

# PULA INVUILA

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# PULA IMVULA

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**B**y November you will all be working very hard in the sun in the fields – by this time all your plans have been made and I hope that your hard work will make your crop dreams for this season come true.

There are so many activities that have to be done correctly if you are going to harvest a good crop next year – your lands should be well prepared; you should have bought the very best seed that you can afford and planted the correct population; you should have applied the

fertiliser as recommended, and very importantly you should have started on your weed control programme. Weeds remain one of our enemies as they rob your plants of water, nutrients, space and light. These days with the modern chemicals available, there should be no excuse for having weeds in your lands – and you need not work very hard standing in the sun weeding. The very small farmers can use knap sack sprayers while the bigger farmers can use boom sprayers.

If you do all the preparation work well, and you have a good weed control programme in

place, you, as the farmer, should also be able to allow yourself a few days of holiday over the Christmas period. If your weed control is poor then you will have to be weeding and not resting!

There is no substitute for your own care when it comes to farming – you need to be in the fields as often as possible so that you can identify possible challenges before any damage is done. Please be diligent so that you can enjoy the fruits of your labours. Good luck for this season! 🍀

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# Minister opens Grain SA office in Maclear

The footprint left by Grain SA in establishing new producers was expanded further when a third farmer development office in the Eastern Cape was opened in Maclear on 15 August this year. The Minister of Agriculture, Forestry and Fisheries, Mr Senzeni Zokwana, also attended the opening.

"I become very excited when I hear black producers and see the yields produced that are commercially competitive and that can be compared with those of any of their white commercial neighbours. This programme by Grain SA and their partners shows us how to

develop producers who are sustainable and can ensure food security for our children. We must accelerate this and get other commodities on board at the same level.

"The Eastern Cape is the area in our country in which food production, particularly maize and sorghum production, can be expanded. To accomplish food security in the country, we must get the Eastern Cape to produce. Farming has a future. Mining has a beginning and an end. Mining feeds only a few shareholders, while agriculture feeds nations," Zokwana told 150 new-era commercial farmers and stakeholders.

Mr Jannie de Villiers, chief executive officer of Grain SA, thanked the Maize Trust for

funding the organisation's farmer development programme in the Eastern Cape, and the Grain Farmers Development Association (GFADA) for subsidising producers' production costs.

"Black producers struggle to get funding because they do not have the title deeds to the land they cultivate. I make a serious appeal to the banks to find new ways to give new producers in the grain industry a chance," De Villiers said.

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The grain industry as a whole was represented excellently at the opening of the Maclear office. Minister Zokwana (fourth from left, front) and dignitaries took some time to pose for a photo in front of the new office just before the inauguration started.





**Photo 1:** "This region is like the Garden of Eden: you have good soil and rainfall at your disposal," said Ms Jane McPherson of Grain SA during her presentation about the organization's Farmer Development Programme.



**Photo 2:** "In order to accomplish food security in the country, we have to get the Eastern Cape to produce." This was the message which minister Zokwana delivered to guests in Maclear at the opening of Grain SA's third office in the Eastern Cape.



**Photo 3:** "The Minister of Agriculture, Forestry and Fisheries is a man of character," said Louw Steytler, chairman of Grain SA. He presented a gift to minister Zokwana on behalf of Grain SA.



**Photo 4:** Grain SA donated a copier/printer to the Joelshoek farm school outside Maclear. The principal, Constance Ndakisa (left), and her colleague, Mobuntu Mthi, share their excitement with Vusi Ngesi.

**Photo 5:** The Maclear office is well equipped and as neat as a pin. Vusi Ngesi (development coordinator at Maclear) showed the offices to Toto Hewu (Maize Trust trustee), back left, and Zolile Duze (GFADA), as well as to Jeffrey Nxiba (Tembelihle Study Group), in front.

**Photo 6:** Minister Zokwana with a group of farmers served by the Maclear office, after the opening of the office.



# Fire is a good servant but a bad master

**F**ire is helpful to control grazing and natural habitats but too many people are careless with fire and this sees small fires blazing out of control and rapidly becoming dangerous runaway wildfires which cause extensive damage.

Fire is a natural phenomenon and an important part of the lives of many South Africans who need the heat and energy it provides. It is also a natural and integral part of veld management as many eco-systems need to burn in order to maintain their ecological integrity. But wildfires ruin lives and livelihoods as they destroy croplands, grazing forests and homes. The economic losses and hardship which follow include loss of possessions and loss of jobs. Other long term results experienced where fires have raged are increased run-off water and a higher intensity of floods and soil erosion.

Wildfires do not respect property or boundaries so without any preventive or control measures, they will continue as long as the weather conditions are favourable and there

is dry vegetation that will burn. In South Africa there are two main fire seasons namely the dry summer months in the Western Cape and the dry winter months in the rest of the country. Fires sometimes start naturally with lightning activity but over 90% of unwanted fires are caused by human negligence.

Wildfires need to be managed by the joint, co-ordinated efforts of a community. The legal framework around fire makes it a criminal act if one's actions lead to a fire escaping. In South Africa the National Veld and Forest Fire Act of 1998 states that the responsibility for the start or spread of a veldfire rests with the land-user and makes it compulsory for all public landowners – and it encourages all private landowners – to join local Fire Protection Associations (FPA's).

It is most often landowners who notice the wildfires. They should instantly notify the local community as well as the authorities. The South African organisation 'Working for Fire' says all citizens have the responsibility for wildfire prevention:

- You may not start a wild fire.
- Fires for cooking or braaiing may only be started in a designated area.
- Every landowner must have the equipment necessary to fight wildfires.
- Every landowner must have personnel available to fight wildfires.
- Every landowner must have a system of firebreaks.
- No firebreaks or controlled burns may be burned when the risk of fires is high.
- It is the landowners' responsibility to manage the fuel load (e.g. overgrown grasslands and invader plants) by removing invasive alien vegetation.

## Firebreaks

The topic of firebreaks is a hotly debated one as it is contended that too many wildfires are the result of the burning of the very firebreaks which are intended to manage and contain the wildfires. The law says:

- Every property must have a system of firebreaks in place.





## FIRE MANAGEMENT

- Fire breaks must be burnt around the boundary of each property unless there is a special exemption from the Minister or an agreement has been made with the neighbouring landowner to locate the fire breaks elsewhere.
- The breaks must be wide enough to control to spread of wildfires.
- Fire breaks may not be burnt during periods of high risk e.g. 1) extreme hot and dry conditions and 2) in windy conditions.

### What are our legal obligations regarding fire control?

- No landowner may simply allow a wildfire to spread across his land.
- If a landowner observes a fire, he must report it to the neighbours, and nearest FPA.
- No landowner may refuse to assist in fighting a fire if he has been asked for help.
- No landowner may interfere with or obstruct someone who is fighting a wildfire.
- Every landowner should develop a fire management plan.

agement plan. This also applies to people who lease land.

- The costs of burning a fire break must be shared between the neighbours who must burn together.

### What is a Fire Management Plan?

- The basic rule is that every property must have fire breaks along its boundary including the areas managed by public roads.
- It should identify the risks and hazards on the different parts of the property.
- The best positions for fire breaks on every property must be identified.
- It has a time-table for carrying out controlled burns and burning fire breaks.
- If a landowner is aware of a fire risk in his area, he needs to either deal with it or make the person responsible, for example a neighbour, aware of the problem. If the neighbour does not comply, the matter should be reported to the FPA in the area and the matter

can be reported to the police, as their actions are unlawful.

Fire management is going to become even more important in the future as we face climate change and increased temperature variability. It is anticipated that temperatures will rise between 3°C - 5°C by the end of the century. Dry spells of longer durations are expected to occur more frequently throughout the year increasing the incidence of fire risk. It is important for farmers and landowners to educate themselves and their employees in wildfire management and to make sure they are equipped with the right equipment and the correct protective gear to be able to fight wildfires responsibly.

**Article submitted by Jenny Mathews, Pula Imvula contributor. For more information, send an email to [jenjonmat@gmail.com](mailto:jenjonmat@gmail.com).**



## Pula Imvula's Quote of the Month

*"The harder I work the luckier I get."*

~ Gary Player





# Soil pH's impact on fertiliser effectiveness

A common mistake which many farmers make is to just annually apply a set mix and amount of fertiliser without considering what the plant is getting from the soil and what it actually needs. If the soil provides the plant with exactly what is required, then there are huge possibilities for what that plant will produce.

The farmer is responsible for knowing exactly what is going on inside of his soils. Regular soil analyses are vital for this. A laboratory can identify the soils composition and recommend where corrections should be made. The soils pH is one of the most important aspects of soil composition to keep track of. The pH of the soil is directly related to the plants ability to utilise the available nutrients in the soil. Soils are classified as acid where the  $\text{pH} < 7$ , neutral where the  $\text{pH} = 7$  and alkaline where  $\text{pH} > 7$ . The pH scale ranges from 0 - 14 and a good pH is between 5.5 and 7. Water and fertiliser most rapidly change the pH of the soil; it is however also affected by the soils organic matter, the soils texture and the micro organisms within the soil. In agriculture today the most common way of manipulating the soils pH is by application of lime which increases pH and by the application of sulphur, which is less common, this lowers the pH of the soil.

## What causes soils to be acid?

Soils can be naturally acid; this is influenced by their composition of organic matter, their texture and the soil micro organisms. Rainfall can also have an influence on the acidity of the soil. Soils also become acid when we apply fertilisers containing ammonium. Ammonium is made up of nitrogen and hydrogen. In the soil the ammonium converts to nitrate, when this happens there are 3 hydrogen ions which are released into the soil. The hydrogen ions are very active and are free to react with any other substances in the soil; this causes the acid in the soil. These hydrogen ions need to be neutralised by applying lime, if they are not neutralised the soil will remain acid.

By understanding all of this we can see that the soils pH is the single most important thing to correct in our soils if we want good yielding crops. We can apply as much fertiliser as we want, but if the soils pH is not correct (between 5 and 7) then the plant will actually take up very little of the nutrients from that fertiliser. With this in mind it is hard to believe that for many farmers the liming and acid correction of their soils is often their last priority. Understanding that soil acidity can have a large effect on yield, and therefore have a direct link to the seasons profitability should prompt farmers to be abso-

“*Soil pH needs to change from being one of the last of a farmer's priorities to one of his first.*”

lutely sure that the pH of their soils is corrected. We cannot afford to overlook this responsibility and think that we are cutting costs by leaving it out of our soil preparation program.

Farming is becoming more and more of a precise business. Precise chemicals, precise seeding, precise rows, it however doesn't help if everything else is precise but the soil and fertilising is not. To increase our overall cropping potential we need to make sure that everything is precise and be sure not to cut corners anywhere. Soil pH needs to change from being one of the last of a farmer's priorities to one of his first. 🍷

**Article submitted by Gavin Mathews, Bachelor in Environmental Management. For more information, send an email to [gavmat@gmail.com](mailto:gavmat@gmail.com).**







# Bovine trichonominiasis: THE SILENT KILLER

The farmer development office in Belfast serves a very large area, with study groups from Sulphur Springs as far as 50 km East of Piet Retief, through to Donkerhoek, near the Heyshope Dam, Sheepmoor study group, Pixley Ka Seme study Group East of Amersfoort, Carolina study group and Nigel study group.

Most of these areas consist of large areas (2 000 ha plus grazing) and some hundreds of hectares arable land and are farmed on a communal basis.

The grazing areas are mostly open, with no camps and are utilised on a free-for-all basis.

## Survey

Most of these study groups consist of 80 or more farmers, and for Grain SA to understand who we are working with, all personal details are gathered, such as the availability of implements, land tenure and assets (cattle, sheep, goats, transportation).

In all these cases a very worrying trend was clearly seen. The typical make-up of cattle owned is something like 15 cows, no bulls, and 3 calves. The low culling percentage was consistent throughout and I started to look at the make-up of herds as I drove through the areas. Herds of 50 or more cows had 5 to 10 calves.

Thinking about past experiences in cattle husbandry, I immediately thought about *Bovine trichonominiasis* and although I still haven't been able to prove it, I am sure that the disease plays a major role in the low culling percentages. If I am right, farmers will be devastated as cattle farming is the most important source of income. The problem is that all conditions in the communal areas are conducive to the spread and maintenance of the disease. They are as follows:

- **No fixed calving seasons.** The disease is a sexually transmitted disease, being transmitted from bulls to cows. Infected bulls cannot be cured while cows can be cleansed if separated from bulls for three months. Infected bulls need to be culled. This never happens.
- **No camps.** This is free-roaming farming and even if one farmer wants to protect his cows from infected bulls, it is made impossible by the grazing system.
- **Non-controlled disease.** Testing of bulls is not compulsory and is never done in these areas, so if the disease is present it is allowed to infect more and more cows.



- **Bull quality.** Most farmers do not own bulls and rely on free roaming bulls to service their cows.
- **No detection of the disease.** Cows do get pregnant but the foetus is re-absorbed at a very young age, so that no abortion or blood is seen in most cases. Furthermore, the non-producing cows are normally in a very good condition, thus putting the farmers in a false mood of well-being.
- **Lack of knowledge.** Most veterinarian offices concentrate on controlled diseases such as rabies, contaminated abortion, etc. The information about this important disease never reaches farmers.

From Grain SA's point of view the integrated farming practices of allowing cattle to graze maize crop residues in winter is such an important source of food and income to commu-

nal farmers, that any problems resulting from systems affecting emerging farmers should be investigated and addressed.

What are the solutions? Here the Department of Agriculture should get involved with the following:

- Training of farmers.
- Infrastructural development with the erection of camp fences to install proper grazing practices and to ensure that cows and bulls can be separated for at least three months.
- Testing of bulls on an ongoing basis and to facilitate the culling of infected bulls.
- The supply of virgin bulls to replace infected animals.

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# Grain legumes in crop rotation will add value

In many developing farming areas in South Africa, mono-cropping (growing one crop year after year) is practiced. In the majority of these cropping systems, maize is the preferred crop. Due to the over-emphasis on maize production in the past, more sustainable cropping systems such as crop rotation has not been well promoted among developing farmers.

In the process, valuable crops such as legumes have been neglected. In many cases, loss of legume seed reserves during dry seasons as well as poor access to reliable seed supply sources contributed to the decline in the production of legume crops.

## Mono-cropping and its disadvantages

Mono-cropping is the agricultural practice of growing one single crop year after year. An important disadvantage of mono-cropping is that it leads to build up of diseases and pests contributing to yield losses. This is attributed to the fact that mono-cropping promotes the constant availability of a suitable host which is

susceptible to particular pathogens or pests. In the long run, mono-cropping creates an environment in which certain pests and diseases can flourish. One example is witchweed (*Striga asiatica*), a parasitic plant which often occurs in the poor infertile soils of some rural areas. As the weed “feeds” on the roots of the host plant, e.g. maize, it can reduce the yield of the host plant significantly. Farmers should be aware that, the continuous production of maize and other host crops such as sorghum will increase the population of witchweed.

## What is a grain legume?

Grain legumes are a special group of plants mainly cultivated for their seed which is used for human and animal consumption. Well known grain legumes include crops such as soybeans, groundnuts, cowpeas and dry beans. The most important characteristic that makes legume crops unique is their ability to fix atmospheric nitrogen. Legumes contain symbiotic bacteria in their roots in structures called nodules. These bacteria have the special ability of fix-

ing nitrogen from the atmosphere and in this way the root nodules are sources of nitrogen to legume plants. When the legume plants are decomposed, following the harvesting process, all of their remaining nitrogen inside the plant residue is released back into the soil. In the soil the nitrogen is converted into a form (nitrate), which can be utilised by follow up crops.

## Crop rotation and legumes

Crop rotation is the practice of planting different crops in consecutive years in the same field. It is a planned practice for the long term and should not happen by chance as it is often the case. Crop rotation is a purposeful strategy in which a farmer can contribute to keep pests and diseases under control. This form of pest and disease management can only be achieved when crops from different families are rotated. The basic principle is that grass type crops like maize have to be rotated with crops of the broad leaf family such as sunflower, soybean or cowpea. In rotating the host crop the build-up of pests and diseases in the environment can be prevented.



Maize (A) compared to maize (B) in mono-cropping planted at the experimental plot. (Co-author, Mr Nematodzi was the research technician responsible for the experiment.)





## LEGUME PRODUCTION

Note: Although sunflower also belongs to the broad leaf group of plants it is not a legume.

Examples of possible rotation options including legumes in a five year cycle (field block sizes are more or less equal).

### Advantages of grain legumes and crop diversification

- Legumes can lower production risks. In hardy conditions, a crop like cowpeas is more tolerant to drought than maize for example. Experience has shown that the crop can achieve substantial yields even in soils with low fertility levels (See **Photo 1**).
- Due to its ability to fix atmospheric nitrogen, legumes contribute significantly to the maintenance and improvement of soil fertility. Therefore, the level of nitrogen fertilisation of

grain crops in rotation with legumes can be reduced without affecting yield.

- Crop-rotation systems including legumes can result in the reduction of pests and diseases in crops.
- Legumes in a rotation system contribute to healthier roots in the follow up crop. So, improved yield performance in follow up crops should not only be attributed to residual nitrogen but also to the positive effect of rotation crops on the root system of the follow up crop.
- The crops can open valuable income opportunities in view of high commodity prices. For example, the producer price for dry beans for 2013/14 varies around R12 500/ton.
- The introduction of legumes in the crop rotation system also implies diversification on the

farm. Diversification does not only contribute to risk reduction but also helps to more evenly distribute the demand for labour and mechanisation.

### Legumes in rotation – a hands on experience

Recently, a study in Nebo (southern maize production area of Limpopo) has been conducted to quantify the contribution of legumes to the improvement of maize yield. Positive results have been obtained to prove that the nitrogen left by legumes in the soil contributed significantly towards the improvement in the yield of the follow-up maize crop. The tables below give an account of the contribution of the two legume crops evaluated in terms of residual nitrogen (**Table 3**) and yield of maize in rotation as opposed to maize in mono-cropping (**Table 4**).

**Table 1: System 1 – two crops.**

Field block number	Production season				
	2014/15	2015/16	2016/17	2017/18	2018/19
1	Maize	Soybean	Maize	Maize	Soybean
2	Soybean	Maize	Maize	Soybean	Maize
3	Maize	Maize	Soybean	Maize	Maize

Note: Every season, one third of the area is allocated to a legume.

**Table 2: System 2 – three crops.**

Field block number	Production season				
	2014/15	2015/16	2016/17	2017/18	2018/19
1	Maize	Soybean	Maize	Groundnut	Maize
2	Groundnut	Maize	Soybean	Maize	Groundnut
3	Soybean	Maize	Groundnut	Maize	Soybean

Note: The more diverse the system, the higher the demand for good management.

**Table 3: Residual nitrogen after the crops were harvested (2010/2011 season).**

Crop in previous season	Mineral N (kg ha <sup>-1</sup> )
Cowpea	32,4
Groundnut	39,2
Maize	18,9

The results clearly show the positive contribution of legume crops to the nitrogen content of the soil as opposed to the lower N level after maize.

## Grain legumes in crop rotation will add value

Table 4: Effect of rotation on maize yield (2011/2012 season).

Rotation	Yield (ton ha <sup>-1</sup> )
Maize after cowpea	2,4
Maize after groundnut	2,9
Maize after maize (mono-cropping)	0,9

It is clear that the cowpea-maize and groundnut- maize rotations performed significantly higher compared to maize after maize.  
Note: In these fields high levels of witchweed also had a huge detrimental effect on the yield of maize in the mono-cropping system.

### Production constraints of legumes

As much as legumes can play an important role in the cropping system, they also have production constraints.

- **Demand for labour:** Harvesting crops like groundnut and cowpea is a labour intensive task.
- **Pest and disease control:** Cowpea for example, is a crop which can be heavily attacked by aphids. Farmers have to spray to control aphids on a regular basis.
- **Food safety:** The quality of groundnut can be compromised by the presence of aflatoxin which is hazardous to humans consuming the affected product. Avoiding this requires

a high standard for quality control and management at farm level.

- **Limited market opportunities:** In many cases inadequate market access or a lack of stable market opportunities for these crops (cowpea, soybeans, dry beans and groundnuts) often discourages developing farmers to produce these crops.
- **Inadequate seed supply systems:** In the more remote areas, inadequate access to reliable seed supply systems remains to be one of the major constraints limiting farmers to expand their production of these crops.

The information above clearly highlights the value of legumes included in crop rotation sys-

tems. It is trusted that developing grain farmers will take these guidelines into serious consideration. Legumes are crops that can, if they are included in the cropping system or more effectively cultivated, enhance the sustainability and also the profitability of many farming enterprises. Research over many years has shown that legumes can contribute to improved crop yields and help ensure a brighter farming future.

Article submitted by APN du Toit and EA Nematodzi, ARC-Grain Crops Institute, For more information, send an email to [dutoita@arc.agric.za](mailto:dutoita@arc.agric.za).

Cowpeas can usually tolerate drought better than maize.







# Avoid resistance with effective pre-emergence herbicides

**S**praying techniques, setting up your spray equipment and scouting for and identifying problem weeds on your farm have been covered in previous Pula Imvula articles. If you have not done so consult your herbicide supplier to work out the spraying programme for your soybeans and sunflowers as soon as possible.

## Herbicides

Herbicides can be described and grouped by activity, use, chemical family, the way the particular chemical acts on the plant or the type of vegetation or weeds controlled.

Contact herbicides only destroy the plant tissue that comes into contact from the chemical mixed and applied in the spray operation. The effect on the targeted weed plants is usually evident very soon after spraying but is less effective on weed plants that can regrow from rhizomes, roots and tubers.

Systemic herbicides that are sprayed on problem weeds move through the leaves or are translocated through the plant system from a spray mix applied to the leaves or from soil applied sprays up to the leaves. This kind of action by the systemic herbicides usually acts slower than contact herbicides but is capable of controlling perennial plants and is usually more effective than contact herbicides.

It is always important to correctly identify the problem weeds in your lands to design an effective spraying programme.

## Soil applied herbicides

Soil applied chemicals are sprayed directly on to the soil and are taken up by the roots and/or the growth point of the germination target weed

plants. Herbicides are also classified as to various ways of killing weeds which can be from disrupting the action of plant enzymes, proteins or other initial biochemical processes.

The main types of soil applied chemicals can be used in three different ways.

### Pre-planting herbicides

Pre-planting herbicides are sprayed onto the soil either before or directly after planting. The soil surface, in the case of conventional tillage methods, should be free of weeds and plant residues and then mechanically mixed with and incorporated into the soil. If a disc plough is used as in conventional tillage methods, for instance when a trifluralin type herbicide is being used, a good rule of thumb is that the chemical will be properly mixed in the soil surface equivalent to half of the depth that the disc was set in working the soil. It is critical to disc at the correct depth so that the chemical will effectively control the germination depth of the targeted weeds.

It is important to ensure that the chemicals sprayed onto the soil are mixed as soon after spraying as possible to prevent decomposition of the active chemicals by exposure to the sun or evaporation into the atmosphere.

### Pre-emergent herbicides

Pre-emergent herbicides are applied to the soil before the crop emerges, after planting, by preventing the germination process in taking place or the early growth processes in emerging weeds.

### Post emergent herbicides

Post emergent herbicides are applied after the

crop of soybeans or sunflowers has emerged from the soil after planting. It is important to make sure that the spraying capacity of your tractors and equipment can apply and cover the area planted before the crop emerges. If at all possible it is wise to set up an integral spray system on your plant or have a separate spray unit follow shortly behind the planting unit. In this way the possibility that heavy rains might fall between planting and spraying can be avoided.

## Conservation tillage systems

Conservation tillage includes various methods that can range from a limited or minimum tillage to a no-till system in which the current crop is planted into the previous crops residues without any disturbance of the soil surface prior to the planting operation. These systems have brought with them many advantages such as higher yields and water efficiency, lower labour requirements, better soil structure development and lower levels of soil erosion.

## Conclusion

It is extremely important to spray the recommended pre-emergent weed control chemicals at the correct application rate and time. This will avoid the building up any long term resistance of the weeds to being controlled or killed with the current chemicals and spray mixtures available whether or not conventional or conservation tillage methods are being used. 🌱

*Article submitted by a retired farmer.*

# A closer look at blue tongue

**B**lue tongue is an acute insect-borne viral disease in sheep. The orbivirus, which causes blue tongue, has 24 types (strains) of blue-tongue viruses, 21 of which occur in South Africa. Goats, cattle and game are also susceptible to blue tongue, but clinical (visible) signs are seldom seen.

## Transfer

Blue tongue is transferred by midges (*Culicoides spp.*) that hatch in the lower-lying areas near rivers and marshes when it is moist and warm.

## Occurrence

Blue tongue is seasonal and occurs in mid-summer and autumn, until the first frost occurs. The blue-tongue virus hibernates in cattle in particular. Indigenous sheep breeds like the Namakwa-Afrikaner, Blackhead Persian and karakul are less susceptible to blue tongue. European breeds like the Merino are very susceptible.

Warm and moist weather conditions promote the hatching of the midges in their natural habitat, particularly low-lying areas like marshes, around pans, dams and rivers. Sheep grazing in such areas run a great risk of developing blue tongue. In certain areas in South Africa that experience heavy frost, blue tongue disappears between June and December.

## Signs of the disease

After the midge has bitten the sheep (blood sucking) and infested the sheep with viruses, the sheep develops a fever (40,5°C to 42°C) after four to six days.

Other general signs of blue tongue are listlessness, loss of appetite and rapid breathing. The mucous membranes of the eyes, nose and mouth become red and the lips start swelling. The mucous membranes of the mouth and tongue later develop a bluish red colour and superficial sores occur on the mucous membrane in the mouth where it rubs against the teeth, and on the nasal mucous membrane.

The blue discolouration of the tongue's mucous membrane gave rise to the name "blue tongue". When the lower and upper lips are turned inside out with the fingers, the sores are clearly visible.

Due to the degeneration (wasting) of the muscles, the neck of such a sheep later becomes crooked. Because of the inflammation of the nasal mucous membrane the nostrils be-



*The Culicoides midge transfers the blue tongue virus to sheep, goats and cattle.*



*Pododermatitis of the hooves of a sheep with blue tongue. The red band between the skin and the hoof is characteristic of blue tongue.*



*Inflammation of the nasal mucous membrane causes the nostrils to be dirty and encrusted and the sheep finds it difficult to breathe.*

come dirty and encrusted and the sheep finds it difficult to breathe.

Pododermatitis occurs where the hoof is attached to the skin. The sheep are therefore stiff and find it difficult to walk. The hooves can be so painful that the sheep try to walk on their knees and eventually cannot get up. Pododermatitis can be seen as a red line where the hoof is attached to the skin. This is clearly visible at the back of the hoof. The hoof has to be cleaned thoroughly with a wet cloth for the pododermatitis to be seen clearly.

Inflammation can also be seen more clearly on a light-coloured hoof than on a dark one. An empty patch is visible in the wool, and sheep sometimes lose their entire fleece. The abnormal wool growth that is the result of dermatitis can be seen only three to six weeks after the sheep has fallen ill.

## Diagnosis and post-mortem signs

A vet should be approached to do a post-mortem examination and confirm the cause of death. A diagnosis is made on the basis of the history, clinical appearance and the demonstration of antibodies and virus isolation.

Bleeding in the wall of the pulmonary artery where it leaves the heart is a typical sign of blue tongue. The pulmonary artery can be found easily by cutting open the right-hand side (soft side) of the heart from top to bottom. Other post-mortem signs are a swollen spleen and watery lungs (foam in the trachea). Bleeding, oedema and pale, striped areas can be observed in the muscles.

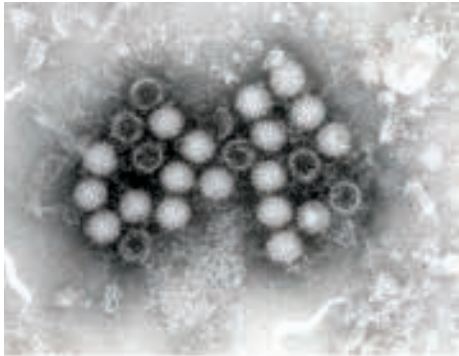
## Treatment

A vet should be approached as soon as possible to ensure the correct treatment for the sick sheep. It is important to treat the sheep symptomatically. The sheep's mouth and tongue are usually too painful to eat, and its feet too sore for it to walk and find food.

The first treatment is therefore to place the sheep in a small camp where shade, green feed and water are close by. They should be handled as little as possible. Antipyretic medicines and painkillers can be administered.

Because of a lot of fluid in the lungs, the animals tend to develop pneumonia due to secondary bacterial infections. For this reason it is recommended that such a sheep be treated with anti-microbial medicine.





*Blue-tongue viruses as seen under an electron microscope.*



*The mucous membranes in the mouth of a sheep with blue tongue are red and the lips swell. These sheep are listless, breathe rapidly and display a loss of appetite.*



*Make sure that sheep are inoculated annually against blue tongue.*



*The blue-tongue virus hibernates in cattle in particular.*

### Immunity

The 21 types (strains) of blue-tongue viruses in South Africa all differ immunologically. If a sheep has been inoculated with one type of virus vaccine, it will not provide protection against another type of virus infection.

Sheep must be inoculated against all the types of viruses for total protection. If a sheep developed blue tongue from a specific strain of the virus, it can also develop blue tongue caused by any of the other blue-tongue virus strains, in which case the disease will usually be less severe. Cross-immunity between the blue-tongue virus strains is poor, and as many strains as possible are therefore included in the vaccine.

### Prevention and control

Vaccinate sheep three weeks apart with a blue-tongue vaccine that consists of three parts. The three vaccines (A, B and C) each contains five different strains of the main blue-tongue viruses. Do not mix the three vaccines (A, B and C).

Blue-tongue vaccine provides a relatively long-lasting immunity and the inoculation can commence as soon as the ewes have lambed in the winter. Lambs of inoculated ewes should not be inoculated before the age of six months, as the colostrum (passive) immunity is effective for six months. The lambs of unvaccinated ewes can be vaccinated at the age of four weeks.

Plan the lambing season so that the ewes give birth in the peak blue-tongue season (autumn and summer). The lambs of the vaccinated ewes will then be protected against blue tongue. These lambs are then inoculated in spring, when they are six months old.

Vaccinate the spring lambs as late as possible, but definitely before the peak blue-tongue season. The last of the vaccinations should preferably be given a month before the peak season.

Blue-tongue vaccine can be given in combination with other bacterial vaccines like pulpy kidney or enzootic abortion, as well as with other treatments like dosing or dipping, to limit the handling of the sheep.

Pregnant ewes should not be vaccinated within the first ten weeks of pregnancy, because the vaccine harms the brain development of the foetus and "stupid" lambs are born. Start vaccinating ewes nine weeks before the breeding season. Rams should be vaccinated after the breeding season. The ram should receive its last vaccination two months before the mating season.

If sheep are vaccinated during a blue-tongue breakout, special care should be taken. Use a sterile needle for each vaccination so that the disease is not transferred from one sheep to the next.

Move sheep from marshes to high-lying areas and keep the sheep in a barn at night – the *Culicoides*-midges do not try and get their feed there. Also treat the animals with insecticides.

**Article submitted by Dr Jan Du Preez, Managing Director: Institute for Dairy Technology, for SA Graan/Grain November 2013. For more information send an email to [jan.dupreez@mpo.co.za](mailto:jan.dupreez@mpo.co.za).**



# The hidden risks in water

**W**ater is used as carrier for fungicides, herbicides and insecticides in order to spread the products as evenly as possible over an area. Because water is transparent we often forget about the hidden factors in water that can have an adverse effect on various pesticides.

To put this into perspective, let us take water with the following cation content as an example: calcium (120 mg/litre), magnesium (60 mg/litre), sodium (800 mg/litre) and potassium (20 mg/litre). If these cations are added up there will be 1 000 mg/litre (1 g/litre) cations that could potentially harm products. For example, if a herbicide is applied at a spraying volume of 200 litres of water per hectare, there are 200 g of potentially antagonistic cations that could react with the herbicide and affect weed control.

This is only one of the risks of water. In this article water quality will be discussed in depth in order to enable the reader to take the correct steps to rectify these risks. In this way weeds, diseases and pests can be effectively controlled, even when poor quality water is used.

## Which properties of water play a role?

There are three factors that can harm product effectiveness. These factors are undissolved salts, pH and buffer capacity.

It is important to realise why these factors are important, which products are influenced by this, and the steps that need to be taken to reduce the adverse effect of these factors.

### Dissolved salts

Any water source contains a certain quantity of undissolved salts (ions). Cations like calcium ( $\text{Ca}^{2+}$ ), magnesium ( $\text{Mg}^{2+}$ ), sodium ( $\text{Na}^+$ ) and potassium ( $\text{K}^+$ ) are common in water. Water also contains various anions, for example chloride ( $\text{Cl}^-$ ) and bicarbonate ( $\text{HCO}_3^-$ ).

If certain herbicides are added to hard (high calcium and magnesium levels) or brackish water (high sodium levels), the dissolved cations bind to the herbicide and therefore impair the absorption of the product. This results in reduced weed control. This reaction does not normally occur in the spray tank, but when the drop of spray dries on the leaf.

The well-known herbicides that are affected by this phenomenon are glyphosate, certain hormone killers, clethodim (and other products in this group) and certain sulphonyl ureas. For example, if glyphosate is applied in hard or brackish water, the absorption will be impaired, resulting in poor weed control. If a producer has more than one water source available, it is important to use the source with the least dissolved salts.

However, there are also many effective additives that can be used. These additives usually contain ammonium sulphate and have the ability to bind antagonistic salts before they can react with the herbicide.

However, it is important to follow the guidelines on the label in this regard. For example, the additive must meet certain requirements for it to be used for this purpose. The following are only a few important requirements for these products known as salt/saline additives:

- The additive must be registered in accordance with Act 36 of 1947 and must have an L number. Products and fertilisers with K and other numbers are not registered for this purpose and it is illegal to use them. Furthermore, these products are probably ineffective.
- The use of the additive must preferably be recommended on the label of the herbicide. Follow the guidelines on the label and never use unregistered additives.
- Only use good quality additives. Certain additives have a higher content of the active ingredient than others. First, make sure how much ammonium sulphate the products con-

tain and choose the product that is the best value for money. This product is often not the cheapest additive per litre.

### pH

Various products, and especially certain insecticides, are harmed by alkaline hydrolysis. Alkaline hydrolysis is the breakdown of insecticides at a high pH while they are dissolved in water. Alkaline hydrolysis starts as soon as the insecticide is dissolved in the water and stops as soon as the droplet is dry. Therefore, if an insecticide is mixed with water with a high pH, it breaks down gradually over time and can result in poor pest control.

The solution for this problem is to use buffers. Buffers are usually mixed with the spraying water first before the insecticide is mixed in. The pH of the spraying water is therefore lowered, which will dramatically extend the lifespan of the dissolved insecticide. This results in improved insect control. Buffers usually lower the pH of the water to a level of between 4 and 6. This is usually the pH level where these sensitive insecticides are most stable.

It is vital to use a good quality buffer. It is also important to determine that the pH is lowered to the correct level in order for the insecticide to function optimally.

However, not all products are affected by alkaline hydrolysis, and in some cases buffers are unnecessary and can even be harmful. Please follow the label and only buffer those products that really require a low pH.

The use of unregistered buffers can in some cases have disastrous effects. An example of this is with the sulphonyl urea (SU) herbicides. The SUs are more soluble and more effective in high pH spraying solutions.

The use of low pH buffers with SU spraying solutions will harm the effectiveness and lead to poor weed control. Therefore, use buffers only if they are beneficial and recommended.





### Buffer capacity

The one property of water that is often forgotten is buffer capacity. Buffer capacity is the ability of certain water sources to withstand changes in pH. Water with a high buffer capacity makes it difficult for pH to be lowered with the use of buffers.

It is often assumed that buffers will lower the pH of the water to predetermined levels. This can be the case with low buffer-capacity water, but with high buffer-capacity water it is possible that the pH will not be lowered sufficiently, and the product can therefore be harmed by alkaline hydrolysis.

The ion in the water that greatly contributes to buffer capacity is bicarbonate ( $\text{HCO}_3^-$ ). The higher the bicarbonate content, the higher the buffer capacity will be, and it will be much more difficult to manipulate the pH of the water.

A low buffer capacity has its own set of problems and the pH of the water can be low-

ered too much with the use of certain buffers. A pH that is too low also has disadvantages, such as acid hydrolysis. Immiscible spraying solutions are often also the result of a too low pH spraying solution. It is therefore important to know the buffer capacity of the spraying water.

### Which steps have to be taken?

The following steps must be taken to ensure that water quality plays little or no role in the effectiveness of pesticides:

- Take water samples of all the available water sources and test for  $\text{Ca}^{2+}$ ,  $\text{Mg}^{2+}$ ,  $\text{Na}^+$ ,  $\text{K}^+$ ,  $\text{HCO}_3^-$  (or alkalinity), pH and electrical conductivity. If it is impossible to do a full water analysis, at least have it tested for pH and electrical conductivity.
- If possible, try to avoid muddy and cloudy water.
- Use additives if they are recommended for a specific product. Use only good quality additives with an L number.

- Make sure that the pH is lowered sufficiently if buffers are used, and that the salt additive has a high enough ammonium sulphate content.

### It can be controlled

Water quality can harm the effectiveness of various products. However, it can be controlled and the use of the correct additives will improve the effectiveness of pesticides, even with the use of poor-quality water.

Always use registered additives – products that are not registered are not suitable to be used as additives. 🌱

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*Because water is transparent we often forget about the hidden factors in water that can have an adverse effect on various pesticides.*



# Preservation of crop residues is of the utmost importance

**T**he preservation of crop residue on top of the soil surface is of critical importance in a conservation agriculture environment. Even if you do not believe in the concept of conservation agriculture, it is still important, and it is hoped that the following information will convince the non-believers.

## Stubble content

Producers aim to reduce their input costs and increase their crops. Research that was conducted over the past 18 years on Langgewens (the research farm of the Western Cape Department of Agriculture) clearly showed that the biggest direct input cost is that of fertilisation.

This amounts to approximately 30% to 40% of the direct input cost, depending on the type of the crop-rotation production system being followed. In the system research there are both cash crop and cash crop/livestock systems.

Attempts were always made to preserve as much material as possible after harvesting, even in systems where livestock grazed on the residues in summertime. Baling and burning and even the grazing of crop residues have a direct effect on the nutrient content of our soils, which in turn has an effect on the amount of fertilisation needed for crop cultivation.

**Table 1** (adapted from work compiled by the International Plant Nutrition Institute [IPNI] and AG-PHD [American agriculture radio and TV company]) shows the amount of nutrients removed by a 4-ton wheat crop, and which part is contained in the crop residues. This table can also be set up for other crop plants by means of an app.

Table 1 makes us realise once more how important our crop residues are for the sustainability of our production. We must let crop residues work for us. Research that was conducted in South America showed that the baling and selling of residues resulted in a smaller income for the producer in the long term and his soil was also impoverished much more. If you sell your residues to someone else, you impoverish your own soil, as all your nutrients that are contained in the stubble end up in the buyer's soil.

The burning of residues has the same effect. The fact that producers still burn residues to combat weeds (mostly ineffectively) and to be able to plant more easily with a tine planter



*Photo 1 and 2: During a visit to a young producer in the Caledon area in February this year it was unbelievable to feel how cool the soil was under the layer of stubble and to see the amount of moisture that it still contained – to such an extent that you could squeeze the soil together to form a clump. This once more confirmed that we cannot and should not work without cover in this water-scarce country of ours.*





is not the answer. In many instances it is only an excuse to do things the easy way, but if you really want to be a conservation agriculturist, you will have to make the mind shift and abandon this kind of practice and look for alternatives. There are enough producers in the Western Cape who can testify to the value of not burning.

## Shade and moisture preservation

South Africa is a sunny country and summer temperatures in the Western Cape can easily rise to 40°C. Without cover the soil temperatures in the top soil can easily rise to 80°C, while the temperature under cover drops to below 40°C (see **Photo 1** and **Photo 2**). As soon as the temperature rises above 40°C, life in the soil is harmed and the micro-organisms cannot do their job properly.

## Erosion

In South Africa we lose more fertile soil annually than new soil that is formed – approximately 400 million tons per year. This loss is 60 times higher than the soil that is formed. **Photos 3 to 5** explain this phenomenon. The three soil covers are exposed to 60 mm rain in 20 minutes.

## Weed suppression

Many of the weed species causing problems,

**Table 1: Nutrient removal by wheat in grain and stubble for a 4-ton wheat crop.**

Element	Grain	Stubble	Total kg	% in stubble
N	76,00	48,00	124,00	38,70
P	13,96	4,80	18,77	25,60
K	15,77	69,73	85,50	81,60
S	6,80	9,20	16,00	57,50
Mg	11,00	9,19	20,19	45,50
Ca	1,77	5,30	7,07	75,00
Cu	0,04	0,02	0,06	33,30
Mn	0,12	0,35	0,47	74,50
Zn	0,19	0,18	0,37	48,60
B	0,05	0,49	0,54	90,70
Fe	0,40	0,39	0,79	49,40

such as rye grass in the Western Cape, offer resistance to several of the chemical groups that are available. We must come up with alternatives to combat weeds.

The use of tine planters can encourage the germination of rye grass by the soil disturbance

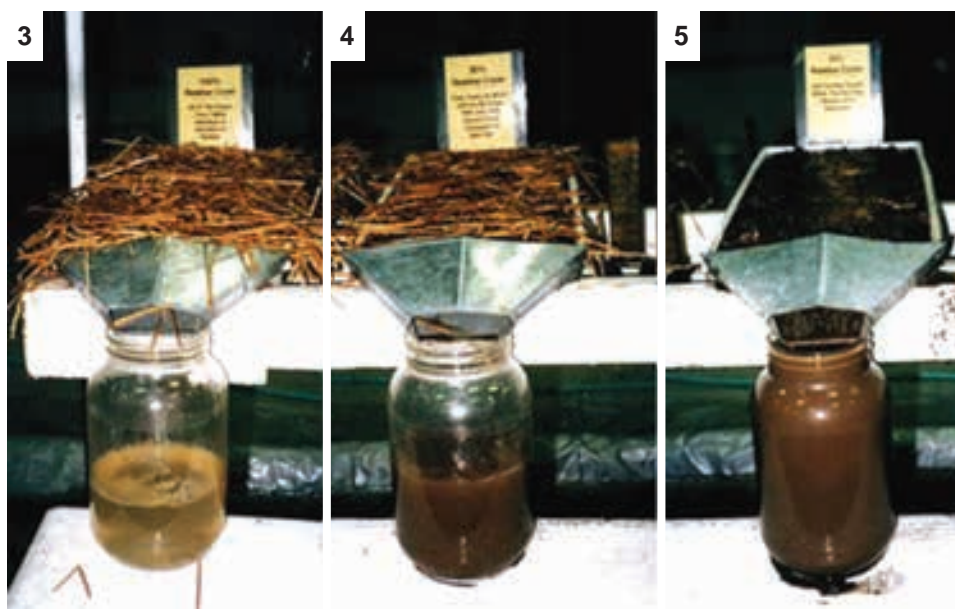
they create. Disc planters can also be a solution for the soil disturbance problem. Weeds can be suppressed by sufficient residue levels covering the soil surface. Weeds can be eliminated by tusing cover crops that produce a lot of material quickly and suppress the weeds in that manner. A problem field can benefit from the withdrawal of production by the resulting reduction and even destruction of the weed seed bank in such a field. However, we are at this stage reluctant to take such a drastic step.

## It is now or never

The time has arrived for breaking away from conventional soil-tilling practices and how we think about our crop residue. The sustainability of our agriculture is important, as food security is inextricably part of the operations of all producers, no matter how large or small your farm is.

We still have a long way to go with conservation agriculture and remember, there are no guarantees that this will be easy. 🌱

*Article submitted by Dr Johann Strauss, Scientist: Sustainable Production Systems, Western Cape Department of Agriculture, for SA Graan/Grain November 2013. For more information send an email to JohannSt@elsenburg.com.*



**Photo 3 to 5: These photos should be convincing enough to stress the importance of residue preservation. The erosion created with conventional soil-cultivation practices also includes the loss of organic carbon. In the Swartland conventional tillage led to carbon contents of less than 0,5%. The only way to increase this content is by preserving the residues.**

# November in groundnut country



**P**lanting time brings a feeling of expectation and hope that the season ahead will bear lots of fruit. However, the potential for the groundnut crop depends on the producer and his planning.

## Crop rotation

Good planning starts with a good crop-rotation system that takes into account that groundnuts can be planted on the same piece of land only after three to four years. The reason for this is to control diseases as well as nematodes.

A good crop-rotation programme for groundnuts will be as follows: Year 1 – groundnuts; Year 2 – maize; Year 3 – sunflower/soybeans/maize; Year 4 – maize/groundnuts (only if maize was also planted the previous year).

It must be kept in mind that crop rotation is beneficial for building up agricultural soil and if it is properly managed, it is much more profitable for the producer himself.

## Soil moisture and temperature

Soil moisture and temperature are two of the most important factors that influence the germinating of groundnut seeds, but they can also be the most unpredictable. If there is no moisture available at the prescribed planting depth of 5 cm to 7 cm, the germination process will not start and the groundnut will remain dormant until sufficient moisture is available. It is therefore preferable to plant in moist soil.

Care should be taken not to plant in search of moisture and adapt the planting depth accordingly, as this causes a form of ridging, leading to crop losses in the end. An eye should be kept on the weather predictions to avoid possibly adverse cold spells, and planting dates should be planned accordingly.

It is of the utmost importance to take soil temperatures into account, as a drop below 15°C can harm developing seeds.

Germinating groundnut seeds are most vulnerable in the first 48 hours after planting, as that is the time when water absorption takes place that switches on chemical reactions in the seed. If a cold shock is experienced during this time, the chemical reactions can be inter-

rupted, causing damage to the cell walls, which will result in leaching of substances from the cells.

The result of all this is that the germ is harmed and a weakened plant develops. In some cases the damage is so great that the germ dies. Weakened plants are also more susceptible to seedling illnesses, such as wilting and *Aspergillus* crown rot. It is therefore also very important to apply the correct seed treatment.

## Preparation

Soil preparation is very important for the production of a good-quality groundnut crop. Soil that has a good water-retention ability, is well drained and easily permeable for the groundnut roots has good production prospects.

Remember that a fine, level seedbed promotes even germination, which leads to good, uniform plant establishment. A correctly calibrated planter that is set for the correct plant depth also contributes to a good, uniform plant establishment.

It is also important to keep the planter speed in mind, because you will see that great haste will only cause problems, as more splits than whole groundnut seeds will be planted.

## Nutrition

Nutritional status and the pH of the soil go hand in hand. There may be sufficient nutrients in the soil, but they are not necessarily available for the groundnuts.

Groundnuts are tolerant with respect to low pH levels, but soil that is too acid harms the forming of root nodules and therefore for the fixation of nitrogen. Although a pH of 5,5 in H<sub>2</sub>O, or 4,5 in KCl, is still acceptable, a pH of 6 in H<sub>2</sub>O or 5 in KCl should be aimed at.

It is also important to keep in mind that lime is used to correct the pH and that the calcium in the lime is released over a very long period of time. This calcium is not always so easily available for the groundnut to take up. It is therefore recommended that you also add gypsum and broadcast it at 300 kg/ha to 700 kg/ha in order to satisfy the calcium needs of the groundnut plant.

Gypsum is the best source of calcium for groundnuts as it is highly soluble and can easily permeate the top 10 cm of the soil layer where the groundnut is then able to absorb the calcium directly through the pod.

Leaf applications of calcium do not have the desired effect, as the groundnut plant absorbs calcium directly through the pod wall, and the calcium is not transported downwards in the groundnut plant.

## Weed control

The correct application of pre-emergence herbicides is very important to ensure good weed control in the groundnut fields. It is therefore very important to choose the correct chemicals with the aid of a chemical representative.

The chemicals that are registered for groundnuts must be strictly adhered to, as traceability is very important in the groundnut industry. Adhere to the correct dosage and application methods in order to obtain the best results. Prevention is always better than cure.

Irrigation producers have a habit of 'washing in' pre-emergence herbicides after application. Care must be taken to prevent a micro cold shock in the form of cold irrigation water, which could cause unnecessary problems.

It is better to administer sufficient irrigation before planting and plant in wet soil where pre-emergence herbicides can then be administered to moist soil. Try not to irrigate irrigation plantings in the first four days after planting in order to avoid the adverse effects of cold irrigation water.

Good planning and the execution thereof ensures a good planting action for groundnuts. Care during the planting process ensures strong, healthy plants with the potential for a good crop. 🌱

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# The importance of healthy family relationships

**F**amily relationships are often the first place where we learn about love, care and respect. A family may be defined as “a domestic group of people with some degree of kinship – whether through blood, marriage or adoption”.

The modern family comes in all shapes and sizes: traditional, single parent, blended (more than one family together in the same house) and same sex couples – just to name a few. No matter the “type” of family you emanate from, there will be good and bad times.

In an ideal world, if a child is nurtured, respected, and raised to care for others, this will result in having a need to cultivate strong relationships, both in personal and work life.

A healthy family relationship is mainly characterised by the following:

- **Effective (good) communication** – family members listen to and genuinely care about what the other family members are saying.
- **Commitment to the family** – family life is seen as a priority and the person will consider the impact on relatives before making important decisions. Family members support each other in times of crisis.
- **Enjoy quality time together** – engaging in enjoyable activities together, i.e. sharing meals together, having family outings every weekend.

- **Respect each other** – i.e. accept individuality amongst family members and resolve conflict in a positive and constructive manner.

Although every family is different, there are certain characteristics that healthy families share. Remember, the quality of the relationship is more important than who forms part of the family group. A healthy family relationship provides a person with the support, encouragement and empathy required to function as an emotional healthy individual.

We all however know from personal experience, that **healthy relationships with your family members are important, but may also pose difficult** at times.

Unhealthy family relationships may lead to poor self-esteem, lack of trust in others, limited communication skills and other interpersonal problems.

In South Africa, many family relationships are characterised by domestic (family) violence. Domestic violence may be described as any act or threat resulting in or is likely to result in physical, sexual or psychological harm or suffering within the family.

Examples of domestic violence include:

- Physical, verbal or sexual abuse;
- Economic abuse;
- Abusing of power;
- Controlling of movements;
- Threats associated with weapons;

- Stalking; and
- Damaging of property, et al.

One of the most challenging aspects of dealing with domestic violence is to know how to protect yourself and how to break free from the relationship.

Speak to someone you trust and consider acquiring a protection order, obtainable from your local Police Station.

A protection order, also referred to as a restraining order or domestic violence interdict, is a court order stating that an abuser should abstain from the said abuse and sets certain conditions preventing the abuser from further harassment or abuse of the victim. It may also assist with ensuring that the abuser continues to pay rent or a bond or interim maintenance. The protection order may also prevent the abuser from obtaining assistance from any other person to commit abusive acts.

Being an emotionally healthy individual means that you realise that, as a member of a family group, you collectively contribute to each other's wellbeing.

(Sources: [www.divorcelaws.co.za](http://www.divorcelaws.co.za); [www.familylawclinic.org.za](http://www.familylawclinic.org.za); [www.pamf.org](http://www.pamf.org))

**Article submitted by Petra Nel from PROCARE. For more information, send an email to [petra@procare.co.za](mailto:petra@procare.co.za) or contact PROCARE at 0861 7762273 or 021 873 0532.**

## Benefits of agricultural mechanisation

**A**gricultural mechanisation embraces the use of tools, implements and machines for agricultural land development, crop production, harvesting, and preparation for storage, and on-farm processing. It includes three main power sources: Human, animal, and mechanical. The manufacture, distribution, repair, maintenance, management and utilisation of agricultural tools, implements and machines is covered under this discipline with regard as to how to supply mechanisation inputs to the farmer in an efficient and effective manner.

### The need for mechanisation

**Farm power** – consisting of manual labour, agricultural tools, draught animals, tractors, implements, equipment, and machinery – is an essential farm input. In almost any agricultural production system the annual expenditure on farm power, whether on labour, draft animals, or fuel and depreciation of machines, largely exceeds the costs of other inputs such as agro-chemicals and seeds. In many developing

countries, agricultural production and food security are adversely affected because of insufficient use of farm power, low labour productivity and/or labour scarcity. The need to improve agricultural labour productivity is increasingly recognised. In the case such as pump sets for irrigation, the need for machinery is undisputed. Rather than agricultural mechanisation, it would be preferable to use the term **Farm Power or Labour Productivity Enhancing Technology**, to recognise not only the importance of manual labour and hand tools, draft animals, and mechanical power, but also other issues related to labour scarcity, such as cropping and farming systems.

**In this context, three benefits of mechanisation may be summarised as follows:**

- **Increase in labour productivity.** The introduction of machinery to substitute for labour (“labour saving”) is a common phenomenon associated with the release of labour for employment in other sectors of the economy or to facilitate cultivation of a larger area with the same labour force.

- **Increase in land productivity.** The purpose of mechanisation is here to produce more from the existing land. Machinery is a complementary input, required to achieve higher land productivity, for example, through the introduction of pump sets, or faster turn around times to achieve higher cropping intensity.
- **Decrease in cost of production.** Introduction of a machine may lower production costs or offset increased costs of draft animals or labour. Usually, in various degrees, a combination of the three objectives will be achieved. Additional benefits to the user may be associated with a reduction in the drudgery of farm work, greater leisure, or reduction of risk. These are subjective benefits and difficult to translate into cash.

**Article supplied by Arno du Plessis, National Sales Manager, CaselH Northmec. For more information send an email to [arno@northmec.co.za](mailto:arno@northmec.co.za).**

# Grain SA interviews...

## Daniel Mndebele

**D**aniel Mndebele farms with yellow and white maize, sugar beans and potatoes in the Fernie area in Mpumalanga. Because of the knowledge and skills received from Grain SA, Daniel is able to harvest at least 4 tons of maize per ha and would like to create more jobs for the unemployed.

### Where and on how many hectares are you farming?

#### What do you farm with?

I am currently farming on 8 ha of arable land at Dambaton in the Fernie area in Mpumalanga. I farm with both yellow and white maize on 4 ha arable lands, 1 ha sugar beans and 1 ha potatoes.

### What motivates/inspires you?

I like farming because I am able to generate money out of farming in order to feed my family. When I left my job in Johannesburg 30 years ago I started farming. Since then I have been able to survive and care for my family.

### Describe your strengths and weaknesses

**Strengths:** I own a small tractor and implements which I use to plough my arable lands. I also have 25 goats and 30 cattle. I have skills in farming as I have attended courses presented by Grain SA as well as the Department of Agriculture. Our soils are good and more than 1 m deep.

**Weaknesses:** We do not have the market to sell our products. We sell to the local people and to the pension points and do not sell at good prices. The farming equipment which we are using is old and breaks down often. We do not have large arable lands to farm on and we do not have money to buy the inputs the way we should. Because we are "small" farmers the institutions are not willing to borrow us money or give us production loans.

### What was your crop yield when you started farming?

#### What are your respective yields now?

I use to harvest anything from 18 bags to 25 bags of maize per ha. Currently, I harvest more than 4 tons of maize per ha because of the knowledge and skills which I received from the Grain SA personnel.

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

I think the main contributor to my success is the skills which I have been taught by the Grain SA

personnel and the Department of Agriculture's Extension Officers. I use to work alone on my arable lands as I experienced that the people I sent to do the work on my behalf, did not do what I expected them to do and this resulted in lower yields.

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

I have attended the Introduction to Maize Production course, Tractor Maintenance course and Basic Engine Repair course. These courses were conducted by Grain SA personnel. I also attend study group meetings, where we are taught correct farming practices, which we must follow in our day to day farming. I need to attend the Vegetable Production course as I now have skills in farming with grains. I would also like to attend some courses in Financial Management.

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

I want to see myself generating a lot of money from farming and owning a tractor and farm implements which are in a good working condition. I would also like to have more arable lands to farm on and hire other people to work on my farm and to create job opportunities for the unemployed.

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

I want to tell them that they must take good care of their crops when planting, by ensuring that they take soil samples to check which fertilisers to apply. They need to check if their soils are acidic or not in order to apply lime if they find that their soils are acidic, as they will waste the fertilisers if they apply fertilisers on acidic soils. I will also advise them to remove weeds on their arable lands as the weeds will use the nutrients intended for the plants and this will result in very low yields. They will thus lose their money which they have used to buy inputs and hire machinery. They must do the work on their own and not rely on their labourers.

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# THE CORNER POST

## THE BEST DEBT – CASH?



**A**s of late the financial problems of African Bank has been in the news and because of that the borrowing of money or then loans. What went wrong?

Remember any business wants to make money or then profits where  $\text{Income} - \text{Expenditures} = \text{Profit/Loss}$ . Banks are no different. But then how does a bank function? Very basically one could say they farm with money. People/Businesses with money available deposit/invest their money with a bank on which they earn interest. The bank then borrows the money which has been deposited with them to others who need money and these borrowers must pay interest. The interest paid is always higher than the interest earned. The difference being the income of the bank from which they must pay all their expenses and make a profit.

In an effort to make more money African Bank made it rather easy for people to borrow money from them. They were a bit lenient on the criteria for a loan to be granted. The problem occurred when a large number of borrowers were unable to pay back their loans and this affected the cash-flow situation of African Bank very negatively and they virtually became insolvent. Consequently the Reserve Bank as the bank of control of the country had to step in, in an effort to rescue African Bank.

However, the result of all this was that the international credit rating of African Bank and other major banks in South Africa was downgraded. A lower credit rating implies that the creditworthiness (their ability to pay back loans) of a bank is judged negatively and they will have to pay a higher rate of interest when they want to borrow money. How does this affect us as clients of these banks? Clients are going to pay a higher interest

rate should they borrow money from these banks and it is also going to become more difficult to borrow money.

Take serious note of the following:

- Borrowing money always costs you something – the interest you pay.
- The easier it becomes to borrow the more interest you are going to pay.
- Vice versa, should a bank consider you a credit risk (they judge that you might experience difficulty to re-pay a loan), they are also going to charge you a higher interest rate.
- You must always repay your loan. If you cannot, you could be, in laymen's terms, be blacklisted and you will find it very difficult to borrow money again because of a poor credit record.

How must I then manage debt of my business or of my personal life? The principles are the same.

First of all, compile a budget (a physical and financial plan) indicating what you are going to do and when and what it should cost and what your income should be. The plan is normally for a financial year but for practical reasons subdivided on a monthly basis.

Secondly, spend according to your budget to keep costs and expenses under control. Even when you have to purchase something unforeseen (forced to buy) first consult your budget – you are then taking a financial decision understanding the implications of the unforeseen purchase on the financial success of your business or the cash-flow of your personal budget.

Thirdly, be very careful of spontaneous buying on the spur of the moment. When people buy a TV, a smart fridge or a bakkie on the spur of the moment they will very easily take up a loan without considering the question "Will I be able to pay

back this loan plus interest?" thoroughly. Should you not be able to pay back the loan, it will affect your creditworthiness adversely. Be disciplined – spend according to your budget. That is proper financial management.

Fourthly, the best debt is cash – thereby implicating that you should rather buy cash than borrow money. Consider the advantages of saving some money for a couple of months and then buying the TV for cash instead of borrowing money.

Lastly, unfortunately we know, especially with a farming business, it is not always possible to pay cash and you are at times forced to borrow money. Then rather borrow from a reputable institution. According to the Consumer Protection Act and the National Credit Regulator, when applying for a loan a financial institution should at least confirm your income and determine your ability to repay the loan by analysing your banks statements and/or cash-flow budget. Be very, very careful for an institution which makes it too easy for you to borrow. You may have seen advertisements like: "Personal loan available in 15 minutes". You pay for this easy loan by means of a higher interest rate.

The fact of the matter is that one should be very careful when considering taking up a loan. Perhaps one should consider the expression: "Do not spend tomorrow's money today".

**This month's edition of The Corner Post was authored by Marius Greyling, Pula Imvula contributor. For more information, send an email to [mariusg@mcgacc.co.za](mailto:mariusg@mcgacc.co.za).**

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