFTEN USED IN THE PRODUCTION OF VARIOUS COMMERCIAL PRODUCTS. SUNFLOWER IS GENERALLY GROWN UNDER RAIN-FED SYSTEMS DUE TO ITS MODERATE DROUGHT TOLERANCE.

This drought tolerance can be attributed to its well-developed and deeply penetrating root system that allows the plant to use available soil nutrients and moisture more effectively. However, from the early flowering stage up to the grain-filling stage, sunflower is particularly sensitive to water and heat stress. Environmental factors such as the temperature, day length, intercepted solar radiation and precipitation have varying effects on sunflower growth and developments throughout its lifecycle.

Fluctuations in the temperature and moisture availability affect both the quantity (grain weight) and quality of oil accumulation in sunflower. Therefore, various cultural practices are implemented to counter negative effects. Among these practices, the implementation of a specific planting date and nitrogen (N) fertilisation are some of the most critical factors in successful sunflower production.

NITROGEN FERTILISATION

N is one of the essential nutrients for sunflower growth and development, and constitutes structural and metabolic elements of plant cells, such as amino acids, proteins, nucleic acids and enzymes. Sunflower absorbs N mainly in inorganic forms such as ammonium (NH_4^+) and nitrate (NO_3^-).

Upon N absorption, the vegetative growth of plants is stimulated, favouring the synthesis of photo assimilates and by-products for fruit and seed formation. Studies suggested an increase of sunflower seed and oil productivity of up to 40% when supplemented with N sources.

Several international studies reported that a 100 kg N/ha application is optimum for sunflower production. However, the application of N below or above the optimum range reduces the effective use of this nutrient by the crop, which leads to a decline in yield.

The application of excessive N dosages will, for instance, stimulate plant growth (height) to such an extent that the risk of lodging in areas prone to excessive winds increases significantly.

Furthermore, an imbalance between the vegetative and reproductive phases of the crop can occur during these circumstances when uncontrolled vegetative growth is stimulated and plant maturation delayed. This leads to a reduction in yield and an increase in pest susceptibility.

Studies also reported a reduction in oil content and seed yield at a 150 kg N/ha application rate. On the other hand, some studies reported that 80 kg N/ha was sufficient, while others showed that an increase in N levels leads to steady increases in yield, protein contents and linoleic acid simultaneously with a decrease in oil content and oleic acid percentage.

Little or no research has been conducted in South Africa, however, to quantify the optimum N application for local sunflower production conditions. This article will bring some insight on the research currently done by ARC-Grain Crops to address this lack of local information and provide valuable information on N fertilisation and planting date effects on the seed yield and oil content.

PLANTING DATE

The semi-arid Free State and Northwest, with its unpredictable and adverse weather conditions during the production season, account for approximately 80% of the total sunflower cultivation area in South Africa. Consequently, these weather conditions can exert significant influences on the seed yield and oil content.

Late sunflower plantings are also more likely to encounter adverse conditions, including seed or seedling exposure to high December and January temperatures, while pollination and seed development will occur under rapidly decreasing temperatures.

On the other hand, the optimum planting time of this crop allows maximum use of all the natural resources in line with optimal environmental conditions and physiological growth stages of the crop that will ensure good seed germination and seedling establishment, optimum root system development, growth and yield. Plants will be enabled to establish themselves better and absorb essential nutrients from a large volume of soil.

In South Africa, sunflower is typically planted from November to mid-January. If these planting dates are delayed, sunflower grain and oil yields are greatly reduced.

ARC-GRAIN CROPS RESEARCH

Funding from the Oil and Protein Seeds Development Trust and

1 Effect of planting dates on sunflower yield, oil content and oil yield over two growing seasons.

Supply	2020/2021 growing season		2022/2023 growing season	
	Optimum planting	Late planting	Optimum planting	Late planting
Seed yield (t/ha ⁻¹)	2,39	1,77	2,30	1,85
Oil content (%)	38,91	40,98	38,88	40,30
Oil yield (t/ha ⁻¹)	0,93	0,73	0,91	0,75

the Agricultural Research Council (ARC) made the ARC-Grain Crops research possible. The aim of the study was to determine the effect of N fertilisation on sunflower yield when planted at the optimum (mid-December) and late (after mid-January) planting dates. To achieve this, two field experiments were established at ARC-Grain Crops Potchefstroom research farm over two growing seasons (2020/2021 and 2022/2023).

- The first planting date (planted on 15 December during 2020 and 2022, respectively) was considered the optimum planting date.
- The second planting date (on 26 January 2021 and 18 January 2023, respectively) was considered as late.

Five sunflower hybrids, including two conventional (PAN 7080 and AGSUN 8251), two Clearfield (AGSUN 5106 CLP and PAN 7160 CLP) and one high oleic hybrid (PAN 7158 HO), were planted to study these effects.

Five different levels of N fertiliser were applied including the control that received no N fertilisation. These included:

1. 45 kg/ha N as a basal application at planting; and
2. 45 kg/ha N one month prior to planting.

This was followed with a topdressing one month after planting applied at:

3. 0 kg/ha.
4. 45 kg/ha (total of 90 kg/ha); and
5. 75 kg/ha (total of 120 kg/ha).

EFFECT OF PLANTING DATE ON SEED YIELD, OIL CONTENT AND OIL YIELD

Table 1 shows the effect of the two planting dates on the sunflower seed yield, oil content and oil yield during these two growing seasons. During the 2021/2022 growing season, the optimum planting date yielded 2,39 t/ha compared to the 1,77 t/ha produced at the late planting date (25% reduction in yield).

The 2022/2023 growing season showed a similar trend, where the first planting date produced 2,30 t/ha, while the late planting produced 1,85 t/ha (19% reduction in yield). These results confirm that of other studies, indicating that early/optimum planted sunflower produced higher yields than those planted later.

The second planting date yielded a 5% (2020/2021) and 4% (2022/2023) higher oil content than that yielded during the optimum planting dates (Table 1). However, the oil yield of the sunflower planted in December (0,93 t/ha and 0,91 t/ha, respectively) was higher than that of the January planting dates (0,73 t/ha and 0,75 t/ha, respectively).

- These results are a clear indication that **when planting dates are delayed** until the last week of January, **the oil yield will be reduced.**

CONCLUSION

- The planting date and different N levels applied at different times have a significant effect on sunflower production.
- When planting later (after mid-January) than the optimum planting date (mid-December), a 19% to 25% reduction in seed yield was recorded.
- Furthermore, the highest seed yield was achieved at high levels of N application (120 kg N/ha), whether planting at the optimum date or the late date.
- However, in terms of N agronomic efficiency and best return on investment, 45 kg N/ha applied on the plant when planting at the optimum planting date and the application of 45 kg N/ha a month before planting, when planting on a late planting date, perform the best. ■



Scan the QR code to read the full article, which includes more results about this study.



DID YOU KNOW?

- Sunflower (*Helianthus annuus L.*) is an annual oilseed crop that is cultivated globally.
- During the 2022/2023 growing season, 28,25 million ha produced more than 55,8 million metric ton, which accounted for 8,41% of the world's oilseed market (USDA 2023).
- In South Africa, the average area planted with sunflower and its annual yield since 2007 was recorded at 565 563 ha and 740 832 t, respectively.



DR SAFIAH MA'ALI, SENIOR RESEARCHER: ARC-GRAIN CROPS, POTCHEFSTROOM. FIRST PUBLISHED IN SA GRAAN/GRAIN, SEPTEMBER 2023.

Gerbils can destroy a grain harvest

GERBILS ARE ONE OF THE AGRICULTURAL PESTS THAT DRIVE GRAIN FARMERS INTO A FRENZY. UNFORTUNATELY IGNORANCE ABOUT GERBILS STILL SEEMS TO BE A PROBLEM, SIMPLY BECAUSE FARMERS ARE OFTEN COMPLETELY UNFAMILIAR WITH THEIR APPEARANCE AND BEHAVIOUR.

SIGNS OF GERBIL INFESTATION

These little pests can reduce a grain harvest by up to 70% if damage control is not done in a timely and effective manner.

The first signs of gerbil presence are usually a few round holes of approximately 50 mm in diameter linked to tunnels in headlands and on the outskirts of fields. Gerbils live underground and only come out to look for food – usually from very late in the afternoon until just before daylight. They overwinter in fields where their burrows and tunnel systems are easily overlooked because they are covered by natural vegetation.

However, once the summer planting starts, they move into the fields and establish colonies that can take over whole fields. There can be as many as ten holes on every square metre, and tunnels are often so extensive that tractors and implements get stuck in them. These conditions indicate an infestation of epidemic proportions that needs urgent action.

ROLE OF CONSERVATION TILLAGE

Although minimum tillage practices are good for the farmer, the crop and the natural environment, this is one of the main reasons why gerbils have become a nuisance for many grain farmers in the last two decades. The role of deep tillage in soil health is often downplayed, while there are many merits for the grain farmer.

In the 'good old days', when fields were deep ploughed every season, plant residues were buried under the ground along with their transmitted diseases, pests and weeds, while gerbil colonies were also affected negatively.

Deep ploughing destroyed the dwelling and breeding place as well as the refuge of gerbils. Spilled grain was also buried. This would have been gerbil food if the fields had not been ploughed. With conservation tillage, ploughing rarely takes place. This not only leaves gerbil colonies undisturbed, but also leaves behind plant residues in which plant diseases and pests such as stump borer can survive. Returning to deep tillage every season will cause adverse effects on the soil itself.

SOLUTIONS

The most important objective to prevent gerbil damage is to prevent the numbers from increasing. It is better to tackle the problem holistically rather than with rodenticides (or rat poison, as it is commonly known).

Owls

The presence of owls is a wonderful way to limit the gerbil population. All owl species in the grain-producing areas hunt gerbils.

Erect suitable perches on poles that are 1,4 m to 2,4 m high to attract owls and other diurnal raptors, so they can quickly take care of the gerbil infestation. Owl boxes, like the well-known JoJo plastic ones and self-made wooden boxes, can also be put up as a breeding place for spotted eagle owls and barn owls.



Invite owls to your property by putting up an owl house like this one where they can breed. The owls will help with the rodent problem.
(Source: <https://www.owlrescuecentre.org.za/Owl-House-Project/>)

Deep tillage

Deep tillage up to at least 500 mm deep is recommended every four years in areas where gerbils are endemic and can become epidemic. It is unnecessary to apply deep tillage if colonies are small and under control.

The most important objective to prevent gerbil damage is to prevent the numbers from increasing.

Rodenticides

Rodenticides can be used successfully against gerbils, but they carry a possible risk of secondary poisoning of owls, diurnal raptors and predators.

Not all poisons are registered for gerbils, simply because not all are successful against these pests. There are also various formulations such as wax blocks, granules (compressed grain), paste blocks and dusting powder to choose from.

- Use **edible bait** when natural food is scarce, like during the winter months. This should set the population back enough so that they



This bushveld gerbil will not be a problem anymore.
Source: <https://www.agtag.co.za/category/14/post/23936>



Gerbils not only cause damage to young maize plants, but consume freshly planted and germinating seed as well as ripening crops.

do not become epidemic during planting time. Bait that is put out when maize or wheat is germinating, will have very little attraction as the gerbils will feed on the germinating seeds.

- No rodenticide may be spread openly on the ground. The advantage of **tracking powder** is that it is not food-related. It is put into the holes and clings to the gerbils' fur as they move around. They then ingest the powder (which contains the active ingredient, coumatetral) when they comb themselves.
- If the holes are covered in the late afternoon by pulling a disc over the fields, there should be less than 10% new holes the following morning. Then you only have to treat the new holes with tracking powder and therefore you will save on cost, time and labour.
- A single treatment with the right rodenticide should wipe out the gerbil population sufficiently, so that the owls and other birds of prey get the chance to keep the rest under control.

Zinc phosphide bait

Zinc phosphide bait works very well, with an extremely low risk of

secondary poisoning because the phosphine gas that kills the animal oxides to phosphoric acid. Aluminium phosphide tablets can also be used, but due to its high cost, it is recommended only for small-scale infestations. However, be aware that gerbils sometimes do not want to eat bait of any kind. In such a case, a trace powder must be used.

Plant a bait crop

A method that keeps gerbils out of fields when there are plantings, is to plant a metre-wide dense stand of a bait crop. It can be any crop that germinates with the maize or wheat and supplies the mice with excess food so that they do not target the new planting.

SEASONAL BEHAVIOUR

In the summer rainfall areas, gerbils are on the lookout for shelter and food from the end of August. Farmers should examine fields to determine if there is gerbil activity. If holes are detected in fields by the end of September, serious control must be done to curb the population.

Bait can be used if there is less than one hole every ten square metres, but if the density is closer to one hole every square metre, it is advisable to tackle the affected part of the field quickly with a plough. If not, it will be too late to do anything to prevent serious damage. They usually wait until the seed has germinated and has grown two leaves, after which they bite off the leaves and eat the soft seed.

In the winter months, it is desirable to use something like a bait pellet for the gerbils that have found a safe home in the fields. They usually eat these baits readily because natural food is scarce. This will have a big enough impact on the population so that they do not become epidemic when it is planting time. ■



DR GERHARD VERDOORN,
OPERATIONS AND STEWARDSHIP
MANAGER, CROPLIFE SA

MINIMISE LOSSES WHEN

ALTHOUGH THERE WILL ALWAYS BE HARVEST LOSSES, ONE SHOULD TRY TO MINIMISE IT. TO ACHIEVE ZERO LOSSES, THE COMBINE HARVESTER WOULD HAVE TO MOVE AT SUCH A SLOW PACE THAT YOU WILL NEVER FINISH HARVESTING IN TIME. THE KEY IS TO ACHIEVE A BALANCE BETWEEN A SUITABLE WORK RATE AND LIMITING HARVEST LOSSES TO ACCEPTABLE LEVELS.

Select the best suitable cultivar for your farm to reduce sunflower and soybean harvest losses. It is important to plant a range of soybean and sunflower cultivars with different growth lengths that are adapted to the area. This will make the harvesting period longer in order to harvest all cultivars at optimal times and will also reduce crop losses.

Acceptable harvest losses for sunflower are about 3% to 5% of the crop. For soybeans it represents approximately 2% to 4% of the total potential yield under good harvest conditions.

MEASURING HARVEST LOSSES

Before looking at reducing harvest losses, you must measure and assess where the losses occur. This will allow you to calculate the losses and where the seed is lost.

Normally losses occur in four areas – pre-harvest losses, header losses, combine threshing losses and then losses with the loading and transportation of the crop. It is important to measure every area to make the necessary adjustments.

To measure the loss, it is essential to count the pips per square metre. This can be done by putting out metre-by-metre boards just after the header passed. Count the pips on top and under the boards, and then multiply it by an average pip weight to calculate the loss per hectare.

Ensure that all the sunflower heads and soybean pods are threshed clean. As a rough guide, 100 seeds per square metre (including the unthreshed seed) is equivalent to about 100 kg/ha for sunflowers. With this information specific adjustments can be made.

Pre-harvest losses

This is where seed is lost or shed before the combine harvests the crop. It can be caused by birds or mammals eating seed, plants falling over and heads not being picked up by the combine later on, or by heads rubbing against each other in the wind, causing seeds to become dislodged.

Pre-harvest losses can be reduced by being prepared to harvest the crop when it is ready and finishing in a timely manner. Waiting for seeds to become too dry increases the risk of pre-harvest losses, so it is generally better to combine at higher moisture levels. It is important that regular samples are tested to determine the moisture percentage and to start when the moisture percentage is in line with the crop regulations.

Header losses

Seed, heads and pods are lost at the combine header and are not gathered into the machine. The rate of losses depends on the skills of the combine driver, crop condition and type of header being used. Sometimes the header performance can be drastically improved, simply by reducing the forward speed and making sure the cutter bar is in proper condition. Being patient during harvest can be to your advantage.

Most header types will cope with sunflowers and soybeans if set up correctly, but investing in speciality headers can be a good investment. There are currently some well-made and competitively priced models for both sunflowers and soybeans available.

For sunflower harvesting the main objective is to gather heads with minimal stalks entering the combine and minimal seed loss from shattering. This can be achieved by raising the combine header high enough to take in the heads while reducing the number of stalks and keeping the heads intact – so it passes through the combine whole or in a few large pieces. One sunflower head contains many seeds, so making sure they all pass through the combine will help largely to reduce sunflower harvest losses.

The objective for soybeans is to gather the most pods, with minimal stalks entering the combine and minimal seed loss from shattering. This can be done by doing the following:

- Decrease your ground speed.
- Position the cutter bar as close to the ground as possible.



Try to minimise harvest losses by setting your combine harvester correctly.

harvesting sunflower and soybeans

- Angle the pick-up fingers on the reel back slightly to pull the lodged plants more aggressively to the cutter bar. Reduce the angle of the fingers if the plants are riding over the top of the reel.
- Move the reel axle forward so that it is 22,5 cm to 30 cm ahead of the cutter bar.

Pre-harvest losses can be reduced by being prepared to harvest the crop when it is ready and finishing in a timely manner.

Combine threshing losses

Once the sunflower heads or soybean pods are gathered in the combine, the incorrect drum, concave and sieve settings can lead to excessive losses. This is because the seed is not effectively threshed out of the heads or pods, or is allowed to pass over the back and is ejected along with the trash.

For sunflower, the aim is to get a completely threshed head onto the straw walker in one piece. Although different combine harvesters will have different optimal settings for sunflowers, the general guide is to combine at a reasonable forward speed, use a slow cylinder speed, have concaves well open, use a low airspeed and harvest when seed moisture is low.

For soybeans, separating problems result from worn parts on the cylinder or rotor, and improper cylinder or rotor clearance or speed settings. The separating equipment must be in good condition to handle soybeans with green or tough stems. Adjustments made to the cylinder or rotor clearance and speed are a balancing act between separating losses, seed damage and split beans. Make one adjustment at a time and inspect the cleanliness of the grain in the tank to determine your progress towards minimising separating losses and maximising seed quality.

Sunflower seeds are light, so the fan airspeed should be low – if it is too high, it will blow seed over the sieve, and seed forced over the sieve and into the tailing's auger will be returned to the cylinder and may be dehulled. Set the fan so that only enough airflow is created to keep trash floating across the sieve.

The airspeed is also very important for soybeans and regular inspections are needed to make sure the soybeans are not blown out or there are too many sticks in the grain bin. Set the fan so that only enough airflow is created to keep trash floating across the sieve.

Aim for a combine speed of about 5 km to 8 km per hour. If the seed's moisture content is low, then a slower speed should be used to reduce shatter loss, while a higher speed can be used when the seed has a higher moisture content.

TOP TIPS FOR A SUCCESSFUL SUNFLOWER AND SOYBEAN HARVEST

- Don't wait for the crop to dry down too much.
- Resist the urge to combine too fast – patience is a virtue.
- Keep the header high to reduce the number of stalks passing through the combine.
- Make one adjustment at a time, then check the losses after each change.
- Use a well-maintained sunflower and soybean header.
- Make sure combines have earth straps touching the ground – chains usually work well. This will help to reduce fire hazards.
- Frequently blow down dust to reduce fire hazards.
- Read your owner's manual before setting the harvester. ■

PIETMAN BOTHA,
INDEPENDENT AGRI-
CULTURAL CONSULTANT



But farmers are patient men tried by brutal seasons, and if they weren't plagued by dreams of generation, few would keep ploughing, spring after spring."

~ RICHARD POWERS AMERICAN NOVELIST
whose works explore the effects of modern science
and technology



Tips to fight **VELD FIRES** on the farm

WILDFIRES ARE A COMMON PHENOMENON IN SOUTH AFRICA, ESPECIALLY DURING THE DRIER SEASONS. THESE FIRES CAN OCCUR DUE TO NATURAL CAUSES SUCH AS LIGHTNING STRIKING, BUT IT IS OFTEN CAUSED BY HUMAN ACTIVITIES SUCH AS UNATTENDED CAMPFIRES, DISCARDED CIGARETTE BUTTS, CHILDREN PLAYING WITH MATCHES OR ARSON.

Veld fires usually occur from May to October in the northern parts of the country and from November to April in the southern parts of the country. They cause devastation and can lead to thousands of rands worth of damage to a farmer. All landowners (and farmers) have an obligation to prevent and fight wildfires. These obligations are set out in the *National Veld and Forest Fire Act (Act no. 101 of 1998)*.

The purpose of this Act is to prevent and combat veld, forest and mountain fires throughout South Africa. The Act provides for a variety of institutions, methods and practices for achieving this purpose.

What should you do if a fire is discovered that could pose danger? You are not allowed to stand by and watch a wildfire spread across your farm. You should do everything in your power to try to contain or extinguish it. However, remember that fires are dangerous and unpredictable. Always take the necessary precautions to protect yourself and your property. Landowners should immediately notify the nearest fire protection association as well as their neighbours.

BE PREPARED

There are many ways you can try to prevent veld fires. One of the best methods of fire prevention is preparing firebreaks. Make a fire-resistant strip without leaves, debris or flammable material at least 10 metres away from your house. You can also prepare firebreaks on the border of your property. Discuss these with your neighbours and plan together so that the firebreaks are prepared in the right area.

Make sure of the following:

1. Firebreaks should be long and wide enough to stop a fire from spreading.
2. It should not cause soil erosion.
3. Make sure that it is free of flammable material.
4. Firebreaks must be maintained throughout the season.

Here are some other tips:

- Maintain your property by trimming trees and shrubs, removing dead leaves and debris, and making sure your gutters are clean.
- It is a good idea to join your local fire protection association or a WhatsApp group in your community so that you can be informed of wildfires in the area. Always have emergency numbers handy of people you can contact for assistance.
- Be aware of different evacuation routes to leave the area in case a fire spreads to your farm.
- Plan for what to do with your livestock in the event of a fire.

- Have the necessary equipment, protective clothing and trained personnel to extinguish fires. Stock up on emergency supplies, including masks and/or respirators that filter out particles from the air you breathe.
- Keep an outdoor water source filled. Sand is also a highly effective method of fire control if water is not readily available.

BE EQUIPPED

All landowners should have fire-fighting equipment on the farm. The Act states that the equipment must be reasonably accessible in the circumstances.

Here are some guidelines that can be useful in the event of a fire:

- Fire 'swatters' made from old belting strips of rubber or wet sacks. Beating the fire with these belting strips or wet sacks will take away the air (oxygen) that the fire needs to burn. If there is not enough air, the fire will smother and die slowly.
- Shovels, rakes and spades to use for making a firebreak to stop the fire from spreading. A break is a clean strip of land where there is nothing that can burn. The shovels and rakes can also be used to remove dry grass and twigs that can burn easily. It can also be useful to put out the fire with sand or soil.
- Rucksack pumps can be used to wet plants and grass. They can also be useful when checking for flare-ups after the fire has been put out.
- A trailer with a water tank that can be hooked behind a tractor or bakkie if possible. Make sure the water containers are filled with water. A small power source with a pump that can spray water is also handy.
- A fire extinguisher. There are different sizes and types available – powder, CO₂ and foam.

All landowners should have fire-fighting equipment on the farm.

SAFETY FIRST

Remember, safety is always the top priority during a wildfire. Stay calm and take appropriate precautions. Make sure your animals are safe and try to prevent the fire from spreading to the neighbours. Report the wildfire to the emergency services, fire protection association and neighbours as soon as possible.

Here are some other tips:

- **Protective clothing** is important. Garments such as boots, helmets and gloves are designed to protect those who are fighting the fire. Respiratory personal protective equipment (PPE) will protect fire-

fighters from inhaling smoke and chemical substances generated by the fire.

- **Communication** is key while fighting a raging fire. You must be aware of what the fire is doing at all times. This can be done through your local two-way radio system or social media groups. If you are trapped, use your communication system to let people know what is happening and report your location. If possible, use a light to help people find you.
- Good advice when fighting fires in areas with dry grass and vegetation, is to **'keep one foot in the black'**. This means those fighting the fire should escape back into the burned (black) area for a safety zone.
- **Stay hydrated:** Drink plenty of water to stay hydrated, as this will help your body cope with the extreme heat.

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<https://afriforum.co.za/wp-content/uploads/2023/08/Veldbrandwenke.pdf>
<https://grainsa.co.za/alles-wat-jy-wou-weet-oor-veld--en-bosbrande>
<https://www.pranafm.com/how-to-prevent-veld-fires/#:~:text=Prepare%20fire%20breaks%20on%20their,cigarette%20buds%20on%20the%20ground> ■

It is the responsibility of every landowner to have knowledge of the National Veld and Forest Fire Act. Scan the QR code for more information.



LOUISE KUNZ,
ASSISTANT EDITOR



Diesel rebate - practical hints

IT IS OF CRITICAL IMPORTANCE FOR FARMERS TO KEEP STRICT RECORD OF THEIR DIESEL CONSUMPTION. THE CUSTOMS AND EXCISE ACT (NO. 91 OF 1964) REQUIRES, AMONG OTHER THINGS, THAT A LOGBOOK MUST BE KEPT OF HOW DIESEL WAS CONSUMED.

As there is no official logbook from SARS as yet, farmers should keep the minimum information required by law.

SOME PRACTICAL HINTS AND TIPS

1. Claim the diesel refund according to usage and not purchases.
2. Be as specific and prescriptive as possible about the activities. 'General' is not accepted.
3. In particular, keep proper records of the activities of trucks and vehicles using tarred roads. It is further experienced that it helps to keep separate logbook for vehicles and trucks.
4. Clearly indicate private use.
5. Transporting labour does not qualify.

HERE ARE A FEW TIPS ON RECORDING YOUR INFORMATION:

1. Date on which the diesel was added.
2. Quantity of diesel added.
3. Description of the vehicle.
4. Timer or kilometre reading before and after use.
5. Reason for which diesel was consumed. (It is important to check which activities qualify for the diesel rebate).

LOGBOOK

Scan the QR code for examples of a logbook supplied by SARS: ■



CORNÉ LOUW, HEAD: APPLIED ECONOMICS & MEMBER SERVICES, GRAIN SA. FIRST PUBLISHED IN THE GRAIN SA GRAIN GUIDE.

Working towards optimal GRAIN MARKETING

IN THE ARTICLE THAT WAS PUBLISHED IN THE MARCH ISSUE (*USE HEDGING TO CONTROL PRICE RISKS*), THE FOCUS WAS ON THE OPTIONS MARKET, EXPLAINING VARIOUS OPTIONS, THEIR MECHANISMS AND PROVIDING PRACTICAL EXAMPLES. THIS ARTICLE WILL EXPLORE THE PHYSICAL MARKET IN GREATER DETAIL, FOCUSING ON TWO CRUCIAL CONCEPTS THAT ARE PIVOTAL IN BOTH THE PHYSICAL AND FUTURES MARKETS.

This article progresses from understanding location differentials to how it influences the basis and ultimately, how it contributes to the physical market price.

LOCATION DIFFERENTIAL

- A location differential aims to determine the value of grain specific to different regions.
- The calculation of location differentials includes, amongst other factors, the expense incurred in transporting grain from its point of delivery to Randfontein.

For those new to this concept, the definition may not offer much clarity, so further elaboration is needed. When the regulated marketing channel was dismantled, it was critical for the South African grain markets to develop a new marketing system. This led to the development of the derivative markets and instruments.

Critical to the development of grain derivatives is standardisation in terms of location. During the development of the derivative contracts, the processing facilities were situated in Randfontein. However, over time grain processing developed to facilities across the country and grain was no longer transported to a single locality.

The Johannesburg Stock Exchange (JSE) uses a standard formula, which includes the transport cost to Randfontein, to calculate the location differential of each silo and makes this information publicly available on its website. Consequently, each silo incurs a distinct location differential. For instance, the silo in Bothaville carries a location differential of R290/t, whereas Koster's is only R205/t. These costs contribute to the basis, which in turn influences the physical market price.

WHAT IS BASIS TRADING?

The basis risk in futures trading within the grain industry pertains to the uncertainty or possibility of a variance between the cash (spot) price of the actual grain in the local market and the price of the corresponding futures contract. Put simply, it involves the risk that the relationship between the spot price and the futures price may alter.

Here is a breakdown:

- **Spot price:** This denotes the current market price of the physical grain, representing what one would pay or receive when buying or selling the actual commodity.
- **Futures price:** This signifies the price agreed upon today for a futures contract of the grain, which will be delivered and settled later.
- **Basis:** This stands for the difference between the spot price and the futures price, calculated as the spot price minus the futures price.

The basis risk emerges due to the possibility of spot and futures prices not moving perfectly in tandem. Several factors such as transportation

expenses, storage costs, local supply and demand dynamics, and other market influences can contribute to fluctuations in the basis. It is important to keep in mind that futures contract prices derive their value from the spot market.

For instance, consider a scenario where you are a farmer employing futures contracts to secure a price for your grain harvest. If the basis remains steady, you will receive the predetermined futures price upon delivering your grain. However, if the basis widens (increases) or narrows (decreases) by the time of delivery, the actual amount you receive could be more or less than your initial expectation.

The basis risk emerges due to the possibility of spot and futures prices not moving perfectly in tandem.

UNDERSTANDING THE PHYSICAL MARKET

To illustrate the dynamics of the physical market, an example will explain this point for better understanding:

- Consider a scenario where a farmer has harvested grain and opted to store it for later sale. When the time comes to sell, the farmer realises that the stored amount isn't adequate to fulfil a complete contract.



- The alternative is to sell the grain in the physical market. Upon contacting his grain marketer, the farmer learns that one silo has a basis of R50/t, while another has a basis of R30/ton. This means that the price the farmer receives will be the prevailing market price minus the basis.
- Consequently, the silo with the lower basis is more advantageous for the farmer as it yields more monetary value for the same quantity of grain delivered.

CONCLUSION

In conclusion, by integrating the two concepts explained earlier – namely, location differential and basis trading – the significant roles each plays in marketing grain in the physical market can be discerned. Mastering and comprehending these concepts will greatly enhance one’s ability to sell grain effectively and grasp market dynamics. ■

**JOHAN TEESSEN,
AGRICULTURAL
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Climate conditions problematic for grain producers



THE RECENT WEATHER CONDITIONS THAT PREVAILED IN THE WINTER GRAIN REGIONS AND CURRENT CONDITIONS IN THE SUMMER GRAIN REGIONS HAVE A SIGNIFICANT ECONOMIC IMPACT ON GRAIN FARMERS.

The winter grain production season faced several challenges, with excessive rain in certain areas resulting in losses in yields and putting financial pressure on producers in affected areas. In stark contrast to the winter grain production regions, the summer grain production regions are currently experiencing major challenges with drought conditions.

Extreme heat and the dry conditions caused the harvest to deteriorate much faster than initially expected. ‘We have seen large areas where the damage is already irreversible,’ stated Dr Tobias Doyer, Grain SA’s chief executive officer. ‘We have seen irrigated maize that is also experiencing challenges due to loadshedding and the heat conditions.’

These challenges are experienced at a time when margins on crops such as maize are already low due to international supplies and international price pressure. This makes the recovery period of individual farmers very difficult in challenging production conditions.

Grain SA is very concerned about the impact of the drought and market conditions on grain farmers. International competitors enjoy the benefits of subsidised, affordable comprehensive insurance, providing them with a competitive advantage. Similar local systems could have substantially supported South African farmers, given the challenging production conditions.

Grain SA continuously monitors the production conditions and publishes a qualitative production overview. ‘The National Crop Estimate Committee’s first estimate, which will be published at the end of February, will be important to evaluate the national situation, but the reality is that there are currently several individual farmers who are facing significant losses due to the drought and markets,’ says Derek Mathews, chairman of Grain SA and farmer in one of the areas experiencing significant challenges.

The organisation sympathises with grain farmers about the current conditions and the damage being done to their crops. In addition, Grain SA will engage with the necessary role-players and further suggests that farmers who have already experienced significant challenges, contact their input financiers at an early stage to ensure that the necessary changes can be made in time. ■

GRAIN SA PRESS RELEASE, ISSUED ON 24 FEBRUARY 2024.

Do we need a WeedSmart-like platform in South Africa?

WEEDSMART IS AN AUSTRALIAN INDUSTRY INITIATIVE ACTING AS A SINGULAR VOICE TO IMPROVE ON-FARM WEED MANAGEMENT APPROACHES AND TO ENSURE LONG-TERM SUSTAINABILITY OF HERBICIDES AND SEED TRAITS. DOES SOUTH AFRICA NEED THE SAME KIND OF INITIATIVE?

LOCAL SITUATION

Local structures that support industry and producers with crucial knowledge on herbicide resistance include the South African Herbicide Resistance Initiative (SAHRI) and the Herbicide Resistance Action Committee (HRAC). SAHRI was established in 2012 at the University of Pretoria as an independent platform to investigate herbicide resistance cases.

Currently the SAHRI team is taking the lead on identifying and monitoring Palmer amaranth (*Amaranthus palmeri*) occurrence and spread in South Africa. Palmer amaranth was first identified in South Africa in 2018 from the Northern Cape, and has also since been detected in Limpopo and North West. Producers should be very concerned about this weed and related species as they are extremely difficult to control and known to be resistant to a variety of herbicide groups.

The global HRAC is an international body founded by the agrochemical industry to provide comprehensive information about weed resistance and best practices to protect crop yields by preventing herbicide-resistant weeds. In South Africa, a local HRAC meets regularly to discuss current weed resistance concerns.

This committee consists of members representing various industries and the research community. The HRAC also undertakes to share information through participating organisations as needed. While HRAC SA creates the network where concerns are raised, SAHRI, universities and the Agricultural Research Council (ARC) conduct the experiments to confirm whether resistance of weeds to herbicides is developing. If confirmed, outcomes are shared with government and industry associations (HRAC SA and CropLife SA communicate with companies) as well as producers (through popular publications, farmer days and training).

Various public and private institutions are actively involved with weed research and extension. In the public sector, the ARC, the Western Cape Department of Agriculture, Stellenbosch University and the University of Pretoria are among the research institutions with dedicated capacity for herbicide resistance screening, weed control and alternative options, training as well as extension.

AUSTRALIAN WEEDSMART MODEL

WeedSmart has a national communications team as well as regional extension teams in the western, southern and northern growing regions of Australia. It is the industry voice ensuring that clear, consistent and science-backed information in terms of weed control is shared with producers and advisors.

WeedSmart is also responsible for a national stewardship campaign to encourage attitudes and actions to minimise crop weeds and sustain herbicide use. To achieve this, integrated control tactics (an approach advocated for by industry and the research community alike and very familiar to producers) were summarised into the 'Big 6' to optimise weed control and prevent the build-up of herbicide resistance.

THE WEEDSMART BIG 6

- **Rotate crops and pastures:** Diverse cropping systems can lower the weed seed bank, and facilitate the use of different chemicals, thereby reducing the pressure for weeds to develop resistance.
- **Increase crop competition:** High population densities and narrow rows increase competition for resources and can suppress weed growth within the season.
- **Optimise spray efficacy:** Optimal application of products to ensure target weeds are killed.
- **Mix and rotate herbicides:** Use chemicals with different modes of action to delay resistance build-up.
- **Stop weed set:** Aim to control weeds throughout and between seasons and monitor for survivors.
- Implement **harvest weed seed control.**

Harvest weed seed control (HWSC) systems have been in use in Australia for several years as an end-of-season approach to targeting weed seed production. Weed seeds are killed as they pass through the combine to prevent those seeds from entering the soil seed bank. In January 2023, Prof Michael Walsh presented workshops on HWSC systems in the Western Cape. His talks were facilitated through the Western Cape Department of Agriculture. The information presented below is a summary of the workshop.

Low weed densities are the best insurance against herbicide resistance.

HARVEST WEED SEED CONTROL

In Australia, controlling weeds at the end of the season became necessary as more weeds were able to survive up to maturation due to herbicide resistance. HWSC systems were specifically developed and optimised for controlling ryegrass in wheat production systems and have had significant success in reducing various weed seed banks in wheat fields.

Herbicide-resistant ryegrass populations occur across the wheat-producing regions of Australia, and significant effort is put into finding alternative control options, as well as to prevent complete resistance of populations to sustain herbicide use.



The HWSC systems comprise of the following:

- **Chaff cart:** A cart is linked to the back of the harvester to collect weed seeds. The chaff can then be grazed, baled or burnt.
- **Glenvar Bale Direct System:** A baler is added to the back of the harvester to collect weed seeds. Bales can be used.
- **Narrow windrow burning:** Chaff and straw residue are concentrated during harvesting and then burnt to kill weed seeds.
- **Chaff tramlining and chaff lining:** Creates a poor environment for weed emergence as chaff material is concentrated into narrow rows. The material can then be grazed, but care should be taken as mycotoxins may occur in residue.
- **Impact mills:** A highly effective chaff processing system, with no need for post-harvest operations. As the only system that fits with conservation agriculture (CA) practices, this approach holds great potential for the Western Cape where CA practices are implemented on most farms.

Research into adapting HWSC for crops such as soybeans and rice has shown potential for these systems to be useful in reducing weed populations, but factors such as the weed species and its growth parameters need to be considered.

IS HWSC THE ULTIMATE ANSWER?

Unfortunately, no. Although Australian producers have seen significant success using HWSC to reduce weed densities, it still needs to be used as part of an integrated control system (i.e. WeedSmart Big 6). Low weed densities are the best insurance against herbicide resistance, and efforts should take place within seasons but also between seasons to keep weed densities low. It should also be said that even when weed densities are low, weed control is still necessary.

Depending on the system, significant start-up costs may be needed to enable the HWSC system. Return on investment over multiple years and avoidance of resistance build-up need to be taken into the equation when considering these systems.

NEXT FRONTIER IN WEED CONTROL

The next goal for weed research is in-crop site-specific weed control to identify and control weeds within the growing season and across large-scale cropping systems. This approach has the potential to reduce the need for herbicides, while also adequately controlling weed emergence.

Developments in artificial intelligence make it possible to not only differentiate between weeds and crops at early growth stages, but

also to accurately identify weeds and then control only those plants identified as weeds.

Alternative site-specific control options are also needed (i.e. not herbicides) to control weeds and decrease reliance on herbicides. Such solutions already exist, like robots employing laserweeding to exercise precision weed control. Unfortunately, these solutions come at a hefty cost and may not be accessible to many producers.

WHERE TO NEXT FOR SOUTH AFRICA?

As a country, we can pride ourselves on the calibre of researchers within public and private institutions. Unfortunately, weed scientists have become few and far between and significant investments are needed to not only ensure sufficient capacity is available to address weed research, but also that sufficient resources are allocated towards this field.

It is necessary to keep an eye on ryegrass in the Western Cape and KwaZulu-Natal, as well as common pigweed (*misbredie*) in the summer grain production regions.

We need to know which weed species are getting more and more difficult to control, and we need enough funds and capacity to keep an eye on it all and to communicate all of it. Focus should be placed on optimal control, as well as alternatives to herbicides and to amplify the voices that are already sharing critical information. ■

To get in touch with the research community for advice or resistance screening, contact:

- Dr Mieke Human – 067 016 9493/miekie@grainsa.co.za
- Dr Godfrey Kgatle – 079 489 5966/godfrey@grainsa.co.za

DR MIEKIE HUMAN, RESEARCH AND POLICY OFFICER, AND DR GODFREY KGATLE, RESEARCH COORDINATOR FROM GRAIN SA. FIRST PUBLISHED IN SA GRAAN/GRAIN, MARCH 2024.



CUTWORM MANAGEMENT:

Are producers getting it right?

THERE ARE SEVERAL *AGROTIS* CUTWORM SPECIES (LEPIDOPTERA: NOCTUIDAE) PRESENT IN SOUTH AFRICA, NAMELY BLACK CUTWORM (*AGROTIS IPSILON*), GREY CUTWORM (*AGROTIS SUBALBA*), BROWN CUTWORM (*AGROTIS LONGIDENTIFERA*), SPINY CUTWORM (*AGROTIS SPINIFERA*) AND THE COMMON CUTWORM (*AGROTIS SEGETUM*). THE COMMON CUTWORM IS THE MOST PROMINENT AND ECONOMICALLY IMPORTANT SPECIES PRESENT IN SOUTH AFRICA.

THE IMPORTANCE OF CUTWORM MANAGEMENT

- Larval feeding can result in severe damage to crops during the seedling stage.
- The larvae move from one seedling to another, cutting and destroying the stems of seedlings close to ground level, often resulting in death.
- One larva can damage numerous plants in a single night.
- If outbreaks occur, replanting of the crop often has to be done.
- These larvae are active at night and during the day they can be found close to the soil surface near dead seedlings.
- Damage resulting from cutworm is not only restricted to seedlings. Plants at the four-leaf stage or older may also be damaged.
- This damage in older plants can be identified as round holes into the stem, just below the soil surface.

SCOUTING IS NECESSARY

- Scouting constitutes one of the best weapons producers have in their arsenal to combat cutworm.
- Emerging crop seedlings must be continuously inspected for signs of cutworm, preferably twice per week, and treated when necessary.
- Scouting post spraying is vital to determine if the initial application was successful or if a second application (depending on the label of a product) is required.
- Producers who apply insecticides at planting must also scout to determine if control has been achieved.
- The edges around bare regions should be inspected by producers for recently 'cut' plants. In addition, the top 5 cm of soil should be thoroughly searched for larvae.
- Where any notched, wilted, dead/cut weed or crop seedlings are observed, one should start digging around roots of the plants to identify cutworm larvae.

MANAGEMENT STRATEGIES

Genetically modified maize (Bt)

While genetically modified (Bt) maize is effective against stalk borers, it is ineffective when it comes to cutworm. The reason is simple – cutworm and stalk borers are different species. Cry proteins in Bt maize

are species specific. In addition, as with insecticides, the size of the larvae being treated is crucial. Therefore, the bigger the larvae, the less effective the cry protein.

Cutworm larvae that target maize seedlings are generally large, late-instar larvae. Producers must be vigilant of any seed companies claiming that the Bt gene will control cutworm larvae – this is patently false based on the reasons highlighted, as well as the fact that there are no legal registrations for this purpose.

Controlling weeds is crucial

Conventional practices of tilling in the form of ploughing, well before planting, is aimed at destroying winter weeds and any volunteer plants present in a crop field. The larvae which become buried or exposed on the soil surface might be damaged, injured or preyed on.

Weed control through the responsible application of registered herbicides prior to planting, is the commonly used method to manage cutworm larvae in reduced and no-tillage systems.

Weed control in this context is crucial to deny newly hatched larvae a food source in the absence of crops. In general, a minimum of 35 weed free days prior to planting (where practically possible) is required in order to starve larvae. While producers may not have weeds at the time of planting, the presence of weeds four to five weeks prior will exacerbate cutworm issues. Therefore, in almost every situation, insecticides will also have to be relied on for effective cutworm management.

Producers who plant maize cultivars with herbicide tolerance, would likely have to wait for seedling emergence before applying an herbicide. This is also true for insecticides.

Insecticides

Applications of suitably registered pyrethroids and organophosphates are considered essential in controlling cutworm larvae infestations. Whether applied preventatively at planting, it is important



Characteristic cutworm larva damage to a seedling.
Photo: Clemson University – USDA Cooperative Extension Slide Series, Bugwood.org



The larvae are dirty-grey or brown in colour with a smooth, waxy appearance.
 Photo: http://www.pyrgus.de/Agrotis_segetum_en.html

to monitor post spraying especially during emergence and throughout the seedling stage to determine if a second application may be required. Importantly, many pesticides registered for use against cutworm make it clear that where reduced or no-till is practiced, particularly with maize, populations of cutworm can be expected to be higher where scouting post spraying is crucial to determine if a second application is required.

When using an insecticide against cutworm larvae, keep the following in mind:

- Where possible, apply during the afternoon – this reduces the degrading effects of heat and direct sunlight on the product, and ensures that the larvae, which are nocturnal, receive maximum exposure to it.
- Personal Protective Equipment and Clothing (PPE) must be correctly used by employees whenever handling a pesticide product. The risks associated with pesticides can be negated by using the product responsibly.

CONCLUSION

Cutworms have been managed relatively well in the country to date and there is no doubt that this will continue. Although there have been isolated issues recently, the Insecticide Resistance Action Committee (IRAC) remains firm in that there are no resistance issues with registered pyrethroids given the available information.

Producers must strictly adhere to product label instructions without deviation in any manner whatsoever when applying a pesticide,

whether herbicide or insecticide. The label of a pesticide product is the law in terms of the Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No. 36 of 1947). It is important to read the label instructions carefully.

Product registration holders have done copious amounts of research to compile the label instructions and if not strictly followed, then efficacy against the target pest, in this case cutworm, cannot be guaranteed. Further, guard against irresponsible tank mixing and consider the conditions of the spray water in terms hardness and pH in relation to the product label instructions.

Finally, producers are encouraged to keep records of pest experiences linked to climatic conditions given that the influence of soil moisture on factors such as cutworm biology and behaviour are often overlooked. This will enable producers to better anticipate and prepare for potential issues in following seasons.

Send an email to CropLife SA at info@croplife.co.za for more information. ■



**HIRESH RAMANAND,
 STEWARDSHIP COORDINATOR,
 CROPLIFE SA. FIRST PUBLISHED IN
 SA GRAAN/GRAIN, MAY 2023.**

ALUMINIUM TOXICITY – developing more resistant crops

ALUMINIUM (AL) TOXICITY IS A MAJOR ISSUE FOR PRODUCERS ACROSS THE WORLD, AFFECTING 67% OF GLOBAL FARMLAND. THIS PROBLEM OCCURS IN ACIDIC SOILS (PH \leq 5,5) AND HINDERS THE GROWTH, DEVELOPMENT, AND PRODUCTIVITY OF CROPS BY DAMAGING ROOT GROWTH.

Plants in acidic soil with Al toxicity usually have stunted growth and thickened roots, making them more vulnerable to drought. Different plant species and cultivars have varying levels of Al toxicity tolerance. Among cereal crops, rice is more tolerant than maize, wheat, and sorghum, while barley is the most sensitive. Researchers work to develop new cultivars that are more resistant to Al toxicity to help producers maintain healthy crops and avoid massive losses.

Studies have shown that using Al-tolerant cultivars, along with soil remediation methods like lime, manure, and compost, can significantly improve crop yield. For example, an Al-tolerant maize cultivar provided 61% higher grain yield than a sensitive cultivar under toxic conditions. The yield further improved when a lime treatment was applied.

AI TOXICITY TOLERANCE STUDY

More recently, ARC-Small Grain researchers conducted a study to investigate Al toxicity tolerance in a wheat population derived from two South African wheat cultivars, Tugela-Dn and Elands. This population had previously been examined for plant height and yield component traits, determining the underlying genetic factors (Lephuthing *et al.*, 2022).

Therefore, the present study intended to identify the genetic factors regulating Al toxicity and to establish the association with plant height. The study involved screening 139 wheat lines for Al toxicity tolerance using a staining technique and a molecular marker associated with Al tolerance in wheat. This research showed that 70% of the wheat population was highly susceptible to Al toxicity.

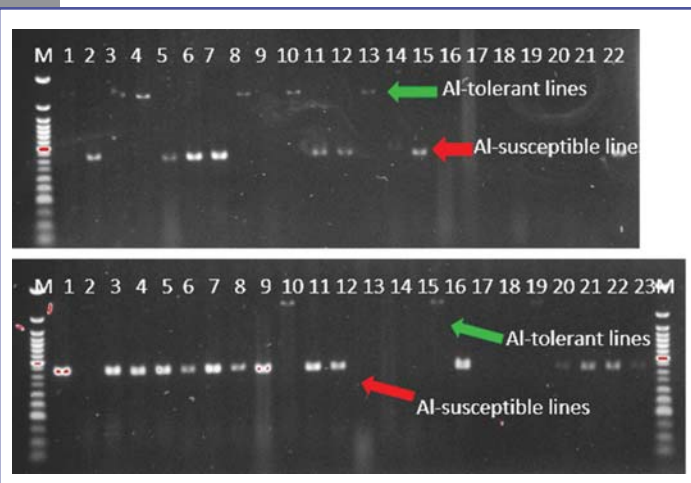
However, 30% of the lines showed tolerance, which could be useful for future breeding efforts. The two screening methods synchronised well ($r^2 = 0,814$, $p < 0,05$), but the molecular screening technique proved to be more efficient and powerful in discriminating between the Al-tolerant and susceptible wheat lines.

The research also revealed that Al toxicity tolerance in wheat is primarily determined by a single major gene located on chromosome 4D, and three new molecular markers for this gene were identified. These markers can help scientists screen for Al toxicity tolerance in future studies and transfer the gene to other wheat lines through the backcrossing method of breeding. Interestingly, the research also revealed that the genes responsible for Al toxicity tolerance and plant height were closely linked on chromosome 4D. This means that both traits can be improved simultaneously in a wheat breeding programme.

CONCLUSION

In conclusion, many cereal crops, including wheat, are susceptible to Al toxicity, which limits their production under toxic conditions.

1 Molecular screening for aluminium toxicity tolerance using diagnostic markers.



However, some Al-tolerant varieties have been identified and can be used in breeding programmes to develop more resistant crops.

The latest research at ARC-Small Grain has identified three new molecular markers for the major gene responsible for Al toxicity tolerance in wheat, which will be valuable for future research and breeding efforts. Additionally, since the genes for Al toxicity tolerance and plant height are closely linked, both traits can be improved simultaneously.

REFERENCES

Lephuthing MC, Khumalo TP, Tolmay VL, Dube E and Tsilo TJ, 2022. Genetic Mapping of Quantitative Trait Loci Associated with Plant Height and Yield Component Traits in a Wheat (*Triticum aestivum* L.) Doubled Haploid Population Derived from Tugela-DN \times Elands. *Agronomy*, 12(10), p2283 ■

ARC-Small Grain has been crucial in evaluating commercial wheat cultivars for Al toxicity tolerance. The information gathered is published in the Annual Production Guidelines and is available to producers on the ARC-Small Grain website or by scanning the QR code.



DR THOBEKA KHUMALO,
DR ERNEST DUBE AND
DR TOI J TSILO, ALL FROM
ARC-SMALL GRAIN, BETHLEHEM. FIRST PUBLISHED IN
SA GRAAN/GRAIN MAY 2023.



Cattle farmers alerted about disease outbreak

THE ZIMBABWE VETERINARY SERVICES HAVE CONFIRMED OUTBREAKS OF THEILERIOSIS ACROSS THE COUNTRY. THIS DISEASE IS CAUSED MAINLY BY THE CATTLE-ADAPTED *THEILERIA PARVA* (JANUARY DISEASE).

No outbreaks of East Coast Fever or January Disease, caused by cattle-adapted strains of theileria parva, have occurred in South Africa since the early 1950s. South Africa still remains free of these diseases. The Department of Agriculture, Land Reform and Rural Development (DALRRD) issued an early warning of the potential threat that this poses to South Africa, and the measures required to mitigate this risk.

ABOUT THEILERIOSIS

Theileriosis in cattle may be associated with very high mortalities, especially if an outbreak occurs in previously unexposed animals.

- The disease is transmitted by brown ear ticks (*Rhipicephalus appendiculatus*).
- All types of *Theileria parva* are controlled diseases in South Africa. Any suspicion of the disease must be reported to the state veterinarian as soon as possible for further investigation and sample submission.
- Due to the breeding cycle of the brown ear tick in the affected areas, the higher rainfall summer months pose the highest risk for disease transmission, which may also place South Africa at a higher risk of incursion between December and May.

Should there be a disease suspicion, frequent acaricide application must be started immediately.

South Africa has not imported any live cattle from Zimbabwe for many years and the import requirements for other risk commodities, including hides, skins and hay, require these commodities to be free of ticks. However, factors such as the illegal importation of cattle, or the inadvertent introduction of infected ticks via people, hay, hides or cars crossing the border into South Africa, may still pose a risk.

HOW TO ACT ON DISEASE SUSPICION

The occurrence of cattle-adapted *Theileria parva* strains could have severe negative effects on livelihoods and the sustainability of the livestock industry. The management, control and/or eradication of this disease require highly intensive and expensive efforts that are difficult to sustain. Therefore, an early warning and immediate eradication of any incursion, should it occur, is of the utmost importance.

Should there be a disease suspicion, frequent acaricide application must be started immediately (at least three times within two weeks) and the following samples must be collected by an official veterinarian:

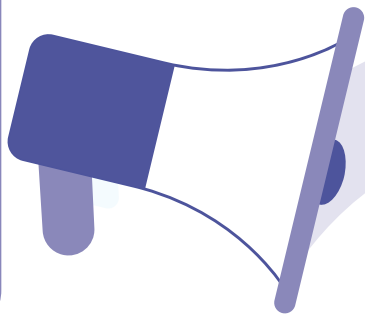


- (a) From live animals: Peripheral blood smears, full blood samples in heparin and in EDTA, serum samples.
 - (b) From postmortem cases: Peripheral blood smears, impression smears from visceral organs, visceral and lymphoid tissue.
- Collected samples must be sent immediately to Onderstepoort Veterinary Laboratory for testing. Samples must be submitted via the state veterinarian and sample submission forms must be completed in full, including full details about the location, reasons for testing and history of the case.

ADVICE FROM THE DALRRD

- The DALRRD encourages everyone to practise strict **biosecurity measures** to reduce the risk of all animal diseases, including not introducing animals of an unknown health status into their herds.
- Regular treatment of cattle to reduce tick loads is strongly advised as a measure to reduce exposure to the vectors of many tick-borne diseases, including *Theileria spp.*, while the involvement of professionals is encouraged to combat the risks of acaricide resistance.

Source: Department of Agriculture, Land Reform and Rural Development ■



HAVE YOU HEARD?

GRAIN SA NEWS

Dr Lavinia Kisten joined Grain SA's research team from the Forestry and Agricultural Biotechnology Institute (FABI) at the University of Pretoria, where she managed the grain diagnostic clinic. With a PhD in botany, she brings expertise of plant pathology, wheat breeding, molecular biology and plant disease diagnostics to the team.



INTERNATIONAL VISITORS EXPLORE SA AGRICULTURE

Delegates from three different countries visited South Africa early in 2024 to look at opportunities.



An Egyptian delegate participated in discussions with the South African Cereals and Oilseeds Trade Association (SACOTA) and the Department of Agriculture, Land Reform and Rural Development (DALRRD). Grain SA's economics and research teams, along with other industry stakeholders were invited to participate.

Ms Thoko Didiza, the minister of agriculture, land reform and rural development, was visited by the Kingdom of Saudi Arabia's minister of environment, water and agriculture, HE Eng. Abdulrahman Abdulmohsen A. AlFadley. The visit was to deepen agricultural trade and investment between the two countries. Dr Tobias Doyer, Grain SA's CEO also attended the meeting.



Dr Litha Magingxa, the ARC's president and chief executive officer, hosted a delegation from the Embassy of the People's Republic of China to discuss areas for cooperation in agricultural fields.



IT'S NEARLY TIME FOR NAMPO 2024

Grain SA's NAMPO Harvest Day is a highlight on the agricultural calendar. Here farmers can experience first-hand the latest technology and products on offer in the farming industry on one terrain. It is a wonderful opportunity to reconnect with others in the agricultural sector.

This is an outing the whole family can enjoy as there are more than 700 exhibitors with products ranging from everything a farmer needs to everything the farmer's wife dreams of – from household goods to jewellery.

**Don't miss out –
14 to 17 May 2024!**

DIFFICULT TIMES SHOW IN GVA

Statistics South Africa recently released figures that indicate that South Africa's agricultural Gross Value Added (GVA) dropped notably by 12,2% year-on-year (y/y). According to Wandile Sihlobo, chief economist of Agbiz, South Africa's agricultural sector faced several challenges in 2023, but Agbiz didn't anticipate that the overall annual performance would drop sharply.

Along with the Bureau for Food and Agricultural Policy (BFAP), Agbiz expected a mild contraction in 2023 because of the animal disease challenges in the livestock and poultry sub-sector. The headwinds in the livestock and poultry industry weighed on the sector more intensely than was anticipated. This industry, which accounts for nearly half of the sector's value, was hit by animal diseases such as foot-and-mouth, avian influenza and African swine fever.

Agriculture has experienced a tough two years with 0,3% growth recorded in 2022 and a 12,2% contraction in 2023. Given the many uncertainties in the global and local outlook, the year ahead will be a tough one to navigate. ■

Corner Post

BY LOUISE KUNZ, ASSISTANT EDITOR

THERE IS A MALAWIAN PROVERB THAT SAYS: THOSE WHO ACCOMPLISH GREAT THINGS PAY ATTENTION TO LITTLE THINGS. SUCCESS IS MADE UP OF PAYING ATTENTION TO 'SMALL THINGS' – THE DETAILS. PAYING ATTENTION TO DETAIL AND REMAINING FOCUSED ON HIS GOAL OF BECOMING A FULLY-FLEDGED COMMERCIAL FARMER, HELPED PHILANI PATRICK KHOZA (36) TO BECOME THE 2023 PGP POTENTIAL COMMERCIAL FARMER OF THE YEAR.

Philani was motivated to become a farmer while studying agricultural management at a college in Mooi River. In his studies, he acquired a basic knowledge of farming. After graduating, he worked at several commercial farms but wanted to try his hand at being a 'real farmer'. With little knowledge (and even less grain-farming experience), he decided to start planting a single hectare in 2014.

It was at about this stage that his path crossed with Grain SA. 'This relationship has been fantastic,' says Philani. Once he became part of the Phahama Grain Phakama (PGP) Farmer Development Programme, he could increase his agricultural knowledge and get the necessary training to develop as a farmer.

His initial single hectare has successfully grown to the current 82 ha he now plants. He farmed with livestock as well, but due to high levels of theft in the area he decided to focus on crops. 'Farming is difficult. There are many challenges, and the challenges change with every season, but I find it exciting.'

The 2022/2023 season offered him quite a bit of 'excitement' with all the challenges he faced. 'It was a tough season that required quick thinking. Due to the heavy rainfall during this season, I was compelled to plant outside the planting window, which led to more challenges.'

Before the maize was ready to be harvested, cattle from the communal area got into the field and Philani was forced to get workers in to pick the crops by hand to avoid big losses. His determination to succeed is clear, as he still managed to produce 5,5 t/ha of maize and 1 t/ha of soybeans in such challenging circumstances.

Philani is confident that the 2023/2024 season will be a better one – although each challenge offers him the opportunity to grow and develop into a better farmer.

PHILANI'S STORY

WHY DID YOU BECOME A FARMER?

I chose farming because I love the outdoors and the variety of things one can do in a day.

My father, Derrick, is a businessman and owner of several liquor stores, where the whole family works. I found the work in the family liquor stores too monotonous.

WHAT CONTRIBUTED TO YOUR SUCCESS?

Attention to detail is extremely important to me. I think my studies in agricultural management contributed to this. I am also focussed on growth and am trying not to deviate from that goal at all, no matter how many challenges I face.

Gaining knowledge also played a vital role in my success. There are so many decisions that you must make as a farmer and even though my mentor plays a huge role and helps making many decisions, I can make them independently as well.

WHAT ARE YOUR PLANS FOR THE FUTURE?

In the short term, I would like to increase my leasing hectares and in the medium term, I hope to continue moving up the commercial farming ladder to become a farmer who is high up on the ladder. Hopefully acquiring my own land is not too far in the future. ■

PHILANI'S 3 TOP TIPS

1. Planning is key.
2. Make sure you secure a market for your products prior to planting.
3. Diversify!



Philani Khoza

FARM FACTS

Farm: Communal land in Dukuza

Nearest town: Bergville

Region: KwaZulu-Natal

Size: 82 ha – plants 40 ha soybeans and 42 ha maize

Type of farming operation: A crop farmer, planting maize and soybean

PGP'S CONTRIBUTION

- Joined Grain SA in 2014
- Mentored by Graeme Engelbrecht and Paul Wiggill
- Member of Dukuza Study Group

Training courses completed:

Has completed several courses including:

- Introduction to maize
- Introduction to soybeans
- Introduction to farm management and farm finance
- Farming for profits

A mentor's view:

Graeme Engelbrecht, regional development manager at Grain SA's Dundee office, says Philani is very level-headed and has a good grasp of working hard to achieve things. 'He is well balanced in his decision-making, with a strong focus on achieving the objective. Decision-making is analysed against whether or not the plan will achieve the objective.' Philani also has strong family values, as he comes from an honest, hardworking family.



Graeme Engelbrecht

A programme that is changing lives



Follow PGP's footprint on social media

IN THE ERA OF TECHNOLOGY THE AGRICULTURAL SECTOR USES DIGITAL TOOLS TO IMPROVE PRODUCTIVITY, SUSTAINABILITY AND INCLUSIVITY. THE FARMER DEVELOPMENT PROGRAMME IS POSITIONED BETWEEN TRADITIONAL FARMING PRACTICES AND DIGITAL INNOVATION, AIMING TO EMPOWER FARMERS THROUGH KNOWLEDGE SHARING AND ACCESS TO RESOURCES.

This article explores the digital footprint of the Phahama Grain Phakama (PGP) Farmer Development Programme (FDP), highlighting how technology is reshaping the landscape of agricultural development in South Africa.

At the heart of the programme's digital strategy is various online platforms, designed to facilitate learning, communication and collaboration. The Grain SA website serves as a central hub, offering resources such as articles, guides and multimedia content on topics ranging from crop management to financial literacy.

Through the online platforms, farmers gain access to expert insights, empowering them to make informed decisions and adopt the best practices. Grain economics offer useful tools to equip farm-

ers in their decision-making with updated market, production and inputs reports.

SOCIAL MEDIA PRESENCE

The FDP maintains an active presence on Twitter and aims to extend its reach to other social media platforms such as Facebook and Instagram. The Twitter page for the FDP has seen notable growth in recent months, with the article titled 'Forecasts point to development of El Niño in 2023' becoming particularly popular, capturing significant attention and encouraging active engagement from followers.

These channels serve as channels for engagement, allowing farmers to connect with peers, share experiences and seek advice in real-time. In addition, social media campaigns raise awareness about upcoming events, initiatives and opportunities in the agricultural community. This fosters a sense of belonging among communities.

MOBILE APPLICATIONS

The FDP utilises mobile applications such as WhatsApp and Telegram to deliver valuable services directly to the farmers' fingertips. From market prices and production conditions to pest identification and crop management tools, these applications empower farmers to overcome challenges and optimise their operations with ease. By leveraging mobile platforms, the programme ensures accessibility and inclusivity.

CHALLENGES AND OPPORTUNITIES

While the digital footprint of the FDP offers great opportunities for agricultural development, it also poses challenges that must be addressed. Digital literacy, limited access to infrastructure and concerns regarding data privacy need to be considered. However, by investing in education and promoting innovation, these challenges can be overcome, unlocking the full potential of digital technologies to drive inclusive and sustainable growth in South Africa's farming communities.

In conclusion, the digital footprint of PGP's FDP reflects a shift in agricultural development. Through digital platforms, social media engagement, mobile applications and data-driven approaches, the programme is transforming the way farmers access information, connect with fellow peers and optimise their farming operations. By embracing innovation, the programme is not only shaping the future of farming in South Africa but also paving the way for a more sustainable agricultural sector.

– Article written by Nolo Bakwa, communications intern at Grain SA.



Special moments at the 2024 Grain SA Congress were shared on the Twitter page. The Congress theme was 'What keep farmers awake at night?'





Knowledge is power

IT is very important to increase your knowledge if you want to become a successful farmer. During February the Farmer Development team presented eleven training courses, which were sponsored by the Oil and Protein Development Trust (OPDT).

The courses were presented by PGP's offices in Kokstad, Mbombela, Dundee, Louwsburg and Lichtenburg. It included an introduction to groundnut, sunflower and soybean production. There were 160 farmers who attended the courses and 154 of these attendees successfully completed the courses.



Mentor and trainer, Timon Filter, presented the introduction to soybean production course at Pixley Ka Seme in Mpumalanga. This group of farmers was keen to learn and can't wait to start planting soybean and move on to crop rotation.



The course held at Dukuza near Bergville comprised of people aged between 32 and 72. Many good questions were asked. The older farmers have an advantage with practical experience, while the younger attendees did well in the theory.

Farmers are serious ABOUT PRODUCTION

A total of 78 farm visits took place during February. Approximately 25 advanced farmers, who are part of either the South African Cultivar and Technology Agency (SACTA) or the Standard Bank/Kgodiso Development Fund projects, were visited by the team.



Mentor Johan Roux paid a visit to Isaac Malakoane in the Ladybrand area. Although it was very dry and rain was urgently needed, the first maize crop was looking promising.



The maize crop of farmer Raphael Tamsanqa Masuku is looking very good. Mentor Chris de Jager reported that weed control was done and the crop has good potential.



Even though Badge Skosana from the Mbombela area received good rain, he had a lot of hail damage after a storm. There was hail damage of up to 80% on his soybean crops and the damage on the maize still had to be determined by an assessor. Mentor Martin Botha trusts that the seeds were not damaged too badly.

"Farming has taught me patience.
It will never happen overnight.
It's a long game."



PROUD TO BE A PART OF YOUR STORY

FARMER: Jeff Hehla

FARMING ENTITY: Sutherland Farm
(owned by Jonathan Biggs)

AREA: Ixopo, KwaZulu-Natal

PANNAR HYBRID USED:
PAN 4R-872BR (Yellow Maize)

PANNAR REPRESENTATIVE:
Andrew du Plessis
082 332 4870
Southern KwaZulu-Natal



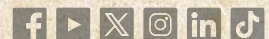
Farming has always been a passion of mine. I've studied farming. I've worked for commercial farmers, gaining learning experience from them and now I have made the decision to farm for myself. I love the process of growing something, of putting a seed in the ground and watching it grow over the growing season. Caring for it and then reaping the results - that one seed has given me a cob or 2 cobs and it grows into something much more than just seed - it's now something of value. I have been planting Pannar's PAN 4R-872 BR on my farm. It's a nice, roundup-ready variety and I've been very happy with it. I currently have a good standing maize population of 55 000 and so I am feeling quite happy so far.



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