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PULA IMVULA

GROWING FOOD • PEOPLE • PROSPERITY



GRAIN SA MAGAZINE FOR DEVELOPING FARMERS



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A WORD FROM...

Liana Stroebel

WE ARE FINDING OURSELVES IN THE MIDST OF INTERESTING TIMES WITH ALL THAT IS GOING ON IN THE WORLD. IT SEEMS AS IF THE WORLD IS FINALLY REALISING THE ABSOLUTE IMPORTANCE OF THE AGRICULTURAL SECTOR AND THE CRUCIAL ROLE THAT FARMERS PLAY IN THEIR DAILY LIVES.

This Covid-19 pandemic has had a huge impact on our economy however, we can be very thankful that it has (apart from an unfortunate rise in input costs), fortunately not disrupted the grain production sector as significantly as other commodities or businesses. We need to count our blessings, work even harder than before and think of those that are less fortunate than us.

Always remember to treat employees like they make a difference and they will.

As you know, July is a busy month with most maize farmers busy harvesting and marketing their crops, where winter grain farmers in the southern parts of the country have finished planting their crops and are busy with weed and pest control. As we go through the season, irrespective of which stage of production we are in, there are certain aspects that we always need to pay attention to throughout our busy schedules.

Some of the most important aspects (which are sometimes neglected) include cashflow management, taking care of our equipment and most importantly, taking care of the people who work with us on our farms. Always remember to 'treat employees like they make a difference and they will' – Jim Goodnight, CEO, SAS. ■

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MACROECONOMICS AND YOUR FARM

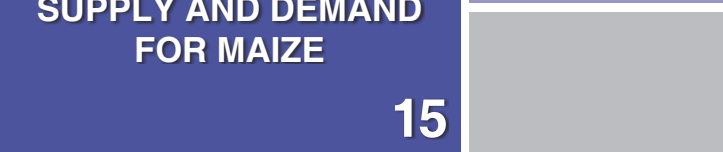
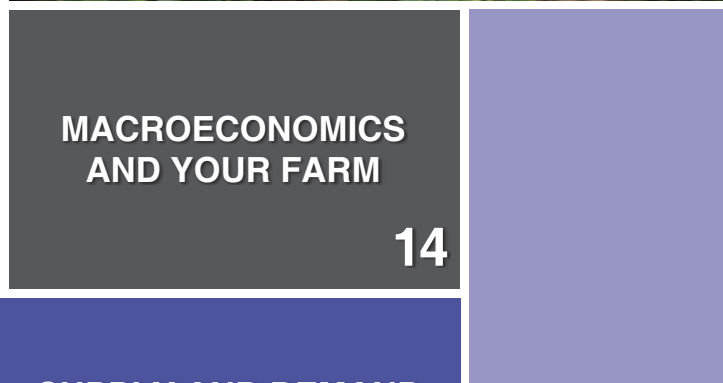
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NIXTAMALISATION

– adding value through agro-processing

ON 20 FEBRUARY 2020, GRAIN SA, ALONG WITH THE DEPARTMENT OF SCIENCE AND INNOVATION (DSI), THE TECHNOLOGY INNOVATION AGENCY AND THE DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT VISITED THE ELUKWATINI DISTRICT, MPUMALANGA, TO EXPERIENCE THE INNOVATIVE PRODUCTS PRODUCED BY THE COMMUNITY THROUGH NIXTAMALISATION.

Nixtamalisation is a process of preparing maize in an alkaline solution followed by washing and grinding to produce a dough called masa of which a variety of products can be made. As a result of the nixtamalisation training in local villages in South Africa, processing of maize into a variety of products is adding value for smallholder maize farmers.

THE IMPORTANCE OF FARMERS IN COMMUNITIES

Smallholder farmers play a vital role in the socioeconomic status of rural communities in South Africa. By providing their local communities with access to employment as well as food and nutrition security, these farmers serve as beacons of hope in their communities. Small farms account for large proportions of rural communities and supply staple food crops to the local market which supports many of these communities. They are more labour intensive than large commercial farms and is a major provider of employment. Therefore, through uplifting smallholder farmers, many socioeconomic challenges of poor rural communities can be addressed.

The desire is that these community leaders would reach a level where they are able to generate an income from the nixtamalised products to improve their socioeconomic status and improve the livelihood of their communities.

GOVERNMENT-INDUSTRY COLLABORATION

The DSI realised the benefits of nixtamalisation in 2018 following a visit to South Africa by a group from Mexico who demonstrated the process at a workshop held at the Agricultural Research Council. The former manager of the Grain SA Farmer Development Programme, Jane McPherson, tried out the process in her own kitchen, with successful results.

The DSI and Grain SA pooled their resources to launch the project and have since held 340 courses, training about 4 145 people. Additional courses presented to support the nixtamalisation training include 79 courses on basic nutrition, which benefited 1 246 participants, and 82 courses on dry bean production, which were pre-

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sented to a total of 1 195 participants. The success of this initiative was showcased to visitors through the variety of products prepared, which included steamed bread, fortified porridge, pancakes, yoghurt and snacks made with groundnuts. Through this project, these farmers are showing the benefits agro-processing provides to food and nutritional security through the value added by nixtamalisation.

THE ROLE OF AGRO-PROCESSING IN FOOD AND NUTRITION SECURITY

It is a national priority for government to ensure that smallholder farmers participate more significantly in agro-processing initiatives. Agro-processing provides additional value to the raw product. This way farmers are able to provide more value to consumers and improve the profitability and sustainability of their farming business. Agro-processing is therefore able to contribute to the alleviation of socio-economic challenges, increase employment and improve food and nutrition security. South African smallholder producers, however, largely lack access to the agro-processing industry, either due to lack of infrastructure, training or market access.

NIXTAMALISATION AS A FORM OF AGRO-PROCESSING

Nixtamalisation, is an example of agro-processing and provides several benefits over unprocessed grain. It is more easily ground, it increases available protein and micronutrient content, flavour and aroma are improved, starch is more readily digestible, and mycotoxins are reduced.

This process requires very little special equipment or ingredients and therefore is cheap to carry out. It only requires a cast iron or stainless-steel pot (as opposed to an aluminium pot) and slaked lime (calcium hydroxide). Since infrastructure is not a major requirement and the market is readily open to maize based products, this project focussed on training farmers in processing maize through nixtamalisation.

INNOVATION AT ITS FINEST

The nixtamalisation training provided a platform for farmers to learn about a new technology and make it relevant to their own conditions. Extensive training courses, manuals and recipes were provided in several districts where maize is a staple food.

Armed with the necessary knowledge, it was up to farmers to create a final product. The variety and the uniqueness of the products prepared were a source of inspiration to the visitors, as these farmers took their new-found skills and incorporated it into a local tradition.





Nixtamalisation...



The nixtamalisation training provided a platform for farmers to learn about new technology and to prepare traditional meals with their new-found skills.

This was just but a taste of the great work these farmers are doing in uplifting their communities.

THE JOURNEY FORWARD

Upon experiencing the success of this programme in these communities, the DSI is looking to expand the programme to other communities and provinces in South Africa. Furthermore, this same technology could be applied on other food types such as beans that would usually take longer to cook and prepare and consume a lot of energy. The desire is that these community leaders would reach a level where they are able to generate an income from the nixtamalised products to improve their socioeconomic status and improve the livelihood of their communities. ■



ABC of NO-TILLAGE practices

NO-TILL IS A SYSTEM OF CONSERVATION TILLAGE WHICH AIMS TO CONSERVE SOIL AND MOISTURE. THIS PRACTICE HAS BECOME A COMMON METHOD USED BY FARMERS, ESPECIALLY IN THE HIGHER RAINFALL AREAS OF SOUTH AFRICA.

Many of the advantages that can be achieved by employing no-till methods are often only achieved after a number of years of practice, thus one should have a long-term outlook when starting. There are also key 'rules' which farmers need to focus on to get the best possible results. Sustainability is the key! We want future generations to be able to produce food just as we do, and in order to achieve this there still needs to be topsoil left for them to produce crops on.

PRIMARY PHILOSOPHY

No-till practices aim to have minimum disturbance on the soil structure. Rather than turning the soil over to create a seed bed, farmers focus on building a layer of mulched organic material on the top of the soil in which to plant crops. This layer of material can aid in reducing loss of topsoil and achieve better infiltration of moisture by reducing run-off.

Another advantage of having the top layer of soil covered is that weed growth is suppressed and microbial development can occur. All of these factors can contribute to the sustainability of the soil.

Profit is obviously another big consideration when making the move to no-till. Many farmers make the mistake of thinking that no-till will be an easy quick saving on production costs. One would assume that less tilling equals less tractor use, therefore a big saving on diesel. This is unfortunately not the case, at least not in the short term. Research has shown that during the 'building' phase of no-till one can expect slightly lower yields than usual as one works toward achieving that all important layer of stubble material and while the soil structure establishes itself. Always bear in mind that a long-term approach is needed when implementing no-till practices.

Keep learning and don't be afraid to ask for advice from experienced no-till farmers.

EQUIPMENT

Having the correct equipment is vital to successful implementation of no-till. You need to have a planter which is suitable to plant under no-till conditions. This would usually consist of a planter that can give significant downward pressure to penetrate through the top layer of material and crust. A drawbar hydraulic system is preferred over a three-point connected planter.

The planter should also be equipped with a ripper tine and cutting disc that can break through the material, some planters also make use of a trash wheel which is an angled tine wheel that 'sweeps'

the trash away making it easier for the planting discs to penetrate the soil.

Your planter should also have good sharp coulters that can cut the groove into the soil where the seed will drop into followed by compaction wheels that squeeze the opening closed. Another essential piece of equipment that you will need is a good spray rig. Considering that you will not be doing conventional mechanical weed control with a cultivator you will need to be sure that your boom spray is in an excellent condition to do chemical applications to control weeds.

If you are considering moving to a no-till system, it is highly recommended that you make use of the correct equipment for the job. One should look at this as investment into a system that can be advantageous into the future.

INITIAL STARTING POINT

You need to have a good starting point from which to build. Don't start a no-till programme on a bare piece of land that hasn't been worked for many years. One should rather have a well worked field that is not compacted and overgrown by weeds on which to start building. This may require you to do one good conventional working of the soil in the first year.

After your land is prepared and ready to be planted you should now consider what crop to plant. Think about the material that you aim to start building-up on the land and what best will provide you with the most bulk to give good soil coverage. For example, maize would be a better option compared to sunflower as the stalks and leaves have better structure and volume than sunflowers.

After harvesting your crop, it may be a good option to spread a winter cover crop on the field such as oats or wheat. This will help to provide soil cover and structure and will also assist with the building of a material stubble layer on your topsoil. When it comes to the next planting season you will have a good foundation to work on. Make sure that you do a 'burn down' spray early in the new season to prevent the weeds from getting too established. Once all weeds are controlled you can plant into your previous season's stubble and cover crop and start your building process.

GOAL

Remember that this is a long-term programme that will only start to pay dividends after a few years of implementation. Keep the end goal in mind – sustainability! Keep working towards building those layers and developing your soil structure. Keep learning and don't be afraid to ask for advice from experienced no-till farmers. ■



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Do the right thing – treat workers with care and respect

MUCH HAS BEEN SAID IN THE MEDIA ABOUT THE PLIGHT OF FARM WORKERS IN SOUTH AFRICA. THE GENERAL PICTURE PAINTED IS A VERY NEGATIVE ONE AND FARMERS ARE GENERALISED AS A GROUP THAT TREATS ITS EMPLOYEES POORLY.

There is sadly very little focus on the good work being done either into how the agricultural sector creates valuable employment in rural areas, or on how farmers contribute generously to their local communities.

The bad rap actually comes from cases where there has indeed been poor treatment of farm workers, or where processes and legislation have not been followed correctly. It is the responsibility of every farmer to work towards changing this negative impression. This is only achieved when as a collective we work with integrity and honesty, doing right by those who work with us to make our farming operations what they are. There is no need to wonder what the right procedures are because Sectoral Determination 13 is in place to regulate the basic conditions of employment and the remuneration of farm workers in South Africa.

WHO IS A FARM WORKER?

A farm worker refers to every person involved in the farming activity and includes all general workers, private security guards (except if they are employed by the private security industry and have been seconded to your business,) and all domestic workers who are active in farm dwellings.

EMPLOYMENT CONTRACTS

It is always better to have a written contract with farm workers. In fact, increasingly nowadays the representatives of the Department of Labour will ask to see these when conducting a farm inspection. The contracts should include information regarding salary and all particulars of the employee as well as terms of employment. The contract should also specify whether it is a permanent contract of employment (i.e. no end date is specified) or a fixed term contract (i.e. a specific time period for the worker's employment e.g. seasonal workers).

Guidelines

What information should be included? Here are a few guidelines only:

- Full names
- Identity document – keep a copy on file
- Where will the work be done – place of work
- Working hours
- Night work – this is often a requirement on farms in peak seasons
- Overtime – your expectations/remuneration
- Wages – when will payment be made, what will remuneration be
- Leave – how many days
- Will there be any deductions on the salary – specify this
- Termination of employment – specify conditions e.g. reasons and/or circumstances



Jenny Mathews, Pula Imvula contributor. Send an email to jennymathews@grainsa.co.za

TERMS OF EMPLOYMENT AND REMUNERATION OF FARM WORKERS

According to the Department of Labour's Basic Conditions of Employment Act No. 75 of 1997, all farm workers must be paid at least according to the stipulated annual minimum wage scales. Farmers must familiarise themselves with the appropriate legislation.

Some points worth highlighting are:

- A farm worker may not work more than 45 hours per week.
- Farm workers should work a maximum of 9 hours per day for 5 days or less a week, but 8 hours per day if he/she works more than 5 days each week.
- Any work done beyond these parameters is by agreement and to be calculated as overtime.
- Overtime is paid at a rate of 1,5 times the workers normal wage. The alternate option is the worker may be given time off as compensation.
- Night work refers to work done after 20h00 and before 04h00. Compensation for these hours is 10% of the normal daily wage.
- If a worker works less than 45 hours per week then the salary is calculated on the prescribed hourly rate.
- In instances where farm workers need to do farm chores on Sundays and Public Holidays then the farm worker is due double wages.



Clients do not come first. Employees come first. If you take care of your employees, they will take care of the clients.



Prohibition of child labour

No one under the age of 15 is required or permitted to work. Every parent is expected to make sure that a child under 15 attends school. No person may employ a child who is under the age of 15 in farming activities. Children older than 15 but younger than 18 cannot work more than 35 hours a week and cannot work with chemicals. An employer must maintain a record of the name, date of birth and address of every farm worker under the age of 18 years employed by them for three years.



It is always the right time to do the right thing – take care of your employees and they will take care of your farming operation.

National minimum wage rate

The new national minimum wage rate for farm workers increased by 3,8% and came into effect in March 2020:

- In terms of the new determination farm workers are entitled to a minimum wage of R18,68 per hour.
- This translates to: R840,60 for a 45-hour week and R3 362,40 per month.

You don't build a business you build people – and then those people build the business!

Leave conditions should also be included in the employment contract

- **Annual leave** – at least three weeks leave on full pay for twelve months of employment.
- **Sick leave** – a sick leave cycle is a period of 36 months. During the first six months of work, the farm worker is entitled to one day paid sick leave for every 26 days worked. During every sick leave cycle, the farm worker is entitled to an amount of paid sick leave equal to the number of days the farm worker would normally work during a period of six weeks.
- **Family responsibility leave** – this applies to a farm worker if he has worked for his employer for longer than four months. Three days paid leave for every twelve months of employment are to be granted if the farm workers child is born, a child is sick or in the event of a death of a partner, parent, grandparent, child, grandchild or sibling. This leave cannot be accumulated and lapses at the end of an annual leave cycle.

- **Maternity leave** – a farm worker is entitled to four consecutive month's maternity leave. The leave can start at any time from four weeks before the expected date of birth. The employer does not have to pay the farm worker for the period that she is away due to her pregnancy – or the parties could agree on the amount to be paid as wages, on condition she is able to claim maternity benefits from the Unemployment Insurance Fund. A farm worker may not work for six weeks after giving birth unless a medical practitioner or midwife certifies that she is fit to do so.

Termination of employment

When we are signing an employment agreement with a new worker often the last thought in mind is the termination of employment, but this does need to actually form part of your initial agreement with the new worker.

How can employment be ended? It is normal to expect a worker to give notice to end the employment relationship. The guidelines say if a worker has worked less than six months then a notice period of one week must be given, if employed for more than six months a notice period of one month must be given. If an employer wishes to terminate the contract, then notice must be given in writing with a verbal explanation in a language he/she understands.

CONCLUSION

You don't build a business you build people – and then those people build the business! Richard Branson has been a highly successful entrepreneur in many sectors. He believes the key to business success lies in the way you treat your employees: 'Clients do not come first. Employees come first. If you take care of your employees, they will take care of the clients.' This is also true in a farming environment. If your workers feel respected and valued, they will in turn treat the machinery and tools they work with, or the animals and farming operations they are involved in with care and respect. ■

What to look out for in *CANOLA* as from July

THE PLANTING SEASON IS BEHIND US AND HOPEFULLY WE HAVE BEEN ABLE TO ESTABLISH AN EVENLY SPACED AND UNIFORM STAND OF CANOLA. THIS, I BELIEVE, IS THE CORNERSTONE OF GROWING A SUCCESSFUL CANOLA CROP.

Leading Australian researcher, Dr John Kirkegaard, emphasises the importance of producing sufficient biomass (vegetative material) to produce the optimum results the high yielding hybrid cultivars at our disposal are capable of producing.

NITROGEN (N) TOPDRESSING

The amount of N to be applied is determined by various factors:

- Yield potential/yield target of the land.
- Total N recommended minus the amount applied at planting.
- Expected rainfall for growing season and rainfall to date.

Generally, two topdressings are recommended, namely 30 to 40 days post emergence of the canola, followed by a second 60 to 70 days post emergence. The second topdressing can be reduced or omitted in very dry late seasons.

Nitrogen sources that contain sulphur (S) are recommended to supplement the S content. A ratio of 7:1 N:S is recommended, especially on highly leached soils or soils with a carbon content of less than 1%.

When deciding whether to spray or not it is important to determine the number of infested plants rather than the number of aphids per plant.

TRACE ELEMENT APPLICATIONS

(Refer to a canola production manual for norms).

Trace element supplements are recommended where analysis indicates deficiencies or in areas with a historic trace element problem.

- Foliar applications are generally more effective than soil applications for correcting trace element deficiencies.
- Deficiencies should be correctly identified (leaf analysis by reputable laboratory).
- Plants must be growing actively for trace element sprays to be effective.
- Preferably spray under cooler, dry conditions with no imminent rain forecast (minimum three hours drying time).
- Spray with sufficient water to ensure thorough wetting of foliage.
- Do not mix trace elements with herbicides in the spray tank.

Since boron fulfils an important function in respect of flower fertility (a deficiency results in fewer pods and fewer seeds per pod) an application of 1 kg/ha to 1,5 kg/ha of solubor as a foliar spray during stem elongation is recommended. Do not spray boron after start of flowering as flowers can be shed.



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IDENTIFICATION AND CONTROL OF IMPORTANT INSECT PESTS

Regular scouting is important to identify insect pests as early as possible in order to assist in making good management decisions.

Once pests are first noted, monitor at more regular intervals to determine whether the population is increasing or remaining stable. Predators and parasites as well as adverse weather conditions (cold, wet weather) can often prevent a pest population from increasing.

Only consider a spray application once the threshold level of infection has been reached (refer to a canola production manual.)

Aphids

Cabbage aphids are the primary aphid species that feed on canola. Aphids migrate from host plants (weeds and volunteer canola) around the canola fields. Once populations infest a canola land they can accumulate very rapidly under hot, dry conditions. For this reason, it is vital to keep the surrounds of lands free from any green plants that can serve as hosts to insect pests.

Cold weather delays the increase in the aphid population and populations can even decrease in cold, wet weather. Canola is extremely sensitive to aphid infestations during early growth stages. Heavy and prolonged infestations during the flowering and early pod formation stages can cause severe damage to both flowers and pod setting. It is particularly important to protect canola from aphids under conditions of moisture stress.



Regular monitoring of aphid infestation levels is important. Aphids feeding on the flower buds at the initiation stage will inhibit growth of the canola plant. Mature canola has a higher tolerance to aphid infestations. When deciding whether to spray or not it is important to determine the number of infested plants rather than the number of aphids per plant. Many different predators and parasites feed on aphid populations which makes it important to only spray when the aphid infestation is on the increase and has reached the spray threshold level.



Diamond back moth (DBM)

The first signs of a DBM infestation is when small grey-brown moths with a white diamond patterned stripe down the centre of the back, when the wings are folded, are noted in a canola field. This sporadic pest can occur from as early as the rosette stage of the canola but normally starts infesting fields from the stem elongation stage. Canola can tolerate increasing numbers of DBM without any significant yield losses when in the vegetative growth stage. As flowering progresses, increasing numbers of larvae move to flower buds, flowers and pods.

The female moth can lay more than 100 pale yellow eggs in her lifetime. The eggs hatch after four to six days, with the first stage larvae burrowing into leaf tissue. The next three larval stages feed on leaf tissue. Larvae grow up to 12 mm in length. When canola enters the reproductive stage, these larvae can cause serious yield losses. The lifecycle, from eggs to moths, can be as short as 14 days under warm climatic conditions, resulting in a population explosion. Under these conditions there will be considerable overlap of generations and all stages of DBM will be present in a crop at any one time.



Once pests are first noted, monitor at more regular intervals to determine whether the population is increasing or remaining stable.



Sampling for larvae should be done regularly. When 10 or more larvae of 3 mm to 4 mm in length are counted, scout more regularly. Should the population remain stable, continue scouting. When the population reaches the damage threshold level for the specific development stage, commence spraying.

Bollworms

Bollworm eggs are laid singly on the upper surface of leaves. The night flying female moth can lay as many as 1 000 eggs in her five to eight-day lifespan. These eggs hatch after five to seven days. The small larva (less than 1 mm) feed on leaf tissue and will moult six times within 14 to 18 days and grow into an adult larva of up to 3 cm in length. Egg laying usually coincides with the start of the flowering stage of canola. Regular scouting for the presence of bollworm moths, scouting for bollworm eggs which are easily visible to the naked eye or using bollworm pheromone traps will assist in identifying the commencement of a bollworm infestation.

Bollworm populations can increase rapidly, especially under hot, dry conditions and heavy infestations can cause extensive damage to the crop. Heavy aphid infestations appear to favour bollworm because the moths are attracted to the aphid honeydew as a source of food. Only start spraying bollworm when the threshold level of five to ten worms per m² is reached.

The next important consideration for canola farmers is spraying for Sclerotinia, should conditions be favourable for the disease. The correct time to windrow and/or direct harvesting are also important decisions that must be made and will be covered in another article. ■

CULTIVAR RE-EVALUATION for the 2020/2021 season

THE DRYLAND PRODUCTION AREAS IN SOUTH AFRICA FOR SOYBEANS AND SUNFLOWERS LARGELY OVERLAP WITH A TENDENCY OF MORE SUNFLOWERS BEING PLANTED IN THE WESTERN REGIONS AS THE SEASON PROGRESSES. HOPEFULLY BY NOW YOU HAVE HARVESTED BOTH YOUR SUNFLOWERS AND SOYBEANS AND CAN MAKE AN ASSESSMENT AND COMPARISON OF THE FINAL YIELDS REALISED.

As usual the crops in some areas within provinces and different farming districts had almost too much rain which hampered harvesting or not enough rain with a mini drought that will have reduced final yields. All this happened in what will be regarded as a wet summer production season.

The late planting of soybeans in some areas was followed by excellent vegetative growth spurred on by the high rainfall received. These potentially high yielding soybean plantings however ran out of enough heat units during March and April 2020 compounded by many overcast days which reduced the final yield.

Some later planted, short season sunflowers could yield between 1,8 t/ha to 2 t/ha. If you have planted both early and later sunflowers you can compare the yields and see which crop had the best gross margin. This will allow you to decide in future whether or not you can plant your soybeans a bit later, or to rather switch to sunflowers during a later season.

Written by a retired farmer



This is also largely determined in which production region your farm is situated and the choice of soybean cultivars available and recommended for your region. Soybeans might also be a critical component in boosting the nitrogen component within your crop rotation planning.

One of the most important considerations, to allow for a more flexible planting window, is to have seed on hand or quick access to a range of cultivars.

CONSIDERATIONS REGARDING SOYBEAN CULTIVAR CHOICE

The development progress in creating soybean cultivars also includes genetically modified hybrids with specific herbicide compatibility and the normal agronomic characteristics standardised at a high level of

yield potential. Added to that are the numerous companies selling different cultivars. The choice is vast. Which cultivar will be right for your conditions?

One of the most important considerations, to allow for a more flexible planting window, is to have seed on hand or quick access to a range of cultivars. The farmer can then use a different cultivar if he or she is unable to plant at the ideal time due to drought or excess rainfall.

Look at the production area region maps from the various seed suppliers and see if you are in a cooler, temperate, warm or hot region. Determine if the cultivar used falls into one of the regions as designated. The yield realised will indicate whether or not it was the right choice for your farm for this year's harvest. In temperate areas, for example, soybean cultivars can range from 56 to 65 days for the days required to 50% flowering with the middle of November plantings and 132 to 143 days to harvest maturity.

In **Table 1** the following data can be seen on the ARC's Soybean Cultivar Recommendations Research Results for 35 different cultivars

from many seed suppliers. It was carried out in all production areas over South Africa.

As can be seen the cool areas can have a harvest maturity that differs by 28 days. If you are in a 'cool' area it can take a minimum of 154 days to crop maturity. If you planted, as a benchmark, on the 15th of November the crop would be at 50% flowering in the last week of February extending into the first two weeks of March or longer. Harvest maturity would be at about the 15th of June. So, you definitely want to choose a cultivar that is rated at 154 days to maturity to be able to have enough heat units to make a commercially viable yield and avoid an early frost.

In a 'warm' zone the same calculation for the slowest cultivar planted on the 15th of November would show a 50% flowering date at the end of February beginning of March and a harvest date on about the 5th of May.

Whichever area your soybean crop will be grown in it is recommended that you have on hand a selection of batches of seed that can be planted over a range of ideal planting windows. If you have to plant late, use the fastest maturing variety available. Trial yields for dryland production can range from 1,3 t/ha to 2,6 t/ha. What yields did you realise?

Another factor is whether or not you have better or worse results with determinate or indeterminate growth habit cultivars. Determinate cultivars stop vertical growth at or during flowering and indeterminate continue to grow at or during flowering.

It seems most dryland cultivars sold are of the indeterminate type while it is recommended that determinate types are used for irrigation. Soybean seed setting periods are largely influenced by the day-light length and this factor must also be taken into account when you choose a cultivar. Generally, any dryland soybean plantings beyond the 20th of November needs careful consideration!

CONCLUSION

When you have grown a successful cultivar on your farm compare your benchmark yields and growth habit with the information above and plant various cultivar trials each year as a comparison. Be careful not to, 'take a chance', and plant a longer season cultivar too late. ■

1 ARC Soybean Cultivar Recommendations Research Results.

Production area climate designation	Range of days to 50% flowering	Range of days to harvest maturity
Warm	37 - 56	119 - 133
Moderate	48 - 65	145 - 158
Cool	62 - 85	154 - 172



Soybean inoculation.

Macroeconomics and your farm

THIS MAY BE SOMEWHAT OF AN UNFAMILIAR TERM TO SOME OF YOU. HOWEVER, IT IS SOMETHING THAT AFFECTS YOUR FARM BUSINESS WITHOUT YOU HAVING MUCH CONTROL OVER IT. THUS, LET'S BEGIN BY EXPLAINING THE TERM.

Economics is the study of the production and consumption of goods and services and the supply of money and is divided into two main branches, microeconomics and macroeconomics. Micro means small and therefore microeconomics studies how individual people and businesses function in specific situations. Macro means big or large and macroeconomics studies how the entire economy of a country functions. In very simple terms economics is concerned about money and thus macroeconomics is concerned with the money of country.

Today farm businesses operate in a complex, rapidly changing, deregulated and globalised environment. There are very few issues that our farmers can control, and this makes farming complex. The key macroeconomic aspects that impact on the economic and financial performance of farm businesses are the inflation rate, interest rate, real growth in the Gross Domestic Product (GDP), the level of employment and the foreign exchange rate. The trends of each of these need to be understood and followed.

The government is responsible to manage these aspects of the macroeconomics by policy decisions and government uses various institutions to regulate these aspects. The South African Reserve Bank is possibly the most well-known institution.

ASPECTS AFFECTING YOUR BUSINESS

Following let's briefly discuss how each of these aspects affect the microeconomic and financial results of your business.

Inflation

Inflation is an economic term that refers to generally rising prices of goods and services within a country. Today prices for many consumer goods are double that of 20 years ago. Prices rise when there is higher demand for goods and services because people have more money to spend. A direct result of inflation is the so-called cost-price squeeze farmers are aware of. To combat this effect of inflation you must do everything in your power to increase the income of your farm every year, whilst containing costs.

Interest

When you borrow money from an official institution you pay interest. The amount of interest paid is determined by the South African Reserve Bank. Simply put, higher interest rates result in higher costs. The interest rate is also used to control inflation. The policy of the Reserve Bank at present is to maintain the inflation rate between 3% to 6%. When the inflation level increases the rate of interest will be raised to force people to borrow less money to spend to limit price increases.

Growth

Just as it is important to grow your business, it is important for a country to grow. When a country grows there is more money available and the demand for goods and services are higher. When more goods and services are produced to meet the higher demand, jobs are created, and more people are employed. In return workers receive a salary which they can

spend on goods and services. To assist in growing the country the Reserve Bank can lower the interest rate, thus making it easier for businesses to borrow money to expand.

Infrastructure

Government also has the responsibility to maintain and improve the infrastructure of country to support businesses to grow and therefore to grow the country. For this government needs money. The money is obtained through taxes and to borrow money. When taxes are lowered businesses benefit and can grow, which again leads to growth of the country.

Unemployment

We have already referred to unemployment and at present the unemployment rate is very high in South Africa, because of virtually no growth in the country. A direct result of the high unemployment is the increased theft experienced on our farms, causing a lower income and higher costs to combat theft.



There are very few issues that our farmers can control, and this makes farming complex.



Foreign exchange rate

Another aspect to take note of is the foreign exchange rate – for us, the price of money of another country paid in rand. The most well-known exchange rate is the rand/dollar rate because a lot of international trading is done in dollars. Exported products gain the most when the rand weakens against other major foreign currencies. When exporting and you are paid in dollars, the dollars must be exchanged for rands. With a weak rand say R18,00 per dollar you receive R18,00 for each dollar exchanged. Vice versa, imported farm inputs become more expensive, rands must be exchanged for dollars.

CONCLUSION

All the aspects discussed are closely inter-related and government must play a balancing act managing the aspects to benefit the country. The current situation in South Africa is that the trends in these aspects are negative and results in financial stress for farming businesses.

To manage and run your farm properly, you must be aware of the tendencies of the aspects mentioned. Thus, empower yourself with information. For instance, by reading the *Pula Imvula*, the *SA Grain* magazine, the *Landbouweekblad* and the *Farmer's Weekly* you can already obtain relevant information to improve the management of your business by incorporating the tendencies in the planning of your business. ■



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SUPPLY AND DEMAND for maize



GLOBAL MAIZE PRODUCTION HAS BEEN RAISED SLIGHTLY DUE TO AN UPWARD REVISION IN HARVESTED AREA AND YIELD FOR THE EUROPEAN UNION.

Utilisation for 2019/2020 is expected to marginally increase by 1% compared to the previous season due to the upward revision in the European Union and Russia. Compared to the previous season trade forecast for 2019/2020 (July/June) has increased marginally to just over 167 million tons, which is at a record, supported by ample export supplies. Ending stocks for 2020 remain almost unchanged from March, but still expected to decrease by about 5% compared to the previous season.

According to the crop estimates committee, maize production is forecast at 15 221 520 tons, with 8 779 470 of white maize and 6 442 050 tons of yellow maize. This is a 2,78% increase compared to the previous forecast and 35% increase compared to the previous season. The expected yield for white maize is 5,43 t/ha, while the yield for yellow maize is expected to be 6,48 t/ha.



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1

July 2020 maize parity prices delivered at Randfontein.



Source: Grain SA, 2020

Local demand for maize is expected to increase by about 2,5%, mainly due to the increase in animal feed and human consumption. Due to the increase in production, it is to be expected that maize imports will be kept minimal, while imports will increase compared to the past two seasons and this is mainly for whole maize.

The export outlook for 2020/2021 is further supported by the sharp depreciation of the rand since the COVID-19 pandemic hit the South African shores. The low value of the rand has increased the competitiveness of South African maize on the international market. The depreciation is also expected to spur a rise in exports of yellow maize, which declined to a below-average level of 400 000 tonnes in 2019/2020. Ending stocks are expected to be about 43% higher than the previous season, this would be enough to last about one and a half months if 940 000 tons is processed monthly.

White maize prices increased by 7% in March 2020 and 24% in April compared to the same period in 2019, following the sharp depreciation of the rand together with strong export demand, mainly from Zimbabwe. At the March level, the price of yellow maize was at a comparable level year on year, while it increased by 8% in April. Both white and yellow maize July futures prices have followed the sentiments of higher prices and are trading at export parity levels (**Graph 1**). ■

1

Global supply and demand of maize.

	2018/2019	2019/2020	
	Estimates (million tons)	5 March (million tons)	2 April (million tons)
Production	1 120,2	1 137,8	1 140,6
Supply	1 489,3	1 498,6	1 501,8
Utilisation	1 140,4	1 150,4	1 152,9
Trade	166,3	166,8	167,3
Ending stocks	361,2	341,8	342,4

Source: USDA, 2020

2

Local supply and demand of maize.

	2018/2019	2019/2020	2020/2021
Production (CEC)	12 510 000	11 275 000	15 221 520
Opening stocks (1 May)	3 689 476	2 663 086	977 643
Total supply	15 867 123	14 035 143	15 651 163
Local demand	10 919 979	11 257 500	11 544 000
Exports	2 284 058	1 800 000	2 700 000
Total demand	13 204 037	13 057 500	14 244 000
Ending stocks	2 663 086	977 643	1 407 163

Source: NAMC and Grain SA, 2020

PROS AND CONS

of soil preparation in conservation farming

SOIL HAS BEEN TILLED SINCE BIBLICAL TIMES TO PRODUCE GRAIN. REASONS FOR THE NECESSITY TO PREPARE SOIL INCLUDE THE CRUSTING OF SOIL, PROMOTING WATER INFILTRATION AND REDUCING RUN OFF, AND INCREASING THE EFFECTIVENESS OF RAINWATER.

Soil is also tilled to ensure a good seedbed for smaller seeds, curb wind erosion, improve soil aeration, incorporate crop residue, control weeds, reduce plant disease, eliminate unfavourable chemical conditions in the soil (for example acid and brack soil), and eliminate soil compaction.

The main reason for tilling soil is to ensure favourable conditions for the absorption of water, oxygen and nutrients – everything required by plants for a good yield.

A deficiency in one of these elements will lead to a reduction in the potential harvest. In order to address these factors, this article emphasises the elimination of soil compaction.

SOIL COMPACTION

Soil compaction is the most common restrictive factor for crop yield in agriculture. In modern times fields are cultivated intensively and they therefore carry a lot of traffic that can easily compact the entire field surface. To combat this problem, producers can follow two approaches, namely track traffic and repeated ripping.

Track traffic

The first method involves applying controlled track traffic judiciously. This has its advantages, like the good traction the compacted track provides to implements that have to drive through the fields. At the same time, less energy (fuel) is required to prepare for the next planting.

Disadvantages include producers having to implement a system to ensure that the wheels drive in the same tracks every time, and that the wheel spacing of all the implements used in the fields have the same intervals (working width).

With a controlled track traffic system the 'negative' properties of compacted soil are used to the benefit of the producer. More about this in a future article.

Loosening compacted zones

The second option the producer has is to loosen compacted soil. Before this task can commence, it is advisable to establish where the problem is, because the focused resolution of the problem can lead to cost savings.

For example: Is the soil compaction on the surface or is the problem just below the plough layer? How widely spread is the problem? Does it occur only in the tracks of implements (for example the tracks are 2,7 m apart and each track is 0,9 m wide), or does the compacted layer cover the entire field?

To determine the above easily and cheaply, the penetration resistance of the soil can be tested in a few places in the field. Use a 600 mm long rod of stainless steel with a diameter of 5 mm, a sharpened point and a 'T' handle (**Photo 1**).

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A home-made device for tracing compacted layers.
Photo: Rianto van Antwerpen

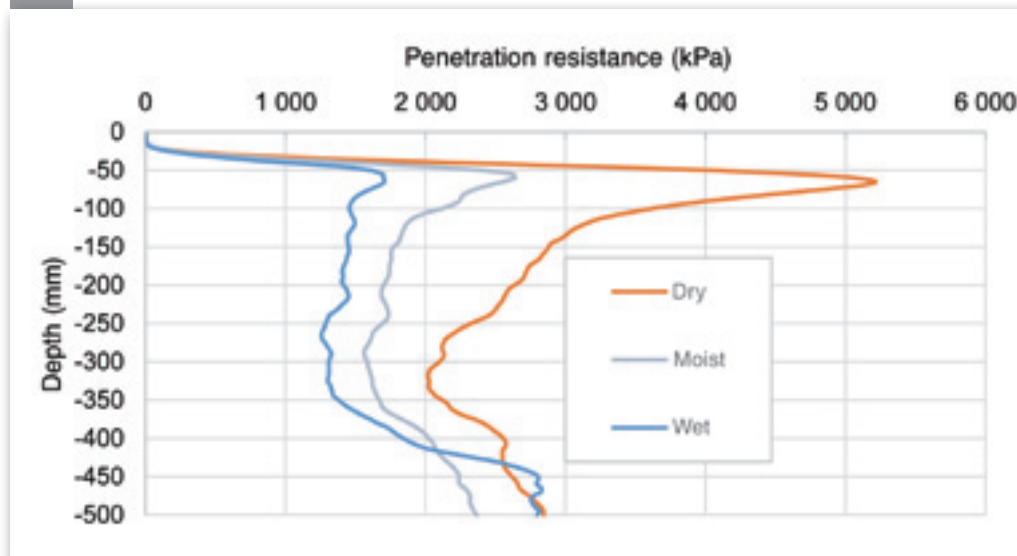
After you have established the extent of the compacted layers, dig a hole or two to physically inspect the compacted layers for thickness and width. This information can be used to decide how deeply and widely and with what the soil should be cultivated. The producer can also keep in mind that there is an opportunity to incorporate a soil conditioner (organic matter, lime or gypsum) at the same time.

This will also affect the choice of the depth and type of cultivation.



1

This penetration resistance graph demonstrates that the compaction occurs as a result of traffic on the surface and that ripping up to a depth of 150 mm to 200 mm will solve the problem. Measurements were taken when the soil was dry, moist and wet and show that the effect of surface compaction is visible at all soil water levels.



ELIMINATION OPTIONS

Once you have established that there is a compacted layer, the depth and how this affects the choice of implements have to be taken into consideration.

The discussion below assumes that a soil conditioner is not applied at the same time. A principle advocated throughout this article is that soil disturbance must be limited to a minimum.

No-till or minimum tillage are not debated here, but the necessity for soil tillage to solve a problem is discussed on the basis of three scenarios.

Crusting on the surface

No compacted layers occur, but there is a thin crust (< 2 mm) on the surface, with signs that water has run off after rain (**Photo 2** and **Photo 8** on page 20). The crust is easy to see if you look at a clod from the side.

The crust sometimes develops after a single shower of rain and can be strong enough to prevent seedlings from breaking through with ease. Usually we say that the soil has crusted. The crust can be up to 10 mm thick.

A rotary hoe or *duisendpoot* (**Photo 4** on page 18), drag harrow (**Photo 5** on page 18), spring-tooth hoe (**Photo 6** on page 19) or similar implement can be used. The implements should preferably be used before emergence. After the plants have emerged, only a rotary hoe should be used for the best results.

Producers who use a system of water harvesting needs to limit the removal of crusts between the rows. Surface crusts in the run-off tracks are used to channel the water to crop rows.

The benefits of eliminating crusts include better soil aeration, increased water infiltration and less run off and erosion.

A disadvantage is the increased rate at which organic matter breaks down in the soil. With this shallow tillage the breaking down of crop residue is limited to the surface, but the surface is also the place where the biggest concentration of organic matter occurs.

The benefits of this tillage method are short-lived, as crusts will form again when the first rain falls. It is therefore essential – particularly in the grain-producing parts of South Africa – to concentrate the crop residue in the future plant rows in an attempt to keep the soil in this area under cover.



2

A surface crust. Photo: Neil Miles

Pros and cons of soil preparation...



3

*Three consecutive compacted layers in a field of sugar cane.
Photo: Rianto van Antwerpen*



4

A rotary hoe or duisendpoet.

Crop residue in the row can interfere significantly with the planting process, as it clogs the planters. To address this problem, the planter can be equipped with stubble managers.

Compaction to a depth of 100 mm

Compaction is only on the surface and limited to a depth of 100 mm (**Graph 1** on page 17). This type of compaction is caused by the tyres of vehicles and elimination does not require a lot of energy. However, the producer must make sure that it is essential to eliminate this compacted layer and that it cannot be used for another purpose, for example for better traction. The principle to apply is working shallowly with a tine implement.



5

A drag harrow. Photo: Martiens du Plessis

If the compaction occurs in parallel strips, a two- or three-tine ripper should be used, with the tines spaced to till the compacted strips. The depth of the tillage should be no less than 150 mm and no more than 200 mm. A chisel plough (**Photo 7**) with the superfluous tines removed can also be used.

When the compaction occurs across the entire surface, a three- or four-shank chisel plough (or something similar) can be used. To break up large clods, a few crumble busters can be added behind the implement.

If tine implements are not available, a turn plough can be considered. The disadvantage of these implements is that the topsoil (0 mm to 200 mm) is turned over, which increases the rate at which organic matter breaks down.

In this case it is advisable to concentrate this resource in future plant rows, particularly in the western parts of South Africa, where organic matter is scarce.

Benefits include improved soil aeration, an increased water infiltration rate, and initially a smaller chance of run off and erosion. The rough soil surface also counteracts wind erosion. Plant roots tend to localise these loosened zones first.



Disadvantages are the effort to till the soil at the right depth, the break-down of soil structure and the increased rate at which organic matter breaks down.

Compaction at a depth of 200 mm and more

The compaction occurs at a depth of 200 mm and more. This type of compaction is mainly caused by implements that are used to till the soil in preparation for planting. Examples are disc ploughs and turn ploughs of various designs.

The latter implements are designed to loosen the plough layer and mix the soil, but at the same time they exert pressure on the cutting plane, which causes a compacted layer under specific conditions (a combination of the amount of clay and the water content).

This compacted layer is very harmful, as it delays the rate of water infiltration and leads to waterlogging, run off and erosion (**Photo 8** on page 20). After rains, water is sometimes visible on the surface for days, which indicates that infiltration and drainage are inadequate. In addition, the roots are limited to the plough layer (**Photo 9** on page 20), which usually leads to smaller yields.



6

A spring-tooth hoe. Photo: Martiens du Plessis



7

A chisel plough for compacted zones within 250 mm of the surface. Photo: Martiens du Plessis

Again you should determine whether this compaction occurs in strips or across the entire field. If track traffic is not controlled, this type of compaction is expected to occur across the field. Using a ripper (**Photo 10** on page 20) is the best way to solve this problem.

Because the compacted layer can easily be 150 mm to 200 mm thick (this must be confirmed in the field), the ripper tine should break the soil at a depth of at least 450 mm. A combination of factors should be kept in mind to accomplish this: clay content, water content, number of tines, design of the ripper, the type of tines on the ripper and the size of the tractor. If necessary, rather reduce the number of tines to ensure the correct tillage depth.

Pros and cons of soil preparation...

8

Soil erosion in a sandy field due to a combination of crusting and soil compaction. Photo: Rianto van Antwerpen



9

A sub-plough-layer compaction (deeper than 200 mm) that restricts root growth to the plough layer. Photo: Martiens du Plessis

Advantages include the absence of a barrier layer, which benefits water infiltration and root distribution. The disadvantage is the cost of the operation (approximately R960/ha for a 60 kW tractor with a three-tine ripper). However the advantages far outweigh the disadvantages.

PROS AND CONS OF SOIL TILLAGE

Disturbing soil holds advantages and disadvantages. Advantages include better aeration, less run off and erosion, an increased water infiltration rate to a greater depth, and also better root distribution and utilisation of the soil profile.



10

A ripper for compacted zones up to 450 mm deep. Photo: Martiens du Plessis

Disadvantages include increased production costs, breaking down the soil structure and the accelerated breakdown of organic matter. In KwaZulu-Natal it was calculated that a single ridging of a Westleigh soil form with 15% to 18% clay and approximately 0,8% organic matter led to the uptake of an additional 30 kg N/ha in sugar cane. This N came from the organic matter in the soil that had mineralised.

Although it may appear as if the plants are greener the deeper the soil is tilled (and this is often the case), the question should be: Why? Where do the elements (mainly nitrogen) come from that improve the appearance of the crop so much?

Some of these additional nutrients come from the soil, because the roots now have access to a greater volume of soil. A significant amount is released by the stock of organic matter in the soil as a result of a population explosion in micro-organisms that have been stimulated by soil disturbance and aeration.

This process is not sustainable. It is an art to maintain a balance between soil tillage on the one hand and the preservation of organic matter in the soil on the other.

ACKNOWLEDGEMENTS

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The price of success is hard work, dedication to the job at hand, and the determination that whether we win or lose, we have applied the best of ourselves to the task at hand.

~ VINCE LOMBARDI



Soil acidity under no-till

NO-TILL PRACTICES, ALSO KNOWN AS CONSERVATION TILLAGE PRACTICES, USUALLY INVOLVE LARGE QUANTITIES OF PLANT MATERIAL BEING LEFT ON THE SOIL SURFACE BY CROP ROTATION SYSTEMS. THE AIM OF SUCH PRACTICES IS TO DISTURB THE SOIL AS LITTLE AS POSSIBLE OVER THE LONGEST PERIOD POSSIBLE.

In this way the evaporation of water is reduced, and the organic-matter content and the microbial activity in the soil are increased over time. Tillage costs are reduced drastically and nutrients in plant residues can also be utilised. However, the development of soil acidity can necessitate the addition of lime, which would counteract the long-term objectives of conservation tillage. How can you postpone or limit the development of soil acidity, and how can this be addressed if it does occur over time without disturbing the soil?

LIMING BEFORE COMMENCING CONSERVATION TILLAGE

The occurrence of soil acidity must be established for different depth increments throughout the profile on the basis of pH(KCl) and acid saturation (aluminium toxicity index). Before commencing conservation tillage, you must aim to ensure that all soil levels achieve at least 0% acid saturation and a pH(KCl) higher than 4,8. Lime levels of as high as 16 t/ha that led to pH(KCl) values of between 6 and 7 had no negative effect on the yield of maize (Venter, ARC-GCI, 2004). Naturally, this comes at a price.

AMOUNT OF NITROGEN

The principal cause of acidification is the use of ammonium-containing and ammonium-forming nitrogen (N). Conservation tillage increases the yield potential of soil, therefore it will also increase the demand for N. As the organic-matter content increases over time, the N delivery capacity will also increase, but the net effect will probably still be an increased demand for N, which could acidify the soil. At the same time, you should guard against over-fertilisation with N – not only for economic and environmental reasons, but also because it causes soil acidification.

SOURCES OF NITROGEN

Using sources of N that contain or form more ammonium will cause greater soil acidity (Table 1). The forming of sulphuric acid also plays a role in increasing the highly acidifying effect of ammonium sulphate (Table 1). LAN contains only 50% ammonium-N and also 20% reactive dolomitic lime, and is therefore the least acidifying of all the N sources in Table 1.

Urea is more than three times as acidifying as LAN, and ammonium sulphate almost seven times more acidifying than LAN/kg N (Table 1).

If more acidifying N sources are used, conservation tillage practices will possibly have to be stopped within three to five years to administer lime again, depending on the amount of N required and the texture of the soil. When ammonium-containing N sources are broadcast on the surface, they move very little and the pH in only

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1

The amount of pure lime that is needed to neutralise acidification that is caused by various sources of N.

Source of N	Kg pure lime/kg N
LAN	1,12
Ammonium nitrate	1,78
Urea	3,57
Ammonium sulphate	7,14

Source: Fertasa, 2017

the top part of the topsoil is reduced when it nitrifies. Urea that is absorbed into the soil will, on the other hand, penetrate the soil just as deeply as the water and acidify it up to that level.

LIMING DURING CONSERVATION TILLAGE

Lime applied on the surface can easily neutralise the acidity caused by ammonium-containing N sources in the upper soil layer. However, if soil acidity occurs at deeper levels in clayey soils, it would be ineffective to apply lime on the surface, as lime has no mobility in clay soils. Gypsum spread on the surface, followed by applications of dolomitic lime or mixtures of 80% dolomitic lime/20% gypsum can be effective in such cases. The timely diagnosis of the development of deep-level soil acidity is essential because treatment is often effective only if applied over a period of years.

When LAN is used, 20% lime is applied together with ammonium in the same granule. This lime will then counteract the acidification due to ammonium in the same microenvironment. It is therefore recommended that LAN preferably be used in planting mixtures and for surface applications.

CONCLUSIONS

- Make sure that soil acidity in the entire soil profile is sufficiently neutralised before commencing conservation tillage.
- Reduce the development of soil acidity by applying the right amount of a particular N source.
- Prevent the development of soil acidity in deeper layers of soil with nitrate sources or with ammonium sources that do not leach and that will therefore acidify only the top part of the topsoil.
- Lime applied to the surface will effectively neutralise soil acidity in the upper layer of the topsoil.
- Gypsum, followed by dolomitic lime or lime/gypsum mixtures, can neutralise deeper soil acidity over time.
- Regular monitoring of soil acidity for different depth increments is essential to neutralise it timeously.

Please note: Consult a qualified agriculturist for more location-specific applications. ■



MADE POSSIBLE BY
BAYER

Understanding conservation tillage practices

THERE ARE MANY POTENTIAL ECONOMIC AND ENVIRONMENTAL ADVANTAGES FOR NO-TILL OR CONSERVATION TILLAGE SYSTEMS. GENERALLY, A TILLAGE SYSTEM SHOULD PROVIDE A PROPER ENVIRONMENT FOR SEED GERMINATION AND ROOT GROWTH FOR CROP PRODUCTION. EACH SYSTEM HAS ADVANTAGES AND DISADVANTAGES THAT NEED TO BE ASSESSED FOR EACH FIELD SITUATION.

For the last few decades, there has been a major trend away from extensive tillage to prepare a proper environment for seed germination and root growth. The decline in cultivation was possible due to the advent of effective herbicides for weed management.

Timing of herbicide application and enhancing crop competition can be effective in managing weeds in a no-till system.

NO-TILL SYSTEMS

In this system, crop residue on the soil surface is not disturbed and should remain on the soil surface from harvest to seeding and from the latter to harvest. This practice helps reduce soil erosion, especially on highly erodible soils, and allows for adequate stand establishment. About 60% to 70% of residue after planting is generally required to



60% to 90% of residue remains on the soil surface and can help reduce erosion.



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ADVANTAGES

Advantages of the system are:

- Conserves soil moisture by reducing evaporation at the soil surface.
- Depending on tillage method, 60% to 90% residue remains on the soil surface to help reduce erosion. Residue can protect soil particles from rain and wind erosion.
- Requires less labour and fuel and reduces soil compaction due to fewer tillage passes across the field.
- Improves soil health and reduces runoff by increasing organic matter, which helps to improve soil structure and increase water infiltration.
- Firmer soil conditions during harvest.
- Potentially less air pollution from dust and diesel emissions.
- Residue provides food and cover for wildlife.

DISADVANTAGES

The disadvantages of the system include:

- Dependency on herbicides for weed management.
- Requires a no-till planter or planter modification.
- Planting may be delayed due to wet, cool soil temperatures.
- Problems with different insects, diseases, and weed species.

manage erosion and conserve soil moisture, depending on soil types, field conditions, and residue.

FERTILISER MANAGEMENT

Tillage systems affect fertiliser management as the immobile elements of phosphorus (P), potassium (K), and limestone move slowly in most soils unless they are physically mixed during tillage operations.

WEED MANAGEMENT

Weed management in conservation tillage systems depends more on herbicides. Pre-emergence or post-emergence herbicides applied on the surface should be used to manage weeds in a no-till production system. Timing of herbicide application and enhancing crop competition can be effective in managing weeds in a no-till system. Glyphosate application is a very handy tool in conservation tillage systems.

SUMMARY

In summary, conservation tillage is a crop production system that allows the establishment of crops in undisturbed residue of previous crops. ■

THE CORNER POST

FRANCIS DAVIDSON

Optimism cultivates positivity

FRANCIS DAVIDSON, A MENTOR FROM THE EASTERN CAPE, BELIEVES THAT OPTIMISM IS THE ONE QUALITY MORE ASSOCIATED WITH SUCCESS AND HAPPINESS THAN ANY OTHER.

His life is a testimony to this. At 72 he is still very active and says he definitely needs a second lifetime as he is not going to get everything done in this one! Apart from being involved in Grain SA's Farmer Development Programme as a mentor and trainer, he is still farming on a smallholding in the Maclear area and also restores vintage tractors as a hobby as he loves giving 'anything old and rusty' new life.

A MENTOR AND TRAINER IN ONE

Francis is native to the Eastern Cape and grew up in Barkly East where his dad was a farmer. Here the Xhosa language became part of his life and he is often asked by the mentees where he learned to speak isiXhosa. 'I never learned the language; it just became part of me while I was growing up.'

He attended Queen's College in Queenstown and started farming with his father after completing his school career. After a few years Francis started his own mixed farming operation which comprised of sheep, cattle as well as a dairy and he planted wheat, maize and lucerne amongst others.

In 1969 he attended a farm mechanics course at the Bloemfontein Technical College and is proud to have been the dux student. He still does all his own mechanical work and repairs thanks to the knowledge he gained through this course.

This course and his hands-on approach make him a valuable part of the farmer development programme. He joined the team in April 2019 after the funds dried up for the Eastern Cape livestock health programme in which he was involved. 'I was at a loose end.' Craig, his son, then contacted Willie Kotzé, the former operations manager of the farmer development programme. After an interview with Willie and Jane McPherson, former manager of the programme, Francis had a new goal on the horizon.

Unfortunately, the lockdown has hindered the programme and training sessions from commencing. To Francis the worst thing about the lockdown – apart from not being able to work as mentor and trainer – is people's negativity. 'We have to remain positive. People's negativity is really depressing.' He is very glad not to live in a city in this time, but to still have nature and enough room to breathe on his doorstep. The only negative is that his wife, Heather, who is working as a carer in England, may not be able to return to South Africa in June as a result of the Covid-19 travel regulations.

MENTORSHIP DEVELOPS YOUR PEOPLE SKILLS

Francis loves being a mentor and trainer but believes that not everyone is cut out to be a mentor. 'You can't just pick someone off the street to be a mentor – certain qualities are important of which patience is probably at the top of the list!' Mentors also need a good

grip of the language. Apart from English, Afrikaans and isiXhosa, he is also fluent in Sesotho. 'One also has to be a good listener – even for the story you are not being told.'

Mentorship has had a massive impact in his life especially as far as communication and people skills are concerned. He believes that as you come into contact with a variety of people your understanding of different personalities and character traits develop. You learn to 'read' people.

Last season Francis mentored about 80 farmers in three study groups in the little villages in the area from Mount Fletcher to Lusikisiki. 'Working with these people has been wonderful – they are incredible people who soak up the knowledge you share.'

Most of these farmers plant maize, with sorghum and oats – which is used for their livestock in the winter – being cultivated on a much smaller scale. 'This is the area where help is most needed. They need more knowledge about growing fodder crops for the animals to get their livestock more productive.'

For the training sessions he spends Monday to Friday at a village presenting a whole training course like tractor maintenance or maize production. 'The tractor maintenance course seems to be a highlight for the attendees.'

Currently it has been mainly women and older men who attend the courses. He finds it disheartening that the younger generation are just not interested in attending these free training sessions. He would love to see the youth seize this opportunity to develop their skills.

There are two problem areas in these villages that need more guidance urgently:

- The first is assistance with livestock, especially as far as parasite and disease control is concerned.
- The other is crop production. 'Their ideas are vague and with their limited knowledge about aspects like fertilisation, soil health, seed selection and seed varieties their yield will remain small.'

Francis believes in South Africa and is positive about the future of agriculture in the country. With thousands of hectares of arable land lying fallow in the former Transkei area, he really hopes that the government will one day unlock the huge potential here as it offers South Africa an opportunity to further ensure food security. 'The area has a wonderful climate and a good rainfall with fertile soil – ideal for crop production.'

For this optimistic father of three and grandfather of four, the only challenge he encountered in his first season as mentor is the roads which are in such a bad condition that it makes travelling to and from the villages a nightmare. 'The highlights, like the grateful farmers' appreciation, far outweigh this challenge,' he says. ■

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