

MARCH 2019

# PULA IMVULA

**GROWING** FOOD • PEOPLE • PROSPERITY

GRAIN SA MAGAZINE FOR DEVELOPING FARMERS





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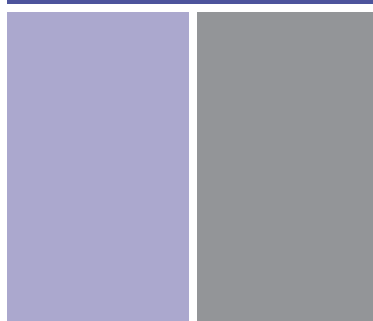
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## A WORD FROM... *Du Toit van der Westhuizen*

**W**E ACTUALLY CALL THIS TIME OF THE YEAR MERCEDES TIME: THE TIME WHEN THE GRAIN IS IN SEED AND WE ARE HOPING FOR A BEAUTIFUL HARVEST, DEPENDING ON THE DIFFERENT REGIONS.

This is the time when farmers usually start looking around to see what new car they are going to buy, but the disappointment can be great when the crop does not turn out like they had envisaged. Do not take chances with debt. Remember: 'Don't count your chickens before they hatch', and please take care of your responsibilities before you incur any unnecessary debt or spend any money.

We have had a difficult planting season across the country, with rain not falling everywhere and on time. We can clearly see where some farmers were forced to make plans to get the seed in the ground on time with the hope that a crop will realise. Farmers in the North West and the Free State in particular had not had rain by Christmas and subsequently had to adapt their crop planning. Less maize and more sunflowers were planted.

There are of course farmers who are still struggling to control weeds. Weeds are definitely the farmer's biggest enemy, and in a year like this one, weed control can be the determining factor between a big crop and crop failure. Financing was also very limited and the farmer's only solution was to save where possible without skimping on the planting.

Luckily, a farmer can make a plan, and plans were certainly made! Farmers should make sure they maintain a healthy relationship with financiers. Great efforts are made year after year to arrange financing for farmers and it is just easier if a farmer is honest about his crop. If you as farmer feel that there is something wrong on your land that might prevent you from servicing your account, report it to the financiers immediately.

May each person who worked hard this past season be blessed and surprised when the harvesters run! Greetings from North West. ■



# IF FARMING IS BUSINESS, then farmers must be BUSINESSMEN

**E**VERY FARMER NEEDS TO VIEW HIM OR HERSELF AS A FULLY-FLEDGED BUSINESSMAN NO MATTER HOW LARGE OR SMALL – AND EMBRACE GOOD BUSINESS MANAGEMENT PRINCIPLES. IN THIS ARTICLE WE LOOK AT FARMING THROUGH AN ENTREPRENEURIAL MAGNIFYING GLASS.

General Eisenhower said, *'Neither a wise man nor a brave man lies down on the tracks of history to wait for the train of the future to run over him'*, which means that every farmer should be scanning the sector and planning his actions very carefully according to the information he gleans.

## SCANNING THE PHYSICAL ENVIRONMENT

At the moment where I live in the North West Province, farmers are busy nurturing young summer crops, waging war against weeds and pests and anxiously monitoring weather reports and the blue, searing hot skies which seem to stretch forever. We long for the gentle curtain of cloud to be drawn across the sun and soft veils of soaking rain to descend upon our dry, thirsty land – but we won't complain if the skies turned angry with dark, thunderous clouds which spit tongues of lightening and send torrential rains either!

*Bill Gates has said we always overestimate the rate of change that will occur in the next two years – but we underestimate the rate of change which will occur over ten years.*

Diverse challenges confront farmers witnessing the fields wither in the heat. A Colorado State University study revealed that **skill is required to manage our businesses in such times** since stress and depression cause farmers to become vulnerable. Among behavioural pattern spikes observed are increased substance abuse, on-farm accidents and injury and suicides. Statistics reveal increased conflict between husbands and wives and raised tensions between parents and children, with a knock-on effect into poor school performance and lower self confidence levels.

The choice lies in how one reacts in these circumstances. **It all comes down to resilience.** Resilient people are ones who have developed leadership competencies and are likely to choose the 'fight' rather than 'flight' option. These individuals seek solutions and reach out for help. Resilience helps us to adjust our thinking away from a sense of lack towards a path where we concentrate on our options – it moves us from inaction to action on the farm and in our relationships.

## A BUSINESSMAN LOOKS TO THE FUTURE

Jim Carroll a leading futurist observes, *'Some people see a trend – and see a threat. Innovators see the same trend – and see an opportunity.'* He believes **we need to acquire 'business agility'**. This empowers us to respond to fast external trends in order to spot opportunity, ward off challenge and align resources for fast success. Farmers, who maintain

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this is not relevant to them, make a mistake. This is exactly why some for example, have successfully embraced the futures trading platforms while others stand by frustrated and negative.

**How do we achieve this business agility** while we contend with issues which make us feel burdened and overwhelmed? We re-focus on the big picture and get a vision for our operations where we can thrive within the change. Carroll says issues we could focus on are:

- Rebuild our competitive intelligence capabilities;
- Abandon tradition and get more projects going on the leading edge;
- Be decisive;
- Be innovative;



## 1 SWOT analysis.

S STRENGTHS	W WEAKNESSES	O OPPORTUNITIES	T THREATS
<ul style="list-style-type: none"> <li>What strengths does your business have that make you competitive? Examples might include family, labour, machinery, farm size, etc.</li> <li>What do you do better than anyone else?</li> <li>Are you a better administrator, agriculturalist or mechanic?</li> <li>Are you a well-respected employer?</li> <li>Are you able to complete planting and harvesting duties efficiently?</li> <li>What do others see as your strengths?</li> </ul>	<ul style="list-style-type: none"> <li>What could you improve?</li> <li>What is holding you back?</li> <li>What little changes might make big impacts?</li> <li>What should you avoid?</li> <li>Have you completed a financial analysis of your business to evaluate enterprises?</li> <li>What do other farmers do better than you?</li> </ul>	<ul style="list-style-type: none"> <li>What trends are facing your business?</li> <li>Will you have to increase in size to remain competitive or can you remain at your present size?</li> <li>What is happening in your community that can be advantageous?</li> <li>Are new facilities coming to your area that could provide a new market for crops you grow and sell?</li> <li>Is there an opportunity to market directly to local consumers?</li> <li>Is there a niche/specialised market?</li> </ul>	<ul style="list-style-type: none"> <li>What obstacles do you face?</li> <li>What is your competition doing?</li> <li>Do changes in technology threaten your business?</li> <li>Does your financial position threaten your business?</li> <li>Could any particular weakness seriously threaten your farm?</li> </ul>

- Develop unique partnerships and mix different generations together; and
- Adapt to new technology – rapidly!

Bill Gates has said we always overestimate the rate of change that will occur in the next two years – but we underestimate the rate of change which will occur over ten years. Ten years ago, there was no twitter, no Amazon Kindle reader and Facebook was used mainly by university students – even Apple and iPads were the playground of few – and yet today they are critical tools for everyday life. There is no doubt that we need to keep our finger on the pulse of change.

*Resilience helps us to adjust our thinking away from a sense of lack towards a path where we concentrate on our options – it moves us from inaction to action on the farm and in our relationships.*

A few changes mentioned in Carroll's '25 Trends for 2025' are:

- Cash will have all but disappeared.
- Africa will have ceased to be 'a rural continent' due to massive migration and urbanisation. The majority of the world's population will live in less than 30 mega-cities by 2025.
- Mass urbanisation will force vertical expansion and 'skyscraper' technology.
- Life expectancy in the west will increase while in Asia, Africa and the Middle East it may decline.
- A new business model will emerge with small groups of people focused on goals, ideas and innovation. Think BIG. Be small!

- Paper will belong in 'the olden days'.
- Education will shift to 'just-in-time' knowledge. Opportunities will depend on the ability to get the right knowledge at the right time for the right purpose. University degrees will be obsolete.
- Sub-Saharan Africa will emerge as the world's new China with fast paced advancements in water osmosis, desalinisation and micro-weather control.

### EXAMINE YOUR BUSINESS RIGHT NOW

**I challenge you to start this new year by conducting a SWOT analysis of your business.** The SWOT analysis is a first step towards strategic business planning and is a technique used to analyse the strengths (S), weaknesses (W), opportunities (O) and threats (T) of a business. This is a useful tool to discover more about these four aspects of your business and will lead you to look at potential for success and be more aware of risks.

Draw four squares on a blank page as illustrated in **Table 1** and fill in any thoughts that come to mind in the relevant blocks. Strengths and Weaknesses will be internal matters which YOU can CONTROL, INFLUENCE and CHANGE while the bottom two squares will be Opportunities and Threats which focus on EXTERNAL issues which you cannot necessarily control – but can possibly manage in a way that reduces the negative impact on yourself and your business.

The SWOT analysis is not a once-off exercise but rather an annual review. You use it to review achievement, measure efficiencies and identify areas that need improvement. If we are serious about business success we need to be serious about our approach to strategic planning and follow through on it throughout the year. May 2019 be a fulfilling and rewarding year for us all. ■

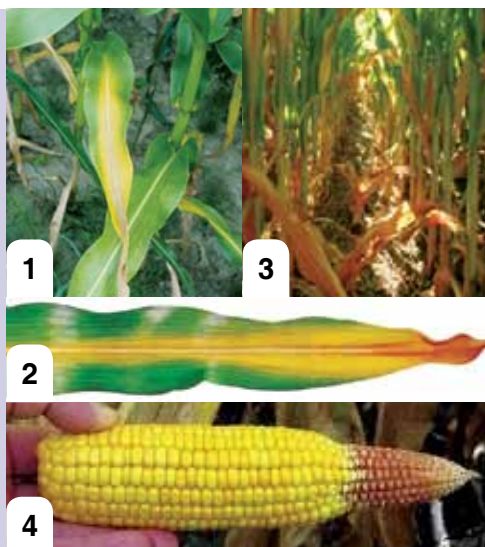
# FERTILISER REQUIREMENTS

## for optimal maize production



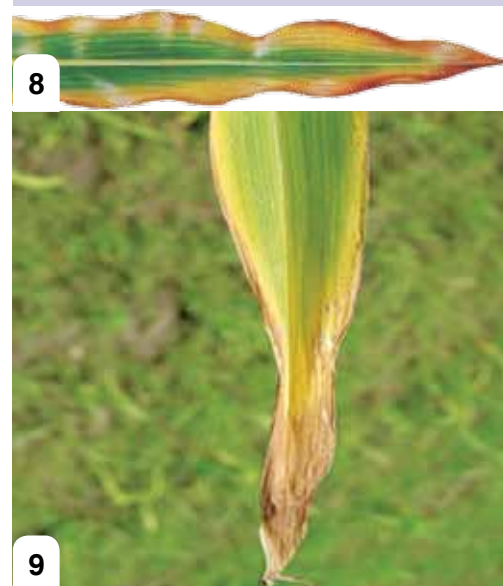
### NITROGEN (N)

- Reduced plant growth and takes longer to flower.
- Pale green or yellow colour (**Photo 1**).
- Yellowing of older leaves starting from the tip, progressing along the mid-rib in a characteristic inverted "V" pattern (**Photo 2**).
- If the deficiency is severe the affected area eventually turns brown and dies. Older leaves show the first symptoms (**Photo 3**).
- Tip of the cob devoid of seed and the tip ends abruptly with flinty seeds (**Photo 4**).



### POTASSIUM (K)

- Yellowing of leaf edges starting from the tip; later becoming scorched; the midrib remains green (**Photo 8**).
- The yellowing of leaves starts on the lower or older leaves and spreads upwards (**Photo 9**).
- Grain diminishes in size towards tip, giving an acute "sharpened" appearance.
- Adult plants fall more easily because of reduced straw or stalk strength. Mainly because the strains are more susceptible to disease under such conditions.



### PHOSPHORUS (P)

- Purpling of the leaves in young plants. (**Photo 5** and **Photo 6**).
- Delayed maturity. (**Photo 7**).
- Reduced flowering and/or seed production.
- The root system of plants is poorly developed.



**F**OR ANY CROP INCLUDING MAIZE TO PRODUCE OPTIMALLY, THE NECESSARY MOISTURE AND FERTILISER ELEMENTS MUST ALWAYS BE AVAILABLE AS NEEDED BY THE PLANT.

The main macro elements commonly required by a plant are Nitrogen (N), Phosphorus (P) and then Potassium (K) but there are a number of other elements such as Magnesium (Mg), Sulphur (S), Calcium (Ca), Zinc (Zn) and Manganese (Mn) that is needed for optimal growth.

Nitrogen (N) is responsible for the life processes such as photosynthesis, growth and reproduction. The maintenance of genetic identity are co-determined by nitrogen. The prominent effect of nitro-

gen is that it gives the characteristic green colour to leaves and the vegetative growth of plants is associated with nitrogen.

Phosphorus (P) also plays a role in photosynthesis, growth, reproduction and maintenance of genetic identity, and also plays a role in the respiration process. Phosphorus is particularly associated with cell division, root growth, flowering and maturation of the crop.



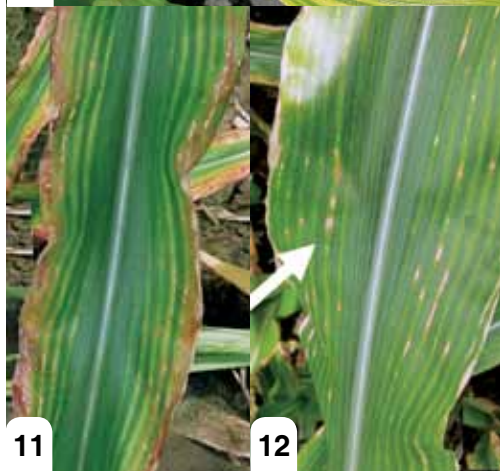
**Pietman Botha, Pula Imvula contributor. Send an email to [pietmanbotha@gmail.com](mailto:pietmanbotha@gmail.com)**





## MAGNESIUM (MG)

- Yellow streaks between the veins (**Photo 10**).
- Streaks later become "beaded" (**Photo 11**).
- Early stages – interveinal chlorosis (**Photo 12**).



## ZINC (ZN)

- Plants are generally stunted (**Photo 13**).
- Yellow streaks or bands on leaves of young plants (**Photo 14**).
- It can also show broad chlorotic (yellow) streaks on one or both sides of the midrib.
- New growth turning white.
- A longitudinal section through the stalk shows darkening of the lower nodes (**Photo 15**).



## MOLYBDENUM (MO)

- Leaves generally light green and narrow (**Photo 16**).
- Leaf tips and edges of young plants become scorched.
- Poor grain set due to less viable pollen.
- Premature germination of seed on the ear is another symptom of molybdenum deficiency.



Potassium (K) is associated with the straw or stalk strength (especially in grains), drought and cold resistance and fruit quality. It promotes the formation of protein, sugar, starch and oils.

In **Graph 1**, the NPK nutrient uptake rate of maize as determined by Pannar is shown. According to Graph 1 it is very important to have all the elements available in time for the plant to produce optimally.

Before blossoming, most of the nutrients are already absorbed by the plant. This makes it so important that all nutrients must be available on time.

According to the Fertilizer Association of South Africa's publication Fertilizer Handbook, 1 ton of marketable maize (stubble is left on the field) will remove about 15 kg N, 3 kg P and 4 kg of K, 0,5 kg Ca, 1 kg Mg and 4,5 kg S. This means that a 4-ton yield will need 60 kg N, 12 kg P and 16 kg of K, 2kg Ca, 4 kg Mg and 18 kg of S. Remember this is kilogram of the different elements not the kilogram of fertiliser that is applied.

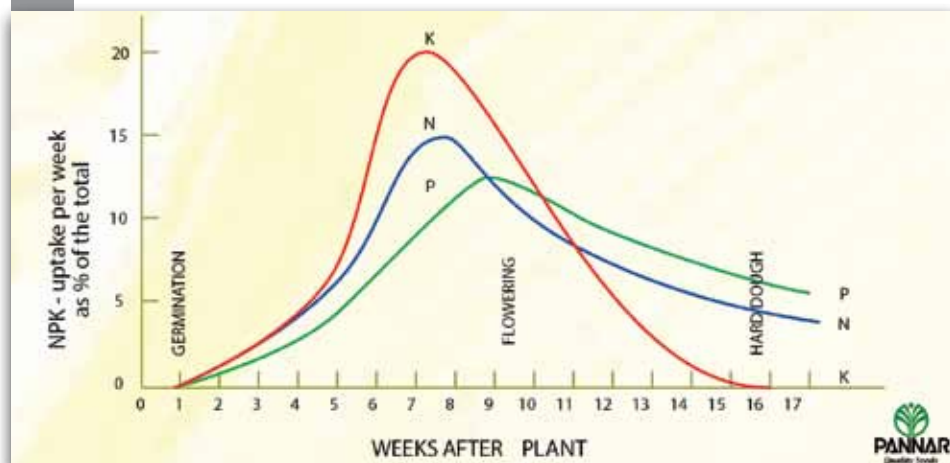
This information must be included to decide how much and what fertiliser to apply for optimal maize production. Soil sample results and the soil potential must also be incorporated to determine the fertiliser and lime needs.

### DEFICIENCY SYMPTOMS FOR DIFFERENT ELEMENT SHORTAGES

Deficiency symptoms are common for different element shortages. If these symptoms are seen there will be a reduction in yield.

It is important not to see this deficiency in the fields but to prevent this by applying sufficient fertilisers for optimal production. ■

**1** The NPK nutrient uptake rate of maize as determined by Pannar.



# INCREASE YOUR INCOME

## – use new technology

**T**O BE A FARMER TODAY IS A VERY CHALLENGING AND RISK PRONE WAY OF MAKING A LIVING. TO SUCCEED, IT IS IMPERATIVE THAT A SUSTAINABLE PROFIT MUST BE MADE OVER THE LONG TERM. NOTE THAT SUSTAINABLE DOES NOT IMPLY A MAXIMUM PROFIT BUT IT REFLECTS ON MAKING AN OPTIMUM PROFIT.

Optimum implying that all resources such as soil, veld and water are used responsibly to be protected for future generations.

Unfortunately, a typical characteristic of our modern-day farming is the so-called cost-price squeeze. Farmers are for the majority price takers, you do not determine the price of your product/s yourself, the market, the free-market of today determines prices. To counter this a farmer must attend to the very basic equation of Profit = Income - Expenditures. Thereby, implying a farmer must increase the income of his business and/or reduce expenditures every year to farm sustainably.

As indicated by the heading of this article a way of increasing income is to use modern technology. There is no doubt by using new technology income can be increased although the new technology comes at a price.

When you experience the word technology, do not always see it as a mechanical object. New technology implies far more. Let's have a look.

As far as **production inputs** are concerned, we have already become rather used to new technology. New cultivars of the different crops are developed continuously. Maize as an example – some 20 years ago the average production under very favourable conditions was 2 to 2,5 tons per hectare, today 4,5 to 5 tons per hectares.

All other inputs such as fertiliser, chemicals, animal feeds and medicine and so forth have all been improved – that is new technology.

On the **physical production** side there has been major developments which is also new technology. There is enough proof that the system of ploughing has damaged the inherent characteristics of our soils which lead to the need to apply more and more fertiliser to increase production. Most will be aware by now of revised land preparation methods – reduced tilling, minimum tillage and no-tilling. These land preparation methods have been developed to address the poor soil health in general to reduce the use of fertiliser and other harmful chemicals. Added to this, the use of cover crops is the latest development or then



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new technology to increase income and reduce expenditures. The above is all part and parcel of conservation farming.

These developments have led to the development of **new machinery**, such as for instance no-till planters. Planters and other machinery used in the production and harvesting of crops, both cash crops and fodder crops, have been improved to increase their functionality. The addition of electronics like GPS to the machinery and tractors to improve their performance has become known as precision farming.

The face of the livestock industry is also changing with the development of new production machinery to advance production. Automatic feeding systems reduce labour and advances precision when for instance feeding livestock. In the egg-laying industry, machinery is available to collect eggs, and not done manually anymore.

### COMPUTERS, IPADS AND SMARTPHONES

Regarding **production information** numerous so-called apps or then applications are available to be used on computers, iPads or smartphones. This makes it possible for a farmer to for instance identify an insect or disease whilst he/she is in a land. One of the latest apps developed is called Khula, a Zulu word that means to grow. The app is intended to help small farmers whose volume of produce is too small for the formal markets by combining produce from a number of farmers to fill a large order from a customer.

Via the internet any information is available at a minimal cost – as it is said just 'google'.

Drones are not unknown anymore and are used to observe, to take photos of your farm – of lands, livestock, crops, for security purposes and many more. Thus, more data is provided to be used to improve management.

With reference to the collection of **production data**, modern technology has been developed to improve the capturing and processing data. Programmes are available that can be used on a computer. One could also develop your own system by using an Excel programme. Remember to manage, to measure is a must.

There is no doubt that the use of new technology increases production and therefore income. However, there are additional costs involved when applying the advanced technology and therefore it is critical to consider your financial position carefully. Start with what you can afford, perhaps a smartphone with internet connection and include other technology as it becomes possible.

Also, be mindful to ensure that your basic management is at a satisfactory level before including new technology. New technology cannot correct any poor management, it can only be a tool to advance your management to a higher level. ■



*The use of new technology can increase production and thus increase your income too.*



# SCOUTING IS THE FOUNDATION of a successful IPM system

**S**COUTING REALLY MEANS WALKING THROUGH YOUR LANDS AND INSPECTING WHICHEVER CROP IS RELEVANT WITHIN AN INTEGRATED PEST MANAGEMENT (IPM) SYSTEM FROM PRE-PLANTING TO HARVESTING AND BEYOND FOR SOME IMPORTANT ASPECTS OF WHOLE PRODUCTION MANAGEMENT CYCLE.

## IPM SYSTEMS

Once a farmer has decided to implement a strategy to start an IPM system it is important to keep a record of what is to be monitored and recorded.

The actual situation prevailing in the crop aspects to be checked can then be compared to the targeted outcomes and crop planning that should have taken place after the last crop when developing the total farm budget or gross margin analysis.

Mistakes made in the previous seasons can then be corrected in the current season.

## WHAT ARE WE LOOKING FOR?

At planting, the soil conditions will affect germination percentage which in turn can be reduced by a spectrum of pests even before emergence. Count and note what plant population emerged. Compare this to your planned target and every few days inspect the roots, emerging leaves or stems and see if there are any signs of worm or beetle damage.

The monitoring within the IPM system will enable you to know from the early growth stages and throughout the various growth stages to maturity when the potential damage from an identified pest on the crop makes it economically feasible to use chemical control.

Sometimes after an early observation of pest damage, preparations can be made to spray the crop as and when it is determined that stem, leaf or young cob development damage has reached the economic threshold to make spraying mandatory. The cost of spraying for that pest must be more than covered as the crop recovers the ability and possibility of achieving economically viable yields. If left, the crop will fail. Your chemical supply consultant as well as your seed supplier should always be consulted as soon as you notice a pest infestation as to the best time or stage to implement chemical control.

The choice of the many maize cultivars to plant that are resistant to pests (Bt Maize) and diseases is the most critical decision to make from the start.

It is required of the farmer, especially if this is your first season of planting maize, to read about the subject or attend relevant courses so that you are familiar with the wide spectrum of insects and weeds that can influence your maize crop at any stage.

If you don't know what to look for you will almost always be too late to save you crop by the time you realise there is a problem. The farmer must also know the signs of initial infections of fungus and other diseases as well. You must know what part of your young growing should be inspected for damage or stalk borer eggs or young caterpillar leaf damage.

If you find a damaged plant, leaf or cob keep a sample in a bag or bottle so that the actual pest can be identified by an expert. In some years infestations from an unfamiliar insect can occur catching the farmer and consultants off-guard.

*Written by a retired farmer*



Remember that while scouting you are also observing crop growth and health, the presence of pests as well as the emergence and development of any undesirable weeds that need to be chemically or mechanically controlled.

## HEAT UNITS

Heat units or day degrees are a measure of time and temperature determined by the amount of time the sun is shining and the prevailing day and night temperatures. The amount of sun energy available for photosynthesis with regards to the crop growth coupled with the temperatures experienced will influence the speed at which the crop reaches various benchmark growth stages.

Depending on planting date and the prevailing temperatures being experienced in a particular season those benchmarks can be different from the normal standards expected. Many of the main seed suppliers have a wealth of information that show the growth stages of maize in great detail and can be downloaded from their websites. The farmer must be familiar with these so that he can communicate the growth stages to his seed and/or chemical supplier so that he can always optimise the timing and quantity of the chemical control to be used.

Just as the heat units affect the growth of the crop so they influence the physiological activity and growth cycles of insects that could become pests in your crops. An insect's temperature is thus similar to the surrounding environment. The climatic cycles will thus affect when stalk borer moths, for example, begin flying for the first cycle and laying eggs on your young maize plants. This in turn determines the timing after one cycle of the young borer caterpillars' growing into flying moths the timing of a second infestation in the maize crop.

## THIS SEASON'S IPM STRATEGY

Each maize cultivar will have an expected relative number of days to 50% tassel and physiological maturity. Depending on your farming area and climate the point of 50% tassel could be reached from 64 to 84 days after planting and physiological maturity from 105 to 240 days after planting. Know these benchmarks for the cultivars you have planted.

The early rains expected might have come late in your area, so planting might have been delayed. Maize planted on 15 November 2018 could only be at 50% tasselling towards the end of February 2019. It would have been important to intensively scout for the second cycle of stalk borer eggs or evidence of leaf damage by young caterpillars over the whole month of February.

For the later plantings any potential damage to the developing maize cobs should be checked with regular inspection of the cobs. The earlier periods of scouting would have helped to spray and control early infestations of stalk borer to avoid any damage to the cobs later. Constant monitoring of the crop by scouting should be done until the crop is harvested. It might be possible during April, while scouting, to look at possible yield estimations using the number of pollinated kernels forming in the developing cobs. ■

# COVER CROPS

## Mixes and applications in the Western Cape

**T**HE USE OF COVER CROPS WITHIN CROPPING SYSTEMS IS VERY NEW IN THE WESTERN CAPE. THE DIRECTORATE PLANT SCIENCES OF THE WESTERN CAPE DEPARTMENT OF AGRICULTURE HAS IMPLEMENTED TWO PROJECTS TO EVALUATE THE USE OF COVER CROPS OVER THE LAST FOUR YEARS. ONE IS FOCUSED ON EVALUATING DIFFERENT COVER CROP MIXTURES AND THE OTHER ON THE UTILISATION OF COVER CROPS.

### WHAT IS A COVER CROP?

A cover crop is a crop or combination of crops planted primarily to manage soil erosion, soil fertility, soil quality, water, weeds, pests, diseases, biodiversity and wildlife in an agro-ecosystem. We have to remember that a farm forms an agro-ecosystem. It includes not only the crops we plant and the animals we raise, but a host of natural occurring plant species, animals, birds and insects.

One of the biggest problems we face in agriculture today is a lack of diversity when we compare farming operations to what has been there before agriculture started. Unfortunately, we have destroyed some of the natural ecosystems occurring on our farms and we need to look at ways to bring some resemblance of these systems back to ensure more sustainability in our farming operations.

### WHERE TO INCLUDE A COVER CROP AND CHOOSING A COVER CROP

Where does a cover crop fit into our production season in the Western Cape? Due to the lack of summer rainfall in the biggest part of the Western Cape, the implementation of a cover crop will have to be as part of your current winter production crop rotation plan.



**2**  
*Cover crop mixtures planted at Riversdale (2016).*



**3**  
*Summer cover crops at Riversdale.*

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**1**  
*An example of a crimping roller.*

By including the cover crop into an existing crop rotation, you are relinquishing the opportunity to grow a cash crop, which currently is still worrisome to producers. There are however several benefits that can be reaped when incorporating a cover crop into a farming system as we can see from the definition above.

If you want a good way of combatting weeds, plant a single crop that competes vigorously with the weeds. An excellent example is black oats or saia oats. In the trial where we develop the mixtures, we measured biomass produced by the cover crops as well as weed control.

Over the last two seasons the black oats have had zero weeds in the trial. It also produces a high biomass that can help cover your soil during the hot summer months and prevent soil erosion by wind. If you have animals on the farm it can also be of benefit since the animals can graze on the residue during the summer. We are currently struggling with herbicide resistance in some of our weed populations and by using a cover crop it gives the producer another tool in the toolbox to combat weeds.

The whole idea of cover crops is to produce them with minimal inputs. We plant them without fertiliser and do not apply any inputs during the season. Before seed sets we terminate them with a crimping roller (**Photo 1**) or with a contact herbicide.

When it comes to mixtures (**Photo 2**), it is important to get the ratios of the different mixtures correct, otherwise one type can suppress other crops in the mixture. The advantage of the mixtures lies in the different rooting depths of the different crops. The shallower rooted crops give you the advantage of breaking surface compaction and the deeper-rooted plants, like the tillage radish, gives the option of biological tillage of deeper compact layers.

With the mixtures, one often finds that the sum is bigger than the parts, which means that we often find a greater biomass production with a mixture than a single crop type. In **Table 1** is a list of the different mixtures that are currently tested in our research programme. The list also gives the biomass production and weed control of the different mixtures.



# 1 *Cover crop mixtures tested in the Western Cape.*

Mixture	Crops	Seeding rate kg/ha	Biomass yield kg/ha		Weed percentage	
			Tygerhoek	Caledon	Tygerhoek	Caledon
1	Cereal rye	15	2 779	3 325	41	6
	Vetch	15				
2	Fodder peas	40	2 690	3 237	32	6
	Rye	15				
3	Cereal rye	10	2 918	3 695	45	5
	Vetch	10				
	Bitter Lupin	40				
4	Saia oats	10	3 291	2 973	35	7
	Vetch	10				
	Fababean	30				
5	Cereal rye	7	3 191	3 082	30	4
	Vetch	10				
	Fodder peas	25				
	White mustard	1				
6	Fodder barley	20	2 812	3 000	42	4
	Berseem clover	5				
	Fodder peas	25				
	Tillage radish	1				
7	Crimson clover	5	1 752	2 828	59	6
	Stooling rye	10				
	Japanese radish	10				
8	Fodder peas	40	3 533	3 413	49	6
	Cereal rye	15				
	Sweet white clover	5				
9	Saia oats	50	3 087	4 116	0	0
10	Stooling rye	10	3 050	2 839	29	8
	Saia oats	10				
	Red oats	10				
	Grazing vetch	10				
	Persian clover	4				

## HOW TO UTILISE A COVER CROP

The research on the different utilisation methods of cover crops are being done on the Langgewens Research Farm near Moorreesburg. We are comparing grazing the cover crop to removing the cover as hay or leaving it as residue on top of the soil.

Some interesting results are emerging from this study. It should be obvious that leaving the cover as residue will result in the highest coverage of the soil, compared to the other two methods. The grazing of the cover crops can, however, still produce sufficient cover on top of the soil if the grazing is stopped early enough so that regrowth can occur.

By making hay of the cover crop, nearly all the material is removed from the soil surface. The surprising results from the trial came from comparing the available nutrients left in the soil and within the residue. The haying process removed a greater number of nutrients than the other two methods. There was, however, no differences in the nutrient content available to the next crop between the grazing plots and the mulching plots. This bodes well for using cover crops as supplemental grazing and makes the selling of the cover crop idea to producers much easier.

The alternative to including a cover crop between your cropping seasons, is to plant a summer cover crop. This is, however, very difficult in the Western Cape if you do not have irrigation. There are producers in the southern Cape who have planted summer covers with varying degrees of success (especially Teff grass and different sorghums), but they have the possibility of summer rains, which the Swartland does not have. We have only had a success with summer covers in our research in one out of the three years we planted them.

The successful year received 200 mm of rain during the summer (**Photo 3**). If you are able to plant a summer cover it could give the producer extra grazing options or provide cover for a field to protect against wind erosion and the harsh summer sun, thus keeping the soil cooler and will also help with retaining summer moisture during the months of February, March and April.

## CONCLUSION

Cover crops can bring so much versatility to our current production systems while protecting food security and increasing biodiversity on the farm. Happy cover cropping all. ■

# Wheat outlook for 2018/2019

**T**HIS ARTICLE OUTLINES WHEAT PROSPECTS FOR BOTH LOCAL AND INTERNATIONAL MARKETS, IN TERMS OF PRODUCTION, SUPPLY, DEMAND, TRADE AND ENDING STOCKS.



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## INTERNATIONAL PROSPECTS

World 2018/2019 wheat supplies are expected to increase by about 0,8 million tons due to additional carryover from Russia and Canada, which offset a reduction in Australian production.

Based on the updated ABARES estimate, Australia's production is lowered by 500,000 tons to 17,0 million. This would be the lowest Australian wheat output since 2007/2008. Canada's wheat production is by raised 300,000 tons to 31,8 million, based on the latest estimate by Statistics Canada.

Projected global 2018/2019 trade is lower, as reduced Australian, EU, and U.S. exports are partly offset by higher Russian exports, which have increased 1,5 million tons to 36,5 million.

Russia and other Black Sea suppliers continue to displace EU and U.S. exports in several markets in the first half of 2018/2019 but are

expected to be less competitive in the second half based on reduced exportable supplies. Australia's wheat exports are lowered by 1,0 million tons to 10,5 million as the export prices are expected to remain uncompetitive and more supplies are consumed domestically for feed.

Global ending stocks are raised 1,4 million tons to 268.1 million, primarily on increases for the EU and the U.S. but are 4% lower than last year's record 279,9 million.

## LOCAL PROSPECTS

**Wheat supply** is projected at 3,9 million tons for the 2018/2019 marketing year; this includes about 700 000 tons of opening stocks as at 1 October 2018, local commercial deliveries of 1,8 million tons and imports of 1,4 million tons, together with a surplus of 8 000 tons.

**Demand for wheat** is projected at 3,3 million tons; this includes 3,2 million tons for human consumption, 3 100 tons released to end consumers and withdrawn by producer together with 19 000 tons of seed for planting purposes.

Exports are projected at 37 000 tons of processed products and 80 000 tons of whole wheat.

**Wheat stock levels** are projected to be about 600 000 tons on 30 September 2019, with an average processed quantity of 260 000 tons per month, representing available stocks for 68 days. ■

1

### International wheat supply and demand.

	2017/2018	2018/2019	
	Estimate	Projections (01 Nov)	Projections (06 Dec)
	Million tons	Million tons	Million tons
Production	760,3	727,9	725,1
Supply	1 015,4	1 004,7	1 001,9
Utilisation	738,0	740,1	739,6
Trade	176,2	173,2	172,5
Ending stocks	276,7	264,4	264,5

Source: Amis (2018)



WORDS OF  
WISDOM



You need to be aware of what others are doing,  
applaud their efforts, acknowledge their successes,  
and encourage them in their pursuits.  
When we all help one another, everybody wins.

~ JIM STOVALL





# Preparing for planting time

## – irrigated wheat and barley

**T**HE PREPARATIONS REQUIRED FOR PLANTING WHEAT OR BARLEY ON A FARM OR CENTRE PIVOT AREA MIGHT IN GENERAL BE THE SAME FOR EACH FARMER BUT MAY DIFFER ACCORDING TO PRIOR PRODUCTION EXPERIENCE FOR THE SOIL CLIMATE AND IRRIGATION SYSTEMS FOUND IN SPECIFIC AREAS.

The management to attain the goal of profitability of either wheat or barley production will be determined by some well-considered and implemented factors.

These would include:

- A properly planned crop rotation system.
- Soil selection.
- Taking of soil samples to evaluate and improve the fertility status of the soil.
- An effective liming programme if cost effective to apply.
- The correct fertilisation programme for either wheat or barley each which require different levels of nitrogen applications.
- The appropriate soil cultivation methods.
- Planting with the best cultivars suitable.
- Exact calibration of planters.
- Planting in the most optimal planting time or window of opportunity.
- A proper planned and implemented spraying programme for the control of weeds, insects and diseases before and during the growing season.
- Timely harvesting of the wheat or barley.
- The effective marketing of your crop.

### MANAGEMENT CONSIDERATIONS BEFORE PLANTING

All the factors mentioned above should be carefully considered before deciding on your own production plan and the actions to be taken. These actions must be done timeously to ensure optimum planting conditions and planting in the correct window for the cultivars chosen.

A thorough knowledge of the detailed growth cycles of either wheat or barley must be acquired by studying the comprehensive description available. The differences to the general descriptions of the growth phases of the cultivars to be used should be noted and management practices adapted accordingly.

For instance, in wheat production, there are three main systems which describe the growth characteristics of wheat namely the Feekes, Zadoks, and Joubert systems. Whatever system you decide to use it is critical to know at which growth stage your crop is so that the correct amount of irrigation water and quantity of nitrogen can be applied at the right time.

Using all the above information and experience it is important to establish a target yield for your circumstances to ensure a profitable crop. This yield target will in turn determine the exact practices to be used to achieve the goal.

### IRRIGATION

The water use of your crop will be determined by the plant available moisture from rainfall received or pre-planting irrigation to bring the soil up to field capacity, the rainfall received during the growth of the crop and the irrigation water applied.

It is critical in both wheat and barley production to have a very well-maintained centre pivot with pumps in good order and fully functioning fertiliser mixing tanks in place before planting commences. The growth cycles

Written by a retired farmer



**Take soil samples to know exactly what nutrients the soil needs (it will save you money).**

are so fast that any breakdown of equipment can be very costly indeed. Attention to detail to ensure that every mechanical component is in 100% working order cannot be over emphasised.

### TILLAGE METHODS FOR SEED BED PREPARATION

One of the most critical considerations is the different operations required to create the optimum seedbed. Conventional tillage is recommended for a wheat on wheat cropping cycle to reduce the chance of root diseases in the crop but leaves the soil vulnerable to wind and water erosion. In some scheme areas continuous cycles of wheat after maize in one and successive seasons are practiced. This can have dire consequences for a decline in soil fertility leading to reduced yields in both crops.

Conservation tillage can reduce the probability of wind and water erosion but can lead to excessive plant residues on the surface that really make planting even with best 'no-till planters' very difficult. A large build up of mulch is good but can promote root born diseases. It is suited to a rotation that includes legumes, summer crops such as maize and fallow periods if many pivots have been established as can be found in the larger farming operations.

### OPTIMAL PLANTING WINDOWS AND SEED DENSITIES

The seeding rate in kilograms per hectare to establish the optimum planting and emerged population per square metre is of the most important for high crop yields. The farmer must carefully measure and count the number of seeds per kilogram of the seed to be planted. Alternatively, the 1 000-seed mass can be weighed and used so that the optimum kg/ha can be applied through the planter used. This can vary from 25 grams to 52 grams per 100 kernels, so it must be carefully worked out.

In general, the recommended planting dates and planting densities for wheat can range from the 1st of June to the 31st of July with seed densities of 80 kg to 140 kg and even 160 kg to 200 kg, for specific cultivars. The farmer must know exactly which cultivar requires which planting rate. Barley is generally planted at 80 kg to 110 kg per hectare. It is important to know what is recommended for your pivot and farm.

### CONCLUSION

It is critical to know in detail the many aspects of irrigated wheat and barley production required to produce a successful crop. Farming successfully is both an art and a science. ■

# Weather and volumes impact the maize prize

**P**RODUCTION IS DETERMINED BY AREA PLANTED AS WELL AS YIELD; HOWEVER, THESE TWO VARIABLES ARE CONTINGENT ON WEATHER.

Considering the uncertainty brought by weather on intentions to plant, this article hypothesises different scenarios for exportable surpluses using the crop estimate's committee (CEC) intentions to plant and average yield as the baseline (**Table 1**).

In **Table 2**, we can see that the CEC has estimated area of production for maize at 2 448 400 hectares (horizontal axis), while the average yield is 4,98 t/ha (vertical axis). Given the area planted and average yield a possible surplus of 3 591 545 tons can be seen on the table. The exportable surpluses shown in the sensitivity analysis are green when there is less than 1,5 million tons for the season and red when there is more than 1,5 million tons. The cells are indicated in bright red with a strike through if there is no exportable surplus.

*Production has an implication on supply and demand, which in turn has an implication on prices.*

Going towards the right of the CEC intentions, if area planted deviates by +10%, +15% or +20% above the intentions at the average yield of 4,98 t/ha, this could leave us with a surplus of between 4 809 624 tons and 6 027 703 tons. With the current weather conditions, this is highly unlikely to happen.

## 1 Baseline figures for maize supply and demand.

Total maize	
CEC Intentions to plant (ha)	2 448 400
Average yield (ton/ha)	4,98
Carry-over stocks 2018/2019 (ton)	2 807 005
Total local consumption (3-year average) (ton)	10 130 000
Pipeline stocks (±1,5 months) (ton)	1 266 250

Source: Grain SA, SAGIS, SASDEC, CEC

Going towards the left of the CEC intentions, if area planted deviates by -10%,-15% or -20% less than the intentions at an average of 4,98 t/ha, the surplus could be between 2 373 466 and 1 555 387 hectares. With the same hectare deviation but lower yield, the extreme is that there will be no surplus.

Production has an implication on supply and demand, which in turn has an implication on prices. With an exportable surplus below 1,5 million tons, prices will most likely move towards import parity level (higher); this is due to a shortage in production. With at an exportable surplus above 1,5 million tons, prices are more likely to move towards export parity (lower), this is due to surplus production. It is clear that with the current weather conditions, area planted for maize is most likely going to be below CEC intentions, which could lead to prices being supportive. ■

## 2 Sensitivity analysis of maize executable surpluses given various planting and yield scenarios for the 2019/2020 marketing year.

		Area Planted (ha)						
		-20%	-15%	-10%	CEC Intentions	+10%	+15%	+20%
		1 958 720	2 081 140	2 203 560	2 448 400	2 693 240	2 815 660	2 938 080
Yield (ton/ha)	3,48	-1 782 693	-1 357 284	-931 874	-81 055	769 764	1 195 174	1 620 583
	3,98	-803 333	-316 714	169 906	1 143 145	2 116 384	2 603 004	3 089 623
	4,48	176 027	723 857	1 271 686	2 367 345	3 463 004	4 010 834	4 558 663
	4,98	1 155 387	1 764 427	2 373 466	3 591 545	4 809 624	5 418 664	6 027 703
	5,48	2 134 747	2 804 997	3 475 246	4 815 745	6 156 244	6 826 494	7 496 743
	5,98	3 114 107	3 845 567	4 577 026	6 039 945	7 502 864	8 234 324	8 965 783
	6,48	4 093 467	4 886 137	5 678 806	7 264 145	8 849 484	9 642 154	10 434 823
	6,98	5 072 827	5 926 707	6 780 586	8 488 345	10 196 104	11 049 984	11 903 863

Source: Grain SA, SAGIS, SASDEC, CEC

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# SOUND LABOUR PRACTICES AND RELATIONS IN THE SPOTLIGHT

## Making sense of the labour turnover on your farm

**S**HOULD WE AS FARMERS STILL CLING TO THE AGE-OLD VIEW THAT WORKERS WHO LEAVE THEIR POST ARE INHERENTLY BAD FOR BUSINESS, OR SHOULD WE LOOK WITH FRESH EYES AT THE LABOUR TURNOVER AND ANALYSE THE REASONS FOR THIS?

My opinion about this important determinant of organisational success is that it has both positive and negative consequences for your farm. On the one hand you definitely lose skills and knowledge acquired over a period, but on the other hand it provides employers with an opportunity to bring different and innovative thoughts to the workplace. It also provides the opportunity to replace employees who do not function effectively in the workplace with ones who meet the requirements for a specific position.

It is important to distinguish between those leavers who would have a negative effect on the farm and those employees who do not fit in with the culture of your farm, or who do not make effective contributions to organisational success. We must be able to identify those employees who will cause a decrease in productivity, profitability and innovation and lower the morale of the remaining employees if they exchange your farm for another business.

The question should now be: How do I do it? How do I establish who is functioning effectively and who is merely going with the flow? How do I ensure that all my employees play an effective role in achieving our objectives?

The answer to this is very easy: You must attract the right applicant to your business, appoint the right applicant, and develop and motivate the new employee to pursue the objectives of the business and carry out his work in accordance with the set standards. This may appear to be an easy answer, but it is extremely complicated to implement. It requires the introduction of various procedures.

In this article I explain to you what to do to select the right employee who matches a specific position, how to appoint that employee and then also how to measure that employee's performance and ensure that he contributes and is not merely a passenger.

Before you can do the above, it is important to know what the employee should do to function effectively in his position, and what the minimum requirements are with which they have to comply. In order to determine this, it is important to first compile a job or task description for each position.

A job description forms the basis of the relationship between the producer and his employee and can be regarded as an agreement in which the expectations of the producer as employer are spelt out clearly to his prospective employee. This also provides the employee with clarity on what is expected of them.

However, a job description is not a procedural manual that contains every unique detail, nor is it an appointment agreement. A job description forms the basis of the labour relations management system of any business, and without it the following processes cannot be carried out effectively: Recruitment and selection, determining of remuneration, performance measurement, training and development, orientation of new employees and follow-up and human resources planning.

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As the job description forms the basis of so many human resources processes, I would like to focus on that. How do we compile an effective job description for a position? Firstly, we have to think about the following questions and find answers to them.

- What is the position I now have to describe?
  - What should the person who is in this position do? (Identifying key performance areas for the position.)
  - What business objectives should the position achieve, and when?
  - What are the aids that the employee will need to be effective in this position?
  - Why are these tasks carried out and what is their value to the farm?
- When all these questions have been answered and the producer knows what the position involves, the effective management and measurement of that position can continue. All the above answers now have to be captured point by point in a job-description document.

After the job description has been completed, the employer will know exactly what he needs in order to carry out the job effectively. A targeted group of persons complying with these requirements can now be approached during recruitment actions. Only persons complying with the minimum requirements for the position are invited for interviews. This guarantees that candidates can be screened according to the right requirements.

### PREPARE FOR INTERVIEW

During the interviews the producer will know exactly what the employee must comply with and what his tasks will involve. Interview questions testing these tasks and requirements can be compiled, and will ensure that sound, objective decisions are made. This will contribute towards a match between the applicant and the job being applied for. A proper match between an employee and his position will ensure that the employee functions effectively and can contribute towards the success of the organisation.

A job description will further contribute towards clear standards being set for the employee, which makes it possible for the employer to identify and address deviations from these standards. In this way, training needs are addressed and employee performance is improved all the time.

A correctly compiled job description has numerous benefits, which help in particular to identify the reasons for labour turnover and to determine when the termination of an employee's employment will be to the benefit or the detriment of the farm.

If a job description and the related processes are utilised and carried out correctly, they can ensure a total labour force of trained, developed and effective employees who can work alongside the employer to achieve all the objectives.

Contact Dirk Coetzee at 082 443 0296 or 056 515 2001 for an example of a job description and a list of what it should contain. ■

# BENEFITS of winter cover crops in a MIXED FARMING SYSTEM

**W**ITH A TOTAL OF ONLY 14% LAND SUITABLE FOR ARABLE CROPPING, SOUTH AFRICA IS NOT WELL ENDOWED WITH RESOURCES FOR DRYLAND (RAINFED) FARMING. SOIL DEGRADATION OFTEN OCCURS DUE TO MONOCULTURE CEREAL PRODUCTION, INTENSIVE TILLAGE AND LIMITED CROP ROTATION.

In conservation agriculture (CA) systems, crop rotation that includes soybean and sunflower produces limited amount of crop residues with associated problems. These crops are mostly grown on sandy soils and erosion is a common phenomenon, especially when crop residues leave insufficient soil cover during winter. Without sufficient cover these sandy soils often develop crusts after rain events.

The impermeability of these crusts leads to runoff, soil erosion and eutrophication of water resources. When these conditions prevail

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during and after a winter fallow period, arable soil is vulnerable to degradation, water loss and weed infestation. Winter or cool season cover crops are seen as an ideal CA practice to combat these problems.

## COOL SEASON COVER CROPS

The most commonly used cover crops fall into one of three broad groups or families. General information on key aspects of these three groups is mentioned below.

### Small grains (grasses)

This functional group includes grasses like rye, triticale, oats and black oats (**Photo 1a** and **Photo 1b**). Winter cereals are the most widely used winter cover crops as part of the crop rotation system.

These crops have a fibrous root system that will benefit the formation of soil organic matter deep in the soil profile. Oats is preferred for grazing. Biological production varies between 3 t/ha/year to 5 t/ha/year for the different crops. All crops in this particular functional group will form associations with arbuscular mycorrhiza fungi (AMF).

Rye, when left to mature, has a high C:N ratio and will form a better mulch that will cover the soil for long periods. Planting into rye after termination might lead to the immobilisation of N by microbes in the process of breaking down the mulch.

Winter cereals are typically planted in late summer through early fall (February to March). Planting winter cereals as part of a mixture, after early rain in September in the North Eastern Free State, was also successful and supplied valuable grazing during November.

Grasses respond well to N fertiliser and increased biomass production and root development is common after application. It is suggested that 40 kg - 60 kg N is applied at planting.

### Brassicas

Brassica cover crops have grown in popularity recently due to their ability to provide many of the same benefits as grasses, but with residues that break down more rapidly after termination. Radish is by far the most productive cool season crop with between 8 t/ha to 10 t/ha dry matter (DM).

In the water table sandy soils of the North West Free State, it raised the soil carbon at a depth of 80 cm by the value of 0,3% during a single season. Brassicas often used in mixtures include turnips, radish (fodder and tillage) and kale (**Photo 2**).

Certain brassicas are also becoming well known for their ability to produce a large taproot that is effective in breaking soil compaction. As brassicas decompose, they produce chemical substances that can fumigate the soil and kill plant parasitic nematodes.

Brassicas is a non-mycorrhizal plant family and evolved on disturbed sites with ample available P. When livestock graze on brassica pastures, bloat might occur, but in a mixture, this does not seem to happen. In a pure stand, infestation of bagrada bugs is a common occurrence and can destroy the crop.



1a

Winter small grains (grasses) sole stand.



1b

Winter small grains (grasses) delayed intercropping in maize.



## 1 Potential benefits of cool season cover crops.

Potential benefit	Description
Sustainable intensification	Cool season cover crops expand and intensify summer cropping systems and keep production at a high level over a long period. It allows us to use resources (sunlight, residual moisture and nutrients) optimally. Spatial and temporal intensification making use of intercropping systems is made possible.
CA	Starting with CA can be a daunting experience for first timers. Cool season cover crops allow ample time to correct soil nutrients, uplift compaction, get rid of problem weeds (e.g. kweek) and build a soil mulch. CA without diversity and soil mulch is doomed to be a failure.
Integration of livestock	Cool season cover crops' nutritional content is high and productive animals (lactating cows, weaners and growing sheep) can benefit from utilising them.
General	<p>Cover crops scavenge soil nutrients as they grow and ultimately release them for following crops to use. This reduces the potential of nutrient losses, especially N.</p> <p>Cover crops reduce crusting, runoff, and protect soil against wind and water erosion.</p> <p>Cover crops biomass contributes to soil organic matter, which helps to improve soil structure, water infiltration, and water-holding and nutrient-supply capacity.</p> <p>Cover crop roots can act as 'living ploughs' breaking up compacted soil layers.</p> <p>Cover crop residues increase water infiltration and limit evaporation. This helps to reduce moisture stress during drought conditions.</p> <p>Leguminous cover crops fix N as they grow. This N mineralises after the cover crop is terminated and becomes available for use by future crops.</p> <p>Cover crops shade the soil, which can reduce high surface temperatures, weed germination and growth. Some cover crops also have an allelopathic effect on weeds.</p>



Brassicas (radish).

### Legumes

Legumes in association with nitrogen-fixing bacteria have the ability to 'fix' nitrogen from the atmosphere. Inoculation is thus essential. Some of that 'fixed' nitrogen will be available to provide low-cost nitrogen for the following summer crop, a very important feature that makes planting of legume cover crops practical and economical. Legumes are valued as cover crops in integrated systems for their high feeding value.

Common legumes used as winter cover crops in cropping systems include vetch (hairy and grazing vetch), sweet clover and crimson clover. To survive the winter, legumes should be planted at such a time that it is well developed before first frost.

In a North West Province trial (Ottosdal) vetch was planted as pure and mixed stands and with a C:N ratio of 15 it contributed to N mineralisation (**Photo 3a** and **Photo 3b** on page 18). The amount of N added by legumes varies among species, but it is directly proportional to the amount of biomass produced.

The residues of cool season legumes break down fast after termination. Legume plants also have the ability to form associations with mycorrhizas.

### Crop mixtures: Why?

Single species leave resources partially unexploited, leaving room for other species to continue or complete the resource exploitation. More diverse systems are hence more productive due to increased niche complementarity or resource use efficiency.

Grass-legume mixtures can be particularly advantageous because they combine the benefits of both and quickly lead to a good canopy cover (**Photo 4** on page 18). The presence of N-rich legume residues can also help break down grass residues more quickly. Disadvantages of mixtures can include increased seed cost and more complicated management.

## POTENTIAL BENEFITS OF COOL SEASON COVER CROPS

The potential benefits of cool season cover crops are explained in **Table 1**.



## Benefits of winter cover crops...

3a

*Winter legumes (grazing vetch), sole stand.*

### PRACTICAL SUGGESTIONS IMPLEMENTING COOL SEASON COVER CROPS

#### Planting of cool season cover crops

Depending on the producer's objectives, three opportunities exist where cool season cover crops can be established:

- Intercropping into standing maize can be an effective establishment method for certain cover crops in short-season environments. In general, legumes and brassicas with extended seedling growth are candidates for in-season seeding (typically from December to January in the summer rainfall area) (**Photo 5**). Planting cereals (grasses) during this period is not recommended, as these species have a higher initial light requirement. Spreading seed with fertiliser spreader or using tailor made drills can be used when maize is in four to eight leave stage.
- Seeding at physiological maturity of grain crops (i.e. during February or March in maize or soybeans) can provide additional time for establishing grasses and grass-legume mixtures as relay or delayed intercropping (**Photo 6**). As the grain crop dries down, sunlight breaks through the canopy and improves conditions for germination and early cover crop growth. Seeding cover crops into mature maize requires high-clearance or aerial seeding equipment.
- Seeding cool season cover crops after soybeans are harvested can simplify the planting process. In the Vrede area, a mixture of cool season cover crops was planted after soybeans were harvested, followed with 40 mm of rain. Livestock was introduced later in winter (**Photo 7**).

#### Putting seed mixtures together

This outcome will depend largely on the producer's objective. In the drier North West Province, for example, creating water saving mulches should be a priority. Rye and black oats can produce residues that decompose slowly. During the first two months after planting cash crops, evaporation from the soil surface should be curbed with soil cover. In areas where rainfall is more reliable, legumes can reduce input cost by adding N.

A typical mixture for the Vrede and Reitz areas as proposed by Barenbrug, is as follows:

- 10 kg/ha black oats
- 5 kg/ha stooling rye
- 3 kg/ha vetch



3b

*Winter legume (vetch) delayed intercropping in maize.*

- 5 kg/ha fodder peas
  - 0,5 kg/ha fodder radish
  - 0,5 kg/ha tiller radish
  - 0,5 kg/ha rape
- Total seeding density of 24,5 kg/ha.

#### Terminating the cover crop

The use of a roller-crimper is a handy tool to terminate cover crops. Small grains are very sensitive during the soft dough stage and will terminate through crimping. If left too late viable seed can create problems as weeds during planting of cash crops. Often producers will use glyphosate after rolling small grain to get rid of other weeds.

Brassicas and legumes are not killed successfully by using a roller crimper. A good herbicide programme to terminate legumes and brassicas is a mix of glyphosate and 2,4-D or dicamba. Glyphosate alone is not a recommended programme to kill a legume such as hairy vetch since its performance is variable.



4

*Winter cover crop mixture with grasses, brassicas and legumes.*





5

*Intercropping winter and summer cover crop mixture with maize.*



6

*Delayed intercropping with winter cover crops in soybeans.*



7

*Winter cover crops planted after soybean, Vrede area.*



8

*Mob grazing on winter cover crops.*

Plant growth regulators such as 2,4-D and dicamba are effective, but also require some delay (one to two weeks) between application and maize planting to avoid herbicide injury. Faster desiccation by using paraquat and 2,4-D or paraquat and atrazine is also a possibility.

#### Grazing of cover crops

Cool season cover crops are preferably utilised or managed by livestock through mob grazing, also called short duration grazing and ultra-high-density grazing. The main purpose of this grazing practice is to increase competition among livestock, concentrate urine and manure and trampling more plant material onto the soil surface. The amount of biomass utilised and trampled by grazers should be managed, for example through different camp sizes (using electrical fences) (Photo 8).

Mob grazing (e.g. grazing intervals) still needs more research in South Africa. A temporary recommendation is to move livestock daily if shorter intervals are impractical. Creating an inclusion zone where livestock can be 'parked' during periods of bad weather, or when you have to work with the animals, will make implementation more manageable.

#### CONCLUSION

Cool season cover crops use substantial volumes of water and it is imperative that response farming principles are adhered to. The recharge of the soil profile with soil moisture before planting grain crops is necessary and grain crops should only be planted after sufficient rain (20 mm in 24 hours). As organic matter in the soil increases, more water will infiltrate, and more plant available water will be stored in the soil. Pest problems might occur due to the availability of more food. ■



# MAKE SURE YOU COMPLY WITH THE FIRE ACT

**T**HE NATIONAL VELD AND FOREST FIRE ACT (ACT 101 OF 1998) IS 20 YEARS OLD THIS YEAR. PRODUCERS STILL ASK A NUMBER OF QUESTIONS ABOUT THE IMPLICATIONS OF THE ACT AND WHAT THEY HAVE TO DO.

It is concerning that such a degree of ignorance exists about legislation that landowners have had to comply with for two decades already. Looking at the Act and its implications in depth can provide us with a better understanding and emphasises that this legislation is actually a very handy tool in the producer's ongoing risk-management plan and the actions he should implement to protect his property.

It is almost like a manual for burning management on the farm – not complete, but definitely a clear guideline for the minimum that has to be done.

The logical starting point would be to understand what the legislator's aim with the Act was and still is. The aim of this Act is to prevent and combat veld fires, forest fires and mountain fires. The Act makes provision for a number of ways, people and methods to accomplish this. Non-compliance can land you with a heavy fine or even a prison sentence.

So, what does the Act actually say? If a fire can start on or spread across your property, you have a duty to comply with the Act. This means that you have to comply with at least the following basic requirements:

- The part we always think of is a firebreak on the border of your property that must be long and wide enough to reasonably prevent the spreading of a fire. Your neighbour has the same duty, which means that there is actually a double break on the border (on either side of the fence). It is important to know that "owner" here refers to a tenant as well.
- The firebreak need not be burnt, but can be cleared or chemically treated to get it clear and free of combustible material. However, the Act allows you to do this with due consideration to the local climate, weather patterns, terrain and vegetation. Remember: You may not cause soil erosion.
- You must provide your workers with protective clothing and the necessary equipment to fight fires.
- In the event of a fire, you must immediately inform your neighbours and other stakeholders.
- You should do everything possible to fight the fire and prevent it from spreading.

I think that, although prescribed by the Act, this is actually a logical list of matters that should be attended to before that risk period starts.

## FIREFIGHTING ASSOCIATION

Everybody asks whether it makes any sense to belong to a firefighting association. If I comply with all the above, then I'm fine?

The Act is not prescriptive about whether you should belong to a firefighting association, but such membership does hold two or three major benefits:

- Reverse liability: If you are not a member of the firefighting association in your area, you as landowner are immediately suspected of negligence should a fire break out. If you are a member, the plaintiff has to prove your negligence.
- If you are a member of a firefighting association, you have a joint plan and aids that you can use to fight fires. A firefighting association can even apply to the minister for exemption from making firebreaks under certain conditions, as per your burning plan.
- You will probably be able to get certain concessions from your insurer if you are a member of your local firefighting association, and this could save you money.

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**Working on Fire and Kishugu Training can assist landowners with training in firefighting. Visit [workingonfire.org](http://workingonfire.org) or contact them at:**

Eastern Cape provincial office	043 683 2184
North West provincial office	018 290 8512
Mpumulanga head office	018 290 8512
Free State provincial office	051 451 2365
Western Cape provincial office	021 532 1516
Limpopo provincial office	015 590 1530
Gauteng provincial office	011 314 0254
Mpumalanga provincial office	013 752 4068
KwaZulu-Natal provincial office	033 330 7715

The information provided in the article is a good indication of the basic points that have to be complied with. The discussion of a duly revised insurance policy requires an article on its own, particularly for producers whose entire crop is in the field and is exposed when the wind is strong and fires spread. There are many ways of hedging this risk with the aid of a properly trained and registered broker. Talk to your broker about this.

The cost of fighting a fire often involves more than just opening a tap and holding a few fire bats. Are you ready for this and equipped to help in a meaningful way to fight an unwelcome fire? ■

## CHECKLIST

**If you are in control of the land (tenant or owner), you are by law responsible for burn management on the farm. Use this checklist to make sure that your preparations for the burning season are in place:**

WHAT	✓	✗
Firebreaks on border or as per approved plan?		
Neighbour informed/involved/agreed?		
Date within permitted limits and burn permit obtained?		
Equipment in place?		
Staff trained/sufficient?		
Supervision?		
Arrange assistance from firefighting association/Working on Fire/local authority/disaster management		
Erosion management?		
Protection of vegetation, for example large trees on border?		
Is my firefighting association membership in place?		
Has my insurance cover been properly reviewed?		



# FARMING OUTSIDE THE BOX

## – a human resources perspective

**T**ODAY I AM WORKING ON A JOB ANALYSIS AND JOB DESCRIPTION FOR A SENIOR FARM MANAGER IN THE BOTHAVILLE AREA. HOWEVER, WHILE I AM WORKING, MY THOUGHTS WANDER TO VARIOUS OTHER BUSINESSES AND INDUSTRIES THAT HAVE NOTHING TO DO WITH AGRICULTURE. SUDDENLY I WONDER ABOUT WHEN THIS MENTAL SHIFT FROM FARMING TO BUSINESS TOOK PLACE, AND WHAT THE TRIGGER WAS.

I found the answer in the analysis of the job I am working on. The key performance indicators for the senior farm manager, and/or in most cases for the owner of the farm, are as divergent as ten other jobs in an ordinary company. The producer must be a project manager, industrial engineer, statistician, soil scientist, biologist, chemist, Safex trader, accountant, tax expert, financial manager, human resources manager, managing director, negotiator, buyer and marketer.

Now I wonder further about how I can include the division of time between all these key performance indicators in a written document – for one person's position. There won't be enough hours in his month to carry out all these functions effectively, and then he still has to have a little time left over for family obligations.

Suddenly I realise that I am not the only person wondering about this, and that the producers have already addressed this issue extremely strategically and with a surprising future vision. Producers in our area have already devised several interesting plans. Various mega agricultural companies have been created – with shareholding by various existing producers.

In this way the employment of resources – human and otherwise – is maximised because larger areas of land can be tilled with the same resources. This further exposes producers to a greater fountain of knowledge that can be tapped when decisions have to be made – to ensure that all relevant information is taken into account.

This practice creates various levels of management that can be tasked with responsibilities, and that can be held accountable by the shareholders.

We also increasingly encounter total farming solutions where existing agribusinesses assist producers who are interested and take over several production and administrative functions in exchange for a percentage of the yields and profits.

Once more this practice is aimed at the maximum utilisation of resources and at bringing producers into contact with experts in the key performance areas mentioned above without constituting a permanent salary liability for the business.

As you can probably conclude from both the models above, resources are used more effectively, which means that fewer tractors, planters and staff are required. By implication, fewer staff is needed, which contributes to unemployment in an area, and also to various socio-economic problems.

### HR: A SYSTEM OR NOT?

From a human-resources perspective, I therefore have to ask: Is labour relations a system and/or is it only the management of complex relationships? Must we develop systems from a human-resources perspective that merely address our need (to reduce the number of resources required), and/or must we rather develop our own resources to the extent that they address those needs?

Involuntarily my thoughts jump to other related businesses, and I realise that farming is after all also a business where the same and/or similar

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management practices must be applied, with different job levels and responsible persons who look after the execution of their responsibilities. A smallish farm's turnover is similar to that of a large business. Why then are farms in most cases not managed like a business?

If I ask most of my farming clients this question, they are going to tell me: 'Remember that I farm with my heart, I want to see my sheep drop their lambs, and my cows their calves, I want to see the wheat sprout and the sunflowers yellow in the field, and do not want to merely manage processes. Farming is a calling, a way of living – my legacy to my children.'

When I receive that answer, I usually have tears in my eyes, because I fully agree with them. However, farming remains a risky, capital-intensive and labour-intensive business that has to be managed.

With the right management positions and practices in place, the daily risks that producers face can be addressed and hedged timeously. With the right management positions and practices in place, the producer will have more time to farm, knowing that someone will identify the risks, report and hedge them.

### HOW TO ACQUIRE THE SKILLS

But how do we acquire these skills that we need to accomplish this in our farming business? We ensure these skills on our farms by appointing the right person with the right skills. However, we can only do this if we know what the position this person has to fill involves, and what specific skills he requires for it.

Make sure that every position has a full job description and job analysis so that you can appoint the right person. When someone has been identified, I want to advise every employer to check the applicant's references thoroughly before making an appointment. If there are gaps in a CV, enquire thoroughly about those periods. It is astonishing how often I run into persons who were fired by one employer at the next employer.

If someone with the necessary knowledge and skills is not appointed, the administrative officer or foreman surely cannot be expected to have all the necessary knowledge. Therefore we also have to provide the necessary training and assistance.

This training and assistance are a real need that has already been addressed by the AGRISETA for some time. Producers are privileged to have a sectoral training authority that functions effectively and can fund most of the training needed on application.

When a producer trains his own people and employs them to assist him, the workplace becomes a system within which relationships can be handled easily and effectively.

In short: Your farm is your business, and sometime you must think outside the box to build that puzzle that tells your success story. I would like to use this opportunity to thank every producer for the privilege to see every day how much you love the land and farm, and even under extremely difficult conditions to see the distant rain clouds that will irrigate your land with drops of grace.

If you require any advice about this matter or any other labour relations or human-resources matters, please call Dirk Coetzee (located in Bothaville) at 082 443 0296 or 056 515 2001. ■

# Key management issues for success

**F**ARMING FOR THE FUTURE MEANS BUILDING YOUR FARMING OPERATION ON A LONG-TERM VISION AND OBJECTIVES THAT WILL KEEP YOU IN BUSINESS FOR GENERATIONS.

The following points summarise the key management issues necessary for success. These are handy to use in your planning phase for the next crop. PANNAR is proud to support farmers and to partner with them to maximise farming enterprise profitability and growth.

Use our expertise and service. We are passionate agriculturalists who take a personal interest in the success of your farm. We pride ourselves on providing honest, reliable technical advice, a complete seed line-up and management guidelines for optimised crop production.

## TECHNICAL ADVICE AND GUIDELINES

- The most important element of crop cultivation is to get the basics right from the beginning. Once the basics are accomplished, practices can be fine-tuned to achieve top returns.
- Secure marketing contracts before planting. Fulfil specific quality requirements of niche market end users.
- Plant hybrids that have the desired characteristics for your conditions and targeted end use market.
- Select a cultivar package. Take note of cultivar's yield potential and yield reliability and match cultivars to a realistic field potential.
- Land selection. Consider the field's history regarding the previous crops harvested, harvested yields (water consumption), weed control and chemicals applied. Consider the possibility of chemical residue carryover as well as the expected weed spectrum to be addressed.
- Set a target yield based on moisture availability and match inputs to the targeted yield (use the field's history as a starting point).
- Adjust the plant population and row spacing to match the yield target and environment.

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- Select the planting time to coincide with optimal germination temperatures and soil moisture conditions. Also, try to avoid early frost damage and extreme heat and drought stress during flowering.
- For irrigated crops, calculate water budgets, matching the crop area to water allocation. Attempt to maintain optimal growing conditions during pollination and grain filling stages.
- The planting process is the foundation of success and the goal is to achieve even emergence and minimise interplant competition. Adjust the pressure wheels to match the soil and soil moisture conditions.
- Apply nitrogen, phosphate and potassium fertiliser based on target yields, soil tests and previous crop yields.
- Use controlled traffic or conservation tillage to reduce soil compaction (maize is relatively susceptible to compaction), improve moisture management and reduce fuel costs, especially in the case with sandy soils.
- Protect the yield potential. Where leaf diseases occur annually, use a fungicide spray programme to protect the maize 'factory'.
- Effective pest control – regular scouting for disease and insect pests is essential for success.
- Apply quality control regularly and without exception and, if possible, take corrective action. By focusing on efficiency and timing it is possible to optimise growth and production for better returns.
- Your footsteps in your fields are the best management practice that exists.

Partner with PANNAR, your success is our goal. ■





# THE CORNER POST

## LAWRENCE LUTHANGO

*You can't teach if you do not learn*



**A**CCORDING TO CANADIAN AUTHOR, MALCOLM GLADWELL, IT TAKES 10 000 HOURS TO LEARN A NEW SKILL. GRAIN SA'S MENTORSHIP PROGRAMME HAS HOWEVER PROVEN THAT IT TAKES MUCH LESS TIME TO MASTER A SKILL, AND MENTOR LAWRENCE LUTHANGO (66), BELIEVES IT WILL TAKE A LIFETIME TO LEARN ALL THERE IS TO KNOW ABOUT FARMING.

### OLD HABITS MAY DIE HARD, BUT THEY CAN CHANGE

Gladwell also states that people learn best by example and by direct experience as there are real limits to the adequacy of verbal instruction. As mentor, Lawrence Luthango (66) is tasked to relay theoretical and practical training regarding agricultural practices to his enthusiastic group of 109 farmers attending his four study groups. He agrees fully with Gladwell's statement. With very few of his farmers being literate, he has seen that the practical demonstrations are what really interests the groups.

Lawrence has been involved in Grain SA's mentorship programme for the past eight years. It formed part of his job description as Development Co-ordinator of the Grain SA Farmer Development Programme, Mthata. He retired in 2016 and then mentored his successor, Sinelizwi Fakade for four months before becoming a fully-fledged mentor in the Chris Hani District Municipality in the Eastern Cape.

Apart from the time he spent with Grain SA, he gained experience working for the Farmer Support Centre, a programme funded by our former president, Nelson Mandela. Before that he was employed by the Transkei Agricultural Cooperation. Lawrence also owns 5 ha of land where he farms with some cattle and produces crops and vegetables. So, he brings a lot of experience to the table.

He says his main responsibility is to train the farmers to understand crop production, from the soil to the table. Farmers attending the study groups all live in a 2 km radius from the various venues where they get together for their weekly information session. Here they can also share their concerns with each other and get advice.

Most of the farmers are older and set in their ways, believing that it is not necessary to change the methods they have been using for years. Their tried and tested methods have been putting food on the table for years. While some resist change, others trust their mentor and with Lawrence's guidance, have been implementing these new agricultural practices. 'Once the results are seen, they all become interested and ready to change,' Lawrence shares.

Motivational speakers often say if you want to change your life, you will have to change your old habits and thinking. In developing agriculture, when change is implemented, the result is usually increased yield which means more food on the table or more money in the pocket and improved lives.

### LEARNING CHANGES LIVES

It is said that he who dares to teach, must never cease to learn. When asked why Lawrence decided to stay on as a mentor after his



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retirement, he answers: 'Being a mentor, helps me to learn a lot of new things! You can't teach if you do not learn. I will grow old too quickly if I don't learn new things.' With good health on his side he plans to stay involved – and learning – for a few more years.

Lawrence has found that soil health has made a huge impact in his area. 'Taking soil samples, doing soil analyses and then feeding the soil did not make sense to the farmers at the onset. Once they witnessed what lime could do on their land they were all on board. Liming to neutralise the soil for a higher yield has become the number one practice amongst these farmers.'

During his regular field visits in season, Lawrence scouts the crops at the different stages of growth for insects and any sign of disease on the leaves. He says it is better to identify problems early so that too much damage to the crops can be prevented. This way he also trains the emerging farmers to spot a problem in time. 'Prevention is better than cure and the appropriate fungicide should be applied at the first sign of infection.'

About this season Lawrence has concerns with little rain falling in the area. 'With last season's good rain, the farmers had good results – some reaching yields of 6 tons/ha on dryland – and although there has not been a lot of rain in our area, the crops are growing nicely, but more rain is needed soon.'

Drought is one the biggest stumbling blocks in this area. The other is mechanisation. 'More equipment is needed to make life easier for these farmers who work in block systems. Bigger machinery which is better suited for this hardy terrain will really help,' says Lawrence.

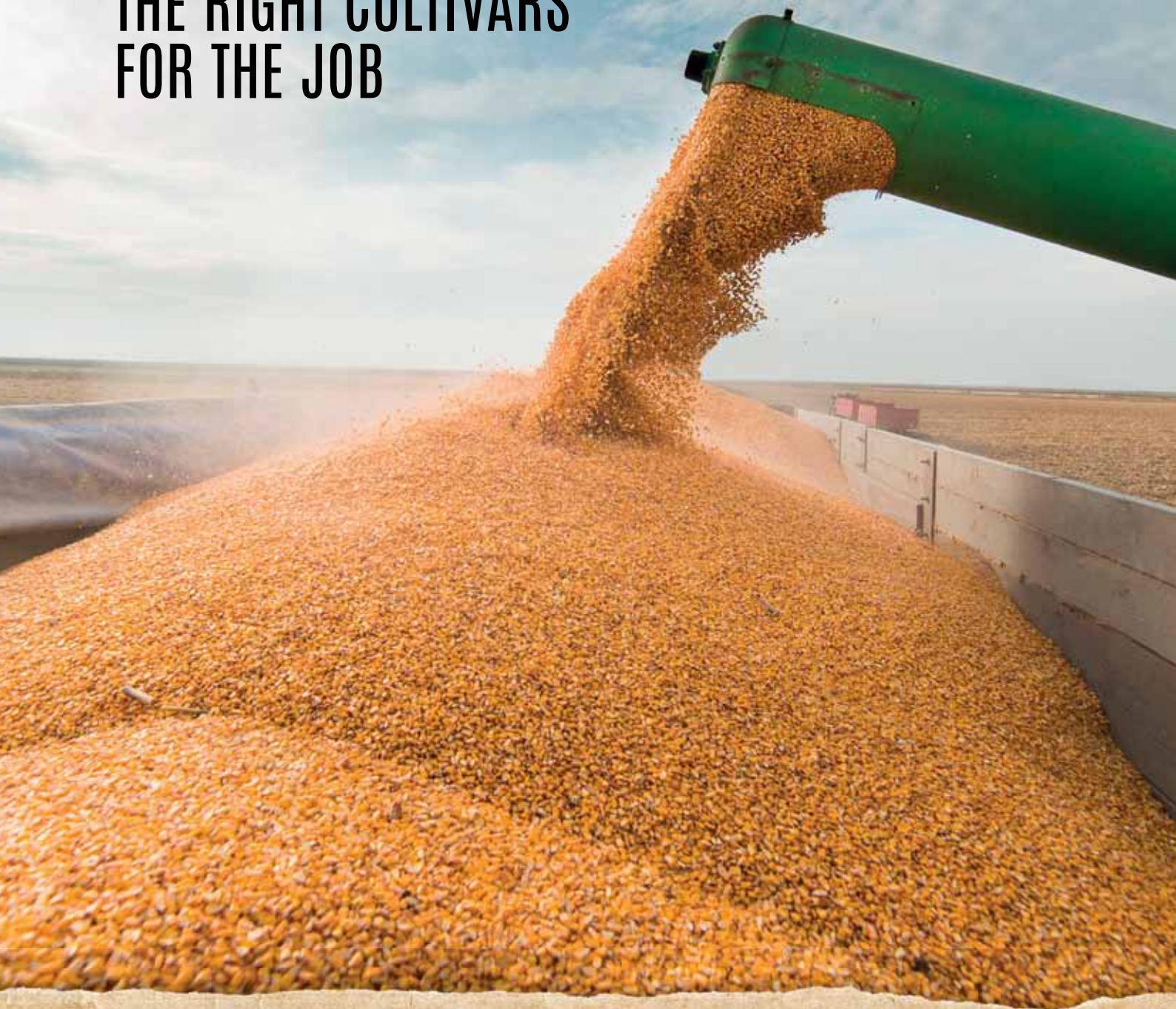
In an article about learning new skills the author, Jordan Scheltgen, shares four steps on how to acquire a new skill and make it part of your everyday life. It seems these are the steps that form part of the mentorship programme too with great results.

- Get a mentor – someone to help you move forward.
- Know that it will take time. Improving does not happen overnight.
- Master one thing before moving on to the next.
- Focus your attention on developing the new skill.

Grain SA adds a fifth step: Celebrate success. One of the highlights in his time as mentor was when one of his farmers, Daliwonga Nombewu from Mthata in the Eastern Cape, became the 2015 Grain SA/Syngenta Smallholder Farmer of the Year. He hopes that in the future another winner from his area will be crowned at the Day of Celebration. ■



# THE RIGHT CULTIVARS FOR THE JOB



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