JUNE 2019

# PULA
# IMVULA

**GROWING** FOOD • PEOPLE • PROSPERITY

GRAIN SA MAGAZINE FOR DEVELOPING FARMERS

GRAIN SA
GRAAN SA

BAYER

# PULA IMVULA


### Editorial team

**GRAIN SA: BLOEMFONTEIN**
46 Louw Wepener Street
1st Floor
Dan Pienaar
Bloemfontein, 9301
■ 08600 47246 ■
■ Fax: 051 430 7574 ■ www.grainsa.co.za

**EDITOR IN CHIEF**
***Jane McPherson***
■ 082 854 7171 ■ jane@grainsa.co.za

**EDITOR AND DISTRIBUTION**
***Liana Stroebel***
■ 084 264 1422 ■ liana@grainsa.co.za

**PUBLISHING PARTNER**
***INFOWORKS***
***Johan Smit*** ■ ***Ingrid Bailey*** ■ ***Marisa Fourie***
■ 018 468 2716 ■ johan@infoworks.biz

infoworks
your ideas can fly

### Grain SA Farmer Development Programme

**DEVELOPMENT CO-ORDINATORS**

***Johan Kriel***
Free State (Ladybrand)
■ 079 497 4294 ■ johank@grainsa.co.za
■ Office: 051 924 1099 ■ Dimakatso Nyambose

***Jerry Mthombothi***
Mpumalanga (Nelspruit)
■ 084 604 0549 ■ jerry@grainsa.co.za
■ Office: 013 755 4575 ■ Smangaliso Zimbili

***Jurie Mentz***
Mpumalanga/KwaZulu-Natal (Louwsburg)
■ 082 354 5749 ■ jurie@grainsa.co.za
■ Office: 034 907 5040 ■ Sydwell Nkosi

***Graeme Engelbrecht***
KwaZulu-Natal (Dundee)
■ 082 650 9315 ■ dundee@grainsa.co.za
■ Office: 012 816 8069 ■ Nkosinathi Mazibuko

***Luke Collier***
Eastern Cape (Kokstad)
■ 083 730 9408 ■ goshenfarming@gmail.com
■ Office: 039 727 5749 ■ Luthando Diko

***Liana Stroebel***
Western Cape (Paarl)
■ 084 264 1422 ■ liana@grainsa.co.za
■ Office: 012 816 8057 ■ Hailey Ehrenreich

***Du Toit van der Westhuizen***
North West (Lichtenburg)
■ 082 877 6749 ■ dutoit@grainsa.co.za
■ Office: 012 816 8038 ■ Lebo Mogatlanyane

***Sinelizwi Fakade***
Mthatha
■ 071 519 4192 ■ sinelizwifakade@grainsa.co.za
■ Office: 012 816 8077 ■ Cwayita Mpotyi

**PULA IMVULA IS AVAILABLE IN THE FOLLOWING LANGUAGES:**
***English,***
Afrikaans, Tswana, Sesotho,
Sesotho sa Leboa, Zulu and Xhosa.





THIS PUBLICATION IS MADE POSSIBLE BY THE CONTRIBUTION OF THE MAIZE TRUST

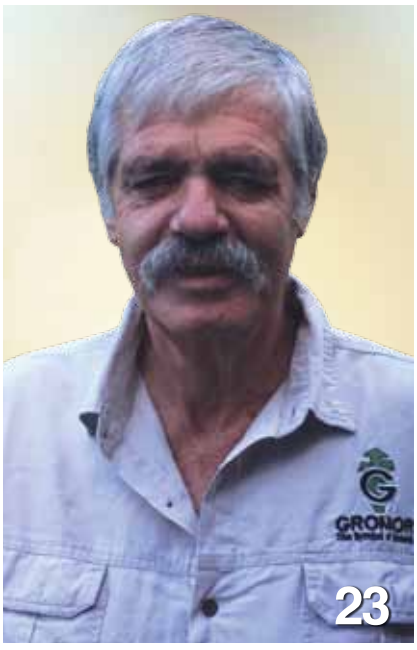

# CONTENTS













# A Word From...

*Liana Stroebel*

FOR MOST FARMERS IN THE MAIZE PRODUCTION AREAS SUCH AS PARTS OF KWAZULU-NATAL, MPUMALANGA AND THE NORTH WEST, 2019 HAS NOT BEEN AN EASY YEAR DUE TO LATE RAINS. SOME CROPS RECOVERED WELL WHERE OTHERS DID NOT.

During seasons like this, it is important for farmers to start thinking about how they can minimise their risk in future. Many farmers are switching their practices to no-till where possible to conserve more soil moisture, where others are diversifying their enterprises with alternative crops or intensifying their livestock components. Charles Darwin said, 'It is not the strongest of the species that survives, nor the most intelligent. It is the one that is most adaptable to change.'

As the harvesting process should be nearly completed, it is important for farmers to stay positive and to focus on your planning for the new season at hand. It is paramount that you review your practices of the past season. Is there anything that you could have or should have done differently? If there is a farmer in your area that had a better yield (with the same amount of rainfall), what did he/she do differently? Ask yourself these questions, be honest with yourself and adapt your practices where needed.

During the month of June, it is also time to focus on ensuring that you have enough grazing for your animals during the winter period. Try not to overgraze your pastures as this can do permanent damage to the regrowth. Furthermore, your pets also need food, water and shelter from the cold. Take care of them and they will always be loyal to you.

All the best with your preparations for the coming season. Work hard, keep your eye on the ball and you will bear the fruit of your work. ■

# Get this *weather app* on your cell phone

FARM MANAGEMENT FOR SMALL SCALE FARMERS (SSF'S) POSES UNIQUE CHALLENGES AND RISKS TO MAKE A LIVING. NO MATTER HOW LARGE OR SMALL, A FARMER NEEDS TO USE SOUND MANAGEMENT PRINCIPLES. MANY OF HIS/HER DECISIONS ARE BASED ON INFORMATION THAT IS NOT READILY AVAILABLE. THROUGH THIS ARTICLE A DIGITAL PLATFORM AGRICLOUD IS EXPLAINED THAT WILL ASSIST SMALL-SCALE FARMERS WITH DAY-TO-DAY DECISION MAKING.

The farming community worldwide need to produce more food as the world's population is expected to reach 9 billion by 2040. All farmers large or small need to increase their current production to feed this population that is becoming more urbanised. Faced with challenges and risks pertaining to climate variability such as droughts and floods, unfavourable market conditions do not contribute towards the sustainability of the farm and making a living from farming.

Lack of water, access to land (in South Africa) and access to reliable information are some of the main problems being encountered. All farmers in South Africa, large or small, need reliable information about historic, current and forecasted weather information to optimise crop growth and to generate income for their families.

Weather-related data is available ranging from manual observations, automatic weather stations, weather radars, satellite and weather forecast modelling output. However, these data sources are often not accessible to or understandable by the agricultural role-players and especially not to individual farmers. As a result, every year, for millions of farmers, crop production is unnecessarily limited due to the limited availability of essential weather data and agricultural advisories.

## THE RAIN FOR AFRICA PROJECT

In order to address this, South African partners (Agricultural Research Council: Soil Climate and Water (SCW) and the South African Weather Service (SAWS) collaborated with Dutch partners in a project called "Rain for Africa" (R4A). The R4A Project has a strong agricultural focus and the aim is to impact on the agriculture sector through services to:

- **Farmers**: Small scale farmers (SSF), commercial farmers and farmers' associations.
- **Agricultural service providers**: Agri-Business, provincial departments of agriculture, cooperatives, NGO's, etc.
- **Agricultural Technical developer's**: **IT** Application developers.

*Nico Kroese, Manager: Research and Development, South African Weather Service. Send an email to Nico.Kroese@weathersa.co.za*

**1** ***Download the AgriCloud app today.***

### How to register for the smart phone app

- Go to Google Play Store
- Search for **AgriCloud**
- Download the AgriCloud app
- Follow the instructions

### Your own statistics (crowd sourcing)

Help us to improve your information/advisories by reporting weather observations on your farm.

### How to register for the AgriCloud USSD service

- Dial *134*8383#
- Press the call button
- Wait for reply
- Follow instructions

### Benefits of reporting observations

- More weather observations mean better information and statistics.
- Better statistics mean better farm management.
- Better farm management means higher yields and lower input costs.

**2** ***Benefits of AgriCloud.***

1. The AgriCloud app incorporates the latest weather information for farmer advisories.
2. The advisories are location specific (specific farm).
3. The advisories are updated on a daily basis.
4. The advisories are available in all the eleven official languages of South Africa.
5. The information provided through AgriCloud is:
   - The right information.
   - At the right time.
   - At the right location.
   - For the right purpose.
6. The mobile AgriCloud app is available for free.

***By using the AgriCloud app farmers can increase their yields and income.***

## THE AGRICLOUD APP

The adoption of new technology is one of the ways a farmer can increase yields and income but usually these services come at a price. The next step is to translate the weather information into weather based agricultural advisories. AgriCloud is an online weather based agricultural advisory system that enriches weather and climate data with agricultural data and local knowledge and generates real-time personalised forecasts and warnings.

*Many of the stakeholders are enthusiastic and impressed with AgriCloud as a useful tool to provide farmers with dynamic daily updated information in the local South African languages for their own farms.*

The AgriCloud portal is a commercial service that helps Agri-businesses, cooperatives and farmers to make well-informed farm management decisions in order to:

- Optimise farm inputs.
- Reduce weather and climate related risks.
- Improve food production in a sustainable manner.

Contact the ARC, SAWS or visit the R4A website for more information on the above services.

The AgriCloud app is aimed specifically at small scale farmers (SSF'S). The following three services are provided for rain-fed crops:

- Planting advice.
- Spraying advice-herbicides.
- Spraying advice-pesticides.

For small scale farmers the service is **free** and can be downloaded via a smartphone application accessible via the Google Play Store for Android phones or a simple text message service (USSD/SMS). The app was tested amongst a number of selected SSF's and extension practitioners across several provinces. Commentary from the users during the testing phase can be summarised as very positive.

*The Rain for Africa (R4A) project aims to provide agricultural advisory services to farmers based on the best available weather and climate information at their specific location.*

## CONCLUSION

There are a multitude of management decisions a farmer must make that address the risk factors he/she is exposed to. The management of risks despite many aides and tools cannot replace management skills obtained from knowledge, experience, initiative, discernment and wisdom. The AgriCloud app is a tool that can assist and guide farmers to make better decisions. For more information, visit *www.rain4africa.org*. ■

## AGRICLOUD APP

AgriCloud is a free mobile app for Android phones, downloadable from the Google Play Store. It provides guidance to farmers on the selection of planting dates for rain-fed maize for the specific location of their own farm. This information is based on the rainfall received over the previous ten days together with the rainfall forecast for the next ten days.

It also gives advice on the weather conditions conducive for the spraying of herbicides and pesticides for the next three days. Extension practitioners, NGOs and others working with farmers can download the app and register a number of farmers to assist them in obtaining the information. Similar information is also available for users of simple phones via a USSD service (*134*8383#).

# What can I expect of my **Executive representative?**

THE RECENT GRAIN SA CONGRESS HELD IN EARLY MARCH, SAW THE ELECTION AND RE-ELECTION OF A NUMBER OF FARMER REPRESENTATIVES TO SERVE ON THE EXECUTIVE OF GRAIN SA. THE QUESTION ARISES, WHAT DO THESE PEOPLE DO AND WHAT CAN WE, AS ORDINARY PAID UP MEMBERS OF GRAIN SA, EXPECT FROM THEM?

*Jenny Mathews, Pula Imvula contributor. Send an email to jenjonmat@gmail.com*

## GRAIN SA IS A GRAIN COMMODITY ORGANISATION

It is important to understand that Grain SA is an organisation established by farmers to serve the interests of farmers. Farmers need to be giving their full attention to running their farming operations and yet, there are many different events in the broader sector that require the attention of experts. The team that is led by the CEO, Mr Jannie de Villiers, is designed to monitor the political, economic and geographic environment both locally and internationally and assess how new developments impact the agricultural sector and grain farming in particular.

The experts whom are employed by Grain SA, network widely and monitor and analyse developments in the sector then feed information through to the different committees. The farmer representatives consider the developments and respond in the best interests of farmers giving management guidance as to how they should respond and comment on the developments. For example, when news of the invading Fall Army worm was released, our research team played a significant role in tracking the path of destruction caused by the worm. They also immediately discovered and informed farmers about the best protocols for managing the pest in our fields.

## FOCUS AREAS

The team is varied and has many different focus areas. Some examples are:

- The Research and Development division which monitors crop improvements like cultivar development, crop protection e.g. monitoring of pests and diseases. They also focus on Conservation Agriculture which promotes soil health, reduced tillage and monitors the environmental influences like water. Further, they monitor policy and legislation so that Acts, Bills and Policies that affect grain producers will be shared as they get passed.
- An Agricultural Economics division monitors a wide variety of instruments at play in the sector which affect the grain economy, ranging from commodity and input price movements, import tariffs, diesel rebate negotiations, production reports and crop estimates, climate change and policy and development etc.
- Farmer Development has been tasked by Congress to make a contribution to the land reform process by contributing to sustainable farming businesses and increased household food security.
- Lobbying in the agriculture and political sector is the responsibility of the experts and leaders of the organisation.
- The Marketing and Communications division are responsible for building relationships with the farmers and other stakeholders in the sector.

This list is not complete but rather is just a small indication of the wide scope of activities and tasks delegated to the Grain SA management team.

## HOW ARE THE FARMERS ORGANISED?

- Farmer members nominate delegates to represent them from the different regions.
- Delegated farmers attend Grain SA's Annual Congress of farmers.
- Congress delegates elect the Executive, referred to in-house as 'Hoofbestuur'.
- Congress also votes to appoint the Chairperson and two Vice-chairpersons. Note: Congress 2019 elected Jaco Minnaar as Chairperson and Derek Mathews and Ramodisa Monaisa as Vice-chairperson.
- The Executive then elect an Executive Committee – this includes the Chairperson, two Vice-chairpersons and at least four other members.
- The Executive Committee, referred to in-house as 'Dagbestuur', is involved with management and monitoring of day to day business, financial and investment decisions and personnel performance among other tasks.
- The Executive also tasks members to serve on different specialist Working Groups (WG), which are comprised of teams of farmers serving on the Executive and members of management. Their focus is on specific areas of interest, e.g. each commodity has a Specialist Working Group focusing on issues unique to that commodity including market environment, price volatility, legislation and research requirements specific to each crop. The Editorial Team WG focus on the SA Grain magazine content and the Farmer Development WG focuses on work being done by the Farmer Development managers etc.

*It is important to understand that Grain SA is an organisation established by farmers to serve the interests of farmers.*

## REPRESENTATION

**Why is it important that you send active, involved leader farmers who are good communicators to represent you as delegates to Congress?**

According to the constitution of the organisation, the Congress of delegates i.e. the farmer representatives who attend Grain SA Congress sessions **is the highest authority of the organisation**. When Congress makes a decision, it stands! This means it becomes

fundamental policy of the organisation and will serve as an instruction to the management team. This is why you need to be clear on what you want.

As a group of farmers, you need to find a common voice to TELL YOUR DELEGATES what you want them to speak about. They are your channel of communication to take your region's issues, concerns, challenges and opinions to the discussion platforms at Congress.

- Your delegates should be going to Congress to REPRESENT your region and those individuals should be willing and ready to speak out on your behalf. Furthermore, they must be ready to vote a single regional representative as Executive Member onto the Executive who is willing to serve for at least a term which lasts two years.
- Your delegate on the Executive needs to be willing to COMMUNICATE – TWO WAYS!
- Executive members must voice their farmers' messages to the Executive and they must return to their regions to feedback discussions and decisions or sector news and developments to their farmers who they are representing. You should EXPECT regular FEEDBACK. And you need to be sure your Executive member stays in touch with your issues and voices them on your behalf.
- IF you are CONFIDENT that your Executive Representative is truly representing you, then you know your concerns will be discussed or debated at that level. Of course, not every debate arrives at the desired outcome because there are many viewpoints to be considered at that level however, if your delegate NEVER VOICES YOUR ISSUES then how will the organisation ever be made aware of them?
- To serve as an Executive member of Grain SA is certainly an honour, but it is also a responsibility. Members are not paid a salary (apart from traveling expenses and a small day fee). This is a VOLUNTEER position where a farmer SERVES their farming community and acts as a CHAMPION on behalf of other farmers.

## CONCLUSION

Ultimately, it is up to every farmer to keep his or her finger on the pulse, to stay in contact with the representatives and to ask questions. Make sure you are being represented at the highest level of the organisation. Send your issues through no matter how big or small they seem. The team is highly competent and willing to assist individual farmers with troubleshooting, even at a one-to-one level. If you don't speak up, they can't know about your challenges to extend a helping hand. ■

*The 2019 Congress was held on 6 and 7 March 2019 at NAMPO Park.*

# Make MACHINERY MAINTENANCE a priority

ONE OF THE MOST VITAL ASPECTS IN OUR FARMING OPERATIONS IS THE MAINTENANCE OF OUR MACHINES. WE OFTEN FORGET ABOUT IT OR PUT IT OFF BY FINDING MORE IMPORTANT THINGS TO DO! HOWEVER, WE CANNOT AFFORD TO NEGLECT THIS JOB CONSIDERING HOW EXPENSIVE MACHINERY COSTS, AS WELL AS THE ANNUAL MAINTENANCE EXPENSES WE INCUR TO KEEP THEM IN GOOD WORKING ORDER.

***Gavin Mathews, Bachelors in environmental management. Send an email to gavmat@gmail.com***

The best practice when it comes to maintenance is having a good routine and being diligent about following through in doing it!

Our farming machines and implements are made up of many different moving and turning parts. All of this moving and turning causes wear and tear and therefore requires routine maintenance in order to keep them operating without a hitch. There is nothing more frustrating than having a hold up in the middle of the busy planting or harvesting time due to neglect by us to look after our stuff.

This usually costs us a lot more money than if we would have serviced everything before the work started. In the time leading up to planting season we should be disciplined about planning our maintenance schedule. Make a point of identifying your priority machines which do the most intense work and which you rely heavily on.

Make sure that you service this machine thoroughly, perhaps it's your planter or a combine harvester. Whichever machine it may be, be sure to get it in perfect working order before the season starts. On each of the machines identify the specific parts that take the most strain such as bearing pullies and belts. Once you have given these important parts extra care it is vital to do one final check before the machine leaves the shed. It is very easy to overlook something small so be sure to look carefully. After your final check is complete you should move it out of your working space into a protected area where it is ready to hook up and go. If there is no covered area try and cover the machine with a large tarpaulin to protect it from the elements.

***There is nothing more frustrating than having a hold up in the middle of the busy planting or harvesting time due to neglect by us to look after our stuff.***

> *Make it a rule that before any tractor or implement enters a land that you or your staff check the fuel, oil and tyres on the tractors and any other mechanical equipment.*

## CARE AND ATTENTION

Whilst using the equipment, we once again cannot afford to abuse our machines. We need to give them the correct care and attention at all times. Usually the best method with regard to on the job checks is to have a 'pre-work' routine. It is also vital that you instil this routine into your labour force. Make it a rule that before any tractor or implement enters a land that you or your staff check the fuel, oil and tyres on the tractors and any other mechanical equipment.

After this is done move on to the drawn equipment and make sure that all bearings are greased, and any other moving parts are checked carefully. Make sure the chains are tight and are moving with no restriction. This should become a basic daily routine which is engrained into your staff. These checks may very possibly save you an unwanted stop, which would more often than not happen at the worst time possible. So, don't be slack about it, rather be proactive and save time and money in the long run.

## PROACTIVE MANAGEMENT

Maintenance is ongoing and needs to be a continuous process of proactive management. We can't be good about it right through the season and then let it slip once all is planted or harvested! Before you pack all the machinery away for the next season give everything a wash to get rid of all the soil, dirt, oil and grease.


***Be sure to check all chains and make sure they get a good covering of oil so that they do not rust and seize up during the down season.***

Clean all cutting discs and shears with a light brushing of old oil to protect from rust. Give all the bearings a pump of grease and make sure that there are none that need replacing. If there are, replace them now. It will be one less thing to do when the new season comes. Don't let any hydraulic hoses lie exposed in the soil. Rather cover them with a plastic bag and hook them up and out of the way.

> *Maintenance is ongoing and needs to be a continuous process of proactive management.*

Any seed and fertiliser bins or hoppers need to be cleaned out and washed properly. Be sure to check all chains and make sure they get a good covering of oil so that they do not rust and seize up during the down season. All chemical tanks and spray nozzles must be washed out with clean water before being stored away. Anything small that may have been giving some problems throughout the season needs to be taken care of properly before the equipment is packed away or else you will be starting the new season with problems from the get go.

Breakdowns and hold ups can cause stress as well as poor productivity. This is why it is essential to take your maintenance seriously and be good about following a strict routine to make sure that everything is working one hundred percent. Obviously break downs can never be completely avoided, but if your maintenance management is good then these problems will be less frequent allowing for a smoother operation. ■

***Check for any oil leaks.***

# How current weed control affects your planning for next year

WEED CONTROL IS A HIGH PRIORITY WHEN IT COMES TO CROP AND PASTURE PRODUCTION. WEEDS CAN CAUSE SERIOUS YIELD LOSSES IN CEREAL, OIL CROPS AND PASTURES FROM YEAR TO YEAR IF NOT PROPERLY CONTROLLED. AS A FARMER YOU HAVE TO KNOW THE WEED STATUS OF EACH AND EVERY CAMP ON YOUR FARM. KNOWLEDGE IS POWER.

***Dr Johann Strauss, Senior Scientist, Western Cape Department of Agriculture. Send an email to johannst@elsenburg.com***

Proper weed control is dependent on various factors. It is important to follow the label instructions of each and every herbicide you wish to apply. Half and double doses instead of the recommended rate can hasten the onset of herbicide resistant weeds on your farm. If this occurs, it might cause the farmer to make drastic steps to rid fields of herbicide resistant weeds.

## HERBICIDE APPLICATION

Applying the herbicide on the field requires the correct water volume as well. If you apply the herbicide with too little water, you will not get enough herbicide coverage of the culprits you want to eliminate. If the water volume is too high the herbicide can run off the plants and again result in poor control. The quality of the water can also affect the effectiveness of the applied herbicide. When spraying mixes, make sure that the products you wish to apply can be blended, otherwise it could cause serious damage to your crop or pasture. Also make sure when applying post emergent herbicides that it is done at the correct growth stage of the crop.

*To prevent herbicide resistance, it is important to rotate crops and herbicide modes of action.*

The farmer must realise that the breakdown period of products differ and that these breakdown periods can be shorter or longer depending on the climate and the biological life in the soil. Certain herbicides can also have a detrimental effect on soil life, suppressing the amounts of micro-organisms in the soil. Why is it important to know the length of these breakdown periods? If you plant a crop that is sensitive to the specific herbicide you have used this year, it can cause serious problems with germination and eventual plant density of a camp. If you lose a large number of plants and the crop stand is sparse, it opens the door to competition from weeds.

Even if you adhere to the rules on planting a crop following the use of a certain herbicide, the climate can still cause an effect in the following season. This can happen very easily if herbicides were applied in a very dry year and not all residues of the herbicides have been broken down. This has happened a few times in the last two or three dry years experienced in the Western Cape. It is therefore very important to read the label and know the length of these periods of with-holding because certain herbicides need not only a certain period of time, but also a certain amount of moisture to be effectively broken down.

***Control weeds before it sets seed.***

## CROP ROTATION

To prevent herbicide resistance, it is important to rotate crops and herbicide modes of action (thus from different groups). The ideal is to rotate broadleaf crops and cereal or grass crops to ease the control of certain types of herbicides. The idea is to manage your grass-weeds in the broadleaf crop so that there is low, or no grass weed pressure in the following cereal crop and vice versa with broadleaf weeds in the cereal crop.

If you find yourself in a scenario where your weed control was not as effective as you have hoped for, it might be necessary to rethink your planning for the following season. Let's say you have planted wheat in 2018 and you struggled to control broadleaf weeds during the season, thus adding a large number of weed seeds to the soil

seedbank, and your planning was to plant a broadleaf crop in 2019 it might be worthwhile to change your plans.

Rather plant another cereal crop to have another season to take out the broadleaf crops. It is not ideal, but in the long run it is more beneficial to lowering the weed seedbank. You can therefore decide to plant wheat again (but it is only advisable if you are not struggling with grassweeds as well) or you can plant oats as a hay crop in order to be able to manage the broadleaf weeds and possible grassweeds that might occur. By cutting the oats as hay you will prevent the broadleaf and grassweeds of setting seed. If this is successful you can go back to your rotation.

The same applies to a broadleaf crop where you struggle to manage the grassweeds. Say you planted canola and the grass control was poor, rather plant another year of broadleaf, like lupine or peas, to get another shot at controlling the weeds before going back to your original rotation. Here you also have the option to plant a fodder crop or a mixed cover crop and allow the weeds to germinate and bale the material before the weeds set seed.

It is also important to manage the weeds during the off season. Weeds use water which could have been stored in the soil for the next season. So, if you plant crops in the winter rainfall areas, control the summer weeds and the other way around if you plant crops in the summer rainfall area.

Remember the importance of keeping the weed seed numbers low to prevent competition with your crop. Read the labels of the products you want to use and plan a crop and herbicide rotation for your farm along with your advisor. ■

***Weeds need to be controlled at an early stage.***

WORDS OF WISDOM

*Successful people do what unsuccessful people are not willing to do. Don't wish it were easier; wish you were better.*

~ JIM ROHN

# TO CREATE WEALTH, money is needed

SURELY YOU WILL ASK THE QUESTION 'WHY AN ARTICLE ON WEALTH?' WHAT HAS IT GOT TO DO WITH AGRICULTURAL MANAGEMENT? A VALID QUESTION, BUT A COUNTER QUESTION. WHY ARE YOU FARMING?

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

Wealth is, per dictionary, described as having an abundance of valuable or desirable possessions or money or is the state of being rich. Being wealthy or rich is having a great deal of money, resources, or assets. A wealthy or rich person is thus one owning a lot of land and/or other property, businesses, having a lot of savings, investments and so forth. The common reference with all these items is that their value is expressed in R-value or then money value.

Back to our basic question of why are you farming? Surely, to make money. You can only make money if you work for somebody and earn a salary or you work for yourself and pay yourself. Interesting, most of the wealthy people of today are entrepreneurs. In other words, they have their own business/businesses. Thus, we are back to our fundamental statement, to make money from your business you must make a profit to save money to buy other assets or possessions. If this is not true you will never become a wealthy person. However, we all know to make a profit from farming is not that easy because of all the risk involved.

In several of our previous articles we have discussed ways and means to assist in making a profit. Diversify, improve the quality of your product, improve the marketing, produce, are just a few aspects discussed. Mostly this was all a bit technical, thus let's look at a few other hints from a more personal perspective to assist your profit-making efforts and thus to eventually create wealth.

## BE AS COMPLIANT AS YOU CAN

Comply with the laws and rules and regulations of our country. Doing so will result in fewer worries and concerns. It frees up positive energy and time to focus on money-making aspects of your business. Is your tractor licensed properly or do you worry about it? By not being compliant could eventually cost you money.

Remember, you do not farm in isolation. Something you do or do not do on your farm could affect the entire industry. The latest out-break of foot-and-mouth disease was apparently caused by someone moving infested livestock irresponsibly. The listerioses outbreak last year originated in a factory that was not cleaned up to standard and caused havoc to the entire pig industry. The outbreak of rift-valley disease during 2010 also comes to mind. Sheep were not inoculated as they should have been, with dire consequences to the sheep industry.

To be compliant is being responsible. It requires some self-discipline and could save you money.

## BE PRODUCTIVE

Be productive by planning in advance and anticipate problems before they arise. We are not always as productive as we can be. Consequently, we are less efficient and waste time, and 'time is money'. Plan for backup methods should your normal systems, such as for communication or power be disrupted. Spare batteries and modems could be of assistance to keep the systems functioning.

## USE DOWNTIME EFFECTIVELY

There are always less busy periods on a farm. Use these times to do preventative maintenance to your machinery and equipment. This helps prevent machines and equipment from breaking down unnecessarily during the busy times. You will all know how frustrating it can be when the harvester breaks down during harvest time or the planter during the planting season. In many cases, such a breakdown could have been prevented by timely maintenance. Preventative maintenance also extends the life of the equipment and saves money in the long run.

> *Business is never easy, but it is worth it. It is always worth creating the income and the life that you want.*

## STAY HEALTHY

By resting, exercising regularly and eating healthy you stay healthy. Being healthy assists in clear thinking, greater energy, speed and efficiency.

## BE CREATIVE AND USE YOUR COMMON SENSE

Making the effort to be creative also pays off whilst a lack of or not using your common sense is a liability in a business. Make a point of applying practical, workable solutions to problems. Do not be afraid to consult with your employees regarding practical solutions.

## BUILD POSITIVE RELATIONSHIPS

Building positive relationships with everybody involved in your business – your family, employees, suppliers, customers and consultants. Positive relationship will reduce stress and improve productivity. Be a good listener by making time to listen to other people.

By building positive relationships you are building a solid reputation based on integrity and responsibility. This will directly influence the value of your business. People will respect you to be trustworthy and will be at ease to do business with you and provide proper service.

## HAVE A STRONG MINDSET

Lastly, having a strong mindset is incredibly important in helping you push forward in your business ventures and to never give up. Business is never easy, but it is worth it. It is always worth creating the income and the life that you want.

## SOURCE

*Information used in this article was taken from an article 'Simple ways to create wealth' by Peter O'Halloran – Farmer's Weekly 7 December 2018*

# Promising outlook for the domestic wheat market

THIS ARTICLE TAKES A BRIEF LOOK AT GLOBAL WHEAT SUPPLIES AND THE POTENTIAL IMPACT IT WILL HAVE ON THE NEW SEASON FOR THE DOMESTIC MARKET.

***Ikageng Maluleke,***
***Junior Economist, Grain SA.***
***Send an email to***
***Ikageng@grainsa.co.za***

## INTERNATIONAL PERSPECTIVE

Global **wheat supplies** have been reduced, primarily on lower production forecasts for Kazakhstan and Iraq, offsetting higher estimates for Argentina and Australia (**Table 1**). **Projected exports** for the United States and Mexico have decreased for the 2018/2019 marketing year, while EU and Brazil exports have increased. The EU's recently improved import competitiveness is expected to increase for the remainder of the marketing year.

**Global imports** have been raised for a couple of countries including Algeria, Morocco and Philippines, while decreased for Bangladesh, Mexico, Venezuela and EU. **World consumption** has been reduced, with most losses accounted for India. **Global ending stocks** for 2019 have been forecasted to decline by 3,9% due to the downward adjustments done by Asian countries and lower inventory levels in Argentina.

## LOCAL PERSPECTIVE

Compared to the 2017/2018 marketing year, 2018/2019 has been a good year for winter cereals, having somewhat recovered from the drought of the year before. With planting season for winter cereal underway, the 2019/2020 marketing season promises to be a good one for the winter cereal growing regions. Weather has been favourable over the past few months with above normal rainfall occurring over most parts of the winter rainfall region, while some areas had normal rainfall or dry conditions.

Looking back, wheat production for the 2017/2018 marketing season took a dip (Table 1) due to the drought that hit the Western Cape region, however we have seen a good come back in the 2018/2019 marketing year with production that went up by about 30%, and this includes new-planted areas in the Free State. With an average consumption of about 3 million tons per year, South Africa is a net importer of wheat as it produces far less than what is needed for consumption. On average South Africa imports about 1,5 million tons of wheat per marketing year. However, during the 2017/2018 marketing year imports increased by about 57% compared to the season prior.

**1** ***Prices of South African and USA wheat delivered in Randfontein.***

*Source: Grain SA, 2019*

**1** ***Global supply and demand of wheat.***

| | 2017/2018 | 2018/2019 | |
|---|---|---|---|
| | Estimate (Million tons) | 7 February (Million tons) | 7 March (Million tons) |
| **Production** | 759,4 | 728,4 | 728,3 |
| **Supply** | 1 014,0 | 1 005,7 | 1 003,6 |
| **Utilisation** | 737,8 | 742,6 | 741,8 |
| **Trade** | 176,9 | 171,8 | 171,0 |
| **Ending stocks** | 275,3 | 266,9 | 264,7 |

*Source: Amis, 2019, Dataset as at 29 March 2019*

**2** ***Local supply and demand for wheat.***

| Supply and demand | 2016/2017 | 2017/2018 | 2018/2019* (estimates) |
|---|---|---|---|
| Production (tons) | 1 910 000 | 1 435 000 | 1 840 000 |
| Average consumption per year (tons) | 3 196 000 | 3 236 000 | 3 234 000 |
| **Ending stocks (tons)** | 341 000 | 725 000 | 724 000 |
| **Imports (tons)** | 935 000 | 2 175 000 | 1 520 000 |

*Source: Grain SA, 2019, Dataset as at 29 March 2019*

In anticipation of the new season, since South Africa remains a net importer we need to look at factors that influence local wheat prices. Firstly, the **supply of global wheat**, the more wheat produced worldwide, the lower the prices will be, and the less wheat produced worldwide, the higher prices will be. Secondly, **cost of wheat** from country of origin, which then ties in with the **rand dollar exchange**, which influences the cost at which wheat can be imported (**import parity**); the weaker the rand the more prices are supported and the stronger the rand the more pressure on prices will be.

## CONCLUSION

The global market seems to have sufficient wheat supplies and as a result, international wheat prices could remain under pressure for another season. Looking at factors that affect local wheat prices South Africa, as a net importer of wheat could also remain under pressure, regardless of the production situation in the domestic market, however a continued weaker rand could be beneficial to the market. ■

# THE NECESSITY TO **MOTIVATE** YOUR EMPLOYEES

WHAT DOES IT MEAN TO BE MOTIVATED? MOTIVATION CAN BE REGARDED AS SOMETHING IN A PERSON THAT DRIVES HIM/HER TO ACT IN A CERTAIN WAY EVEN IN THE ABSENCE OF ANY EXTERNAL DRIVING FORCES. IN THIS RESPECT MOTIVATION CAN BE LINKED TO THE WILL OF A PERSON. NORMALLY A MOTIVATED PERSON IS SOMEONE WHO REACTS POSITIVELY ESPECIALLY WITHIN THE WORKPLACE. TO BE MOTIVATED MEANS TO BE TREATED WELL AND BE USED WELL.

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

Is it necessary to have motivated employees? Or, what are the advantages of having a motivated workforce? A motivated employee is a productive employee, in other words he/she does the work or task in the correct way and within a reasonable and expected time without continuous supervision. This employee will take care of any tools needed and use the tools responsibly.

- Performance = Ability (can do the job) x Motivation (will put in an effort).
- Ability = Aptitude (willingness) x Training x Resources (have the correct tools).
- Motivation = Desire (have a desire to do the job) x Commitment (to do the job correct and in time).

From a financial perspective it is a necessity to have motivated employees. You will re-call the formula Profit/Loss = Income - Expenditures, which we have so far used frequently in our articles. Due to the ever-increasing cost/price squeeze that our farming businesses found themselves in, the proper managing of income and expenditures becomes even more important. Motivated employees will assist by being responsible and more productive.

## MOTIVATE EMPLOYEES

By this time, you will have asked yourself the question – but how do I motivate my employees?

Have a good look at yourself as owner/manager. Do you portray a positive attitude towards your own business? What example do you set when using your resources? (tools for instance). Do you respect your employees and treat them accordingly? Do you apply high ethical standards when conducting your business? Do you tolerate poor performance? Do you show favouritism? Do you ever threaten your employees?

> *Motivated employees will assist by being responsible and more productive.*

Motivation is a management component and begins and falls with the manager. It is quick and easy to demotivate people; it takes much more time and effort to motivate them and it differs from person to person. Important to remember, that building a motivated team is often more about not demotivating than creating motivation.

## DEMOTIVATING FACTORS

Generally demotivating factors, also referred to as treatment factors, are problems related to salary and other employment conditions, overdoing supervision, relation with supervisor, relations with fellow workers, relations with subordinates, company policies, rules and regulations, physical working conditions, status, job security, petty and senseless bureaucracy, public correction of an employee and, biasedness when applying discipline.

Motivating factors or utilisation factors can be recognition of achievement, the possibility of growth in skills and knowledge, promotion, increasing responsibility, challenges in the workplace, proper and respectful communication and the work itself.

Every person wishes to be treated well and be used well. Thus, the treatment and the utilisation factors are both of importance. In case the one group of factors is neglected, the other group on its own will not be strong enough to cause job satisfaction or better performance. If only a good wage is paid, and a neat house provided, but the employee is forced to work continuously, very boring, physically hard work, day in and day out, he/she will not be motivated. The opposite is also true. If someone is given very good training and a lot of responsibility but kept on a low wage and are continuously treated unkindly, he/she also will be poorly motivated.

The two groups of factors also differ regarding to their effect on the employee. The effect of treatment factors is of short duration. Consider wages for example. The employee is satisfied with the wage increase only for a short while – one or two months – at the most, then the effect and the motivation has worn off. It is like being hungry. You eat something, but you simply get hungry again very soon. The need for more money and for the other treatment factors will never be fully satisfied. These represent an ever-increasing level of expectations.

The treatment factors such as better housing, food, transport, or money, are not strong enough to make people work harder. They simply give a small upsurge in performance.

Long term motivation, however, could be obtained by introducing those factors which cause someone to be interested in his/her work because he can use his skills, his knowledge or his talents. Also, because he can be trained and because enthusiastic attempts are recognised: This we call job enrichment.

## CONCLUSION

Both sets of factors – the treatment as well as the utilisation factors should be tackled at the same time. If the utilisation factors are neglected, employees will only ask for more and more of the treatment factors which will increase costs for the business. ■

# Animal diseases that affect humans

## Psittacosis or parrot fever

PSITTACOSIS IS A DISEASE THAT CAN BE CONTRACTED BY PEOPLE WHO COME INTO CLOSE CONTACT WITH BIRDS AND MORE PARTICULARLY THOSE OF THE PARROT FAMILY (PSITTACINE BIRDS). THE MICO-ORGANISM CAUSING PSTITTACOSIS IS *CHLAMYDOPHILA PSITTACI*.

***Jan du Preez, veterinary specialist, Public Health.***
***First published in SA Graan/Grain July 2018. Send an email to drjanh.dupreez@gmail.com***

Infections occur naturally worldwide and have been identified in at least 400 avian species, particularly caged birds, colonial nesting birds, raptors, ratites and poultry. Pigeons, turkeys and ducks are most often affected. Among cage birds affected, more than 70% belong to the parrot family.

For practical purposes, all species of birds are a potential source of infection, although the prevalence of infection is significantly greater in caged birds than in wild ones. Some birds carry this organism asymptomatically. Others become mildly to severely ill, either immediately or after they have been stressed (nutritional deficiencies, handling, overcrowding or egg laying).

The micro-organism lives within the cells (intracellular) of the body. In people, parrot fever is readily treated with antibiotics, but it can be fatal if it is left untreated. Other potential hosts of *Chlamydophila* species include sheep, goats, cattle, dogs, pigs and horses. The disease is also known as bird's fever and avian chlamydiosis.

### HOW DO PEOPLE CONTRACT THE DISEASE?

Psittacosis is a direct zoonosis contracted as a result of close contract with birds, usually by inhalation of the infectious agent. The droppings of infected birds, which may be symptomless carriers or noticeably sick, contain large numbers of organisms. When the droppings dry out an aerosol is formed in which in the organisms are suspended and can be inhaled by people. Contaminated feathers also play an important role in spreading the disease.

Transmission from one bird to another also occurs by inhalation of contaminated droppings and by the ingestion of infectious material, but transmission via the eggs (transovarial) of infected birds to the chicks is also possible.

A person is an incidental victim of the disease and transmission between people (person-to-person) is rare. Dogs can be infected with *C. psittaci* if they eat infected bird carcasses or faeces. They are probably also infected via inhalation.

### THE DISEASE IN BIRDS

The disease in birds may not be obvious and apparently healthy birds may carry and excrete the organisms in their droppings. When stressed, such birds show severe symptoms of illness. Birds that have a lowered resistance due to overcrowding and unhygienic conditions in their cages, nutritional deficiencies, or prolonged transportation are more prone to the disease. Birds with the disease may show fever, greenish diarrhoea, inappetence, emaciation, respiratory distress, discharges from the eyes and nose and listlessness.

### SOURCE OF INFECTION

The natural sources of infection are wild as well as domesticated birds, other animals of both types may also possibly constitute a source of infection. If the host animal, usually a bird, is exposed to stressful conditions, the micro-organism multiplies readily and is consequently excreted in large numbers.

Birds excrete the organism intermittently and at times continuously for weeks or months in faeces; this applies to a lesser extent to nasal secretions. There are several strains of *C. psittaci*, which vary in their capacity to cause disease. This may explain why the disease in humans varies so much in severity.

### SYMPTOMS IN HUMANS

The interval between infection and first signs of illness is usually about ten days but varies from four to 15 days. Symptoms include fever, headache, muscular pains, chills, respiratory signs such as coughing or pneumonia and malaise, among others. The disease in humans may vary from a minor to a serious illness. Parrot fever in humans and birds often starts with flu-like symptoms and becomes a life-threatening pneumonia.

### PREVENTION AND CONTROL

- Psittacosis is a controlled animal disease in South Africa in terms of the Animal Diseases Act, 1984 (Act No. 35 of 1984).
- Total prevention and control of psittacosis is impossible in practice because of the large number of host animals, including wild birds, which may serve as source of infection. To date no successful vaccine has been developed for use in host animals and birds to prevent dissemination of infection.
- Strict implementation of efficient quarantine measures, especially those applicable to birds imported from areas or countries is essential.
- Preventive treatment of birds (chemoprophylaxis), using specific medication, is successfully used during transport to prevent excretion and dissemination of the causative organism.
- Good control, hygiene, care and ventilation for birds in captivity (cages) is essential to minimise stress and thus keep the level of infection as low as possible.
- People who keep birds in their homes, especially those of the parrot family, and who are therefore in close daily contact with these animals, should consult their veterinarian about the health of the birds. ■

# Favourable microbes in sustainable agriculture

FOOD PRODUCTION MUST DOUBLE BY 2050 TO FEED THE GROWING WORLD POPULATION. AT THE SAME TIME THE RESEARCH ENVIRONMENT IS SUGGESTING THAT THE USE OF INORGANIC FERTILISER AND HERBICIDES SHOULD BE REDUCED.

***Owen Rhode, ARC-Grain Crops, Potchefstroom. First published in SA Graan/Grain July 2018. Send an email to RhodeO@arc.agric.za***

The dual aim of securing food production and farming sustainably places a renewed focus on gaining bigger benefits from the interactions between agricultural crops and microbes. The benefits that soil microbes hold for sustainable agriculture are invaluable.

Microbes play a key role in, among other things, nitrogen fixing, absorption of nutrients, disease control, and promoting the soil structure.

## RHIZOSPHERE ACTIVITY

The rhizosphere can be described as the thin layer of soil around roots that is influenced directly by the secretion compounds of the roots and microorganisms. Plant roots manufacture and release a variety of compounds, which are then used as food by soil microbes. These root secretions act like messengers that stimulate the microbial population. Some of the compounds that are produced by the plant can promote the growth of beneficial bacteria, while others suppress harmful bacteria.

A group of compounds released by the roots is the sugars that are produced in the leaves of the plant or crop. The sugars then move downwards to the rhizosphere and serve as food for bacteria and fungi. These microbes are able to dissolve phosphates locked in the soil and thus make them accessible to the plant.

Fungi like *Trichoderma* spp. can suppress other harmful fungi and promote the plant's defence mechanisms. Nitrogen-fixing bacteria live in close association with plant roots and can also supply the necessary nutrients to the plant.

Like the bacteria and fungi, protozoa are also active in the rhizosphere. Protozoa have the ability to feed off the bacteria and thus to control the number of bacteria. The presence of protozoa in the rhizosphere can promote the growth of plants.

It has also been found that protozoa like the amoeba can absorb bacteria as food. In this way bacterial nitrogen can be released in the rhizosphere. Nematodes are also effective predators of bacteria. They have an effect similar to that of protozoa.

## NITROGEN FIXING IN SYMBIOSIS AND FREE-LIVING NITROGEN FIXATORS

Many microbes fix nitrogen symbiotically to a host plant. In this specific partnership the plant provides sugars to the microbes and nitrogen is then fixed by microbial processes so that the nitrogen is later released to the plant again. This process occurs particularly in the well-known interaction between microbes and legumes, where nitrogen is fixed symbiotically.

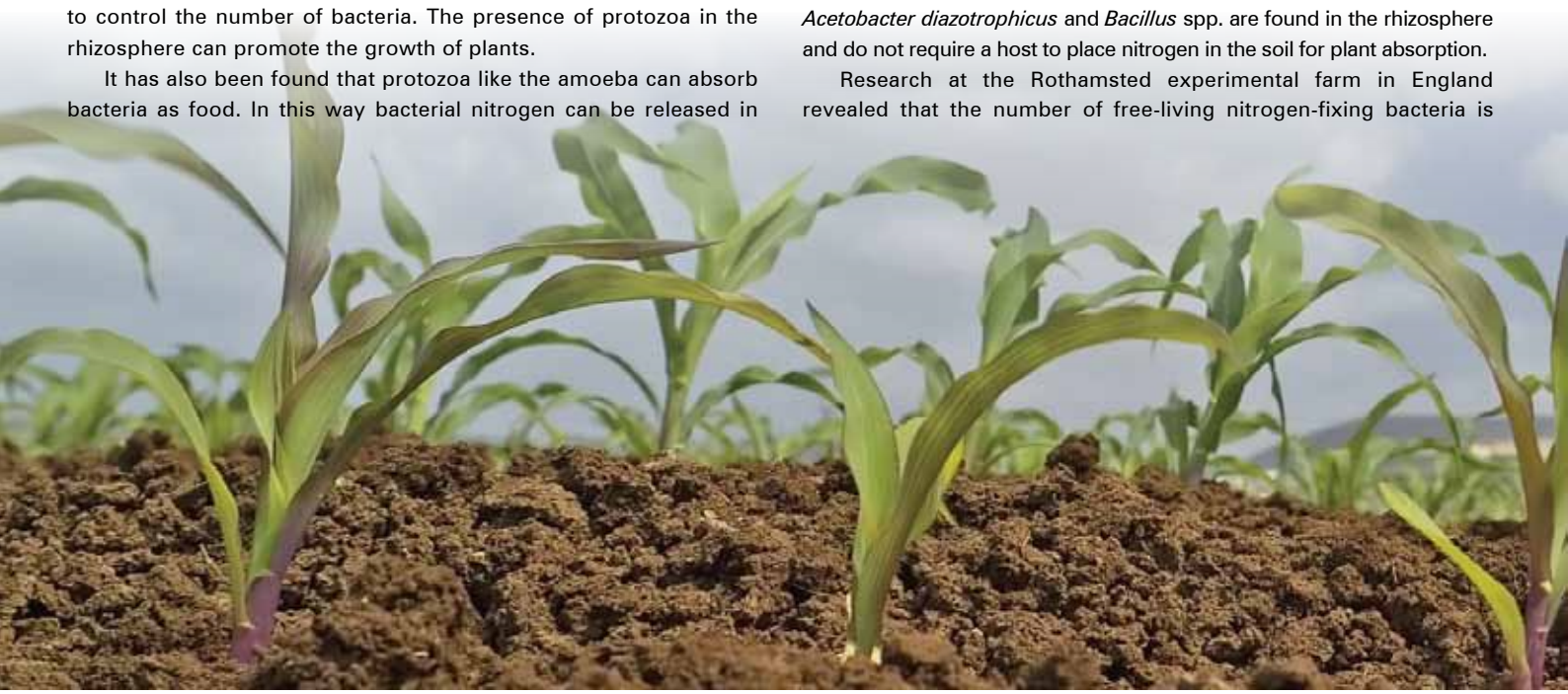
The best-known example of symbiotic nitrogen fixing is probably the interaction between legumes and rhizobia bacteria. Examples of the latter are the well-known Rhizobium and Bradyrhizobium bacteria that are applied to legumes like soybeans and groundnuts.

A unique property of rhizobia bacteria is their ability to form specialised nodules in a symbiotic association with the legume. The process of nitrogen fixing is activated if the rhizobia encounters compounds like flavonoids, secreted by the plant roots, in the rhizosphere.

A range of rhizobia genes is activated, leading to the infection of the plant by rhizobia bacteria, and ultimately the formation of nodules. The interaction converts atmospheric nitrogen to a renewable source of nitrogen for agricultural use, with estimated additional values of as much as 300 kg of nitrogen per hectare per year.

There is a range of bacteria present in the soil and that can fix significant quantities of nitrogen without any other organisms playing a role. Free-living nitrogen-fixing bacteria like *Azospirillum* spp., *Azotobacter* spp., *Acetobacter diazotrophicus* and *Bacillus* spp. are found in the rhizosphere and do not require a host to place nitrogen in the soil for plant absorption.

Research at the Rothamsted experimental farm in England revealed that the number of free-living nitrogen-fixing bacteria is



higher in fields where no nitrogen has been applied. It was also found that these bacteria can also provide up to as much as 20 kg of nitrogen per hectare in the soil additionally if crop rotation is applied.

## MYCORRHIZA AND PHOSPHATE-RELEASING MICROBES

One of the main role-players creating a bridge between the plant and the soil is the well-known arbuscular mycorrhiza fungi. Several studies have shown that mycorrhiza fungi hold a direct benefit for a crop as they make nutrients available to the crop, which can lead to increased productivity.

Arbuscular mycorrhiza fungi live in harmony with plant roots. Mycorrhiza, also known as root fungus, is derived from the Latin word *myco*, which means fungus, and the Greek word *rhiza*, which means root. It is found in most types of soil and is abundant in the rhizosphere.

Unfortunately, mycorrhiza fungi can grow and reproduce only in the rhizosphere. A part of the fungus is therefore inside the root, as the host plant's roots are colonised by the fungus. Certain plants are suitable hosts to mycorrhiza. Crops like maize, legumes and sunflower are excellent hosts to mycorrhiza fungi. However, canola and cole crops cannot serve as hosts to mycorrhiza fungi. Each plant or crop has its own group of species of mycorrhiza.

Mycorrhiza forms a network of fine hyphae in the rhizosphere to extend the root surface and thus to increase the absorption surface of roots by between 100 and 1 000 times. The extended network of hyphae makes the plant roots more effective when absorbing water and other nutrients like phosphorus (P) and zinc (Zn).

In turn, the mycorrhiza fungus obtains sugars (carbon) and other substances from the plant roots. Both host and fungus benefit. Soil cultivation is extremely harmful to mycorrhiza. Mycorrhiza inoculants are commercially available and are particularly beneficial in P-limiting soils.

Another group of bacteria, for example *Pseudomonas, Bacillus* and actinomycetes, as well as fungi (*Aspergillus* and *Penicillium*), has the ability to mineralise and release phosphorus (P) that is unavailable to plants in the soil. Like in the case of arbuscular mycorrhiza fungi, the use of inoculants for the above organisms is also viewed as beneficial – particularly in P-limiting soils.

## SUPPRESSION AND PROTECTION AGAINST DISEASES

The roots of young crops in particular are susceptible to infection by pathogenic fungi, bacteria or viruses. Mycorrhiza and pathogens compete for infection spaces on the root surface and also compete for carbon and other nutrients. In this way the pathogens are kept out through competition.

Mycorrhiza fungi can also secrete compounds with anti-microbial properties, which prevents undesirable fungi from penetrating the roots of the host plant. In the presence of mycorrhiza, pathogens are to a great extent excluded from the process. Without any help from outside, mycorrhiza serves as an extremely effective biological control intermediary.

An excellent example of mycorrhiza protecting the plant against pathogens is *Fusarium* spp., which causes root rot and crown rot in maize. In cases where mycorrhiza cannot accomplish complete suppression of pathogens, it still contributes to the defence of the host plant in combination with other biological agents like the well-known root nodule bacterium, *Rhizobium* spp.

## SOIL STRUCTURE AND NUTRITIONAL BENEFIT

The network of mycorrhiza hyphae contributes to soil structure and stability. A by-product of the activity of mycorrhizae is the manufacture of glomalin, a compound that improves soil structure.

Glomalin is basically the glue that binds clay particles together to form larger aggregates. In this way larger pore spaces are established in the soil, which promotes gaseous exchange around the root zone. Naturally, this creates the ideal spaces for plant roots to grow and function. The spaces also promote the rapid division of beneficial aerobic bacteria that can fix nitrogen and dissolve phosphorus and make it available to the plant. Mycorrhiza hyphae can also bind sand, which creates an ideal moisture retention environment for plant roots and bacteria.

Mycorrhiza colonises younger plant roots in particular. In older plant roots the root cortex layer in which the mycorrhiza occurs, also breaks down in time. Fine roots are the main location of mycorrhiza development and are also the most active section for nutrient absorption.

The addition of organic matter like compost can also have a positive effect on the spore numbers of arbuscular mycorrhiza fungi. In dry areas the mycorrhiza fungi help to transport scarce water to the plant.

## CONCLUSION

Favourable microbes in the soil are responsible not only for breaking down organic matter, but also bind and release important plant-absorbable nutrients, build up the soil structure, break down toxic substances and suppress diseases and pests – everything in promotion of a sustainable plant and crop production system. ■

# How to improve
# SOIL FERTILITY MANAGEMENT

FARMING IN SOUTH AFRICA IS UNDER SEVERE PRESSURE. IN ADDITION TO POLITICAL AND CLIMATE PRESSURE, COSTS ARE ALSO PINCHING. IN THIS RESPECT IT IS REMARKABLE HOW HIGH NITROGEN COSTS ARE IN ALL PROVINCES IN SOUTH AFRICA COMPARED TO THOSE IN THE REST OF THE WORLD.

***Adri Theron. First published in SA Graan/Grain July 2018. Send an email to johan@infoworks.biz***

'Over-fertilisation is a reality. Not only does it cost the producer money, it also reduces the health of his soil and makes the soil addicted to fertiliser, as it were. Grain producers in South Africa have above-average input costs, and fertiliser costs in particular are extremely high measured against international figures and should be addressed,' said Mr GP Schoeman, chief executive of Agrisol, at the beginning of his presentation at the Conservation Agriculture Conference in Ottosdal on 13 and 14 March 2018.

There are a few principles that Agrisol regards as important in soil fertility management:

- Ratios between elements; synergism and antagonism; and the fact that one element influences another. If there is too much of one nutrient, another one is reduced.
- Calcium and magnesium and the ratio between the two nutrients are extremely important. The elements are important nutrients and have a major influence on the pH of the soil. pH is important, but land with the correct pH can offer other challenges, like poor infiltration, compaction, drought sensitivity and waterlogging, to mention only a few. Nutrients are available to a greater extent at a particular pH, but that is not all that is involved. pH is the result of the correct cation balance in the soil. It is about nutrition, but also not just nutrition. Cation balance has a major influence on the structure of the soil, and structure has a significant influence on other aspects like drainage, salination, gaseous exchange, soil life and cultivation costs. (See examples of good and poorly structured soil in **Figure 1**.)
- Soil health. Soil life is important and has always been underestimated. It reduces risk, puts rands in producers' pockets and makes farming sustainable.

## POINT OF DEPARTURE

'Firstly, the variation in a field should be eliminated as far as possible. We do this by making grid analyses every two to four years and recommending a variety of corrections. Over time Agrisol has developed algorithms that take the importation ratios at a particular spot in the field into account and enable us to make recommendations on the basis of the specific characteristics of the soil,' he said.

Secondly, soil health analyses are carried out before every new planting. On the basis of this information a fertiliser plan is compiled for the year that takes soil health, available inorganic as well as organic nutrients and also the crop and yield objective into account. Only nutrients with too low levels are then supplemented.

The results of the producer's conservation culture practices are thus measured and the producer can utilise the benefits. In general, fertiliser costs are then considerably lower than would normally be the case. In the following year, there are usually also more nutrients available than expected, because the soil health recovers and soil microbes start playing a bigger role. Having nutrients in balance is therefore beneficial. This further reduces input costs.

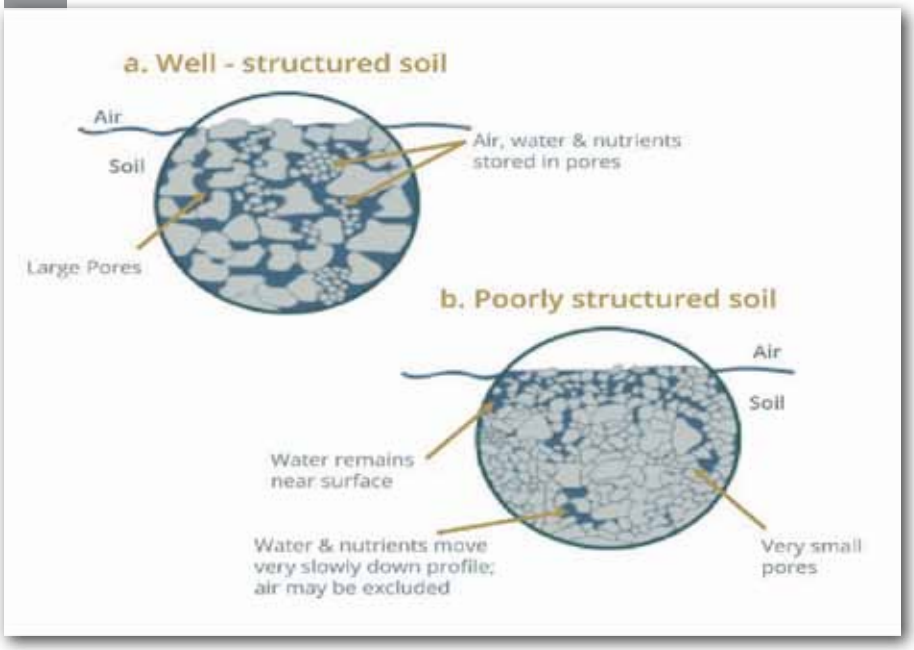
Thirdly, the fields are monitored throughout the season by agricultural scientists with the aid of a cellphone app. This app offers a variety of maps, your current position, communication between role-players and record-keeping.

'We have encountered fields that are poor and leached, and where everything needed had to be applied. Then there are fields where nitrogen has built up to high levels and little has to be applied. Here the nitrogen build-up is actively detrimental to soil health.'

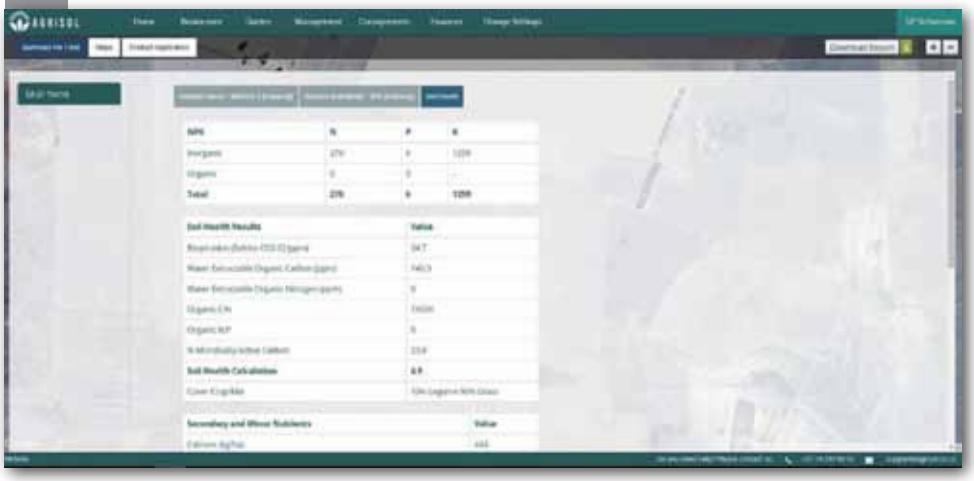
The ideal situation is to have more organic nitrogen and phosphates available, which reduces costs because nutrients are supplied 'free' and can be utilised.

'On a poor, leached field a producer must apply 23 kg of nitrogen per hectare, and on a field with a degree of inorganic nitrogen and a little organic nitrogen, you can get away with 15 kg/ha. Then there are fields where a lot of inorganic nitrogen (fertiliser) is lying, where a producer need not fertilise a lot, and there are fields that have little

**1** ***Good and poorly structured soil.***



**2** ***A Mehlich 3 analysis of a field owned by Mr Cobus van Coller.***



inorganic nitrogen and that require little fertiliser, because in such a case the soil is alive and the soil organisms make a significant contribution to the production of organic nitrogen,' he explains.

Schoeman used the example of a field belonging to Mr Cobus van Coller (former executive member of Grain SA – Viljoenskroon) (see **Figure 2**), where the Mehlich 3 analyses did not look too bad at first glance, according to him, but the pH was quite close to correct; calcium and magnesium were a bit low and potassium was extremely high. The field did not perform well.

'The soil health analyses we carried out indicated that there was 270 kg of inorganic nitrogen in the soil of that field. It was also remarkable that according to the Mehlich 3 analyses, there was 26 ppm of phosphate, but if you study the soil health analysis, there was only 6 kg/ha available for plants to use. There was therefore a really major challenge in that field as far as phosphate was concerned, and there was a lot of nitrogen available.

'What we did, was to apply a lot less nitrogen than normally and focus on making phosphates more available. With the high potassium (1 259 kg/ha were available) it was not necessary to apply potassium. Those were rands waiting to be utilised by the producer.'

It was decided to apply very little nitrogen, more phosphate and no potassium – which differed completely from a fertiliser plan based on withdrawal figures.

## HOW IS CROP FERTILISATION APPROACHED?

According to Schoeman, Agrisol 'measures' the inorganic nutrients, adds the organic portion and then makes a recommendation per crop, per field and in terms of the yield objective. While rendering all these services, they have become aware of the importance of data and the processing of this data. That is why they have an excellent IT department, where software is developed to use in this regard.

Their internal software team and agricultural experts have developed a web system to which every producer and his co-workers have access – if the producer wants to give them access. Agrisol has also invested a lot in presenting it as simply as possible to the producer and making the process simple and understandable.

Because it is also an extremely important input, they also developed a lime module, because they believe that the industry is quite chaotic. Their approach was to establish how much calcium and how much magnesium a farm required. The analysis and effectiveness of each source are taken into account to calculate how much of that particular product can make the necessary corrections. They then calculate the distance from the farm gate to all the lime sources (all the lime companies are included) and within a day or so supply the producer with the cheapest to the most expensive way to make the corrections, taking the effectiveness of the lime into account as well.

'We have also developed an app (iOS and Android) that we believe will make a major contribution to research in the future – in the sense that one can retrieve more value from the data – and so that everyone coming to a farm can work from the same set of data. Information can even be shared in study groups and in other forums,' Schoeman says.

## WHAT METHOD IS RECOMMENDED?

'We believe that the playing field should be level, so we conduct precision analyses of soil of which we correct the balance or that we equalise after about three crops more or less every third year.'

Soil health is measured annually after every crop. What they do in KwaZulu-Natal, is to obtain 2 ha of grid samples and carry out a combined soil analysis, analyse the soil health so that one can see the trends over time, and also to determine what organic and inorganic elements are available and what is still required, and then we fertilise every field accordingly.

'We have already accomplished enormous savings in fertiliser and still achieved enormous successes. For example, Mr Chris Bothma in the Viljoenskroon district along the Vaal River, who is also quite progressive with respect to conservation agriculture and is extremely interested in it, last year planted with 42 kg of nitrogen per hectare, where he usually applied 90 kg/ha. There was already considerable inorganic and a lot of organic nitrogen available in the soil. The objective was 4,8 t/ha, and in the end he harvested 6 t/ha. The consumption of chemicals was the lowest of everyone at the company where they usually buy their chemicals. They consequently achieved extremely low costs and the weed pressure was low – chemical and nutrient imbalances can have a major effect on weed pressure too. In addition, all their fields produced the same yield for the first time – with little variation in the fields.'

Other services that Agrisol intends providing soon are to draw more detailed precision maps where they scan the fields with electro-magnetism (EM physical surveys), provide detailed physical properties analysis, and measure surface drainage and deep subterranean drainage.

Address any enquiries to GP Schoeman at 018 297 8516, 076 775 0359 or *gp.schoeman@agrisol.co.za*. ■

# DOES OUR INSECT RESISTANT MANAGEMENT STRATEGY STILL WORK?

***Dr Annemie Erasmus and Elrine Strydom, ARC-Grain Crops, Potchefstroom. First published in SA Graan/Grain July 2018. Send an email to ErasmusA@arc.agric.za***

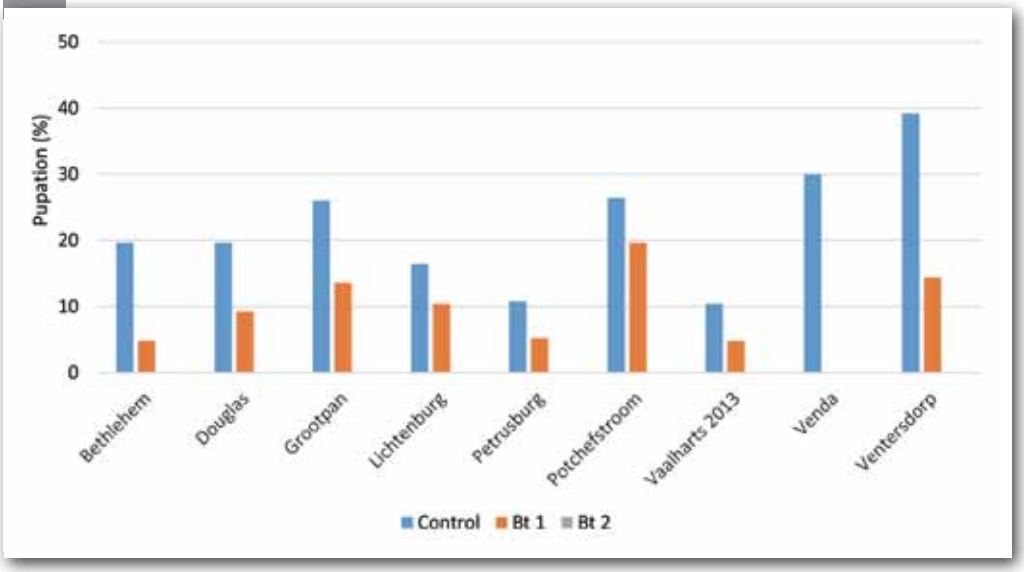
GENETICALLY MODIFIED MAIZE EXPRESSING THE BT GENE, IS PLANTED IN SOUTH AFRICA TO CONTROL ONE OF THE MOST IMPORTANT INSECT PESTS OF MAIZE, THE AFRICAN MAIZE STEMBORER, *BUSSEOLA FUSCA* (LEPIDOPTERA: NOCTUIDAE). THIS SPECIE HAS BEEN REPORTED TO BE RESISTANT TO THE FIRST GENERATION BT MAIZE (BT 1) AT SEVERAL LOCALITIES IN SOUTH AFRICA.

However, no resistance to the second generation Bt maize (Bt 2) planted in South Africa has been reported to date. The urgent need to evaluate different African maize stemborer populations by comparing these populations' life parameters were recognised by the ARC-Grain Crops in collaboration with the North-West University.

Larvae of the African maize stemborer were collected from a few localities across South Africa where maize is being produced. Feeding studies were conducted in which these larvae were reared on plant tissue of maize events expressing the single (first generation Bt maize) and pyramid (second generation Bt maize) proteins, to compare the fitness to that of larvae surviving on the non-Bt iso-hybrids.

In a previous article published in the *SA Graan/Grain* of June 2017 (*'n Oorsig van stamboorderpopulasies se weerstandsvlakke teen enkel- en dubbelgeen Bt-mielies*), results of only larval survival and larval mass were presented. With the current article, life parameter results of pupae (**Photo 1**) and moths (**Photo 2**) are presented.

**1** ***Pupation (%) of different* Busseola fusca *populations after larval feeding on non-Bt and Bt maize.***





**Busseola fusca *pupae.***


**Busseola fusca *moth.***

The pupation percentage of each location was determined. The highest pupation percentages were recorded for the non-Bt treatment from the Ventersdorp population (39,2%) followed by Venda (30%), Potchefstroom (26,4%) and Grootpan (26%) (**Graph 1**).

Pupation on the single Bt event was less successful and the Potchefstroom population had the highest pupation percentage of 19,6% (Graph 1). No pupation occurred in the Venda population on the Bt 1 treatment, indicating that this population is still highly susceptible to Bt maize. No larvae of any populations survived on the Bt 2 treatment and therefore no pupal data could be recorded.

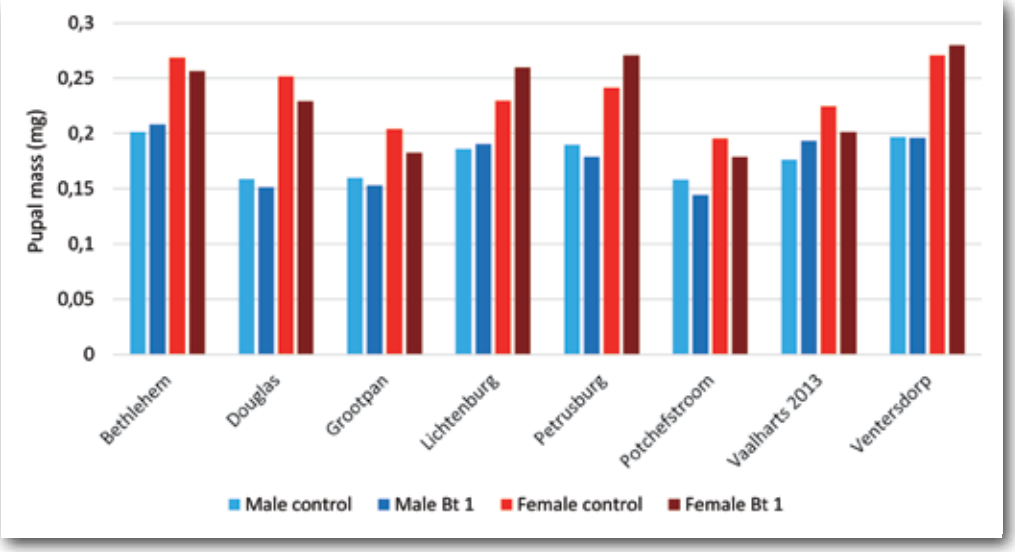
The mass of both male and female pupae were determined separately. Statistically there was no significant difference between pupal weight on the non-Bt and Bt 1 treatment for both male and female pupae (**Graph 2**), indicating that the larvae that had fed on the Bt 1 treatment was just as fit as larvae feeding on the non-Bt treatment. From this data it was also apparent that the female pupae tend to be heavier than the males.

Moth longevity was determined from populations that had sufficient numbers of moths that emerged from pupae. There was no significant difference in moth longevity between the non-Bt and Bt 1 treatments of any of the populations. Male moth longevity on both treatments ranged between five and seven days and female moth longevity between six and eight days, respectively (**Graph 3**).

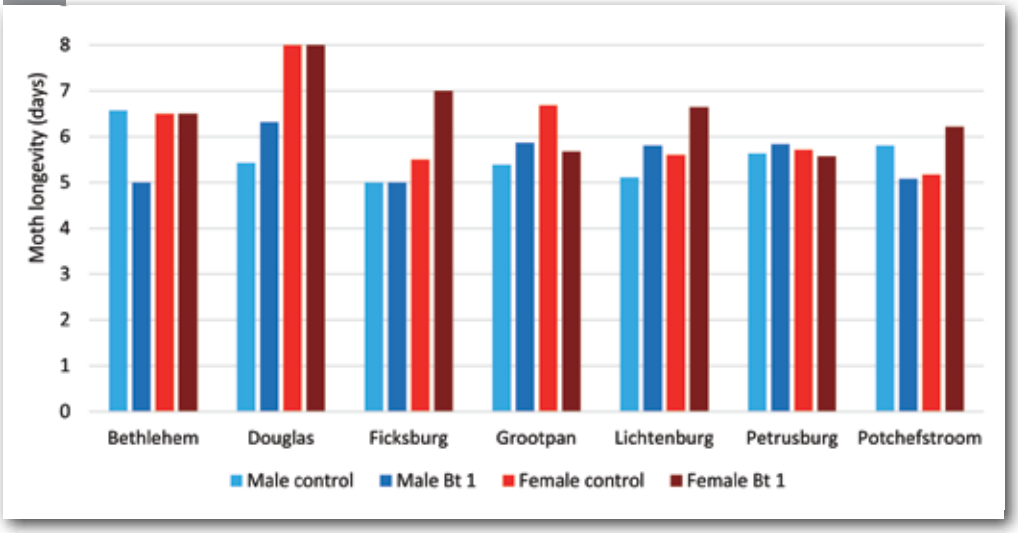
It is important to monitor these life history parameters of pupae and moths – not only that of the larval stage as described above, because of concerns about evolution of resistance due to the extensive cultivation of Bt maize.

Monitoring the fitness of all the life stages of the African stemborer to survive and reproduce provides valuable information that can be used in the management of insect resistance evolution. Since the African maize stemborer is already known to be resistant to Bt maize that express Cry1Ab proteins, it is therefore important to know if there is any fitness cost present in resistant populations.

**2** ***Mass of male and female pupae of different* Busseola fusca *populations feeding on non-Bt and Bt maize.***




**3** ***Longevity of* Busseola fusca *moths after feeding on non-Bt and Bt maize.***




*It is important to monitor these life history parameters of pupae and moths.*

Fitness costs could possibly play a role in resistance management strategies as it may select against resistance. This study not only provides baseline information of the African stemborer susceptibility to Bt maize in South Africa, but also other African countries. Information compiled about pupa and moth life parameters adds value to determine if the insect resistant management strategy that is used still has the power to delay resistance development. ■

# MINIMISE RISK
## with our product range

BAYER CROP SCIENCE IS COMMITTED TO THE DEVELOPMENT OF A WIDE RANGE OF INTEGRATED PRODUCTS TO SUPPORT COMMERCIAL AND SMALLHOLDER FARMERS ALIKE. OUR RESEARCH FOCUSES ON THE IMPROVEMENT OF FARM PRODUCTIVITY AND OUR PRODUCTS AND SERVICES ARE AIMED AT IMPROVING THE HEALTH OF PLANTS, ANIMALS AND PEOPLE AS WELL AS OUR ENVIRONMENT. AS A COMPANY WE TRY TO ADD VALUE THROUGH SUSTAINABLE INNOVATIVE PRACTICES, IDEAS AND PRODUCTS.

'Because plant biotechnology, genetics and breeding, as well as our crop protection solutions play an important role in the improvement of productivity and profitability on the farm, we focus on all these aspects in our research', says Magda du Toit.

### PRODUCT RANGE

The DEKALB seed product range offers excellent agronomic traits to farmers, but also supports our plant protection solutions which ultimately add to improved yield potential. Farmers can select from the DEKALB product range and compile a complete package to address their needs to minimise risk.

***Magda du Toit, Corporate Engagement and Communications Manager SA, Bayer. Send an email to magda.dutoit@bayer.com***

**Irrigation market**

In the irrigation market, we offer short growth season hybrids such as DKC60-76BR, DKC60-74R and DKC60-70. These hybrids are specifically adapted for planting under irrigation after wheat.

DKC60-76BR has an excellent yield potential with a good seedling vigour that grows very well. It also dries off quickly and has excellent tolerance against Diplodia, northern leaf blight and grey leave spot and rust. The ideal plant density is between 80 000 and 100 000 plants/ha with row widths of 50 cm to 75 cm. At maturity the plant height will be approximately 215 cm to 250 cm with the ears at 100 cm to 120 cm. We advise that this hybrid be harvested at 12% moisture. DKC60-74R and DKC60-70 are two similar products in the same family.

**Dry land hybrids**

Regarding our dry land hybrids, we are very proud to have DKC72-76BR, DKC72-72B, DKC72-74R, DKC72-70, DKC76-77BR, DKC76-73R and DKC76-71 in our product range.

DKC72-76BR is known for its prolificacy and this trait contributes hugely to the excellent yield potential of the hybrid in both the eastern and western maize production areas. It has a very quick dry off period and good standability. We advise that the hybrid is planted to a population of between 20 000 to 60 000 plants/ha in row widths of 0,75 m to 2,3 m dependent on the production area. The plant height is between 280 cm to 380 cm and ears will be placed at about 110 cm to 170 cm. DKC72-72B is a very similar hybrid but contains only the YieldGard® Maize 2 trait technology for control of corn borers and fall army worm. DKC72-74R contains the Roundup Ready® Maize 2 trait technology to assist with broad control of weeds. DKC72-74R can also be used to plant the refuge area for DKC72-76BR. DKC72-70 is also available and can be planted as a refuge for DKC72-77B.

DKC76-73R is also a prolific hybrid that contains the Roundup Ready technology and is also suitable for planting in both the eastern and western maize production areas. The hybrid has a very good standability and the ears are nicely protected by the husks. DKC76-73R shows good tolerance against all maize diseases and can be used in the planting of refuge areas. We would advise that the hybrid be planted to a density of between 20 000 to 60 000 plants/ha in row widths of 0,75 m to 2,3 m depending on the area in which you are situated. This is a medium growth length hybrid with a plant height of about 220 cm to 320 cm and the ears will be at a height of approximately 95 cm to 150 cm.

DKC76-77BR is a stack hybrid that contains both the Roundup Ready and YieldGard and will give good yields in both the eastern and western maize production areas. It shows good tolerance against most of the maize diseases and can be planted at 20 000 to 60 000 plants/ha in row widths of 0,75 cm to 2,3 m. The plant height is 220 cm to 320 cm with cobs at 95 cm to 150 cm. Another product in this product family is the conventional hybrid DKC76-71. ■

# THE CORNER POST

VIEWPOINT

## ROB IRONS

### *Improving skills means eliminating hunger*

ROB IRONS IS A FARMER FROM THE WINTERTON AREA WHERE HE HAS A DAIRY AND CROP ENTERPRISE AND CULTIVATES MAIZE, SOYA AND WHEAT. HE STARTED HIS FARMING OPERATION IN 1979 AND BEFORE THAT WORKED ON A FARM ABOUT 20 KM FROM WHERE HE IS CURRENTLY FARMING. WITH 46 YEARS OF FARMING EXPERIENCE BEHIND HIM, HE HAS A VAST KNOWLEDGE ABOUT FARMING, BUT SAYS HE LEARNS SOMETHING EVERY DAY FROM VARIOUS FARMERS. IT IS SAID THAT EXPERIENCE IS THE TEACHER OF ALL THINGS, WHICH PROBABLY MAKES ROB AN IDEAL MENTOR.

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

This is Rob's third season as mentor and 212 mentees form part of his seven study groups this year. Of these, 80% are women who are growing in confidence as their knowledge of agriculture increases. In the Emmaus area, which ranges from Winterton to Cathedral Peak, he has three different groups which all form part of one main group, totalling 120 mentees. In the Loskop area he mentors four more groups and has monthly meetings with each group with individual visits between group sessions.

Previously these families went to bed hungry if their crop failed. The mentorship programme has had an enormous impact on their lives and most of the participants in the programme have managed to at least double their yield since starting the programme, which meant more money and improved lives.

### HOBBY LEADS TO MENTORING

Graeme Engelbrecht, Dundee Development Co-ordinator, had shared details about Grain SA's mentorship programme with Rob. 'He called on me a couple of times and told me what they wanted to achieve with the programme which stimulated my interest as I had previously done some development work with our farmers' association.'

His decision was further influenced by visits to the area through his keen interest in bird watching. Travelling in the mountainous areas, he saw how underutilised the land was – high potential soil with above average rainfall was not being used. 'I saw people living in absolute poverty and doing nothing to use the exceptional soil.' He knew that this needed to change as crops could be grown there almost effortlessly.

When Rob's son returned to the farm to join his dad, Rob decided to step back and give his son the opportunity to take over. 'I think young people need their space and I didn't want to tread on any toes, so I decided to take a step back.' He therefore had extra time on his hands and decided to become involved in the programme as a mentor.

American business magnate Steve Jobs said, 'If you are working on something exciting that you really care about, you don't have to be pushed'. Mentoring has now become Rob's 'full time job' with no one 'pushing' him to be involved.

Through the programme he has also experienced personal growth. 'When you see a previously poverty- stricken household no longer going to bed hungry, you have to change'. He shares that he has gained a large amount of satisfaction from seeing the growth of the mentees and has become more understanding, humble and patient. 'I have also realised that we all face the same problems as farmers whether we are big commercial producers or subsistence farmers. We all have to deal with price fluctuations, the changing weather patterns, workers and theft.'

### GUIDING TO HELP SOLVE PROBLEMS AND GROW CONFIDENCE

In this area farmers face huge challenges and livestock damage to the crops is one of the major problems in this area. 'Farming on communal land is challenging,' Rob says and explains that as the land belongs to the chief they are subject to his decisions. In these areas the cattle are kept in the mountains in the summer months. 'When it gets colder the livestock is moved to lands where there is no fencing. If the farmers haven't harvested yet, there will be nothing left, so they have to reap quite early – often before the crops are dry enough.'

So many of the farmers would also like to expand their enterprise, but as they lease land this is not possible. Often farmers cultivate the land for a season, but when the owner sees what is being achieved, the land is taken back, and they must start from scratch again on a different piece of land.

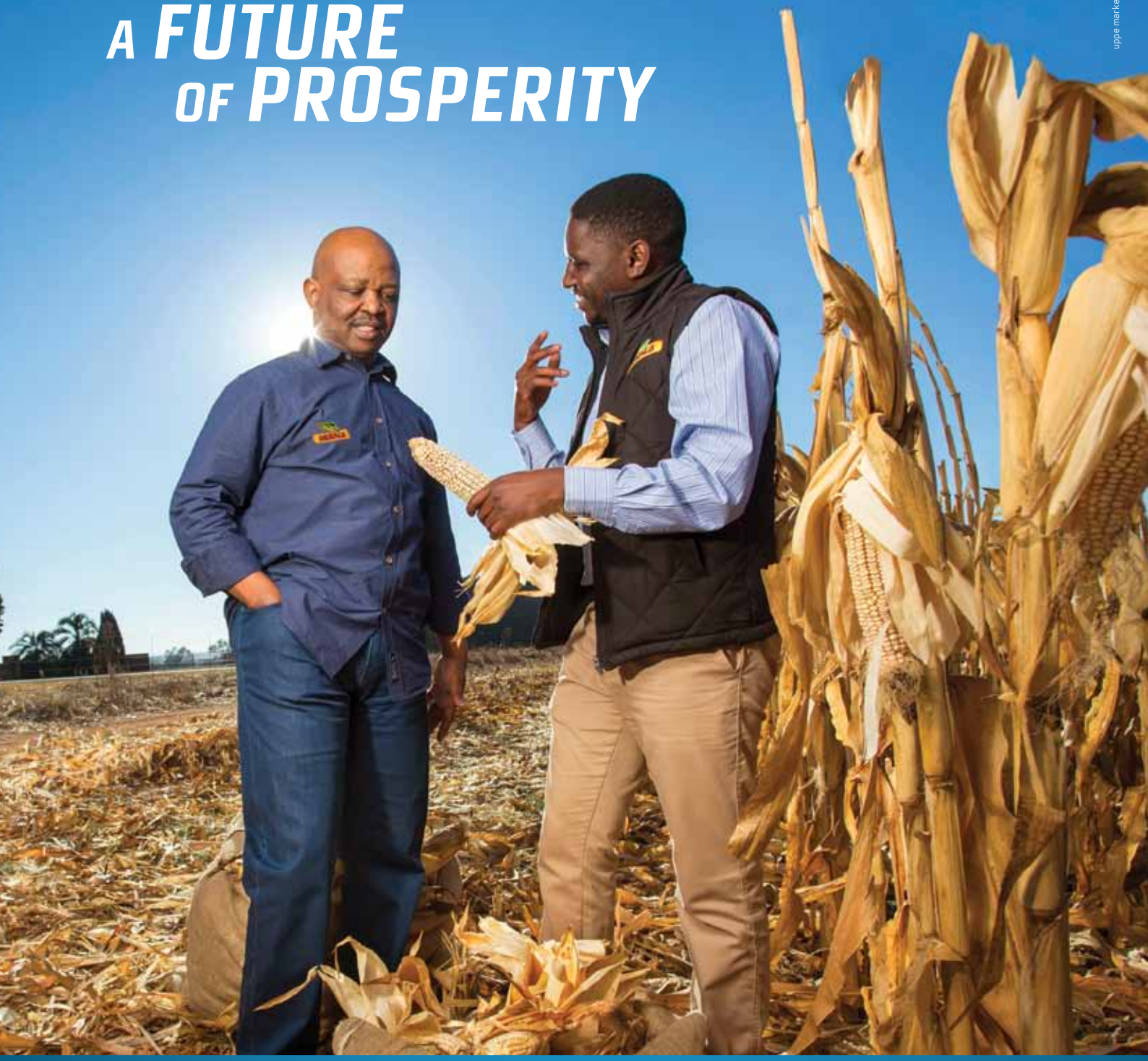
The area makes transport and the use of mechanisation difficult. In the Emmaus area, 90% of crops are hand planted. Poor infrastructure and treacherous roads make transport challenging which in turn makes selling maize difficult.

Although the mentorship programme cannot make a difference in these tricky circumstances, a lot is being done to tackle the situations that can be improved. Rob has been working hard to amend incorrect agricultural practices to improve their yield. Effective weed control is key. He is also trying to create a no till culture by not ploughing and hoeing. Recently he has also been attempting to get the farmers to think bigger and to establish the idea of commercial farming. 'The farmers must start farming to thrive and not just to make enough to survive,' he says.

They get so excited once they sell their first maize and have more than enough left to feed the whole family for a year. The women especially enjoy the status of being providers in the community with their own money, who no longer have to beg for money from male figures. 'It is incredible to see their sense of pride when they realise what they have achieved. You can actually see their confidence growing when they realise they are now the providers.'

This year Rob has a finalist in the category, Smallholder Farmer of the Year and is looking forward to the Day of Celebration in anticipation. ■

# A FUTURE OF PROSPERITY



## DEKALB® seed ... the key to your future prosperity

With the outstanding quality and advanced genetics of **DEKALB®** seed, you can look forward to an abundant crop and successful harvest. Planting **DEKALB®** innovation ensures you of the latest technology and research, supported by expert advice and professional service to unlock your full potential.

DEKALB
SEED YOUR SUCCESS



www.dekalb.co.za | DEKALB South Africa

DEKALB SA | dekalbsa | @DEKALB_SA