



GRAIN SA MAGAZINE FOR DEVELOPING FARMERS



### PULA IMVULA

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### A WORD FROM... Derek Mathews

HE PULA IMVULA TEAM CHATTED WITH GRAIN SA'S NEWLY ELECTED CHAIRPERSON, DEREK MATHEWS. WE ASKED HIM WHY HE THINKS FARMERS SHOULD BELONG TO AN ORGANISATION LIKE GRAIN SA. THIS IS WHAT HE HAD TO SAY: 'NOW, MORE THAN EVER BEFORE, IT IS VERY IMPORTANT TO NOT ONLY BELONG, BUT ALSO TO PARTICIPATE IN THE ACTIVITIES OF GRAIN SA!'

Firstly, allow me this opportunity to convey my thanks to all the Grain SA farmers who have placed their trust in me to be their new Chairperson with Ramodisa Monaisa and Richard Krige as deputies. I look forward to my term of office and all the challenges that we will face together. We are living in 'different' times. A time where politics are confusing and concerning. Add to those challenges the raging pandemic brought by the coronavirus – it's very easy to be overwhelmed by it all. But still ... as farmers and producers of food, we have to go about our business every day – because we know that that is what it takes to survive.

Most of us cannot stay away from work – because work is where we stay. So, we need to do our best to keep our families and our workers as safe as we possibly can. With all the noise going on about the virus now, please pay careful attention to the advice of the authorities and follow the guidelines carefully so we can be part of the solution and not part of the problem.

We also face a new harvest season and we are grateful for the good summer season and the prospect of a good harvest. Grain SA will be focusing very clearly on sustainable and profitable farming going forward. I know how difficult it is for our grain farmers to keep their businesses alive when input prices are so high and grain prices are so low. If we can't make a sustainable living out of growing crops, then we have to do something different.

Please be assured, Grain SA is there to assist in every way possible. We can only solve the problems that we know about. So, it's up to each one of us to keep Grain SA informed about what our challenges are. Good luck with the harvest season. My wish is that you enjoy the fruits of your labour this season.

### FARMERS CONTRIBUTE far more than the food they produce

OOD FARMERS PRODUCE AN ABUNDANCE OF HEALTHY FOOD AND MANY OTHER VALUABLE GOODS TOO. FARMERS TAKE CARE OF THE SOIL, THEY CONSERVE WATER RESOURCES AND WILDLIFE AND THEY'RE THE CARETAKERS OF MOTHER NATURE.

Farmers play a significant role in community life. I've travelled widely and have met many farmers since I have been involved with Grain SA Farmer Development. One thing that has made a lasting impression on me is how amazing it is that most farmers are involved in their local community in one way or another, giving back, uplifting, helping ... and generally making a difference to the lives and well-being of others.

No man is an island – and no one must tell me that farmers are in business for themselves alone. Our farmers' community contributions have ranged from building churches and schools, to maintaining community cattle kraals and watering points, supporting soccer clubs and one farmer in the Eastern Free State was even running a boxing club to give local youth something to look forward to on weekends. Farmers play an important civic role in their communities.

### **CUSTODIAN OF THE EARTH**

To be a custodian means to be a caretaker. The first place that a farmer makes a difference is on the land. Farmers have a responsibility to use the natural resources at their disposal, sustainably and wisely. To use anything in a sustainable manner implies that the activity on the land will be able to be continued from one generation to the next. For example, it would be short-sighted, greedy and unreasonable to suck the lifeblood out of the soil without putting back. This means caring for the soils so they will be able to keep producing food for many years to come.

> You have to be a part of the solution and make sure farming becomes a vibrant sector that improves rural livelihoods.

No good farmer will plant crop after crop without doing soil sampling and applying fertilisers, planting cover crops or practising crop rotation to improve the health of the soils. True farmers care about the land for today and tomorrow. They are not only businessmen today, but they are the visionaries of tomorrow. We are stewards of the land and we should be finding ways to make other members of the community, in particular the youth who will be the stewards in future, more environmentally aware.







Local produce stimulates the local economy.



#### AGRICULTURE CAN STIMULATE LOCAL ECONOMY

Farmers provide food, fibre and fuel to the marketplace; but they also provide jobs for farm and seasonal workers who in turn spend their money and stimulate local economies.

I believe we need to see even more local farming activities become viable again. By this I mean that everyone who has access to land can become productive and grow food for their families



and sell their excess profitably. We should definitely all be growing seasonal vegetables for our households. It is sad that profit margins have been squeezed so tight in some agricultural value chains that many farmers say it's not worth their while.

Some say they buy a litre of milk more cheaply than it costs them to keep a cow healthy, feed her and then milk her every day. It's also hard to believe that for too long it has been more cost effective to buy imported chicken more cheaply than it could be raised here at home. If that chicken was grown here, the feed would be bought from our farmers and the jobs created would be given to our people. The poultry industry together with support from Grain SA, has been lobbying on this matter for long now and we are hopeful that some changes will be made in this regard very soon.

We need to build vibrant rural communities and agricultural activities must be the lifeblood. It is possible only if cheap imports don't compete with local farmer prices. We need to see a rural South Africa filled with many more motivated farmers and we need to encourage increased access to healthy, locally produced food. Local food supplies keep the rands and cents in the local economy.

Farming is not only about huge commercial farming, it is also about making a difference to household and community nutrition. Grain SA believes the size of the farm does not matter – we help anyone who has access to land and who wants to learn more about grain farming the correct way. We aim to assist farmers to get the best yields possible off each hectare. There is no reason why a small-scale farmer can't produce the same tons per hectare as a large-scale farmer – the processes must just be done correctly and at the right time.

### **ADVOCATES FOR AGRICULTURE**

An advocate is a champion, a person who speaks up and pursues what is right and good. Too many farmers accept that they are disempowered, and they have no voice. This is why it is important for every single farmer to belong to a farmer organisation like Grain SA. And then to talk to the managers within the organisation about the issues that concern them.

It is Grain SA's job to make sure there is every opportunity for grain farmers to be successful. To do this they have to monitor the quality of inputs, watch weather systems, conduct research and development and monitor diseases and pests which could affect our crops. They also constantly speak to government about policies that they need to change or put in place. If you as the farmer do not discuss your issues with the representatives, how must they know what to address on your behalf? I wonder why more farmers are not complaining more loudly and 'advocating' for a healthier, viable local poultry or pork industry? Ask for what you want. When things aren't right, get involved in the processes that could make them right. You have to be a part of the solution and make sure farming becomes a vibrant sector that improves rural livelihoods.



John Donne said, *'No man is an island entire of itself; every man is a piece of the continent, a part of the main...'* We are all interconnected and have a responsibility to our communities. As farmers we are called to play an important role as food producers – now more than ever. With the shattering onset of the dreaded pandemic Covid-19 or coronavirus, it has become clear how important our work is as producers of life sustaining food on home soils. Farmers, we need to advocate for a better local food production economy that ensures it is profitable for us to grow more food and participate in the many agricultural value chains. At the same time it is not good enough to say South Africa produces enough food for all its people (which it does) – we have to speak up and demand that solutions be found to ensure that food is accessible and affordable to all, including the poorest of the poor. The farmer is one, but those who eat the fruits of his labour are many.

### Maintain a balanced management approach

N THIS SERIES OF ARTICLES, WE CONCENTRATE ON FARM MANAGEMENT. TO REFRESH YOUR MEMORIES – THE DIFFERENT AREAS OF FARM MANAGEMENT ARE PRODUCTION, PURCHASING, MARKETING, FINANCIAL MANAGEMENT, ADMINISTRATION (OFFICE), HUMAN RESOURCES, PUBLIC RELATIONS, ASSET AND STOCK MANAGEMENT AND GENERAL MANAGEMENT SUCH AS OCCUPATIONAL HEALTH AND SAFETY.

Although the areas are mentioned separately, the areas are interrelated and whilst you may be busy managing (planning, organising, implementing and/or controlling) one area you will in all probably be busy managing one or more of the other areas. For instance, whilst you are busy with production management you could also be busy with financial management, the emphasises of this article.

To be a successful farmer you must make a profit over a long period of time by farming in a sustainable manner. This means in short, take care of the environment and other resources of your business by applying conservation farming methods. Conservation farming methods is a very relevant topic at the present time with articles in all agricultural publications. Remember, profit means all your expenditures (including private expenses) must be less than your income during a financial year or profit = income - expenditures. Costs are classified as fixed, overhead and production costs. Normally the emphasis is mostly on reducing input costs whilst overhead and fixed costs receive less attention.

In previous articles, we have discussed ways and means to increase income and reduce costs to make a profit. But there are limits to reducing costs, especially input costs. From a financial perspective you can reduce your input costs to be able to make a profit, but you could reach a point where the yield of your product/s will be influenced negatively. From a production management perspective, you could use more and more inputs, naturally at higher costs to increase yield, but you could also reach a point where the higher yield does not warrant the cost of the higher input costs. These two scenarios have been confirmed by research and is applicable to any type of farming. This affect is illustrated by a production-curve (**Graph 1**).



Marius Greyling, Pula Imvula contributor. Send an email to mariusg@mcgacc.co.za

To compile such a production curve proper records are needed. At point A too little inputs are used and yield is therefore low, and a loss is made. At point C to much inputs are used with too little increase in yield to warrant the high cost of production. Thus, in between there is an area where you will make maximum profit – point B. To strive for maximum yield in view of maximum profits is not a sound practice. This practice – maximum yield – will always be to the detriment of one or more of your resources, such as the soil, water or grazing and is never sustainable over the long term.

The natural approach of farmers is to always attempt to farm better than the previous year in order to increase profits by for instances obtaining higher prices. Unfortunately, farmers are for the most price-takers. However, by increasing the yield per production unit of your product/s and increasing the quality of your product/s you could obtain better prices.

An investigation by Hughes and von Broembsen as reported in the *Farmer's Weekly* of 22 February 2019 on the typical cost chain for citrus from producer to consumer confirmed that yield and product quality affected farm profits far more than any other factor. With a fair chance of correctness, one could assume that this will be applicable to all types of farming. Both the two factors are largely under the control of the farmer and determines the success or failure of a farm business. Depending on your product/s, add to this reliable supply and you could earn yourself a premium on the normal price. The practical implication for farmers is not to worry too much about price but rather to improve their production management.

Production efficiency is a key determinant of profitability. As a farmer has more control over this than over costs and pricing, it should remain a prime focus area. Farmers should thus strive to increase profitability by increasing production efficiency – yield, quality and reliable supply. But, also strive to reduce your costs as discussed in previous articles.

Do remember as farmers you are playing a money game and all science will be of no value if not used correctly. The financial impact of management decisions must always be tempered by sound financial decisions. All management areas are linked to each other and all has an influence on making sustainable profits. Should you concentrate too much on financial management it could be to the detriment of production management and vice versa. Should you concentrate too much on your production management it could be to the detriment of your finances (profit).

The lesson – maintain a balanced approach to the management of the different areas of management of your business – be a business manager.

## Reassessing your FERTILISATION

HE 2019 TO 2020 CASH-CROPPING SEASON IS DIS-TINCTIVE IN MANY PRODUCTION AREAS, FOR DROUGHT CONDITIONS THAT DELAYED PLANTING OF CROPS IN THE IDEAL PLANTING WINDOW. OTHER AREAS HAD MORE NORMAL EARLY SEASON RAINS AND SO FARMERS COULD PLANT ALL THEIR CROPS ON TIME FOR A MAXIMUM POSSIBLE YIELD.

The continuous follow up rains during the vegetative crop phase will result in above average and on some farms record crops of maize, soybeans, sunflowers and other crops. Permanent pastures and annual teff pastures will deliver above normal grass and seed yields.

Some areas could only plant in the latter part of November and early December. Although these crops looked to be of very high potential during February and March 2020 the final yields realised will be affected by a shortfall of the maximum heat units required. The yields will also be further negatively influenced by the long periods of overcast weather conditions experienced in some areas which occurred during the critical grain filling stages of the crop.

### ASSESSING YOUR FERTILISATION PROGRAMME AND FINAL YIELD

After the very variable rainfall patterns and drought conditions experienced over the last five years farmers in many cases cut back on the fully recommended fertiliser programme for maximum yields. This lowers the financial risk for crop production but in a good rainfall year could result in a shortfall of nutrients to produce a maximum yield. The shortage of nitrogen at planting and subsequent further leaching of nutrients in the fertiliser applied at planting could be observed in maize lands during February and March 2020. A sulphur shortage can be masked together with a nitrogen shortage when yellowing leaves are observed prior to final physiological maturity.

The fertility programme for each land and crop planted should be carefully reassessed after the 2020 crop has been harvested.

If you harvest an unusually large crop this year experience has shown that in some soils, you will experience lower fertility levels due to the unusually high extraction of nutrients this coming season. Some medium potential maize producing lands could produce two or more tons over the best yields ever realised.

### SOME POINTERS TO IDENTIFYING A SOLUTION

Good farmers will make detailed observations of the growth progress from planting to harvesting.

Some of the main deficiency symptoms that you might have observed in your maize crop for some main elements are summarised below.

### Phosphorus

Abnormal dark green or purplish colour of the leaves in young plants resulting in short internodes and thin stems and reduced cob formation.

#### Nitrogen

Yellowing of leaves and plants not growing to a normal size, or stunting, showing first in the older leaves with an inverted V pattern along





the midrib of some or more older leaves. It was quite evident in some of the maize lands observed this season. Plants with five cobs also weaned off some of these to end up with two or three cobs of various sizes. Ask yourself the reason!

#### Sulphur

Causes pale green leaves or yellowed plants and reduced growth. Although easily confused with nitrogen deficiency sulphur deficiencies show first on the younger leaves compared to nitrogen in the older leaves.

The fertility programme for each land and crop planted should be carefully reassessed after the 2020 crop has been harvested.



### Potassium

Shows up in older leaves with yellowing and dying of the leaf margins. It is suggested that you look at the previous soil samples for your

lands and compare them to the recommended fertiliser applications for the target yield to the actual fertiliser applied at planting or top dressing and the actual yield realised.

It is highly recommended that you test for sulphur levels and use a fertiliser regime with a nitrogen and sulphur combination in your next crop.

What is interesting this year is that in many cases the ideal combination of crop management, fertility, fertilisation, soil potential, soil condition, previous crop rotations, cultivars used and other positive factors will combine to show you what could be a benchmark high maize crop yield for certain lands.

In an ideal situation the pH should have been corrected with the ideal calcium to magnesium ratios and your phosphate status to at least above 25 parts per million (ppm). The previous soil tests should be compared with the one that will be done in August this year and compared with the nutrients extracted in the actual yield realised These can be seen in the '*Fertilizer Handbook'* (*ISBN 0-909071-86-1*), mentioned in other articles.

If you have had a good year financially it might be an advantage for the future to lime some lands if needed and correct the phosphate status if too low.

### CONCLUSION

Use your records and crop husbandry observations as to nutrient deficiencies and soil fertility to improve future fertilisation levels for optimum yields.

### Good maize harvest expected

HE 2019 SEASON WAS QUITE STRESSFUL FOR THE FARMING COMMUNITY, WITH DROUGHT PLAGUING MOST PROVINCES AND KEEPING PRODUCTION AT BAY. THE NEW SEASON HAS STARTED ON A BRIGHTER NOTE WITH CROPS IN THE WESTERN PARTS OF THE COUNTRY GENERALLY LOOKING GOOD, WHILE CROP CONDITIONS IN THE EAST-ERN PARTS OF THE COUNTRY VARY FROM POOR TO EXCELLENT, SOME AREAS WERE AFFECTED BY DROUGHT CONDITIONS AND THAT HAS HAD A NEGATIVE EFFECT ON CROPS.

According to the Crop Estimates Committee report, maize production is expected to be 14,809 million tons, which is about 1,71% more than the previous forecast of 14,560 million tons, with an expected yield of 5,67 t/ha.



Significant increases are expected in the main producing provinces of North West, Free State and Mpumalanga, where 83% of the maize crop is expected.



### Supply and demand of maize.

	2019/2020	2020/2021
Supply	Tons	Tons
Opening stocks	2 663 086	1 082 643
Producer deliveries	10 761 000	14 229 350
Imports	545 000	80 000
Early deliveries	15 057	0
Surpluses	22 000	24 000
Total supply	14 006 143	15 415 993
Demand		
Local demand	11 178 500	11 464 000
Exports	1 745 000	2 560 000
• Products	355 000	350 000
Whole maize	1 390 000	2 210 000
Total demand	12 923 500	14 024 000
Ending stocks (30 April)	1 082 643	1 391 993
		and the second se

*Source: Grain SA, NAMC, 2020* \*Data as at 31 March 2020





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Prices of USA white maize delivered in Randfontein.



North West, Free State and Mpumalanga, where 83% of the maize crop is expected.

### **SUPPLY AND DEMAND**

**Table 1** shows supply and demand for maize, the opening stocks for 2020/2021 are about 60% lower compared to the previous season, mainly because of the lower production caused by drought in 2019. Local demand is expected to be 11 178 500 tons, which includes maize processed for human consumption, animal consumption and gristing, together with balances for any withdrawals and deficits.



To add to total demand there is an export quantity of 350 000 tons of processed products and 2 210 000 tons of total whole maize estimated for exports for the 2020/2021 marketing season. At the end of the 2020/2021 season stock levels are estimated at 1 391 993 tons, with an average processed quantity of 938 875 tons per month, which would last the country about one and a half months.

### **MAIZE PRICES**

Maize prices as shown on **Graph 1** and **Graph 2** are moving as expected, with both white and yellow maize at export parity level; this indicates the expectation of a good crop for the country, hence enough for consumption and exports.

 boog
 A clear vision, backed by definite plans, gives you a tremendous feeling of confidence and personal power.

 ~ BRIAN TRACY

### leng get your head around its potential benefit

ENCING HAS BEEN USED FOR CENTURIES FOR VARI-OUS PURPOSES AND IN VARIOUS FORMS. IN THE EARLY YEARS BEFORE WIRE WAS AVAILABLE PEOPLE WOULD ERECT ROCK WALLS, HEDGES, AND WOODEN FENCES AND EVEN DIG TRENCHES. CASTLES WOULD HAVE MOATS DUG AROUND THE ENTIRE PROPERTY AND FILLED WITH WATER TO KEEP OUT ANY UNWANTED GUESTS.

As far back as we go in history, there has always been the need for some form of fencing to establish boundaries, to protect crops and properties from trespassing and theft as well as control the grazing of livestock. This is still the case today and for good reason. Our methods and materials have changed, but we still have the same motivation for erecting these divisions.

#### **MATERIALS AND METHODS**

In modern times we make use of wire and steel as it is quick and easy to erect, and the materials are readily available. Most farms erect a strong boundary perimeter with five or six strands of barbed wire fence and steel standards and droppers as supports.

For corners wooden or steel box structures are erected to provide an anchored support on which to strain the wire. Farms also then divide portions internally with four or five strands for livestock and crop land. Some intensive grazing farms make use of electric fencing to control pasture grazing; this is done with a single steel wire strand or a polly wire strand that is connected to an energiser. Farms which run sheep and other small stock will often make use of bonnox or mesh fencing rather than barbed wire in an attempt to keep out predators.

#### USES

Internal barbed wire divisions are erected primarily to control livestock grazing and to keep livestock out of crops. Over grazing is a big problem in South Africa and by controlling the intensity of grazing patterns the farmer can allow certain portions of the farm to rest at different times. By creating these partitions or 'camps' farmers can also manage their grazing in order to save grass for the winter months.

From a cropping point of view farmers usually make considerable efforts to prevent livestock from breaking into their fields. Cattle especially can cause huge amounts of damage if they get into a maize field by trampling and breaking stalks as they move through the land. This causes significant losses when it comes to harvest time. It is extremely important to assess the condition of these fences at the start of the season and to make sure that they are well maintained to prevent these kinds of damages.

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In the rural areas of South Africa this can be one of the hardest things to control as there are little if any fenced areas. Many times, when a can be demoralising and remains one of the biggest challenges for small scale cropping farmers in these areas.

Farmers make a big effort to plant a good crop but when it comes to harvest time then the cattle start coming into the fields and cause big damage. What I found when I was working as a mentor in rural KwaZulu-Natal was that farmers started to harvest their maize early before it was properly dry to try and avoid damage by cattle. This created a new problem of rotting and moulding grain as well as significant weight loss in the grain. This is a big challenge, but it can be overcome, and I found that the committed farmers who made the effort and investment yielded the results at harvest time.

#### COST OF FENCING

As a farmer one must weigh up the cost of fencing with the potential benefit you may receive. To make a new fence can cost a lot of money. For 1 000 m or 1 km of new barbed wire fencing you can expect to pay more than R10 000. This can be daunting as this investment now sits unprotected out in the field. There are however ways to cut these costs and still protect your crops. You can source second-hand fencing; you can cut your own droppers and posts. It doesn't need to be beautiful; it needs to do the job.

If you make the effort and erect some sort of boundary around your crops, then you will definitely reap the benefits at harvest time. If your maize is properly matured it will weigh more, your risk of rotting and moulding grain is reduced, and you will be able to make use of your own stalks for your own animals after you have harvested.

No fence is 100% effective all of the time. We have come a long way in the advancement of materials available, however everything still requires attention and maintenance. Anything that is maintained will last longer. Make the effort and spend the time in your field, mend the fences and reap the benefits at harvest time. One small investment can protect your big investment which is the grain in the ground.

# Employees with benefits are MORE PRODUCTIVE

HILE THE REST OF THE CITY SLEEPS, FARM-ING BEGINS AT THE CRACK OF DAWN WITH THE ICONIC SOUND OF THE ROOSTER PIERCING DAYBREAK. WHILE OUR FAVOUR-ITE FOODS ALMOST MAGICALLY SEEM TO APPEAR IN GROCERY STORES, THERE IS A TREMENDOUS AMOUNT OF WORK THAT HAPPENS BEHIND THE SCENES. THERE IS CLEARLY A LOT MORE TO FARMING THAN WHAT MEETS THE EYE.

Businesses within the farming industry like any other business in any other sector, can be affected by low levels of employee productivity.

Momentum Corporate's Effective Employee Index<sup>™</sup> shows that employees who are physically and financially healthy are more productive and can impact a business' bottom line positively. Having employees that feel cared for means they are more productive and more likely to contribute to your business' journey to success.

This is echoed by agricultural economist Dr Kobus Laubscher in an article on *Bizcommunity.com*. According to Dr Laubscher the agricultural sector seems to have lost its appeal to young people as a possible career choice. They rather look for work in the cities with employers that offer retirement, insurance and healthcare benefits. Without these benefits farm workers tend to feel less valued and have a lower commitment to their employers.

Through an exciting partnership, Grain SA and Momentum Corporate exclusively offer farmers an innovative financial wellness solution to meet their employees' retirement savings, disability cover, life cover and funeral cover needs – taking the unique requirements and characteristics of this industry into account. Nashalin Portrag, Momentum Corporate. First published in SA Graan/ Grain July 2019. Send an email to mamello.raborifi@Momentum.co.za



### UNEXPECTED LIFE-CHANGING EVENTS COULD LEAVE EMPLOYEES UNABLE TO EARN AN INCOME

A recent investigation by Momentum Corporate into our group insurance data shows that the proportion of accident-related deaths is increasing. The data analysis also shows that more labour-based industries have higher relative proportions of accidental death claims than other industries. Accidents could also leave employees severely disabled. Therefore, employers are encouraged to consider taking up benefits that will ensure that their employees are adequately covered should the unfortunate happen – especially since workers in the agricultural sector use various types of equipment and tools on a daily basis.

Additional Momentum Corporate research on the reasons why employers provide employee benefits to their staff, shows that they feel a strong moral obligation to do so. Death cover is high on the list of benefits offered, while other priority benefits include disability and funeral cover. Key factors for employers when selecting an insurer to provide these benefits, include affordability as well as good design, ensuring that the needs of employees are effectively met.

It is important that employers partner with a leading employee benefit provider with extensive experience that understands the changing requirements of the workforce – a provider that is able to offer affordable innovative benefits specifically designed to take the unique needs and characteristics of the farming industry into account.

### ENSURING THAT EMPLOYEES RETIRE COMFORTABLY

Employers in the agricultural industry are encouraged to provide such benefits if they would like to attract, retain and build relationships with their employees. This will also be key in increasing productivity and helping the employer's bottom line. Employers must give high priority to their employees' safety and financial security if they want to see good returns.

Saving for retirement via their employer's retirement arrangement is often the only form of retirement provision many South Africans make.

Partnering with the right umbrella fund can help workers make retirement provision for the day they will no longer earn an income. Over and above the inherent cost efficiencies of these funds, employers need to make sure that they partner with a leading umbrella fund that offers the right level of integrated benefits and solutions – working together to enable and encourage workers to make the right pre-retirement choices that will boost their retirement outcomes.



Financially healthy employees can positively impact the success of your business.



### THE IMPORTANCE OF MARKET INFORMATION: What do we learn from it?

HE SOUTH AFRICAN GRAIN AND OILSEEDS MAR-KET HAS BEEN OPERATING IN A FREE MARKET SINCE THE LATE 1990S. ONE OF THE MAIN IS-SUES FOR THE OPTIMUM FUNCTIONING OF SUCH A MARKET IS THAT SUFFICIENT MARKET INFORMATION MUST BE AVAILABLE FOR THE DIFFERENT ROLE-PLAYERS IN THE MARKET TO MAKE WELL-CONSID-ERED DECISIONS.

In this respect, our grain industry is truly privileged with the amount of information that has been available in the public domain since the establishment of the free market. The South African Grain Information Service (SAGIS) and the National Crop Estimates Committee (CEC) are two institutions that offer considerable value to the grain industry with respect to information.

This article deals with the basic importance of information to the local grain industry. It will be followed by a series of articles that throw more light on the information with respect to the different crops and what can be learnt from the long-term trends in the information available.

### SUPPLY AND DEMAND

Supply and demand are the most important aspects of the free market, as they constitute the main principle according to which such a market functions. On the one hand, supply and demand represent the buyers of the product who are prepared to pay a certain price for the product, and on the other hand the sellers of the product who are prepared to sell the product at a certain price. The point at which the buyers are prepared to buy and the sellers are prepared to sell is the point at which the price is fixed.

In the local grain and oilseeds industry supply and demand are also the main aspects that determine the prices of these commodities. It is important to keep the market dynamics in mind when you look at these concepts of supply and demand as the basis to be used for price formation. As the local market operates in a free-market system, it is virtually impossible to isolate the local market form the international market.

That means that the local grain and oilseeds market will always at some stage have to compete with the international market, whether it be on the import or the export side of the market.

The international market is the 'alternative' to the local market. If there are not sufficient quantities of the crop available locally, buyers will have to buy this internationally. When there is a surplus locally, it has to be sold internationally.

### **DYNAMICS IN THE LOCAL MARKET**

Import and export parity are two common concepts in the grain and oilseeds industry and a number of references are found in general information structures. These two concepts indicate the price levels at which the local market can compete against the international market.



Luan van der Walt, Agricultural Economist, Grain SA. First published in SA Graan/Grain June 2019. Send an email to luan@grainsa.co.za



**Graph 1** indicates the basic principle of the parity prices of grains and oilseeds in South Africa. If the local supply of the crop is less than the minimum local demand for the crop, it means that there is a shortage domestically and that the balance between the supply and demand will have to be imported. This will cause local prices to trade at closer to import parity price.

On the other side of the spectrum is the export parity price. If the local supply of the crop is more than the maximum local consumption, it means that there is a domestic surplus of the crop and that the surplus must be exported. In this case the market price of the crop will trade closer to the export parity price.



Although the import and export parity prices are not rigid, they are a good indication of the limits within which the local prices should trade. The parity prices can to a great extent be viewed as the minimum and maximum price levels at which the market should trade. Naturally there are other fundamental factors that can cause the local market price to trade considerably higher or lower than these price bands. But this will not occur that often.

### THE DIFFERENT SOURCES OF INFORMATION

Given the information regarding the supply and demand, as well as the local pricing mechanism, it is clear that the information determining the supply and demand with respect to different crops in particular is vital to the local market. It is important to be familiar with the different sources of information that are available. These include the local and international context of information.

The international information that is mainly used includes daily, weekly and monthly information. The daily information involves daily price movements on the international markets, while the weekly and monthly information involves the fundamental aspects.

Weekly information mainly includes the information released by the American Department of Agriculture, like the production conditions of



American crops and the tempo of plantings. This information can then be compared to that for the previous season and with the average for the same time of the year in previous seasons. This provides a good overview of the international production conditions and what can be expected of international production.

The monthly reports contain the global supply and demand figures, which are also released by the American Department of Agriculture. This information indicates the expected supply and demand situation for the season in the biggest countries, which plays a role in the supply of and demand for the specific crop. This report provides valuable information to create a clear image of the international context.

With respect to local information on supply and demand, the CEC and SAGIS play important roles. The CEC estimates the expected production



Schematic presentation of an import and export parity price graph.

for the season, which is important to establish the local supply and demand balance sheet for the season. SAGIS also releases weekly and monthly reports containing information on the supply of and demand for the different grains and oilseeds.

The weekly SAGIS reports deal with aspects like the actual weekly producer deliveries of maize, wheat, soybeans and sunflower, while the actual weekly imports and exports of maize and wheat are also reported on a weekly basis. In addition to the actual import and export figures, SAGIS also reports on the objectives of the importing and exporting of maize. This report contains the maize imports and exports planned for the eight weeks after the date of publication.

In terms of the monthly information, SAGIS reports the actual supply and demand figures for the different crops. These figures in-

clude aspects like monthly consumption and available stock of the various crops.

Other institutions like the National Agricultural Marketing Council release supply and demand projections on a monthly basis by using the above information, among other things, to make estimates on expectations with respect to supply and demand for the season.

### **IN CONCLUSION**

The required information that affects the supply of and demand for the different grains in the country plays an important role in the optimum functioning of the local grain and oilseeds market. Without this type of information, the market is left in the dark and accurate decision-making would be almost impossible for role-players in the market.

Another important aspect of this type of information is the fact that it has been available for a long time. Not only does it offer the opportunity to make the required estimates for a particular season, but it can also be used successfully to acquire better knowledge on the market and study the functioning of the market.



### **Supplementary feeding** for grazing ruminants

ARGE AREAS OF SOUTH AFRICA CONSIST OF VELD USED BY FARM CATTLE AND GAME. MANY DIFFER-ENCES CAN BE FOUND IN THE COMPOSITION AND COVER OF THE VELD. ALTHOUGH THERE IS LITTLE SCIENTIFIC EVIDENCE OF SIGNIFICANT BENEFITS FROM SOME LICKS IN THE VELD, IT IS COMMON PRACTICE TO GIVE A LARGE VARIETY OF LICKS TO GRAZING ANIMALS.

### **GRAZING CAPACITY**

Climate, especially effective rainfall, affects both the amount of grazing and its quality. This leads to differences in veld production during drier and wetter years, as well as between seasons, and determines the longterm grazing capacity of the veld. The latter is the number of animals that can be kept per hectare of veld.

Proper knowledge of veld and animal management plays a major role in optimising the production of the animals. Insufficient knowledge is why the 'inherent poor quality of veld' is used as reason to 'correct' supposed deficiencies with licks. However, insufficient grazing material in the veld is a bigger problem than the quality.

### UNIQUE DIGESTIVE SYSTEM

Ruminants with their unique digestive system provide ideal circumstances for hosting microbes in the rumen and reticulum – these work together in symbiosis. Among other things, microbes break down cellulose into simpler nutrients and also manufacture microbial protein and water-soluble B vitamins.

Seasonal shortages of crude protein can be supplemented by a non-protein nitrogen source (NPN) like feed-grade urea for microoperation – so-called rumen stimulating licks. However, the rumen function in suckling calves and lambs is still developing, therefore natural protein rather than NPN should be used in such licks.

### PRACTICAL PRODUCTION SYSTEMS

Implementation of practical production systems on veld will produce realistic levels of animal performance and should be sufficient, with only strategic supplementing of confirmed deficiencies of specific minerals and sometimes also an N supplement in the veld.

Depending on the natural salt present in the veld, the physiological needs of cattle and sheep can be satisfied with a salt lick (NaCl). However, the daily intake should be limited to 80 g NaCl for cattle and 8 g NaCl for sheep.

### **P DEFICIENCIES**

Ruminants have the ability to select good-quality diets. Certain veld types may lack specific minerals like phosphorus (P), and P should also be supplemented strategically with a salt lick. Armoedsvlakte (near Vryburg) shows the most extreme proven P deficiencies, therefore the cows there should be supplemented with 16 g P/day from late pregnancy up to middle of lactation (September to February), and with 9 g P/day from March to August. However, daily salt intake should still be limited to 80 g/head.



Prof HO de Waal, affiliate professor at the Department of Animal, Wildlife and Grassland Sciences at the University of the Free State. First published in SA Graan/Grain July 2019. Send an email to dewaalho@ufs.ac.za



#### SUPPLEMENTARY FEED

A clear distinction should be made between supplementary nutrition and supplementary feed. The so-called production licks (consisting of energy, protein and various minerals) are given in large quantities on veld. With recommended intakes for cattle being more than 1 kg/ head/day, they cannot be regarded as licks anymore, but are in fact supplementary feed. In addition to the grazing intake from veld, a relatively large amount of food is in other words fed to the animals in troughs. Every producer should reflect thoroughly about the financial benefits of such practices.

### **HIGH INPUT COSTS**

Regardless of the many claims about so-called 'good' results, it is not a given that supplementary nutrition always delivers the desired results – especially with the high input costs. Before one starts with a large-scale supplementary feeding programme, the following questions should be answered critically:

- What is the goal with the supplementary nutrition? Should protein, energy, or a combination of protein and energy, or minerals be supplemented? Should certain animals just increase in mass? Should dry animals on veld be maintained more easily? Should lactation be supported with supplementary nutrients? Animals in different production phases should receive specific types and quantities of supplementary nutrition.
- How can the goal be best achieved? Have the less productive animals been removed from the veld already to make grazing material available to the remaining animals? This option is used too little by producers and can contribute a lot towards making the supplementary feeding programme more purposeful, effective and cheaper for the remaining animals.
- Can it be determined if the goal was achieved? Most of the wellintended attempts fail to improve the performance of grazing ruminants. The recommended levels at which supplementary nutrition should be provided at are seldom maintained. Variation in the intake of supplementary nutrition is unknown and is affected by feeding space (number of animals/trough), access to the troughs, levels of supplementation and the frequency with which the troughs are filled. If the provision of supplementary nutrition is not managed well, some animals eat far too much, while others get little if any value from it.

Take another look at the cattle production system(s) compared to the available nutrition source(s) (veld and possibly also pastures and crop residue) on the farm. If the factors are connected optimally, the strategic role and specific supplements still needed in the area can be achieved easily.

### Make sure your LIME is sorted out

OIL WITH A VERY LOW PH CANNOT BE MAN-AGED EFFECTIVELY WITH RESPECT TO TILLAGE (PARTICULARLY NO-TILL) AND FERTILISATION. PRODUCERS CANNOT INVEST IN EXPENSIVE FERTILISING PROGRAMMES AND MECHANISA-TION BEFORE THE SOIL'S PH LEVELS HAVE BEEN COR-RECTED, AS THE SOIL PH IS DIRECTLY LINKED TO THE AVAILABILITY OF THE FERTILISERS AND TO THE PHYSICAL PROPERTIES OF THE SOIL.

### WELL-PLANNED LIMING PROGRAMME

Optimum farming practices start with reliable sampling and a wellplanned liming programme. In this way the pH levels are corrected to the levels crops need to grow optimally.

This increases the availability of fertilisers and improves soil structure. The probability of manganese ( $Mn^{2+}$ ) and aluminium ( $Al^{3+}$ -) toxicity is reduced and symbiotic nitrogen bindings in legumes improve. The impact of soil pH on microbes in the soil in particular should not be underestimated.

### **SOIL ACIDIFICATION**

In order to understand the process of soil acidification and its management, it is necessary to know where the hydrogen ions ( $H^+$ ) come from. Under natural conditions, soil tends to become acidic because of carbon dioxide (CO<sub>2</sub>) in the atmosphere, which dissolves in rain water to form a weak acid called carbonic acid.

The burning of coal and oil (fossil fuels), which has increased a lot over the past 200 years, releases large quantities of gases into the atmosphere. These gases combine with rain water to form sulphuric acid and nitric acid. These acids are the source of protons (H<sup>+</sup> ions), which drive the acidification process.

Soil can also be acidified by rotting plants, the leaching of base cations through rainfall, parent material that is naturally acidic, carboxylic acid from microbial and plant respiration, and organic acids that are secreted by the roots of plants.

However, the biggest contributor to soil acidification in crop production is fertilisers with high levels of ammonium, particularly if more ammonium fertiliser than the crop can use is applied.

### FERTILISE ACCORDING TO NEED

To limit acidification through N fertilisers, crops should be fertilised according to need. The right choice of the type of N fertiliser and the placement of the source are critical.

Agricultural lime must be applied regularly to counteract this acidifying effect. The acidifying characteristic of ammonium-containing fertilisers is located in the nitrification process, which releases protons (H<sup>+</sup> ions) and nitrate ions (NO<sub>3</sub>-).

### **NEUTRALISING ACID SOIL**

If the pH (KCI) value drops below 5,0 and the producer does not apply lime, a lower yield can be expected, which could lead to much Dons Jordaan, Bastion. First published in SA Graan/Grain July 2019. Send an email to Marelize.Smit@BastionLime.co.za



greater financial losses than the 'saving' brought about by not liming. At a pH value of 5,5 (KCI) the accessibility of nutrients is optimal and the soil microbes also function best.

Because of the high cost of fertilisation (fertiliser and lime), some producers tend to save on liming in particular, whereas this is actually the most important way of neutralising acid soil.

Calcium and magnesium form an integral part of the nutrient requirements of crops. It is vital for plants not to be subjected to nutrient deficiencies, and liming before planting is undoubtedly the only way to resolve the problem of calcium and magnesium deficiencies.

These deficiencies can only be corrected with the right type of lime and the right preplanting liming programme.

### **CLIENT ORIENTATION**

Client orientation forms the core of Bastion's strategy, and the Fertasa accreditation once again proves that sustainable and ethical practices are the norm for us. Clients can rest assured that they do not take unnecessary risks when doing business with us.

At the presentation in August 2018 at The Barn in Klerksdorp, Bastion was declared to be the new name for Grasland. In addition, we also announced our new vision: 'To simplify the purchasing of natural lime products and reduce risk – in such a way that sustainability can be promoted.'

To confirm this further, two additional appointments were made at Bastion during the past season. Marelize Smit was appointed as sales coordinator and Lourens Swart as logistics co-ordinator. The appointments were in line with our purpose of regarding the client as central to the company's activities.

The sales co-ordinator is the central link between Bastion and all its client groups, while the logistics coordinator manages a range of contracts to deliver the best logistics service possible. In addition to these appointments, considerable effort is made to ensure products are of the highest quality.

### **UPGRADES AT PLANTS**

A series of capital upgrades also took place at all Bastion's plants over the past few years, including capacity expansions, new mining vehicles and crushing and screening plants. This was done to produce more sustainably and at the highest quality levels.

The consequences and focus of all the above actions are that producers trust and support Bastion to an increasing extent.



# **Liming** in minimum-tillage systems investigated

OIL ACIDITY IS AN IMPORTANT YIELD-LIMITING FACTOR IN AGRICULTURAL SYSTEMS. THE LOW PH THAT IS HARMFUL TO MOST CROPS IS NOT THE ONLY LIMITATION POSED BY ACIDITY. THE LOW PH OF ACID SOIL NOT ONLY AFFECTS THE CROPS DIRECTLY, BUT ALSO AFFECTS THE AVAILABILITY OF NUTRIENTS.

Some nutrients like calcium, magnesium and phosphorus become less available to plants, while the availability of aluminium in acid soil can increase to toxic levels.

### **MINIMUM TILLAGE**

Minimum tillage is already an established and popular tillage system across the world. In the Western Cape, minimum or no-till has been well established since the 1980s. Currently, no-till systems are used by roughly 90% of the producers in the Western Cape. No-till is regarded as a more sustainable alternative for conventional tillage systems.

No-till involves the use of planters to place seed directly in the soil, and other tillage activities are limited as much as possible. A challenge that arises when minimum-tillage systems are applied for a long time, is that soil acidity in the subsoil is difficult to address.

It is generally accepted that lime may not be able to deal with soil acidity past the depth at which the lime is applied. In other word, lime is not mobile – it moves very slowly to deeper soil levels. A consequence of long-term minimum tillage is that lime is continuously placed at a shallow level and stratification of soil acidity occurs. The topsoil becomes alkaline, while the subsoil remains acidic.



The effect of soil acidity on the root development of a canola plant.



Dr Pieter Swanepoel, senior lecturer: Department of Agronomy, Stellenbosch University. First published in SA Graan/Grain July 2019. Send an email to pieterswanepoel@sun.ac.za



### SOIL SAMPLE

Lime needs are usually established from a soil sample that is taken up to 15 cm. After liming in minimum tillage systems, the top few centimetres of the soil may become alkaline, while the lime has a limited effect in deeper soil layers. A soil sample from up to 15 cm therefore consists of an alkaline top layer and an acid sublayer.

The results of the soil sample analysis could create an erroneous impression of the actual conditions because it gives an average indication of the top 15 cm and cannot indicate the stratification.

An example of soil pH stratification of typical soil in the Overberg region (Caledon) is provided in **Graph 1**. A soil environment with an alkaline top layer and an acidic sublayer is not ideal for root development. With certain crops a sudden transition between alkaline and acidic soil can lead to the J-rooting phenomenon (**Photo 1**).

### J-rooting phenomenon

Roots grow downwards and when an unsuitable soil layer is reached, in this case acidic soil, the roots grow at a sharp angle and follow a J-shaped growth pattern to avoid this unsuitable environment. A limited yield is expected under such circumstances.

#### **SOIL ACIDITY**

Canola, wheat and barley are economically important crops in the Western Cape and are grown in rotation with other small grains and pasture grasses, usually legumes. Barley, canola and legumes are more sensitive to soil acidity than wheat and other small grains.

An optimum soil pH (KCl) of 5,5 is recommended for barley and canola, while a pH (KCl) of 5,0 should be sufficient for wheat.



Unfavourable conditions for root development are clear, with a high pH in the top 5 cm and a suboptimal pH in the deeper soil layers.



Adriaan Liebenberg and Ruan van der Nest at a pile of Class A lime – a common image in the grain-producing areas of the Western Cape before planting.



Lime granules broadcast on top of the soil and disintegrating after rainfall of about 10 mm.

However, the effective application of lime in minimum tillage systems is unclear, particularly with the different sources of lime and value-added products like granular lime (micronised/granulated lime) and liquid lime that are available on the market.

### **RESEARCH PROJECT**

Two MSc students from the Department of Agronomy at the Stellenbosch University, Adriaan Liebenberg and Ruan van der Nest, are currently investigating the application of lime in minimum-tillage systems. Adriaan is investigating the effect of lime application to canola, while Ruan focuses on barley.

Besides the stratification of soil acidity, which is a focal point of Ruan's studies, the calcium needs of the crops are also being studied. Canola has a greater need for nutrients than wheat or barley. It is particularly sensitive to low levels of calcium in soil, which is aggravated by soil acidity, because the availability of calcium to crops declines as soil acidity increases.

This research project comprises two parts, namely a survey and a field trial. A broad survey is first being conducted in the Swartland and Southern Cape to examine the extent of soil acidity and to establish how widely spread the stratification of soil acidity throughout the Western Cape is.

Correlations between liming methods and soil-tillage practices will also be identified on the basis of soil acidity. Various indicators of soil acidity are begin studied, for instance pH, exchangeable acidity and acid saturation, but the effect of acidity on the availability of nutrients in the soil is also included.

The neutralising ability of various sources of lime and lime products is being determined through incubation studies in collaboration with Dr Ailsa Hardie (Department of Soil Science, Stellenbosch University). The movement of lime and calcium absorption by crops are also being studied.

### **FIELD TRIALS**

Two field trials were further established in 2019 – one with barley and one with canola – to investigate the effect of the movement of various lime products in minimum-tillage systems, while some treatments include a once-off conventional-tillage activity. The barley trial is funded by AB InBev.

Previous research in the Western Cape by Dr Johan Labuschagne has shown that a once-off tillage activity on soil that has been managed under minimum tillage for a long time had no significant effect on soil health or crop production. The possibility of tilling soil once in order to mix lime effectively in the soil is therefore also being investigated.

The field trial will be repeated for three years. The researchers hope to make recommendations on effective liming practices for minimum-tillage systems after the completion of the trials. The effectiveness of ordinary Class A and fine, granulated lime at different levels of application and in different localities (broadcast or placed in the planting furrow) is being investigated.

#### RECOMMENDATIONS

Various forms of lime are being assessed for minimum-tillage systems, including granulated lime placed at different levels in the planting furrow. For a once-off tillage activity, implements that work at various degrees of soil disturbance and depths are included. These recommendations will provide information on the form and quality (fineness and purity) of lime, and also on what once-off tillage activity, or lack of tillage activity, most effectively addresses soil acidity.

The researchers also hope to establish whether the calcium needs of barley and canola are being met if the soil pH is optimal. The information and results will be released to producers in due course.



### MAIZE NUTRITION BASICS

T IS IMPERATIVE TO UNDERSTAND THE PRINCIPLES OF SOIL FERTILITY TO EFFICIENTLY MANAGE MAIZE NUTRIENTS, AND MAIZE PRODUCTION, AND ENVIRON-MENTAL STEWARDSHIP. THERE ARE 17 CHEMICAL ELE-MENTS THAT ARE KNOWN TO BE ESSENTIAL FOR PLANT GROWTH, 14 OF THESE ELEMENTS COME FROM THE SOIL.

Leonard Oberholzer, Market Development Lead – South Africa, Bayer. Send an email to leonard.oberholzer@bayer.com



Each essential plant nutrient is needed in different amounts by the plant, each varies in mobility within the plant and varies in concentration in the harvested mature maize plant components. Knowing the relative amount of each nutrient by crop and the amounts removed with harvest is useful for calculating the amount of fertility that will need to be added to the soil to maintain optimum harvest levels.

To be classified as 'essential', the element needs to meet the following criteria:

- · The plant cannot complete its life cycle (seed to new seed) without it.
- · The elements' function cannot be replaced by another element.
- · The element is directly involved in the plant's growth and reproduction.

### HOW PLANTS UPTAKE NUTRIENTS

Each of the nutrients cannot be taken up by plants in its elemental form, they must instead be taken up in an 'ionic' or charged form, with the exception of boron (B) as boric acid which is uncharged (Table 2). Most fertilisers are made up of combinations of these available nutrient forms, so when fertiliser dissolves, the nutrient(s) can be immediately available for uptake.

Knowing what form of a nutrient the plant absorbs helps inform what controls the cycling and movement of the nutrient in the soil. Additionally, understanding how nutrients function within the plant is useful in diagnosing nutrient deficiencies.

Element	Source	Role in the plant	Concentration
Carbon (C)	Air	Constituent of carbohydrates; necessary for photosynthesis	45%
Oxygen (O)	Air/Water	Constituent of carbohydrates; necessary for respiration	45%
Hydrogen (H)	Water	Maintains osmotic balance; important in many biochemical reactions, constituent of carbohydrates	6%
Nitrogen (N)	Air/soil	Constituent of amino acids, proteins, chlorophyll and nucleic acids	1% - 5%
Potassium (K)	Soil	Involved with photosynthesis, carbohydrates translocation, protein synthesis	,5% - 1%
Phosphorous (P)	Soil	Constituent of proteins, coenzymes, nucleic acids and metabolic substrates; important in energy transfer	,1% - ,5%
Magnesium (Mg)	Soil	Enzyme activator; component of chlorophyll	,1% - ,4%
Sulfur (S)	Soil	Component of certain amino acids and plant proteins	,1% - ,4%
Chlorine (Cl)	Soil	Involved with oxygen production and photosynthesis	,01% - ,1%
Iron (Fe)	Soil	Involved with chlorophyll synthesis and in enzymes electron transfer	50 ppm - 250 ppm
Manganese (Mn)	Soil	Controls several oxidation-reduced systems and photosynthesis	20 ppm - 200 ppm
Boron (B)	Soil	Important in sugar translocation and carbohydrates metabolism	6 ppm - 60 ppm
Zinc (Zn)	Soil	Involved with enzymes that regulate various enzymes	25 ppm - 150 ppm
Copper (Cu)	Soil	Catalyst for respiration; component of various enzymes	5 ppm - 20 ppm
Molybdenum (Mo)	Soil	Involved with nitrogen fixation and transforming nitrate to ammonium	,5 ppm - ,2 ppm
Nickel (Ni)	Soil	Necessary for proper functioning of urease and seed germination	,1 ppm - 1 ppm

Essential plant elements, source, roles and relative quantities in the plant.

From: Overview of Soil Fertility, Plant Nutrition and Nutrient Management

### Nutrient forms taken un hv nlants

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Nutrient uptake by roots is dependent on the activity of the root (maize root number, root dry matter and root length), ability to absorb nutrients and the nutrient concentration at the surface of the root.

Water moves toward and into the root as the plant uses water or transpires. This process is referred to as 'mass flow', accounts for a substantial amount of nutrient movement toward the plant root, especially for the mobile nutrients such as NO3.

Diffusion is the process where chemicals move from an area of high concentration to any area of low concentration. Fertilising near the plant root, the plant is less dependent on exchange processes and diffusion to uptake nutrients, especially P. The nutrients that are most dependent diffusion to move them toward a plant root are relatively immobile, have relatively low solution concentrations, and yet are needed in large amounts by the plant, such as P and K. The secondary macronutrients (Ca, Mg, S) often do not depend of diffusion because their solution concentrations are fairly high in soil, relative to plant requirements.

2 Nutrient forms taken up by	Nutrient forms taken up by plants.		
Element	Form		
Nitrogen (N)	NO3 <sup>-</sup> (nitrate), NH4 <sup>+</sup> (ammonium)		
Potassium (K)	K+		
Phosphorous (P)	H <sub>2</sub> PO <sub>4</sub> <sup>-</sup> , HPO <sub>4</sub> <sup>-2</sup> (phosphate)		
Calcium (Ca)	Ca <sup>+2</sup>		
Magnesium (Mg)	Mg <sup>+2</sup>		
Sulfur (S)	SO4 <sup>-2</sup> (sulfate)		
Chlorine (CI)	Cl <sup>.</sup> (chloride)		
Iron (Fe)	Fe <sup>+2</sup> (ferrous), Fe <sup>+3</sup> (ferric)		
Manganese (Mn)	Mn <sup>+2</sup>		
Boron (B)	H3BO3 (boric acide), H2BO3 <sup>-</sup> (borate)		
Zinc (Zn)	Zn <sup>+2</sup>		
Copper (Cu)	Cu <sup>+2</sup>		
Molybdenum (Mo)	MoO4 <sup>-2</sup> (molybdate)		
Nickel (Ni)	Ni <sup>+2</sup>		

From: Overview of Soil Fertility, Plant Nutrition and Nutrient Management





### THE CORNER POST

### JURIE MENTZ It is about more than guidance and expertise



To Jurie Mentz, provincial co-ordinator from the Louwsburg office, the mentors who are involved in the *From Subsistence to Abundance* and several other projects of Grain SA's Farmer Development Programme are invaluable and often do much more than most people realise.

Jurie has been involved in Grain SA's Farmer Development Programme as provincial co-ordinator since 2009 after land claims were lodged on two of his farms. He is currently responsible for the Mpumalanga Highveld and the north eastern parts of KwaZulu-Natal. His vast knowledge of agriculture is a direct result of growing up on a farm near Louwsburg. It is also here where he learned to speak IsiZulu fluently. His father's farm was isolated, and his Zulu friends made sure he not only joined in the games but could also follow and later join their conversations. 'We played together, looked after the goats and cattle, caught fish and made clay oxen.'

He went to the agricultural school in Vryheid, where he matriculated after which he joined the army for his military service. Jurie then decided to further his agricultural knowledge by completing an agricultural diploma at the Technicon of Pretoria, now called the Tshwane University of Technology (TUT). He was a farm manager for eight years before buying his first farm.

The mentorship programme has had a definite impact on him as it has given him refreshed hope for this country and its people. He has realised that all farmers, no matter what their background, have the same problems and challenges. 'There is a positivity in agriculture that should not be underestimated which will make a big difference in South Africa.'

### THE THREE C'S OF MENTORSHIP

To Michelle Wright, CEO of Cause4 in the United Kingdom, a mentor has three important roles to fulfil. That of a:

- Consultant who shares his knowledge and expertise with the mentee.
- Counsellor who listens and guides but does not do the work for the mentee.
- Cheerleader who supports the mentee in difficult times and is enthusiastic about the good times and praises the progress being made.

Jurie believes that most of the Grain SA mentors seem to have mastered the three C's. 'It is very fulfilling to give of yourself to others. When the mentors see that by applying the knowledge and guidance they have received, a better outcome is achieved, it makes it all worthwhile.

'Mentors at Grain SA give a lot of themselves in time, patience, knowledge, skills and personal attention. They have to deal with sick cattle, goats, sheep, donkeys, poultry as well as vegetables with all kinds of problems. They also need knowledge of tools and tractors so that they can give guidance or help fix that which is in poor condition.'

'The best mentors usually have a personal relationship with their farmers – they laugh together about rain and cry together about drought and losses. To see how a farmer starts to regain hope when he has

Louise Kunz, Pula Imvula contributor. Send an email to louise@infoworks.biz



been used to harvesting less than a ton and then begins to reach his full potential – whether it is 3 t/ha, or 8 t/ha is an amazing event to witness.'

To Jurie mentoring is actually about bringing about change in someone by making them think and do differently. 'I think back to the years when we started. The term no-till was seen as something foreign and the use of herbicides was unknown. It is wonderful to see how the implementation of these concepts has restored hope. Suddenly the farmer not only has enough maize for himself and his animals but can sell a few tons for extra income. Many other positive things like an improved self-esteem and confidence have followed,' he adds.

### SUCCESS AMIDST STUMBLING BLOCKS

Approximately 1 878 farmers ranging from subsistence farmers to smallholder farmers as well as bigger farmers producing more than a 1 000 t/ha fall under the Louwsburg office. To Jurie the size of the farm makes no difference, it is all about production and reaching their full potential. As provincial co-ordinator he tries to see the farmers as often as possible – with smaller farmers being addressed at study group meetings and larger farmers being visited once a month on their farms.

The main obstacles that one encounters with farmers in this area is the fact that they cannot own the land they cultivate. A farmer can cultivate five acres very successfully and then the chief decides one day to donate the land to someone else. The fact that the farmer does not own the land also means that he cannot get financing, which in turn means that it is very difficult to expand or grow his farming operation.

Even though farmers are faced with these challenges, there have been several success stories in this area. 'We have seen quite a few emerging farmers who started off on 1 ha to 3 ha expand after about ten years to 12 ha, 30 ha or even to 100 ha with an average yield of more than 6 t/ha.

According to Jurie, there are a few things the emerging farmer needs to do to succeed.

- Firstly, a farmer must be equipped with knowledge and skills before he can start farming successfully otherwise it will cost you dearly.
- Secondly, he must take soil samples and apply lime and make corrections to the soil before he can cultivate anything.
- Thirdly, rather begin on a smaller piece of land and apply the correct agricultural practices, than on a large piece of land where you do not have the capacity to do what is right.

The American financier, Suze Orman, believes that the key to being a good mentor is to help people become more of who they already are. It seems that the Grain SA Farmer Development Programme is succeeding in doing this through its provincial co-ordinators and mentors.

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