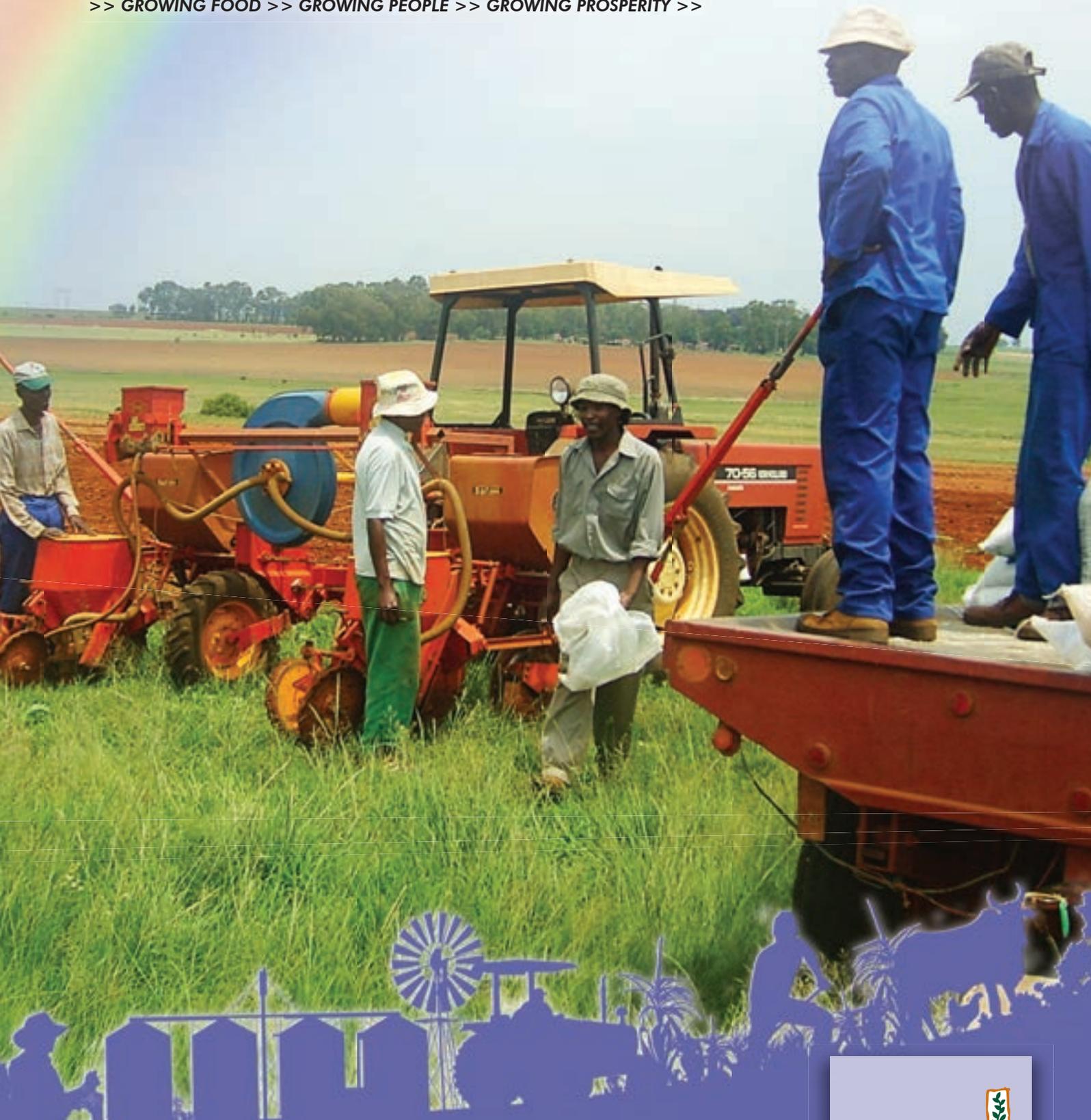


# PULA IMVUILA

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



AUGUST  
2015



MONSANTO



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## NKGONO JANE SAYS...

## IN THIS ISSUE...

04

Increase the lifespan of your equipment with good maintenance  
Farming, especially crop farming relies on mechanical equipment...

06

Take note of new DEKALB seed sizes  
From time to time any company needs to look at their offerings in the market...

07

Plan ahead and order inputs timeously  
We all know the phrase time management. It would be great if we could manage time to suit our needs and deadlines...

08

Malignant oedema or gas gangrene (blackleg, dikkop blackleg and malignant oedema)  
Across South Africa malignant oedema (gas gangrene) causes thousands of deaths among livestock every year...

11

Why, when and how regularly do we need to take soil samples  
We have no sooner completed the harvesting...



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**W**e hope that this year the August winds will start blowing so that the Spring rains can come early. The Western parts of our country experienced a severe drought and they are in need of rain so as to be able to plant the next crop.

Over the years we have been very outspoken about the use of agricultural contractors in the developing sector. As Grain SA we believe that farmers should farm for themselves and use their land to produce crops. Unfortunately there are always opportunists who “pretend” to be helping the farmers by planting crops on the land of farmers (usually communal lands) – in most cases the farmer is not involved at all. Over the years we have seen a large number of these projects start up and die – the continued

use of contractors for developing farmers is simply not a solution. We are always told that the contractors will only be used in the first year and that skills transfer will take place and later the farmers will be using the land themselves. This does not happen.

We are against the use of contractors because it is very expensive, the work is not always done to the right standards, and the work is often done late because the contractor over-commits himself. We have recently been made aware of a project in the Eastern Cape where the contractor charged the farmers R3 500 for land preparation, planting and spraying. This is double what they should be paying. The contractor is sure to be paid, the input suppliers are paid, the consultants see that they are paid – and the crumbs that remain are for the farmer. This is not development and these people

are not helping you as a farmer – they are helping themselves at your expense.

We understand that some people only have a little land, but that does not mean you have to allow someone else to use that land. You can use it yourself to better your household food security and generate an income. Your land is a resource that you can use for your own benefit – use it and get the maximum from that land for you and your family.

It is time to think about your next crop – what are you going to be planting and what inputs will you be using? Please don't wait for a government department to bring you inputs – take charge of your farming and make plans. If you have land, use it well and you will be on the road to food security and financial independence. 

12

### Integrated crop and pasture-based livestock production systems

This article highlights a specific pasture crop species that can play an imperative role in conservation agriculture (CA)...

15

### How to apply proper financial management

Why are you farming? Yes, you like to farm but surely the real reason is because you want to make money,...

16

### What difference does the sulphur content of diesel make?

At some fuel stations consumers can buy more than one grade of diesel...

18

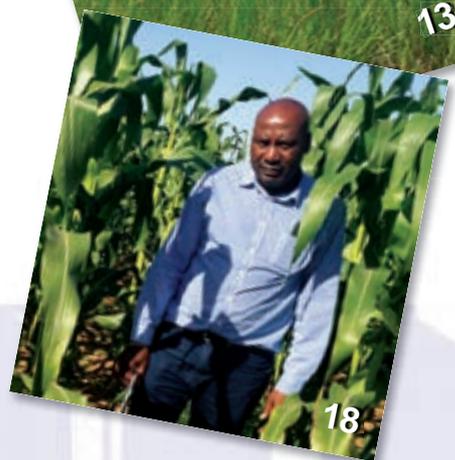
### Grain SA interviews...Elias Pangane

Our Mpumalanga Development Co-ordinator, Jerry Mthombothi, interviewed Elias Pangane...

19

### Corner Post Why every farmer needs a mentor

The year 2015 is a tough year for grain farmers in South Africa. The summer season was very dry and...



# Increase the *lifespan* of your equipment with good maintenance

**F**arming, especially crop farming relies on mechanical equipment and all mechanical equipment has moving parts. All moving parts wear down after a period of time therefore they need continuous maintenance and attention to make sure that they are in good working order.

The best kind of maintenance is preventative maintenance. There is nothing worse than trying to get a job done and continuously being held up by breakdowns. This is inefficient and unproductive and should be avoided at all costs. Obviously sometimes things do breakdown, even a brand new piece of equipment can break down on its first day of operation. But, if things are routinely checked and serviced then breakdowns can considerably be reduced saving time and money.

Let us take look at how we can work through our farm machinery:

## Moving parts

### Bearings

Bearings should be checked daily when the machine is operating and before it is put away for storage. You don't want to leave a problem waiting for the next time the machine will work. Make sure bearings are running firmly and have no play. As soon as there is any movement or play the bearing should be replaced. Always keep bearings greased and make sure that dust covers are in place. It is also essential to make sure that you use good quality bearings when replacing old ones. There are many knock offs and inferior products on the market these days, make sure you purchase a product that will last.

### Belts

Make sure that all belts are firm and taught. Turn the belts and check that there are no breaks or cracks. Replace anything which looks worn.

### Chains

Chains tend to give trouble when they are not oiled and when the links are worn and old. If a chain starts to get worn then change it immediately. It is important to make sure that chains are running firmly and smoothly. If a chain is slightly droopy or loose then it should be tightened on the appropriate tensioning arm.

### Shafts

Shafts should occasionally be assessed to make sure that they are firm and running true. If any shaft is slightly bent then it can cause many other problems.

### Sprockets

Make sure that the sprockets are rigid and that the teeth are not worn. If the teeth start to wear then the chain will start to slip causing many other problems. It is also essential that jockey sprockets are tight and turn smoothly.

### Engine checks

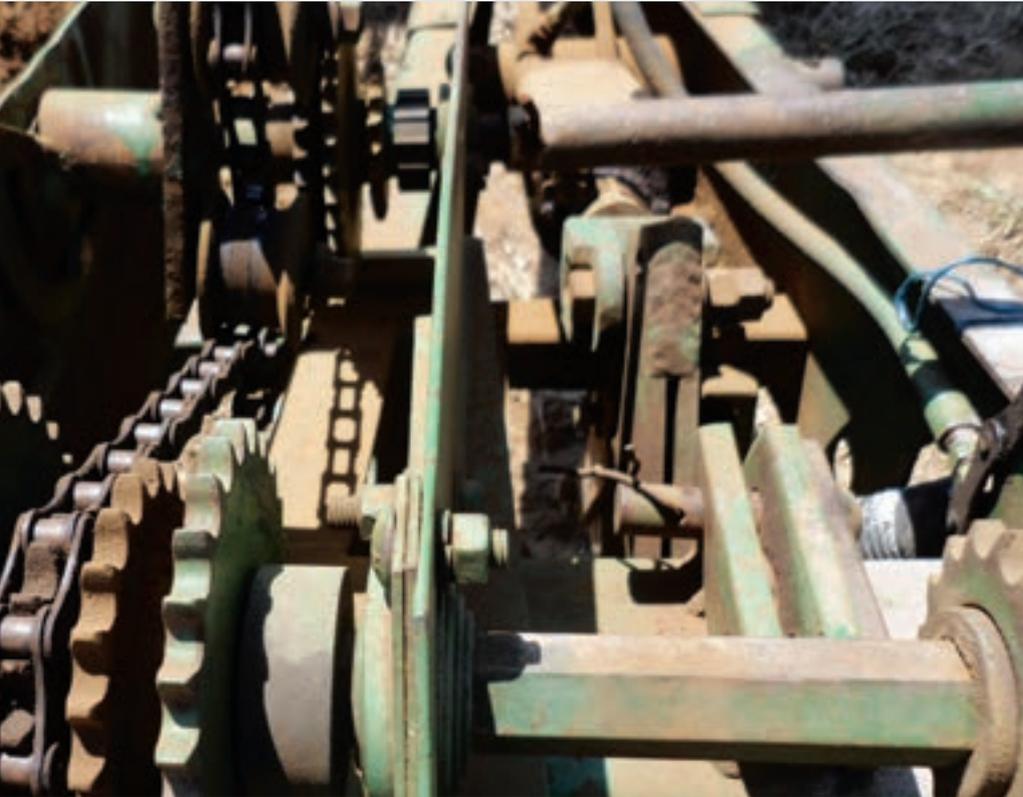
#### Oil filters

Make sure that an engine always has enough oil and that the oil filters are regularly changed. Oil





## MAINTENANCE



**Photo 1: All parts must be inspected thoroughly.**

**Photo 2: Proper maintenance will increase the efficiency of your equipment and reduce wastage.**

**Photo 3: Remember to always try your best to do things right. Do not do what is shown in this photo.**

**Photo 4: The importance of maintaining your equipment cannot be over emphasised.**

as sieves, augers, blowers, planter plates and vacuum's.

The more meticulous we become in making sure that our machinery is in good working order the more time it will save us during the busy seasons. Make sure that you train your labour so that it becomes second nature to them to do routine checks such as these.

By following a good maintenance plan you can significantly increase the lifespan of all your farm equipment. In farming we need to try and cut costs wherever possible, if simple routine maintenance can help to achieve this then it is essential that we do it as a priority.

filters should be changed every time the oil is replaced. Oil levels should be checked daily before the engine is even started.

### **Water**

Make sure that the radiator is always full of water and that there are no leaks.

### **Fuel filters**

These should also be changed at every service. A fuel filter which is dirty will cause breaks in the fuel flow causing the tractor to cut out.

### **Air filters**

When machines are operating in dusty circumstances then the air filters can fill up quickly. These should be blown out daily with a compressor from the inside to the outside.

Certain equipment needs special attention such as planters and combines which are made up of lots of intricate parts. It is also essential to make sure these kinds of machinery are always in top shape as time is crucial when

they are operating. Sometimes you may only have a limited time to work and breakdowns will only hold you up and may cost you getting in a crop or reduce your crop quality when harvesting. On these kinds of equipment there are finer parts that need to be checked over such

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“*The more meticulous we become in making sure that our machinery is in good working order the more time it will save us during the busy seasons.*”



# Take note of new DEKALB seed sizes

From time to time any company needs to look at their offerings in the market to see where they can improve and recently Monsanto decided to reduce the number of seed sizes in the DEKALB maize range.

The number of seed sizes available in the DEKALB brand range will be reduced from 15 to 8 for the next planting season.

The seed sizes that will be available for the 2015/16 planting season will be the following:

- SF – small flat
- SR – small round
- MF – medium flat
- MR – medium round
- LF – large flat
- LR – large round
- XF – PFL or extra large flat
- XR – extra large round

Farmers will benefit from the new reduced number of seed sizes as larger seed volumes per seed size will be available, ensuring that clients will have a very good opportunity to get the seed size that was ordered.

For Monsanto it will mean easier warehouse management and optimisation of warehouse space. Seed quality testing is a very laborious activity and the reduction in seed sizes will also have an impact on the number of samples needed for testing in the laboratories. This will have a positive effect on sample turnaround time and results availability.

But this decision was not taken lightly. In 2009 Monsanto embarked on a research project to determine the plantability of the different seed sizes available in the DEKALB brand. A Metermax planter simulator was used in the laboratory to test the accuracy of single seed placements (singulation) on three planter types namely on finger planters, vacuum planters and positive air planters. The results of the simulations showed that there was very little difference between the accuracy of the different seed sizes.

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## Pula Imvula's Quote of the Month

*"Learn all you can from the mistakes  
of others. You won't have time to  
make them all yourself".*

~ Alfred Sheinwold



# Plan ahead and order inputs timeously

**W**e all know the phrase time management. It would be great if we could manage time to suit our needs and deadlines. But, it always runs out, just when we need it the most. **Unfortunately time can't be managed.** Each second will tick away into eternity...No one can stop the clock.

However, **we can manage ourselves to best utilise the time available to us.**

In agriculture the only thing we have to wait for, is the weather. Just like time, it can't be managed. Unfortunately some of us take a well-deserved break after the harvest and wait for the rain, or new season to awaken us into action. By then, it is often too late to realistically evaluate input needs, compare prices and place orders for timeous delivery.

Remember. **The most important activity in farming is planting.** You reap what you sow. If you start badly you are sure to fail – a whole year of opportunity down the drain. So, be well prepared.

Many of you, reading this article have experienced problems with access to inputs, close to planting time. Suppliers are trying to catch up on backlogs and you have to wait your turn. Truck drivers are on strike. Power failures or labour disputes at warehouses or fertiliser depots. The worst being – no stock.

So we compromise and take what is available. Or we are forced to wait for the inputs – we end up planting too late, or at the wrong time. A recipe for disaster!

Let us look at what we can do with regard to the main input components for crop farming.

## Consider the following actions immediately after the harvest

### Fertiliser and soil nutrition

- Soil evaluation – soil samples or estimates based on previous yield. Most soil analysis companies give a recommendation, based on the current yield as well as future crop expectations.
- Fertiliser representatives are also trained to interpret soil analysis results. Discuss your

next crop with them, (recommendations, volumes, price and discounts).

- There are always discounts available for early orders and early delivery.
- Lime is best applied long before planting time.
- Calibrate your planters/spreaders as soon as you receive your inputs.

### Seed

- Evaluate your crop. Check the performance of the hybrids against the national statistics and the promises that were made. Discuss this with the seed company representatives.
- Decide on the crop you intend planting the following season.
- Consider crop rotation which is essential for crop farming – especially with limited tillage or no-till operations. One important benefit of crop rotation is the containment, or hopefully, destruction of specific disease spores that affect specific crop types – year on year.
- Consider the size and shape of the seed that best suits your planter and soil. **The most popular sizes are sold out very quickly.** When you are planting with a seed unsuited to your planter or soil type, you are asking for trouble.
- Most seed companies offer discounts on a sliding scale, month to month – the longer the wait the lower the discount.
- Calibrate your planters as soon as you receive the seed.

### Chemicals

- Ask your chemical representative to evaluate and examine the weeds that are evident after the harvest before tillage – it is difficult to see exactly what is happening once the soil has been tilled. The choice of your next crop might also be determined by the extent of a specific weed problem. For example, it would be more difficult to control an olieboom infestation whilst planting broad leaf crops.

- Calibrate your sprayers in time. You don't have to wait for the products. Make sure you get it right. Most chemical representatives are keen to assist. Their reputation is on the line. Use their expertise. If your representative is unable or unwilling to help you – find one that can. Be fair and ask for assistance timeously – they are extremely busy during planting time.
- Chemical companies use different brand names to market their products. Become familiar with the chemical composition (ingredients) of these products and use this when comparing prices and recommended programs. At the end of the day, the easiest way to make a decision is to compare cost per hectare for each recommended program.

### Diesel

- Diesel is another major input but prices are not controlled by fuel companies and discounts are more related to volume than timing. If you rely on bulk deliveries, make sure you have sufficient diesel for at least two weeks of planting – long before the time. In all cases, ensure that you see at least one other company for comparison. Loyalty is an important factor, but it is prudent to keep up to date with products and services available from other suppliers.

Don't believe that the "second mouse gets to eat the cheese" – in agriculture it is "the early bird that gets the worm". Don't be caught in the rush. Things always go wrong when we wait until the last minute!

Get all the above done early and then relax and wait for the rain. Good luck with the next season. 🌧️

**Article submitted by Raymond Boardman, Farmer, Consultant and Mentor from Ventersdorp, North West Province. For more information, send an email to [rhboardman@gmail.com](mailto:rhboardman@gmail.com).**

# MALIGNANT OEDEMA OR GAS GANGRENE

## (blackleg, dikkop blackleg and malignant oedema)

**A**cross South Africa malignant oedema (gas gangrene) causes thousands of deaths among livestock every year, as bacteria are found in the soil over a wide-spread area.

It is a complex disease, as at least three different bacteria can be responsible for the illness. The most important causes of gas gangrene are blackleg, dikkop and malignant oedema, which are caused by *Clostridium chauvoei*, *C. novyi*, *C. sordellii* and *C. septicum* respectively.

All the bacteria are gas forming and consequently the diseases are easily confused. Cattle, sheep, goats, horses and pigs can contract gas gangrene. More than one of the abovementioned bacteria can be responsible for gas gangrene at the same time.

Although the diseases are described as separate entities, it is not necessarily the way the disease is found in nature. The disease has a sudden onset and most animals usually die as a result.

These diseases can be controlled effectively with a single or a combination of vaccines. There are also various other clostridial bacteria that could play a role in or are associated with malignant oedema/gas gangrene in farm animals.

### Blackleg

The bacterium *C. chauvoei* that causes blackleg in cattle can also cause gas gangrene in cattle, sheep, goats and sometimes in horses and pigs after infection of wounds.

### Description of blackleg

Blackleg is a very common disease in cattle, but sheep are less affected. The disease has a rapid onset and is usually fatal. The *C. chauvoei* spores that lie dormant in the cow's larger muscles (buttocks, thighs and shoulders) multiply and produce toxins and gas after an injury of the muscles, which is the cause of death.

Blackleg is found more commonly in rapidly growing young animals (nine months to two years) that are in a good condition and have a good nutritional level, but sometimes older animals are also affected.

### How infection takes place

The *C. chauvoei* spores, which can survive outside the body for years, are found everywhere in the soil and in polluted water. Spores are ingested by mouth together with food or water. Infection often occurs when young animals shed their teeth.

Animals are presumably infected through small wounds in the mouth. Outbreaks of blackleg in cattle seem to be seasonal, especially after heavy rains during summer and autumn. In certain areas blackleg is more prevalent than in other areas and it seems as if the composition of the soil plays a role. Blackleg is not contagious. Therefore, direct infection from one animal to another does not occur.

Animals that die from blackleg is the main source of contamination of the environment and the spores can survive for years. Cattle, sheep, goats, horses and pigs of all ages can contract

local malignant oedema after *C. chauvoei* infection of wounds as a result of shearing, lambing/calving, dipping, castration, operations, or from the new-born's umbilical cord.

### Disease and post-mortem signs

The course of blackleg is usually very rapid (less than 24 hours) and therefore signs of the disease are seldom seen. The body temperature rises, appetite diminishes, rumen activity diminishes, and stiffness and lameness occur. Swellings that are spongy to the touch and become cold and numb later on, form under the skin.

The carcasses of animals that die bloat quickly and decompose rapidly. A bloody, foamy liquid seeps from the nose and anus. Affected muscles contain gas and are dark red in colour.

### Dikkop blackleg

Dikkop in cattle is less known among producers, but is of fundamental economic significance. In South Africa the disease dikkop is better known to affect sheep than cattle. Horses and sheep also die of dikkop. Dikkop can be effectively prevented and controlled by vaccination.

Dikkop is more prevalent in young rams under the age of two years. The disease is found less in older rams and ewes. Dikkop is less familiar as the cause of death in cattle. During the past few years many deaths that occurred among cattle (dairy cattle and beef cattle) in South Africa were caused by dikkop. Dikkop is caused by the bacterium *Clostridium novyi* type A.

### Where *C. novyi* bacteria occur

These bacteria occur widely in nature. The bacteria are found in the soil as well as in the intestines of animals. Soil containing a lot of organic



**Photo 1: Blackleg is more common in rapidly growing young animals in a good condition. This heifer died of blackleg. Note the swelling of the right back leg and buttock.**

**Photo 2: A Jersey dairy cow that died of dikkop (swollen head). The animal bloats very quickly and decomposition rapidly follows.**

**Photo 3: This sheep died of dikkop. Bleeding and inflammation are clearly seen in the neck.**



**Photo 4:** Gas gangrene is a very common disease in cattle, but sheep are less affected.

**Photo 5:** Infection with blackleg and dikkop occurs especially when young animals (goats, sheep and cattle) shed their teeth.

material, or of which the pH is alkaline, promotes the survival of the bacteria. Carrier animals (for example sheep and cattle) spread the bacteria from farm to farm through their dung. Animals that die from dikkop and then decompose contaminate the environment with the bacteria.

#### **How animals are infected**

Cattle and other animals (for example sheep and horses) become infected by ingesting the spores of the bacteria when they eat contaminated grass or feed. Spores of bacteria are taken up in the animal's bloodstream and deposited in the organs in a latent form.

If tissue damage of these organs occurs, the spores begin to grow and produce their toxins, setting off the disease. Infection of animals (for example sheep) by *C. novyi* can also occur through wounds, the umbilical cord of lambs, or the wombs of ewes. Wound contamination by *C. novyi* probably plays a role in the development of dikkop in cattle.

#### **Signs of the disease**

Cattle are often just found dead, as the illness is quite acute. The dead cattle bloat very quickly and post-mortem decomposition follows very rapidly.

Cattle often die before specific significant signs can be observed and older and younger

cattle are affected, although blackleg usually affects young animals (six months to a year old) and deaths are acute.

In cases where signs of dikkop can be observed in cattle, the animal is lethargic, does not eat, the head and neck are stretched forward, the animal lies down a lot, it breathes rapidly and superficially, its heartbeat is weak, it moves with difficulty and falls behind when the herd is driven on. Its temperature is sometimes normal or below normal. Horses can die very quickly (within 24 to 72 hours) before significant signs can be perceived.

#### **Post-mortem lesions**

Post-mortem changes appear very quickly after a death and the carcass decomposes rapidly. The typical spongy feeling below the skin in some parts of the body, as found in blackleg, is mostly absent because fluid collects under the skin.

In cattle the tissue is affected by bleeding and inflammation, especially in the neck muscles and chest organs (especially the heart). In sheep and horses these types of lesions are also found. Many other lesions that could be useful to veterinarians could be present.

#### **Malignant oedema**

Malignant oedema, which is caused by *C. septicum* and *C. sordellii*, affect cattle, sheep, goats, pigs and horses. The bacteria are found in soil, water and the intestines of animals.

The malignant oedema forms after wound contamination, for example after operations, shearing wounds, inoculation, and after giving birth (womb blackleg). The illness has a rapid onset with accompanying fever and blood poisoning and many animals can die. Other *Clostridium* germs can also play a role in malignant oedema. The affected part of the body bloats, gas bubbles form and lameness can develop.

#### **Diagnosis for blackleg, dikkop blackleg and malignant oedema**

The history, signs of illness and the findings of a post-mortem must be taken into account. Detailed laboratory examinations on samples of the animal that died must be done in order to confirm the illness.

The veterinarian will take pressure swabs of lesions to identify bacteria with immunofluorescent colour techniques.

#### **Prevention and control (blackleg, dikkop blackleg and malignant oedema)**

- These diseases, which are most commonly found in cattle and sheep, can only be prevented by continued annual vaccination as the disease-causing bacteria (spores) are found widely in nature.
- Consult a veterinarian regarding the immunisation programme and whether the animals

# Malignant oedema or gas gangrene (blackleg, dikkop blackleg and malignant oedema)

**Photo 6:** Gas gangrene spores causing blackleg and dikkop are ingested by the animals like these sheep through their mouths with food and water.

**Photo 7:** Horses can die very quickly from dikkop blackleg (24 to 72 hours) before significant signs can be observed.

**Photo 8:** Prevent and control gas gangrene in cattle and other livestock by sustained annual vaccination.

should be inoculated against only one or two, or all three diseases. Single or combination vaccines are available.

- Inoculate calves against blackleg for the first time at six to nine months of age, with a booster (second vaccine) three weeks after that, and then annually until they are three years old. On farms badly contaminated with blackleg calves can be inoculated from the age of three months and all other cattle every six months up to the age of three years. Sheep have to be inoculated annually against blackleg six to eight weeks before shearing. The inoculant must be administered under the skin.
- Sick animals can be treated with a penicillin or a tetracycline, for example Engemycin, Reverin, Reverin LA. The prognosis after treatment is poor and producers are warned to consult their veterinarian. 🍀



**Article submitted by Dr Jan Du Preez, Managing Director: Institute for Dairy Technology, for SA Graan/Grain August 2014. For more information, send an email to [jan.dupreez@mpo.co.za](mailto:jan.dupreez@mpo.co.za).**





# WHY, WHEN AND HOW regularly do we need to take soil samples

**W**e have no sooner completed the harvesting of the last seasons crops when we have to start the physical and financial planning for the basket of summer crops to be planted in the 2015 to 2016 summer production season.

One of the highest cost centres in crop production gross margin analysis is the budget and financing for fertilisation. I hope as farmers you were fortunate enough to have had a reasonable crop despite the very difficult season just past. Whether you had good or poor yields the question will arise as to the planning of an optimum fertilisation taking into account the physical and financial restraints experienced on your farm.

A good place to start is an evaluation of your soil's potential and current fertility status.

## Why do we take soil samples?

Knowing the nutrient makeup of your soils, as well as the soil depth and the potential for realising various crop yields within the climate prevailing on your farm, will enable you as a farmer to make an accurate assessment of what fertilisation programme is required.

Taking soil samples and sending them to a reliable test laboratory will need to give you, as a minimum standard, the parts per million results for the major elemental nutrients found being nitrogen (N), phosphorus (P) and potassium and the secondary nutrients sulphur, calcium, and magnesium. The test should also show the acidity of the

soil (ph), clay content and the ratios of calcium (Ca) and magnesium (Mn). Minor nutrients include iron, manganese, copper, zinc, boron, molybdenum and chlorine. As a rule in South Africa, zinc, molybdenum and boron are usually added in the fertiliser mix or seed dressing as a precaution against any deficiency in the soil leading to poor plant growth.

This information is used by you as a farmer together with your agronomist and fertiliser representative to plot a detailed plan for the fertilisation of the various crops to be planted. These may include maize, sunflowers, soybeans, sorghum and groundnuts. The cost of the fertilisation programme can then be accurately worked out and included in the budget. The yield results of certain level of nutrients in the fertiliser programme together with the known available nutrients are well proven for most soils and areas in South Africa.

It is also essential to know the current status of your soil after a bad year, where very little of the fertiliser in the previous plantings were removed and after a good year where additional phosphates and other nutrients might need to be increased to ensure optimum yields and a profitable financial return.

## When is the best time to take soil samples?

If you are taking over a new farm or land, soil samples should be taken as soon as possible after or during July and sent to the laboratories before the end of August. Laboratories are inundated with soil samples being received from all over the country from August to October so be prepared and do it early.

Soil samples can be taken right at the end of a season as well. It also makes sense to combine the soil sample gathering operation while having a look at 1 meter by 1 metre and by 1 metre in depth soil profile holes that can be used to examine soil type effective root depth and the presence of any hard pan that might have developed in any of the lands to be planted. The correct cultivation techniques can

then be used to break the hard pan before the coming season.

Lands to be tested should be identified as to soil depth and soil type. A minimum of one sample for every ten hectares is the acceptable rule of thumb. Each section should be walked in a zigzag pattern with the soil sampler by using one of several kinds of soil augurs on the market to take at least 150 mm depth of top soil per sample at every hundred metres. Each mini-sample is then combined and well mixed in a clean bucket and a representative sample is in turn taken from the bucket and placed in the commercial standard plastic lined cardboard boxes which are available from the various laboratories. The boxes must be well labelled to show the farm and each land very clearly. It is really worth it to do a few lands properly so that accurate results can be obtained for the expense involved in fertilisation per hectare as it is a considerable cost these days and needs to be right. The most accurate results can be obtained by sending the samples to a lab within 24 hours.

## How regularly do we need to take soil samples?

If a base line evaluation of the fertility of your own farm has been established for every land then at a minimum lands can be tested in rotation every three years. In the instance of double cropping in high yielding irrigation production so many nutrients are removed an annual test would be recommended. It is also advisable after very good or bad years to take soil tests so that the fertiliser plan can be optimised for the coming season.

## Conclusion

Take the extra time and trouble to know your soil fertility status. Don't guess! 🌧️

*Article submitted by a retired farmer.*



*Take at least 150 mm depth of top soil per sample at every hundred metres.*



*A minimum of one sample for every ten hectares is the acceptable rule of thumb.*

# Integrated crop and pasture-based livestock production systems

This article highlights a specific pasture crop species that can play an imperative role in conservation agriculture (CA) based crop-pasture rotations. Besides improving the physical, chemical, hydrological and biological properties of the soil, such species, including annual or perennial cover crops, can successfully be used as animal feed.

Livestock production systems are in many ways dependant on the utilisation of pasture species, in this case as a pasture ley crop, and can therefore become an integral component of CA-based crop-pasture rotations. It is imperative however to identify a pasture species fulfilling the requirements of a dual purpose crop, i.e. for livestock fodder and soil restoration.

## *Cenchrus ciliaris*/Blue buffalo grass (*bloubuffelsgras*)

Blue buffalo grass also known as foxtail buffalo grass, is an indigenous, tufted grass with underground root stocks. This grass can have a typical blue-green colour, such as the Molopo cultivar or a bright green colour, such as the cultivar Gayndah.

The Molopo cultivar is known to grow as tall as 1 500 mm. The most common cultivar available in South Africa is Molopo, named after the place of origin. The cultivar Gayndah is a cultivar commonly imported from Australia, and has shown its adaptation and potential in many parts of the country. This cultivar has a finer structure than Molopo, resulting in a more palatable pasture and better quality foggage.

## Agro-ecological distribution

The drought resistance of this grass species is what makes this grass a good summer grazing and hay crop, especially in the drier parts of the country. This species has the ability to survive in areas that receive as little as 300 mm of rainfall a year.

Blue buffalo grass will grow the best in an area where the temperature and light intensity is high. Whenever the day temperatures are high and the night temperatures are medium to low, it can be expected that growth will be affected. This grass must preferably not be planted at heights above sea level of more than 1 550 m. Australian research has indicated that if no other restricting factors occur, the grass will grow the best at temperatures of 35°C .

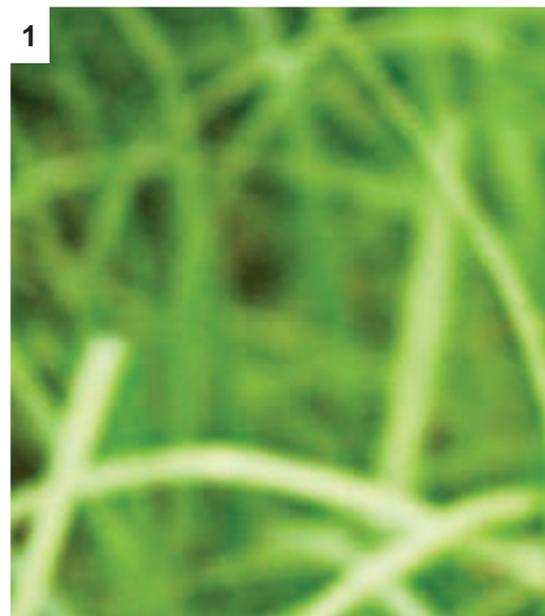
Blue buffalo grass grows well on most soil types except light, sandy soils. Some heavy soil types are suitable as well, however, the establishment of this species on these soils are difficult, and often the risk of drowning for this species is evident on such soils.

Soil types with pH's below 5,5 are not suitable for the establishment of the grass, unless lime is applied to rectify the pH. Research has further indicated that blue buffalo grass does not establish well on soils with a low phosphorus (P) content, resulting in poor seedling survival.

## Management and utilisation

The establishment of blue buffalo grass can often be a major challenge. Diligence and patience is of the essence when planting this species. The soil should be cultivated well, preferably 300 mm deep

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in the autumn of the previous year, or as early as possible in the year of planting.

Lime can be applied if needed at the same time as cultivation to ensure uniform incorporation. Light discing is recommended to preserve moisture as far as possible, to control weeds and to maintain a firm seed bed by the time of planting. Superphosphate can be applied before the final preparation of the seedbed to ensure soil phosphorus (P) content of approximately 15 mg/kg - 20 mg/kg of soil.

The establishment of blue buffalo grass is a delicate process. In the environmentally suitable areas of the country it is suggested that this species is planted at the end of January to the middle of February. Earlier plantings are possible, but weed control can often be a problem. The best time for planting is when the rainfall events are frequent and reliable. It is imperative that freshly harvested seed is not planted, as the seed requires nine to twelve months after harvest to become ripe. It is recommended that certified seed is used to protect the buyer as well as the seller.

The seeding rate can vary between 4 kg/ha when the field production potential is low, and 6 kg/ha for a field with a high production potential. Pelleted seed can be planted at seeding rates of 5 kg/ha - 8 kg/ha. A very important determinant for the successful establishment of blue buffalo grass is the method used to establish the grass.

**Photo 1:** A blue buffalo grass seed head.

**Photo 2:** A good stand of blue buffalo grass.

**Photo 3:** Well-fertilised blue buffalo grass.

**Photo 4:** Cultivar Gayndah (left) and Molopo (right).

**Photo 5:** Blue buffalo grass foggage.

**Photo 6:** Erosion control.

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If general fertiliser recommendations are adhered to, it will not be necessary to fertilise P within three years. The following year's superphosphate can be applied to maintain the soil P content at 15 mg/kg soil and above. In highly productive areas, it can be beneficial to split P applications between spring and summer.

With regards to nitrogen (N) fertiliser recommendations, it often very difficult to obtain a clear recommendation since it is largely dependent on the rainfall being the determining factor. A very common recommendation based on research findings at Mara Research Station, ranges between 40 kg - 100 kg N/ha for an area receiving a rainfall of 400 mm - 800 mm.

These applications can be split over two periods. With the production of hay, and the resultant high removal of potassium (K), K will need to be applied regularly in the form of potassium chloride (KCl) at a rate of 50 kg - 100 kg K/ha.

**Management challenges**

One of the most important factors that determine the quality of the blue buffalo grass is the age of the material since the last harvest. The older the material, the less acceptable the hay will be for the animal.

Digestibility and therefore nutritional value will decrease substantially as the plant becomes more mature. For these reasons, the farmer should try to cut hay every six to eight weeks (approximately 750 mm tall).

Higher hay yields can be obtained, but possibly with lower quality if intervals between harvests are longer, therefore less harvests. The quality of hay cut at the correct stage, can be sufficient to maintain dry and pregnant cattle during the winter months.



The three methods used for establishment are:

- Broadcast seeding: This method is suggested when dense plant populations are required, especially areas that are to be irrigated or in areas where the soil fertility and rainfall is high.
- Row planting: This method is recommended for areas with low rainfall and when the field has a low production potential. The distance between rows will differ according to environmental conditions. In an area where the rainfall ranges between 400 mm - 550 mm, row spacing can be as much as 2 000 mm, while in an area with a rainfall of 600 mm and higher, the row spacing can be 750 mm. A maize planter, the tractor wheel method or a specially designed blue buffalo grass planter can be used to establish the grass. This seed should never be planted deeper than 5 mm, as it will delay germination and negatively influence establishment.
- Planting of root cuttings: Blue buffalo grass can also be planted using root cuttings. Use cuttings that have three to four active buds. Plant the root cuttings in a sufficiently moist soil, and ensure

that the soil around the cutting is consolidated properly. To plant 1 ha, twenty to thirty 50 kg bags will be required.

The fertilisation of blue buffalo grass needs to be aligned with the amount of moisture received. For instance, in the drier western and northern parts of the country, where low rainfall is evident, it is critical that fertilisation rates are adapted.

Blue buffalo grasses' popularity has increased and can often be seen in the central and eastern parts of the country, especially the Lowveld regions along the roadside. The fertilisation rates will therefore be determined by rainfall and fertiliser prices.

Fertilisation during establishment is important, and lime will not necessarily ensure significantly higher yields, however, raising the soil pH to above 6, will facilitate optimal assimilation of nutrients required for growth and resistance to growth limiting factors. It is imperative that the phosphorus (P) content of the soil should be sufficient, since research has shown that blue buffalo grass seedlings have a high P requirement.



## Integrated crop and pasture-based livestock production systems

5



6



With respect to grazing, animals tend to graze the leaf material more selectively than the stem. If the animals are forced to eat the stem material, it can be expected that an insufficient amount of feed will be available and will negatively affect animal production.

A good practice to revitalise grazed blue buffalo grass pasture is to aerate the pasture with a tined implement every two to three years depending on the soil texture and the moisture content of the soil. A clay soil is less dependent on this practice than most other soils, and it is advisable to apply this practice when soils are not too dry.

### Soil conservation and health benefits

Blue buffalo grass is a species that is widely adapted and has the ability to grow in various soil conditions and can optimally use all the resources available to it. Since it is well adapted to drier conditions, it becomes very attractive to use this species to rest soils and restore soil quality under extreme climatic conditions.

With the amount of dry matter produced under variable moisture conditions, this species has the ability just as many other sub-tropical grasses have, to lower the soil temperatures which facilitate further seed germination, as well as preserving moisture from soil evaporative loss. This preserved moisture is rather used for plant growth which will ultimately contribute to organic matter which can partly be used for animal feed, decomposed to soil organic matter and then also be a competitor for unwanted, worthless weed species.

### Animal production aspects

It is generally known that blue buffalo grass can become unpalatable the older it becomes and especially when it grows out too tall. At this stage too many thick stems develop which the animals avoid when grazing.

Just as production is affected by rainfall and fertiliser, so will the grazing capacity. Grazing capacity values established in the past were

1,2 LSU/ha/180 days on average for both the Bloemfontein and Mara district with a long-term average rainfall ranging from 400 mm to 550 mm.

On the Springbok flats grazing capacities of 1,1 and 1,5 LSU/ha/180 days have been determined; however it can be as low as 0,8 LSU/ha/180 days whereas high rainfall or irrigated areas it can increase to 2,5 LSU/ha/180 days.

Animal production on Blue Buffalo grass can deliver live weight gains of 140 kg/ha - 185 kg/ha and can go up as high as 345 kg/ha. Many researchers and authors recommend that this species only be used for young growing animals for the most economic results.

On the other hand hay production can be as low as 2 tons/ha in lower rainfall regions, however yields of up to 12 tons/ha in high rainfall regions have been obtained. With a six to eight week regrowth of blue buffalo grass, that has been fertilised well, crude protein values of up to 12%, crude fibre values of 35% - 50%, and a digestibility of 55% - 65% can be achieved.

As part of an animal production system, it is important to have alternative uses for pasture species and blue buffalo grass has the potential to also be used as a foggage. This species can therefore retain some quality in winter to maintain animal weight with the supplementation of a winter lick.

### Grain crop production

In the North West and central parts of our country where grain crop production is prominent, blue buffalo grass can typically be used in a cropping system for a period of around five years. After this period, the soil should be sufficiently restored to cultivate annual grain crops under a CA-system.

Herbicides kill the pasture quickly and the pasture residues remain on the soil surface providing cover that limits erosion, enhance water infiltration and reduces their rate of mineralisation. Once a decision is made to terminate the ley, all pasture components should be considered as "weeds" that

need to be removed. They should no longer be regarded as a source of fodder for livestock.

Depending on the pasture species and situation (e.g. dry or wet area), the pasture could be killed a season before planting grain crops to allow the soil profile to be replenished with water. The water requirement of the first crop planned after pasture will influence the timing of removal of the pasture.

Reliable and timely seasonal rainfall forecasts may assist in this planning. Following the pasture phase, grain crop yield will be restricted unless the soil water profile is replenished. After removing the pasture, weeds in the fallow must be controlled to conserve soil water to maximise the benefit of the ley.

A suitable no-till planter should be used to plant the grain crops directly into the residues of the pasture crop, without any other cultivation practice disturbing the soil. Normal integrated fertiliser (based on soil fertility levels and yield targets), weed and pest control practices should be followed.

### Conclusion

*Cenchrus ciliaris* (blue buffalo grass/bloubuffels-gras) is regarded as one of the best pasture species adapted to dry and wet conditions. It has the ability to produce good quality pasture if managed correctly.

As many other sub-tropical species, this species can also be mismanaged and provide very little value at all. With good establishment, rainfall and fertility (irrespective of how much), this species can offer fantastic grazing and high quality hay for animal production, while restoring the soil for future grain production.

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# HOW TO APPLY proper financial management

**W**hy are you farming? Yes, you like to farm but surely the real reason is because you want to make money, therefore your business must be financially successful.

How do you know your farming business is financially successful? There is but one answer to this question – you must determine it by applying proper financial management. Whether you like it or not, it is paperwork.

Today's farmer should be thoroughly familiar with the numerous management functions, **regardless of the size of the farm business.** Although all the management functions are important, it is the financial management of the farm business that brings everything together. Defining and monitoring farming activities in financial terms will give the farmer an overview of the entire farm business, which in turn will result in better informed business decisions. Financial management is not only the link between all aspects of the farm business, but also "oils the wheels" that allow the business to function more effectively.

Practically the first step to proper financial management is to obtain and keep all so-called source documents for **all transactions** related to your business where money is involved (directly or indirectly). In all instances a source document will be a piece of paper, such as bank statements, bank and deposit slips, purchase invoices (including till slips, cash slips, petrol slips), sales invoices and delivery documents and so forth.

The name source documents, is derived from the fact that these documents are the basis of financial management. Without these documents it is **TOTALLY IMPOSSIBLE** to manage the finances of your business properly.

As the second step to apply proper financial management you need to record all the source documents in some way or the other. The recording needs to be done in order to eventually compile the three financial statements that are required for financial management. The three financial statements being:

- An **Income Statement** which determines the financial result – profit/loss of your business.
- A **Balance Sheet** determining the financial position of your business. This relates to the ratio of assets to liabilities of your business. Is your business in a safe position – solvent, or is your business at risk? Do you have a lot of liabilities?

- A **Cash-flow Statement** indicating whether your cash inflow is greater than the cash outflow or vice versa. Practically, this statement indicates whether you will have enough cash available at any specific time, such as at the end of a month, to meet all your commitments. For instance, the paying of wages, electricity bill, monthly payments on accounts, and so forth.

In order to apply proper financial management the three statements should be available at least **every month** and as close after the end of a month as possible.

Certainly many of you will be saying you cannot do this – you have not got the time and/or you do not have the know how and/or my business is small, I do not need to do it. Unfortunately, these are only excuses.

In all the articles thus far regarding management we have always emphasised if you cannot do something yourself you must get someone to do it for you, maybe a family member or somebody from the outside. This person will then be known in common language as your bookkeeper. If it is someone you have appointed to do the job it will increase your costs because the person will have to be remunerated. However, it will be money well spent.

This bookkeeper must be provided with all the relevant source documents and must then record them and compile and provide you with the financial statements as mentioned every month. And then assist you to analyse and compare the financial statements with your budgeted (planned) statements to determine

whether you are still on track with your business and what is the financial position of your business. Ensure that the bookkeeper knows how to compile the financial statements for management purposes for a farming business. The layout of financial statements for management purposes for a farming business does differ from that of other businesses because of the practical differences between the businesses and it differs from the way financial statements are set up for tax purposes.

With today's modern technology (computers) it is possible to do this work and have the financial statements available immediately even after each and every transaction. You can even determine the effect of a transaction on your finances before the time. Should your business be small and you cannot really afford a computer the financial record keeping can be done manually. A financial record keeping book to be completed by hand and that is very easy to use is available.

In closure, in order to manage your farming business properly you need someone as a bookkeeper to assist with the proper financial management of your business. The bookkeeping function is very much an integral part of your business. 📌

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# What difference does the SULPHUR CONTENT OF DIESEL MAKE?

**A**t some fuel stations consumers can buy more than one grade of diesel. What is the difference between the 500 ppm, 50 ppm and at some petrol stations now also 10 ppm diesel, and will it have an effect on the performance of the engine?

These numbers indicate the sulphur content of the fuel in milligrams sulphur per kilogram of fuel. (The term ppm is the abbreviation for parts per million and refers to, for example, 50 parts sulphur per million parts fuel on a mass basis [m/m] and is the same as mg/kg.)

The sulphur content of the diesel does not really have an effect on the performance of the engine, but has a dramatic effect on the environment, on humans, as well as on the engine itself. The reduction of sulphur in diesel leads to less sulphuric acid and soot in engine oil, and as a result the intervals between the changing of oil can be increased. This is definitely of benefit to the consumer.

A further benefit of diesel with a lower sulphur content is that the platinum catalysts in exhaust pipes work better, and as a result the levels of emissions of carbon monoxide (CO) and other partially combusted hydrocarbons, as well as nitrogen oxides (NOx), are diminished. The lower sulphur content also increases the life of the platinum catalysts.

Sulphur also plays a role in the forming of particles in the exhaust gas of a diesel engine. There is a direct link between the sulphur content in diesel fuel and the particle content of exhaust gases. The particles smaller than 10 micrometres can be absorbed by the lungs and will definitely be harmful to a person's health.

Technologically speaking diesel engines have changed a lot during the past years, leading to greater effectiveness. The new technology also resulted in the diminishing of the particle content in the exhaust gases because the fuel combusts better. The combustion of fuel has been regulated by legislation for many years and engine manufacturers must act within the law.

This kind of legislation has diminished air pollution dramatically in Europe and the USA. In order to comply with this new legislation, the use of diesel engines in particular is a very good alternative to petrol engines, especially as diesel engines are more effective than petrol engines.

Sulphur forms part of crude oil and by refining the crude oil, oil, petrol and diesel and

other fuels are produced. The refineries must refine the sulphur from the crude oil and that involves a lot more additional processing of the crude oil.

Therefore refineries had to be modified and processes added to produce fuel with a lower sulphur content. The lower sulphur content in diesel has major cost implications for the refineries. That is why the price of diesel with a lower sulphur content is higher than that of standard diesel.

## Implementation of legislation on emission standards

In order to reduce harmful emission levels in Europe, certain requirements known as Euro I, II, III, IV and V were set. These requirements are enforced by legislation and therefore engine manufacturers must adapt their products to these requirements.

It was decided that South Africa would follow the approach as implemented in Europe, but with a time delay regarding its implementation. This step makes it possible for new engine technology to become available in South Africa as well.

In South Africa the current specifications and standards are in accord with the Euro II emission standards. At this stage most of the developed countries have already implemented Euro V standards or the equivalent thereof, while developing countries are in the process of implementing the latter requirements.

South Africa has to be on the same level as Euro V in 2017. This will mean that the sulphur content of the existing 50 mg/kg will be reduced to 10 mg/kg. Polycyclic aromatic hydrocarbons (PAHs) have to be decreased to 8% on a mass basis. The cetane number have to be increased from 45 to 51, and the limit by which 95% of a diesel sample rectifies, may not be more than 360°C (T95 limit). The latter ensures that fewer heavy components remain to cause harmful deposits in the engine.

## The role of particle contamination

From the viewpoint of the consumer there are various aspects that have to be taken into account when looking at the performance and life expectancy of diesel-powered equipment. Diesel suppliers make sure that their products comply with at least the minimum requirements, but in many instances they are better than these requirements.

The maximum level of solids contamination required in South Africa is currently 24 mg/litre, but in the USA and Europe the maximum level is much lower, namely 10 mg/liter. At this stage the particle size and nature of the contaminants are not specified, but sand and dust can undoubtedly cause considerable damage to the delicate injection systems of modern diesel engines. Effective filtration of diesel before it enters the injection system is critical.

Although the nature of the damage done to injectors differs, depending on whether the lack of lubrication or particle contamination was the cause, the results are the same. Care has to be taken that when diesel is stored, for example, it is not contaminated with particles of any nature.

## Other sources of contamination

It is furthermore important to make sure that the diesel used is not contaminated with paraffin. Paraffin has no lubricating properties and damages the injectors as well as the diesel pump. Faulty injectors cause an irregular spraying pattern in the combustion chamber, which could cause serious damage to the piston head.

Another very important consequence of ineffective injection systems is that the crankshaft oil could become diluted and thus the lubrication effect can be compromised. This will naturally only happen when the rings on the pistons are damaged in such a way that diesel filters through to the crankshaft.

Always keep in mind that diesel is a complex product that has to satisfy many requirements. Some of the properties of diesel cannot be obtained and maintained without the addition of suitable additives. These additives are usually added in very small quantities (typically parts per million) and are aimed at, for example, improving the lubrication action, increasing oxidation stability, limiting corrosion and reducing deposits during combustion.

Often a sensitive combination of properties is obtained by a balanced variety of additives.

Water in diesel is a further 'household' problem that definitely has to receive attention. The diesel specification makes provision for this as well – diesel may not contain more than a certain quantity of water in the solution. Of course free (visible) water is totally unacceptable.

## IMPLEMENTS AND EQUIPMENT

### What about the future?

This remains an interesting question. Provision has already been made for the handling of fuel for use in hybrid vehicles (combination of internal-combustion engines and electrical propulsion, as well as for the use of flexi-fuel engines, in other words engines that can be used with either petrol or diesel, as well as engines that can be used as a spark-ignition or compression-ignition engine.

The phasing in of biodiesel is another matter that has to be taken into account. Provision has been made since 2006 for a maximum of 5% biodiesel (in other words diesel manufactured from renewable material like sunflower oil and soybeans) to be mixed with conventional diesel.

With the great emphasis on renewable resources and sustainability an increasing trend to manufacture liquid fuels from renewable sources is to be expected, but this has various technical and other implications that need to be taken into account too.

The most important of these is probably the fact that it is almost impossible to completely substitute crude oil-based or coal-based diesel with diesel of a vegetative origin.

Very interesting research is being done at the tribology laboratory of the Department of Chemical Engineering at the University of Pretoria on the performance of lubricants, and more specifically on the nature and role of wear and tear and the consequences of water in diesel.

In future this work could set a new standard that will in turn improve the effectiveness of diesel engines in particular. A variety of diesel and oil tests are also done to determine whether products meet specifications.

**Photo 1** shows an injector of which the contact area is seriously damaged, and **Photo 2a - 2c** shows the result of that on the pistons of a diesel engine.

In conclusion, it has to be mentioned that diesel fuel as delivered by the oil refineries is a complex mixture that has to comply with strict requirements. It contains a variety of additives that, although they are added in small quantities, play a major role in ensuring that the engine in which the diesel is used functions optimally and will have a long life.

It would be simply irresponsible to add all kinds of preparations and additives to diesel unless they are recommended by the manufacturer of the engine.

### Sources

*Petrol and diesel in South Africa and the impact on air quality*, November 2008, SAPIA, <http://www.sapia.co.za>.

SANS 342:2014 Edition 5: South African National Standard on Automotive Diesel Fuel. ISBN 0-626-18752-4.

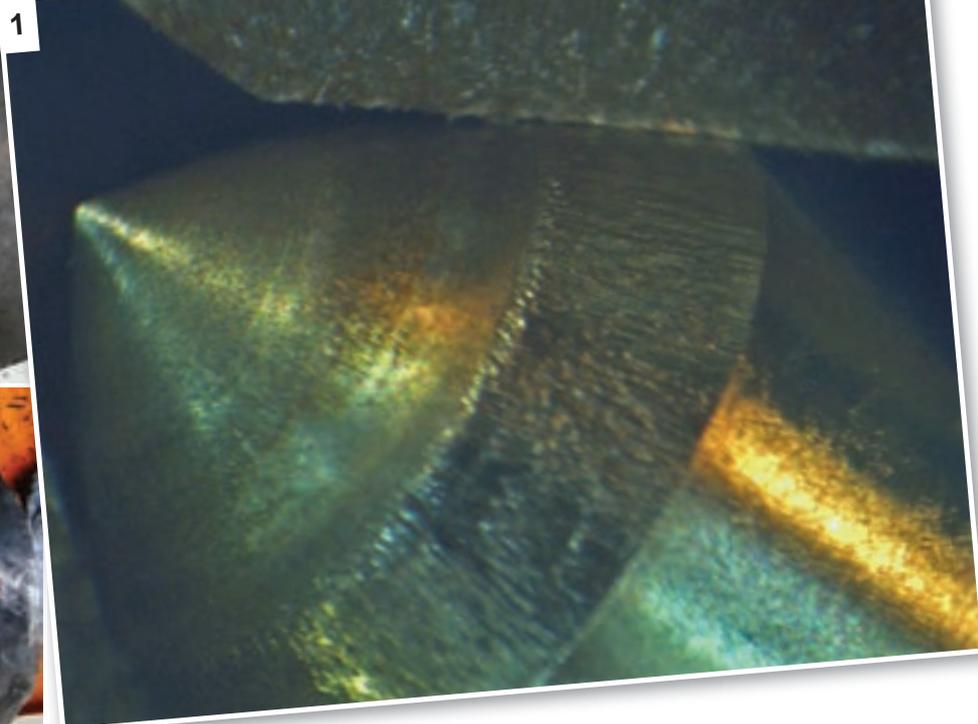
Government Gazette, 8 March 2011 No. 324089, "Discussion document on the review of fuel specifications and standards for South Africa".

Government Gazette, 1 June 2012 No. 35410, "Schedule for amendment of regulations regarding petroleum products specifications and standards".

Department of Energy, [http://www.0energy.gov.za/files/policies\\_frame.html](http://www.0energy.gov.za/files/policies_frame.html).

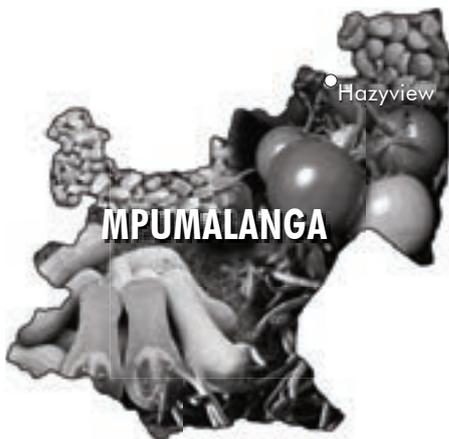
Von Wielligh, A.J., De Vaal, P.L.; *Discrepancy between laboratory fuel tests and engine failures: two case studies*; 10th International Tribology Conference, University of Pretoria, 2011.

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**Photo 1:** A damaged injector.

**Photo 2a - 2c:** Damage to a piston.



# Grain SA interviews... Elias Pangane

**O**ur Mpumalanga Development Co-ordinator, Jerry Mthombothi, interviewed Elias Pangane for this issue of Pula Imvula. Elias farms between Mkhuhlu and Hazyview on 50 hectares of arable land and would like to become a commercial farmer in the next five years.

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

I farm on 50 hectares arable land at Mashobane Boerdery (Loss and Found Farm) between Mkhuhlu (Bushbuckridge) and Hazyview. I currently farm with 4 hectares green mealies, 2 hectares green beans, 2 hectares butternuts, 1 hectare tomatoes and 40 hectares Macadamia nuts.

## What motivates/inspires you?

I enjoy farming as a hobby but also farm to create job opportunities. I grew up helping my father who was a small scale farmer. The income I generate from farming also motivates me.

## Describe your strengths and weaknesses

**Strengths:** My strengths are that I have knowledge of farming. I receive good support from various organisations like Grain SA, Bayer, Hygrotech and Sabie Valley Macadamia Processing. I own the following farming implements: Three tractors, one Landini, one farm track and Fiat 6555, one disc plough, one disc harrow, one rotavator, one boom sprayer and one planter. I also do construction jobs and own a TLB, four trucks and six bakkies.

I have 136 cattle: Four are bulls, 100 are cows and 32 are heifers who graze on 5 000 ha communal land. I employ 25 permanent workers and dedicated management staff. I have a readily available market for my green mealies and vegetables from Veg Fresh Mark. For the marketing of the Macadamia nuts, I make use of Sabie Valley Macadamia Processing.

**Weaknesses:** I have stock theft problems and another problem is that I can't sell my livestock because I'm situated next to the Kruger National Park and my area was declared a "red line" area because of the foot and mouth disease. The area where I am situated is a low rainfall area (we received  $\pm 350$  mm per annum) and at times we have drought. Another challenge is the minimum wage

issue – we need to pay our labourers under the difficult situations which we are facing.

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

When I started farming with maize under irrigation, I used to yield  $\pm 3$  tons/ha but now I'm yielding between 6 tons/ha and 7 tons/ha. With tomatoes I used to yield less than 10 tons/ha, now I yield between 25 tons/ha and 30 tons/ha. With butternuts I used to yield less than 4 tons/ha and now I yield between 13 tons/ha and 15 tons/ha.

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

The main contributor to my success was the training I received from the various institutions like Grain SA, Bayer, Hygrotech, DARDLA and Omnia. These institutions send their representatives to visit us on a regular basis to give us advice and support.

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

I have attended workshops, Farmers' Days and other courses organised by the Department of Agriculture, Grain SA and Sabie Valley Macadamia. I still require training on tractor and implement maintenance as well as vegetable production.

## Where do you see yourself in five year's time? What would you like to achieve?

I want to become a big commercial farmer and employ more workers to reduce the unemployment rate in our area. I want to process more products on my farm and sell processed products.

## What advice do you have for young aspiring farmers?

They must be patient, any business needs patience. They must work hard and dedicate their time to whatever they are doing. They must be hands on and not rely on other people to do the job for them.

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# THE CORNER POST

## Why every farmer needs A MENTOR



The year 2015 is a tough year for grain farmers in South Africa. The summer season was very dry and the winter season's rain came very late. The negotiations regarding land reform are progressing very slowly. For grain farmers, this is the time of character building. The characteristics that are needed for a sustainable grain farmer of class are: perseverance, integrity, master planner and faith.

I read the book "*The Hard Thing about Hard Things*" recently. The author is the CEO of a software company in Silicon Valley (USA). He explains the tough times he faced during the ups and downs of the technological developments and the financial difficulties he had dealt with. It reminds me of the similar situations grain farmers are facing in this country, like planning a crop with no or very little access to finance, dry planting conditions and equipment that has seen better days. What I missed from this author was his interaction with mentors. In difficult times it pays one to get as much as possible advice from mentors – people who went through these types of difficulties more than once and have succeeded. It is not the talkers that you should consult, but those individuals that can show the fruit of perseverance and self-discipline to keep costs down when it is going tough.

Mentorship differs a lot from coaching. A coach has his own game plan and tells you what to do (even at your own cost) to achieve his goals. You have to practice frequently and he is the driver to achieve. A mentor however, is a person that gives you advice on how to achieve your own goals and dreams. You determine the frequency and pace of your interactions. Do you have a mentor? In my younger days I watched the captains of industry and

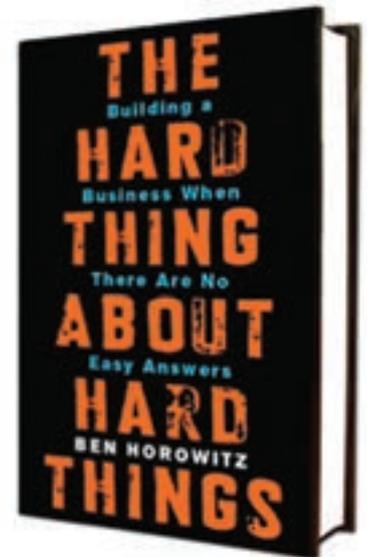
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*Perseverance and the will to overcome difficulties are in the DNA of every grain farmer – let's keep it that way. Grain SA will be there right beside you to help.*

tried to engage with them as frequently as possible. I even had a list of questions to ask them. Today, I have a longstanding relationship with them and can phone them as frequently as I wish for some advice. Teachability is a great gift. Your openness to advice of others will deliver great dividends in the long run. If you act as a mentor for others, remember to focus on how you can assist them to achieve their goals in life, not your own.

Grain SA has worked very hard this year to open up financing facilities for the new era commercial grain farmers. I am confident that the little streams that started to flow will become small rivers and eventually big rivers. We are encouraged to see new institutions such as input suppliers taking on risks to assist our farmers. This is a space the Commercial Banks have avoided thus far. The concept of having a title deed to access crop finance is definitely busy getting through to Government. More so the concept of crop finance without a title deed. This is good news for all of us!

Currently there are serious discussions between the funders (Maize Trust and Winter Cereal Trust) of the Farmer Development Program and Grain SA. Funding for the program in its current format is secured till September 2016. There might be some changes in future, but the services to you as farmers will



*The Hard Thing about Hard Things*  
by Ben Horowitz.

be maintained. Grain SA will do its utmost best to ensure that the quality and continuation of the services to you will remain in place.

I want to conclude with a comment on a quote from a lady farmer in Mozambique published at the end of May 2015: "*It becomes easier for us to beg and get aid. It's harder to farm ourselves.*" Perseverance and the will to overcome difficulties are in the DNA of every grain farmer – let's keep it that way. Grain SA will be there right beside you to help. Foreign aid cannot be the answer. 🌱

**This month's edition of The Corner Post was authored by Jannie de Villiers, CEO of Grain SA. For more information, send an email to [jannie@grainsa.co.za](mailto:jannie@grainsa.co.za).**



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