PULA IMVULA

>> GROWING FOOD >> GROWING PEOPLE >> GROWING PROSPERITY >>

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NKGONO JANE SAYS...

IN THIS ISSUE...

During this month we hope that all of you will be harvesting a crop. It is so very rewarding to be able to get a good harvest – every year you work hard and do your very best, but you are not rewarded adequately each year. We have to remember that we farm outside and we cannot control the rainfall. We can do our best in every way, but we remain dependent on the rain for a good crop.

As farmers, we have a huge responsibility to feed our nation – firstly, we have to feed ourselves. Each small farmer who perhaps can feed his/her family, is making a great contribution – because you are looking after yourself, no one else has to do that. For those of you who are able to do more than feed your family – that is great because you are helping provide food for the people who live in the cities. We need every bag of grain, cereals and oil seeds that you are producing – you are feeding our country, contributing to the broader economy, creating employment and providing the raw materials that start the entire food chain in South Africa.

Please take the time to celebrate your successes – South Africa is proud of the contribution you are making and as Grain SA, we would like to thank you.

It is almost time to start planning for the next season – for the Jobs Fund farmers, please remember that you should make your financial contribution for your hectares by the end of July. We cannot postpone the date as this will make our inputs late. Take some of the money from your current harvest and invest it in your next harvest – we hope that you will be well rewarded again.

I love to read the words of Kalil Gibran in The Prophet – 'And before you leave the market-place, see that no one has gone his way with empty hands. For the master spirit of the earth shall not sleep peacefully upon the wind till the needs of the least of you are satisfied'. Let us all heed this advice and use our land and our skills to make sure that the need (for food) of everyone in South Africa is met – each of us can do our little bit to contribute. Happy harvesting!

Front page photograph taken by Liana Stroebel

PRECISION FARMING – is it a buzz word or not?

A good plant population (the basics should be done well consistently). Photo taken by Johan Kriel

We read a lot about precision farming or as it is also described High Technology Farming (HTF) in agricultural magazines these days. This already gives one the idea that the reference is to something advanced. Precision farming refers to as advanced mechanical technology (as discussed in our previous article) combined with electronic or digital technology and global positioning systems (GPS) to provide advanced records.

Precision is a word derived from the word precise which is described as something being very exact and expressed in detail. In our farming environment one could relate this to what we do on the farm, to do it as precisely and in detail and as correctly as possible. Keep in mind the statement – to manage you must measure. To make decisions you need information which you get for instance from keeping proper records. The more accurate your information, the better decisions you will be able to make, and the better your management.

> *"Precision farming is not just a buzz word, it is a fact.*

As stated in our previous article farmers in South Africa face but one major problem – to make a sustainable profit over a period of time. This is because of, for one, the so-called cost-prize squeeze. To exaggerate the position, our farmers also face the challenge of providing enough food at reasonable prices to a growing population. Thus, it is a continuous battle to keep expenditures under control and to increase income and to produce more.

Precision farming is not just a buzz word, it is a fact. Modern technologies which have been developed are for instance precision equipment, improved ways to capture and process data, global positioning systems (GPS), and radio frequency identification (RFID). To be able to survive as a farmer, big or small, you will eventually have to apply and use all the technology available to increase production per production unit, also referred to as vertical expansion. However, there are additional costs involved when applying the advanced technology and therefore it is critical to use the modern technology to it's fullest to reap the advantages of it.

Advantages of applying precision farming will be for instance:

- To use all resources (soil, water, grazing) optimally;
- To ensure traceability of products, something consumers are pushing for;
- To keep track of input costs, and thus being able to judge if the capital outlay pays dividends in the long term;
- Allowing for quick reaction to changing circumstances; and

Excellent weed control is not negotiable and will affect your yield. Photo taken by Johan Kriel

- To use each production unit, be it a plant or animal or a hectare of land or grazing, optimally.

The aim of precision farming is to assist you to acquire more detailed, correct, exact, and timeously information quicker (to measure) from satellite images, and electronic devices (even your cell phone) on a much more regular basis than from manual records. This will then enable you to manage for instance the fertilisation, crop health program, water requirements, and harvesting of your crops on a much more advanced level (to manage). This presents you as farmers with opportunities to improve the production efficiency of every production unit on your farm.

However, a word of caution. Do not attempt to apply precision farming if you do not do the basics correctly already. As an example, someone has said – do not fertilise, just to fertilise. You must fertilise according to what the plant needs and what the soil provides. In the past, basic recipes were used for fertilising, then came the era of taking soil samples to determine the need for what fertiliser to use and how much. This still remains the basics to applying fertiliser. If you do not apply this basic action, precision farming is not going to be of any use. Precision techniques to improve your fertilisation 'recipe' still begins with the use of soil samples which is combined with additional information to improve your recipe to increase production. For instance, with satellite images problem areas in a specific land can be identified and the fertilisation (recipe) of that specific area within a land, be adapted and then applied using GPS on mechanical advanced applicators.

As far as record-keeping is concerned, the same applies. You must first be able to manage the basic records manually and to use it when taking decisions before commencing to precision farming. By means of precision farming so much more and accurate data is provided which is transformed electronically to information to be used when taking decisions. Should you not be able to use manual records properly, how are you going to use all the records provided by precision farming?

Should you wish to survive as a farmer, big or small, you will have to do all the basic activities correctly and then advance to precision farming to improve efficiency every year. To introduce precision farming will take time and needs to be done step by step, but it's an essential tool you will have to apply sooner or later – the sooner the better.

Article submitted by Marius Greyling, Pula Imvula contributor. For more information, send an email to mariusg@mcgacc.co.za.

Mycotoxins and human health

Now that we are aware of the fact that mycotoxins are produced by food-borne fungi that can infect many types of agricultural crops, the question we need to ask is why are they important to us as humans?

Mycotoxins enter the human food chain via three possible routes i) directly via the diet that includes the consumption of cereals, such as maize; ii) indirectly via the consumption of other food products prepared from fungal contaminated crops; and iii) the consumption of animal products from livestock fed mycotoxin contaminated feed.

From a commercial perspective, most food products may contain lower levels of mycotoxins due to good agricultural practices, selective breeding, modern biotechnology methods, improved storage, food preparation and processing. However, if your diet is limited and you consume more of one particular food, and if this food item is a cereal such as maize that is vulnerable to mycotoxin contamination, then your health may be at risk.

In some areas in South Africa many people still consume home-grown maize as part of their culture and eat a large amount of maize each day. In fact, between 67% and 83% of South Africans eat maize or maize-based products every day. For the purpose of this article we shall only concentrate on the health effects of the so-called "big five" mycotoxins which include fumonisin B (FB), deoxynivalenol (DON), zearalenone (ZEA), ochratoxin A (OTA) and aflatoxin B (AFB). In South Africa, we are mostly concerned about FB, DON and ZEA known to contaminate maize, AFB that can contaminate groundnuts (peanuts etc) and to a much lesser extent OTA.

Home-grown maize farms from the Eastern Cape.

Human (and animal) diseases caused by mycotoxins are called mycotoxicoses and are grouped under "toxicological conditions or poisoning by natural causes" that can be either acute (an immediate visible toxic reaction) or chronic (usually low-dose exposure over a long-term period concluding in a disease condition).

In **Table 1** the main harmful effects of the six important mycotoxins on human health are summarised. The concept "**Provisional maximum tolerable daily intake**" (PMTDI) are very important values set by international health authorities such as the World Health Organisation (WHO) and the Food and Agriculture Organisation (FAO) of the United Nations. These organisations are jointly responsible for arranging meetings between expert scientists from all over the world in the field of food safety, to form a special committee called the Joint FAO/WHO Expert Committee on Food Additives (JECFA).

This international and independent committee has been meeting since 1956 and is responsible for evaluating the risks of chemicals in food in order to protect human health, and to highlight suitable prevention and control methods. Based on the specific biological and chemical properties of these chemicals, daily threshold values or levels are set to safeguard humans. Then, based on international levels of contamination in certain foods, JECFA can highlight regions of high exposure where health problems may be encountered. The more dangerous a chemical is to human health, the lower the PMTDI for that chemical.

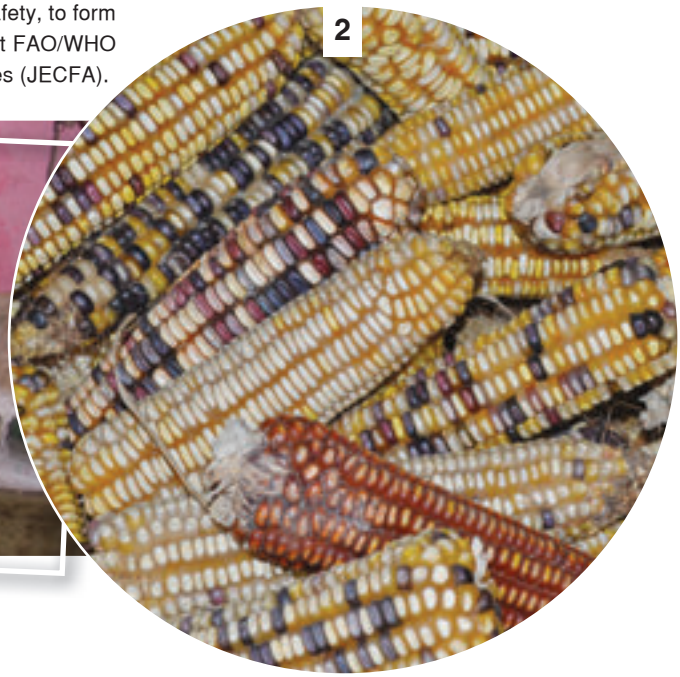


Photo 1: A lady grinding home-grown maize to maize meal.
Photo 2: Home-grown maize from the Eastern Cape.

Back to Table 1, the column with the heading "**Classification according to the International Agency for Research on Cancer**". The International Agency for Research on Cancer (IARC) is another WHO-associated organisation that specialises in cancer and one of its many functions is to classify certain chemicals as substances that may or may not cause cancer in humans. For instance, a chemical may be classified as a Group 1 (cause human cancers), Group 2A or 2B (possibly can cause cancers), Group 3 and 4 (does not cause cancers). As far as mycotoxins are concerned, AFB is the most dangerous (Group 1), whereas FB may possibly cause cancer in humans (Group 2B).

How do we measure a person's exposure to mycotoxins and how do we interpret the information using the PMTDI? There are many ways to assess exposure but the most basic way is to measure a person's probable daily intake or PDI. For this calculation we need to know the mycotoxin of interest, such as FB, and what crop or cereal (e.g. maize) is contaminated. We then need to measure the mycotoxin levels in that crop, the amount of cereal that a person ate on that day and the body weight of the person.

For example, let's suppose a dish of cooked maize porridge is contaminated with FB at a level of 500 micrograms/kg. A person with a body weight of 75 kg eats 500 g (2 cups) of cooked maize for lunch then his/her exposure or PDI for FB will be 3,3 microgram/body weight/day which is above the PMTDI for FB (see Table 1) of 2 micrograms/body weight/day. If a person eats this amount of maize every day then his/her health may be at risk. Fumonisin B levels of 500 micrograms and higher have been observed in maize from rural areas in the Eastern Cape Province of South Africa where they grow their own maize and eat large portions of maize every day. Much lower levels, almost a 100 times smaller have been reported in South African commercial or shop-bought maize products.

As far as South African commercial maize is concerned we are therefore more protected from harmful mycotoxins, but as mentioned above if you eat mostly commercial maize, and in large quantities every day, than you may still be at risk to the harmful effects of mycotoxins. In the last article of our series we shall write about ways of reducing your dietary exposure to harmful mycotoxins.

Commercial maize (sweetcorn) and maize meal.

Article submitted by HM Burger and P Rheeder from the Institute of Biomedical and Microbial Biotechnology (IBMB), Cape Peninsula University of Technology (CPUT). For more information, send an email to Burgerh@cput.ac.za or RheederJP@cput.ac.za.

Table 1: Summary of the "big five" mycotoxins and their known effects on human health.

Mycotoxin	Associated human diseases	Provisional maximum tolerable daily intake	Classification according to the International Agency for Research on Cancer (IARC)
Fumonisin B (FB)	Possible role in: • Neural tube defects • Hinders child development and growth • Liver and oesophageal (gullet) cancer	2 micrograms/kg body weight/day	Group 2B carcinogen
Deoxynivalenol (DON)	• Stomach and intestinal disorders • Loss of appetite • Weight loss • Vomiting and nausea • Headache • Chills, light-headedness, seizures	1 micrograms/kg body weight/day	Group 3 carcinogen
Zearalenone (ZEA)	• Early onset of sexual maturity in girls • May decrease fertility	0,5 micrograms/kg body weight/day	Group 3 non-classifiable carcinogen (limited evidence in animals)
Ochratoxin A (OTA)	• Have been link with kidney damage	0,1 microgram/kg body weight/week, or ± 14 nanogram/kg body weight/day	Group 2B carcinogen
Aflatoxin (AF)	• Acute liver inflammation • Liver cancer • Hinders child development and growth • Affects the body's immune system	None AFs are harmful to genetic material (DNA) and may cause direct damage. Therefore, it has no threshold level. Regulations set by the South African Department of Health for AFs: All foodstuffs ready for human consumption should not contain more than 5 micrograms/kg for AFB1 and 10 micrograms/kg for total AFs	Group 1 carcinogen

Managing your wheat crop following emergence

Your wheat has been planted and has established well. What do you need to focus on in the time from planting your crop until the stems starts to elongate? This is the period of the growing season where you as farmer can play a major role in the eventual success of the wheat crop.

Although the type of season you are experiencing will play a major role in your management decisions, the aim is still to ensure that there is enough food for the growing plant, that there is no competition from weeds and that you are prepared to protect the plant from disease.

The first 40 days in the life of a wheat plant is very important. It is during this period that the yield potential of the crop is maximised. What do we mean by that? It is during this timeframe that the number of tillers are formed (more tillers = more possible ears), the number of spikelets per ear and the number of flowers per spikelet is initiated (more spikelets and flowers per spikelet = more potential number of kernels). We are striving to get the potential as high as possible, because once we have established the potential it will never increase, but can always decrease, which leads to lower yields.

So, the first step is to ensure that there is enough food for the plant. Some of the total fertiliser for the season you have placed with the seed (if you have a planter) or broadcasted before sowing (old school style). This usually serves as a starter to get the crop growing once it has emerged. Initially the wheat plant requires very low amounts of nitrogen for its growth, but as the season progresses and the more and more leaves are formed, the need increases. It might therefore be necessary to give the first topdressing within the first 40 days. A lack of enough available nitrogen will lower the formation of the yield potential. Depending on your production system (either conventional or conservation agricultural) your soil might be able to deliver nitrogen to the growing wheat plant which might lower the need for high amounts of extra fertiliser (more so if you have a legume in your crop rotation), but always be careful to know what is available and how much you might need.

Soil samples can be sent to certain soil labs to determine the amount of available nitrogen in your soil at the start of the season, which can help with planning your total amount of fertiliser to be applied during the season. There is also biological tests available to determine the amount of nitrogen available to the plant.

Post emergence weed control is also very essential during this period because weeds are strong competitors for light, moisture and nutrients. Broadleaf weeds are the easiest to control in the wheat crop and a wide range of herbicides are available for control. Managing grass weeds is not so easy and selective herbicides are needed to control these weeds. It is also important to alternate your herbicide's mode of action to prevent herbicide resistance. The application rate is important because if the application rate is too high or too low it can also speed up the occurrence of herbicide resistance. Make sure and read the label very carefully.

Diseases can also limit the yield potential. There are some seed treatments available that will protect the early growth of the wheat plant against certain fungal diseases as well as against insect predation.

Once the yield potential is established we need to protect the crop to ensure that we reach our maximum possible yield. The optimum timing for foliar application of fungicides in cereals is from the start of stem elongation to ear emergence. This period coincides with the emergence of the four most important leaves in the crop and the ear. The leaves are the factories that convert sunlight and CO_2 into yield, so any disease that reduces either the number of leaves or reduces the area available for photosynthesis will reduce the potential yield. It is also important to remember that leaves that have not emerged at the time of the application will not be properly protected and it might be necessary to do a second application.

Our aim should be to keep the plant as healthy as possible to ensure that we maximise our potential yield as well as maintaining that potential yield. Be sure to walk through your crops as often as possible so that you can be pro-active and not reactive in managing your wheat crop.

Article submitted by Dr Johann Strauss, Directorate Plant Sciences, Research and Technology Development Services, Department of Agriculture Western Cape. For more information, send an email to johannst@elsenburg.com.

MADE POSSIBLE BY THE WINTER CEREAL TRUST

Why it's important to understand international wheat prices

Wheat production is one of the most important crops in South Africa. Most wheat produced in South Africa is used for human consumption with very little used for animal feed. In general, local wheat production has declined over the years. However, in the 2016/2017 marketing season, wheat production increased by 30,2%.

The **annual average** total commercial demand for wheat amounts to 3 million tons, while the average production is 1,7 million tons; it is clear then, that local production is outpaced by local consumption. South Africa therefore relies on imports in order to meet total demand.

Currently, South Africa's import demand for the 2016/2017 season is estimated at 1,2 million tons while exports are estimated at 110 000 tons. The country is therefore a net importer of wheat.

Wheat market structure

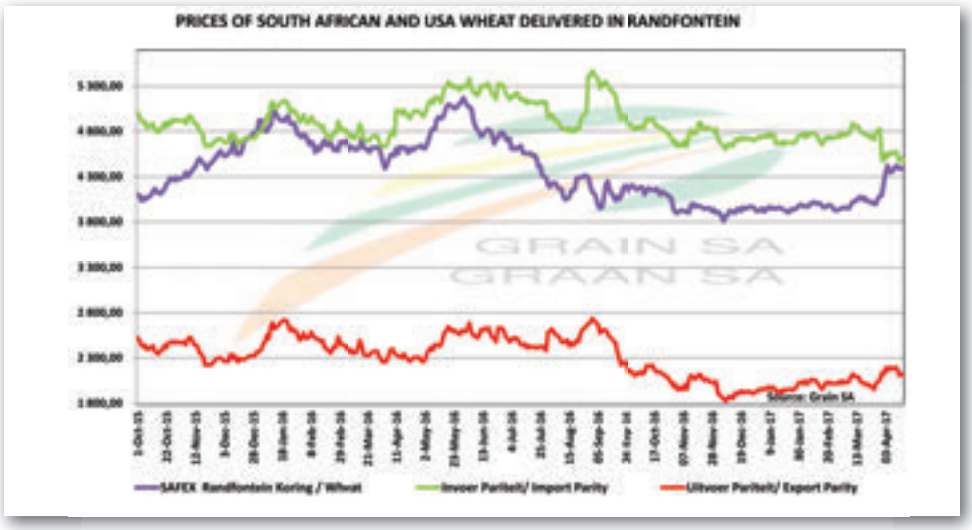
Since South Africa is a net importer of wheat, local wheat prices have to compete with international prices known as ***import*** and ***export*** parity. The import parity price is the price that it will cost the importing country to buy the product and gets it delivered at a specific delivery point. This will normally happen when there is a shortage in production, such as the case of wheat in South Africa. The export parity price on the other hand is the price that a country will receive when exporting the product to another country. Due to South Africa's net importer status and the constant shortage of wheat, South Africa's wheat prices therefore trades towards the import parity band (see **Graph 1**).

Since the local prices trade towards the import parity, it is clear that local wheat prices are largely driven by the international market. The exchange rate also has an effect on parity prices which in turn have an influence on wheat prices. A weaker exchange rate, supports wheat prices, while a stronger exchange rate, places pressure on the prices.

As a wheat farmer, it is therefore important to understand international market factors and the movements of the local currency as these two factors have an influence on local wheat prices.

Article submitted by Michelle Mokone, Agricultural Economist: Grain SA. For more information, send an email to Michelle@grainsa.co.za.

Graph 1: Prices of South African and USA wheat delivered in Randfontein. Source: Grain SA



Pula Imvula's Quote of the Month

Keep away from people who try to belittle your ambitions. Small people always do that, but the really great makes you feel that you, too, can become great.

~ Mark Twain

RATEL – the reliable wheat cultivar for the Southern and Western Cape

Ratel is the ARC-Small Grains' most reliable cultivar for this region. According to data of the past four years, Ratel is among the top performers in the Southern and Western Cape. The cultivar was developed specifically for this area.

The cultivar was developed from a Kariega background for good baking quality. The cultivar is only resistant to stem rust. Farmers should also note that the cultivar is susceptible to powdery mildew, which can lead to a lower yield. Farmers must monitor their crops, especially when it is a wet year.

Agronomic information

Ratel has a medium growth period with an average height of 80 cm to 100 cm. The cultivar also has a good straw strength and is moderately tolerant to pre-harvest sprouting. The cultivar's shatterproof tolerance is also good.

Although Ratel is a spring type with no cold requirement, farmers must keep in mind that

> *"The cultivar is only resistant to stem rust. Farmers should also note that the cultivar is susceptible to powdery mildew, which can lead to a lower yield.*

Ratel is among the top performers in the Southern and Western Cape.

Table 1: Ratel tested positive at the molecular level for stem rust gene two (Sr_2).

Lines	Resistance genes	
	Sr_2	Lr34
Kariega	0	1
Ratel	1	0

Acknowledgement: WC Botes – Stellenbosch University Plant Breeding Laboratory

Table 2: Agronomic and physiological data of Ratel.

Cultivar	Growth period	Days to flowering	Spikes – shatterproof	Straw strength	Pre-harvest sprouting tolerance
Kariega	Medium	100 - 108	Good	Good	Good
Ratel	Medium	98 - 107	Good	Good	Good

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Figure 1: Average yield in t/ha of Ratel in the Rûens Elite trials of 2012 - 2015 compared with yield standards for the region.

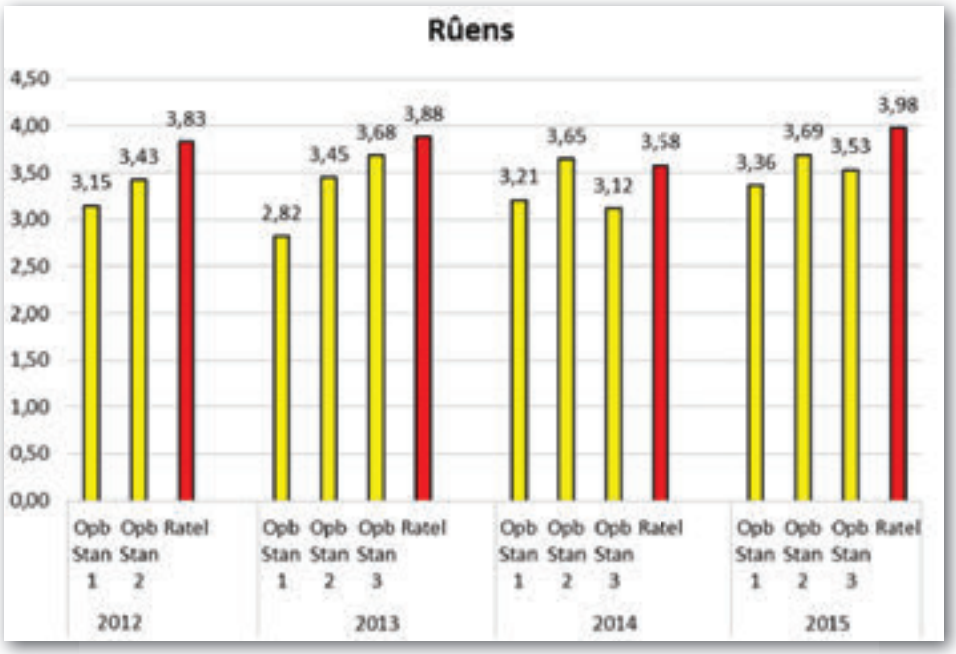


Figure 2: Average yield in t/ha of Ratel in the Swartland Elite trials of 2012 - 2015 compared with yield standards for the region.

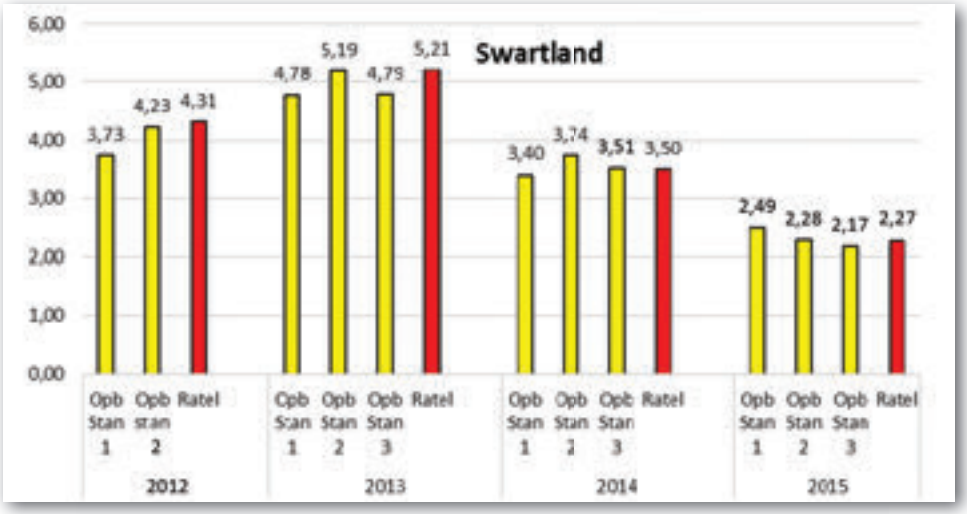
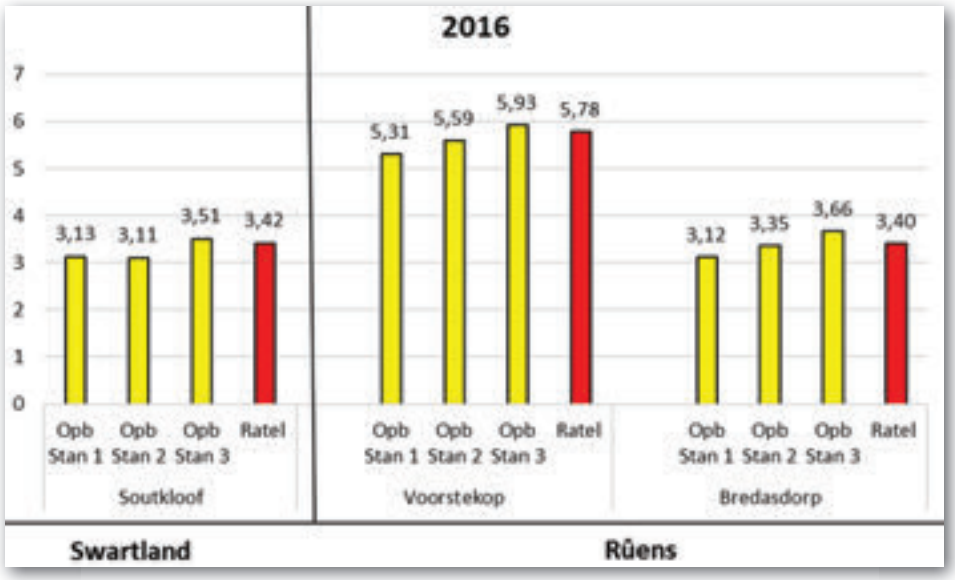


Figure 3: Average yield in t/ha of Ratel in the Rûens and Swartland in three Elite trials of the past production season.



this is a C3 plant, which is very ineffective with transpiration and respiration. Thus, a cooler after-season will lead to higher yields, as the kernels are filled better.

To achieve Ratel's full yield potential, the cultivar must be planted early enough. Although the cultivar can be planted up to the end of May with good yields, plantings before 10 May gives the cultivar a better chance to develop to its full yield potential. However, it should be noted that early planting is only possible if there is sufficient soil moisture available.

In **Table 2** the agronomic and risk determining physiological information of Ratel is given. This is important information that the producer has to keep in mind when choosing a cultivar for his specific production area.

Available yield data of Ratel from the Elite trials of the ARC compared to yield standards for different areas.

Long-term data

During the four years Ratel's average yield data in this area has shown that the cultivar can compete well with a yield rank of either first or second in terms of the yield standards included to select objectively for yield.

In the past season, Ratel competed well against the yield standards, which were included in the ARC Elite trials. In the Swartland (one locality) and Rûens (two localities), Ratel had the second highest yield, measured against the yield standards included in the trials.

This research was made possible by funding of the Winter Cereal Trust and the ARC.

Article submitted by Rorisang Patose, André Malan and Ian Heyns from ARC-Small Grain, Bethlehem.
For more information or advice please contact Dr R Patose at 058 307 3430 or Dr A Malan at 058 307 3446.

How do I compete with BIGGER FARMERS? (Part 2)

Take good care of your equipment to ensure there is no wastage or costly breakages. Photo taken by Johan Kriel

Following on from the previous article (May 2017) you have now assessed your resources, refined your vision for your "small" farming operation and completed the comparative gross margins for the grain crops that you are able to grow profitably on your farm.

Comparative income from crops in the 2016/2017 production period

Most of your grain crops have probably been harvested now and an analysis of what yields and income took place can be completed. As a benchmark and working to the estimates made by the Crop Estimates Committee (CEC) at average yields the gross incomes generated per hectare would be as shown in **Table 1**.

Compare your results to the national averages and assess your current financial position. If your yields are better then you have managed to compete with the average of the

Table 1: Gross incomes generated per hectare.

Crop	Average yield t/ha	Safex or other value/ton in Rands	Estimated transport differential	Nett value	Gross income/ha
Yellow maize	5,90	R2 010,00	R200,00	R1 810,00	R10 679,00
Sunflowers	1,40	R4 618,00	R200,00	R4 418,00	R6 185,20
Soybeans	2,00	R4 925,00		R4 925,00	R9 850,00
Speckled sugar beans	1,45	R14 000,00	R800,00	R13 200,00	R19 140,00

medium and largest commercial farmers. If you have, please congratulate yourself!

The main consideration would be to determine if the gross income after direct costs was able to pay for all fixed or overhead costs including equipment depreciation and owner's drawings or salary. You will realise immediately if you are making progress and surviving as a "small farmer".

Adding value to commodities

If your yields were high enough within the potential of your soils and fertility you may be able to sell your whole crop to your local silo or co-operative and be ready to compete in the market again in the coming season. At lower maize yields it might be wise to store your grain if the next years July futures market is higher than the 'spot' price or to add value to on farm stored maize. Or to add value in other areas by producing milk and/or cheese, through finishing weaner calves, table eggs through layer hens or producing broiler chickens for your local market as some examples.

The income from growing speckled sugar and other beans might be a very attractive proposition as a small farmer and would enable you to move away from competing with the basic commodities produced by the medium, large and mega farming operations. It would be ideal, as a small farmer, even if producing some grains to diversify into as many added value enterprises to enhance your viability and sustainability as a farmer. You will ensure that you remain self-employed instead of being unemployed and in this way contribute to your family, local community and the country.

Assessing your production strategy for the coming season

Look at the results of the past season and identify all the factors that caused or might cause shortfalls in production. Your mechanisation or labour force must be able to plant each crop in the appropriate production window on time and with the correct plant populations and weed and insect control. This is the time to educate yourself on using better crop cultivars and production methods. This might entail a new tractor or acquisition of a more accurate planter and spray rig for example.

Look at each cost item in your direct cost and fixed cost budgets to see where any improvement in price or efficiency can be gained. It would also help if your production inputs can be pooled and bought in the market in bulk and then distributed to each participating farmer.

As a smaller farm, you must aim to do 'more with less' but work to a strictly planned production programme. Improve your management skills on a continuous basis and talk to your local farmers about sharing resources to plant and harvest crops as well as sharing in projects and purchasing the correct equipment to enable the development of products for sale in your local market to add value to the basic grain commodities grown.

Conclusion

Consider in depth if the grain or basket of grains produced in your operation will enable you to 'compete' and survive in a risky market environment. Strongly consider the option of investigating the right added value enterprise to produce the right products for sale in your community.

Article submitted by a retired farmer.

Budgeting and strategic planning is crucial. Photo taken by Johan Kriel

Subsoil acidity harms yields

FERTASA was approached by Grain SA and a private consultant, Mr Pietman Botha, about a suspicion that subsoil acidity may restrict the development of plant roots in water-table soils in the Free State. This suspicion arose when a producer's experience in this regard was discussed at an editorial meeting of *SA Graan/Grain*. It is common knowledge that acidic soils considerably reduce the production of maize in particular.

Confirmation of possible problem

Enquiries to FERTASA members' agricultural experts confirmed that a significant percentage of subsoils – not only the water-table soils, but also other high-potential soils – have pH (KCl) values of less than 4,5. The general impression is that it occurs quite widely. Agricultural experts among FERTASA members are ready to assist their clients to identify and quantify such cases. There were speculations about the reason why soils have acidified considerably over the past two years.

Further investigation necessary

The above is very general and farmers will have to establish and assess their individual situations in collaboration with experts in the fertiliser industry and elsewhere. If it is seen as a focus area, plans can be made.

Experience has taught that there will definitely be spots where the pH is even lower than 4,5 pH (KCl). At these levels of acidity aluminium becomes soluble and can stop root growth through this layer completely.

If soil samples are taken in the normal manner, the extremely acidified layer may be overlooked, as it is sometimes only a few centimetres thick and is 'diluted' if a thicker layer of soil is included in the sample.

It is wise to dig profile holes and study the root zone thoroughly. Mechanically compacted layers are sometimes confused with chemically restrictive layers. Aluminium poisoning of maize roots is very characteristic. The roots stop very suddenly at a relatively shallow depth and do not turn sideways. The total absence of hair roots is a further sign. With mechanical compaction the main root turns sideways and still has hair roots.

In many cases subterranean acidification can occur at a deeper level than that normally ploughed. In most cases it takes place at the same depth as that at which N fertiliser was placed beforehand, for example.

> *Liming and fertilisation supplement each other.*

Possible causes of acidification

The reason why subsoils acidify is usually that topsoils were not limed properly.

This occurrence is described in the chapter regarding liming in FERTASA's Fertiliser Manual.

The practice of managing unbuffered grounds at certain acidity levels, together with injudicious nitrogen fertilising, can undoubtedly lead to this situation.

The compromising of nitrogen absorption during the previous dry years definitely contributed to the acidification of the soils. It is common knowledge that when ammonium nitrogen oxidises to nitrate nitrogen, hydrogen ions (H^+) are released. The soil will acidify if the plant does not absorb the nitrate ion (NO_3^-) and release a hydroxyl ion (OH^-) for every nitrate ion that neutralises H^+. This can occur when NO_3^- leaches with heavy rain or during drought, when plants cannot absorb plant nutrients. Heavy rains after drought, as was the case this season, will definitely lead to soil acidification.

Subsoil acidification can certainly occur if very fine lime was applied only in the fertiliser band at reduced levels without managing the overall acidity levels of the soil.

Producers should evaluate practices like prior fertilisation and determine the impact of this on soil acidification.

Possible resolution of the problem

Guidelines for dealing with this problem are given in FERTASA's Fertiliser Manual.

FERTASA members' agricultural experts, with their wide knowledge and experience, are also geared to give advice on dealing with the problem.

A few aspects to take into account include determining the exact extent and position of the acidification.

Some people feel that gypsum applications can neutralise subsoil acidity in the sandy soils of the Free State. This can be a risky practice, as gypsum can only have a self-liming effect in subsoils with sufficient sesquioxides. In sandy soil the magnesium can leach even if the gypsum is applied with dolomitic lime. Potassium is also easily stripped from the topsoil with gypsum applications. The amount of gypsum added to the lime reduces the amount of lime being applied and this needs to be taken into account.

> *The compromising of nitrogen absorption during the previous dry years definitely contributed to the acidification of the soils.*

Unfortunately it may be necessary in many instances to lime deeper than usual if the soil is acidified below the cultivation depth. One would have to look at suitable implements and operations to apply the lime effectively. No till could also hold its own challenges if the subsoils are acidified.

The effect of topsoil liming can also move downward in the profile, but this takes several years and crop losses could be suffered in the meantime. However, re-acidification can be avoided with slight over-liming of the topsoil.

Conclusion

It may be necessary to discuss all the variables at a workshop or conference where farmers and advisers are present. FERTASA members have declared themselves willing to add their inputs in this regard.

Soil acidification is a natural process that needs to be managed correctly. If liming is approached scientifically, it can be profitable in the long term.

It is very important that ordinary fertilisation of crops is not neglected. Lime can never be applied instead of fertiliser.

Liming and fertilisation supplement each other.

Article submitted by Pietman Botha, SA Grain contributor and Pieter Hauman, Fertasa. For more information, send an email to pietmanbotha@gmail.com or pieter@fertasa.co.za.

The physical properties of fertiliser: What questions should you ask?

With the current challenging conditions in agriculture, the temptation is stronger than ever to buy the cheapest inputs. However, the risks involved in buying substandard inputs should be considered very carefully, as this increases production risks and can lead to lower income and a lot of frustration.

Good quality fertiliser is liquid and does not clog equipment.

Buying fertiliser is no exception. The purpose of this article is to show the fertiliser buyer this and to provide broad guidelines about properties that should be noted when buying fertiliser.

Apart from the chemical composition of fertiliser, the physical properties are of the utmost importance when handling fertiliser. To apply fertiliser accurately, a constant flow and spread width with the minimum deviation are very important. To ensure this, attention should be given to certain physical properties in the production process.

Here are several important questions that should be asked:

Do the granules all weigh the same?

It is a well-known fact that heavier granules will spread further than the lighter ones. Therefore, the weight and density of a specific type of fertiliser affect the application levels and the spread width of an implement applying fertiliser broadly. The product will spread better if the density is more uniform.

How big are the granules?

The average diameter of a fertiliser granule should be between 2 mm and 4 mm. The narrower the range of the granule size distribution, the easier it is to ensure optimal calibration and distribution of the fertiliser.

Under the microscope: A chemically granulated fertiliser granule (left) compared to a bulk-mixed product (right).

The density and size of fertiliser granules determine to what extent settling (segregation) will occur. Segregation occurs when a bulk-mixed product separates due to vibration. Granules of the same size and density are less likely to segregate.

However, a better option would be to use a chemically granulated product, where every granule contains all the registered nutrients and where the density is uniform. Chemically granulated products can be applied evenly, despite the differences in granule-size distribution.

The shape of the granule

The granule shape is very important, seeing as it determines how the granule will react during the application process. The ideal granule is round, with a smooth surface for even, accurate application – be it spread or placed.

Hardness of granules

Harder granules are damaged less during transport, handling and application of fertiliser. Broken granules cause dust and a variation in granule size, which affect distribution. Broken granules and dust also cause granules to clog together due to bridging. This has a big impact on air seeders, which clog because of this.

Granule hardness is measured by the pressure (weight) necessary to break the granule. It needs to be at least 3 kg (30 N).

How much dust is in the bag?

The amount of dust in fertiliser not only has a negative effect on the ability to apply the product, but on the environment and the workplace as well. Fertiliser dust results in over-application directly behind the implement, which leads to salt shock and clogging of the equipment – even in very low humidity conditions.

Fertiliser's dust content is determined by separating the dust from the granules and expressing it as a percentage of the total weight.

Is it prone to caking?

The tendency of fertiliser granules to clog together to form large, hard lumps is known as caking. There can be various reasons, for example irreconcilable chemical characteristics of raw materials, the presence of dust, or a soft product.

Fertiliser lumps negatively impact the liquidity and distribution of fertiliser. High-quality fertiliser is manufactured by treating the surface of every granule to prevent dust and caking.

Do yourself a favour and insist on more than the chemical analysis of the product supplied to you. The ideal physical properties can save you a lot of frustration, time and money.

Article submitted by Johann Peek, director: Technical and Production Omnia fertiliser and Vosie Wilsnach, manager: Chemtech, Omnia Fertiliser, for SA Graan/Grain July 2016. For more information, send an email to Johann.peek@omnia.co.za or Vossie.wilsnach@omnia.co.za.

Manage soil fertility like this

Soil fertility is a subject that presents challenges and problems to many farmers. A lot of research still has to be done on the management of soil fertility, but there are already a few principles that I believe will not change in the foreseeable future.

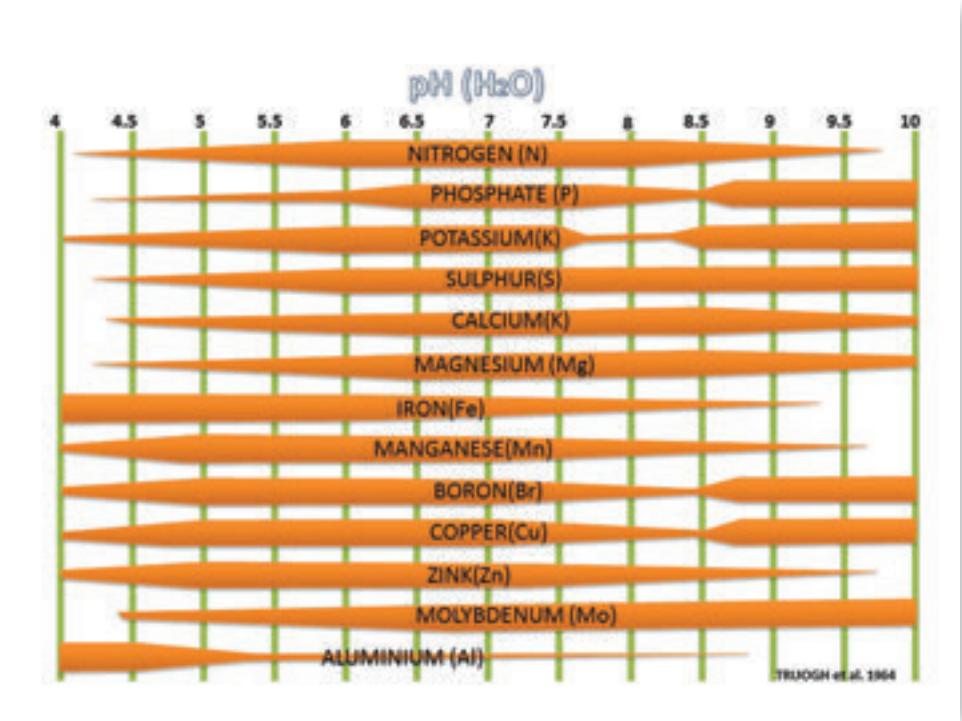
The first step in expert soil fertility management is ensuring that the right pH is maintained to make the elements available for absorption by the plant. The ideal pH (H_2O) in the soil solution was determined in 1964 by Trough at between 6,5 and 7,5. It was found that the plant availability of the nutrient elements in a soil solution in the 6,5 to 7,5 range was the best – as illustrated in **Figure 1**.

Soil acidity, or pH, is an indication of the balance of H+ and Al3+ ions in the soil solution. The increase in the H+ ion causes the release of Al3+ ions from the clay minerals to the soil solution, which is toxic to plant roots.

The excess Al3+ ions prevents the plant availability of most plant nutrients. Let us ask the question: 'What exactly is pH measurement?

pH is a numerical scale used to indicate the acidity or alkalinity of an aqueous solution. Roughly, it is the negative of the logarithm to the base 10 of the molar concentration, measured in units of mole per litre, of the hydrogen ions. To be more specific, it is the negative of the logarithm to the base 10 of the activity of the hydrogen ions. It can be expressed as the following formula: pH = -log [H^+].

Figure 1: Plant nutrient availability at different pH values.



However, what does this mean to the producer in the management of soil fertility and cultivation of crops? The answer is illustrated in the diagram in **Table 1**, where an indication of the pH units is provided in the logarithmic scale.

From Table 1 it is evident that the H+ concentration of the pH value relative to pure water varies ten times from the previous value. This means that if the pH value falls from 5 to 4, the H+ concentration will be ten times higher than it was, and if the pH value should fall to 3, the H+ concentration will be 100 times more that when the pH value was 5.

Table 1 clearly indicates that the variations of the pH values are much more to the producer than just the one or two value changes

Table 1: Logarithmic scale indication of pH units.

pH values	H+ concentration relative to pure water	Example
0	10 000 000	Battery acid
1	1 000 000	Stomach acid
2	100 000	Lemon juice and vinegar
3	10 000	Orange juice and carbonated cooldrink
4	1 000	Tomato juice and acid rain
5	100	Black coffee and bananas
6	10	Milk
7	1	Pure water
8	0,1	Sea water and eggs
9	0,01	Baking soda

that are indicated, and that the H+ concentrations can change tenfold with every change in the pH value.

It is a well-known fact that if the pH is not at the desired levels, it will affect and reduce the availability of plant nutrients in the soil solution dramatically. The negative influence also extends to the plant nutrients or fertiliser the producer applies to obtain the expected yield.

The impact of different pH levels on plant nutrient availability in the soil solution is illustrated in **Figure 2**.

It is clear from Figure 2 that if the pH levels of the soil solution are not corrected beforehand, fertilisation at lower pH levels is a waste of money. The best and cheapest way to correct pH levels in the soil solution is still to use liming with a good quality lime.

The correction of the pH closer to a neutral pH level causes nutrients that were prevented from being absorbed to be available again for absorption by the plants through the soil solution. The amount and type of lime to be used is determined with a soil chemical analysis of the available plant nutrients in the soil solution.

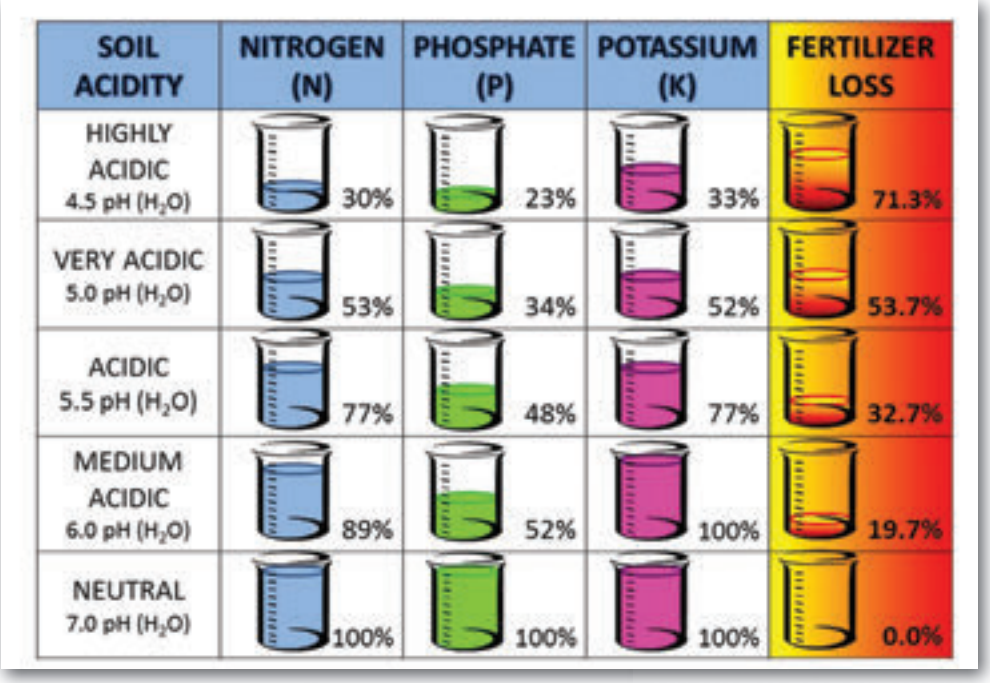
However, there are a few factors of which the producer should be aware when choosing an efficient lime source to restore the pH to acceptable levels.

If the magnesium levels are too low, a dolomitic lime is recommended, and a calcitic lime when the magnesium levels are sufficient.

The most important factor is definitely the reactivity of the lime, because if it does not react in the soil quickly and efficiently, it is not worth the cost and effort of applying it. The factors determining the lime reactivity are chemical purity, fineness, composition and hardness of the lime purchased.

Chemical purity indicates the total calcium and magnesium carbonate content of the lime, as well as the calcium carbonate equivalent (CCE) (HCI) value, which is the total neutralisation potential of the lime. The fineness of the lime required by Act 36 of 1947 is that almost all the lime should be able to pass through a 1,7 mm sieve and at least 50% of it should pass through a 0,25 mm sieve.

Figure 2: Plant-available nutrients at different pH values.



The part that is smaller than 0,25 mm is the part that actually effectively and quickly reacts with the soil to increase the pH levels. The CCE (Resin) value is a function of the fineness of the lime and the chemical neutralisation potential of the lime. This means that the CCE (Resin) value is the closest meaningful indication of how the lime reacts in soil solutions to make a positive contribution.

Lime can be seen as an associated fertiliser source that adds calcium and/or magnesium to the soil solution and at the same time also causes a positive pH change. For this reason lime application should not be neglected.

Liming is particularly important after a dry season, where residual fertiliser elements in the soil are still present and should be made available to the plants through sufficient liming.

Producers are warned again to remember that the application of lime might release some herbicides into the soil and this might have an effect on the crop. Take this into account when choosing crops.

Article submitted by Esmond Coen, Grasland for SA Graan/Grain July 2016. For more information send an email to esmond.coen@grasland.co.za.

Grain SA/Sasol photo competition

CULTIVAR CHOICE AND PROFITABILITY OF WHEAT – stepping on each other's toes or in accord?

Wheat producers supply essential calories worldwide. In Africa an increase in wheat consumption is expected due to the growing demand for processed grain products. Cultivar choice is therefore very important in southern Africa in order to make wheat production profitable and to keep the milling and baking industries competitive.

The expected increase in wheat consumption is however not reflected by the national wheat plantings of 2015, which constitute less than 75 000 ha in the summer rainfall region, as opposed to the 225 000 ha in 2011 (Grain SA, 2015).

Economic factors are forcing producers to switch to summer crops, so that more wheat has to be imported, even though modern technology, production resources and infrastructure exist locally to satisfy the national demand.

Producers need strong incentives to produce wheat again and currently the indicators look good. The rand/dollar exchange rate gave the wheat price a major boost, and serious reflection is taking place regarding the extremely high quality standards for releasing high-yield cultivars in South Africa. Many producers are rediscovering the value of wheat in their cash-flow systems.

A wheat price that as recently as 2015 lacked ± R1 500/ton for profitable production, is one of the main reasons why alternative crops are being considered.

Yield potential therefore became a very important selection parameter to the wheat breeder and is one of the primary production choices that a wheat producer has to make every season. And this is where the problem lies…

Wheat price and the grading scale

The price a producer receives for his wheat crop is not determined solely by grain yield (t/ha), but also by hectolitre mass (hectolitre mass per kg), falling number (seconds) and grain protein content (percentage).

The national grading scale for bread wheat (**Table 1**) takes the quality of the producer's wheat into account when setting the final price for it and is therefore just as important as grain yield when deciding on a new cultivar.

Table 1: The South African grading table for wheat.

Grade	Grading parameters for Class B wheat (bread wheat)		
	Hectolitre mass	Falling number	Grain protein content
1	77	220	12
2	76	220	11
3	74	220	10
4	72	200	9
Utility grade	70	150	8
Other	< 70	< 150	< 8

Grading determines the extent to which millers need to make adjustments during the processing of the specific grain and gives bakers an indication of the end-product that can be manufactured from it. Hectolitre mass, falling number and grain protein content therefore each addresses a different component of grain quality:

Hectolitre mass (hl/kg)

The hectolitre mass of cultivars is a genetic property, but is mainly determined by the environment. It is a density parameter and provides a good indication of the flour extraction and eventual profitability that can be expected.

Falling number (seconds)

Falling number is determined by the time it takes a cylinder to move through a glass jar filled with a flour suspension. It indicates the alfa-amylase enzyme activity in the wheat. A low falling number (high alfa amylase activity) is an indication that starch molecules have broken down into sugars, which then makes the wheat unacceptable for commercial milling and baking purposes.

Grain protein content (%)

Determined by the Kjeldahl or Dumas method in which grain samples are incinerated and the nitrogen formed during the process is measured. Grain protein indicates which potential end-products can be produced from the wheat. The international norm is that high protein is required for bread products and lower protein for biscuits.

Consider more than only yield potential

Basing the choice of a prospective cultivar solely on grain yield creates a distorted picture, as yield and quality have a negative effect on each other in most cases.

In other words, the ideal cultivar should have a high yield, high hectolitre mass, high falling number and high grain protein content that are reflected in the final price received by the producer. The misconception that yield alone should be considered for cultivar choice is common in all the wheat-producing regions of the world and Hollamby and Bayraktar came to the following conclusion in 1996: 'Yield is the prime objective. Despite a new cultivar's improvements, including quality capable of attracting premiums, farmers will not grow it unless they expect it to yield well on their farms' (*Hollamby & Bayraktar, Increasing yield potential in wheat: Breaking the barriers, 1996*).

To illustrate this statement, an alternative ranking for cultivars was determined according to the price (R/c) each one would have achieved, which then is compared to the ranking of their grain yield potential.

The grain yield, hectolitre mass, falling number and protein content of all the dryland cultivars recommended for early and late plant-

Table 2: Price and yield rankings of dryland cultivars from the eastern Free State (2014).

Early planting date (June)					Later planting date (July)				
Cultivar	Yield Ranking	t/ha	Price Ranking	R/ha	Cultivar	Yield Ranking	t/ha	Price Ranking	R/ha
SST 347	1	3,93	1	12 576,00	SST 398	3	4,07	1	13 024,00
PAN 3111	2	3,90	2	12 480,00	PAN 3368	5	3,97	2	12 704,00
PAN 3195	3	3,81	3	12 192,00	SST 317	6	3,91	3	12 512,00
Matlabas*	4	3,80	4	12 160,00	PAN 3111	1	4,21	4	12 419,50
SST 356	5	3,65	5	11 680,00	Elands	8	3,77	5	12 064,00
SST 316	6	3,57	6	11 424,00	SST 347	4	3,98	6	11 741,00
SST 317	7	3,52	7	11 264,00	Senqu	11	3,63	7	11 616,00
SST 387	8	3,49	8	11 168,00	PAN 3195	2	4,09	8	11 043,00
SST 398	9	3,49	9	11 168,00	SST 316	12	3,62	9	10 679,00
PAN 3120*	10	3,43	10	10 976,00	PAN 3379	12	3,60	10	10 620,00
PAN 3118*	11	3,30	11	10 560,00	Gariep	15	3,25	11	10 400,00
PAN 3379	13	3,18	12	10 176,00	PAN 3161	7	3,78	12	10 206,00
Gariep	14	3,09	13	9 888,00	Koonap	16	3,17	13	10 144,00
Senqu	15	3,06	14	9 792,00	SST 356	9	3,74	14	10 098,00
PAN 3368	16	3,04	15	9 728,00	SST 387	14	3,52	15	9 504,00
PAN 3161	12	3,26	16	9 617,00	PAN 3198	16	3,12	16	8 424,00
Elands	17	2,85	17	9 120,00					
Koonap	19	2,67	18	8 544,00					
PAN 3198	18	2,83	19	8 348,00					

Cultivars marked with an asterisk are recommended only for an early planting date*

ing in the eastern and north-western Free State in 2014 were used for this purpose.

First, an imaginary price of R3 500/ton was assigned to Grade 1, with a difference of R250 between any adjacent grades. The grain yield (t/ha) that a cultivar achieved was then multiplied by the price of the grade (R/ton). This 'price ranking' was then printed alongside the ranking for grain yield and compared.

Virtually no fluctuation between the yield ranking and the price ranking occurred in the early planting (June) in the east Free State (**Table 2**) and only results for the later planting are discussed.

If a producer were to choose SST 398 on the basis of the price ranking and not PAN 3111 (on the basis of the yield ranking), the financial difference per hectare would be R604. In other words, the choice of SST 398 would earn a producer planting 300 ha of it an additional R181 350, because the hectolitre mass, falling number and grain protein would result in a better grade.

The same measure of fluctuations occur in the north-western Free State (**Table 3**), although, unlike in the eastern Free State, they occurred for both early and later planting dates. For the early planting, the choice of PAN 3161 (ranked first according to price) over PAN 3195 (ranked first according to yield) would have made an enormous difference of more than R2 600/ha. To a producer with 300 ha of this cultivar, it would have meant an additional R800 000.

At a later planting date, the number one cultivar according to yield ranking and price ranking is the same, namely Matlabas.

The fluctuation between rankings in the late planting in the eastern Free State and the early planting in the north-western Free State respectively in 2014 was mainly due to the variation in hectolitre mass and not protein content, as would generally have been expected. Hectolitre mass is mainly affected by the extremely dry conditions and/or heat during the second half of the growing season.

Profitability is probably one of the most important incentives that can stimulate wheat production, but is dependent on the correct choice of cultivar.

Consider the information available to you timeously and plan carefully

The above-mentioned examples from 2014 illustrate an important principle in cultivar choice, namely that a wheat producer should consider all the information available to him carefully and timeously and then apply it judiciously. The ARC-Small Grain (ARC-SG) annually prints and distributes guidelines for small grain production in the summer rainfall region (dryland and irrigation wheat) and winter rainfall region.

Cultivar choice and profitability of wheat – stepping on each other's toes or in accord?

Table 3: Price and yield rankings of dryland cultivars from the north-western Free State (2014).

Early planting date (April)					Later planting date (May)				
Cultivar	Yield Ranking	t/ha	Price Ranking	R/ha	Cultivar	Yield Ranking	t/ha	Price Ranking	R/ha
PAN 3161	2	2,67	1	8 544,00	Matlabas	1	2,62	1	8 384,00
PAN 3379	3	2,61	2	8 352,00	PAN 3161	3	2,46	2	7 872,00
SST 347	5	2,55	3	8 160,00	SST 347	4	2,43	3	7 776,00
Senqu	8	2,43	4	7 776,00	PAN 3118	2	2,47	4	7 286,50
PAN 3118	3	2,61	5	7 699,50	PAN 3379	7	2,24	5	7 168,00
Matlabas	6	2,54	6	7493,00	Koonap	11	2,09	6	6 688,00
PAN 3120	12	2,28	7	7 296,00	PAN 3111	6	2,25	7	6 637,50
Gariep	13	2,27	8	7 264,00	SST 387	8	2,17	8	6 401,50
Koonap	14	2,26	9	7 232,00	PAN 3198	15	1,99	9	6 368,00
Elands	17	2,11	10	6 752,00	SST 317	10	2,13	10	6 283,50
SST 317	7	2,50	11	6 750,00	PAN 3195	5	2,27	11	6 129,00
SST 387	9	2,41	12	6 507,00	Senqu	12	2,07	12	6 106,50
PAN 3198	16	2,20	13	6 490,00	Gariep	9	2,14	13	5 778,00
SST 356	10	2,35	14	6 345,00	SST 398	17	1,92	14	5664,00
PAN 3111	11	2,31	15	6 237,00	Elands	18	1,91	15	5 634,50
SST 316	15	2,23	16	6 021,00	SST 316	13	2,07	16	5 589,00
PAN 3195	1	2,67	17	5 874,00	PAN 3368	14	2,04	17	5 508,00
SST 398	18	1,97	18	5 319,00	SST 356	16	1,99	18	4 875,50
PAN 3368	19	1,90	19	5 130,00					

Information in these guidelines is comprehensive and results are based on data from statistical trial designs. The cultivar recommendation list for each region is also adapted annually to accommodate new cultivar releases. Informed cultivar choice is a process consisting of several actions. Here are a few important guidelines:

- Obtain the most relevant production manual and make your own cultivar choices – you understand your production environment and resources the best.
- Focus your attention on recent, credible and useful cultivar information that supports your production goals. Avoid 'marketing noise' because it mostly consists of vague and unfounded information.
- Determine which recommendations are valid for your region and then weigh the cultivar achievements of the past season and the long-term average up against each other.
- A simple method to determine a potential winner (according to price ranking) for your area is to add up rankings of yield potential, hectolitre mass, falling number and grain protein for a specific cultivar. Compare the totals of the cultivars you are interested in. The cultivar with the lowest total will probably have the best price ranking.

Also consider the cultivars' resistance to insects, diseases and sprouting on the ear in the final decision.

Article submitted by Robbie Lindeque, ARC-Small Grain, Bethlehem for SA Graan/ Grain April 2016. For more information, send an email to lindequerc@arc.agric.za.

Get yours here

Follow these steps to obtain an electronic copy of the production manuals:

- Go to ***www.arc.agric.za.***
- **Click** on 'Quick links'.
- Go down the menu and **click** on 'Smart Grain'.
- Choose the relevant production guideline on the menu and click to open.

Focus on affordable hybrids

Monsanto focuses on the provision of new, yet affordable, hybrids for emerging subsistence and small-scale farmers. According to Jako Benadie, agriculturist at Monsanto SA, this market segment has been receiving a lot more focused attention in South Africa since 2015 to meet the needs of clients.

In the 2016/2017 maize production season, eleven different white maize cultivars were planted at ten trial sites; including products from the "WEMA" stable. First, the yield potential of the new material was examined. Thereafter, the products were planted under a wide variety of conditions before data was collected and analysed. The team thus ensures that Monsanto provides hybrids to the market that meet the needs of the client.

Under mentorship and with proper training regarding the use of Roundup Ready and YieldGard technology, some of the subsistence farmers experienced enormous benefits with above average yields over the past season.

There is also a need for Monsanto's agriculturists to turn their attention to technical skills to align modern technology with basic cultivation practices and old machinery and equipment. Positive success has been observed where conservation practices were followed.

Attention should also be given to newer, more modern plant types and genetics that do not necessarily correlate with the existing perception of high yield but which can produce extremely high yields. It is therefore important to emphasise true yield in tons/ha. The optimal conditions of the past season provide the Monsanto team with the opportunity to test all the hybrid traits against those of the previous growing season, which will ultimately benefit the emerging farmer.

Article submitted by Magda du Toit, Corporate Communication Manager, Monsanto South Africa. For more information, send an email to magda.du.toit@monsanto.com.

Grain SA interviews...
Organ Gasetswele Serema

Hard work, dedication and determination are the qualities that make Organ Gasetswele Serema the successful farmer he is. Organ believes that if you put your mind to something, in his case, working and living on a farm, you can achieve it.

Where and on how many hectares are you farming? What do you farm with?

I live 25 km's outside Lichtenburg on Bethlehem Farm, which I lease from the Department of Rural Development and Land Reform. I have access to 270 ha of arable land and farm with sunflowers and maize.

What motivates/inspires you?

I am motivated by the fact that I also contribute to food security in our country. I have also realised, with farming, I am part of the chain that feeds the nation.

Describe your strengths and weaknesses

Strengths: I am hard working, persistent, a problem solver, a fast thinker and I am able to withstand any challenges that may come my way.

Weaknesses: I can't sit and do nothing.

What was your crop yield when you started farming? What are your respective yields now?

When I started farming, I yielded around 0,5 t/ha with my sunflowers and 2 t/ha with my maize. This was when I used old methods of farming.

Currently my respective yields are about 1,5 t/ha and 2,5 t/ha with sunflower, depending on the season. My maize is 3 t/ha to 5 t/ha, but I have stopped planting for some time, due to theft in our area.

What do you think was the main contributor to your progress and success?

I believe that Grain SA has contributed to my progress and success as they have given me training and it opened my eyes to the new methods of farming. They also taught me new great methods of farming and I have learnt a lot from the study group meetings that I attend through Grain SA. The on-farm support that I receive from our provincial co-ordinator, Du Toit van der Westhuizen is just amazing.

My late father, Petrus Serema, also played a huge role in my farming career as he was the one who introduced me to farming and mentored me from a very young age. I started farming in 2001, working side by side with him and he taught me that I can make a life for myself out of farming, and that I can achieve anything if i put my mind to it.

What training have you received to date and what training would you still like to do?

The training that I have received so far include: Basic Engine Repairs, Introduction to Sorghum Production, Settings of Implements – Practical Skills course, Farming for Profit, Introduction to Sunflower Production and Tractor and Farm Implements Maintenance.

Training that I would still like to do include: Introduction to Soybeans, Introduction to Groundnuts, Business Ethics, Advanced Sunflower Production and Marketing as well as Advanced Maize Production and Marketing.

Where do you see yourself in five years time? What would you like to achieve?

I would like to see myself as more than just a commercial farmer but a manufacturer – like manufacturing and packaging my own products like oil from the sunflower I farm with, maize meal from the maize I plant, sorghum etc.

I would like to own my farm and not just lease it from the department – but owning it. I want to have the title deed for my own farm that I bought for myself.

What advice do you have for young aspiring farmers?

Young farmers must never stop dreaming big, they must never stop working hard, they must be determined and they should never stop learning.

I believe there is always something new to learn every day. They should learn to be resistant from discouragement, they should focus on what they would like to achieve. I was once discouraged by people around me, that I couldn't make it in farming, but I learnt to put all that negativity behind me and focus on my ultimate goal.

At one stage of my life I didn't believe that I could one day live on a farm and be the one farming, but I never stopped hoping and dreaming and here I am today doing exactly that. Hard work and dedication can really take one a long way.

Article submitted by Lebo Mogatlanyane, Office Assistant and Du Toit van der Westhuizen, Development Co-ordinator of the Grain SA Farmer Development Programme, North West Province. For more information, send an email to lebo@grainsa.co.za or dutoit@grainsa.co.za.

The Corner Post

SINELIZWI FAKADE

Mentorship is about changing lives

In this new series, *The Corner Post* will feature the mentors who form part of the Grain SA mentorship programme. A mentor is that person who gives you advice on how to achieve your own goals and dreams.

If you look for a synonym for the word 'change' the list is endless – alter, transform, exchange, modify, amend, replace, substitute, convert, adjust, shift. However, one thing is certain, change involves a process through which something grows and becomes something different.

To Sinelizwi Fakade the mentorship programme is all about changing lives and ensuring food security at the bottom level. He was employed by Grain SA as a Provincial Co-ordinator in the Eastern Cape region in February 2016 and joined the mentorship programme at the same time. Lawrence Luthango, his predecessor, who is now a fully-fledged mentor in the Eastern Cape showed him the ropes and was his mentor for four months.

Although he is not a farmer, he studied agriculture extensively and has specifically specialised in rural development, food security and policy. As far as practical experience goes he has been exposed to the farming environment for the past five years. His studies involved vocational work and he also did a lot of volunteer work on commercial farms in and around the Eastern Cape.

As a student, his studies also focused on rural development, extension resource management and production and now has the opportunity to see how it integrates practically. Working as a mentor has shown him the imperative aspect of what Grain SA is doing. Sinelizwi has just completed a Master's Degree in Food Security and has started his PhD which he hopes to complete by 2020.

A holistic approach

With the Eastern Cape having a data basis with 2 300 registered farmers already forming part of the programme, it is quite a task to ensure that the necessary knowledge is conveyed to all. Theoretical knowledge is communicated at study groups, but the practical visits is where the real changes takes place. Sinelizwi visits between four and ten groups (comprising 40 members each) per week for two hour sessions at a time. 'I see these visits as holistic where theoretical information is conveyed on the one side and thereafter thoroughly practiced ensuring that farmers understand exactly what has been discussed,' he explains.

It is imperative that farmers have the basic production knowledge. 'In the Eastern Cape, dry beans and maize forms the corner stone for farmers, so it is important to get the message across for example how production works, what you need to know as far as mechanisation is concerned, rules about marketing, ensuring that your budget balances, etc.' Farmers should be made aware of all the value chain processes that happens to ensure that they become part and parcel of the farming industry. Although it depends on the level of the farmer the three key areas Sinelizwi identified are production, management and marketing.

He has had very positive feedback from the farmers, especially as far as the one-on-one sessions are concerned and says it's all because of the Grain SA programme. This programme is receiving such good reviews in the Eastern Cape that more farmers are yearning to get involved. These farmers probably agree with a statement made by the well-known South African author, Max du Preez: 'We cannot become what we want to be by remaining what we are'.

At the farmers' days in the Eastern Cape success stories are often shared by farmers. 'It is inspiring to hear farmers speaking of their success of how the programme changed their farming practices and increased their yield from 30 to 100 bags. I don't know if you want to call that development or not, but in my eyes that is definitely progress,' Sinelizwi says.

Replacing poverty with opportunity

'We have a huge problem in the country with the greater part of the population going to bed at night without having eaten a substantial meal for the day.' He is therefore enthusiastic about a programme that alters a life of poverty with one where goals are attainable through training and where farmers can become independent. To him independence is crucial and development programmes must change lives.

He has witnessed farmers who produced hardly enough for their own community who are now producing maize of commercial quality. 'That is transformation – not just changing for the sake of change, but empowering an individual,' Sinelizwi says and adds, 'Grain SA's Farmer Development Programme is succeeding and our goal is changing lives, equipping smallholder farmers and ensuring that farmers are left independent with a commercial future.'

It is not only the lives of the farmers that are changed, but the lives of all those involved in this programme. 'To see the smile on the face of someone that never thought they would ever harvest 100 bags of maize, is one of the most rewarding moments I have experienced,' he shares of the impact the programme has had in his own life.

One of the most exceptional events he witnessed in the Eastern Cape was when a 74-year-old lady was so inspired by what was demonstrated that she picked up a 20 litre knapsack sprayer, put it on her back and started spraying the maize at knee height.

To farmers not yet part of this programme, he wants to say: 'You must make a choice to take a chance and be part of this journey or your life will never change'.

This month's edition of The Corner Post was written by Louise Kunz, Pula Imvula contributor. For more information, send an email to louise@infoworks.biz.

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- DKC80-40BR GEN

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- DK8031
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