

PULA IMVULA

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



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PULA IMVULA

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NKGONO JANE SAYS...

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In this Pula Imvula is an article about land tenure systems in South Africa. Irrespective of your system of tenure, and whether or not you "own" the land, the most important aspect of farming is the use of the land. After all, all of us only use the land – it belongs to the future generations. Everyone who has access to land needs to be put in a position to use the land productively. It is the use of land that enables farmers to feed themselves and the nation. Unfortunately we have many farmers with land which they cannot use because they do not have any mechanisation or production inputs – this is the challenge we are trying to address.

Once again, we have become aware of various organisations that are exploiting farmers while

pretending to be helping them. They say they are doing "farmer development" whereas they are actually enriching themselves in the process. I have seen the budgets of some of these projects and their production costs are often double those of the commercial farmers. The use of contractors is not something new to any of us, but in so many cases, this is where "exorbitant profits" are hidden. Your mechanisation costs should not exceed R1 800/ha for all operations and it is not uncommon to see budgets of more than R3 000/ha. In these cases, the contractors are the ones making the money. One budget that crossed my table recently included R2 000/ha for the "identification of the farmers" – this is a scandal! When you challenge these people they say that it is fine because the farmers are

getting "grants" from Government. I cannot agree with this – grants come from the taxes we pay as citizens and we should not allow the misappropriation of these taxes.

We are very excited about the Jobs Fund project that we will be doing for the coming four years – this year we will be helping 1 700 farmers to use modern production practices on their 1 hectare lands in the communal rural areas. It does not matter if you only have access to a little land – on that land you too can achieve commercial yields. You can feed your family and contribute to the South African food basket.

Seize the opportunity you have to produce food for our nation – you are needed to make your contribution. 🌱

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HALALA, *farmers of Grain SA!* HALALA, *Grain SA Farmer* *Development team!*



Solomon and Christina Masango, are the proud owners of a brand new John Deere 5403 MFWD 48 kW tractor, sponsored by ABSA and John Deere Financial. Jurie Mentz (Grain SA Development Co-ordinator) and Jane McPherson handed over the keys to the winner.

Once again farmers, many wearing their colourful traditional outfits, gathered in Bloemfontein from all corners of South Africa to spend a happy day together acknowledging growth, progress and hard work and to celebrate their successes.

It was a DAY OF CELEBRATION for the Grain SA team and the members of Grain SA's Farmer Development programme – and a day to recognise the progress at grass-roots because of the hard work of dedicated men and women who work their fields and produce food for their families and the nation.

The air around the venue was filled with happy sounds produced by the marimba players accompanied by friendly greetings as people met friends from far corners of the country. A welcoming cup of tea with refreshments was enjoyed and then it was time to hear the good news of who were the finalists and winners of each of the three categories: Subsistence Farmer of the Year, Smallholder Farmer of the Year and New Era Commercial Farmer of the Year. Regional Managers Johan Kriel and Danie van den Berg thanked the members of the Judging Panels who had travelled thou-

sands of kilometres and had the difficult task of selecting the winners for each category.

It was most noticeable that each and every nominee had grown their farming operations in some way or other. Many told of dramatic increases in their yields simply because they had better knowledge of the best practices for their area and they had learnt more about the importance of weed control, soil health and seed selection. It is exciting to hear how a few small changes in their farming practices have resulted in dramatic increases in their returns which has motivated them to plant more crops and grow their farming operations.

How wonderful to hear that one farmer was able to feed his household and sell the excess for cash so that he can provide for his family and keep them healthy! In the world of development it is not always the huge farming operations that count...small improvements can change lives in rural areas – that's what matters! Many farmers told us that even though the 2014 - 2015 season was dry, they still harvested decent crops. This was the result of valued advice received from Grain SA's team and mentors.

The farmers spoke of wonderful relationships with Grain SA mentors who help them



DAY OF CELEBRATION

Subsistence



The 2015 finalists of the Grain SA/ABSA Subsistence Farmer of the year are: Musawenkosi Ntombela, Ngubengcuka Moyo and Jabulani Mbele.



...and the winner of the Grain SA/ABSA Subsistence Farmer of the year is Ngubengcuka Moyo. Congratulating Solomon, from left, Jane McPherson (Grain SA: Programme Manager of the Farmer Development Programme), Ramodisa Monaïsa (Master of Ceremonies and Vice-chairperson of the Farmer Development Working Group), Jannie de Villiers (CEO: Grain SA) and Ernst Janovsky (Head: Absa AgriBusiness).

Smallholder



Daliwonga Nombewu, Lawrence Mtsweni and Salphanus Motswenyane are the 2015 Grain SA/Syngenta Smallholder Farmer of the Year finalists.



The winner of the Grain SA/Syngenta Smallholder Farmer of the Year, 2015 is Daliwonga Nombewu.



Halala, farmers of Grain SA! Halala, Grain SA Farmer Development team!

New Era Commercial

Grain SA/ABSA/John Deere Financial New Era Commercial Farmer of the Year finalists for 2015 are Vuyani and Lungelwa Kama (Lungelwa was not present), Maseli Letuka and Solomon Masango.



Solomon Masango, accompanied by his lovely wife, Christina, is 2015's Grain SA/ABSA/John Deere Financial New Era Commercial Farmer of the Year. Jannie de Villiers, Ramodisa Monaïsa, Ernst Janovsky and Antois van der Westhuizen (Head: Retail Finance – Sub Sahara Africa, John Deere Financial) proudly congratulate the winner.

with advice in their fields. Many also emphasised the value of building good relationships with commercial farmers as well as the agri-businesses. One farmer said that he gets expert advice on sprayer calibration/application every season because the products and dosages can change every year. The improvements were the result of better weed control, soil sampling, seed cultivar selection, practising crop rotation and implementing no-till conservation farming. Small improvements have returned amazing results. The farmers emphasised the importance of business and financial management. Many have attended Grain SA's business and financial management courses. All the winners said they have attended Grain SA courses themselves but they are also empowering their workers by sending them on the courses as well.

It was heart-warming to see how many of the leading farmers paid tribute to their wives, sons and daughters who are committed to help

build successful farming operations giving support in the fields, in office management and helping with marketing.

The winner of the Grain SA/ABSA Subsistence Farmer of the Year, 2015 is Ngubengcuka Moyo who is mentored by Lawrence Lutango from the Mthatha office. He does all his farming manually and has improved his yields by using a hand planter and a knapsack sprayer. He chooses to farm using no-till methods and is happy that this is helping him to conserve the land for future generations. He lives in a remote region with limited infrastructure and says his biggest challenge is in marketing his crop.

The winner of the Grain SA/Syngenta Smallholder Farmer of the Year, 2015 is Daliwonga Nombewu from the Eastern Cape. His Grain SA regional manager is Vusi Ngesi based in Maclear. Even in this dry season his 13 ha of maize yielded on average 4,5 t/ha.



Halala, farmers of Grain SA! Halala, Grain SA Farmer Development team!

This young farmer has been so inspired that he is planning to grow by renting additional lands. He believes it is important to spread ones risks and he also grows dry beans, potatoes and spinach which are in demand locally and boosts his cash flow. He paid tribute to his wife who works hand in hand with him in the farming business and together they focus on good office management practices.

The Grain SA/ABSA/John Deere Financial New Era Commercial Farmer of the Year, 2015 is Solomon Masango. Solomon farms near Carolina and his Grain SA Development Co-ordinator is the recently retired, Naas Gouws. (Jurie Mentz recently took over the co-ordinator reigns). Solomon practices no-till farming and plants maize, soya and sugar beans. He emphasises the importance of good relationships with other farmers and advisors who helps him with his planning. He believes it is important to look ahead and plan in advance for the next season. Solomon values his farm workers and even plants a few hectares for each of them. He has seen amazing progress and his yields have grown from 3,5 t/ha to 6 t/ha. No wonder he is found to be a worthy winner who is taking home the grand prize: A brand new John Deere 5403 MFWD 48 kW tractor. This is the biggest prize we have ever had thanks to the partnership between **ABSA and John Deere Financial.** Wow, what a celebration we had! Tears of joy and stunned disbelief were all mixed up on Solomon and his wife's faces as they let the news sink in.

A hearty luncheon was enjoyed amidst sounds of ululating and a John Deere tractor being started up again and again as fellow farmers admired Solomon's prize. Slowly the farmers left for home, back to working with the rhythm of the sun and the seasons – working in their fields close to Mother Nature and filled with new inspiration and hopes of experiencing rewards in due season.

Thank you to the generous sponsors of the competitions and to all the other supporters and friends of the Grain SA Farmer Development Programme who came to share in this DAY OF CELEBRATION and left for home with large smiles and warmed hearts – because an encounter with the farmers of South Africa ALWAYS does that to one! Long live Grain SA! Long live Grain SA Farmer Development!

Article submitted by Jenny Mathews,
Pula Imvula contributor. For more information,
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You've made your bed, now lie in it

You made a decision and now must accept its consequences – this old idiom is normally used in response to people who are complaining about problems they have brought on themselves.

Don't let yourself fall into the trap of taking the preparation of your seedbed for your new maize crop too casually. It can make or break your crop before it has even started growing and you may be the one moaning about a problem which was actually your own fault!

It is true that many things are going to impact the final yield of any crop in any given season. In a previous article the importance of planter maintenance and planter calibration was discussed and highlighted the importance of accurate seed placement and an ideal plant population but...IF THAT SEED is not placed into a well prepared seedbed, it can also nullify all the good work put into the actual planting operation!

Sometimes we are blessed, as many regions have been this year, with good early rains which give us plenty of time to prepare the soil for planting. But along with this also comes the challenge of early weeds and grasses which have to be controlled because you don't want to waste all the precious moisture on weeds.

A good seedbed starts already with your primary preparation, whether you are practising traditional cultivation practices like ploughing, conservation or minimum tillage by using tined implements, or even no-till. You always need a good, even seedbed in which to place your seed.

The timing of your seedbed preparation is also important as the results will not be ideal if your soil is either too wet or too dry. This can be determined by a simple hand test in which you take a handful of soil and squeeze it. Does it feel sticky? Can you form a ball that sticks together? Does it form a ribbon when pressed between your thumb and forefinger? If this is true then there is too much moisture to start your seed bed preparation.

Soils ready for seed bed preparation should crumble easily between your fingers. You don't want to do your final preparation when the soil is either too wet or too dry! On the one hand you will have a too fine seedbed which can easily compact the surface and tend to blow away when the winds come (wind erosion) or if it is too dry you may have big clods which won't break down and will affect the seed-soil contact causing poor and uneven germination. When the seed bed is just right, i.e. not too fine and not too rough, then the levelness or evenness is the next important aspect.

When your seedbed is as it should be, it allows the seed to be placed at an even depth and plants are more likely to germinate simultaneously to present an even stand. The depth of planting is also likely to be more uniform which encourages the seed to emerge simultaneously and grow at the same pace. This helps the seeds to compete equally for the water and nutrient available in the soil and will ultimately return a better yield.

The seedbed preparation process achieves many things like:

- Killing weeds before planting;
- Incorporating crop residue, manure, nutrients and herbicides into the soil;

- Reducing soil compaction;
- Manipulating the soil surface to minimise soil erosion;
- Enabling the planter to provide consistent seed depth and spacing;
- Conserving soil moisture;
- Enabling soil moisture below the seed to move up to the seed as the soil surface loses moisture;
- Minimising soil clods at the seed depth for maximum soil-seed contact while providing some clods on the surface to minimise soil erosion; and
- Reducing soil crusting which prevent the seeds from emerging evenly.

Always remember that although the maize seed itself looks quite big and robust, it is the tender new roots which need to develop in the seedbed and they have difficulty growing in compacted soils. If the roots are unable to penetrate the soil then their moisture and nutrient uptake will be reduced limiting yield potential already at this early stage.

Seedbeds must be prepared then with the aim of achieving quick, even germination and unhindered early growth. Furthermore this should be done as close to planting time as possible but if there is a rainfall between seedbed preparation and planting, be patient and wait for the soils to dry out enough before planting. 🌧️

Article submitted by Jenny Mathews, Pula Imvula contributor. For more information, send an email to jenjonmat@gmail.com.



Use whatever you have access to.



The soil is nice and crumbly.



A prepared seedbed – a few clods are too big.

TAKE CONTROL of your debt



It is a fact that this year due to the drought conditions, production was not what it should or could have been. Therefore many farmers are burdened with debt, especially for production purposes, that cannot be repaid in full or none at all.

So-called outstanding or carry-over debt which is always serious debt and places your business under extreme financial pressure until the debt is repaid. With a farming business, it is not always possible to pay cash and you are at times forced to borrow money. Therefore it is not strange to be in a position like this. Many people have been in this same predicament over the years. It is the way you handle the situation that is important.

There are two ways to handle debt. One will damage the relationship you've built up with others forever. The other will see you survive and emerge more trusted and respected than ever before which a solid history of creditworthiness.

We cannot control or manage adverse situations, many a time the reason for being burdened by serious debt, but we can manage

outstanding debt. What then must I do when in a similar situation?

When you have outstanding debt go and TALK TO YOUR CREDITORS (institutions you owe money). Do not avoid them. Visit each and every one of your creditors in person and explain to them your predicament. Support your explanation with facts – for instance what is your long term average production and what your production for the last season has been. Also explain to them your plans to rectify your situation. Also support this with a written explanation. And undertake to keep them informed about your recovery. You will most probably be most amazed by the positive attitude you will experience. The attitude of creditors is always first of all to assist you to keep your business – it means more money to them over the long term.

However before you go and talk to your creditors you must do some homework.

Compile a revised budget (a physical and financial plan) taking in consideration the unpaid debt. Indicate what you are going to do and when and what it should cost and what your income should be. Indicate how you will repay the outstanding debt. Part of this revised plan will be to cut your business costs and your personal costs to the bone. In other words take a smaller salary for yourself. Postpone any capital expenditure (buying of assets) until you are out of the woods.

When compiling this revised budget consider alternative plans by having a good look at your business. Alternative plans may be to request a temporarily increase of the limits of your credit, to request a restructuring of your outstanding debt, to request only to pay the interest on the debt until a later date, to consider eliminating an enterprise that is not making a profit or not a good profit, and/or to consider the selling of unproductive assets such as implements/vehicles you can do without. Should you have an investment, use it to pay the debt – interest paid is always more than interest received.

Restructuring of loans implies that you request to pay back the outstanding loan over a longer period, or request exemption of payments for a period of time. Bear in mind whatever you do will cost you – you will be paying more interest. Nobody will help you free of charge.

Then it is up to you to execute the plans. Spend according to your budget to keep costs and expenses under control.

Be very careful of spontaneous buying on the spur of the moment. Be disciplined – spend according to your budget. That is proper financial management. Remember you are already in trouble and you are the only one as owner/manager of your business to get your business out on a sound financial basis again. Nobody else is going to do it for you.

Lastly, it is then of the utmost importance to keep your creditor/s informed on a regular basis (perhaps at least once a month) of your progress. You are fighting for the future existence of your business and therefore your own livelihood. Keep your word.

Once again remember one of the principles we have emphasised is that everything and everybody, involved with the farming, be it the owner/manager or employees, does or does not do when necessary, affects the profit/loss of the business. You have a legal obligation to repay any loan. By not paying it back and avoiding your creditors you are damaging any relationship with them. By managing your outstanding debt according to the aforementioned principles you will create positive relationships with them. Positive relationships are a major asset for the existence of your business. In the future you may find it far easier to acquire credit because people respect honesty and integrity.

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

Pula Imvula's Quote of the Month

"Nothing can stop the person with the right mental attitude from achieving their goal; nothing on earth can help the person with the wrong mental attitude".

~ Thomas Jefferson

The basics of *FUSARIUM GRAMINEARUM* species complex (red rot) in maize

Maize is the staple food commodity in South Africa and it is plagued by many ear and stem rot diseases.

The fungi infecting maize can also produce mycotoxins, which are toxic substances. Mycotoxins can cause various diseases in humans and animals. In this article the focus will be on the *Fusarium graminearum* species complex and their resultant mycotoxins.

Gibberella ear, crown, root and stalk rots are widespread throughout the South African maize production area. Globally these diseases are caused by 16 fungal species belonging to the *Fusarium graminearum* species complex. However, only three species have been found on South African maize thus far.

Gibberella ear rot usually occurs where maize is produced under wet, warm conditions. The disease has been common in the moderate eastern production areas and has recently been noticed to be on the increase in the western production areas. The pathogen can also infect wheat, oats and barley.

Maize grown in monoculture or rotation with other graminaceous crops can increase disease levels depending on the amount of inoculum that is carried over from one crop to the next. The disease can also increase in reduced tillage fields because of an increase in inoculum levels due to stubble retention. Gibberella ear rot can cause yield losses and affect grain quality, while root, crown and stalk rots can also have financial implications.

Ear infections initially appear as white fungal growth on the ear tips which grow toward the base of the ears (**Photo 1**). The mycelium will later turn red-pink in infected kernels. If the disease starts early during the growth stage of the development of the ear, the mycelia may cover the whole ear and tightly adhere the husks together.

Symptoms of root, crown and stalk rots become evident by the appearance of brown or discoloured patches in a field, by uneven growth, plants that become chlorotic or show symptoms of dwarfing. In severe cases the plants will lodge.

When infected roots, crowns or stems are cut open, a characteristic pink to red tinge of the tissue (**Photo 2**) is visible. It is important to send diseased material to an institution that can help correctly identify the fungal species causing the disease.

The fungi in this complex are known to produce mycotoxins such as deoxynivalenol (DON), nivalenol (NIV) and the estrogenic metabolite zearalenone (ZEA), which are harmful to humans and livestock.

NIV and DON are known protein synthesis inhibitors and the consumption of grain contaminated with these mycotoxins can cause anaemia, skin lesions, vomiting, diarrhoea, and damage to haematopoietic (liver) tissues in humans and animals. Zearalenone-contaminated feed can lead to animals developing reproductive problems.



Photo 1: Gibberella ear rot caused by the *Fusarium graminearum* species complex.
Photo: <https://www.pioneer.com/home/site/ca/agronomy/crop-management/corn-insect-disease/gibberella-ear-rot/>

Control measures

- Host-resistant or -tolerant varieties are the most cost-effective and practical means of combating the disease.
- Avoid planting maize at unacceptably high population densities as this increases stress and crop susceptibility.
- Rotate with non-hosts of the *Fusarium graminearum* species complex such as legumes, cotton or sunflower.
- Harvest early to avoid losses due to lodging.
- Control insects such as stalk borers which may serve as possible vectors, observing the threshold value of 10% of infested plants for chemical control.
- In order to prevent ear rot after harvest, store grain under low moisture and temperatures.

At the ARC-GCI we are performing research on the *Graminearum* complex and we focus on Gibberella root, crown and stalk rot, as well as Gibberella ear rot on maize plants. 🍷



Photo 2: The characteristic pink discoloration of root tissue infected by the *Fusarium graminearum* species complex.

Article submitted by Aneen Schoeman and Sonia-Mari Greyling, ARC-Grain Crops Institute, for SA Graan/Grain October 2014. For more information, send an email to BelgroveA@arc.agric.za.

SOIL EROSION IN SOUTH AFRICA

– its nature and distribution

Soil erosion is a major environmental problem confronting land and water resources in South Africa. Although soil erosion is a natural process, it is often accelerated by human activities, for example by the clearing of vegetation, soil tillage or overgrazing.

Poor farming practices as well as the trend toward agricultural intensification have been considered to be major causes of erosion. Soil formation is a relatively slow process and therefore soil is essentially a non-renewable and a limited resource.

Prolonged erosion causes irreversible soil loss over time, reducing the ecological (e.g. biomass production) and hydrological functions (e.g. filtering, infiltration and water holding capacity) of soil. Several scientists agree that the cost of food production is increasing in many parts of the world due to erosion and loss of nutrients.

Soil erosion not only involves the loss of fertile topsoil and reduction of soil productivity, but is also coupled with serious off-site impacts related to increased mobilisation of sediment and delivery to rivers, causing siltation and pollution of South Africa's water resource.

Water scarce countries, such as South Africa, are increasingly threatened by pollution and sedimentation of water bodies due to suspended sediment concentrations in streams. One of the main concerns of the Department of Water Affairs of South Africa is the mobilisation of eroded soil and its delivery to rivers and dams. For example, due to siltation, the storage capacity of the Welbedacht Dam near Dewetsdorp in the Free State reduced rapidly from the original 115 million cubic metres to approximately 16 million cubic metres within 20 years since completion in 1973.

As a result, the Mangaung Municipality in Bloemfontein recently received water from the more distant Katse Dam in Lesotho at a tariff of R2,20 per kilolitre instead of the normal 18,7 cents from the Welbedacht Dam (as reported by Marietjie Gericke in the *Volksblad* on Friday, 29 August 2014). The soil erosion/sedimentation problem may get worse in the future due to population growth and potential climatic changes. Given the increasing threat of the sedimentation/siltation of reservoirs, it is important to identify source areas and key processes of sediment transport from field to stream.



Photo 1: Sheet erosion on the Springbok flats, Limpopo Province.

Recent erosion assessments sketch a gloomy picture

The most recent erosion map includes a gully erosion map for South Africa created by Dr Jay le Roux (previously at the Agricultural Research Council, but currently at the University of the Free State) and Mr Ndifelani Marakanye (Department of Agriculture, Forestry and Fisheries) using satellite imagery.

SPOT 5 satellite imagery was utilised because it provides high resolution air, photo-like quality for erosion mapping and was acquired from government agencies for the whole of South Africa. As a result, the study successfully mapped over 100 000 gully erosion features ranging from just a few cubic metres to several hectares each.

The map shows that all provinces are affected by gully erosion (see **Figure 1**). The Northern Cape (160 885 ha) and Eastern Cape (151 759 ha) are the most severely affected, followed by KwaZulu-Natal (87 522 ha), the Free State (64 674 ha), Limpopo (58 669 ha), Western Cape (25 403 ha), Mpumalanga (17 420 ha), North West Province (10 782 ha) and Gauteng (110 ha).

Prior to above-mentioned study, a soil erosion model, known as the Universal Soil Loss Equation, was used by Dr Le Roux and his colleagues to estimate rainfall erosion in South Africa. The model has sufficient simplicity for application on a national scale with incorporation of the main factors causing soil erosion including rainfall erosivity, soil erodibility, topography and vegetation cover (and management).

The results emphasise sheet and rill erosion and illustrate that areas with high erosion risk occur mostly in the eastern parts of South Africa (see **Figure 2**).

In this context, the Eastern Cape (3 860 702 ha) is the most severely affected province, followed by the Free State (2 153 343 ha), Northern Cape (1 974 854 ha), Limpopo (1 943 376 ha), KwaZulu-Natal (1 284 975 ha), Mpumalanga (1 222 727 ha), Western Cape (1 030 530 ha), North West Province (379 879 ha) and Gauteng (347 149 ha).

In quantitative terms, the average predicted soil loss rate for South Africa is 12,6 tons/ha/year, while the average soil loss rate under annual cropland (grain crops) is 13 tons/ha/

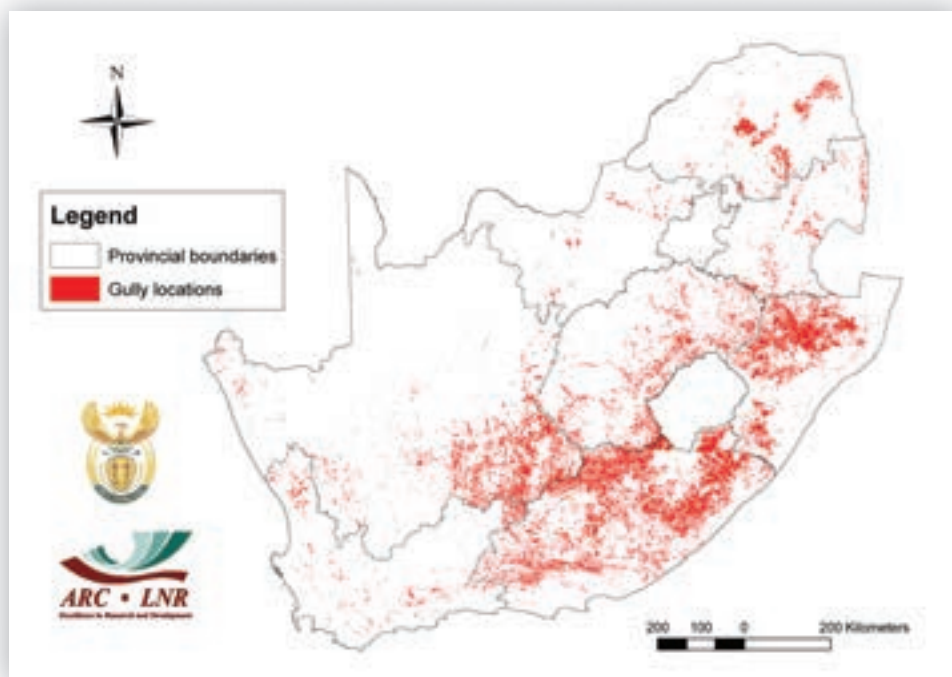


Figure 1: Distribution of gully erosion in South Africa.

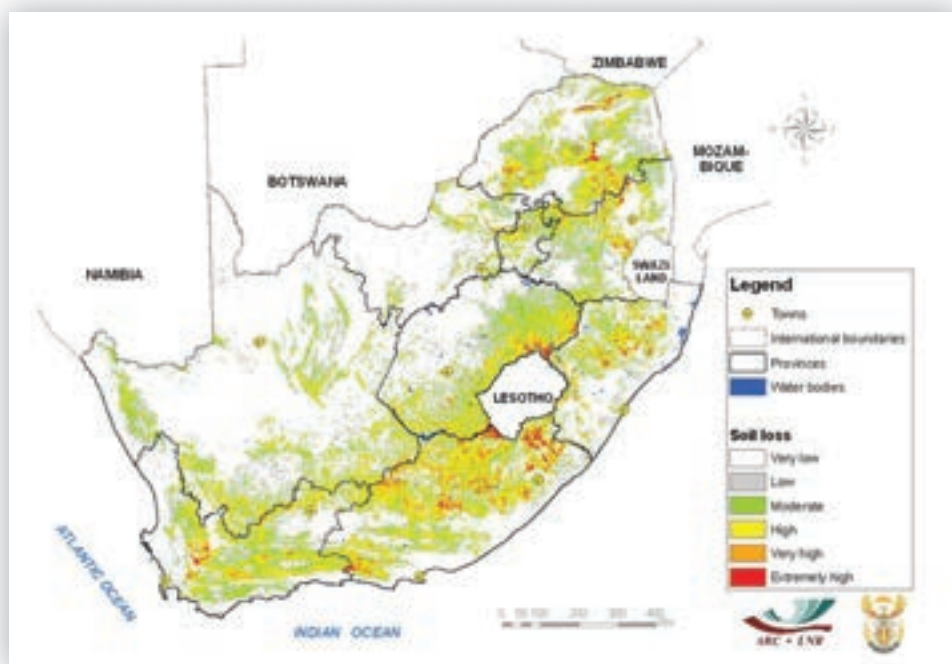


Figure 2: Distribution of sheet and rill erosion in South Africa.

year, which is much higher than the natural soil formation rate of less than 5 tons/ha/year. This simply means that we are losing much more soil than we gain.

It should be stressed that these results give a broad overview of the general pattern of the relative differences, rather than providing accurate absolute erosion rates. It is also noteworthy that differences between sediment yield and soil loss can be very high. Research findings suggest that soil loss within a catchment can be up to five times greater than sediment yield due to the reduction of the total eroded volume by deposition within the catchment.

Consequently, a soil erosion figure of 12,6 tons/ha/year could correspond with a sediment yield of 2,5 tons/ha/year. Compared to Australia (4,1 tons/ha/year), the average predicted soil loss rate for South Africa is three times as much. South Africa has a higher soil loss rate than Australia, presumably due to extensive tillage-based cultivation and overgrazing. More than 60% of the country is currently under commercial and subsistence farming, while around 10% is under cultivation.

Due to limited financial resources it will not be feasible to rehabilitate erosion features with large and expensive structures at a broad/



Photo 2: Gullies in Eastern Cape, Tsitsavalley.

Sustainable natural resource management practices, including CA, as well as area-specific management and control measures, will not only prevent soil loss and sustain agricultural production, but will also prevent sedimentation of water resources and increase the life span of dams in South Africa.

catchment scale. However, it is imperative to minimise current expansion of erosion with appropriate soil conservation measures or structures, expansion of conservation agriculture (CA) under cultivated areas and protecting the natural vegetation from overgrazing through rotational grazing management systems.

In addition to site-specific rehabilitation of existing erosion features, the identification and mapping of currently vegetated or erosion-free areas (that are susceptible to erosion) can be achieved. It is especially important to identify areas that are intrinsically susceptible to erosion before being extrinsically triggered or

Soil erosion in South Africa – its nature and distribution



Photo 3 and 4: Tsitsavalley gullies.
Photo 5: Tsitsavalley merge.



accelerated by land use and human-induced reduction of the vegetation cover. Appropriate strategies then need to be designed for susceptible areas in order to protect the current vegetation cover.

Excessively high soil erosion rates normally occur under aggressive tillage-based cultivation practices, especially on erodible soils during peak events (heavy thunderstorms) and on steeper, longer slopes. The potential of CA to protect and improve soil resources and improve production has been well documented. Under CA, crop residues are retained on the

soil surface to protect it from the erosive impact of rain drops and wind.

The use of cover crops can further increase the crop canopy and ground cover on the soil, while the presence of permanent and strong living root systems in the soil, greatly enhances the resistance of the soil against erosion. Ultimately, the increased organic matter levels in the soil due to quality application of CA, is the key factor stabilising cultivated lands against the devastating effect of erosion.

Sustainable natural resource management practices, including CA, as well as area-specific

management and control measures, will not only prevent soil loss and sustain agricultural production, but will also prevent sedimentation of water resources and increase the life span of dams in South Africa.

Article submitted by Jay le Roux, senior lecturer: Department of Geography, University of the Free State and Hendrik Smith, conservation agriculture facilitator, Grain SA, for SA Graan/Grain November 2014. For more information, send an email to lerouxjj@ufs.ac.za or hendrik.smith@grainsa.co.za.

When to plant soybeans

Soybeans and maize react in more or less the same way to heat units. The more heat units that are available during the growing season, the later you can plant. In cooler areas you should plant earlier to obtain the best results.

The other factor to be taken into account is that soybeans must experience a certain number of hours of darkness every day before they progress from the vegetative to the reproductive stage. As the blossom stage in soybeans is controlled by the number of hours of darkness, the harmful effect of a midsummer drought cannot be avoided by changing the planting date. These two factors, together with the growth class of the cultivar being planted, determine the optimum planting date for each area.

Advantages of an early planting date

- Soybeans have a need for hours of darkness that is affected by the number of calendar days. That is why an early planting date will lead to a bigger plant. A bigger plant has more internodes and therefore also more spikelets, which lead to bigger harvests.
- In the cooler eastern areas an earlier planting date leads to earlier maturation, therefore the risk of early frost damage in autumn is limited.
- More rapid growth leads to earlier closure of the canopy over the rows, which facilitates weed control.
- Early closure of the canopy leads to increased transpiration and reduced evaporation. Most of the available water now goes towards increasing the yield.
- An early planting date results in bigger plants that bear pods higher above the ground, which makes the harvesting easier and reduces wastage.
- An early plant date has a bigger effect on yield than row width, and special planters are therefore not essential.

Risks of an early planting date

- Cold, wet soil early in the season can lead to serious plant establishment losses.
- The extended time it takes seed to emerge extends the period for which herbicides must work to successfully control weeds.
- Late frost can cause great damage.
- In warmer areas an early planting date can result in excessive vegetation growth, which can cause lodging.

The interaction between length of daylight and temperature on blossom stimulation has a major effect on the ideal planting date. The impact is much bigger in the moderate and warm production areas than in the cool areas. In the cool areas the 4,5 to 6,5 growth classes are the best adapted ones. The ideal planting date for the areas is from the beginning of October to the beginning of November. The shorter growth classes (4 - 5) usually have a smaller need for hours of darkness than the taller growth classes, and it is therefore better to plant the six growth class cultivars very early and the 4 - 5 growth class cultivars after the middle of October.

Should weather conditions not allow a normal planting date and force a late planting date, it is better to start with the quicker growth classes and then plant the tallest ones. Any planting after the end of November is regarded as late.

Growth classes from 5 to 7 are adapted the best to the moderate areas. The western part of the moderate areas usually receives rain later in the season and it is better to plant 6 to 7 growth class cultivars here. In the warm production areas any growth class can be planted. However, the full-season cultivars usually provide the best yield here.

With earlier planting dates soil temperature can play a major role in effective germination. Soybeans can germinate at 10°C, but the ideal soil temperature is 13°C for strong germination. If you plant early in the cool production areas, it is better to measure the soil temperature before starting to plant. Take the temperature at 07:00 at a depth of 5 cm, and if it is

warmer than 13°C for at least three consecutive days, the planting process can start. Just keep in mind that cold fronts or a big hail storm can drastically reduce the soil temperature.

There are a few management aspects that should be addressed to make the best of a late planting date. Yield is determined by the amount of sunlight that is intercepted. Soybeans that are planted late, have a shorter period to absorb sufficient sunlight. This is applicable in the grain filling stage in particular, when the days become shorter. The plants themselves are also smaller and have fewer nodes where pods can develop. Soybeans that are planted late should therefore be managed so that they can absorb more sunlight to produce maximally.

Management practices for late planting dates

- Narrower rows catch more sunlight for vegetative growth at the beginning of the growing season, and more internodes per hectare are produced.
- Together with the narrower rows, the plant establishment should be increased by 25%.
- Late planting dates are usually associated with wetter soil. Prevent compaction and make sure that seedlings can emerge quickly and grow strongly.
- Pythium is a major destroyer of plant establishment in warm, wet conditions. Make sure that seed has been treated with a fungicide to protect the arrangement.
- Plant the growth class recommended for a normal planting date for the area concerned, as a shorter growth class cultivar goes through the experimental stages more quickly, which reduces the number of nodes.

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VELD MANAGEMENT

improves quality of veld – Part 2

In the previous edition the benefits of high-density and ultrahigh-density grazing for the stock producer and his grazing were discussed. As the stock producer has to assess his stock branch to determine profitability, changes can now easily be made to the grazing management to make it as effective as possible.

In this edition the effect of this grazing system on the soil is discussed, as is its implementation.

Effect of ultrahigh-density grazing on the soil

This grazing system has a definite effect on the soil and its preservation. As the stock density is so high (up to an equivalent of about 5 000 animals/ha), it has a trampling effect on the soil.

The hard upper layer of the soil is trampled loose before the animals leave the camp, with the following results:

- The hard crust is broken, which limits water runoff to a minimum.
- The loose topsoil is now receptive to water penetration and aerating, which are very beneficial.
- The soil is now a seedbed in which a lot of new grass seeds that are present in the soil will germinate in the coming growing season, and form new plants where bare spots occurred previously.

The farm owner has a social duty to look after the farm and develop it for the next generation. To achieve this fully, the farm must be improved or developed vertically. As the topsoil improves, the micro-organisms in the soil will also increase and earthworms will return. All these factors mean that the soil becomes increasingly fertile.

The deeper the fertile layer is, the higher the veld's grass production will be, and the greater the carrying capacity will become. The influence of droughts will also be smaller if the soil is more fertile.

Implementation of the system

The implementation on each farm will differ, as the layout of the farm, capital available, number of cows and other factors differ from one farm to the next. The principle of implementation is addressed in this article so that producers can apply this effortlessly.

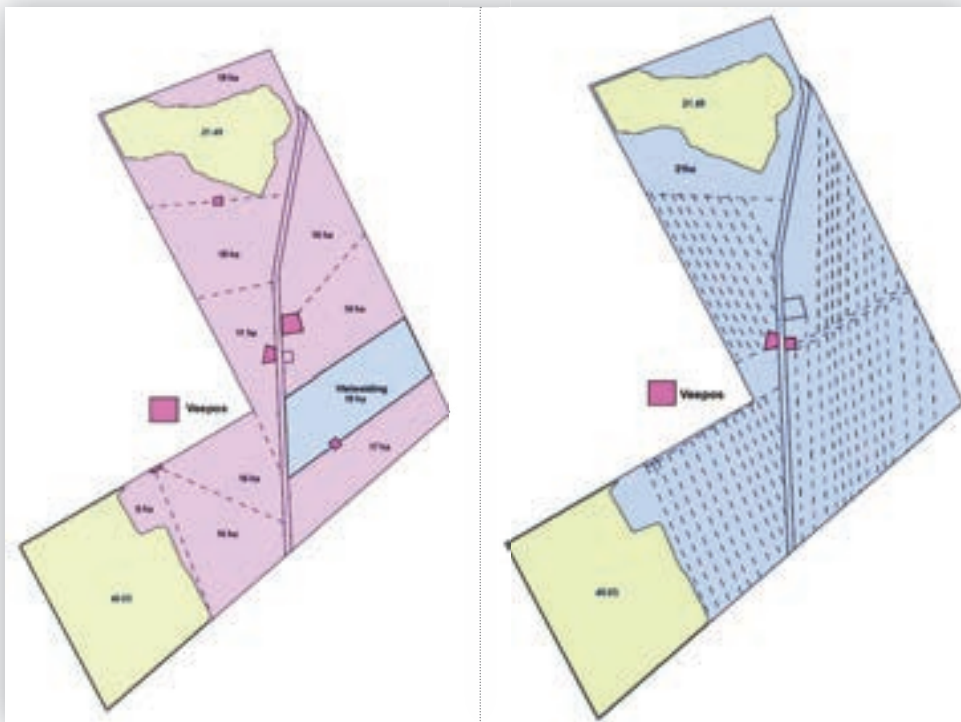


Figure 1 and Figure 2: Each camp should be assessed separately to determine how to divide it. Examples of the division are shown in the figures.

Step 1: Selection of a system

The first choice the producer must make, is to determine which system will be followed. Will only high-density grazing (small camps) or will ultrahigh-density grazing (strips in a camp) be implemented? This choice will affect the further steps to be followed.

Step 2: Number of camps available

The number of camps and their size will affect the implementation of these systems, as well as the decision as to whether new fencing must be purchased and whether electric fencing will be used. It is very expensive to purchase wire and poles, but this obstacle can be partially overcome by using electric fencing. Wooden droppers can be made by the producer, or bought droppers can be planted in the veld where the fence is to be constructed. This makes it easier to erect the fence every time the camp is grazed.

Each camp should be assessed separately to determine how to divide it. Examples of the division are shown in **Figure 1** and **Figure 2**. The farm must be checked camp by camp to plan the divisions. Try to make the divisions from the water point so that the same water point can be

used for a number of camps. This saves further costs and is in most cases easy to achieve.

For the high-density grazing system, the camps will be approximately one fifth of the herd size, in other words for a herd with 100 cows, the camps must be 20 ha at the most. The grazing time per camp must be roughly 10 to 14 days before the animals have to be withdrawn.

The more animals that are placed in a camp now (therefore smaller camps), the more extreme is the grazing system. The extreme use of ultrahigh-density grazing involves the cows being placed in a strip of roughly 50 m to 80 m wide for a certain period to graze away all the material. The animals should be moved approximately every hour in this strip to get to new pasture.

However, a convenient management system must be developed to fit in with the farm and its activities. A workable system is small camps that allow the stock density/camp to be roughly 30 animals/ha.

This means that the animals are moved to a new camp every day. For a herd of 400 cows, the camps will have to be roughly 15 ha big. A wagon-wheel system is very effective, with the water in the middle of the camps and the cows being moved to a new camp every day.

It is important to remember that these are only guidelines and that the period of grazing for each farm will differ from that on the next farm.

Step 3: Grazing cycles

As soon as the camps have been planned and the droppers have been planted (optional), the wire can be strung in the first camp to be grazed. Make sure that the animals are under constant supervision for the first few days, as they have to become used to the system and the electric wire. Also make sure that the electric appliance (energiser) is well grounded so that the power remains strong throughout. The cattle must know that they will get a shock if they touch the wire.

As soon as all the plant material has been grazed, the cattle are moved to the next part of the camp. Care should be taken that all material is utilised (**Photo 3**) before the cattle are moved.

Conclusion

The way agricultural conditions are at the moment, each producer, whether he farms with crops or cattle, will have to utilise his farm as fully as possible. Not a single hectare may lie unused, as the profitability is no longer good enough. That is why a grazing system like the one being discussed is so valuable.

The importance of good veld is essential to a stock farmer. Care should therefore be taken that each stock farm is managed as effectively

as possible. Make the best of your farm and stock so that they can look after you.

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Article submitted by Hennie du Toit, chief animal scientist, NWK Agricultural Management Services, for SA Graan/Grain November 2014. For more information, send an email to hennie@nwkc.co.za.



Photo 1: The trampling effect on soil.

Photo 2: Good, fertile soil with many plant roots.

Photo 3: As soon as all the plant material has been grazed, the cattle are moved to the next part of the camp. Care should be taken that all material is utilised before the cattle are moved.

Grain SA interviews...

Themba Congwane

Jurie Mentz, our Vryheid Development Co-ordinator, interviewed Themba Congwane for this issue of Pula Imvula. Themba's love for farming started when he was little, as he grew up on a farm and his dream is to become a better farmer and plans to achieve this by acquiring knowledge and working hard to achieve his goals.

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

Currently I farm on 186 hectares on a farm which I acquired through the land reform process. I started by planting a few hectares of maize and expanded as my knowledge increased over time. The past season I planted 60 hectares of maize and I am planning to plant about 90 hectares of crops this coming season. I am planning to plant soybeans in the upcoming season for crop rotation and a bit of maize. We also have 2 000 layers on the farm and have a herd of 30 cattle.

What motivates/inspires you?

What motivates me the most is when I look around and see the commercial farmers. I would really like to become one of them. My biggest motivator was Mr David Gooseberg who was appointed by AFGRI and was my first mentor. One has to push hard and work hard on a farm and set goals for yourself.

Describe your strengths and weaknesses

Strengths: My biggest strength is my family who supports me all the time and that I am committed to what I would like to achieve. I also believe in learning and training, as technology is changing all the time. One must upgrade oneself through training to become a better farmer.

Weakness: My biggest weakness is that I am impatient and that perhaps I would like to grow my farming enterprise too fast.

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

My very first maize crop yielded 4 tons/ha and this year despite being very dry and challenging I managed to get 7,8 ton of maize/ha. This I believe was achieved by planting early or at the right time



and by being on my farm every day. I do believe in hands on approach and good maintenance of my equipment before the season starts. I continue looking for information to better myself and my farming and I am not scared to ask my commercial neighbours on how to do something.

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

I have completed the Introduction to Maize, Advanced Maize, Soybean, Farming for Profit and On-farm Maintenance courses so far but would really like to learn more about no-till, engine repair and other training in order to better myself.

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

In five years time I would love have a bigger farmer – maybe planting double the amount of fields with

better equipment and tractors. I would also like to better my yields. Then I would love to help with social responsibility by transferring my knowledge to other farmers in my area.

What advice do you have for young aspiring farmers?

My advice to young aspiring farmers is that they should be patient, acquire knowledge and work very hard at achieving their goals. I would like to encourage them to never give up on their dreams and set themselves achievable goals and to remember farming is a long-term goal. 🍷

Article submitted by Jurie Mentz, Development Co-ordinator of the Grain SA Farmer Development Programme, Vryheid. For more information, send an email to jurie@grainsa.co.za.

THE CORNER POST

LAZARUS MOTHUSI

– farming is about family and passion

Walter Schirra was one of the first Americans to enter space and said the following about fathers and sons: “You don’t raise heroes, you raise sons. And if you treat them like sons, they’ll turn out to be heroes, even if it’s just in your own eyes.”

For Lazarus Mothusi who farms near Weltevreden in the Mooifontein area, this is true. His son, Jomo, is his hero as he has not only become his right hand on the farm, but also his eyes since losing his sight a few years ago. Going blind has however in no way deterred Lazarus from growing his farming enterprise or losing his passion for farming. “Farming has always been part of my life. It is who I am!”

Lazarus Leratoeng Mothusi was born and raised in the Mofutso settlement in the North West Province. He inherited an innate passion for farming from his parents, who were cattle farmers. In 1965 he married his sweetheart, Mamojaki Ruth Mashudute and together they raised nine children two of which have sadly passed away. Apart from Jomo, the other six are all employed in urban areas. Jomo has stood by his father through thick and thin and has made sure the farming enterprise continues to be successful. “He is the one who is always prepared to work long hours to ensure that everything runs smoothly on the farm especially when I have to fulfil my duties as assistant to the chief of the Weltevreden settlement,” he explains.

Lazarus started crop farming in 1996 and currently he and his son have approximately 200 hectares of communal ground as well as a further 300 hectares on a farm which they acquired from the Department of Rural Development

and Land Affairs to cultivate maize and sunflower and raise their cattle and sheep.

As a beginner farmer he harvested approximately 4 tons of sunflower on 15 hectares. “To me this was very good and I considered myself to be very fortunate,” he shares this early memory. After meeting Cois Harman (previously from Grain SA) he gained enough knowledge through Grain SA’s training programmes to increase the yield to 16 tons and has improved on this since then. “Obviously in dry seasons the harvest is much lower, but still better than before Grain SA improved my knowledge of farming.”

Thanks to Grain SA’s input in areas like soil preparation, cultivar choices, fertilisation and weed control, his knowledge of farming has grown tremendously. As every farmer knows, there are many challenges in farming – from financing to the natural circumstances that have to be faced every season. Lazarus explains that Grain SA has even instructed him on how to work with nature and to save and preserve moisture to allow for times when rainfall is lower.

He would like to thank his previous mentor John Mathews and Thabo (Du Toit van der Westhuizen) the current provincial co-ordinator in the North West Province who have played the biggest part in developing his farming skills. “Grain SA has also shown me how to do honest business and to adhere to the principles embedded in me by my parents’ upbringing,” he says and adds, “I am very proud to be a commercial member of Grain SA and will always be grateful to this organisation for making me a better farmer.”

One of his proudest moments as a farmer was when he was announced as winner of the

Lazarus hopes that agriculture in South Africa will grow so that farmers can firstly provide food security to our own country and secondly supply food to the rest of the world.

Grain SA Developing Grain Producer award in 2006. This award motivated him to work even harder to make a success of his farming enterprise.

Lazarus hopes that agriculture in South Africa will grow so that farmers can firstly provide food security to our country and secondly supply food to the rest of the world. To him politics have no place in agriculture and the focus of the country’s leaders should be on making sure a nation is fed.

What advice does this successful farmer have for emerging farmers?

- The opportunities in agriculture are endless. Work hard and make sure you receive sufficient training before you begin.
- Be willing to learn from others.
- Develop a passion for agriculture. Make it part of who you are.
- Be sure to first fulfil all your financial obligations before purchasing luxuries.

This month’s edition of The Corner Post was authored by Louise Kunz, Pula Imvula contributor. For more information, send an email to louise@infoworks.biz.

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