PULA IMVULA

GRAIN SA
GRAAN SA

JULY 2014

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

PULA IMVULA

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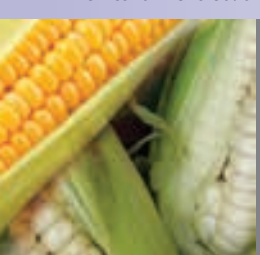

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NKGONO JANE SAYS...

IN THIS ISSUE...

INSIDE

Harvesting is almost over for some people whereas others are still working hard at it. It is wonderful to reap the rewards of hard work and good weather conditions. Having a good season shows the potential of your land if you do everything correctly.

In a good year, those who are not following good practice will also get a better crop, but they will never reach the real potential of the conditions. Well done to those of you who have an excellent harvest this year – you deserve the reward because much effort has gone into your work. Remember to plan for the inputs that you will require for the coming season – it is good to use some of the income you have generated for your household needs, but always keep enough so that you can plant again.

It is so very important for us to farm in ways that are sustainable. The sustainability refers to financial sustainability as well as ecological sustainability. We must never lose sight of the fact that the land we are using is the same land that existed thousands of years ago, and is most likely to continue for thousands of years. We need to ensure that what we do to the soil will not prevent future generations from using the same land to produce food for themselves.

Farming is an activity that we do in harmony with nature. If we destroy the land and the habitat, we are in conflict with nature and we will eventually pay the price for that. During this year there have been problems with gerbils again (*springhaasrotte*) – this is a symptom of the disturbance of the balance of nature. People have killed all the natural predators of these rodents and now we have to use very dangerous poisons to control them. These poisons not only kill the gerbils, but other birds and animals as well. As time goes on, we have eventually killed almost everything. This is not sustainable and we will be the losers in the end when we are no longer able to use the land that we have destroyed.

Let us try to maintain the balance on our land – good production practices that are in harmony with nature will keep us farming for generations to come.

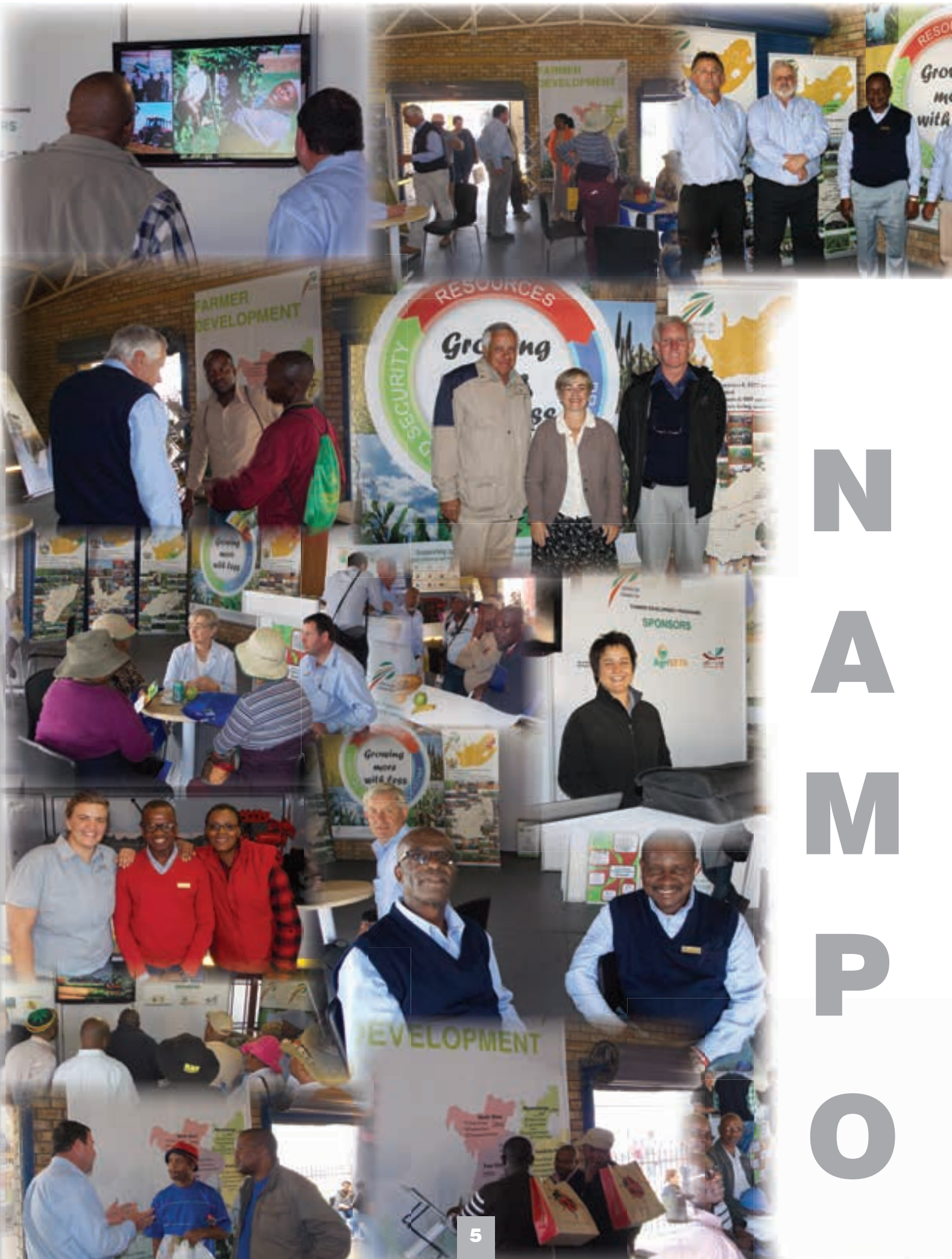
Farmer Development impresses at NAMPO

The annual NAMPO Harvest Day which Grain SA hosts took place from 13 - 16 May in Bothaville in the Free State. This event was an enormous success with exhibitors coming from far and wide to showcase their products to all of our farmers and industry role-players throughout South Africa. The exhibition area was also extended with an additional 2 ha this year to offer visitors an even bigger variety of products.

The Grain SA Farmer Development Programme once again presented a welcoming exhibition of all the different aspects of the program including training offered, Study Group structures, Farmer of the Year winners, our growing schools programme and much more. The area was also staffed with all of our Grain SA provincial co-ordinators to welcome visitors and farmers from every province and also to be able to communicate first hand what is happening in every province. We also had the opportunity to welcome persons from other commodity organisations, input suppliers, farmers from African countries as well as delegates from as far as France and other European countries.

Although it is of the utmost importance to build strong relationships with all of these parties, our main focus and most honoured guests remains our developing farmers. We would like to thank each and every farmer who saved up to be able to attend this event and who took the time to visit the Farmer Development Programme exhibition. We are also very thankful to have received various enquiries from young as well as older farmers who have heard about our programme and are interested in joining our study groups. We hope to welcome you at NAMPO in 2015 as fully integrated members!

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


FARMER DEVELOPMENT
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NAMPO

Make crop rotation an integral part of your planning

Crop rotation is a practice of growing different crops on one field in a regular, repetitive sequence according to a long term plan for that field. It also means that the crops following on should belong to a different family than the previous crop.

The plan of rotation may vary from between two or three years and even up to five years. This plan of rotating the crops not only offers good variation in the nutrition put into the soil but it also sees different plants rooting to varying depths in the soil, which means the different crop's roots can explore different soil layers for their nutrients. So nutrients which may have leached into deeper layers of the soil may not be reached by one crop but then the next crop could still utilise them and so the different rotating crops act as biological pumps.

The other big advantage of crop rotation is that the diversity of crops grown in one field lead to further biodiversity in flora and fauna there since each different crop's roots secrete and give off different types of bacteria and fungi which play an important role in the transformation of these substances into plant available nutrients.

The most important reason for crop rotation is to prevent the development of a build-up of weeds, pests and persistent soil-borne diseases by reducing their population levels in the soil. Many of the pests and diseases which harm our crops actually live in the soil. A common source of soil-borne problems is actually the seedbed itself and if a plant becomes infected at this early stage it will never be able to thrive. Farmers often spend a lot of money to drench their fields with pesticides to prevent this but a clever rotation program will lower both the risk and the expense for the farmer. Furthermore, if a farmer grows crops from the same category year after year in the same field, that land will most certainly build up pest and disease problems.

Generally speaking crop rotation should be an integral part of any crop farmer's planning especially when doing a medium term plan for the farm business which is normally about five years.

Mono-cropping i.e. only planting one crop on the same land year after year does have some advantages such as:

- Offering a degree of convenience as one becomes knowledgeable and familiar with all that is required to plant a crop with confidence;
- Only having to use one set of implements; and
- Using the same repetitive production practices.

However, the reality is that of all the traditional crops it is only maize that can, with some degree of success, be planted year after year on the same land and only then if the soils are managed expertly.

Why is it a good idea to practise crop rotation?

1. It fits in with the global trend which is moving towards climate smart agriculture. This means farmers are actively seeking ways to counteract the effects and realities of climate change. This means finding ways to restrict runoff, conserve moisture and

reduce the impact of pests and disease.

2. Fluctuations in the markets make some crops more cost effective to produce in certain seasons. Farmers should be reading about these trends so they can make a plan to take advantage of different markets as part of a crop rotation management program. Global and local trends in production, as well as the over production of one commodity or even shortages of another, all result in price variations and all contribute to volatility in the market place. A wise farmer will make adjustments to his cropping program to try and capture the higher prices.
3. Not only is price risk a consideration but crop rotation enhances risk reduction in many other ways too. Crop rotation reduces the risk of diseases and pests which are inclined to build up in the soil. Another very important consideration nowadays is moisture conservation. The moisture requirements of different crops vary and shallow rooted crops like legumes and some grasses have a lower moisture requirement that maize and sunflower for example.
4. The nutrition status of the soil is always an important aspect of crop management. Sunflowers do very well on the residual fertiliser left over from a previous maize crop. The legume crops such as groundnuts and beans all produce nitrogen, adding valuable nutrients to the soil. Sometimes a mulch crop such as cow peas is grown to improve the organic material in the soil – especially where no till farming is practised and the entire crop is ploughed back into the soil.

Crop rotations and livestock

Crop rotation can also be incorporated into a long term cropping program where the farmer has a cattle enterprise as part of his operation. A pasture crop with a 4 - 5 year cycle where a field is planted to grass pastures like Smutsfinger or Bloubuffel grass or possibly a grass-clover mix in wetter regions can also be integrated into a crop rotation cycle. A shorter cycle is possible where annual grasses such as Eragrostis teff for summer or rye grass for winter are used as either hay or forage crops. These are also shallow rooted crops with lower moisture requirements.

Please note: It is very important that the farmer is well informed on what herbicides were applied on the field previous to planting grasses, since the residual chemicals sprayed onto a broad-leafed crop like sunflowers could negatively affect the grass crop in the next season still.

> *Crop rotation should be an integral part of any crop farmer's planning especially when doing a medium term plan for the farm business which is normally about five years.*

There is unquestionable scientific evidence that increasing the diversity in our cropping systems through a sensible and appropriate crop rotation system balances productivity, profitability and environmental health.

Article submitted by John Mathews, a commercial farmer and Pula Imvula contributor. For more information, send an email to jenjonmat@gmail.com.

The secretive Aardvark

I was most concerned when I recently learnt of people hunting aardvarks as a sport and for their meat. Firstly the idea is revolting as they are terribly smelly creatures and they have a sour earthy stench to them. Secondly, they are fast becoming a threatened species due to a sharp decline in numbers.

Very little is actually known about this secretive creature, but the simple fact that their numbers are declining should be enough of a reason for people to start taking action to save this species. Much of this responsibility falls into the hands of farmers as we are one of the culprits responsible for their decline.

The aardvark is a solitary nocturnal creature which has the physical appearance of a large rat or a small kangaroo according to one of our farmers. It has donkey like ears and a long round snout. Its legs are short and stocky and its feet have sharp claws. The aardvark is very well suited to its purpose of digging, burrowing and eating large amounts of ants and termites. This is their primary dietary preference and it takes thousands upon thousands of them to satisfy their giant appetite. Unfortunately their famous digging capabilities have made them unpopular with farmers over the years. Their huge holes can be destructive to dam walls on farms and can also cause expensive damage to vehicles and tractors.

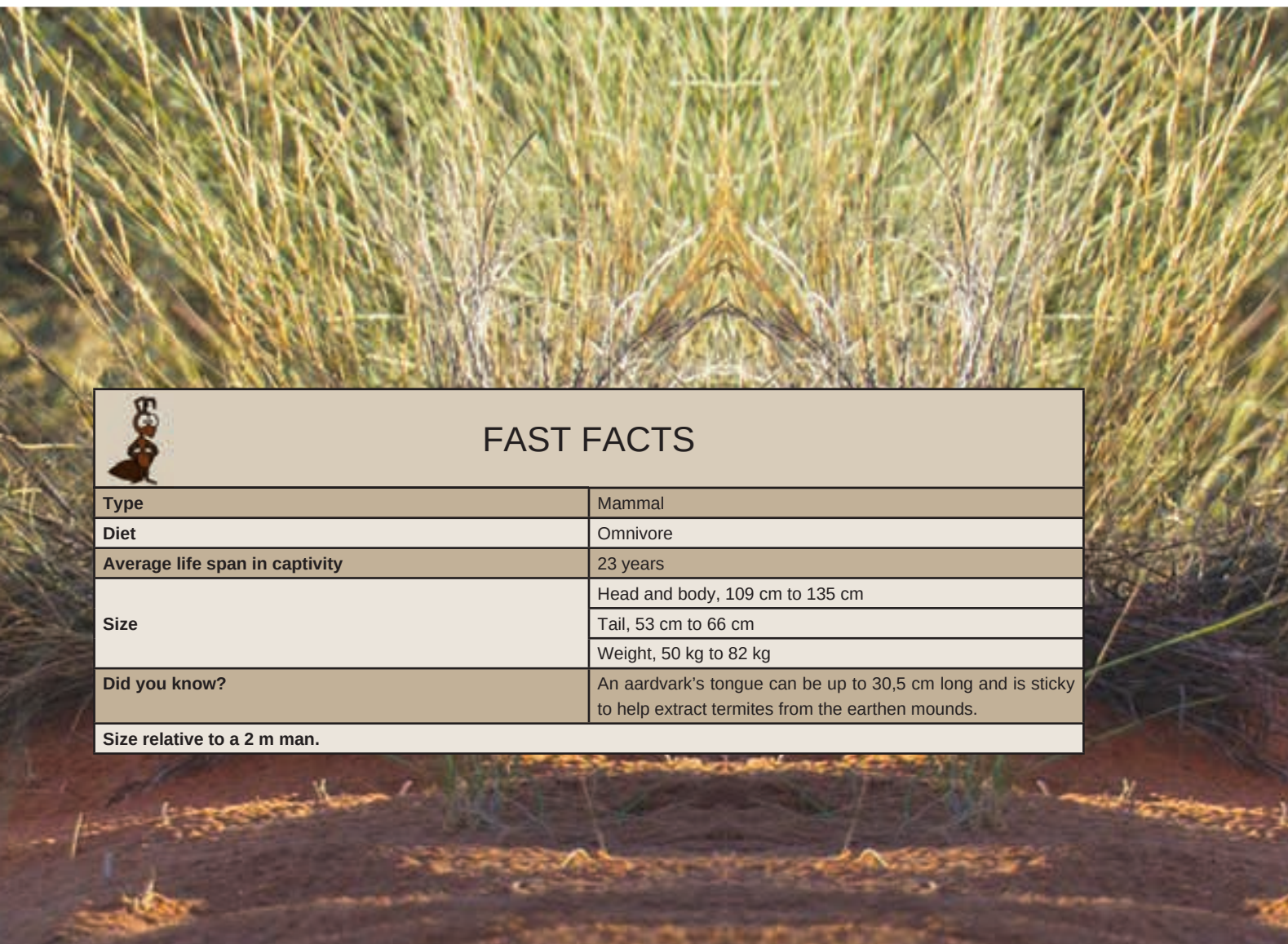
This is however no excuse for anyone to destroy their habitat and reduce their numbers by physically killing them!

Their value far outweighs the occasional damage which they may cause. We may not be able to attach a monetary figure to the benefits which they provide but the ecology of your farm is very dependent on this creature. More

DID YOU KNOW

The aardvark is nocturnal and is a solitary, elusive creature that feeds almost exclusively on ants and termites? After dark, an aardvark emerges from its burrow and forages over a considerable home range of up 30 km. It swings its long nose from side to side to pick up the scent of food. When a concentration of ants or termites is detected, the aardvark digs into it with its powerful front legs, keeping its long ears upright to listen for predators, and takes up an astonishing number of insects with its long, sticky tongue-as many as 50,000 in one night have been recorded.

Adapted from http://www.goodsafariguide.com



FAST FACTS

Type	Mammal
Diet	Omnivore
Average life span in captivity	23 years
Size	Head and body, 109 cm to 135 cm
	Tail, 53 cm to 66 cm
	Weight, 50 kg to 82 kg
Did you know?	An aardvark's tongue can be up to 30,5 cm long and is sticky to help extract termites from the earthen mounds.
Size relative to a 2 m man.	

and more research is being done on the aardvark as their numbers are declining and it is becoming more evident that they are a crucial keystone species in the ecosystem.

What is their role and how can they benefit farmers?

- Their burrows provide a habitat for many other species such as jackal, bat eared foxes and porcupine. Many other smaller creatures also make use of their burrows as well as the food that they waste. You will often find birds and lizards around their holes eating up all the ants that were left behind. Most of these creatures do not have the ability to dig their own holes, so depend on these for survival. Soil has excellent insulating properties which provide these different species with shelter from harsh environmental conditions. Many of these creatures will be affected and possibly even lost if the aardvark were to disappear from the ecosystem.
- The burrows which aardvarks dig usually become intricate tunnel systems which all link up underground. It is believed that these tunnels are important for providing aeration into the subsoil as well as helping with water absorption.
- Termites and ants can destroy large sections of vegetation and even crops. The aardvark helps to control their numbers, thus reducing the potential damage to grass and croplands. In the rural North West regions of South Africa where overgrazing is a problem you may notice hundreds of round termite mounds. These termites take advantage of the short grass and help to keep it mown down. If there were sufficient aardvark numbers then this situation may have been kept in balance. Unfortunately most of the aardvark populations in rural areas have been destroyed by hunting dogs and also the destruction of their natural habitat.
- It is believed that there are many more advantages that we benefit from that we don't even know about because there is still so little known about aardvarks.

We need to do much more than we currently are to try and protect these creatures from the endangered species list. This means that we should inform and educate all who we know about their benefits to the biodiversity of an ecosystem. People need to realise that there is still so much to learn from them and about them. It may turn out that aardvarks provide an environmental service which we cannot do without, but if they become extinct then it will be too late to do anything about it.

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

Water quality in irrigated wheat production

This the first part of a two part article covering water quality and will be followed by a discussion of the importance of water usage and soil factors to be considered in irrigated wheat production.

Water sources

Irrigation farmers will use water for crop production from various main sources. These will include surface water pumped from small streams, larger rivers and dams as well as ground water or more accurately underground water from shallow or deep boreholes.

These water sources vary in the amount of silt, or suspended soil particles, dissolved salts or other chemical substances that can influence whether or not plants will grow to their optimum potential in the irrigated soil medium. Water containing high amounts of sodium together with other chemicals in the soil can, after long term usage create sodic soils which will result in reduced yields over time. The development of sodic soils over a long period is not easily reversed.

As a start to ensuring a profitable yield with irrigated wheat production it is advisable to benchmark both the water quality being used and the soils. Water and soil tests can thus be carried out from time to time so that an integrated comparison can be made.

Short and long term application of nutrients in the water or soil can then be taken into account so that excessive nitrogen, chlorine, boron or sodium that might be found in the water can thus be managed in a responsible way.

The water will contain most of the major and minor nutrients required by the soil bacteria and plant roots together with the main nutrients found in the soil.

Water quality in streams and rivers on our main irrigation schemes can only be maintained if the industrial and commercial agricultural users all work together to preserve the resource for the future. The overuse of nitrogen in irrigated and other crops can result in soil nitrogen leaching and pollution of the resource for all users.

> *"Water quality in streams and rivers on our main irrigation schemes can only be maintained if the industrial and commercial agricultural users all work together to preserve the resource for the future.*

Water quality and sampling

The characteristics of irrigation water and soils in general are determined by the following main chemical compounds always found in association with each other and shown in the table below. The cations are positively charged (+) and the anions are the negatively charged components of compounds found in both water and soils.

The measurement of total dissolved solids, electrical conductivity, residual sodium carbonate, lime deposition potential, sodium adsorption and acidity can be carried out by registered laboratories such as the Institute for Groundwater Studies situated at the University of the Free State. The lab technicians have extensive experience with the analysis of both surface and ground water.

Both Iron (Fe) and Manganese (Mn) can be tested if iron deposits in pipes become a problem.

The results can then be assessed to be able to calculate how much of each nutrient will be applied to the crop in the total water applied.

Cations (+)		Anions (-)		Other main factors	
Calcium	Ca^{++}	Chloride	Cl^{-}	Total dissolved solids	TDS
Magnesium	Mg^{++}	Boron	BO_3^{-}	Electrical conductivity	EC
Sodium	Na^{+}	Carbonate	CO_3^{--}	Residual sodium carbonate	RSC
Potassium	K^{+}	Bicarbonate	HCO_3^{-}	Lime deposition potential	LDP
		Sulphate	SO_4^{--}	Sodium adsorption ratio or sodium hazard	SAR
		Nitrate	NO_3^{-}	Acidity or Alkalinity	pH

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For irrigated wheat the amount of water used will usually be between 7 500 and 8 500 cubic metres/ha. A 60 hectare centre pivot would thus use about 450 000 cubic metres to produce 7 tons/ha or 420 tons of wheat at reasonable target yields.

It can be seen that a large amount of nutrients contained in the water is applied to irrigated soils over time.

High sulphur levels in the water can be advantageous to the crop at certain stages in the wheat plant development whereas excess nitrogen together with the fertiliser nitrogen can be applied. All applied nutrients are expensive these days so careful planning is required to keep costs to only that which is required. High calcium and other chemical deposits such as chlorides on leaves affect the exposure to sunlight and ability to photosynthesise the nutrients required for top wheat yields.

High soluble salts in soils damage plants through the natural process where water moves from low concentration, being the plant root, to an area of higher concentration being the soil. The plants become stressed and wilt even though the soil may be wet.

High calcium in the water will also be deposited over time in the pipes of the irrigation system.

Remember to have the soil tests at hand when working out the planned fertiliser regime for the season.

Soft water makes “hard” ground

Household water can be treated to become “soft” by replacing calcium and magnesium with sodium. This water deposited in the soil however can increase the sodium content and makes the ground stick together and become “hard” and makes it difficult to work with implements and impedes root growth. Low sodium relative to calcium creates a “soft” ground that has good structure with unimpeded water movement through the soil.

Conclusion

Have your water and irrigated soils tested so that the correct management plan can be developed to enhance water quality crop yield as well preserve the soil quality for the future.

Article submitted by a retired farmer.

Using WINTER CEREAL CROPS to sustain your livestock through the winter

One of the biggest challenges that farmers face is providing enough food for their animals in the winter. This is especially challenging in the sourveld regions of South Africa where grass becomes unpalatable in the winter. The farmer needs to assess his situation to find the best and cheapest method to feed his animals.

This could be:

- To make hay and bale it for the winter.
- To use crop residues after harvesting.
- To plant winter cereal crops after harvest time.

The common winter cereal crops include oats, rye grass and turnips. The use of crops such as these is becoming more popular as different varieties and cultivars are being developed. So the main question which needs to be asked is:

How and when do we establish these crops?

The best time to plant will depend largely on your region and your climatic conditions. In central South Africa most farmers tend to plant in the late summer and early autumn when there is still a chance for a few good rains and some warm days. Planting time will also depend on whether or not you will be irrigating the winter crop. If you will be irrigating, then you can delay your planting time by a few weeks to a month. If you are not and it will be growing on dry land then the best practice will be to plant the crop late in the summer or early in the autumn while there is still some moisture in the ground. Rather than grazing the green growth as soon as it appears, it will be better to leave it to foggage. This means to not graze it until there is a substantial amount of material available for the animals to graze. This is a better option because you will never have a very good re growth on dry land.

Land preparation

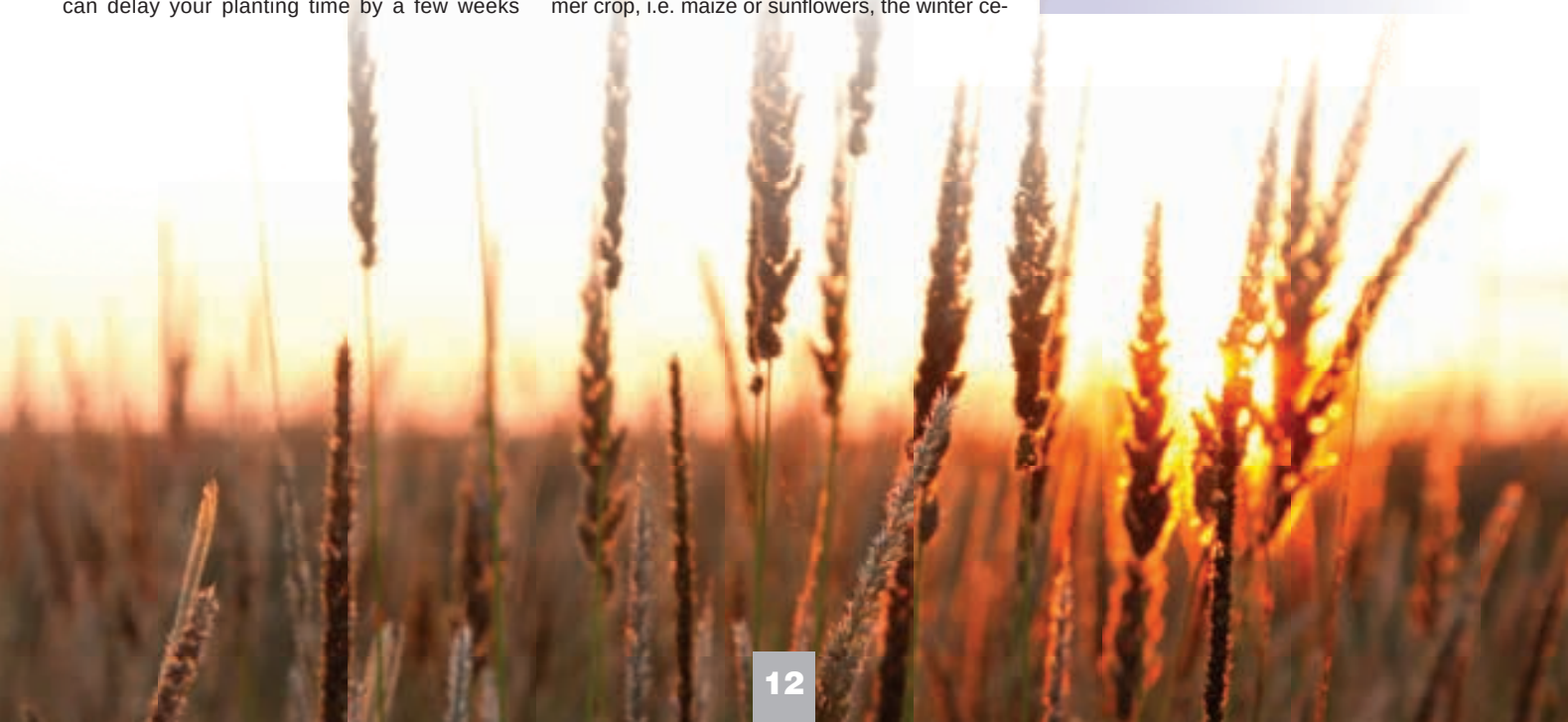
For best crop growth to be achieved we need to have a good seedbed. Therefore the soil needs to be tilled well by using a disc, plough or cultivator. Once a good seedbed has been established then the winter cereal can be sown by using a fertiliser spreader or it can be drilled using a fine seed drill such as a wheat planter. Some farmers prefer to drill the cereal crop directly into the land using the no-tillage practice. To do this it is important to have the correct equipment. Once planted, good fertilisation is essential. Using a heavy roller or a tractor to compact the seedbed will improve your germination and your stand.

Many farmers have also implemented the practice of over sowing their summer crops with a winter crop. After the maturation of the summer crop, i.e. maize or sunflowers, the winter cereal crop is sown in between the rows. The winter cereal crop will receive enough moisture to germinate and grow; once the crop is harvested there will be a good amount of green material to accompany the dry crop residues. Farmers usually do this by means of hand sowing or by using a crop sprayer to apply the seed from the air. It is impossible to roll the seed once it has been sown, therefore it is better to increase the application rate in order to achieve a good stand.

> *"The wellbeing of our animals is essential!*

Because of the volatile weather conditions that we seem to be experiencing these days it is difficult to know what to expect for the season lying ahead. This is why it is crucial for a farmer to always be prepared. The wellbeing of our animals is essential! It is imperative to have enough food to feed during the dry winter months and winter cereals are a good option to explore to help with this challenge.

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



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Weed control in wheat

Before any decision can be taken regarding methods of weed control, the relevant weeds should be identified and the farmer should know when these weeds will pose a problem.

The following questions should be asked:

- What herbicides were used in this land previously and what crops do we want to plant in the future?
- Is the herbicide registered to control that specific weed?
- Is the herbicide registered to be used on that specific crop?
- What is the registered application of that particular herbicide to control that particular weed in that particular crop?

Factors that influence the action of pre-emergence herbicides

There are various factors that influence the action of pre-emergence herbicides namely:

Hondebossie.

Fine and even seed bed

A fine and even seed bed enhances the even distribution of the herbicide. In an uneven seed bed the herbicide may land on clods and therefore not affect the germinating weeds.

Soil moisture or rainfall

Pre-emergence herbicides require a certain amount of moisture in the soil, or a certain amount of rain or irrigation water to activate the herbicide.

Quantity of clay, organic material and humus

Soil applied herbicides bind chemically with the clay, organic material or humus and might not be available to the germinating weed. The higher the levels of clay, organic matter or humus, the higher the application of herbicide will be required to control the weeds.

Soil pH

Soil pH influences the degeneration of the herbicides and therefore the residual periods of the herbicides. The higher the pH, the more available the herbicides are to be absorbed, and therefore the shorter the residual periods.

Timing of weed germination

Weeds that have already germinated at the time of the application of the herbicide will not be controlled by the herbicide.

Depth of weed germination

Weeds that germinate very close to the surface of the soil may escape the effect of the herbicide as it is taken into the soil. The opposite is also true. Weeds that germinate very deep down in the soil may also escape the effect of the herbicide i.e. of their roots develop below the level to which the herbicide has been incorporated.

Methods of application

The accuracy and timing of the application of the herbicides is of the utmost importance in weed control. An integrated programme including pre- and post- emergence herbicides as well as mechanical weed control is necessary for the control of weeds in crops (The most expensive herbicide is the one that did not work!).

Factors that influence the action of post-emergence herbicides

There are various factors that influence the action of post-emergence herbicides namely:

The growth stage of the weed is important – young weeds are very sensitive to herbicides, while a large leaf area and an actively growing plant will promote the transport and absorption of systemic herbicides.

Weeds that are not growing well for reasons of moisture stress will not be affected by the herbicides because the transport of the herbicide within the plant will be limited.

Climate affects the uptake – e.g. rain soon after the application of an herbicide may wash it off the leaves and thereby reduce the uptake. Certain herbicides cannot be mixed together in one spray – they undergo a chemical reaction that prevents their efficacy. In some cases, a combination may be more effective than the theoretical combination of the two. The application method as well as suitable equipment is important so as to ensure good wetting of the leaves and stems.

Article adapted from the Wheat Production manual.

Manage your assets and stock

It is important to understand that all the assets on the farm, being items like the buildings, the vehicles, tractors, implements, fences, equipment, tools and so forth represent money. Therefore every time one of these items are lost or stolen or damaged through abuse you lose money which impact negative on the profits of your farming business.

Stock refers to the all the production inputs you need to produce products and also represent money whether bought or produced by yourself. Inputs may be diesel, fertiliser, seed, feed, chemical remedies, oil, medicines, and so forth. Most of the time inputs are purchased and stored somewhere for a period of time before they are used. Whilst being stored, and during the process of applying the inputs there may be losses. As with assets this also represents a loss of money impacting negatively on the profits of your business.

The question is can you afford to lose money in this way? Most definitely not – therefore you must manage all your assets and stock properly.

The basic purpose of asset management should be to ensure that all assets are protected against losses and abuse. Control should be exercised over the assets used during the production processes and with daily activities, especially smaller assets, in terms of promoting the correct use and reducing losses due to whatever reason. A basis for an appropriate system of continuous stock taking must also be provided for which information regarding the assets are needed.

The basic purpose of stock management should also be to protect the stock against losses such as obsolescence, waste, damage and theft. Control must also be exercised on all production inputs (stock) from purchase up to the point where the inputs have been used. A basis for an appropriate system of continuous stock taking must also be provided and information regarding stock is also needed. With the information it can also be ensured that stock required for production purposes is available in the right quality and quantity at the required time and place and the level of stock is kept as low as possible.

In order to keep control (manage) your assets and stock you first of all need a place where you can store them in a safe and secure way at all times, especially when not in use. In this regard one will have to use your initiative to make provision for places of storage. For instance, if you cannot provide for an undercover storage for all your implements, fence of an area perhaps under some trees. Should you not have a lockable room or small store for the

Assets register for year: End of March 2014.

Item	Description	Number of item	Number beginning of year	Number purchased	Number sold	Number end of year	Actual	Difference
Buildings	General shed	1	1			1	1	0
	Poultry house	2 & 3	2			2	2	0
Vehicles	Toyota bakkie		1			1	1	0
Machinery	Tractor		1			1	1	0
Implements	Plough	1	1			1	0	1
	Trailer	1	1			1	1	0
Equipment	Water troughs		10			10	10	0
Small tools	Spades	1 - 5	5	2	1	6	5	1
	Hammers	1 - 2	2			2	2	0
	Screwdrivers	1 - 3	3			3	2	1
	Spanners	1 - 5	5			5	5	0
	Pliers	1 - 2	2			2	2	0

Register of stock for month: May 2014.

Item	Number beginning of month	Purchased	Used	Number end of month	Actual	Difference
Fertiliser	10 bags	10	15	5	5	0
Feed	5 bags	100	90	15	14	1
Diesel	100 litres	200	150	150	140	10

production inputs, you can create a place of storage in a larger store by enclosing a small area.

Secondly, you need to identify all your assets by a numbering system of some sort. Tractors, vehicles and equipment can be identified for instance by their registration numbers or engine numbers. Identify implements and tools by welding, painting or punching on a number. Buildings, troughs, and so on can also be numbered.

Stock is normally identified by their specific brand and name and quantities for instance – 3:2:1 XXXXX fertiliser – 10 bags.

Thirdly, you will need to record and compile a register of all assets and all the stock. See the examples.

You may now ask the question: "I have done all this, what now?" Now you are ready to manage your assets and stock with control, the important action. Remember, if you prevent the loss of a number 13 spanner, a bag of fertiliser or a bag of feed, you manage your profits better.

Assets should be checked at least once a year by comparing the assets to your register. Count all your assets, note the number in the actual column and calculate the difference. Is everything still there? If not clarify the difference. It would however be preferable to control the assets more than once a year especially the smaller items. Hand tools and workshop tools should be controlled when used.

In terms of stock management the stock register should be checked at least once per month and the differences accounted. Keep the records up to date. Certain stock items such as diesel should be controlled every day.

Remember you must measure to manage – store everything properly, identify all assets and stock and keep proper records. By applying proper asset and stock management everybody will be aware of the control you exercise and that will already reduce theft, wasting and so forth. Abuse will be reduced and you will be respected as a thorough manager. More importantly, it will save you money.

> *"By applying proper asset and stock management everybody will be aware of the control you exercise and that will already reduce theft, wasting and so forth.*

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

The importance of soil pH and fertilisation investigated

Fertilisation represents between 38% and 50% of the production costs of crops like maize and wheat. It is therefore obvious that every gram of fertiliser that is spread is expected to produce a yield.

This is where soil acidification becomes a major problem to the farmer. Not only do elements like aluminium become toxic at a low pH, but a physical loss of applied elements also occurs through leaching.

Figure 1 illustrates a simplified model of how low pH conditions lead to the leaching of essential elements. As the soil acidifies, hydrogen ions build up in the soil and displace essential cations like calcium, potassium, magnesium and sodium. Rain and/or irrigation water then leaches these free nutritional elements from the top soil so that they are out of the reach of plant roots. This means money lost to the farmer.

The acidification of agricultural soil has many causes, for instance natural acidification, the use of fossil fuels and of fertiliser containing ammonium. The application of lime is the only cost-effective way of combating acidification.

Figure 2 contains an illustration of how applied calcium hydroxide (also known as slaked lime) reacts with the surplus hydrogen ions in the soil to correct the pH. Corrected pH means more effective nutrient absorption and therefore better yields for the fertiliser applied.

SA Lime and Gypsum (Pty) Ltd entered the South African agricultural lime and agricultural gypsum industry in 2003 to stimulate the application of calcium and magnesium nutrients in particular at national level, knowing that acid soils are unproductive and that maximum crop yields in South Africa are viable only through a strategy of judicious liming.

The company offers the farmer a choice of more than 30 different products, of which the following are only a few examples:

- ProLime natural high-grade calcite ($CaCO_3$).
- Olifantsfontein natural dolomite ($CaCO_3$ + $MgCO_3$).
- Ulco high-grade hydrated calcite ($Ca[OH]_2$).
- CalMag slaked dolomite ($Ca[OH]_2$ + $Mg[OH]_2$).
- SiliCa and AquaSil – two unique products with, among other things, a liming component and a high plant-available silicon component.

More information on products and product components is available on the SA Lime and Gypsum website.

Agricultural sources of lime naturally have different capacities for correcting the soil pH. Liming materials are also compared to a standard, which is calcium carbonate in this case, and this comparison is expressed as calcium carbonate equivalents (CCE) in **Table 1**.

By comparing the CCE of different products, the best product can be selected. The

Figure 1: A simplified model indicating how low pH conditions lead to the leaching of essential elements.

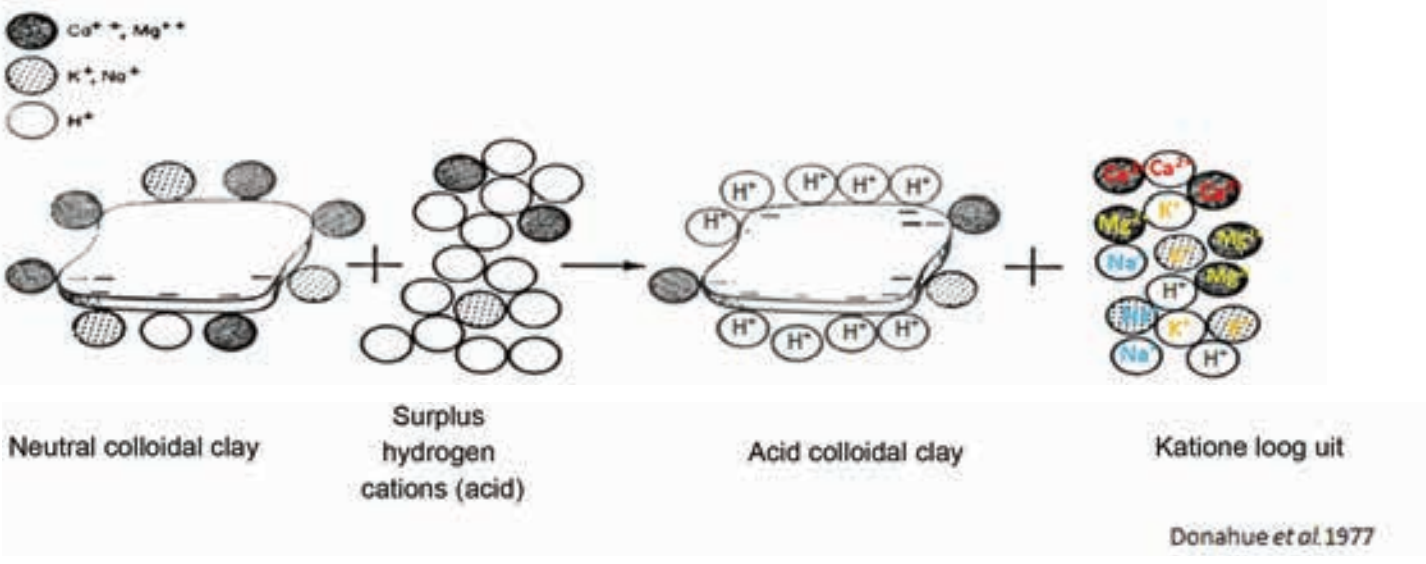


Table 1: Calcium carbonate equivalents.

Product	$CaCO_3$ equivalents (% CCE)
Calcitic lime ($CaCO_3$)	100
Dolomitic lime [$CaMg(CO_3)_2$]	109
Hydrated calcite [$Ca(OH)_2$]	136
Calcined calcite (CaO)	179
Calcium silicate (slag) ($CaSiO_3$)	86

Figure 2: An illustration of how applied calcium hydroxide reacts with the surplus hydrogen ions in the soil to correct the pH.

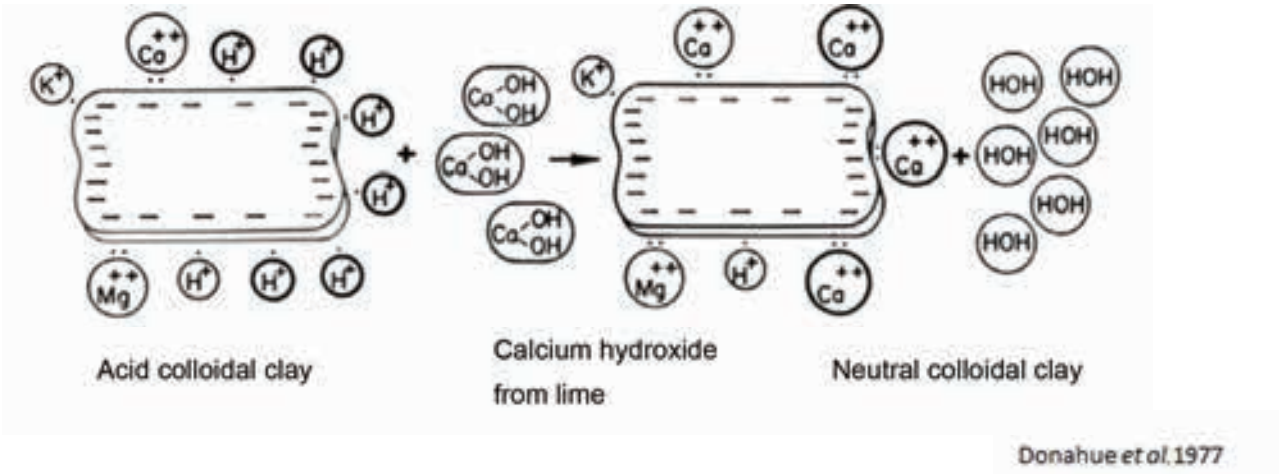
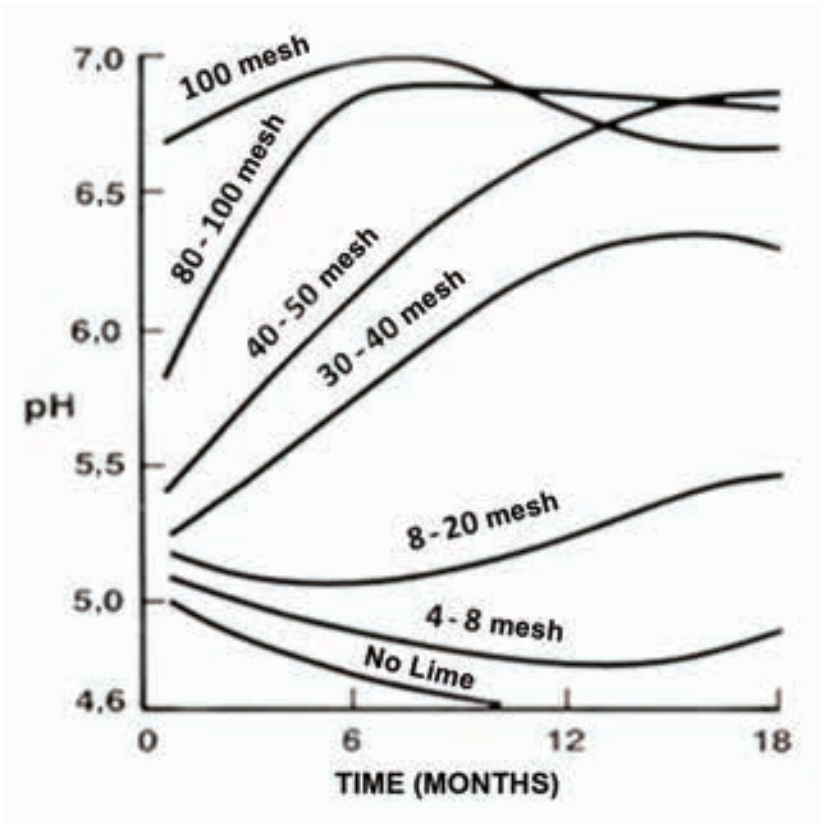


Figure 3: The change in soil pH over time for different degrees of fineness of lime.



farmer can also choose the most cost-effective lime in this way. The fineness of the liming material is also very important to its effectiveness.

The reason for this is that calcium carbonates dissolve very slowly, which means that the reaction is limited to a very small area around the lime particle. The finer the product, the greater is the effective area, and therefore the area that is exposed, which then leads to a faster reaction. This trend can be seen very clearly from Figure 3, which indicates the change in soil pH over time for different degrees of fineness of lime. In this figure, 100 mesh = 150 microns, 80 mesh = 180 microns, and 20 mesh = 850 microns.

In conclusion: what about the question regarding dolomitic as opposed to calcitic lime? Research has shown that these two limes take the same time to change the pH of the soil when equivalent products are compared. The decision would therefore rather be determined by the soil analysis and the accompanying analysis by an agricultural expert.

Optimum cost savings for the farmer obviously lie in the correct choice of lime. Farmers of different agricultural crops across South Africa can confidently use the countrywide network of representatives and agricultural experts of SA Lime and Gypsum to determine their liming needs timeously and scientifically.

This company, with its head office in Stellenbosch, is South Africa's biggest national supplier of agricultural lime and gypsum and offers affordable access to a wide range of strategically positioned, high-quality dolomite, calcite and gypsum sources.

Article submitted by Martin Wilding, Research and Development, SA Lime and Gypsum for SA Graan/Grain July 2013. For more information, send an email to martin@sakg.co.za.

Soil analyses unlocks the potential of soil

Soil analyses is the key to a successful fertilisation programme. Samples that are taken correctly can ensure that fertiliser is applied effectively to achieve the expected yield.

Soil samples should be taken at least every three years. Correct sampling and good record keeping enable a farmer to identify trends like soil acidity that develop over years. If the correction of soil acidity with the aid of liming is planned, soil samples should be taken at least four months before a new planting.

The following sampling guidelines from the Production Manual of the ARC-Small Grain Institute will ensure that results recorded over years can be compared:

- Divide fields to be analysed into homogeneous units preferably no larger than 50 ha. Homogeneity is determined on the basis of the performance of the previous crops, soil texture and topography.
- Sample problem spots separately.
- Remove loose stones, grass and sticks from the sample.
- In order to ensure a representative sample from a homogeneous unit, 20 to 40 samples must be taken at the same depth, evenly across the full area of the field. Avoid spots that are obviously poorer than the rest, headlands and stock standings.
- The recommended depth for a topsoil sample is 0 mm - 200 mm, and subsoil samples are taken in the 200 mm - 600 mm layer of the profile.
- If fields have been ploughed, samples should be taken randomly across the entire area. In cases where rows of the previous crop are still visible, subsamples can be taken randomly between and in the rows.
- Use a clean bag to mix the subsamples. Remove the sticks and break the large clumps. Then mix the sample very well and spread the soil in a thin layer across the bag. Take small scoops evenly across the full depth and area of the bag and place this in a sample box or plastic bag. The final sample should weigh about 500 g.
- Results are easier to compare if samples are taken at approximately the same time of the year, or during the same phase of a cultivation programme each time.

These laboratory reports are consumer friendly and each report includes norms that can assist with the interpretation of results. Most clients prefer the package analysis, which can be used for fertiliser recommendations.

The package analysis provides results for pH (KCl), phosphate (Bray1), cations (ammonium acetate) and the percentage of acid saturation. Clients sometimes enquire about the cation ratios (marked blue in the report) that are reported together with the mg/kg values of cations.

These ratios are calculated with the equivalent values of the cations, and not with the analysis result, which is reported in mg/kg in the report. The results of cations are converted from mg/kg to their equivalent values as follows:

K:	mg/kg/391 = cmolc/kg
Ca:	mg/kg/200 = cmolc/kg
Mg:	mg/kg/122 = cmolc/kg
Na:	mg/kg/230 = cmolc/kg

According to the Fertilisation Manual of the Fertiliser Society of Southern Africa, the ratios between Ca:Mg:K:Na vary around 65:25:8:2.

Ca/Mg	1,5 to 4,5
Mg/K	3 to 4
(Ca+Mg)/K	10 to 20

These ratios are only general guidelines. However, it is advisable to monitor and correct these if required.

The ARC-Small Grain Institute's soil analysis laboratory is 21 years old and offers farmers accurate and reliable analyses within a fair turnaround time. An internal control system and participation in the control scheme of the Agri-Laboratory Association of Southern Africa (AgriLASA) ensures ongoing accuracy.

Feel free to the visit the laboratory for friendly and personal service. Free sample boxes and advice for wheat farmers are available on request.

Article submitted by Lientjie Visser, Small Grain Institute, an institute of the ARC-Field Crops Division, Bethlehem, for SA Graan/ Grain July 2013. For more information, send an email to VisserL@arc.agric.za.

Free sample boxes are available on request.

Verna Wessels working on analyses.

Correct sampling is important.

Figure 1: An example of a soil analysis report.

LNR-KLEINGRAANINSTITUUT
Grondontledingslaboratorium
Privaatsak X29
BETHLEHEM
9700
Tel: (058) 307-3501 Faks: (058) 307-3519

ARC-SMALL GRAIN INSTITUTE
Soil Analyses Laboratory
Private Bag X29
BETHLEHEM
9700
Tel: (058) 307-3501 Fax: (058) 307-3519

Name:
Address:

Farm:
Fax:
Tel.:
Cell:

Ref.:
Date received:
Completion date:
Rep.:

Sample No.	Sample Ref.:	pH (KCl)	P (mg/kg)	K (mg/kg)	Ca (mg/kg)	Mg (mg/kg)	Na (mg/kg)	US	AS %	Ca/Mg	(Ca+Mg)/K	CEC cmolckg-1	Clay %	Zn (HCl)	C %
167	L1	4.2	25.2	122.6	317	92.6	2.2	0.52	16.27	2.09	7.48	3.19			
				(10)	(50)	(24)	(0)								

Extraction methods	*AS*	*- Acid saturation*
P - Bray 1	*CEC*	*- Cation exchange capacity (calculated)*
Cations - NH4OAc	*( )*	*- Result as a % of CEC*

Set up and checked by:
LIENTJIE VISSER

Norms	P	K	Ca	Mg	Na	Zn(HCl)	Soil acidity	% AS	pH
Result as a % of CEC	*	6 - 12	55 - 75	20 - 30	<5	*	Extremely acidic	>60	<3,5
Low	<15	<60	<200	<40	<10	<1.5	Very strongly acidic	50 - 60	3,5 - 3,8
Medium	15 - 25	60 - 80	200 - 400	40 - 80	10 - 30	1,5 - 2,0	Strongly acidic	40 - 50	3,8 - 4,0
Medium high	25 - 35	80 - 120	400 - 800	80 - 120	30 - 50	2,0 - 6,0	Acidic	30 - 40	4,0 - 4,3
High	>35	>120	>800	>120	>50	>6,0	Moderately acidic	20 - 30	4,3 - 4,5
							Slightly acidic	10 - 20	4,5 - 5,0

Soil texture can affect the above norms.
Crops vary with respect to aluminium tolerance.

Jupidex has the solution you're looking for!

With the new season approaching, farmers have to take stock of their equipment to ensure that they are able to start cultivating their land timeously. Late winter is the ideal time to plan, do maintenance on existing or buy new machinery and equipment.

Jupidex wants to assist farmers when they decide to buy equipment. We offer you HT Alpler's quality cultivator and ploughs. They are economic, strong, safe to work with and specifically designed and adapted to meet South African farmers' unique requirements.

HT Alpler Spring Cultivator

With the HT Alpler Spring Cultivator safety is the key. Its vibrations reduces traction force. You also have different share types and an optional hydraulic mechanism for different kinds of challenges. Its specifications are as follows:

- Different share types for different solutions.
- Spring vibrations for the safe working opportunity.
- Due to the vibrations, reduction of traction force.
- Greasable bushes made from special material.
- Hydraulic mechanism (optional) for shifting the cultivator easily closer to the trees and fences.

HT Alpler Chisel Plough

The HT Alpler Chisel Plough is strong and specifically designed to accommodate farmers' unique requirements. The legs are secured by bolts and adjustable in order to be able to work different widths. The reversible shares are made of special steel and are uniquely designed to optimise penetration.

The HT Alpler's Chisel Plough's specifications are:

- Specially alloyed steel casting legs uniquely designed to get the most convenient penetration angle for maximum efficiency.
- Opportunity to work different widths with adjustable legs.
- Reversible shares made of special steel and processed with heat treatment.
- Bolt secured legs.
- 100 mm profile.
- High leg.
- 30 mm distance between beams.

HT Alpler Disc Plough

Buy a plough to last a lifetime! The heavy duty, economic HT Alpler Disc Plough is strong and designed for challenging conditions. It is an excellent solution for rooty, sticky or abrasive soil and its discs can be adjusted at different angles and positions to meet your unique requirements. The frame is designed to add an extension, if necessary, and its scrapers can be used for cleaning and overturning. The adjustment arm ensures best, trouble-free tractor-plough alignment to ensure safe, easy operation. Its specifications are:

- 20% - 30% fuel economy in comparison with mouldboard ploughs.
- Standard 660 mm or 710 mm optional discs made from Boron Steel with special concavity.
- 5 level disc penetration angle and 3 level disc positions, lateral 5 positions for use in tough or soft soil conditions.
- Excellent solution for rooty, sticky or abrasive soil.
- Flanged frame to add an extension, if required.
- Adjustable and replaceable scrapers not only for cleaning, but also for overturning.
- Heavy duty rear furrow wheel from hardened steel, spring loaded, fully adjustable vertically and laterally, with additional cast weightenings.
- Steel bearing housings to assure trouble free long operation life.
- Adjustment arm for best tractor-plough alignment.

You no longer have to wonder if your equipment will last the season. With the HT Alpler equipment you have a strong cultivator and heavy duty ploughs to meet our requirements in South Africa. They are ideal partners for farmers who want to lead the way.

Disc plough.

Chisel plough.

Spring cultivator.

Contact Jupidex today and speak to one of the representatives at 033 386 3574 or email them at info@jupidex.co.za or visit their website at www.jupidex.co.za.

Article supplied by Jupidex.

How important is Russian wheat aphid resistance in South African wheat cultivars?

Russian wheat aphid resistant cultivars have been bred throughout the world for a long time and are numerous among commercially available wheat cultivars.

When choosing a wheat cultivar, there are many factors to consider. One such factor is whether the cultivar you have chosen has sufficient Russian wheat aphid resistance. The question is how important is this factor to consider.

What is resistance?

In nature, plants are attacked by a variety of different insects, which necessitates some kind of strategy to defend them against these attacks. One of the strategies that plants developed to survive is resistance against insects.

Insect biotypes develop as a result of an arms race between insects and plants. When insects feed on plants there is a selection pressure by the insects on the plants. The plants need to develop some sort of strategy to survive and this result in the development of resistant characters in the plant.

Consequently the survival of the insects is reduced and this again results in the development of counter-resistance in the insects. By breeding resistant lines, plant breeders are speeding up the natural process in favour of the plant, but nature will follow its course and when breeders release a resistant crop, counter-resistance will eventually follow.

Why is resistance necessary?

Increased genetic diversity in wheat breeding is desirable for dealing with present and future challenges caused by the need to adapt to changing climate and change in pest dynamics as a result.

Of the several constraints towards realising the potential wheat yield, losses incurred due to biotic and abiotic stresses are enormous. Therefore breeding for resistance in wheat takes the centre stage in any breeding programme with the end goal of breeding high yielding varieties.

The advantage of Russian wheat aphid resistant cultivars for producers is a direct economic benefit – a reduced cost of pesticides and fuel due to a reduced need for applications. Deploying genetic resources for resistance also assists in achieving yield stability without resorting to harmful chemicals in addition to preventing environmental degradation and benefiting the resource-poor producers who cannot afford the use of costly chemicals.

These benefits are of greater importance when cereal prices are low, because low prices make the application of pesticides less cost-efficient. While the main benefits of Russian wheat aphid resistant cultivars are for producers, society as a whole has a lot to gain from them as they contribute to a general reduction in pesticide use, which is recognised as a significant and worthwhile public objective because of the environmental and health problems linked to the use of pesticides.

How is durable resistance achieved?

New Russian wheat aphid resistant genes need to be incorporated into the breeding programmes all the time to keep ahead in the race. The most important step in any breeding programme is the availability of genetic diversity for the objectives of the breeding programme.

Resistance traits governed by major dominant genes are not stable over time, while those governed by several genes are more durable. The strategy of building up a combination of genes each of which contributes only a partial degree of resistance would in the long term offer more effective management.

Despite the common and lengthy experience in breeding for Russian wheat aphid resistance, the evolution of new biotypes after the cultivar occupies the wider cultivation, makes breeding for resistance an ever continuous process. There are, however some cultivars that have remained resistant for fairly long periods of time, giving credence to the fact that resistance conferring durability can be achieved. The true test of resistance is how well a particular genotype develops and yields in the presence of aphid in the field, under a range of environmental conditions.

Scientists' efforts over many years resulted in availability of resistance in wheat and became related to wheat sustainability over decades and consequently contributed to food security. For sustainable, long term management of Russian wheat aphid biotypes, planting a cultivar with Russian wheat aphid resistance will therefore be an important factor to consider.

Article submitted by Dr Astrid Jankielsohn, ARC-Small Grain Institute, an Institute of the ARC-Field Crops Division, Bethlehem for SA Graan/Grain June 2013. For more information, send an email to jankielsohna@arc.agric.za.

Grain SA interviews...Elmon Mthombothi

Elmon William Mthombothi from the Khumbula area in Mpumalanga, aspires to one day become a commercial farmer who employs many people and creates many job opportunities which will help alleviate hunger in our country.

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

I farm on 12 ha communal arable land in the Khumbula Village near White River. I currently farm with 8 ha maize, 1 ha Jugo beans, 1 ha groundnuts, 0,5 ha sweet potatoes and 0,5 ha dry beans.

What motivates/inspires you?

I farm because I enjoy farming. My parents were farmers thus I grew up on a farm and my parents paid for our school fees and clothes with the money they earned from planting and selling vegetables. I became aware that one can earn a living as well as create job opportunities from farming.

I attended college at Tompiseleka in Groblersdal and received a Diploma in Agriculture. I also worked for the Department of Agriculture in Mpumalanga as an Extension Officer for 40 years. I retired in July 2013.

Describe your strengths and weaknesses

Strengths: I own farm machinery including 2 tractors, a plough, a disc, a trailer and a harrow. All of these implements are still in a good condition. I am a qualified Agriculturalist and am attending various courses which are being offered by Grain SA as well as other organisations. I started farming part time 20 years ago and have built up quite a lot of experience over the years. Currently, I own 55 cows, 3 bulls and 57 goats.

Weaknesses: My biggest problem is theft and the weather, which is uncontrollable. Our area, which is situated next to the Kruger National Park, reaches temperatures of 40°C and at times we experience drought. We do not have water for irrigation and therefore only plant crops under dry land conditions. As we farm on communal lands we need to be assisted with buying our own farms, so that we can plant more crops as well as keep more livestock in order to generate a profit from farming. One cannot invest on communal land, it is better to own your own land and develop it so that you can sustain your farming activities.

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

When I started farming I used to harvest approximately 1 ton of maize per hectare. Currently, under the difficult conditions we experience (drought), I manage to harvest 3 tons/ha. This I can attribute to becoming a Grain SA study group member.

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

I think the main contributor to my success is to be hands on. I would wake up early every morning (between 4:30 am and 5:30 am) to check on my livestock and lands, then go to work. Once I returned from work in the evenings, I would again check to make sure everything was fine. I did not rely on my workers to do this for me, as I felt they would not do things they way I would have. I still wake up early every morning and follow the same routine.

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

I have attended the following Grain SA Courses: Introduction to Maize Production, Tractor Maintenance and Basic Engine Repairs. I can easily manage my farm implements on my own because of the skills that I acquired from these courses. I have also attended other courses like Budgeting and Leadership, which were offered by other institutions.

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

I want to see myself owning a big farm where I can keep my livestock and plant maize on a large scale, so that I can feed my livestock and sell the surplus. I would like to become a commercial farmer and employ many people to work on my farm so that I can create job opportunities and alleviate hunger in our country. I would like to become a role-model to the upcoming farmers.

What advice do you have for young aspiring farmers?

Young aspiring farmers must work very hard in order to achieve good results in whatever they are doing. They must not rely on their workers to do things for them and they must always lead by example. They must acquire skills in order to do their job correctly. They must also attend workshops and courses offered by Grain SA and other organisations in order to develop themselves. They must not be selfish and be ready and willing to share information with anybody and any farmer in need.

Article submitted by Jerry Mthombothi, Development Co-ordinator of the Grain SA Farmer Development Programme. For more information, send an email to jerry@grainsa.co.za.

Elmon Mthombothi standing between the weed-free rows of maize on his communal land in Khumbula, White River.

The Corner Post

My experience of the Farmer of the Year visits

The Grain SA Farmer Development team invited me as a commercial farmer from the Arlington area to be one of the judges for the 2014 Farmer of the Year competition. The main reason why various judges are used is to keep the competition fair and impartial. I was very appreciative of the invitation but was not quite sure what to expect.

Our group of three judges started our visits on 31 March in Elliot and visited the last farmer on 9 April in Welkom. We visited a total of twelve finalists appointed for the three categories of the competition, which comprised of subsistence farmers, farming on 1 - 3 ha, smallholder farmers, producing less than 250 tons of grain and commercial farmers, producing more than 250 tons. Areas visited included the Eastern Cape, Northern KwaZulu-Natal, Mpumalanga and the Western Free State.

One of the most surprising factors to me as a farmer myself, was the condition of the roads, the rough terrain and the poor infrastructure and the absolute remoteness of where these candidates farm.

It was amazing to hear that all of these farmers belong to the Grain SA study groups! Seeing that most of the land in these rural areas is governed by local chiefs, the Grain SA provincial co-ordinators firstly has to ask permission from the chiefs to start a study group in the area, which is an accomplishment in itself. It is encouraging to see that irrespective of the local conditions, these farmers simply carry on and continue to develop. Most of these farmers have always planted crops but their yields initially started off at 0,5 tons/ha. With the aid of the Grain SA study groups, who introduced improved knowledge and new technologies, some of these farmers are achieving yields of up to 10 tons/ha! It was amazing for me to see how farmers reach these commercial level yields by planting by hand or using small planters, fertilising by hand and practising very good weed control by using knapsack sprayers.

The great difference between conventional practices versus where farmers used improved methods was quite evident. The farmers who are part of the Grain SA study groups and practise what they have learnt stand out and have become the leaders in their communities. I have to reiterate the fact that these farmers are achieving the quality and yields per hectare similar to large commercial farmers!

To see the development of these farmers left me speechless. It was also encouraging to learn of the good relationship that some of these farmers have with local commercial farmers and input suppliers in their area and that they receive good support and cooperation from them.

Lastly, this tour was a very special experience and an eye-opener for me and I wish that more people can see and experience what I did. I feel that we need to showcase these farmers and let South Africa see what true development is and show them what can be achieved. Grain SA's support through courses, study groups and guidance as well has the good work of mentors and most importantly, the hard work and dedication of these farmers are transforming the face of subsistence and smallholder grain production throughout South Africa.

My message to you as a developing farmer out there: Become involved, join a study group, and equip yourself through training courses, practice what you have learnt and you will achieve success...

This month's edition of The Corner Post was authored by Dirk van Rensburg, a commercial farmer and independent judge for the Farmer of the Year competition. For more information, send an email to dvrens@mweb.co.za.

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The R500 is a baler of small dimensions, born as an alternative to traditional prismatic presses, but with the advantages of the round balers:

- Use of small dimensions and low-power tractors.
- Very compact; easy movements in tight places and on accentuated slopes.
- The bales are more resistant to weathering; they can also be wrapped and transported manually.
- The net binder allows for greater speed in the binding phase, and lower permeability of the bale.
- Due to its size, the mini baler is widely used for harvesting in mountain areas and for horse breeding.

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Wolagri Columbia Evo Series

The Columbia Evo series round balers have fixed chambers and crossbars top always guarantee perfect rotation of their contents. The closed chamber holds inside the whole product, foliage included.
The user can choose, according to his needs, between three different pick-up widths.
On the basis of the product to be collected and the working conditions (on the flat or sloping) the pick-ups can be coupled with two different feeding systems: alternative feeder or rotary feeder.
The Columbia Evo series is capable of baling any type of product, either dry or green, and represents the ideal choice for all of those seeking an extremely reliable machine able to combine high productivity with low operating costs.

Wolagri R98 Baler

- Bale Diameter: 120 cm
- Bale Width: 98 cm
- Pick-up Width: 140 cm
- Required Power (kw/HP): 25/35

Wolagri R10 Evo Baler

- Bale Diameter: 120 cm
- Bale Width: 120 cm
- Pick-up Width: 162 cm
- Required Power (kw/HP): 30/40

Wolagri R12 Evo Baler

- Bale Diameter: 155 cm
- Bale Width: 120 cm
- Pick-up Width: 162 cm
- Required Power (kw/HP): 30/40

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