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GRAIN SA
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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

DESIGN, LAYOUT AND PRINTING
Infoworks
▸ 018 468 2716 ◂ www.infoworks.biz

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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 ◂ Emelda Mogane

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

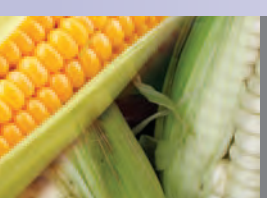
Graeme Engelbrecht
KwaZulu-Natal (Dundee)
▸ 082 650 9315 ◂ dundee@grainsa.co.za
▸ Office: 012 816 8069 ◂ Nkosinathi Mazibuko

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



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NKGONO JANE SAYS...

IN THIS ISSUE...

Farming is a constant reminder of the circle and cycle of life – you have just finished harvesting and now you are planning for the new season.

Each year we start again and we hope to be able to achieve a good crop – as farmers we cannot lose hope because it is our belief in the next season that enables us to feed the world.

For many years now, we have been trying to help the larger farmers to access production credit. It remains very challenging due to the fact that the profits to be made in grain production under dry land conditions are really not very high. Another challenge is that the farmers do not have title to the land and so they cannot offer the land as security for a loan. Although this is a problem when it comes to accessing a loan, we must always bear in mind that if you offer your farm as collateral for a loan and you are not able to repay the loan, the bank will take your farm and sell it to recover the amount owing.

This brings us back to the basic of any farming and that is the profit motive. We will only be able to farm sustainably if we are making a profit every year – we have to get more back from the crop than it cost to produce the crop.

In recent times, there has been pressure on the profitability of grain and cereal production and we have to think carefully of which crops we can afford to grow in the different areas. It is necessary to work out the total costs of producing the crop on a per hectare basis – then the average yield that you are able to get from that crop in that area and multiply that with the reigning price. If your costs are higher than the income you expect to generate then you should perhaps consider other crops. There is no sense in producing a crop at a loss.

In some areas where the rainfall is low, and the soils shallow, there might be no crop that you can produce profitably and you might need to increase your livestock and plant fodder crops. This requires an assessment of your farm and the area in which you are farming.

In many instances, the banks turn down a production loan because they can see that you will not make a profit. We should not be angry with them and accuse them of being unwilling to help you – they are actually assisting you so that you rethink the crops that you should be planting. They also want to see you succeed. We need to be absolutely sure that we can make a profit – otherwise we will not be able to continue farming for the long haul. It is nice to get grants from the Government, but we know that these grants cannot continue forever as there is simply not enough money to meet all the needs of all the people. We need to be able to make a profit without the help of grants.

Keep working hard and with time you will see results!

MAIZE – keep this in mind for August and September

In this article I would like to outline a few essential management practices to keep in mind when it comes to maize production.

As a maize producer you should have a goal of achieving the highest possible yield with the best possible quality grain. This does not always come easily as there are numerous challenges to deal with throughout the year. There are however a few simple management practices that you can put into place that can make this goal achievable.

What to do during August

Many farmers are still in the process of harvesting their crop at this time. Harvest time should be a rewarding experience as you are now reaping the fruits of your labour. If, however you did not put the effort in during the growing season this will unfortunately not be the case.

For the most part, not much more can be done at this stage to improve your crop or increase your yield. There are however a number of things that you as farmer have control over at this time which can improve the quality of grain flowing into the trailers and bags and also to a certain extent the quantity.

- First and foremost, you must make sure that your maize is at the correct moisture content before harvesting commences. Take a few samples before you get started and test the moisture content. Usually grain will only be accepted for storage at 14% moisture or less. This can vary from place to place depending on the market and facilities of the depot. Some grain storage facilities do have drying bunkers where your maize can be dried at an extra cost. Usually a deduction will be taken off the price that you receive.

> *Harvest time should be a rewarding experience as you are now reaping the fruits of your labour.*

Do a full assessment of your equipment after harvest time. Before anything is put away for storage be sure that you check and make sure that it is cleaned and stored in good working order.

Be careful of harvesting areas that has a lot of weeds that are in seed and rather harvest these sections by hand or keep them for animal feed. Many of these seeds can get into the grain sample and significantly reduce the quality of you grain.

- Make sure that your combine harvester is working optimally and not wasting grain. You can do this by checking the sieves and making sure everything is set correctly.
- Make sure that the grain is not breaking by setting the beaters correctly. The more broken kernels there are, the lower your grading will be on the grain. If there are lots of broken kernels in the grain sample this means that the machine is set too aggressive and needs to be adjusted.
- Avoid areas that are inundated by weeds that are in seed and rather harvest these sections by hand or keep them for animal feed. Many of these seeds can get into the grain sample and significantly reduce the quality of your grain. The market to which you are selling may even refuse to accept such maize or may request you to sieve it again costing you time and money.
- Be sure that your driver is properly trained. Whether you are using a tractor drawn combine or a self-driven combine it is essential that you or your driver is familiar with the machine that is being used. An untrained driver can lead to many tons being wasted due to trampling as well as a poorly set header.
- Finally make sure that all of your grain storage and grain carting equipment is in good condition. If there are gaps in the panelling or rusty holes in the metal you will have a lot of wastage. Even if there are small leaks make sure that they are patched up and closed properly. Every little bit adds up.

> *"September should be a time of planning and preparation as well as a time for reflecting on the completed harvest season and working on ways to improve in the next one.*

What to do during September

By now all your harvesting should be complete. We will be awaiting the first spring rains and once again be getting ready for the next season. September should be a time of planning and preparation as well as a time for reflecting on the completed harvest season and working on ways to improve in the next one.

- Do a full assessment of your equipment after harvest time. Before anything is put away for storage be sure that you check and make sure that it is cleaned and stored in good working order.
- Do a financial assessment of your business situation post-harvest.
- Write out a budget for the season to come and make the necessary financial arrangements to access the capital to plant again this year.
- Decide what crops you will be planting in which fields and draw a map for your own reference.
- Start your planning for the season to come by writing out a list of important things to do:
  - Order inputs;
  - Check spray rig;
  - Go through planter and order any necessary spares;
  - Do soil samples;
  - Start land preparation;
  - Check tractors and do services if necessary;
  - Prepare chemical room; and
  - Make sure that seed and fertiliser storage area is secure, clean and dry.

Being a farmer is about getting into a good routine. You need to develop a system of planning that works for you personally and once you find a system that works, you should stick to it. Everything comes down to efficiency. If you put the effort in to achieve a smooth-running business you will most definitely see the results when it comes to harvest time.

Article submitted by Gavin Mathews, Bachelor in Environmental Management. For more information, send an email to gavmat@gmail.com.

Do I use FOREIGN CAPITAL or not?

When setting a farming business, the first resource you need is capital – that is money. The money is needed to buy land, equipment, machinery, livestock and so forth.

How much capital you will need depends on the size of the farm, the type of farming you will be practising, the area and several other factors.

After you have set up your business you still will require additional capital for the daily running of your business. The implication is that you need a lot of money or capital being the more correct term to use. Those already in farming will agree, farming is one of the more costlier businesses to run.

The question then arises, where do I obtain the necessary capital? In broad terms there are two main sources of capital. One – you provide your own capital, or two, you borrow capital, from a third party (somebody else – either a person or business). The capital belongs to that somebody else and that is why it is referred to as foreign capital. This places you under an obligation to repay the capital you have borrowed.

“Those already in farming will agree, farming is one of the more costlier businesses to run.

Sources of own capital are either that you have money of your own available that you are willing to invest in your business for initial capital or for production capital. Normally once your business is up and running production capital is needed on an annual basis. The only way to provide your own capital for production purposes is when your business makes a profit. Remember the basic question – why do I run my own business? To make money (profit).

Unfortunately, a farming business, no matter the size, requires a lot of initial capital and then production capital and perhaps capital to expand your business. Thus, farmers, whether small or big, most of the time requires foreign capital.

As already stated, borrowing foreign capital implies that the capital must be repaid with a further cost implication – interest. The third party from which you borrowed the capital needs to be compensated for the risk taken to borrow you the money. Thus, the repayment consists of capital plus interest. The cost of repayment (the interest) reduces your profit and in total the repayment has a negative effect on your cash-flow position.

Thus, the question should one use foreign capital or not is quite relevant. The basic answer is – do not use foreign capital, it is costly and puts you at risk. In a previous article we concluded that the best debt is cash. However, we all know from practical experience, at times you must borrow money to keep your business operational.

Bear in mind in principle whatever you have purchased with foreign capital belongs to the third party until the capital has been repaid. Should you not be able to repay, the item/s or your crop may be repossessed.

To decide to borrow money requires thorough management on your part, which begins with planning. The first aspects that need attention is whether you really need to borrow capital, and will you be able to repay the money and the cost involved. The only way to answer this is to compile a cash-flow statement. The cash-flow statement will also assist to decide should you borrow the money or are there alternative ways to overcome the need for the capital.

We know to plan and compile a cash-flow statement in the farming environment is very difficult because of factors beyond our control. Such as drought, the occurrence of bird flu and as of late the listerioses affecting pig producers. But any plan is better than no plan.

Part of your planning and organising is to acquire all information from financial institutions willing to provide you with a loan. What are all their conditions about security, repayment period, interest rates and other? They will need security, preferably in the form of land but other forms of security will be considered. We often hear some small farmers complaining about this. Financial institutions will be willing to provide you with funds should you be able to prove to them that your business is profitable. Unfortunately, some small farmers do not manage their businesses properly and do not even have proper records.

When you have acquired a loan, part of the implementation is to repay on time. Should you not be able to repay, discuss it timeously with your service provider as part of your control function. A farmer who shows that he is responsible about paying his creditors, builds up a good credit record. This means he is a low-risk client and uses sensible credit purchases as a means of running his business.

Thus, using foreign capital is a burden with some risks involved, therefore it requires careful consideration. But as a farmer you might not have much of a choice than to use foreign capital – but do it responsibly.

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

Good practices for tractor tyre care

With a competitive agricultural and industrial sector, there is a large demand for quality tyres. The life of your tyres will, however, depend on the correct application and use – no matter how high the quality of the product.

It is essential to follow specifications to ensure that the tyres are used to their full potential. We therefore look at the most important aspects to ensure you extend the life of your tyres. We believe that an informed consumer is a smart consumer.

Application

Always ensure that the tyre is suited to its application. In other words, ensure that the tyres are the correct product for the machine, trailer or tractor. Tyres are tested, produced and guaranteed for a specific task and terrain, and if it is used properly, the tyre will function at maximum capacity.

Tyre pressure

One of the most important maintenance features is to always ensure that the tyre pressure is correct.

Tyres are designed to carry a specific weight based on the pressure of the tyre. The pressure of your tyres should be checked daily and the pressure recommended specifically for that tyre should be used.

Once the pressure of the tyres is too high, the tyres stretch and twist out of position. The tyres then do not absorb shock, which results in too much pressure on the rubber, and leads to the tyre being more susceptible to cuts and impact breaks, and the tyre will wear down more quickly.

If the tyre pressure is too high, it could not only damage the tyres themselves, but can also cause soil compaction, which can be harmful to your fields.

It is equally harmful when the tyre pressure is too low and can cause unnecessary distension and warping of the tyres, as well as generate too much heat and cause the tyre shoulder to wear down.ry Lower tyre pressure can also cause higher fuel consumption.

All tyre pressure refers to the 'cold' tyre. This means that the tyre pressure must be measured while the tyre is cold. In other words, the pressure should be measured before the tyres start rolling or after the machine, trailer or tractor has been standing still for a while.

Carrying capacity

Ensure what the carrying capacity of the tyres should be. The weight of the vehicle – as well as the weight of the product intended for transport – should be determined. It is important that the machine, trailer or tractor should never be overloaded. Overloading is one of the biggest mistakes made by consumers.

Fitting and removing a tyre

It is vital that the correct procedures should be followed when tyres are fitted or removed. Ensure that the vehicle is in a good condition and that the bead of the tyre is positioned correctly on the rim. As soon as the tyres have been fitted, ensure that the width between the tyre and the vehicle is correct – there should be equal spacing between all the tyres and the vehicle.

Remember this

Check the tyres regularly for cracks, cuts and wear. When a tyre shows serious cuts and/or cracks, or is worn down more than 80%, the tyre should be replaced immediately.

It is important to adopt proper driving habits. Avoid potholes, sharp turns, high speed and sudden braking. Reckless and wrong driving habits can shorten the lifespan of tyres significantly.

Natural elements like the sun, rain, snow and hail can also have a negative effect on tyres. It is essential to store your tyres correctly. Tyres should not be stored for longer than recommended. Make sure that the tyres are not stored in direct sunlight, that the storage area is clean and that the tyres are placed in a vertical position. The tyres should not be stacked on top of each other.

Chemicals play a big role in the life of tractor, trailer and machine tyres. It is important to keep in mind that the rubber of the tyres absorbs certain chemicals more easily than others, and that it is very important to clean your tyres regularly, especially if the fields worked in contain compost. For example, we have a wide range of agricultural tyres that offer a unique self-cleaning function that also helps to extend the life of your tyres.

Always buy the best product you can afford and ensure that you buy a brand that you can trust. It is also important to ensure that the tyres not only have a proper guarantee, but that an after-sales service is offered.

The tips mentioned above are only the most common and important ones to ensure that the life of your farm tyres is extended. It is important to be informed in order to work smartly with your tyres.

Tubestone is the proud as well as exclusive wholesaler of agricultural and construction-range BKT tyres in South Africa and Namibia. BKT is a brand that a producer can/may trust. Tubestone representatives and salespeople are trained to answer all your questions and offer excellent after-sales service.

Article submitted by Lara de Goede, marketing administrator, Tubestone, for SA Graan/Grain August 2017. For more information, send an email to lara@tubestone.co.za.

Meet our 2018 FARMER OF THE YEAR NOMINEES (Part 2)

It is that exciting time of the year again where the nominees for the 2018 Grain SA Farmer of the Year competition have been identified.

It must always be kept in mind that the main goal of this competition is not about winning, it is about celebrating the learning, growth, development and hard work of the thousands of farmers in the Grain SA Farmer Development Programme.

It is meant to act as a beacon of motivation and inspiration to all of us to continuously work towards bettering ourselves to achieve our goals, irrespective of how big they are. Your goal should never be to be nominated or to win anything, but to grow every day, every month and every year to get closer to reaching the yields, profitability, the efficiency or whichever goals you have set for yourself and your family. Ultimately, that is winning!

If you have been nominated for this competition, you are doing something right and setting an example to others of what can be achieved. With that said, we would like to introduce you to 2018 Farmer of the Year nominees!

Our nominees are...




Potential New Era nominees

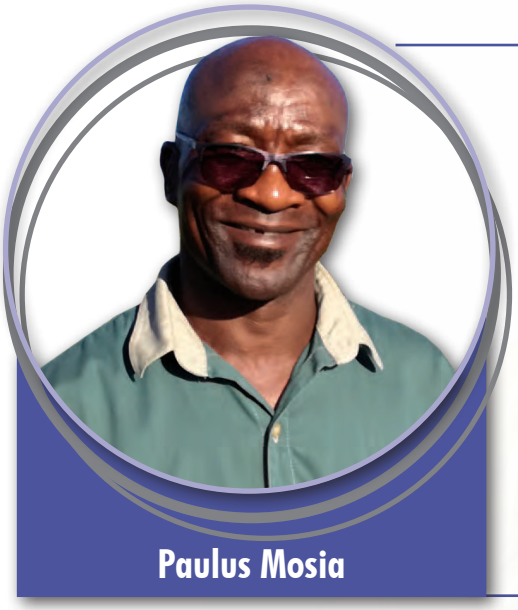
Anton and President Mabaso

Anton and President Mabaso were born on a farm, Krytfontein in the Bothaville District. Anton on 20 February 1966 and President on 7 July 1970. Both their parents were farm workers and they had eleven children – two boys and nine girls. Both brothers have always had a keen interest in agriculture.

Since 2010, they were able to secure lands from the Bothaville Municipality for which they are very grateful seeing as it is not easy getting hold of land in Bothaville as the soil is considered prime for crop farming, but also very expensive.

In 2007, the two brothers joined the Grain SA Farmer Development Programme. They attended many study group meetings, information days and training courses. Grain SA also started visiting them on their lands. They felt empowered and were ready to farm and during the last three to four years, they have progressed from subsistence to potential commercial candidates.



Paulus Mosia

Paulus was born on 22 September 1968 on the farm Vryheid in the Edenville District. He was the sixth child of ten children (six boys and four girls). In 2007, he joined the Grain SA Farmer Development Programme and in 2008, he was given the farm Sterkwater by the DRDLR on the PLAS Programme.

Sterkwater is 200 ha in total, with 60 ha being arable and 140 ha grazing. Paulus is an active member of the Edenville Study Group. Both him and his wife, Nomasonto, have attended many study group meetings, information days and training courses. Nomasonto was instrumental in starting a new study group in Heilbron, which is now part of the Grain SA Programme. They both state clearly that the Farmer Development Programme changed their lives.

New Era Commercial nominees

Rykie Raphoto

Rykie was born in the village of Rietfontein in the trust lands of the former Bophuthatswana. While he was at school he had to help his father plough, plant and look after everything in their subsistence farming enterprise. Working with his father during school holidays had a very huge impact in the love that he developed for farming.

In 1991 Rykie decided to farm on his own with his son, William, assisting him with the farming operation.

They joined Grain SA at the time when the Farmer Development Programme commenced. After a long struggle they received a farm, called Lareystryd, near Lichtenburg in the North West Province from the Department of Land Reform where they are currently still farming.

Meet our 2018 Farmer of the Year nominees (Part 2)

Jeremia Makhosini Mathebula

Jeremia was born on 14 September 1979. He grew up in the Iswepe area near Piet Retief on the Ingwempisi estate farm where he used to help his father plant maize on their small piece of land. His father used to plant 1 ha of maize and had a herd of twelve cattle on communal land.

Jeremia's starting point in his agricultural career began in 2009 when he started with a herd of twelve cattle and planting only 40 ha of arable land on which he could only achieve about 4 tons of maize/ha. He currently manages over 400 breeding cows and plants a total of 450 ha of maize and 100 ha of soybeans. This farmer has shown growth every year and is renting more farms to be able to plant more maize. He has also grown as an independent farmer as he does everything himself and is progressing in leaps and bounds.

Paul Malindi

Agriculture has always been in Paul's blood. He was born on 21 June 1969 on a farm in the Heilbron district where both his parents were farm workers. They were seven children – four boys and three girls. His dad had a few head of cattle on the farm where he worked and Paul had to look after them.

When he got the opportunity to lease some fields from another black farmer he immediately did that. In 2012, he was granted the farm, Dankbaar, by the DRDLR through the PLAS system. The farm is 441 ha in total with 320 ha good arable soil and 121 ha of grazing. Paul, who is now 48, leases 130 ha arable land and 170 ha of grazing. This year he has planted 254 ha of sunflower and 216 ha of maize.

Daniel Maqala

Daniel was born on a farm in the Ficksburg area to parents who were both farm labourers. They were four children – two boys and two girls. He used to work on the farm from a very young age, looking after the cattle, milking cows and feeding chickens. His father drove a tractor and he used to sneak away to the lands after school to ride with him on it.

This farmer purchased his own 197 ha farm, Kosmos, with a loan from Land Bank. The DRDLR supported him with Die Hoop on the PLAS system – 326 ha and he has since leased 186 ha of high potential lands near his farm. Daniel currently farms on 709 ha. All the lands are well cultivated and well planted and he has made the transition from being a farmer to becoming a food producer, businessman and entrepreneur. He plants five different types of crop and has a livestock component as part of his farming operation.

Thamsanqa Sampie Booizene

Thamsanqa was born on a farm near Ottosdal in the North West Province where his father worked as a farm worker. He never attended school as, in those days, it was expected of the young men to work as herd masters for the sheep and to assist wherever necessary with the keeping of the flock.

He started his farming business in 1969. While working, he saved up to plough a small piece of land, then bought a few goats, a few cows and eventually a tractor. From there he rented some communal land and as his business grew steadily over the years, he has managed to buy three more farms. Thamsanqa is one of the elders at the Zion Christian Church and a pillar to the community. He is well known by his fellow commercial farmers. If they need something from him, he is always willing to help and return the favour when Thamsanqa requires something.

David Ramoledeli Mongoato

David was born on 11 October 1970 in Matatiele. Both his parents were unemployed, so farming was their only source of income and food. They worked the land with oxen and planted by hand. His interest in agriculture developed as a young boy working with his parents. This passion grew when he landed up teaching, agriculture in the school's curriculum. You could say that he was destined to farm.

He began his agricultural career whilst teaching and leased a small portion of land where he began with basic crops and a few head of livestock. Year after year this grew with whatever money he could get together until he was able to lease Donald Drift Farm. David has improved, not only with his yields, but also with equipment and assets that the operation now uses. His yield has improved year-on-year. He slowly grew from subsistence to smallholder to an advanced farmer joining the 250 Ton Club. The growth has been steady and consistent.

Article submitted by Liana Stroebel, Grain SA Provincial Co-ordinator, Western Cape. For more information, send an email to liana@grainsa.co.za.

Nominees are in no particular order.

Pula Imvula's Quote of the Month

There are no secrets to success. It is the result of preparation, hard work, and learning from failure.

~ Colin Powell

A LOOK AT SUBSOILER OR RIPPER EFFICIENCY

Why is ripping necessary? When tractor and implements are used, soil compaction may take place because of the texture of the soil and plough-pan effect by heavy weight of large scale machinery. Soil compaction prevents the root development of plants and planted crops.

Soil compaction can be solved mechanically or biologically. With mechanical action, ripping is the most common practical method used to loosen the soil deeply through a rip action. This gives plant roots a chance to develop well, which produces healthy plants and good crops.

Drawbar power required

A rip operation, however, is an action that requires a lot of traction and energy. It therefore is very expensive, so it is important to do the operation as effectively as possible.

Traction efficiency

Traction efficiency can be defined as the optimal utilisation of the tractor's traction on a specific implement. However, there are a number of factors that can affect effective traction.

Rolling resistance

Rolling resistance is the resistance the tractor has to overcome to move forward before any traction takes place. The factors that affect rolling resistance are soil hardness, the ground pressure that takes place under the wheels and the load.

Wheel load

Wheel weight load also plays an important role in effective traction, but must be used in accordance with the tractor manufacturer's requirements. If the wheel weight load is too heavy, it may also result in traction disadvantages.

Graph 1 shows traction against 15%-wheel slip with changed wheel load. The graph indicates that the pulling force is reduced when too much wheel-weight load is applied in soft soil.

Tyre pressure

Tyre pressure also plays an important role in improving traction. Again, it is important to follow the tractor manual for the correct tyre pressure.

Lower tyre pressure will allow greater traction and a bigger contact area to the soil, but can also lead to greater rolling resistance.

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An example of inefficient ripping.

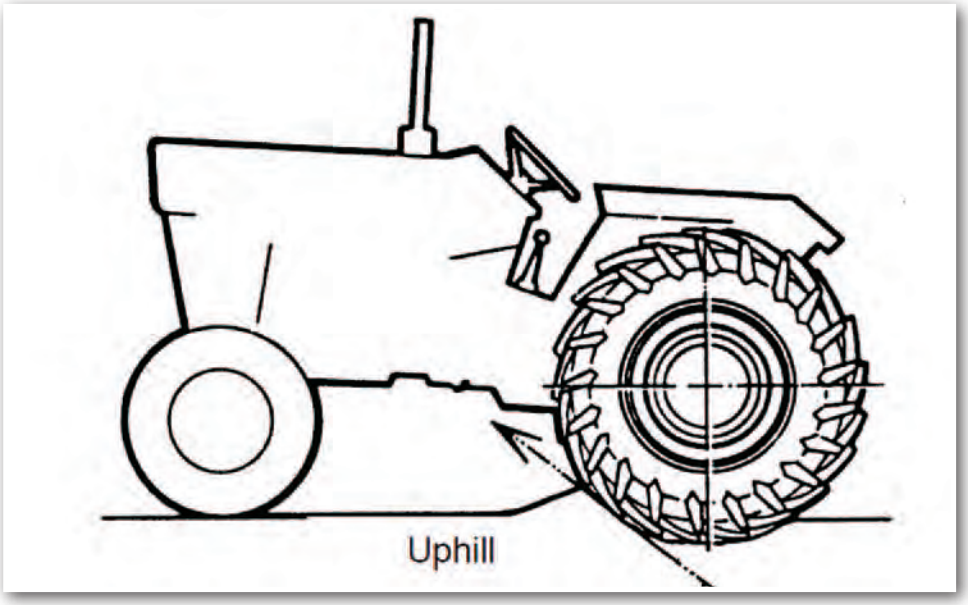


Figure 1: Rolling resistance.

Efficient ripping.

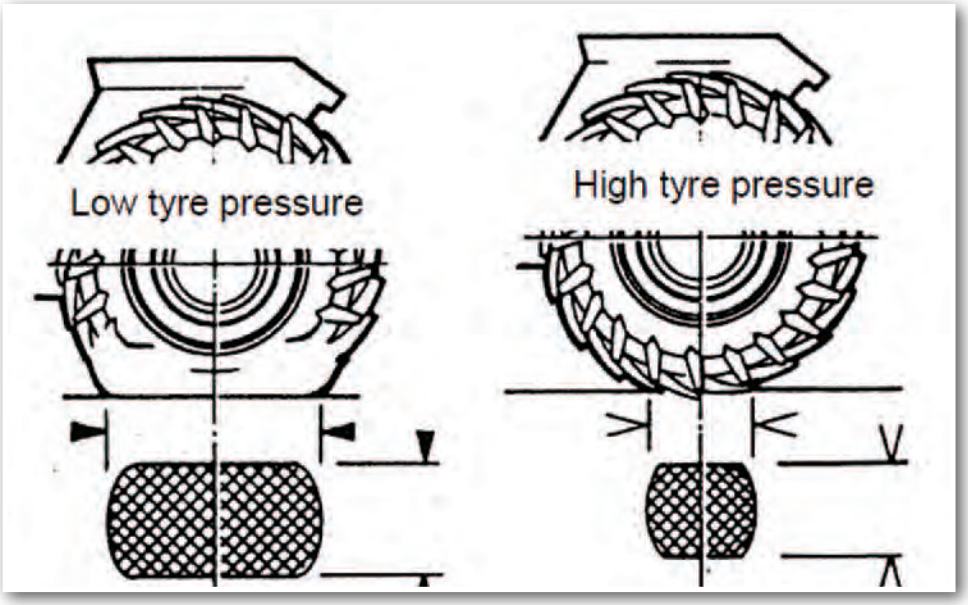


Figure 2: Tyre pressure.

> *The main differences are ripper teeth shapes, some straight teeth designs and some with an arc shape.*

Tyre width

The use of wider or double wheels will enlarge the tyre contact area on the soil and therefore better traction. Wider tyres will also reduce soil compacting.

Wheel slip

A certain percentage of wheel slip is required for good traction. During wheel slip, the ground particles are compressed to create traction.

However, there is an optimum wheel slip percentage for different soil types. A too high

A look at subsoiler or ripper efficiency

wheel slip can reduce traction and also increase fuel consumption. **Graph 2** shows that maximum traction power takes place at optimal wheel slip.

Implement hitching system: Three-point linkage

The resulting pulling force is perpendicular to the ripper tine shears. The pulling force is at an angle downwards at the back of the tractor and the moment is around the rear axle of the tractor wheels. This causes more traction on the rear wheels, but tends to lift the tractor's nose and front wheels (**Figure 4**).

This can be a disadvantage for four-wheel drive tractors, because of the traction losses at the front wheels of the tractor.

> *"The purpose of a ripping operation is to loosen the soil or break a plough-pan layer. Effective ripping can only be done when the maximum volume of soil is released. The energy input must therefore justify the output.*

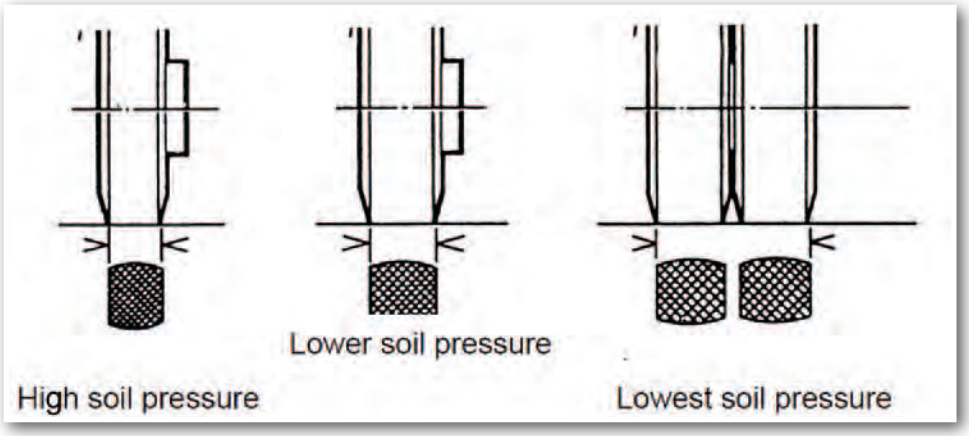


Figure 3: Tyre width.

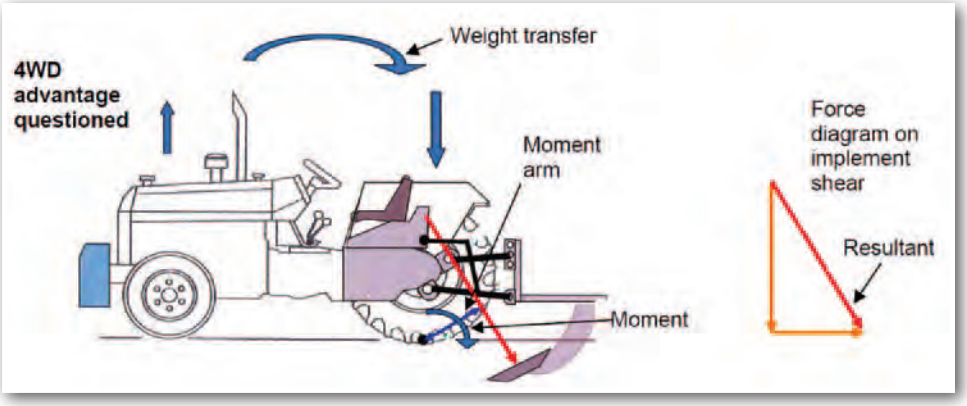


Figure 4: Implement hitching.

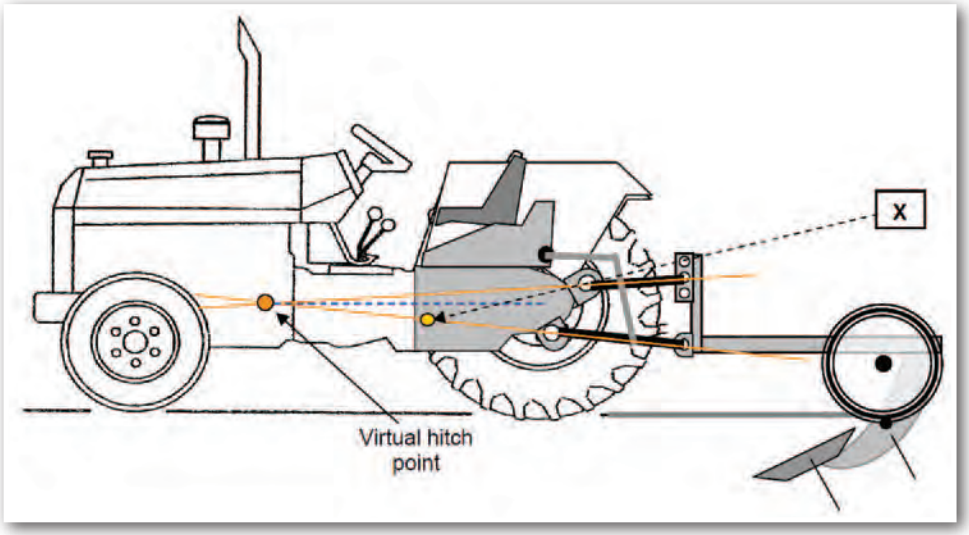


Figure 5: Implement hitching with depth control wheel.

Implement hitching system: Three-point linkage with depth control wheels

When using a depth control wheel on the implement, the force moment is between the centre of the ripper shears and the depth control wheel axle. This causes a downward pressure on both the rear wheels and front wheels of the tractor. In this way, better traction will be obtained over the front and rear wheels of the tractor, so a four-wheel drive tractor will deliver good traction (**Figure 5**).

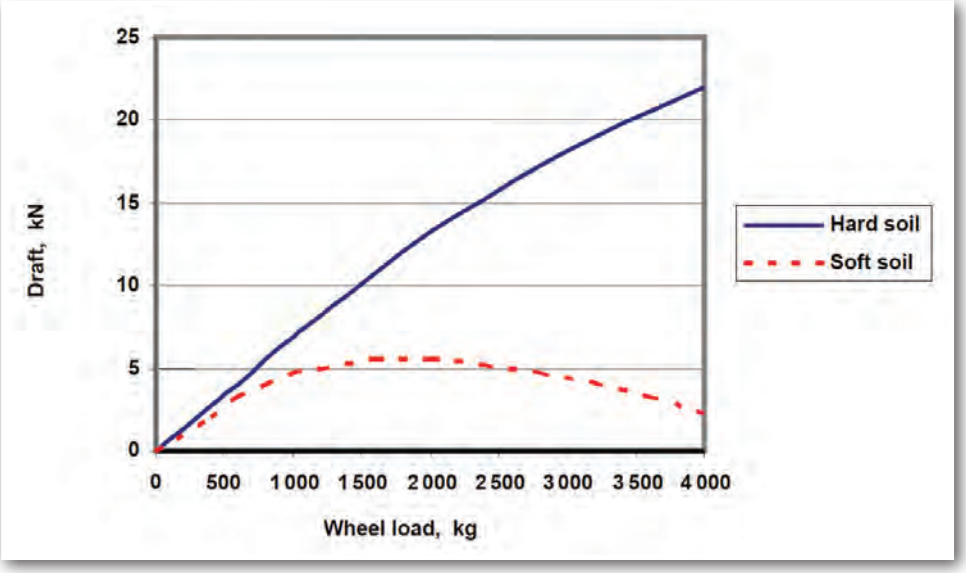
Different types of rippers

Rippers come in different shapes. The main differences are ripper teeth shapes, some straight teeth designs and some with an arc shape. Ripper teeth designs differ from each other because manufacturers try to create the best design for their product for best soil penetration.

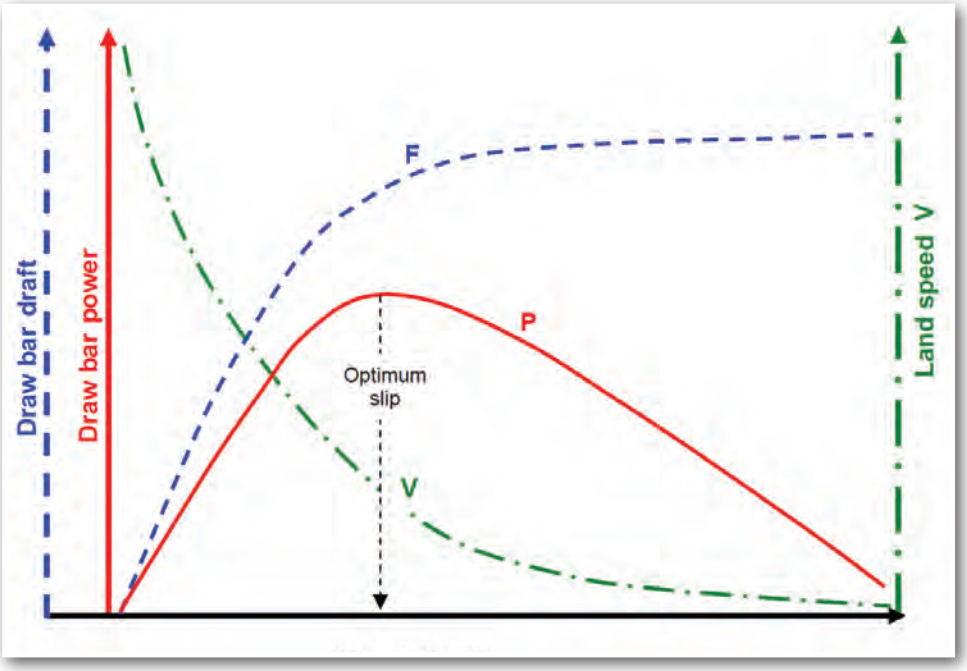
Then there are also the different ripper teeth shears that are being used. The shears of course help to effectively loosen the soil. Manufacturers come with different ideas of shear designs to loosen the soil. In most cases, the ripper shears are mounted at an angle to achieve better penetration.

The other important component that is sometimes added is depth control wheels, especially on the larger ripper frames. The function of the depth control wheels is of course for more effective depth control, but also to balance the weight and traction between the tractor's front and rear wheels, which is ideal for four-wheel drive tractors or tractors with belt tyres.

Graph 1: Effect of wheel load on traction.



Graph 2: Effect of wheel slip on traction.



Ripping efficiency

Rip processing is not a cheap operation, so it's important to do the operation as effectively as possible. The purpose of a ripping operation is to loosen the soil or break a plough-pan layer. Effective ripping can only be done when the maximum volume of soil is released. The energy input must therefore justify the output.

Several tests have already been done on different soil types and it has been found that not all rip actions are effectively done. The effectiveness of the ripping depends largely on the soil type, soil clay percentage and moisture percentage. The mechanical differences will, of course, depend on the working depth, working speed, shear type and shear cutting angle.

Photo 1 is an example of an inefficient rip operation where the soil is not properly loosened. **Photo 2** shows an effective ripping process because the volume of soil is more effectively loosened. Thus, the amount of energy used to do the work is better utilised.

Drawbar power needed for rippers

The pulling force required for rippers is generally very high, but will depend on the soil type, ripper teeth design and shear design. Of course, the ripping depth will also play a role. The question is, what is the optimal working depth because the deeper the ripping action, the higher the power demand.

Ripping depth will depend on the specific need, whether it is to break a plough-pan, or because of very sandy soil which need to be ripped every year because of the characteristics of the soil.

Shear design, shear working angle, shear width and placement of shears will also have an effect on the energy consumption. Tests have been done with different shear angles versus the drawbar power required.

It was found that the higher the shear angle with the horizontal, the higher the drawbar power needed because of more soil disturbance taking place at higher shear angles.

Implement efficiency improved rapidly by increasing the ripper shear angle on the ripper tine. This is due to the fact that better and more efficient loosening of soil takes place. Again, the amount of drawbar power is better utilised.

Spring tension setting of the ripper tine

Some rippers are designed with an auto release mechanism on the tines which operate against a spring tension. The purpose of the ripper tine spring is to safeguard the ripper tine when hitting a rock or hard pan in the field.

The spring tension setting will normally vary according to the soil type and conditions. It is important to check the ripper manufacturer's manual and set it accordingly. When the setting is not correctly done it may either damage the ripper tine or have an impact on ripper depth control.

Conclusion

When a sub-soiler or ripper needs to be utilised, the following factors can be considered with regards to the operational efficiency:

- Optimal traction efficiency of the tractor.
- Different types of soil such as sand, clay, loam or combination of different components.
- Soil physical properties such as moisture content and bulk density.
- Number of ripping shanks.
- Plough-pan and optimum ripping depths.
- Shear design parameters such as shear working angle, shear width and placement of shears.
- Make sure to correctly set the spring tension on the ripper tines for correct operation purposes.

Article submitted by Johan van Biljon and Dr Tingmin Yu, ARC-Agricultural Engineering, for SA Graan/Grain August 2017. For more information, send an email to vbiljonj@arc.agric.za.

Kg grain/mm water:

How does the efficiency of your farm compare?

In the modern agricultural environment the concept of efficiency plays an enormous role and the efficiency of producers or production systems is increasingly used as a measure of sustainability.

This efficiency is measured on the basis of various aspects, which can be simply expressed as the amount of production per quantity of resource or inputs consumed, with the ultimate objective of producing more with less.

Sustainable intensification means that agriculture will have to produce more (food, feed, fibre, fuel) per soil unit (hectare) with as little negative effect on the natural resources and community as possible. Efficiency can also be used as a good measure to compare different aspects and practices with each other at farm level.

There are various ways to measure the efficiency of production systems. Efficiency is best measured in terms of the most limiting factors, like water nutrients, labour, soil and capital.

In view of climate change, the reduction of greenhouse gases and fixation of carbon per kilogram of a specific output for food security and agriculture are one of the main objectives and opportunities. Increasing input costs force producers to measure efficiency in the use of inputs like fertiliser.

Unique South African context

In general, South Africa is a water-scarce country with an average long-term rainfall of between 450 mm and 500 mm per year. The global average rainfall is approximately 850 mm to 900 mm per year. This emphasises the importance of effective water consumption to ensure the long-term sustainability of the resource. Water plays a critical role in the country's food security.

In South Africa, where grains like maize and wheat are the chief staple food of a large part of the local population, the sustainable cultivation of these crops is also critical. The great majority of grain crops are cultivated in dryland conditions, and the producers are mainly dependent on rain for successful cultivation.

In this context, water will have to be used with considerable more efficiency in grain production systems. In general, people assume that droughts are the result of low rainfall, but data proves that poor soil and water-management practices are the actual causes of 'drought' in southern Africa.

Graph 1 shows the distribution of the number of hectares of maize between dryland and irrigation. It is clear that approximately 90% of the maize area planted is dryland, while the rest is produced under irrigation. It is therefore vital for producers to implement practices that use rainwater in the most efficient manner for a variety of crops.

Why should efficiency be measured?

It is essential for irrigation as well as dryland producers to establish the efficiency of water consumption. Irrigation producers have to consider various factors when doing crop planning.

Electricity constitutes a large part of the irrigation producer's costs, and it is therefore essential for this producer to establish on a year-on-year basis what the efficiency of his water consumption is and whether it shows a rising trend.

Better efficiency with respect to water consumption can reduce factors like pump and water costs, which would be beneficial for the producer from a financial point of view.

How is the efficiency of water consumption improved?

The basic principle for efficient use of rainwater for plant production lies in optimising each of the groundwater balance components. This implies that the productivity of the soil-plant-atmosphere system per unit of rainfall must be maximised.

The groundwater balance components are the following:

- Water absorption by the plant roots, or water loss through transpiration.
- Water runoff/run-up on the soil surface.
- Deep drainage from the soil profile, or upwards in the root zone.
- Water loss through evaporation from the soil surface.

Maximising the water budget

In South Africa's semi-arid grain production conditions, the soil and water management strategies should be aimed at maximising the profits in the water budget and minimising the losses. Various practices can be implemented to achieve this, with the most important pertaining to grain cultivation being discussed:

Soil health

Increased soil organic matter leads to healthier soil. Soil organic matter is essential, particularly to develop soil structure. Well-structured soil offers a much better ability to store rain and irrigation water and provide it to plants.

Soil organic matter can store water volumes of about 20 times its weight. Higher soil organic material content will make crops more drought resistant by storing additional water.

Minimum soil disturbance

Reduce mechanical soil disturbance to the absolute minimum (for example through no-till) to reduce the breaking down of soil organic matter and soil structure and ultimately lose less water as a result of evaporation.

Ground cover

A good ground cover reduces crusting, water run-off, erosion and evaporation and improves infiltration. The most common practice is to retain crop residue on the ground. A minimum of 6 t/ha crop residue (or 70% ground cover) is required to sufficiently prevent run-off and evaporation.

Evaporation causes the biggest loss of water by far, with 60% to 75% of the rainfall being lost on bare soil in the dry sowing areas.

Higher plant density

This refers to a higher plant population and row width. A good practice is to develop foliage as soon as possible after planting to cover the soil 100% with shade and thus limit soil temperatures and evaporation.

A plant population of more than 22 000 plants/ha and row widths of as narrow as 0,52 m are typically recommended for summer grains to achieve this.

Diversify cropping systems

Cover crops can be planted in conjunction with cash crops like maize (for example through intercropping) to promote optimum water use and to serve as a 'catch crop' to use superfluous ground or rainwater for production, reduce water run-off and maximise infiltration, as well as to improve soil health (by increasing soil organic matter).

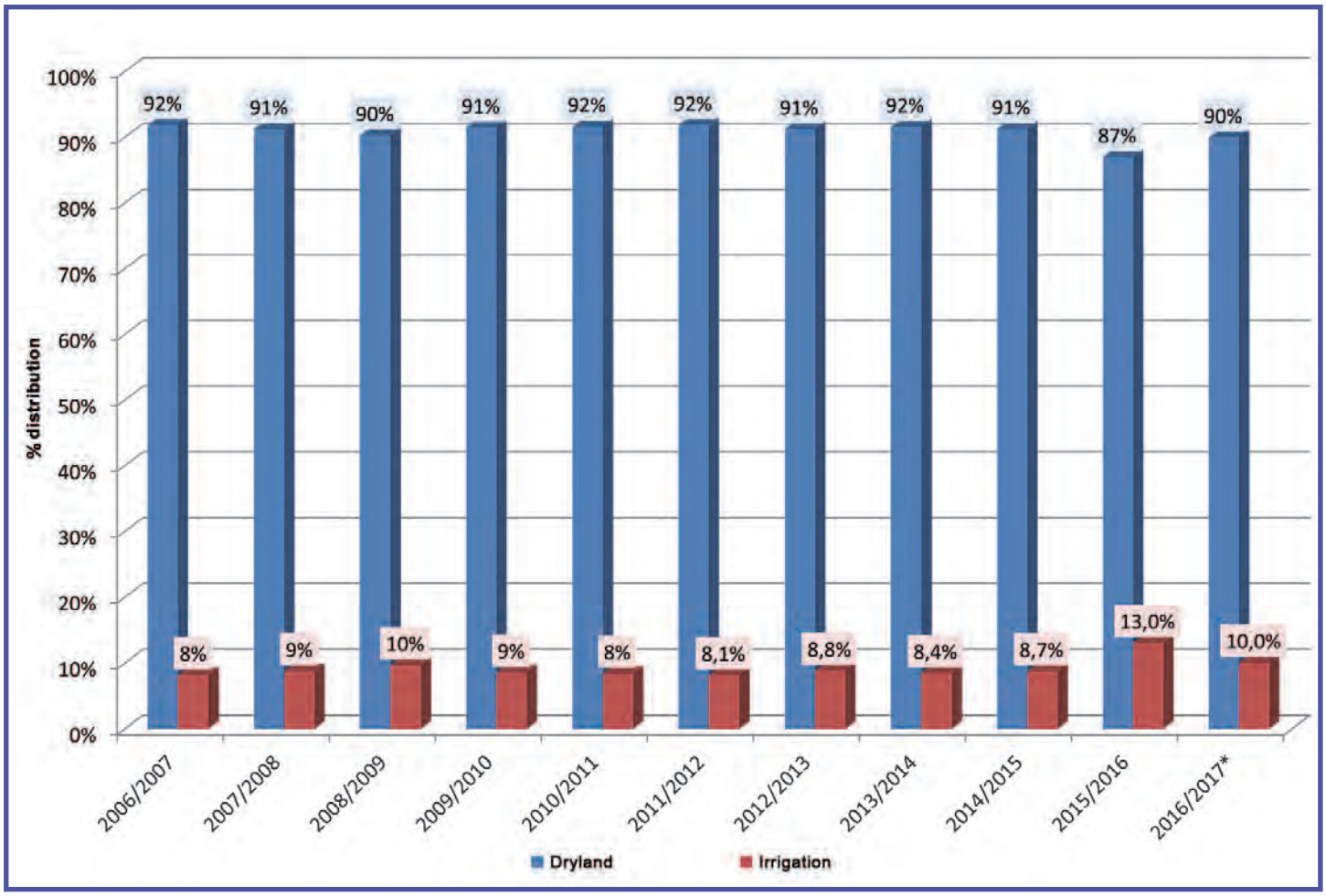
Deep root systems can recirculate water to the topsoil and release it before it drains away. Careful selection, timing and management of the cover crop ensure minimal competition for groundwater between the cash and the cover crop.

Green ley systems

Accumulation of water before planting (fallow land), specifically bare fallow land (or black fallow land), is very harmful to soil health and accelerates the loss of water through evaporation, as well as run-off and erosion. Although this can lead to increased stable yield and a reduced risk for the follow-up crop, it is an ineffective way of using water, with a rainwater accumulation efficiency of between 2% and 37% – a lot of water is lost due to evaporation.

An alternative is to plant cover crops in the 'off season' as a green ley system between the main cash crops for grazing, to protect the soil, supple-

Graph 1: Distribution of maize area planted between dryland and irrigation.



Source: CEC and Grain SA
**Provisional*

ment the soil organic matter and promote biological diversity and soil structure to the benefit of profitability and subsequent cash crops.

Irrigation practices that increase effective water use

In many areas that already rely on irrigation the climate is expected to become even dryer and this will create a new, greater need for water-saving irrigation practices. In addition to regular maintenance and audits of existing systems, producers recycle water, switch over to drip irrigation or use precision irrigation to target specific areas in their fields with the exact amount of water required.

How is the water consumption efficiency calculated?

The efficiency of water consumption can be established with various methods. These methods can be very complicated, for example by taking all the different variables into account or by modelling them, or a simple calculation can be used to express the quantity of grain produced compared to the quantity of water available.

It must also give an indication of how the crop yields compare to potential yields (in other words if available water is used 100% efficiently). For example, a general rule of thumb for maize says that approximately 15 kg to 20 kg of grain can be produced for every millimetre of water consumed (the potential yield).

It is essential for the producer to keep good records of the water applied and/or the amount of rain received in the course of the season, as well as how much water is stored in the soil on planting. If the producer has this information available, they can calculate the water consumption efficiency for the season.

A simple calculation of efficiency

The average rainfall for the summer sowing areas over the past ten years was approximately 523,22 mm per season. The average yield for maize over the same period was approximately 4,32 t/ha. The average water consumption efficiency for the country over this period can be calculated as follows:

- Potential water available (mm) = 523,22
- Average yield (t/ha) = 4,32
- Average yield (kg) = 4 320
- Water use efficiency (kg/ha/mm) = 4 320 ÷ 523,22 = 8,25

According to measured results of best practices in South Africa, the potential efficiency for maize is higher than 20 kg/ha/mm water, in other words the potential crop yield in this example is 10 t/ha.

The average water consumption efficiency for the country over the past ten years is calculated as 8,25 kg/mm/ha.

How do your results compare to this calculated average for the country?

In conclusion

Although various methods have been used to calculate the efficiency of water consumption, it can be established in a simple way. However, it is important for each producer to find a suitable method to measure and monitor efficiency.

Sufficient information and the integration of more efficient practices are the key to successful and sustainable production systems.

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Article submitted by Luan van der Walt, agricultural economist: Grain SA and Hendrik Smith, conservation agriculture facilitator, Grain SA, for SA Graan/Grain August 2017. For more information, send an email to luan@grainsa.co.za or hendrik.smith@grainsa.co.za.

RAIZCORP – mastering the skill of business

Growing up in an agriculture-oriented family in a rural area of Limpopo, Bruce Diale has always had a passion for agriculture and a strong desire to make a difference in the world.

After school, he completed a BSc in agriculture and worked for the Department of Agriculture for several months before hitting out on his own.

Diale founded Brucol Global Development, an agricultural consulting company that creates innovative agricultural solutions to help develop rural communities across Africa. The company offers farmer support services, food security services and farm infrastructure development. Diale believes that what sets his business apart from others is innovation. 'We try to innovate in everything we do. Our systems and products are innovative and so is the infrastructure we've designed,' he says.

In 2017, Diale discovered the ENGEN Pitch & Polish pitching workshop and competition online and decided to enter. The Pitch & Polish programme was created by Raizcorp CEO, Allon Raiz, in 2009. Raizcorp is deeply involved in supporting entrepreneurs and believes that entrepreneurs struggle to raise finance, not because their ideas are flawed, but because they don't know how to pitch their businesses or ideas effectively. Pitch & Polish was created to address this crucial element in an entrepreneur's journey. To date, the workshop and competition has helped polish over 10 000 hopeful entrepreneurs' pitches.

'Before this experience,' says Diale, 'I thought I knew how to pitch my business but now I feel like I've really mastered the skill of being able to sell my business and products within a limited timeframe.'

Using what he learned during the ENGEN Pitch & Polish workshops, Diale has honed and crafted the perfect pitch for his business. 'I have used the same pitch to government ministers and mayors and it works all the time,' says Diale. He also credits the programme with teaching him more about finances and giving the business more stability. Since Diale won the 2017 ENGEN Pitch & Polish, Brucol's turnover has tripled!

> *If you would like to enter to take part in the 2018 ENGEN Pitch & Polish workshops and competition, please visit www.pitchandpolish.com for more information.*

'I would definitely recommend ENGEN Pitch & Polish to other aspiring entrepreneurs,' says Diale. 'Even if you don't win the competition, just by entering you will learn so many valuable things. The competition has really changed my life and how I view business. I am very grateful for the experience and hope to make the competition sponsors, Engen Petroleum and Nedbank, very proud!'

If you would like to enter to take part in the 2018 ENGEN Pitch & Polish workshops and competition, please visit *www.pitchandpolish.com* for more information.

In addition, Raizcorp is partnering with a global agricultural giant to offer seed packagers and distributors the opportunity to join a sponsored business growth programme. The programme will provide entrepreneurial training and guidance, as well as assistance with agricultural best practices, with a view towards making the participating businesses part of a corporate supply chain.

As part of this partnership, Raizcorp is also powering an outreach programme called REAP in Ventersdorp in the North West and Maclear in the Eastern Cape. REAP is a business growth programme for aspiring entrepreneurs in outlying areas and is looking for businesses in the following areas: water and sanitation; the health sector; the agricultural sector; agri-processing; and transportation and logistics.

If you are interested in applying to join any of these programmes, please SMS 'Pula' to 44332.

Article submitted by Penny du Plessis, Communications Officer at Raizcorp. For more information, send an email to pennyd@raizcorp.com.

Bruce Diale – founder of the agricultural consulting company, Brucol Global Development.

> *As part of this partnership, Raizcorp is also powering an outreach programme called REAP in Ventersdorp in the North West and Maclear in the Eastern Cape.*

The Corner Post

SHADRACK MABUZA
United passions promote agriculture

The Indian activist, Mahatma Gandhi, touched many lives with his philosophical thoughts, like 'Find yourself in the service of others'. In this series of *The Corner Post* we feature the mentors and provincial co-ordinators who find themselves in the service of Grain SA and emerging farmers throughout South Africa.

These dedicated mentors all form part of the Grain SA mentorship programme, giving advice on how to achieve your own goals and dreams.

From manager to mentor

Shadrack Mabuza thinks highly of Grain SA. His path crossed with the organisation whilst he was the smallholder development manager at Monsanto SA. 'The interaction I had with Grain SA while being employed by Monsanto for about ten years was at a very high level as the farmers they were servicing, were also getting farming assistance from Monsanto,' he shares. With a similar interest in developing emerging farmers they shared the same goals and understood how to assist each other.

He worked closely with developing and emerging farmers for several years sharing his knowledge with them before making the decision to try his hand at his passion, farming. Shadrack started as a vegetable farmer in 2016 in KwaZulu-Natal. However, it became inconvenient to operate a farm so far from his family who were located in Johannesburg. He therefore made the decision to relocate to be closer to his family and has been farming in the Ermelo district since 2016. Here he produces maize, sugar beans, dry beans and potatoes on 423 arable land. He is also the proud owner of some cattle and sheep.

Since relocating to Mpumalanga, he has become a member of Grain SA and also became involved in the Grain SA mentorship programme. He says he jumped at the change when he was offered the opportunity to assist smallholder farmers again and believes when you help others you benefit from it as well. The experience he gained at Monsanto has provided him with the necessary background to assist emerging farmers.

Currently 180 Mpumalanga farmers form part of his four study groups. They meet every week in season and out of season once in two weeks. 'I also visit the farmers individually as often as I can,' he adds. As he is fluent in Isizulu and SiSwati none of the Nguni languages spoken in this area is a hindrance to him.

Knowledge is the key to good farming practices

According to Shadrack good farming practices come through knowledge. Many of the farmers do things as a routine but don't understand fully why it is be done. Once they comprehend why practices are employed, they can learn to improve their farming skills. In the Highveld area of Mpumalanga, he found the following three issues were hampering production:

1. Soil status: 'The biggest problem I found was that most of the farmers did not understand the soil,' Shadrack says. 'Soil status, the acidity of the soil, soil texture and how to manage the variety of soils were foreign to them.' He has tried to improve this knowledge by emphasising the fact that to achieve a higher yield, one must understand the soil in which you plant, manage the pH influences and know the amount and type of fertiliser that needs to be applied. The rule is what you put in, you get out.
2. Using agrochemicals: During the planting season, various factors affect the germination of the crop. He found that due to inexperience many farmers do not do the basic things correctly. 'Farmers make a lot of mistakes when planting – especially regarding the wrong application and quantity of agrochemicals. These are the things with which the Mentorship Programme assists the farmers.'
3. Marketing: Currently he is working on educating the farmers about marketing at the right time. With moisture content playing such an important role, farmers need to know more about drying maize for storage purposes. 'It is important that farmers know that maize at the correct moisture level can be kept for long periods without losing value. It can be stored until prices have improved and a greater profit can be realised.'

Change for the better

His time as mentor has meant his own farming skills have improved. 'What happens on their farms, also happens on my farm. We face the same challenges, so when we discuss agricultural matters I benefit as well,' he shares. He can impart the knowledge he has gained as a farmer with them to help them be more successful, but it works both ways as he often learns a lot from their experience and insights as well. 'What I see on their farms, helps me to improve my own farming practices,' he adds.

The winner of the 2017 Grain SA/Absa/John Deere Financial Subsistence Farmer of the Year award, Mavis Nomvula Hlatshwayo, from Hereford in Mpumalanga is mentored by Shadrack. He is very proud of her and believes that she is going to be even more successful this year. 'Last year she achieved 8 tons per hectare and I believe this year her yield can be even higher.' He is very proud to have another finalist in the 2018 competition and is holding thumbs that she will also win an award.

Shadrack loves mentoring the farmers and says he is sure that most of them appreciate the value he adds as a result of his own experience. 'Those that listen to Grain SA's advice are truly benefiting from the assistance.'

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.

APPLY TODAY TO JOIN MONSANTO'S SUPPLIER DEVELOPMENT PROGRAMME, IMBEWU.

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In order to be considered for this programme, business owners must:

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- Be the owner of a seed-distribution or seed-packaging business (51% black ownership) and be active in it full-time
- Have a minimum monthly turnover of R10 000 or more
- Have a business that has been operating for more than 6 months

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Entrepreneurs are required to meet the following programme criteria:

Seed distributors

- The entrepreneur must have an in-depth understanding of agriculture and maize production.
- The entrepreneur must have access to an outlet or small shop that has enough space to house between 5 000 and 15 000 bags of seed (a minimum of 25 square metres).
- The entrepreneur must have a reliable pick-up or similarly suitable vehicle.
- The entrepreneur must be in proximity to smallholder maize farmers.
- The entrepreneur must have relationships with local farmers.
- The entrepreneur must be based in the Eastern Cape, KwaZulu-Natal or Mpumalanga.

Existing seed-packaging businesses

- The entrepreneur must be able to prove knowledge of how to handle chemically treated/conventional seed products.
- The business must have enough space to store 26 to 80 tons of seed products.
- The business must have bagging line machinery that can bag 1.3 tons of seed per hour.
- The entrepreneur must have proof of operating permits, security to safeguard seed from theft, and seed inventory control.
- The business must be located in Gauteng or the North West Province.