OCTOBER 2020

PULA
IMVULA

GROWING FOOD • PEOPLE • PROSPERITY

GRAIN SA MAGAZINE FOR DEVELOPING FARMERS

PULA IMVULA

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PULA IMVULA IS AVAILABLE IN THE FOLLOWING LANGUAGES:
English, Tswana, Sesotho, Zulu and Xhosa.

THIS PUBLICATION IS MADE POSSIBLE BY THE CONTRIBUTION OF THE MAIZE TRUST

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A Word From...

Graeme Engelbrecht

THESE ARE UNCERTAIN TIMES. PLANNING FOR THE COMING SEASON HAS DEFINITELY BEEN DIFFICULT. DID YOU MANAGE TO GET FINANCIAL SUPPORT, ARE THE NEEDED SUPPLIES AVAILABLE AND ARE YOU READY FOR THE NEW SEASON?

We have become complacent in this world, relying on doing it the same way over and over again, finding comfort in that that is familiar, not liking it when it changes, resisting, even fighting the change... Until that which has changed has become the new norm, then the cycle begins again, doing it the same 'new' way over and over again.

With this global pandemic we hear those words a lot lately, 'the new norm'. That is because there has been a massive shift in the way the world works, and it may never go back to how it was. The people that survive in any changing world are those that can adapt quickest and best to those changes. It often feels as if some expected it, they adapt so fast!

How adaptable are you and your business? What can we do to make ourselves more adaptable? Is it merely an attitude, is it age related (it often feels so?), is it socio-economic circumstance, is it where you farm or what you farm with that makes you more vulnerable?

All of the above and many more factors do contribute to how adaptable you can be. Farming is a business that likes constants and we tend to set our whole being on that constant. Planting dates, crop selection, agronomical practices, financial sourcing and so the list can go on.

You need to evaluate what has made **YOU** vulnerable and what can **YOU** change about your situation to ensure your survival. You need to use hindsight to look back to see honestly what changes you can make to your farming so that future changes will not be as devastating.

A sophisticated modern world is often depicted as one that is based on networking and reliance on multiple relationships to achieve the almost impossible, until the unthinkable happens. Farmers are known for their strong independence, now may be a time we should learn to rely more on ourselves.

In uncertain times, actually in life, there is one constant certainty, CHANGE. We as farmers are thus particularly vulnerable in setting up our business' in such a way and not taking this **CERTAINTY** into account. This needs to change, we need to change, we need to be the change ourselves.

TOMORROW'S JOURNEY *is prepared today*

THE PLAYER SLOTTED THE PERFECTLY TIMED BALL NEATLY BEHIND THE GOALKEEPER AND A THUNDEROUS ROAR FILLED THE FOOTBALL STADIUM AS THE SPECTATORS ROSE AS ONE CHEERING THE PLAYER AND CELEBRATING THE WIN!

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

We all know the feeling. It's like watching an artist paint the final brushstroke on his masterpiece, or a maestro conducting an orchestra in perfect harmony or even witnessing academic efforts being rewarded on that victorious walk across the graduation stage. We also know that special moments like these don't just happen … it takes a lot of preparation and planning to reach the highest point of success in any game, in any activity – and it's no different in farming. You have to recognise that although timing is very important, it is those difficult, behind the scenes, days, months and even years of preparation that make the successes possible.

For sure, farming is all about timing. The changing of the seasons. The unpredictable weather patterns. The sowing of the seed. Spotting an unwelcome invading pest or disease. And then taking the crop off the field at exactly the right moment. Timing the marketing process has become increasingly more important. But in order to get the timing for all these processes right, one has to be prepared. We can talk about the many processes involved in running a farming operation as much as we like but if we don't plan and prepare for each step along the way we will never be able to play the game – let alone score the winning goal!

Give me six hours to chop down a tree and I will spend the first four sharpening the axe.
– Abraham Lincoln

'A CHATTERING BIRD BUILDS NO NEST' (OLD AFRICAN PROVERB)

How many times have you listened to someone talking and talking about all they are going to do and all they will achieve and you think to yourself 'I wonder if this is another one who is all talk and no action!?'

The bottom line is while many people will talk about doing something, far fewer people will actually get that thing done. Life is full of talkers and doers. We need to stop talking about what we want to do … and begin doing. I speak to myself too. I have always had a fairly decent food garden supplying my home and household, but with me it's often feast or famine. One month I do not know where to turn with all the tomatoes coming in and another month, I am cross with myself because I was not good at keeping the plantings going throughout the season. This year I have promised myself I will stop talking about the ideal of sowing seed every 2 - 3 weeks and I will be consistent about sowing seed regularly. Here's hoping 2020 has some good summer vegetables in store throughout the season! In the same way, a farmer has to be particularly well prepared to plant the next crop or prepare the heifers to receive the right bull for their first calves.

Every project manager, team leader and successful person knows the importance of planning. There is no way any project will be executed without a plan – it does not mean there is no flexibility – it means you have a good idea of what needs to be done in order to achieve your goals.

As we enter another summer season here on the southern tip of Africa, most farmers are eagerly looking forwards to planting the next season's crops. And it follows a particularly good 2019/2020 season for summer grains which saw a higher than average rainfall – something we haven't experienced for a good few years. In my corner of the North West, there was no lull on the farm once the harvest was off the fields because the residual moisture meant the fields were ready to be prepared immediately. So the combines had hardly been parked when tractors were out humming across fields to chop the stalks and rip the soils. Some farmers were also spraying a winter weedicide.

These actions are all important to ensure control of the winter weeds and seed banks that threaten to use up precious moisture. And they are actions based on:

- **Knowledge** – there is residual moisture in the soils.
- **Information** – one must control weeds and conserve moisture whenever possible.
- **Preparation** – readiness to do the right thing at the right time with tractors and implements serviced and ready, as well as the budget for diesel and chemicals where necessary.

BE PREPARED FOR 2020/2021

October month is ready and waiting for first rains. Farmers need to have already decided on their goals for the new season, what crops will be planted and where they will grow. Ideally soils should have already been prepared to control winter weeds and conserve last season's moisture. Furthermore your production facility will have been arranged and you have sourced seed, fertiliser and fuel. Remember we can do what we can with what we have. Be

realistic. Be disciplined. Stick to your budget. Don't over-extend yourself.

AN ANT ON ITS FEET CAN DO MORE THAN AN ELEPHANT LYING DOWN!

Soil samples should have been taken during July or August and the necessary liming operations should already be completed. Fertilisation programmes should be a priority for September and October if you follow a pre-plant programme, otherwise farmers must order and store fertiliser to apply at the same time as planting.

Seed selection is critical now and many influencing factors should be discussed with your seed representatives – pick their brains, make them mentor you! Your budget is important in informing which seed you choose, because your genetically modified (GM) varieties are more expensive. Your seed sales representative should discuss the season and offer advice on short, medium and long-term growers. If the predictions are good for normal to good rains in the new season, the medium to long growers will normally hold better yield potential than the quick maturing varieties. And remember, if you don't select GM and Roundup Ready seed cultivars, you need to have a good weedicide programme planned with the advice of your chemical representative.

Let's take a look at your tractors and implements that will do the hard work getting your crop in the ground. We can't emphasise enough the importance of pre-season maintenance. Down time costs farmers much more money than they realise. Losing precious planting time, while the moisture is steadily seeping away while a tractor or implement is in for repairs can mean the difference between 1 t/ha to 3 t/ha in yield lost and ultimately make or break a crop.

Seed bed preparation is so important regardless whether you are a large commercial farmer or planting a field of maize for your household food supply. An even seed bed must be prepared. Every single maize seed requires:

- Good seed to soil contact for germination.
- Uniform depth in the seed bed.
- Unrestricted space for healthy root development.
- Good air, soil, nutrient movement potential.
- Unrestricted seedling emergence potential.
- Warm soil temperatures.

Seed is very expensive so we need every pip planted to germinate and be productive. You need to know what the ideal plant population in your region is. It will be influenced by your regional rainfall and soil types so network and ask the local experts.

MAIZE PLANTER PERFORMANCE

The quality of the tools you use are as important as the work itself. For the maize farmer, the planter must surely be the most important tool. We do not need the biggest or newest planter but we do need to ensure our planters are serviced and functioning properly. The planter is key to planting the seed at an even depth to ensure best germination. A constant watchful eye should be kept on the planter bins, chains and other working parts, supervising the seed is being dropped consistently and correctly.

The Grain SA Farmer Development team wishes every farmer a successful new season. May our preparations make it possible to do the right things at the right time. May 2020/2021 bring more good rains and fruitfulness to our fields. May we see reward for our labours and may we as farmers, be a blessing to our families, our neighbours and our nation as we fill the storehouses with goodness from our fields. ■

Keep an eye on these indicators during COVID-19

WITH THE COVID-19 PANDEMIC UPON US, THE WORLD IS FACING A GLOBAL HEALTH CRISIS, PART OF THE IMPLICATIONS ARE DEEP ECONOMIC, AND SOCIAL IMPACTS FELT ACROSS THE WORLD. SOUTH AFRICA TOGETHER WITH OTHER COUNTRIES ACROSS THE GLOBE DECIDED TO LOCKDOWN THE COUNTRY TO CONTAIN THE SPREAD OF THE VIRUS.

Ikageng Maluleke, Agricultural Economist, Grain SA. Send an email to Ikageng@grainsa.co.za

For agriculture, which is considered an essential service, the better part of the operations kept going, although there were a few bottlenecks. The lockdown measures that were taken severely affected an already-weak economy. With the challenges facing the economy, farmers need to understand how the overall state of the economy affects their businesses, either directly or indirectly.

RAND/DOLLAR EXCHANGE

An exchange rate is a rate at which the currency of one country is exchanged for the currency of another country. South Africa operates within a flexible exchange rate regime and this means that market forces of demand and supply determine the value in relation to other currencies. A currency's value is mainly determined by demand for goods and services of a country. Since lockdown began, the rand weakened by 22,9%. A weaker rand is supportive towards exports of maize, but the opposite applies to imported inputs like crude oil.

> *South Africa requires bold policies that will lower costs generally and increase investment opportunities, growth potential and job creation.*

CONSUMER PRICE INDEX (CPI)

Measures the changes in prices for household goods and services monthly. Changes in the CPI record the rate of inflation or rising prices and deflation or falling prices. The annual inflation rate in South Africa fell to 3% in April 2020 from 4,1% in March but remained within the Reserve Bank's target of 3% to 6%. Food price inflation, which is a component of CPI, represents the movement in food, indicating an increase in the wholesale price index of essential food items relative to CPI. Food price inflation has increased to 4,6% in April compared to 2,9% the same month last year.

REPO RATE

Is the rate at which the Reserve bank of South Africa lends money to commercial banks in the event of any shortfall of funds. The monetary committee uses the repo rate to control inflation. The South African Reserve Bank has reduced the repo rate by 250 basis points this year, bringing it to a 50-year low at 3,75%. This move is supposed to ease financial conditions and improve the resilience of households and firms to the economic implications of the COVID-19 outbreak.

BUSINESS CONFIDENCE

Measures the degree of optimism that describes the forward-looking expectations of businesses. It is the willingness of investors to engage in investment opportunities based on their perception of risk and return in the economic environment. Businesses give their expectations of the next 6 to 12 months. According to SACCI, business confidence index sank to 77,8 in April 2020 from 89,9 in March.

CONSUMER CONFIDENCE

Measures how consumers feel about the overall state of the economy and their financial situation. When consumer confidence is high, consumers make more purchases. When confidence is low, consumers tend to save more and spend less.

GROSS DOMESTIC PRODUCT (GDP)

Is the total value (monetary or market value) of all finished goods and services produced in a country in a specific period. Since GDP measures domestic production, it functions as an indicator of a country's economic health; it is used to estimate the size of an economy and growth rate. It has been forecasted that the economy could contract by 7% in 2020, revised from the 6,1% decline initially expected in April. Even if lockdown conditions are eased and economic activities recommence, GDP is not expected to grow by more than 4% in the next two years.

UNEMPLOYMENT RATE

Refers to the percentage of the workforce that is unemployed but is willing and able to work and actively looking for work. The unemployment rate is a useful measure of the underutilisation of the labour supply. Reflecting the inability of an economy to generate employment for those people who want to work. South Africa's unemployment rate rose to 30,1% in the first quarter of 2020 from 29,1% in the previous period. It is the highest recorded amount since 2008. The reported amount was before lockdown regulations were instituted. Taking the lockdown situation into consideration treasury estimates that the unemployment rate will surpass 50%.

CONCLUSION

There is a lot of uncertainty in the economy caused by the COVID-19 pandemic. With lockdown expected to ease in the coming months, for the rest of the year and even the first half of next year, investments, imports and exports are expected to decline sharply, with job losses expected to be widespread. Although monetary policy has been used to try to cushion the economy, on its own it cannot improve growth rate or reduce financial risk in the economy. South Africa requires bold policies that will lower costs generally and increase investment opportunities, growth potential and job creation. ■

Why you should consider CROP ROTATION

CROP ROTATION IS ANOTHER ESSENTIAL TOOL IN MANAGING YOUR MOST IMPORTANT ASSET IN CROP PRODUCTION WHICH IS YOUR SOIL. AS A FARMER A KEY OBJECTIVE IS CREATING A SUSTAINABLE AND PROFITABLE CROP PRODUCTION SYSTEM THAT WILL ENSURE THE LONG-TERM SURVIVAL OF A SMALL FAMILY FARM OR A LARGE COMMERCIAL GRAIN PRODUCING ENTERPRISE.

Written by a retired farmer

Crop rotation will go hand in hand with building your soil fertility and the yields of all crops and pastures within the chosen sequence of crops that would be most ideal for your farming enterprise. If legumes such as soybeans or nitrogen fixing pastures such as lucern are included in the rotation the costs of nitrogen fertilisation for the next grain can be reduced. One of the objectives being to reduce input costs and the financial risk within a farming business over the long term.

If you have been mono-cropping (planting the same crop year after year) for many years on a farm or certain lands on the farm, you can start with one or two alternative crop choices in the next production season. It takes several years of producing alternative crops to gain the knowledge to produce them efficiently. The change can go together with introducing a minimum till system as well as crop rotation on farms that have only been mono-cropping. Plan your introduction of either or both carefully to be able to use your existing equipment if possible.

BENEFITS OF CROP ROTATION SYSTEMS

Minimum till systems are based on minimum soil disturbance, crop residue retention on the soils' surface help to improve water absorption by the soil, soil structure or tilth, moisture retention, increase organic matter, reduce soil erosion and increase crop productivity. Planting different crops within a minimum till system can be challenging at first.

Some of the advantages of a crop rotational system are as follows. Alternating shallow rooted and deep-rooted crops ensures that different ratios of soil nutrients are removed from different soil levels. The deep-rooted crops use deeper situated soil nutrients which are then made available for the shallow rooted crops when the plant residues are eventually recycled into the next crop. Soilborne pest and fungi infections cannot gain a hold as can be experienced with monocropped grains. Weed control in maize for example for broadleaf weed control can be alternated with control of weed grasses in sunflowers or soybeans.

This reduces the build-up of resistance to chemical control of weeds in continuous production of maize. These weeds will eventually not be able to be killed by any chemical as they are survivors of previous control regimes over many plant generations. The only way to control weed resistance in this situation is by planting a different crop and to change the chemical control regime accordingly.

Grain yields improve with each crop if the fertilisation is optimally applied and fertility of the soil is also improving. The planning of the right amount of fertilisation for each crop is still critical in maintaining or improving yields within the rotational cycle.

PLANNING THE CROP ROTATION

In making considerations for your planning you can ask whether your crop choices contribute to soil organic matter, provide for pest management, manages the nutrient build-up such as nitrogen for the next crop or the removal of certain nutrients, contributes to soil erosion control, reduces the cycle of build-up of certain weeds or pathogens that can affect the next crop, and the possible effect of chemical control on the next crop or crops in nearby lands.

When starting and planning the rotation use crops with proven yield results in your area.

If you can include soybeans or other legume crops which have been proven to be successful in your area it can be an advantage. Soybean plants collect available nitrogen from the air by harnessing a mutually beneficial relationship with rhizobium bacterial nodules that form on their roots. They supply the current crop with nitrogen and as these nodules break down, they supply nitrogen to the soil for use by the next crop. As an example, in a simple three crop system plant soybeans after an optimally fertilised maize crop followed by sunflowers. The organic nitrogen in the soil will improve the nitrogen required by the sunflower crop which responds well to a build-up of nutrients in the soil as well as the fertiliser applied at planting.

In some areas a maize and soybean or drybean rotation has been successfully implemented. After proving a simple crop rotation pattern, pasture legumes, wheat and barley, medics, teff or a minimum of three years eragrostis pastures for your livestock factor can be introduced. This diversity lowers the risk. If you only plant one crop type and that enterprise fails, it can destroy your farming business.

The crops and pastures used will depend on the prevailing farm climate and circumstances in your farming area.

CONCLUSION

Consider the many advantages of introducing a crop rotation system. If you currently only plant one kind of crop, it is important to start diversifying to lower production and financial risk and to promote sustainable farming into your future. ■

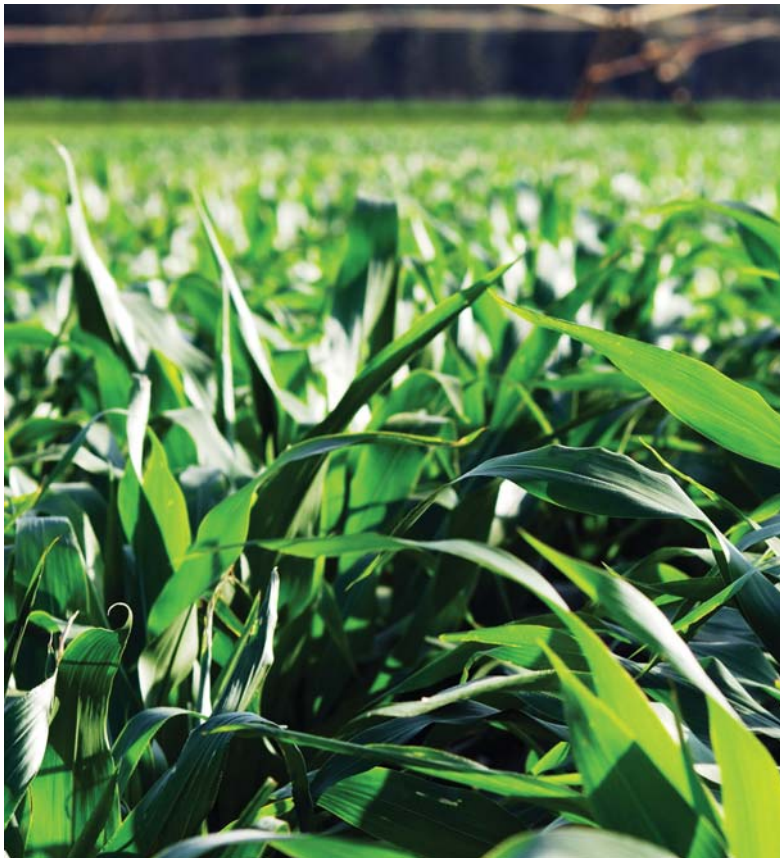
Precision farming
= improved management

LET US REFRESH OUR MEMORIES. PRECISION IS A WORD DERIVED FROM THE WORD PRECISE WHICH IS DESCRIBED AS SOMETHING BEING VERY EXACT AND EXPRESSED IN DETAIL. IN OUR FARMING ENVIRONMENT ONE COULD RELATE THIS TO WHAT WE DO ON THE FARM, TO DO IT AS PRECISELY AND IN DETAIL AND AS CORRECTLY AS POSSIBLE.

Marius Greyling, Pula Imvula contributor. Send an email to mariusg@mcgacc.co.za

Keep in mind the statement – to manage you must measure. To manage properly you need information available from keeping proper records. The more accurate your information, the better decisions you will be able to make, and the better your management.

> *Higher production leads to a higher income whilst the improved management regarding the use of inputs assist in decreasing costs. The combined effect of this are better profits.*



Advanced technologies have taken on a life of its own, giving rise to the concept of precision farming. Precision farming involves the use of advanced equipment, fitted with GPS, variable-rate technology (VRT), computer applications and more, to maximise crop yield with minimum resource expenditure and by providing you with much more accurate information.

BENEFITS

The benefits of precision farming can be summarised in three major categories namely:

1. Higher productivity;
2. Financial benefits; and
3. Greater sustainability and environmental protection.

All aspects of the environment – soil, weather, vegetation, water – vary from place to place. All these factors determine crop growth and farming success. Farmers have always been aware of this, but they lacked the tools to measure, map and manage these variations precisely. Precision farming makes it possible to achieve higher productivity and reduce potential environmental risks, by monitoring and managing all the factors of growth to ensure the optimal conditions for plant growth are achieved.

At the same time, you will be provided with more detailed, correct, exact, and timeously information quicker from satellite images, and electronic devices (even your cell phone) on a much more regular basis than from manual records. This will then enable you to manage for instance the fertilisation, crop health programme, water requirements, and harvesting of your crops on a much more advanced level. The result being higher yields per production unit and/or improved quality products using fewer resources and reducing production costs.

Financial benefits are also achieved. Precision farming aims to reduce a farmer's expenditure by minimising the need for inputs like fertiliser, pesticide, and herbicide. Over a growing season, farmers have experienced significant reductions in the amount of money they are spending on inputs. The technology is assisting in the use of components sparingly and only where and when needed. Higher production leads to a higher income whilst the improved management regarding the use of inputs assist in decreasing costs. The combined effect of this are better profits.

To illustrate – the nutrients supplied by the soil can vary substantially between lands and even within a specific land. We are used to applying fertiliser on an even basis on specific lands for instance 200 kg of Superphosphate per hectare. With the advanced equipment and using GPS information it is now possible to apply different levels of fertiliser

on different areas within a specific land. Where more is needed more is applied and where less is needed less is applied. There could be a cost saving and/or because the plants are supplied according to their needs a higher productivity. Some farmers have achieved an increase of up to 10% in production by using advanced technology.

As far as sustainability is concerned, farmers in South-Africa face but one major problem – to maintain a sustainable profit over the long term. This is because of, for one, the so-called cost-prize squeeze.

Farmers must deliver optimum production and improved quality outputs on a continuous basis whilst minimising inputs, without damaging the environment. To achieve this to the maximum, the use of advanced technology should be considered thoroughly – it can be advantageous but bear in mind it will put pressure on your finances and management.

A word of caution – you must first manage your basic record-keeping and other farming practices correctly and precisely before commencing to actual precision farming using advanced technology. The advantage being that by means of precision farming your farming practices can be done so much more precisely whilst more and accurate data and information are provided timeously to be used when taking decisions.

Precision is a word derived from the word precise which is described as something being very exact and expressed in detail.

When introducing the advanced technology be careful not to overdo it. There could be negative financial implications, and you could become strangled in all the information. Practise precision farming with your manual systems and record-keeping and then introduce the real thing step by step with support from trustworthy advisors according to your needs.

To emphasise – should you wish to survive as a farmer, big or small, and amidst disasters such as the recent drought and now the COVID-19 pandemic you will need to be a smart farmer. These difficult times emphasises that correct, and the necessary information is needed now more than ever to be able to manage your business on a sustainable basis. Precision farming is a tool to assist you in this regard. ■

WORDS OF WISDOM

Inaction breeds doubt and fear.
Action breeds confidence and courage.
If you want to conquer fear, do not sit home and think about it. Go out and get busy.

~ DALE CARNEGIE,
AMERICAN BUSINESS ICON

Enough fertiliser supports sunflower yield

THE PLANNING FOR THE FERTILISATION OF ANY CROP INCLUDING SUNFLOWERS, WHICH IS THE FOCUS OF THIS ARTICLE, REALLY SHOULD START WITH AN EXAMINATION OF YOUR SOIL STATUS, CURRENT NUTRIENT LEVELS, THE PAST FERTILISATION REGIME ADMINISTERED, YOUR CROP ROTATION PLAN AND THE YIELD RESULTS OVER A FEW SEASONS.

If you have not done a soil test in the last few years now is the time to do it. Please take the time and trouble to take the soil samples carefully as described in other articles. It is advisable to use the same laboratory over several seasons to ensure some consistency in the results so that the recommendations can be 'calibrated' for the yield results realised.

Calibration is a term used to measure how effective the fertiliser applied related to the recommendations. It can also be related to the actual yields obtained in practice. Establish a benchmark for your own yields in the same or differing soil types, on your farm, for sunflower yields for example and then make adjustments to the fertiliser regime if you need to increase your average yields.

SOILS

It must be remembered that when you use artificial fertilisers that you are feeding a very complex mixture of soil bacteria, fungi, and other organisms found in a healthy soil first. These then transform all these nutrients into plant available nutrients which can be taken up by the roots to enable plant growth through germination, vegetative growth, flowering and finally seed production.

Study your soil profiles, effective root depths and condition continuously as you farm. Those who have moved to a minimum till system and crop rotation will notice the improvement in soil

Written by a retired farmer

structure, tilth and fertility. If you can build up humus in the soil your soil will be able to hold more plant nutrients which can become available to your sunflowers in the seed head and flowering stages. Please research the concept of humus if this is a new term or concept.

CROP ROTATION EFFECTS

In a rotation, for example, of maize-soybeans-sunflowers, the soybeans (inoculated with rhizobium bacteria), having formed effective nodules on the roots, would have fixed nitrogen from the air which in turn the soybean crop used to grow. The breakdown of the nodules after the harvesting of the soybeans would result in a build-up of organically available nitrogen for the following crop.

> *Assess your soil conditions, do proper soil tests and provide enough fertiliser to achieve your target yield to ensure that a profitable sunflower crop is harvested.*

The estimates for the amount of nitrogen available for the next crop range from 10 kg to 40 kg per hectare depending on soil type, climate, previous crop yield, and tillage methods. This has been extensively researched in a continuous soybean to maize rotation. A minimum tillage system would tie up some nutrients in the plant residues left on

the surface. In your considerations to fertilise your sunflowers you can allow for some tie up of nutrients in the crop residues as well as the nitrogen available in the soil.

A reasonable estimate might be about 25 kg of nitrogen (N) that could be available for the sunflowers planted after soybeans. An assessment of the status of your soil and reference to your soil test will enable you to decide which is the best option for your circumstances.

SUNFLOWER FERTILISATION RECOMMENDATIONS

It is generally accepted that sunflowers respond more to the build-up of soil fertility than the fertiliser applied at planting. **Table 1** can be used as a guideline for your current crop requirements.

The new varieties with the correct cultivation methods are showing yields of 2 tons or more per hectare. It seems reasonable to target 2 t/ha to 2,5 t/ha yields in your planning.

If you target to fertilise for 2 t/ha after soybeans it would allow for the assumed 25 kg/ha of nitrogen reserve to produce up to 2,5 tons in a good season.

Refer to your soil test results. Assuming a phosphate (P) count of 25 parts per million (ppm) and a potassium (K) count of 80 ppm and a yield target of 2 t/ha the following nutrient supply would be required.

Kg N/ha required would be 52 kg; kg P/ha required would be 10 kg and kg K/ha required would be 11 kg (kg = kilograms).

It is assumed that all the fertiliser will be all placed at least 50 mm away from the seed at planting. Some farmers might do an additional leaf spray during the growth phase after a leaf test has been analysed for any nutrient shortage.

It is also an advantage to use a zinc containing fertiliser as well as one with a sulphur component sourced from ammonium sulphate. Ammonium sulphate is very kind to the soil microbes and can really enhance potential yields. If your soils are very high in potassium at above 120 ppm you can get away with no potassium in the applied fertiliser. Some soils might show a high test but is it available to the plant?

The example below assumes that you will plant with potassium using a 4.1.1 (27) rated fertiliser with 0,2% Zn + 16%K+9,0%S.

100 kg of the above mix will contain 18 kg of N, 4,5 kg of P and 4,5 kg of K.

Using the requirements shown above we need 52/18 = 2,88 x 100 kg of N, 10/4,5 = 2,22 x 100 kg of P, 11/4,5 = 2,44 x 100 kg of K/ha for a 2 t/ha yield.

An application of 300 kg of the 4.1.1 will supply 54 kg of N, 13,5 kg of P and 13,5 kg of K/ha which will build our P content and have enough nitrogen to reach our target of 2 tons and allow for a little nitrogen leaching in a very wet year.

The cost/ha for the above recommendation would be calculated from the delivered cost of about R6,100/ton as R6,100/1 000 kg/ton = R6,10/kg x 300 kg/ha for a total cost per ha of R1,830 per hectare. (A 4,1,0 mixture would be about R410 lower if your K status is far above 120 ppm).

Many granular or liquid mixes are available from different fertiliser suppliers but the actual mix applied might be a compromise between all the nutrient requirements planned for the application and the cost thereof.

CONCLUSION

Assess your soil conditions, do proper soil tests and provide enough fertiliser to achieve your target yield to ensure that a profitable sunflower crop is harvested. ■

1 ***Sunflower fertilisation guidelines.***

Compiled by Agrimetrix								
Sunflower fertilisation guidelines (based on FSSA guidelines)								
NPK – removal by sunflowers per 1 ton of marketable product – replacement maintenance								
	N	P	K	S	Seed mass to total above ground ratio is about 1:7			
Seed only	**25,8**	**1,9**	**8,5**	**4,5**				
Stalks and leaves	41,2	5,2	87,6	5,2				
Total	67,0	7,1	96,1	9,7				
Sunflower fertilisation guidelines								
Yield target		**1,0**	**1,5**	**2,0**	**2,5**	**3,0**	**3,5**	**4,0**
Recommended kg N/ha		22	38	54	71	87	102	120
Phosphate (P)								
Bray 1 mg/kg	**Isfei**	Recommended kg P/ha						
5		14	23	32	41	50		
10		11	16	22	28	35		
15		9	12	10	21	26		
20		7	10	13	16	20		
25		6	8	10	13	16		
30		5	7	9	11	13		
Potassium (K)								
NH_4OAc	**Isfei**	Recommended kg K/ha						
20		16	21	27	33	39		
40		10	15	20	25	30		
60		7	10	14	18	22		
80		0	8	11	14	17		
100		0	0	9	11	14		
120		0	0	0	0	0		

Soybean stem rot and STRATEGIES TO MANAGE IT

SCLEROTINIA SCLEROTIORUM IS A YIELD-LIMITING FUNGAL PLANT PATHOGEN, PRESENT ON EVERY CROP-PRODUCING CONTINENT WITH OVER 500 KNOWN SUSCEPTIBLE HOST PLANTS, INCLUDING WEEDS. IN SOUTH AFRICA, HOSTS INCLUDE (BUT ARE NOT LIMITED TO), CABBAGE, CANOLA, CAULIFLOWER, DRYBEAN, HUBBARD SQUASH, SOYBEAN, SUNFLOWER, PEA AND POTATO.

Lisa Ann Rothmann, University of the Free State. Send an email to CoetzeeLA@ufs.ac.za

The diseases caused by *S. sclerotiorum* are characterised by the distinguishing features namely, watery soft rot (**Photo 4A**; symptoms), followed by white cottony mycelia (**Photo 4B** to **4D**), a shredded appearance (Photo 4B) and ultimately melanised mycelium, known as sclerotia (**Photo 1A, 1B** and **6**; signs).

The sclerotia are crucial to the lifecycle of this pathogen, they are the survival structures and with the ability to survive for up to eight years in and on the soil (**Photo 1**). The complexity of this pathogen is complicated due to the sclerotia affording this pathogen the opportunity to form two inoculum types, mycelia (product of myceliogenic germination; **Photo 2A**) and ascospores (product of carpogenic germination; **Photo 2B**). These germination pathways are induced under contrasting environmental conditions.

Carpogenic germination usually occurs under lower temperature ranges than that of myceliogenic germination, however, both pathways prefer high relative humidity, moisture or leaf wetness. The initiation of the stipes from sclerotia leads to the development of apothecia (**Photo 3A**), a mushroom-like structure, which appears much like a teacups' saucer (**Photo 3B**). Ascospores, infection propagules, are forcibly discharged from apothecia when air pressure changes are observed within the canopy, widely dispersing spores. Apothecia are frequently misidentified as the common bird's nest fungus (Photo 3B), belonging to the Nidulariaceae family. In contrast, mycelium of *S. sclerotiorum* is responsible for crown and stem infections nearer to the soil surface (Photo 4D).

The complexity of managing Sclerotinia diseases are extenuated as no conventional resistance exists within any of the host crops. Management strategies have thus relied on reducing the opportunity for the sclerotia to germinate and thus keep the sclerotial population limited, as well as ensuring the disease initiation risk is limited. Although, chemical control is available, in South Africa, there are limited registered active ingredients to manage diseases caused by *S. sclerotiorum*.

Benomyl is registered as a sunflower seed treatment. The remaining active ingredients listed are recommended for application at early bloom, ~1% to 20% flowering depending on the crop. Procymidone is registered for the application on dry bean, green bean, soybean and pea. Sclerotinia stem rot management of canola is possible with either azoxystrobin or a prothioconazole + tebuconazole combination. While leafy vegetables, such as lettuce, can be controlled with a combination of cyprodinil + fludioxonil (AVCASA, 2018).

Registered products are applied at different application frequencies in fields due to the nature of disease variation between provinces, as a result of pathogen virulence and inoculum potential, host susceptibility and environmental conduciveness. As a result of the wide host range, pathogen biology, and environmental dependence the management of Sclerotinia diseases requires an integrated approach. Planting dates, selecting cultivars less sensitive to *S. sclerotiorum*, crop rotations, weed management, population densities, tillage practices and biological control been integrated to manage Sclerotinia epidemics.

SOYBEAN STEM ROT CAUSED BY *SCLEROTINIA SCLEROTIORUM*

1 Sclerotia can be found in harvested seed or in the soil and plant residues after harvest. They have the capacity to survive for approximately eight years in and on the soil.

Common Bird's Nest fungus often confused with apothecia.

3B

Sclerotia formed in the pods and stems of soybean plant.

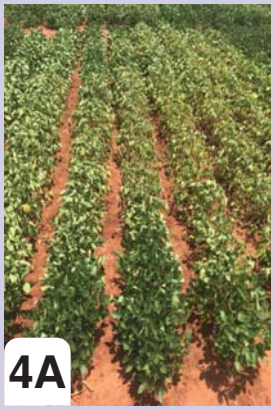
Germination

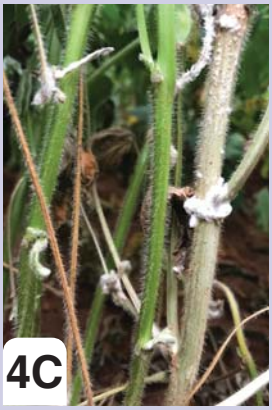
Apothecia as the result of carpogenic germination.

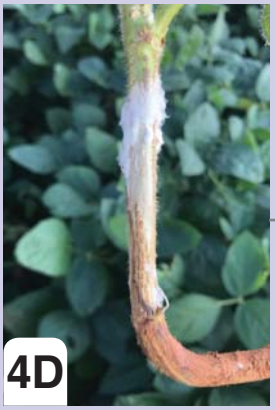
2A Myceliogenic (white mycelium).

2B Carpogenic (stipe formation).

3A Ascospores are forcibly discharged from apothecia.







Stem rot symptoms observed at different scales in the field.

Early flowering through to senescing flowers.

Compiled by Lisa Rothman; Photos by Lisa Rothman and Marlese Meiring

FARMERS ARE THE HEARTBEAT OF OUR NATION

BEING A FARMER IN SOUTH AFRICA HAS TO BE ONE OF THE HARDEST PROFESSIONS. THE CHALLENGES FARMERS GO THROUGH ARE OVERWHELMING, TO SAY THE LEAST. THEIR HOST OF PROBLEMS INCLUDE FARM SAFETY, INFRASTRUCTURE, ACCESS TO MARKETS, FINANCIAL CONSTRAINTS PERPETUATED BY DROUGHT CONDITIONS, UNCERTAINTY IN POLICY DIRECTION AND A TEETERING ECONOMY.

Ikageng Maluleke, Agricultural Economist, Grain SA. Send an email to Ikageng@grainsa.co.za

With the harvest period upon us, things have been rather good for most summer-grain producers, with average to above average yields in most areas. Oilseeds are already harvested, while maize is still being harvested in the Western and Eastern Free State.

I recently had the privilege to travel around the country and visit 20 black grain farmers in five provinces, namely Mpumalanga, KwaZulu-Natal, the Eastern Cape, North West and the Free State. Given my background of being an agricultural economist in the grain sector, I work with farmers daily, but I am based in the city in an office set-up. Our means of communication is via phone or email. We often visit regions, but typically meet in a central location, usually in a town of that region. My exposure to farm life is rather limited and the farms I have visited in the past were more commercial and well developed. We visited different-sized farming operations – from smallholder to new era commercial farmers.

Firstly, I was amazed at the state of the road infrastructure – if there was any – to reach some of these farmers. How do they even reach the market or how do inputs reach their farms? But somehow, they make do. The majority of these areas do not have running water or electricity. Despite all these apparent challenges, one is always welcomed with a big, warm smile when arriving at the farm.

Danie Reichel, Ramoso Pholo, Mapidiyana Manoto, Ikageng Maluleke and Du Toit van der Westhuizen during a farm visit in the Lichtenburg area.

Within these communities there is a social fabric and a sense of warmth like nowhere else I have been. Although each community has its social ills, the presence of a farmer always makes a difference – from job creation to fostering children and even feeding orphaned or elderly neighbours. Among all the farmers that we met, I should just acknowledge the importance of mentorship and partnerships with input suppliers. The knowledge transfer, friendship, trust and dedication are seen through the improvement of each farming operation.

I must say, the subsistence and smallholder farmers captured my heart; they farm on 1 ha to 15 ha of land. With the help of Grain SA, these farmers can produce commercial yields on their small pieces of land, allowing them to feed their families and animals and to sell the surplus to their neighbours or even to mills close by. The pride in their eyes when they talk about their farming operations and show off their fields or great-looking harvest stored in cob cages, is beyond amazing. Most of them work the land using hand tools and they thresh using communal threshing machines that belong to their study groups. This is truly a labour of love. I witnessed first-hand the daily struggles that these farmers face. From a farmer with worry in his eyes because his cow is struggling to calve, to a farmer who has to get water over a kilometre away from her home, but still maintains a vegetable garden. The amazing thing is that they remain so resilient and hopeful regardless of their circumstances.

Moving on to potential commercial and commercial farmers, I have one word to describe this category – impressive. Most of these farms have been taken over from their parents by the younger generation. It is remarkable to see young people so passionate about agriculture and doing well. The use of technology, the level of innovation and new techniques of doing things are astonishing. Although there are many challenges, these young people are committed to the cause for the long haul.

If you ever have an opportunity to visit with a farmer, the conversation will flow easily if you ask about either the weather, their animals, machinery or their family. Throughout all our visits, I met the most humble human beings. What they all had in common was the love they have for the land. Some of us even call it dirt, but to them it is potential. No matter their age, the heart of a farmer remains the same. In their heart lies the desire to bring life to the soil and harvest that life to provide for others. They are tough, true and determined.

Reflecting on this journey, I salute these unsung heroes who contribute to our country's food security despite the odds. I have learnt a lot about grain production and the challenges it presents. This has given me a new perspective on how I can cater to the needs of a farmer. ■

MANAGEMENT TOOLS
to improve yield and oil content

FOLLOWING SOYBEAN, PEANUT AND RAPESEED, SUNFLOWER OIL IS THE FOURTH MOST IMPORTANT VEGETABLE OIL IN WORLD TRADE WITH ANNUAL SUNFLOWER PRODUCTION OF AROUND 18 MILLION TONS AND A CULTIVATED AREA OF OVER 47 MILLION HA. AS IT IS RELATIVELY DROUGHT-TOLERANT AND UTILISES SOIL NUTRIENTS EFFICIENTLY DUE TO ITS WELL-DEVELOPED AND DEEPLY PENETRATING ROOT SYSTEM, SUNFLOWER IS USUALLY GROWN IN RAIN-FED SYSTEMS.

Dr Safiah Ma'ali, ARC-Grain Crops, Potchefstroom. First published in SA Graan/Grain October 2019. Send an email to MaaliS@arc.agric.za

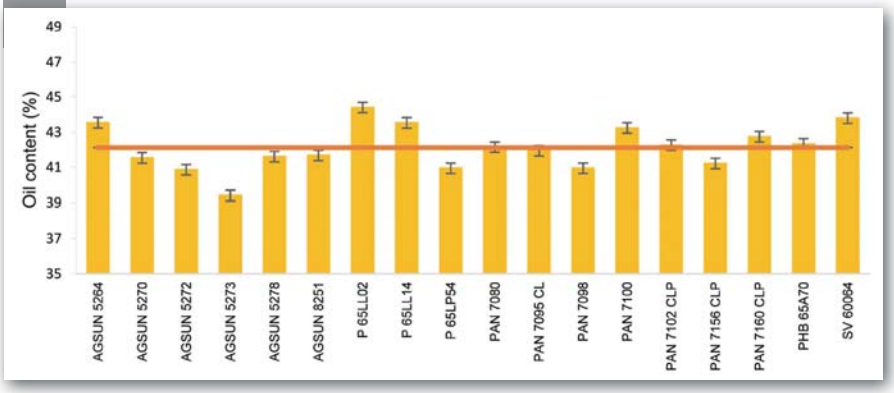
South Africa is the only country in Africa that features within the top 15 global sunflower seed producers, ranked at number twelve and making up a 2% share of global output at 49 million tons. Local sunflower seed production reached 874 595 tons in the 2016/2017 production season.

Worldwide, sunflower is mostly produced for its oil. Oil concentration (usually expressed in percent of seed dry mass) mainly determines the industrial yield of the grains. As a consequence, a 2% price premium is given by buyers in some countries for each percentage point the oil content increases between 40% and 45%. However, a 2% price discount is also taken for each point oil content decreases between 40% and 38% and even a larger penalty as oil percentage decreases further. Both seed yield and oil percentage are accordingly of importance to producers in order to maximise gross income.

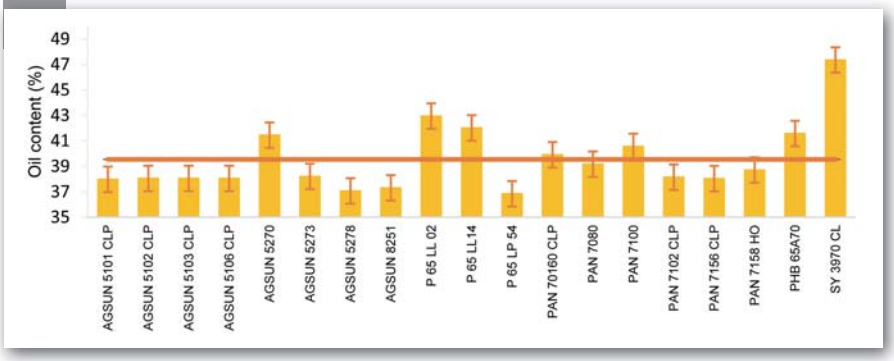
Under optimum water and nutrient requirements, temperature and intercepted solar radiation play a key role in determining yield components and grain quality in sunflower. Grain oil concentration is mainly determined by the amount of the photosynthetically active radiation intercepted per plant during the grain-filling period. In order to maximise the use of natural resources, the appropriate planting date is very important. This ensures good seed germination as well as the timely appearance of seedlings and the optimum development of the root system.

Management tools to improve...

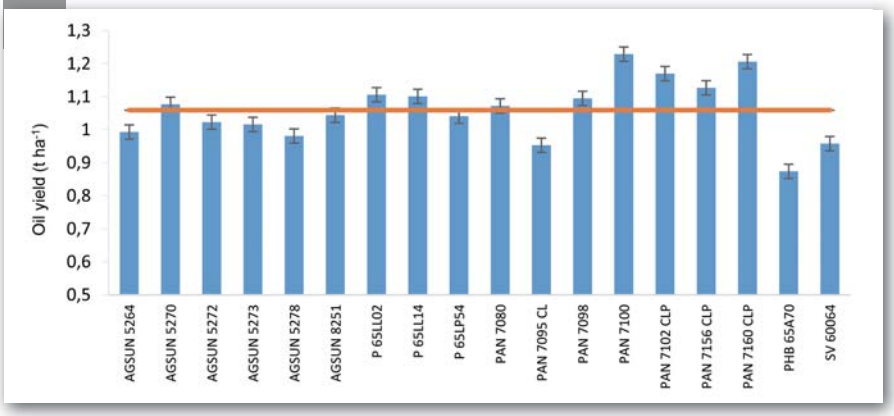
1a ***Oil content (%) of different sunflower hybrids tested during the 2016/2017 growing season.***



1b ***Oil content (%) of different sunflower hybrids tested during the 2017/2018 growing season.***



1c ***Oil yield (t ha^{-1}) of different sunflower hybrids tested during the 2016/2017 growing season.***



A recently conducted South African study indicated that sunflower seedlings exposed to higher than optimal soil temperatures during establishment, experienced impaired seedling development (emergence and root growth). It was also evident that sunflower seedlings can survive and develop at 40°C, but at temperatures higher than this seedling emergence and development will be inhibited.

It has internationally been found that the number of seeds per unit area, which is the main yield component in cereals and oilseed crops, is closely related to the crop growth rate during the critical period for grain set. It was concluded that the critical period for the seed number determination is between 24 and 30 days after anthesis, while grain weight and grain oil concentration are determined during grain filling. It is the only stage during which the determinations of the oil yield components are partially overlapped. Therefore, environmental conditions during this period have a highly significant effect on yield.

Abiotic stresses, such as high soil temperatures (above 40°C), can cause delayed emergence, resulting in uneven stand and ultimately poor yields.

In order to investigate the influence of planting date on oil content as well as oil and seed yield of sunflower, fourteen field trials from the sunflower national cultivar evaluation trials were evaluated. It was done at different localities with different planting dates in the North West and the Free State from the 2016 to 2018 growing seasons. A randomised complete block design with three replicates were implemented for each site. Grain yield was recorded for each trial individually and seed samples were sent to the Southern African Grain Laboratory (SAGL) for oil content analyses.

CRITICAL PERIODS FOR YIELD AND QUALITY COMPONENTS

The relative effect of environmental factors on a given component such as oil content vary according to the crop growth stages, because oil yield components and grain quality are defined in different phenological stages. Seedling emergence is a sensitive stage during sunflower establishment. Abiotic stresses, such as high soil temperatures (above 40°C), can cause delayed emergence, resulting in uneven stand and ultimately poor yields.

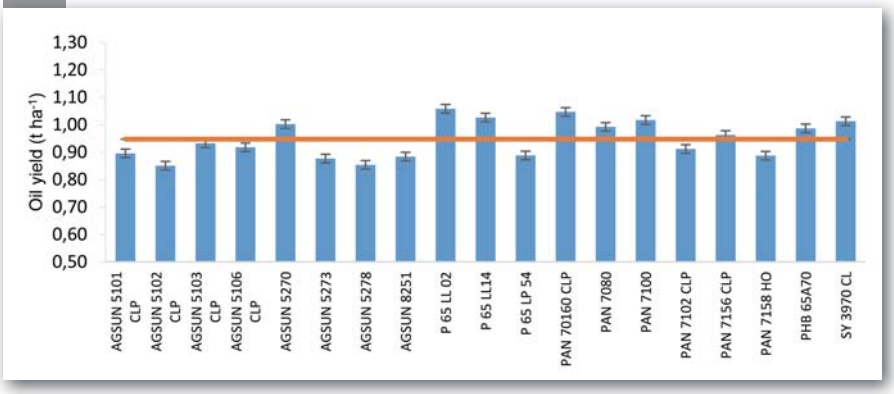
OUTCOME

Oil concentration and oil yield

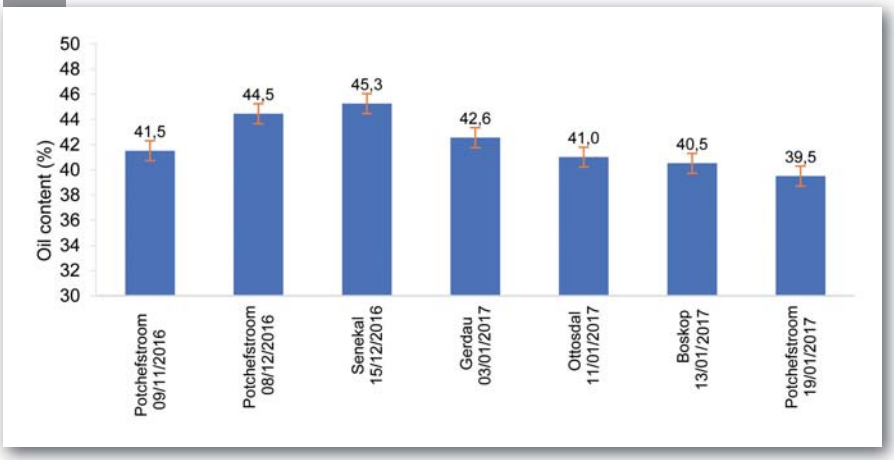
Obtaining higher oil concentration varieties appeared to be an alternative track for enhancing sunflower production and could become a plus value for South African producers. Although sunflower oil concentration was reported to be a conservative genetic component, some studies highlighted differential responses of sunflower genotypes in different cropping conditions. Greater variability of oil concentration was either linked to management and environmental conditions or to genotypic and environment interactions.

The moisture free oil concentrations from the 14 field trials during the 2016 to 2018 growing seasons, as analysed by SAGL NPC, are shown in **Graphs 1a** and **1b**.

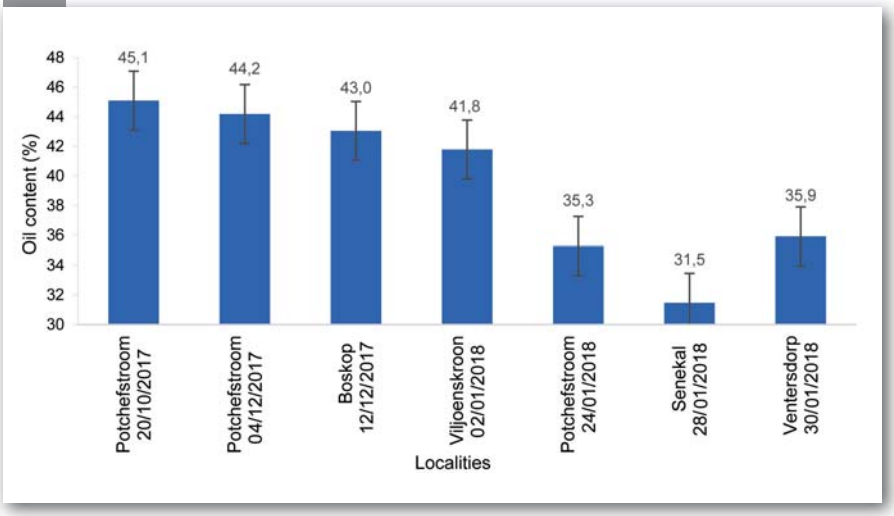
1d ***Oil yield (t ha^{-1}) of different sunflower hybrids tested during the 2017/2018 growing season.***



2a ***Oil content (%) at different localities for the 2016/2017 growing season.***



2b ***Oil content (%) at different localities for the 2017/2018 growing season.***



In the 2016/2017 growing season, the moisture free oil content for cultivars at the seven localities planted during this season varied from 39,4% to 44,4% with an overall mean of 42,1%. The highest oil concentration among cultivars and calculated across localities, was P 65 LL02 at 44,4% followed by SV 60064 at 43,8%. During the 2017/2018 growing season, the moisture free oil content for cultivars at the various localities varied from 36,84 to 47,34% with an overall mean of 39,54%. The highest oil concentration among cultivars and calculated across localities, was SY 3970 CL at 47,34% followed by P 65 LL 02 at 42,94% (Graphs 1a and 1b). Oil yield per unit area is the product of grain yield and seed oil content (ton ha-1) and was calculated by multiplying oil percentage with seed yield. The oil yield for cultivars at the seven localities during 2016/2017 varied from 0,87 t/ha to 1,23 t/ha with an overall mean of 1,06 t/ha. During the 2017/2018 growing season the oil content varied from 0,85 t/ha to 1,06 t/ha with an overall mean of 0,95 t/ha. PAN 7100 and P 65 LL02 (both conventional sunflower hybrids) produced the highest oil yield for 2016/2017 and 2017/2018 respectively (**Graphs 1c** and **1d**).

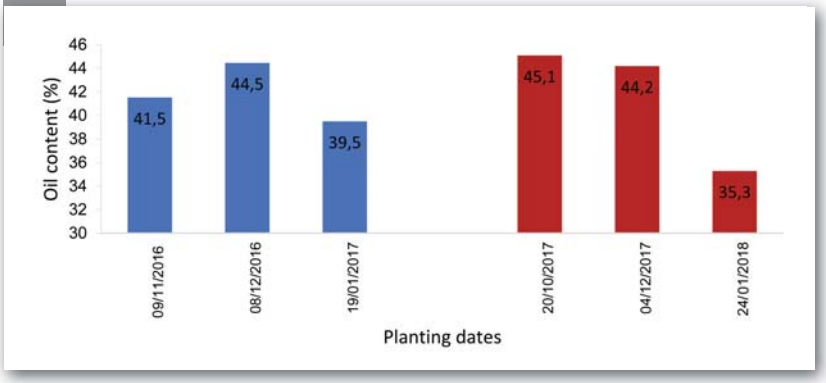
Different planting dates may cause flowering and seed development to occur during periods of widely variable temperatures, radiation, day length and water availability. These variable factors can lead to modification in oil content of the seeds. **Graphs 2a** and **2b** show the effects of localities and planting dates on the oil content (%) during 2016/2017 and 2017/2018. Senekal (planting date 15 December 2016) and Potchefstroom (planting date 8 December 2016) obtained the highest oil content of 45,3% and 44,5% respectively. During the 2017/2018 growing season Potchefstroom (planting date 20 October 2017) had the highest oil content of 45,1%, followed by Potchefstroom (planting date 4 December 2017) with 44,2%. Average oil content was 42,11% and 39,54% during the 2016/2017 and 2017/2018 growing seasons respectively and confirms that oil content is highly affected by genotypes and environment.

A comparison of the effects of different planting dates on oil content at the Potchefstroom research farm is presented in **Graph 2c**. The results indicated that late planting reduced the oil content of sunflower in both growing seasons. Late planting (last week of January) reduced the oil content by 5% and 10% during the 2016/2017 and 2017/2018 growing seasons respectively.

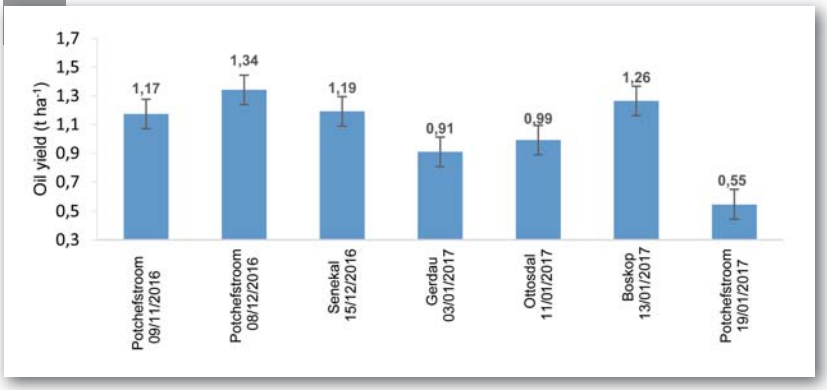
Oil yield per unit area is the ultimate target in growing high-oil sunflower genotypes. Components of oil yield (number of plants per unit area, grain number, weight per grain and grain oil concentration) and quality (fatty acid composition) are genetically determined, but they can be affected to a

different extent by environmental factors that could highly vary during the crop cycle. Oil yield (t/ha) was affected by delaying in planting dates for both seasons. In the 2016/2017 growing season, the highest oil yield was achieved at Potchefstroom, planted in the first week of December, whereas the lowest oil yield (more than half oil yield reduction) was at Potchefstroom with a planting date of 19 January (**Graph 3a**). In the 2017/2018 growing season, the highest oil yield was recorded at Boskop, planted in the second week of December and the lowest oil yield was recorded in Senekal, planted in the last week of January (**Graph 3b**). Comparing the oil yield at one locality (Potchefstroom) with different planting dates (**Graph 3c**), the late planting date (end of January) resulted in a 62% reduction in oil yield during both growing seasons.

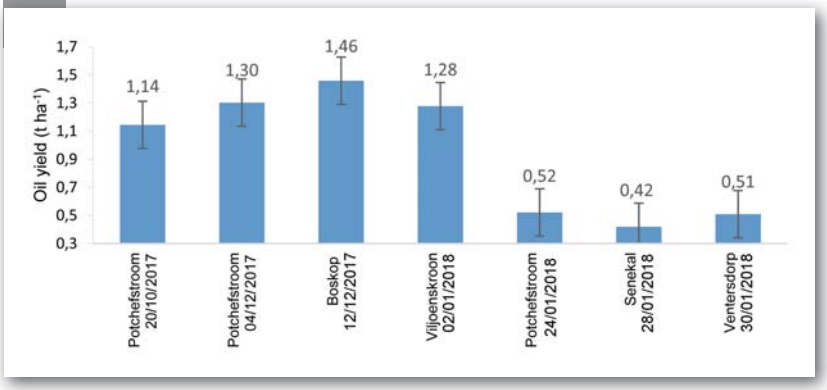
2c ***Oil content (%) at Potchefstroom with different planting dates from the 2016 to 2018 growing seasons.***



3a ***Oil yield (t ha^{-1}) at different localities with different planting dates for the 2016/2017 growing season.***



3b ***Oil yield (t ha^{-1}) at different localities with different planting dates for the 2017/2018 growing season.***



Obtaining higher oil concentration varieties appeared to be an alternative track for enhancing sunflower production and could become a plus value for South African producers.

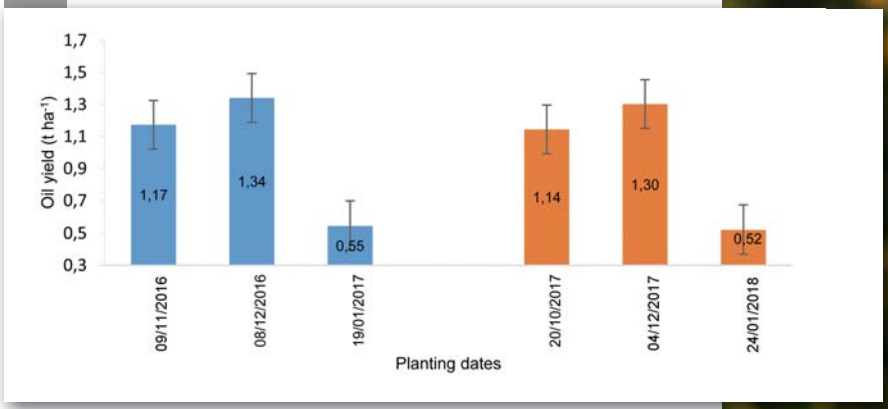
Seed yield

In the 2016/2017 growing season, the average seed yield of 18 sunflower hybrids at seven localities was 2,50 t/ha. The highest locality mean yield (3,12 t/ha) was recorded at Boskop, planted on 13 January 2017 and the lowest of 1,38 t/ha at Potchefstroom, planted on 19 January 2017 (**Graph 4a**). The average seed yield of 19 sunflower hybrids at seven localities during 2017/2018 was 2,31 t/ha. The highest locality mean yield of 3,39 t/ha was recorded at Boskop, planted on 12 December 2017 and the lowest of 1,32 t/ha at Senekal, planted on 28 January 2018. Similar to oil yield, late planting (last week of January) during the 2017/2018 growing season produced lower yields than the optimum planting date at all localities (**Graph 4b**). Significant differences in seed yield were noticed among the tested sunflower hybrids over both seasons. Comparing of yield results at Potchefstroom over two growing seasons and different planting dates, showed that the highest yields were achieved with planting in the first week of December and the lowest yields with planting in the last week of January (**Graph 4c**). Yield reduction was approximately 50% between the optimum and late planting date over both growing seasons.

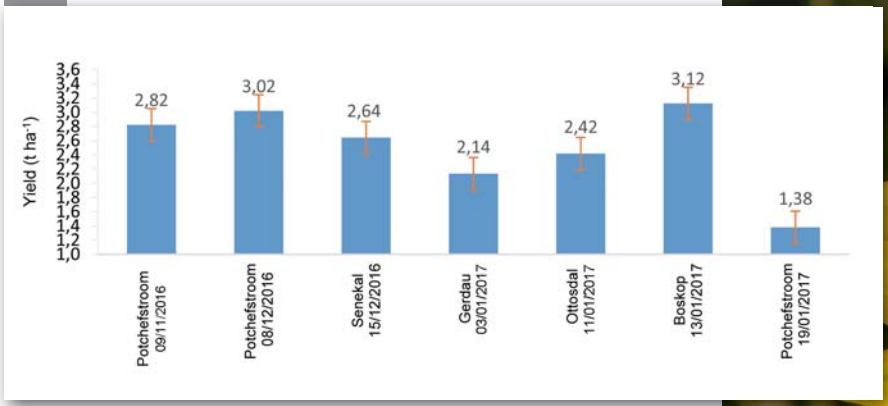
CONCLUSION

This study demonstrated that environmental and agricultural factors such as location, planting date and hybrid may significantly modify oil content and oil yield of sunflower grown in the North West and the Free State. This suggests that these could be used as management tools to improve sunflower seed yield and increased oil content. Significant differences were observed among the sunflower hybrids regarding oil content, oil yield and seed yield. Late planting reduced the seed and oil yield by almost 50 % and oil content reduced significantly compared to the optimum planting date. ■

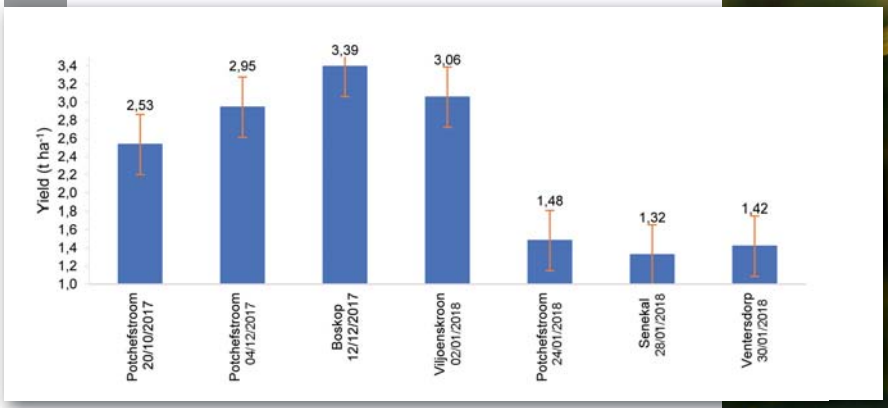
3c ***Oil yield (t ha^{-1}) at Potchefstroom with different planting dates for the 2016 to 2018 growing seasons.***



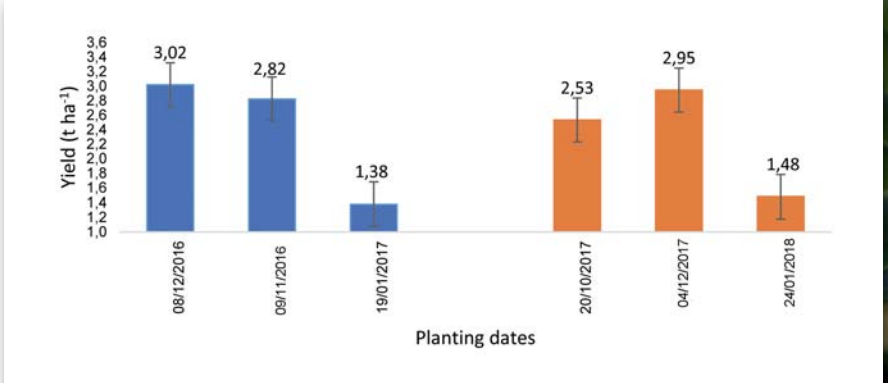
4a ***Seed yield (t ha^{-1}) at different localities with different planting dates for the 2016/2017 growing season.***



4b ***Seed yield (t ha^{-1}) at different localities with different planting dates for the 2017/2018 growing season.***



4c ***Seed yield (t ha^{-1}) at Potchefstroom with different planting dates for the 2016 to 2018 growing seasons.***



KWEEKGRAS:
A customer that is difficult to control

IN AN OPINION SURVEY RECENTLY CONDUCTED AMONG 41 COMMERCIAL PRODUCERS, CULTIVATED GRASS (*CYNODON DACTYLON*) OR MORE COMMONLY NAMED *KWEEKGRAS* WAS NAMED AS ONE OF THE TOP THREE WEEDS THAT GIVE PRODUCERS THE MOST PROBLEMS. INTERNATIONALLY, *KWEEKGRAS* IS REGARDED AS A PROBLEM WEED IN 40 DIFFERENT CROPS IN MORE THAN 80 COUNTRIES.

Dr Maryke Craven, Marlene van der Walt and Dr Jeanetta Saayman-du Toit, ARC-Grain Crops, Potchefstroom. First published in SA Graan/Grain October 2019. Send an email to CravenM@arc.agric.za

This weed is characterised by its ability to rapidly penetrate cultivated fields, leading to great crop losses. In a Brazilian study it was found that *kweekgras* reduced yields in cotton by 40%, while the weed, together with red nut grass (*Cyperus rotundus*), reduced maize yields by up to 90%.

Kweekgras is legendary for being difficult to eradicate when it has taken root. This article focuses on aspects that contribute to *kweekgras* being such a difficult weed to control (**Photo 1a** and **Photo 1b**), and on the control strategies that are recommended.

BIOLOGY

Kweekgras is a creeping perennial weed that mainly spreads through runners on the ground (stolons), and rhizomes (rhizomes) below the surface (**Photo 2**). The weed has an average area increase of 0,9 m² per month, which is considerably lower than the 2,8 m² of red nut grass, for example.

This weed does not grow very high – including the inflorescence, usually not higher than 40 cm. The inflorescence consists of three to seven ears of 3 cm to 6 cm that are digitally arranged (**Photo 3**). Approximately 85% of the rhizomes are located in the top 20 cm of the soil, with few rhizomes occurring deeper than 30 cm.

When temperatures start increasing in spring, new runners grow longer and new shoots (stems) sprout. Seed start germinating when daily temperatures are above 18°C. During the summer the weed grows laterally in concentric circles from the original rhizome. Significant growth takes place at temperatures above 24°C, while maximum growth rates occur at 38°C.

Internationally it has been found that seeds that have moved through the digestive system of sheep and cattle retain their vigour and in certain cases display even better germination. Seed can survive and remain vigorous under field conditions for between three to four years.

Kweekgras is adapted to a wide range of soil types and conditions. It grows better in heavier clay soils than in sandy soils in dry regions, possible because of the higher water-holding capacity of clay soils. *Kweekgras* can also survive long periods of waterlogged conditions, although little to no growth occurs without sufficient soil aeration. Eight days of waterlogged conditions under running water and four weeks of standing water, for example, had no effect on the ability of the weed to sprout.

Although the weed can grow in a wide range of pH soils, it tolerates alkaline soils better than acid soils. Growth is promoted, for example, when lime is applied to soils with a pH of 5,5.

Kweekgras *in maize plantings.*

CONTROL

Experts agree that although *kweekgras* can be controlled, no instant solution is available. Despite the fact that mechanical control often just aggravates the problem by breaking up the stolons and rhizomes into cuttings, it does have a role in an integrated control programme.

Studies have shown that rhizomes buried at a depth of 20 cm produced shoots within a month,

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***Runners and a rhizome of* kweekgras.**

3

***The inflorescence of* kweekgras.**

while those buried at a depth of 30 cm did not produce any shoots above ground. The latter rhizomes did form growth buds, but these rotted before they could reach the surface.

Kweekgras is very susceptible to drying out. However, long rhizomes and dormant runners require long periods of drying to destroy the activity of the growth buds. It has been found that the air drying of single-node rhizome fragments for a period of seven days led to budding being inhibited. A three-node rhizome fragment continued to bud after seven days.

Actively growing runners are more susceptible to drying out than runners that are dormant or just out of the dormant stage (post-dormant). The critical moisture levels required to stunt regrowth differ between the runners and the rhizomes – 39% for the runners compared to 15% for the rhizomes. Greater inhibiting effects were further obtained when *kweekgras* was cut on warm, dry days rather than on cool, moist days.

Kweekgras requires not only high temperatures to grow optimally, but also high light intensity. The weed requires direct sunlight to grow and dies with increasing levels of shadow. Producers should exploit this characteristic in controlling the weed by looking at two widths, plant establishment and the type of crop that is planted.

International studies show that the growth decreases at higher temperatures due to overshadowing, possibly because of the increase in respiration rate relative to the rate of photosynthesis. Increasing the nitrogen level while maintaining a low light intensity can further harm the growth of the *kweekgras*. This phenomenon is attributed to the fact that nitrogen increases the hampering growth effect of the low light intensity on the shoots and rhizomes, while the reserve carbohydrates are reduced and the raw proteins are increased.

Herbicides form a vital part of *kweekgras* control. Unfortunately, limited options are available to producers in this regard, with glyphosate still being the common product that is used in the battle against *kweekgras*. However, excessive or repeated use of this leads to the development of resistant populations. It is therefore extremely important for producers to introduce other products in their weed control programmes too.

Here crop rotation plays a major role, because it broadens the spectrum of useful herbicides. Agrochemical agents should be contacted in this regard with respect to the available options, as well as the latest products on the market.

In the case of heavy *kweekgras* infestations, active steps should be taken to bring the weed under control. During the fall (February/March) the metabolism of *kweekgras* changes and the plant starts moving nutrients to the roots in order to survive in the cold months. Fall is the best time to spray *kweekgras*.

Glyphosate (at the highest recommended dosage) that is applied at this stage, for example, is then translocated to the roots together with the nutrients and this kills the entire plant. However, take cognisance of the label instructions to make sure that the glyphosate is applied correctly. Where regrowth occurs in a few cases, spot spraying can control the *kweekgras*. It is always important to spray headlands and access roads too before the *kweekgras* establishes itself there.

Experts recommend a mechanical winter tillage to break up the stolons and rhizomes. When rhizomes and stolons sprout during spring and early summer, glyphosate (at the highest recommended dosage) can be applied again. Normal tillage practices for the season can be resumed after three weeks.

As was mentioned before, crop rotation should also form part of the control strategy, however, particularly by alternating grass crops with broadleaved crops. A grass control programme is then followed within the broadleaved crops, after which the winter tillage programme is followed once more with spraying of glyphosate at the highest recommended dosage. If the principles above are applied repeatedly, they will contribute towards the control of *kweekgras* infestation.

The international recommendation is that no-till is not be considered where very high infestations of *kweekgras* occur. ■

COLLARS HALT THEFT AND PREDATION

STOCK THEFT IS PROBABLY ONE OF THE BIGGEST CHALLENGES TO ANY STOCK PRODUCER. THE LOSS OF A SINGLE ANIMAL IS ONE TOO MANY. HERDS ARE BUILT UP OVER DECADES AND EVEN GENERATIONS, AND THE LOSS OF GENETIC MATERIAL, GROWTH AND PEACE OF MIND MAKE RETENTION AND INVESTMENT DIFFICULT. IT SIMPLY BREAKS A STOCK PRODUCER'S HEART.

Gert Meintjes, Hotgroup. First published in SA Graan/ Grain October 2019. Send an email to gert@hotgroup.co.za

Hotgroup's collars are an ideal aid not only against stock theft, but also against predation. It can furthermore be used for grazing management and precision management, and with distance farming as in the case of leased land or multiple farms.

These collars monitor aspects like grazing behaviour, health, virtual borders and the utilisation of grazing. However, it is the syndrome monitoring of group behaviour that makes the system so successful. The collars also identify specific behaviour.

They are made from a thick woven fabric with a rubbing-protection layer on the outside that is reinforced with an interwoven band of 10 mm stainless steel. Only a few collars are needed per herd and each one contains a rechargeable battery that has to be recharged only once or twice a year.

They are easy to use, and no towers, solar panels, contracts or debit orders are involved.

The collars communicate via the 2G cell phone signal (GPRS/ EDGE) of Vodacom and MTN and use GPS satellites for positioning. Cell-phone airtime is provided by Hotgroup. A producer monitors his herd on his cell phone and/or laptop via satellite images from any place in the world – distance is therefore not a problem. Notices are sent by SMS and email.

Hotgroup collars remain under guarantee (excluding damage during use) and therefore have an unlimited useful life. If you therefore have one, you have it for always! ■

Different collars have been designed for specific animals and applications.

The *challenges* of our smallholder farmers

SMALLHOLDER FARMERS TEND TO FARM IN AREAS THAT HAVE VAST POTENTIAL, YET, THE CHALLENGES FACING THESE FARMERS ARE COUNTLESS. TO TURN PASSION INTO PRODUCTIVITY REQUIRES EFFECTIVE SOLUTIONS, TAILORED TO MEET THE NEEDS OF THESE PRODUCERS.

Everlyn Musyoka, Smallholder Strategy Lead in Africa, Bayer. Send an email to everlyn.musyoka@bayer.com

One of the biggest challenges that smallholder farmers in Sub-Saharan Africa face, is the fact that they are expected to produce more with the limited resources available to them.

'Part of the challenges that smallholder farmers are facing today is low productivity. This is mainly driven by the fact that they lack access to quality inputs', says Everlyn Musyoka. In this regard, the affordability of cutting-edge technology together with the lack of knowledge on how to improve productivity and maximise the small production areas in which they are located, poses major threats to the sustainability of these farming practices.

Over the years, the breach between smallholder and commercial farmers have grown and so has the need to bridge this gap and improve the efficiency and productivity of smallholder farmers. According to Everlyn, this has allowed the opportunity for the private sector, the government and development partners, to assist smallholder farmers in the process of scaling-up. This involves the improvement of access to better technologies and linking them with the correct financial institutions in order to gain access to credit facilities to afford these inputs.

Accessibility to quality inputs such as technology, will not only increase productivity, but will have a notable effect on the sustainability of smallholder farming practices. For this reason, Bayer is deploying resources to ensure that we interact with smallholder farmers to help them gain access to our latest innovations and technologies. Bayer is also taking hands with development partners and government to ensure that the relevant production knowledge is passed on.

Bayer is committed to continuously develop products and technology to support the important work of our smallholder farmers and to provide solutions for the challenges they are facing. Together with the unrivalled support from our dedicated sales teams, you can rest assured of an abundant harvest.

Contact your nearest Bayer sales representative and receive the support you need. ■

THE CORNER POST

ERIC WIGGILL

Big changes start with small steps

AMERICAN AUTHOR, LOUIS SACHAR, SAID: 'IT IS BETTER TO TAKE MANY SMALL STEPS IN THE RIGHT DIRECTION THAN TO MAKE A GREAT LEAP FORWARD ONLY TO STUMBLE BACKWARD.' AS MENTOR, ERIC WIGGILL FROM THE SWARTBERG AREA IN KWAZULU-NATAL, REALISED THAT BEFORE THERE WOULD BE VAST IMPROVEMENTS IN YIELD, HE FIRST HAD TO TAKE SMALL STEPS AND ADDRESS THE LACK OF KNOWLEDGE ABOUT THE BASICS.

Louise Kunz, Pula Imvula contributor. Send an email to louise@infoworks.biz

'Lack of basic knowledge was one of the biggest challenges we faced when we started the programme. The aim was to teach maize production, but you ended up first sharing the basics, like how many kilograms are in a ton.' Through addressing small things initially before sharing knowledge about agricultural practices that would improve agricultural practices, there was vast improvement amongst the mentees in this area'.

FROM HARDWARE TO MENTORSHIP

Eric got involved in Grain SA's mentorship programme through Ian Household, the previous development coordinator. They established the Jobs Fund project in deep rural areas in the Eastern Cape and KwaZulu-Natal where poverty is widespread.

Right at the beginning he covered a vast area and travelled about 1 500 km per week. 'The Kokstad area started off with about 200 farmers. There was however such a desire for knowledge that there was huge growth in the area. Our numbers doubled every year and approximately 1 500 mentees are now part of the programme,' he shares.

Eric's own agricultural knowledge stems from attending Weston Agricultural College in Mooi River, KwaZulu-Natal. After completing his final year, he travelled abroad and did tractor driving on farms in Europe.

Although he tried his hand at plumbing and even opened a building maintenance company, he eventually returned to his passion, agriculture, when he bought a smallholding in the Swartberg area. Here he has been farming with sheep, chicken and pigs for about six years.

At the onset of the mentorship programme, Eric's biggest challenge was to try to adapt to the language. Being fluent in IsiZulu, study groups in KwaZulu-Natal didn't prove a problem. As he had some Xhosa skills, the areas like Bizana where Xhosa was spoken, actually helped him to improve his language skills. Sotho was the main language spoken in areas nearer Lesotho and although with time he could understand more of what was being said, he often battled to find the right words to express himself.

Eric has since qualified as an assessor and facilitator to be more equipped in teaching older people in rural areas.

TURNING STUMBLING BLOCKS INTO MILESTONES

As in many of the areas, mechanisation is one of the biggest stumbling blocks the mentees have to face. 'Not having their own machinery, they have to rely on contractors who are not reliable and whose knowledge is also lacking.' He even included contractors in his study groups giving guidance on the calibration and maintenance of equipment. Eventually each small step was a step towards improvement.

Another problem was changing poor agricultural practices that have been with them for generations. Trying to get the farmers into the planting times was a huge challenge as they planted on the same date every year. 'No-one had taught them that there are various factors like weather patterns to take into account when it comes to planting dates.'

Fortunately seeing is believing and as soon as the mentees witnessed the improvement in the field, they were on board. 'An 80-year-old *gogo* stood up at a study group session one day and said she didn't understand why she had to wait until the age of 80 to be given this information.' Farmers were only harvesting between 1 t/ha and 2 t/ha and after implementing the changes they were getting 7 t/ha to 9 t/ha.

Although hunger was on the table in so many communities during the COVID-19 lockdown, Eric found that his mentees were coping. 'They knew how to grow and mill maize and had also learned to grow veggies and feed their animals. Growing maize forms a small part in the bigger picture of farming,' says Eric.

In many of the rural areas where the mentorship programme has been implemented the attendees are older with more ladies than men joining the study groups. In Eric's groups there are more women than men ranging in age between 55 and over 70. He tried to address this problem by inviting the young people who were at home to join the study group sessions. He tried to involve them and get their interest growing as they will have to take over from their parents eventually.

CHANGE IS PART OF THE PROGRAMME

To Eric the rewards in being a mentor are huge. 'Seeing a whole community harvesting and being happy, realising things are looking more positive, makes the effort you put into it worthwhile. Mentoring is about going the extra mile.'

He also says that personal change comes with the territory. 'I have become more accepting of people who are lacking in knowledge. Instead of brushing them aside, I have learned to slow down and teach – and being a teacher is very rewarding.'

Even though he was raised in Lesotho and was always surrounded with people from rural areas in his childhood, Eric was still surprised at how easily he became part of the community. 'I met amazing people and never felt threatened anywhere in these rural areas. I was really looked after by the mentees.'

Eric has not just gone the extra mile, but is taking the complete journey with his mentees. He still receives phone calls from some of them who just want to check in on him. 'And sometimes all they want is a bit of advice,' he adds. ■

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