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PULA IMVULA

GROWING FOOD • PEOPLE • PROSPERITY

GRAIN SA MAGAZINE FOR DEVELOPING FARMERS

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A Word From...

Du Toit van der Westhuizen

FARMING IS A CALLING AND NOT A JOB, AS FARMERS NEVER KNOW WHAT THE NEXT SEASON HAS IN STORE FOR THEM. THEREFORE FARMERS HAVE TO ADAPT TO SITUATIONS BEYOND THEIR CONTROL.

This year has been smooth sailing in some of the regions where everything on the farm went quite well, while farmers in other regions had to deal with floods at the beginning of the season and eventually ended up with drought.

In most of the areas everything looked promising until January presented a mid-summer drought period, when some of the crops reached the critical stage of grain filling. This is a typical picture of what farming is – you never know what is going to happen.

At this time of the year, some farmers have completed the harvesting process while others are still hard at work. Now is the time to list all the failures of the past season to ensure that it doesn't happen again in the coming season.

One of the most important agricultural practices is to do proper winter weed control to conserve the soil moisture. The way you farm with moisture, will determine your success in the coming season. Make sure you get the right advice from experts so that you can conserve the moisture – by controlling the winter weeds chemically or mechanically.

Winter weeds are one of a crop farmer's biggest enemies. When you control it properly, you will have an advantage for the coming season and you will be ready when the predicted El Niño reaches us.

> The way you farm with moisture, will determine your success in the coming season.

Be a wise farmer and be waterwise. Make sure you get rid of winter weeds, as soil moisture is a farmer's friend.

– Du Toit van der Westhuizen is the regional development manager in North West.

GOOD BOOKKEEPING is vital for farmers

BUSINESS ACCOUNTING IS AN ESSENTIAL ASPECT OF ANY SMALL- AND MEDIUM-SIZED BUSINESS. SOME FARMERS MANAGE THEIR OWN FINANCES, WHILE OTHERS HIRE A BOOKKEEPER AND OUTSOURCE THE ACCOUNTING DUTIES. IT IS ALWAYS THE FARMER'S RESPONSIBILITY TO KEEP A FINGER ON THE PULSE OF THE FINANCIAL HEALTH OF THE BUSINESS.

It includes vitally important work to manage the farm's daily financial activities – accurate invoicing, recording tax invoices and account statements with payments made. Financial tracking, analysis, recordkeeping, budgeting and many other activities demand the farmer's attention for the business's sake – and for the South African Revenue Service (SARS), who will give attention to every enterprise at some time.

Business owners who are good managers will use accounting systems to keep track of the assets owned by the business, record and analyse profit and loss scenarios, and check the cashflow, including where the spending is too high or figures that seem inaccurate. This means problems are identified and changes can be made where necessary.

REMAIN IN THE GOOD BOOKS OF THE TAXMAN AND BANK MANAGER

Record all transactions

The government has laws in place that govern how a company must record transactions. Some requirements include supporting documentation such as receipts, invoices or other proofs of purchases. SARS requires one to organise supporting documents according to the year and type of transaction.

Have a system that works for you. A good recordkeeping system for business transactions should include items such as:

- A monthly record (journal) of the cashflow.
- Expense tracking: A record of the monthly banking, including debit orders, electronic transactions and bank card charges.
- All tax invoices issued to the business must be recorded and stored safely, as they are required when SARS does an audit.
- Income tracking: Record which division of the farming enterprise was the source of income.
- The salary records of employees (permanent and casual) and the monthly spending on the business's labour force.
- A summary of cash receipts (daily and monthly).
- An inventory list of everything that is owned by the business.
- A depreciation worksheet: Depreciation is considered an expense for accounting purposes, as it results in a cost for doing business. When assets such as machinery and equipment are used, they experience wear and tear and decline in value over their useful lifespan. Depreciation is recorded as an expense on the income statement.
- Keep careful documentation of all vehicle and other hire purchase accounts. The accountant needs these for compiling a year-end financial report.

Document your receipts and invoices

Proper documentation of financial transactions like purchases is important for preparing financial statements such as balance sheets, preparing tax returns and monitoring a company's financial health. When documenting receipts and invoices, have an organisation system that tracks the VAT, zero-rated and non-VAT transactions and the source of the purchase.

Manage the cashflow

Cashflow refers to the total amount of cash that comes in (revenue) and goes out (expenses) of a company. It is vital to maintain a positive cashflow and have a system to manage it. This means a company should manage and track when and where cash is spent at all times. A company can get into a negative cashflow by having too much debt or too much income in overdue accounts receivables (unpaid monies owed to you).

Have a strategic plan for paying all bills. Paying your bills on time is an important aspect of taking control of your financial life. Knowing when your bills are due and making a habit of paying them by the deadline can reduce your stress, save you money, boost your credit score and enable you to get lower-interest credit in the future.

Oversee and keep track of the payroll

A payroll consists of all payments to a business's employees, including benefits, salaries, taxes and deductions. It is important to know what labour is costing the business – this applies to all permanent labour and the seasonal or casual labour force.

- The Department of Labour requires any employer with one or more employees to register for Workman's Compensation.
- The onus falls on employers to make sure all workers are registered with the Unemployment Insurance Fund (UIF), and they must make sure that an employee's contribution is deducted from his salary every month.

Make projections

To achieve long-term financial goals, small businesses make projections to prepare for the future. Business accounting provides companies with the financial insight and records to make strategic and smart projections and budgets.

Understand tax

The taxes a company pays, is dependent on the type of business.

It is important for the small business owner to build a good relationship with an accountant, to guide him through this complex business environment.

Submit tax returns and financial reports
This is a complex environment, and a good accountant can save a farmer a big amount of money. If this area is neglected, SARS will certainly catch up and not hesitate to issue severe fines for late returns or inaccurate information.

Manage profits and losses
Profits are earnings or incoming cash, and losses refer to anything the company must pay for or outgoing money. Record the profits and losses to establish the financial health and viability of the business.

Separate your accounts
Keep your personal transactions and your farm transactions separate to avoid confusion.

Separate lines of credit
Enterprise tracking: It is important to know which aspects of your farming are bringing in the money and which divisions are costing you money.

Balance early and often
- Check your accounts as often as possible to make sure your bank balance aligns with your records.
- Enter payments made (expenses) as you make them and receipts (income) as you deposit them.
- Reconcile your accounts every month when the bank issues the statement. Know where and how every cent has been spent or earned.

Avoid paper storms
Stay organised and win the war against the mail pile and late fees: Open all mail and emails when you receive them. Record monies owed, and make payments as required. Also keep track of who owes you money. Profitability hinges on turning your physical work into an invoice, which turns into cash. Get the cash, pay your bills, save interest expenses and breathe a little more freely.

WHY BOOKKEEPING?

The regular data entry and journal entries only exist to help you run your business better, because you are better informed with accurate information. You as the farmer must stay involved in the process. Get the financial feedback you need to reinforce or redirect your management decisions.

Lastly, keep your promises and honour your contractual agreements. Your reputation and credibility grow when you fulfil commitments. This way you can become known as a dependable, reliable and trustworthy farmer and businessperson. ■

JENNY MATHEWS,
MANAGEMENT AND DEVELOPMENT
SPECIALIST AND EDUCATOR

WORDS OF WISDOM

Our greatest weakness lies in giving up.
The most certain way to succeed is always
to try just one more time.

~ THOMAS A. EDISON
American inventor

PREVENT UNPLANNED FINANCIAL SURPRISES

IT IS IMPORTANT TO UNDERSTAND THE DIFFERENT COSTS OF A BUSINESS – REGARDLESS OF WHETHER IT IS A ONE-MAN BUSINESS OR A COMPANY. IN ANY BUSINESS, INCLUDING A FARMING BUSINESS, THERE ARE TWO MAJOR TYPES OF EXPENDITURES – VARIABLE AND OVERHEAD COSTS.

Some expenditures will change when the production increases or decreases. However, other costs will stay the same up to a certain point and are not influenced by an increase or decrease in production. Therefore, the costs are divided into the directly allocatable variable costs and the fixed or overhead costs to form the total cost of the business.

VARIABLE AND FIXED COSTS

Variable costs

The variable costs are directly related to the quantity produced per enterprise. If no production takes place, there will be no variable inputs and costs needed. The variable costs will increase when the production level increases – for example, seed, fertiliser, fuel and seasonal labour costs.

If maize is produced, it is easy to calculate the quantity of seed needed. The more you plant, the more seed will be needed. It is common knowledge that in maize production seed, fertilisers, herbicide pesticides, diesel, repairs and other inputs are needed. These inputs must be available during planting time.

Fixed costs

On the other hand, some costs must be paid on a monthly basis, such as the cellphone account, farmworkers' salaries, groceries and other expenditures. These monthly costs are normally called fixed or overhead costs.

Fixed costs are the part of the total cost that will remain unchanged, regardless of whether production takes place or not. Normally it is not influenced by an increase or decrease in production.

To illustrate this, look at the example of your household needs. If more hectares of maize are planted, your household needs usually remain the same. If less hectares of maize are planted, it also remains the same. But on a hectare basis, the cost will change drastically – if more hectares are planted, the cost per hectare will decrease; and if less hectares are planted, the cost will increase. It does not matter how much is planted, the fixed costs must form part of the total cost for the enterprise.

1 *An example of a normal fixed cost sheet for a farming business.*

Fixed cost heading	Total for the year	Crops fixed cost	Livestock fixed cost
Labour: Wages and salaries			
Electricity			
Repairs for fixed improvements			
Management, vehicles, fuel and repairs			
Administration and office expenses			
Bank charges			
Tax			
Auditor			
Miscellaneous expenses			
Land rent and share cropping			
Licences			
Mail and phone			
Legal fees			
Insurance: General			
Living cost			
Personal insurance			
Once-off field costs			
Depreciation			
Interest on overdraft			
Long-term and medium-term instalments			
Allocation of fallow land costs			

In **Table 1** an example of the normal fixed cost sheet for a farming business is shown. It is important to understand that all farming businesses will have nearly all these costs, but there can be exceptions. For example, if a business does not own any tractors and entirely uses contractors to perform all the cultivation tasks, then there cannot be a depreciation cost for tractors.

These fixed costs are normally overlooked in the budgeting process. Sometime during the year the money in the bank will be finished, with a few months still left before the crops will be harvested. During this time, farmers will start to sell unmarketable cattle to generate cash for paying the labour and debit orders on the account.

BREAKEVEN PRICE PER TON PRODUCED

In the current grain marketing situation, it is important that every farmer must know what his breakeven price per ton produced must be. Remember, the crop prices are available daily on Safex and farmers can sell their crops on forward contracts.

It is important to know how much it is go-

The more you plant, the higher the variable costs will be.

ing to cost you to produce a ton of the crop. A farmer can then decide when to sell or what to plant. If you do not include all your fixed costs, you will not make the best decision for your business.

> *It does not matter how much is planted, the fixed costs must form part of the total cost for the enterprise.*

DIVIDING THE FIXED COSTS

Farmers must make sure that the fixed costs are divided fairly between the different farm enterprises. Firstly, the fixed or overhead costs must be allocated where possible to the different enterprises.

The fixed costs can be divided between the crops and livestock enterprises, according to the number of permanent workers in the enterprise. For example, if there are ten farm workers and two of them are livestock herdsmen, 20% of the fixed costs can be allocated to the livestock and 80% to the crop production.

When planting maize and sunflower, the fixed cost allocated to crops can be divided between the maize and sunflower according to the litre diesel used per hectare. By doing it this way, a crop that is using more diesel will carry a higher fixed cost.

CONCLUSION

Farmers may ask why the fixed cost is important and why depreciation must be included (like in the example about tractors). The main reason is that tractors will lose their value over time and extra money is needed to replace an older tractor with a newer one. So, depreciation is in a way a technique to help make provision for replacing older equipment. Everybody know that the old tractor needs to be replaced at a certain time and by adding depreciation as a cost, it will ensure that there is money available to replace the old tractor.

Never forget the fixed costs, as the small costs add up to an enormous amount that needs to be paid. For example, you pay R500 per month for your cellphone and at the end of the year it adds up to R6 000. Given today's July maize price of R3 000 in the farmer's bank account, it means that 2 tons of maize is gone. With a living cost of R120 000 per year, 40 tons of maize is gone. Start adding the costs up and in the end you will need a lot of maize to cover the overhead or fixed costs.

In the next article we will focus on the direct cost and total cost to produce grains and oilseeds. ■

PIETMAN BOTHA, INDEPENDENT AGRICULTURAL CONSULTANT

Guidelines for first-time

AS THERE ARE A NUMBER OF FACTORS THAT MUST BE CONSIDERED AND ADDRESSED BEFORE PRODUCTION BEGINS, THE DECISION TO PLANT SOYBEANS SHOULD BE MADE AT LEAST TWO YEARS BEFORE THE FIRST PRODUCTION SEASON (ACTUAL PLANTING).

The most important factor is to obtain soil samples of the earmarked areas, have these samples analysed and do the necessary soil corrections recommended from the samples. The pH and lime requirements are particularly important, as the lime application should be done on the crop planted before soybeans. If large corrections of phosphorus (P) and potassium (K) are required, a large part of it can also be done on the preceding crop.

A second factor to consider is the possible transmission of herbicides from one season (crop) to another season (crop). For instance, herbicides that are used in maize and wheat production can generally not be used on soybeans. There are also waiting periods before soybeans can be planted in the same soil where certain herbicides were used previously. It is advisable to withdraw herbicides that have a waiting period of ten to twelve months at least two years prior to planting soybean in the same soil.

Thirdly, all compacted layers should be broken up (ripped). It is also important to use fields that are not rocky and/or very uneven. Soybeans are harvested at a low level (30 mm to 60 mm), and the harvester blade can be damaged if lands are uneven and/or rocky.

When a farmer makes use of contract harvesting, he/she should ensure that the contract makes provision for a set harvest date. The number of days between planting and harvesting varies greatly between seed cultivars. It is therefore important to obtain this information from seed companies. Lands that are prone to waterlogging and yellow nut sedge (*uintjies*) should also be avoided.

SOIL

Avoid soil with structural damage, which is usually indicated by the presence of clods with sizes between a golf ball and tennis ball (**Photo 1**) and occurs due to heavy showers. This leads to the poor emergence of soybeans. Soil that compacts because of textural problems (clay percentage), should also rather be avoided.

However, if a farmer chooses to cultivate these soils, the cultivation methods should be amended to improve its organic content. Soybeans can be cultivated in soil with a wide spectrum of clay content (10% to 45%).

Although soybeans perform relatively well in soils where the elements are not optimal, it is important to know what the optimal level for these elements are in the different soil types (see **Table 2** on page 11). The pH value of soil in which soybeans will be cultivated, should vary between a water-pH of 5,8 and 6,5.

If the application of lime is necessary, the magnesium content (Mg content) is often used as an indicator for which type of lime to use. If it is below 100 mg/kg, dolomitic lime must be used. If it is higher than 100 mg/kg or 0,6 x soil-calcium (Ca), calcitic lime should be used. Although soybeans are not overly sensitive to brackish soil, it is preferable that the natrium level should be below 50 mg/kg, with the resistance (R) between 2 000 ohm and 3 500 ohm, and the conductivity (EC) below 75 mS/m.

AGRICULTURAL PRACTICES

In the following sections, soil and other agricultural practices are discussed as they are applied throughout the season.

Fertilisation

As with many other crops, the fertilisation of soybeans depends on the withdrawal of elements by a specific crop. If the nutritional elements are thus at an optimal level, only the elements that were removed by the previous crop are replaced. **Table 3** (on page 11) indicates the removal rates from the soil by soybeans.

Soybeans can be self-proficient in their nitrogen requirements through symbiosis with Rhizobium bacteria.

As can be seen in Table 3, there is a need for especially K in the cultivation of soybeans. The fertilisation guidelines for P and K in soybeans are indicated in **Table 4** and **Table 5** (both on page 11).

Most farmers spread fertiliser laterally and work it into the soil – or in the case of no-till, fertiliser is absorbed through rain and earthworms. Some farmers also use planters to ensure that the fertiliser is not put near the seed during planting. They usually plant using a mixture.

Where wind and sandy soils are a problem (as typically in the west), planting can be done with a complete NPK mixture, with the

1 ***Values in green and blue indicate the optimal row width and plant population at harvesting time.***

DECISION ON PLANT POPULATION AND ROW WIDTH						
	150 000	**200 000**	**300 000**	**400 000**	**500 000**	**600 000**
Rows	**Number of plants per metre, distance between plants (cm)**					
38 cm	6 (16,6)	8 (12,5)	11 (9,1)	16 (6,25)	19 (5,3)	23 (4,38)
45 cm	7 (14,3)	9 (11,1)	14 (7,14)	18 (5,55)	23 (4,35)	27 (3,70)
52,5 cm	8 (12,5)	11 (9,1)	16 (6,25)	22 (4,55)	26 (3,85)	32 (3,13)
60 cm	9 (11,1)	12 (8,33)	18 (5,55)	24 (4,17)	30 (3,33)	36 (2,78)
76 cm	11 (9,1)	15 (6,67)	23 (4,35)	30 (3,33)	38 (2,63)	46 (2,17)
90 cm	14 (7,14)	18 (5,55)	27 (3,70)	36 (2,77)	45 (2,22)	54 (1,85)

Source: Protein Research Foundation

limitation that not more than 15 kg to 20 kg N is placed in the plant furrows. The mixture should also be kept away from the seed to prevent fertiliser burn. **Photo 2** and **Photo 3** (on page 10) indicate deficit symptoms of P and K.

Cultivars and maturity groups

All cultivars can be categorised in maturity groups, which indicate the number of days that it takes from the date of planting to reach maturity and be ready for harvesting. Maturity groups are divided into more groups, with 000 being the closest to the poles and 10 being the closest to the equator – put differently, a maturity group of 000 is planted in cooler areas, while a maturity group of 10 is planted in warm areas.

Maturity groups are furthermore divided in tenths within groups, for example 4,4 or 6,2. In South Africa, groups 4, 5 and 6 are most often planted and sometimes group 7. Groups 4 and 5 are planted in the cooler areas, groups 5 and 6 in the moderate climate areas, and groups 6 and 7 in the warm areas.

It is preferable that more than one maturity group is planted to mitigate the risks of drought, hail and diseases. It also prolongs the harvesting period. Certain soybean cultivars have a specific growth pattern. This means that it starts to bloom and finishes blooming within four to six weeks, and ends on the main stem with a raceme of pods.

The other type of growth pattern is non-specific. It is very sensitive to daylight and blooming will only start when the night-time is a certain length. If this type of soybean experiences drought conditions, it will stop growing and start producing pods. However, when there is moisture again, it will continue to grow and bloom until it reaches a certain number of days after planting (specific maturity groups).

Other characteristics to consider when choosing a cultivar, is the seed mass and structure (bushy or upright). For instance, a bushy structure has bigger potential because of more side stems. Also consider resistance to shattering late in the season and plant height – plants with a height of 76 cm to 80 cm are big enough and will be less prone to fall over than taller plants.

1

Damaged soil structure.

2

P-deficiency symptoms can be seen on the two rows in the middle.

Currently more than 40 different cultivars are sold by various seed companies. It is important that seed is ordered before the season starts (as early as May), to ensure that farmers get the specific cultivar that they want.

Grafting of seed with Rhizobium bacteria

The soybean plant is totally dependent on nitrogen (N), which it gets from the Rhizobium buds on the roots. The plant provides carbohydrates and sugars to the Rhizobium in return for N. As the specific type of Rhizobium used in South Africa is not endemic to the country, it is important that the seed is properly grafted each season.

It is also important that when soybeans are planted for the first time, the seed is grafted in the plant furrows before and during planting. Keep in mind that Rhizobium are live organisms that can be killed by direct sunlight and the absence of oxygen in the soil, resulting from drowning.

If mistakes are made with the grafting, it will cost the farmer much more for something which could have been obtained for R60/ha to R90/ha. Currently there are seed companies that graft soybeans themselves and then sell it as such. Make sure you plant the seed before the expiration date of the vaccine.

Row widths and plant population

Soybeans are planted in row widths of 25 cm to 150 cm. However, the most row widths vary between 38 cm and 90 cm (**Table 1**). If the correct plant population is used, soybeans can be planted in any of the row widths mentioned above – just ensure the spacing of plants within the row is not closer than 4 cm and further than 8 cm. The idea behind this practice is that the farmer can use the same planter with which he plants maize.

It is important to remember that the plant population must be the same as what should be on the land at harvest time. A number of factors can contribute towards the 'disappearance' of plants throughout

3

K deficiency symptoms are clearly visible on the two rows in the middle on this field.

4

Opening of plant furrows: Left (coulter) and right (tine).

the season, such as a low germination percentage, insects, diseases and the oppression of some plants by others. Therefore, 15% to 20% more seed should be planted than the intended plant population at harvest time.

Planting date and planting process

The planting date is determined by the region (cool, moderate or warm). In the cooler regions, soybeans are sometimes planted as early as 10 October, but the optimum planting date is between 20 October and 20 November. In the moderate regions, planting takes place between 1 and 30 November, and in the warm regions it is between 15 November and 15 December.

The growth height of the cultivar also influences the planting date. If short growers are planted too early, it can be ready to harvest at the beginning of March, when quite a lot of rain can still fall and delay harvesting. However, do not plant it too late either, as it could then be ripe at the same time as the longer growers.

The best is to first start planting the longest growers to utilise the heat-units of the season optimally, then the shortest growers and thereafter the cultivars in-between according to the growth length. Take note that when reference is made to the longest and shortest group of cultivars, it refers to the region where it is planted.

In other words, in the cool regions, the longest group will be something like 5,8 or 6, while the shortest group will be something like 4,2 or 4,4. Likewise, in the warmer regions, a short grower will be indicated as 5,5 to 5,8 and a long grower as 6,8 to 7,0.

When replanting is necessary due to weak emergence or hail damage, a different approach is followed. If there was weak emergence or early hail, replanting can be done immediately, using the same maturity group that was planted originally. If late hail occurs and soybeans can still be planted, use a cultivar that is medium long, between 5 and 6. The idea here is that fast growers start to bloom two weeks after emergence – the plants end up being very small, with a low yield.

Soybeans are planted mainly with maize planters, of which the plates have been altered to accommodate the extremely high plant density. The opening up of the plant furrows – either with coulters or teeth – is used in specific conditions. In regions where wind damage can occur after planting, a deeper plant furrow is preferred to protect seedlings against the wind. The use of teeth is therefore a better option, and it can later be evened out with a land roller.

With coulters, there is basically only a cut in the soil, and the soil is then even for the harvesting process (**Photo 4**). Soybeans absorb 50% of their weight in moisture before they can germinate, and thus care must be taken not to plant too dry or too shallow. The planting depth can vary between 3 cm and 5 cm. If the chances are good that no rain is likely to fall between planting and emergence, planting can preferably be done a little deeper at 3,5 cm to 4,5 cm.

Weed control

These days, most soybean cultivars are resistant to glyphosate. This leads to farmers no longer effectively fighting weeds from emergence, because they can control it at a later stage. However, this practice is incorrect – over the last few seasons many farmers were caught off-guard by drenching rains in December, preventing them from entering the lands with spray equipment to control weeds. Soybeans that emerge together with weeds suffer damage from the start, and crop losses is a reality.

There are very good pre-emergence herbicides on the market that can be used to control grasses, broad leaf weeds and sedges. Farmers applying these herbicides usually do not even have to go back afterwards with glyphosate, which is economically a good practice.

Some weed species are becoming resistant to glyphosate, such as *skraalhans*, small-leaf spiderwort (*wandelende Jood*) and even green amarant (*misbredie*). Control with other herbicides is therefore extremely important, so that resistance does not get out of control.

Insects and diseases

Insects that can damage soybeans should be controlled timeously. Pests that should be controlled are bollworm, soybean looper, *bontrokkie*, all species of stink bugs, redspider, aphids and locusts.

Of the various diseases that occur on soybeans, two are especially important from an economic viewpoint: Soybean rust and Sclerotinia. Both these diseases are destructive, and although soybean rust can be effectively controlled with preventative spraying, there currently is not a product that is effective against Sclerotinia.

Attempts are made to eliminate Sclerotinia through the use of fast growers, as plants only get infected with it through lesions where

2 *Norm of soil fertility.*

Nutritional elements		Red soil mg/kg	Yellow soil mg/kg	Black soil mg/kg
Phosphor (P) Bray 1	Low Medium High	15 15 - 40 >40	10 10 - 30 >30	5 5 - 30 >30
Nutritional elements		**Sand mg/kg**	**Loam mg/kg**	**Clay mg/kg**
Potassium (K)	Low Medium High	40 40 - 120 >120	60 60 - 180 >180	80 80 - 200 >200
Calcium (Ca)	Low Medium High	200 200 - 600 >600	400 400 - 1 100 >1 100	600 600 - 1 800 >1 800
Magnesium (Mg)	Low Medium High	35 35 - 100 >100	60 65 - 150 >150	100 100 - 250 >250

3 *Removal rates taken from soil by soybeans.*

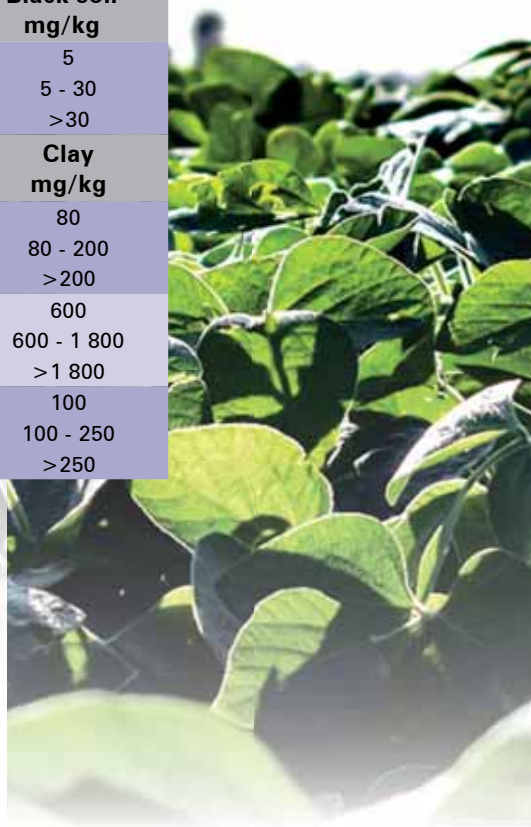
	N	P	K
The plant with 1 ton seed/ha removed	60 kg	5 kg	18 kg
The seed component removed per ton	42 kg	3,5 kg	9,9 kg
The plant component removed	15 kg	1,2 kg	7,2 kg

4 *Phosphorus guidelines for soybeans.*

Soil P	Kg P application for yield of (t/ha)				
Bray 1 (mg/kg)	**1**	**2**	**3**	**4**	**5**
5	10	20	30	40	50
10	9	18	27	36	45
15	8	16	24	32	40
20	7	14	21	28	35
25	6	12	18	24	30
30	5	10	15	20	20
50+	0	0	0	0	0

5 *Potassium guidelines for soybeans.*

Soil K	Kg K application for yield of (t/ha)				
(mg/kg)	**1**	**2**	**3**	**4**	**5**
40	20	40	60	80	100
Sand 40 - 120	15	30	40	50	60
>120	0	0	0	0	0
60	25	45	65	85	125
Loam 60 - 150	20	40	60	70	80
>150	0	0	0	0	0
80	60	80	100	120	140
Clay 80 - 180	30	50	70	90	110
>180	0	0	0	0	0



flowers fall off. At this stage, the microclimate for the disease to start its lifecycle is not optimal and plants are thus not infected. Under irrigation, charcoal rot often causes problems.

Harvest

Soybean is harvested with a wheat harvesting table on a combine harvester. Several factors should be considered. It is important to set the speed of the feeding wheel to minimise the shattering of seed. The drum speed and concave must also be adjusted to limit the splitting of seeds, while also adjusting the air volume used to blow the crop residues away.

When harvesting, stop to assess the spillage of beans before it goes into the harvester and also the spillage behind the harvester. Make the necessary adjustments and then continue. In some cases, the spillage can be up to 150 kg/ha. Remember that silos receive soybeans at 12,5% moisture – therefore try to finish harvesting as soon as possible, as the moisture content can drop very quickly to 8%. ■

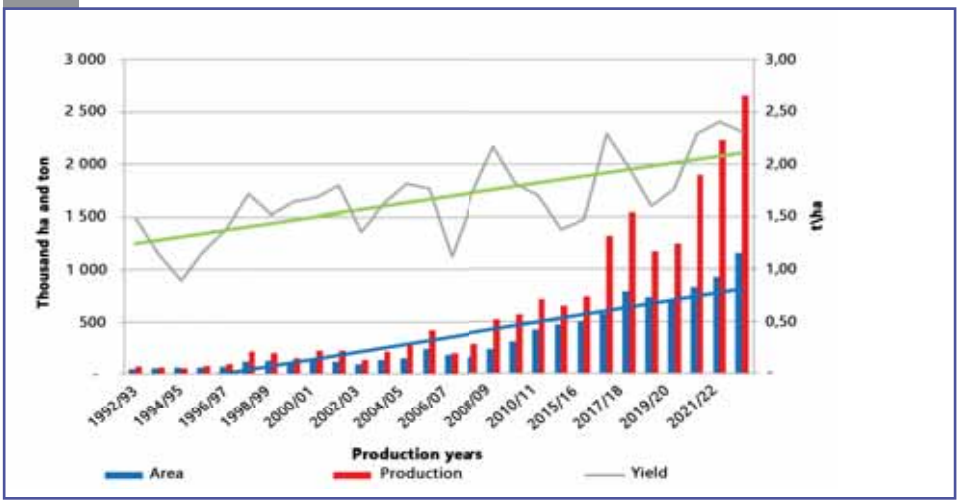
WESSEL VAN WYK, SOYBEAN SPECIALIST AND CONTRACTOR, PROTEIN RESEARCH FOUNDATION

Advantages of soybean production

SOYBEANS, AS A CROP, HAVE MANY ADVANTAGES. THIS INCLUDES BEING AN ALTERNATIVE CROP FOR MAIZE PRODUCTION, BEING A GREAT SOURCE OF PROTEIN FOR ANIMAL FEED AND BEING AN OILSEED THAT CAN BE USED FOR VEGETABLE OIL PRODUCTION.

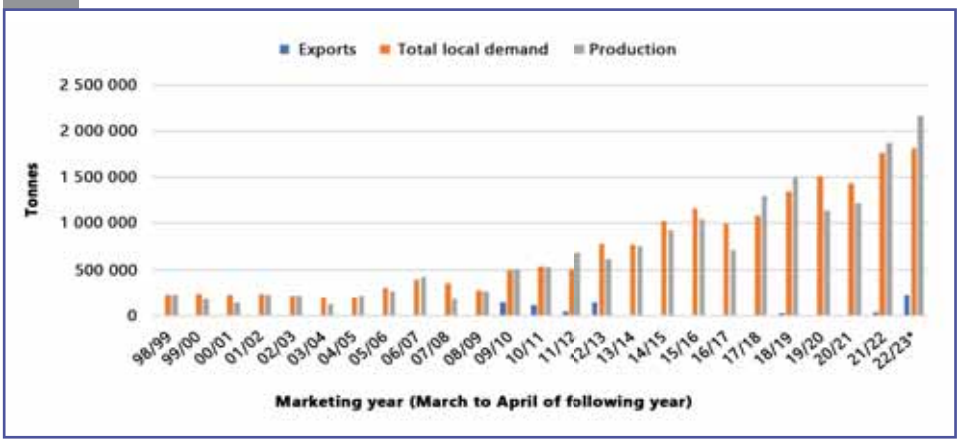
It is no secret that soybean production has increased significantly over the past three years. Looking at **Graph 1**, it is obvious that the planted hectares and production of soybean have increased by significant amounts since the 2020/2021 production season.

1 ***Soybean area planted, production and yield.***



Source: Grain SA

2 ***Soybean demand vs production.***



Source: Grain SA

> *It is important that new markets are developed, so that soybean exports continue regularly and the inland stocks remain stable.*

Increases in production can be attributed to many factors, such as new technologies improving yields and excess soil moisture in the western regions that aided the planting of soybeans. Even though production has increased significantly, the total local demand has not followed the same trend – as can be seen in **Graph 2**. Graph 2 also illustrates the production, total consumption and exports of soybeans.

Past trends indicate that the norm for the South African soybean market, prior to the 2020/2021 marketing season, was for local soybean production to be insufficient in meeting the total local demand. However, after the 2020/2021 marketing season, production exceeded the total demand to such an extent that exports were needed. If South Africa did not have the ability to export soybeans, local prices would have felt the pressure.

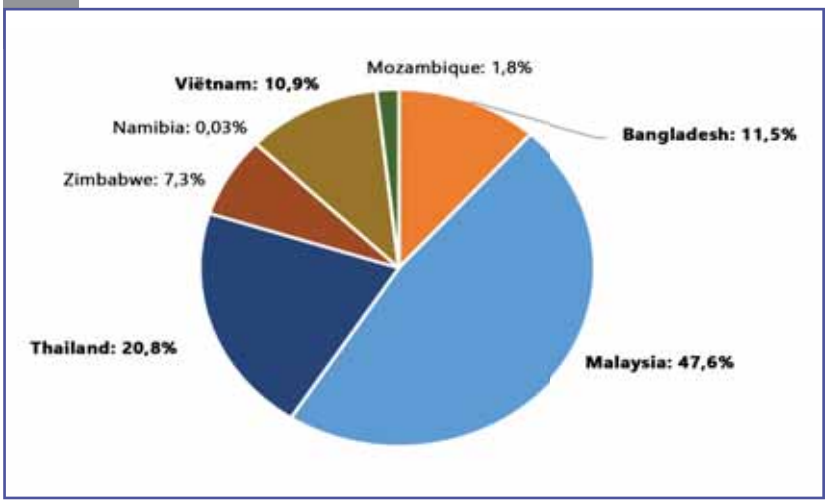
Graph 3 illustrates the countries to which soybeans have been exported in the 2022/2023 marketing year. The soybean export market is relatively new, and export markets are still being discovered. In the previous season, the biggest portion (91%) of South African soybeans was exported to the East Asian markets. Approximately 230 000 tons of soybeans were exported to these countries, which is a significant increase in exports compared to previous seasons.

It is important that new markets are developed, so that soybean exports continue regularly and the inland stocks remain stable. Looking at the new season, new markets can include Egypt, China, Turkey and Indonesia. The soybean exportable surpluses are expected to again show a significant increase this season, and as such export market development is crucial.

SUMMARY

The soybean industry is growing faster than the local consumption, which creates a build-up of inland soybean stocks. To

3 ***Soybean export destinations in the 2022/2023 marketing year.***



Source: Grain SA

keep the local supply and demand balance sheet stable, soybean exports are critically important. If South Africa did not have the ability to export the mass amounts of excess soybeans, local contract prices would surely have felt a strong downward pressure.

Looking at the new season, export markets are continuously being pursued and developed. For the 2023/2024 marketing season, which started in March, an exportable surplus of approximately 600 000 tons is anticipated. This exportable surplus will help to keep the pace for the current fast-growing soybean industry. ■

HELEEN VILJOEN, AGRICULTURAL ECONOMIST GRAIN SA

HEALTH AND SAFETY **Part 10**

Take care *at high areas*

EMPLOYEES WORKING AT HIGH AREAS SHOULD BE AWARE OF THE DANGERS THAT CAN OCCUR AND THEREFORE MUST BE TRAINED FOR THIS TASK.

- A lifeline must be available to which the employees can attach themselves when working at heights.
- The necessary protective clothing must be provided, especially when dangerous substances such as asbestos are present, e.g., working on asbestos roofs. In such a case, the employer must ensure that the asbestos regulations' requirements are also met.
- The employer must ensure that employees are medically fit for the task.
- Employees should preferably not work alone at high places and must be able to communicate with the supervisor.
- A trained first-aid worker and a first-aid kit should be available on the premises.
- Training for these tasks is extremely important. A 'fall-arrest plan' – a set of procedures designed to help identify and reduce fall hazards – must also be compiled for the task. Employees should be aware of these procedures.
- No work should be done at high areas when the weather conditions are not favourable. ■

CHARL SAAYMAN, HEALTH AND SAFETY CONSULTANT AT MEGA HEALTH AND SAFETY

GRADING

ensures your product is on par

WHEN TRADING OF COMMODITIES TAKES PLACE, IT IS VITAL THAT THE PRODUCTS' QUALITY IS GRADED TO DETERMINE IF IT COMPLIES TO THE SET STANDARDS AND REQUIREMENTS. THE QUALITY OF PRODUCTS (CANOLA, SUNFLOWER SEED, SOYBEANS AND GROUNDNUTS) ARE INDICATED IN THEIR OWN STANDARDS AND REQUIREMENTS (AND GUIDELINES IN THE CASE OF GROUNDNUTS) AS CLASSES AND GRADES.

Grading particulars are normally documented as a regulation in accordance with the Agricultural Product Standard Act (APS Act 119 of 1990). With regards to the producer grading for groundnuts, the grading particulars are not published as a regulation under the APS Act but are recognised by industry as a guideline.

1 ***The different classes and grades for oilseeds.***

Product	Classes	Grades
Canola	Two classes: Class C and Class Other	Two grades for Class C No grades for Class Other
Sunflower seed	(a) Class FH – a cultivar with a high oil content/a cultivar with a low oil content (b) Class FS (c) Class Other	One grade for Classes FH and FS: Grade 1 No grades for Class Other
Soybeans	Two classes: Class SB and Class Other	Class SB shall be graded as Grade SB1 No grades for Class Other
Groundnuts	Five classes: Class A, B, C, D and E	* In **pod form**: Choice (OK), standard (OS), sundry (OD), crushing (OP) or Grade Other (F-pods). * In **kernel form**: Choice (K), Standard (S), Sundry (D), Crushing (P) and Grade Other (F-kernels)

** Class Other only becomes applicable when the standards for classes are not met.*

The different classes and grades for each product are indicated in **Table 1**. When one determines the grade and class of a specific product the following general quality aspects must be complied with. However this is not applicable for Grade Other, see **Table 2**.

SPECIFIC QUALITY REQUIREMENTS FOR OILSEEDS

The specific requirements for each of the products are explained below with references to specific tolerances that will be applicable.

Groundnuts

When groundnuts are delivered in pods, the kernel contents will be determined as a percentage to indicate the kernel mass that can be expected in the consignment of pods. When inspecting pods, a standard deduction of 1,5% will be made to compensate for shell loss adjustments that are likely to take place.

A 10 kg sample of pods will be inspected:

- Shelled kernels in the consignment of pods shall not exceed 5%.
- Sticks in consignment op pods - not to exceed 10%.
- Foreign matter and sticks together not more than 15%.

A 200 g kernel sample of a consignment of groundnut pods will be screened and inspected to determine the quality aspects. From the 200 g sample the following tolerances will be applicable during grading:

- Edible groundnuts should not have unsound, blemished, soiled (UBS) kernels that exceed:
  - Choice grades 10% max.
  - Standard grades 20% max.
- Edible groundnuts should not have unsound kernels that exceed:
  - Choice grades 5% max.
  - Standard grades 10% max.
- Edible groundnuts should not have defective kernels that exceed:
  - Choice grades 20% max.
  - Standard grades 35% max.

The total sundry edible groundnuts should not have:

- UBS kernels – 30% max.
- Unsound kernels – 15% max.
- Defective kernels – 40% max

The total unsound kernels in the consignment should not exceed 20%.

The following screens will be used to determine the following grades:

- 7,5 mm slotted screen: Choice grade 1 (or standard grade 1).
- 6,75 mm slotted screen: Choice grade 2 (or standard grade 2).
- 6,0 mm slotted screen: Sundry grade (80/100 size).
- 7,2 mm round hole screen: Split kernels.
- 5,15 mm slotted screen: Crushing grade 1.
- Pan: Crushing grade 2.

The prices that will be paid for a consignment of groundnuts will be

2 ***General quality aspects.***

	Canola	Sunflower seed	Soybeans	Groundnuts
(a) Khaki-bush, musty, sour or other unacceptable odours	Free of odours	Free of odours	Free of odours	Free of odours
(b) Live insects	Free from insects and snails	Free from	Free from	Free from
(c) Must not contain more poisonous seeds than permitted in terms of the Foodstuffs, Cosmetics and Disinfectants Act, 1972 (Act No. 54 of 1972)	Specifications of regulation R1225	Specifications of regulation R1225	Specifications of regulation R1225	Be free from seeds from *Ricinus communis*, specifications of regulation
(d) Chemical residues	Not applicable (n/a)	n/a	n/a	Must not exceed maximum limits
(f) Substance which renders it unfit for human or animal consumption or processing into or utilisation thereof as food or feed	Free from	Free from	Free from	Free from
(g) Glass, metal, coal or dung	Free from	Free from	Free from	n/a
(h) Animal filth	n/a	Free from	Free from	n/a
Grades	Graded as Grade Other if it does not comply with requirements for C1 or C2	Graded as Grade Other if it does not comply with requirements for FH1 or FS1	Graded as Grade Other if it does not comply with requirements for SB1	Graded as Grade Other if it does not comply with requirements for choice, standard, sundry or crushing

determined by the respective percentages of kernels of each grade – choice, standard, sundry and crushing) as they are screened.

Soybeans

When soybeans are delivered the following grading particulars and maximum tolerance will apply for grade SB1 soybeans:

- Wet pods determined per 10 kg sample – tolerance of 0,2%.
- All foreign matter, including stones other grain and sunflower seeds – tolerance of 5%.
- Other grain in the sample – tolerance of 0,5%.
- Sunflower seed in the sample – tolerance of 0,1%.
- Stones in the sample – tolerance of 1%.
- Sclerotia – tolerance of 4%.
- When screened, soybeans above 1,8 mm slotted screen but pass through the 4,75 mm round hole screen – 10% tolerance.
- Defective soybeans on top of the 4,75 mm round hole screen – 10% tolerance.
- Soiled soybeans – 10% tolerance.
- Collectively: All foreign matter and Sclerotia – 7% tolerance.

Sunflower seed

With sunflower seed delivery the following grading particulars and maximum tolerance will apply for grades FH1 and FS1:

- Foreign matter – 4% tolerance.
- Damaged sunflower seeds – 10% tolerance.
- Screening (sunflower seed below the 1,8 mm slotted screen) – 4% tolerance.
- Sclerotia – 4% tolerance.
- Collectively: Foreign matter screenings and Sclerotia – 6% tolerance.

Canola

When canola is delivered the following grading particulars and maximum tolerance will apply for grades C1 and C2 (Table 3). ■

3 ***Grading particulars and maximum tolerance for canola.***

Deviation	Permissible deviation Grade 1	Permissible deviation Grade 2
Heat damaged seed	2%	5%
Distinctly green seed	4%	10%
Sprouted kernels	2%	5%
Mouldy seed	0%	0%
Stones	0,5%	0,5%
Damaged seed	6%	15%
Sclerotinia	4%	4%
Other grain	2,5%	3%
Foreign matter	3,5%	4%

NEELS WEGNER, HARMONISATION PRODUCT SPECIALIST, PPECB

EXTRUSION STRENGTHENS the grain value chain

ACCORDING TO THE WORLD HEALTH ORGANISATION (WHO), MORE THAN 260 MILLION PEOPLE IN SUB-SAHARAN AFRICA (SSA) ARE UNDERNOURISHED. THIS REPRESENTS 21% OF THE POPULATION IN THIS REGION. THERE IS ALSO A RISING INCIDENCE OF NON-COMMUNICABLE DISEASES AS DIETS SHIFT WITH INCOMES AND URBANISATION.

In 2019 the total consumption of grains in SSA was 140 million metric tons. According to the Food and Agriculture Organisation of the United Nations (FAO), maize, rice, wheat, and sorghum equate to 89% of total grains consumed. These grains contribute to about 45% of average daily caloric intake in SSA. Since these grains have generally low levels of protein, general diets in the SSA region usually lack sufficient proteins as macronutrients.

NUTRITIONAL VALUE OF GRAINS

Table 1 gives typical nutritional values of raw grains per 100 g. Nutrients are compounds in food that are essential to life and health. They provide energy, the building blocks for repair and growth as well as substances necessary to regulate the chemical processes in the human body. Chickpeas and soy are better sources of protein. Multigrain products that use two or more grains therefore provide more nutritionally balanced foods.

Micronutrients, which include vitamins and minerals, can be added through fortification. Most countries therefore introduced regulations that make fortification of raw meal and flours mandatory. However, it is important to note that cooking of the meal or flour destroys most vitamins from grains and pulses. Traditional starch-based meals in the region, such as pap, ugali and chapati, therefore lack sufficient levels of vitamins after being cooked.

According to the WHO, micronutrient malnutrition affects millions of people in Africa. Micronutrient malnutrition accounts for 7% of the global burden of diseases. Iron and vitamin A deficiencies contribute to 1,5 million deaths per year.

New studies have found that whole grains reduce the risk of cancer, diabetes, infectious disease and help to reduce the risk for cardiovascular disease. Many countries therefore suggest 33% to 50% of grain servings should be wholegrain. The USA and Canada recommend that at least 50% of grain products consumed each day should be wholegrain, while the Swiss Society for Nutrition recommends that 67% of daily recommended starch servings should be wholegrain.

1 *Typical nutritional values of raw grains per 100 g.*

RAW PRODUCE	MAIZE	WHEAT	RICE	CHICKPEAS	SORGHUM	SOYBEANS	CASSAVA	MILLET
NUTRIENT								
PROTEIN	9,2 mg	12,4 g	7 g	7,5 g	11 g	37 g	1 g	10,6 g
FAT	3,8 g	2,0 g	0,7 g	3,0 g	3,46 g	18,0 g	0,3 g	1,3 g
CARBOHYDRATES	65,5 g	59,5 g	78,5 g	22,0 g	72,09 g	29,5 g	38 g	72 g
DIETARY FIBRE	9,2 mg	10,6 g	1,3 g	5 g	6,7 g	5 g	2,9 g	3,2 g
ENERGY	354 cal	329 cal	355 cal	325 cal	339 cal	428 cal	141 cal	327 cal
VIT A	0	0	0	0	0	0,08 mg	0	0
VIT B1 (THIAMIN)	0,36 mg	0,5 mg	0,06 mg	0,05 mg	0,33 mg	1 mg	0,06 mg	0,26 mg
VIT B2 (RIBOFLAVIN)	0,20 mg	0,15 mg	0,03 mg	0,03 mg	0,1 mg	0,52 mg	0,03 mg	0,14 mg
VIT B3 (NIACIN)	1,8 mg	6,4 mg	1,6 mg	1,5 mg	3,7 mg	1,6 mg	0,85 mg	4,7 mg
VIT B6	0,40 mg	0,4 mg	0,15 mg	0,5 mg	0,44 mg	1,20 mg	0,30 mg	0,75 mg
VIT B12	0	0	0	0	0	0	0	0
FOLATE	0	0	6 mg	0,6 mg	20 mg	0,38 mg	27 mg	85 mg
VIT C	0	0	0	0	0	30 mg	32 mg	0
VIT D	0	0	0	0	0	0	0	0
SODIUM	6 mg	10 mg	5 mg	20 mg	2 mg	4 mg	2 mg	3 mg
POTASSIUM	330 mg	500 mg	100 mg	300 mg	363 mg	1700 mg	400 mg	300 mg
CALCIUM	15 mg	45 mg	10 mg	50 mg	13 mg	260 mg	37 mg	30 mg
PHOSPHORUS	250 mg	400 mg	120 mg	0	289 mg	600 mg	38 mg	310 mg
IRON	0,5mg	3,3 mg	0,6 mg	1,8 mg	3,4 mg	8,6 mg	1,3 mg	9 mg
MAGNESIUM	45 mg	140 mg	10 mg	50 mg	165 mg	250 mg	20 mg	150 mg
ZINC	1 mg	4,1 mg	0,50 mg	1,2 mg	1,67 mg	1 mg	0,60 mg	1,8 mg

1

Examples of extruded products.

2

Examples of plant-based products.

It is becoming generally accepted that good nutrition leads to optimal brain development, great health and ultimately thriving communities. The provision of adequate nutrition is therefore seen as central in uplifting local and regional communities and to develop their ability to uplift themselves.

Figure 3 (on page 18) shows the different food extrusion resources of Africa. It includes the following:

- Top five supplying countries of maize, wheat, rice, sorghum, soy, cassava, millet and chickpeas.
- Populations of the main countries.
- Average age of the countries.
- Annual gross domestic product (GDP) of the countries.
- Male and female population age distribution.

Africa has a total population of 1,343 billion, making it the second most populated continent. The population is expected to increase to 2 billion by 2050. An ever-increasing number of children is suffering from malnutrition. The average population in Africa is 19 years of age, meaning that more than 50% of the population is not part of the working population. Urbanisation will lead to 30% growth of cities' population by 2030 according to the World Bank. 90% of the world's urbanisation will be in Africa.

Covid also had a severe negative impact on the local economies of Africa and SSA. It disrupted the food supply chains and forced millions of people and children into poverty that caused hunger, malnutrition, job losses and hardship.

NEW OPPORTUNITIES EMERGE

As signs are here that the end of the pandemic is moving closer, opportunities are starting to emerge for the SSA region and Africa. Africa has fertile agricultural land, water, and sufficient sun to rebuild itself post Covid-19. To succeed regional and local economic activities need to be created and established to create sustainable local supply of safe food, energy, and water.

The opportunity therefore exists to build strong value chains from the farm gate to the end consumer that supply safe affordable nutritious foods made from locally produced agricultural products.

Humans cannot eat raw grains and pulses. It therefore must be cooked, either in a processing facility or at home before it is consumed. Extrusion has become a popular technology for processing and cooking of grains and pulses. It is a continuous high pressure and high temperature cooking process that is used to produce ready-to-eat products, such as instant porridges, breakfast cereals, puffed snacks, pet foods and aqua feeds. The latest developments focussed on meat analogues from plant-based proteins.

Extrusion plants are central to the establishment of complete value chains between the farm gate and the end consumer. These plants form the heart of the value chain and perform functions that cannot be done by humans. Extrusion is therefore a technology that – contrary to general belief – creates jobs and does not take them away! The establishment of strong value chains also creates a market for local producers, thus strengthening the local economy.

Benefits of using extrusion to cook grains and pulses include the following:

- Enable the production of safe, affordable nutritious foods.
- Local beneficiation of local produce.
- Localised technology – from Africa for Africa.
- Create value chains from farm gate to end consumer.
- Local economic development.
- Job creation.
- It is energy efficient.
- Continuous cooking process.
- No waste streams.
- Mitigate climate change – shifting towards more plant-based diets.

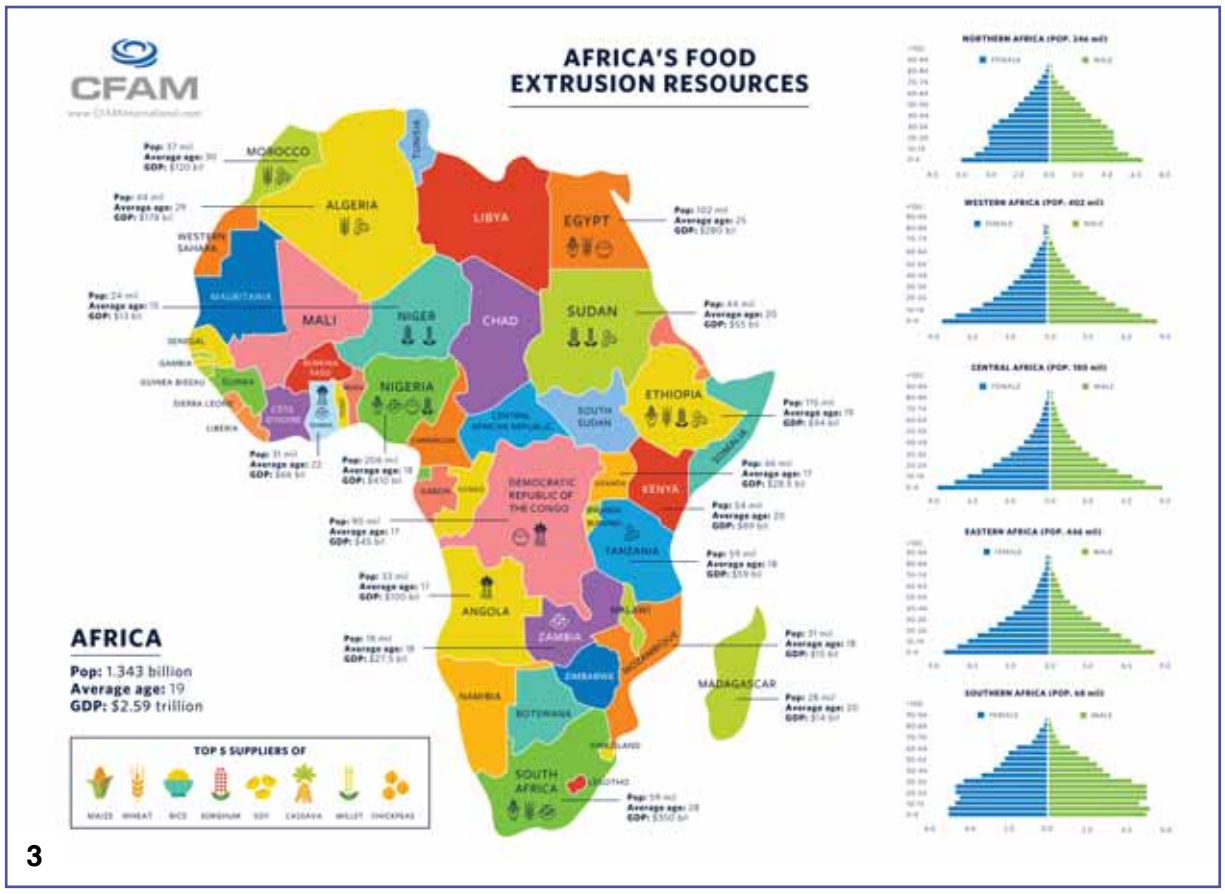
Figure 1 shows samples of extruded products. All products have been produced on the same machine that were reconfigured for the different products.

The latest advancements in extruders and specifically twin-screw extruders have been central in the development of modern meatless meat analogue products. With twin-screw extruders it is now possible to produce meat analogues with the same attributes as real meat. When prepared in a dish, it is often impossible to distinguish between the meat analogue and the real meat product (**Figure 2**).

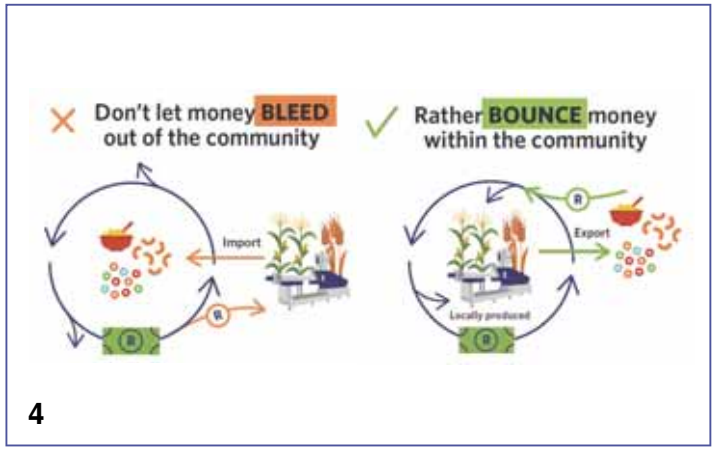
Proper implementation of these value chains therefore assists in creating jobs and alleviating poverty, while leading to local economic growth, local beneficiation of products, regional revitalisation, food security and supply of nutritional foods.

CFAM Technologies is a South African company that was established in 2007 with the aim to commercialise twin-screw extruders for Africa and the developing world. It is a spin-off company of the North-West University (NWU) and the only manufacturer of twin-screw food extruders in Africa and the Southern Hemisphere.

CFAM's extrusion equipment is backed by more than 20 years of research and innovation at the Faculty of Engineering at the NWU in Potchefstroom. It focussed its research on developing safe,



Food extrusion resources of Africa.



Local economic development through extrusion.

nutritious, affordable foods from locally produced agricultural products. CFAM is well positioned to assist the South African, SSA and African agricultural sector in developing new products to beneficiate locally produced agricultural products.

Figure 4 illustrates how extrusion can assist in creating local economic development.

BUILDING THE LOCAL ECONOMY

When a community is dependent on imported produce and products, money bleeds out of the community, resulting in an unstable economy. By creating a circular economy, money flows between different sectors. By exporting products, money flows into the circular economy, thus strengthening the local economy.

The production capacities of small and medium-sized commercially viable extrusion plants typically vary from 300 kg per hour upwards to 6 tons to 10 tons per hour. Larger plants have capacities of up to 25 tons per hour and more. Small and medium-sized extrusion plants are ideally suited for regional plants that assist with local economic development.

An extrusion plant creates a market for the local farmers' agricultural produce and forms the heart of the value chain between the farmer and the end consumers. The cost for complete small extrusion plants starts around R6 million. Mid-sized extrusion plants cost between R15 million to R20 million with medium-sized plants around R30 million.

Extrusion plants generally generate annual revenues that exceed the setup cost of the plant. Such plants add significant value to the raw materials that are being processed. Under normal business conditions the payback of an extrusion plant is about three years. Under favourable business conditions it can be less than two years. ■

PROF LJ GROBLER, DIRECTOR: CFAM TECHNOLOGIES (PTY) LTD, PROFESSOR IN MECHANICAL ENGINEERING, NORTH-WEST UNIVERSITY, POTCHEFSTROOM. *FIRST PUBLISHED IN SA GRAAN/GRAIN, JUNE 2022.*

Steps to destroy the FMD VIRUS

Photo: Dijān de Waal

FOOT-AND-MOUTH DISEASE (FMD) IS A SEVERE, HIGHLY CONTAGIOUS VIRAL DISEASE AMONG LIVESTOCK THAT HAS A SIGNIFICANT ECONOMIC IMPACT. THE DISEASE AFFECTS CATTLE, PIGS, SHEEP, GOATS AND OTHER CLOVEN-HOOFED RUMINANTS.

The FMD is estimated to circulate in 77% of the global livestock population in Africa, the Middle East and Asia, as well as in a limited area of South America.

The FMD virus is vulnerable to extremes in the pH. Both acids (such as citric acid) and bases (such as caustic soda or sodium hydroxide) can destroy the virus. However, to be effective, these disinfectants must be applied properly – in the right concentration and at the right temperature – and must remain in direct contact with the target surface for a sufficient time. Before applying a disinfectant, the surface must free of dirt, dust, manure, mud and other debris.

CLEAN

The goal is to remove as much debris as possible. Such material can shield contaminants from the action of chemical disinfectants. Pre-cleaning is also important because many disinfectants are less potent in the presence of organic material. Scrape, brush or sweep the surface to remove all solids (dirt, feed, manure, bedding and other debris). If it is dusty, moisten the area to control dust and minimise aerosolization.

Proper disposal of solid waste, dirt, bedding, manure and other organic material is important. Local regulations may require burning, burial or composting. Personnel should wear protective clothing (for example, gloves, face masks, goggles or headwear) and rubber boots.

WASH

Try to reduce the number of contaminants on the surface as much as possible. Soak surfaces with water and detergent or another cleaning agent. Then wash the surfaces by spraying, wiping or scrubbing. Steam and high-pressure washers (200 psi to 1 000 psi) can be useful, especially for cleaning porous surfaces. A washing solution can also be applied with a simple, low-pressure (90 psi to 120 psi) garden hose applicator.

Proceed from the cleanest areas to the dirtiest and from the highest level (ceiling) to the lowest (floor). Equipment that can be removed, should be brushed and soaked in detergent before disinfection. Hoses, connectors, troughs or drains can serve as reservoirs for pathogens and should be cleaned last.

After washing, thoroughly rinse all surfaces at a low pressure to remove any residue. Some disinfectants (i.e., hypochlorite) can be inactivated by soaps and detergents. To reduce the risk of excess dilution of the disinfectant, areas should be allowed to drain or dry before application. Use extra care in high-pressure spraying to minimise spreading contaminants via aerosolization. Personnel should wear protective clothing (e.g., gloves, face masks, goggles or headwear) and rubber boots.

DISINFECT

The goal is to deactivate the remaining FMD virus. Read the entire product label and follow the instructions carefully to ensure that the application is as safe and effective as possible.

Be sure to:

- Use the proper concentration because effectiveness against the virus depends on the pH of the dilution. Do not combine acid and alkali agents, as they neutralise one another when mixed.
- Apply disinfectant at the correct temperature. Because some disinfectants are ineffective at low temperatures, the agent and/or the surface may require heating during cold weather.
- Thoroughly wet the surface. One gallon (about 3¾ litres) of diluted disinfectant is ordinarily applied to about 9 to 14 metres of surface area (about 0,4 ℓ/m).
- Apply disinfectant from the highest level (ceiling) to the lowest level (floor).
- Allow the disinfectant solution to 'sit' and work for the recommended length of time. Disinfectants need time to work. The minimum contact time is usually at least five to ten minutes.
- Personnel should wear protective clothing (e.g., gloves, face masks, goggles or headwear) and rubber boots. Selection of the proper disinfectant will depend not only on the micro-organism suspected, but also the environmental factors (e.g., temperature and pH) and safety issues.
- The following products are recommended to inactivate the FMD disease virus:
  - 5,25% sodium hypochlorite (NaOCl) 'household bleach'.
  - Acetic acid (CH_3CO_2H).
  - Potassium peroxymonosulfate and sodium chloride 'Virkon S'.
  - Sodium carbonate (Na_2CO_3) 'soda ash'.
  - Sodium hydroxide (NaOH) 'lye'.
  - Citric acid ($C_6H_8O_7$). ■

HAVE YOU HEARD?

GRAIN SA NEWS

NAMPO 2023: Another successful NAMPO was held on 16 to 19 May. With 81 945 visitors this year, it was once again an example of innovation by the grain value chain but also the South African agricultural sector. The Minister of Agriculture, Land Reform and Rural Development, Thoko Didiza, was one of the visitors to NAMPO Park on Friday, 20 May.

These agricultural students were excited to meet Ms Thoko Didiza.

NEW IDENTITY: Grain SA's new brand identity was launched at a special event on Monday, 15 May. The new logo includes the mathematical greater but also equal-to symbol (≥), which symbolises the fact that all grain producers, irrespective of their farming operation's size, are equally important while they are stronger if they stand united under the Grain SA umbrella.

HEROES GET RECOGNITION

Two of Grain SA's Farmer Development Programme's farmers recently entered their heroes into a competition by Grain SA and John Deere, where agricultural heroes are placed in the spotlight. Both these winners walked away with a handy cash prize of R2 500 each.

Luvuyo Mbutho, who farms in the Swartberg area, entered his neighbour, Dawie du Plessis, who played a huge part in his farming success; while Mzewakhe Mthimkulu, who farms in the Senekal area, nominated his father, Koos.

Why don't you enter your hero? It can be a local producer, your grandfather or father who guided you. It can be a farm worker who has helped you achieve success or any role model who made a difference in your farming career.

BLUETONGUE VACCINE REGISTERED

The Red Meat Producers Organisation (RPO) expressed concern about the shortage of strategic vaccines in the livestock and animal industries. This shortage caused a state of disaster in the red meat industry, as commercial and developing farmers are suffering serious losses due to bluetongue outbreaks that cause up to 50% mortality among herds.

On 10 May, Design Biologix announced the registration of the bluetongue vaccine, BLU-VAX (G4534), after the Department of Agriculture, Land Reform and Rural Development (DALRRD) assisted them in the emergency registration process of the vaccine. BLU-VAX (G4534) is an inactivated, adjuvanted polyvalent bluetongue virus (BTV) vaccine, formulated as an emulsion, for the active immunisation of healthy sheep against blue tongue disease.

Due to the emergency registration process, the evaluation of the vaccine has not been as extensive as it would have been under normal circumstances for Design Biologix's product development. However, the company has committed to further vaccine evaluation post-registration, as well as epidemiological studies to continue evaluating the extent of the disease.

Source: AgriOrbit

AGRICULTURAL BUDGET SPEECH BRINGS GOOD NEWS

On 9 May, minister Thoko Didiza of the DALRRD announced during her budget speech that the development of traditional agricultural areas, previously known as reserves, will be a key priority in the coming financial year. She referred to an analysis by the National Agricultural Marketing Council (NAMC), which found that placing a mere 10% of this land back into production would unlock 500 000 job opportunities and increase the gross domestic product (GDP) by R59 billion.

To mitigate against loadshedding, Didiza also shared that an Agro-Energy Fund was being set up at Land Bank.

- Large-scale farmers will qualify for 30% grant funding, capped at R1,5 million, to be matched with a 70% loan portion.
- Medium-scale farmers will qualify for a 50% grant, capped at R1 million, to be matched with a 50% loan.
- Smallholder farmers will qualify for a 70% grant, capped at R500 000, to be matched with a 30% loan.

Corner Post

BY LOUISE KUNZ, ASSISTANT EDITOR

THOKOZANI HLATSWAYO (41) FARMS WITH HIS 86-YEAR-OLD FATHER, ROBERT, ON THEIR 800-HECTARE FARM, BROEDERSTROOM, IN THE AMERSFOORT DISTRICT. ALTHOUGH HE IS NOT PLANTING ON A BIG SCALE YET, HE HAS ACHIEVED AN AVERAGE YIELD OF MORE THAN 6 T/HA OF MAIZE FOR THE PAST COUPLE OF YEARS.

This season, ThokoZani planted 18 hectares of soybeans instead of maize to create a rotation system. Unfortunately, the high rainfall in the Mpumalanga area made it a challenging season, but he remains positive that it will still be a good season.

Although he would like to grow the crop side of the operation, he has decided to start small and gradually increase his production. This way he can make sure that he masters the skills required to be a successful crop farmer. Apart from the crops, they own cattle, sheep and goats.

After completing his school education, ThokoZani first worked for a furniture firm making office furniture. He then made a career change and worked for African Cables, a company that replaced cables for mines all over South Africa. When he was retrenched in 2015, he went home to the farm and eventually realised that farming was his calling.

At the end of that year, he bought goats at an auction in Ermelo. It was here that he heard about Grain SA and the input developing farmers can receive through the Farmer Development Programme. In 2016, he joined a study group at Daggakraal near Amersfoort and started expanding his agricultural knowledge. He was so committed that he was selected as a finalist in the 2022 Smallholder Farmer of Year category of Grain SA's Farmer of the Year competition.

ThokoZani is very handy and can fix all his own. Although none of his are interested in agriculture, his 19-year-old nephew is keen to learn the ropes from his uncle and grandfather.

THOKOZANI'S STORY

WHAT IS THE BEST THING ABOUT FARMING?

The soil! Everything we do on the farm revolves around soil – and turns into life. Without soil there is no life. Farming also offers me the opportunity to make a difference in the community, whether it is by the food I grow or the job opportunities I create in harvest time.

HOW ARE YOU INVOLVED IN THE COMMUNITY?

Apart from sharing my knowledge with other farmers and my workers, I also check the group members' products and assist them where necessary until harvest time During harvest time, I offer job opportunities by hiring extra hands from within the community to help with the workload.

HOW HAS GRAIN SA CONTRIBUTED TO YOUR OPERATION?

This is a high rainfall area and initially the soil did not produce according to its potential. I phoned Grain SA for assistance and gathered the necessary information from the experts. I have learned so much from them about the importance of input requirements and crop estimates.

WHAT IS YOUR DREAM FOR THE FUTURE?

I would love to see the youth of South Africa become more interested in agriculture. We sometimes invite pupils to come and see first-hand how farming works. I also hope to one day be a commercial farmer.

THOKOZANI'S THREE TOP TIPS

1. You must be passionate about farming before you even begin.
2. Farming is hard work – it is not for lazy people.
3. Don't make money your focus – sometimes you win, sometimes you don't. Then you try again.

FARM FACTS

Farm: Broederstroom
Nearest town: Amersfoort
Region: Mpumalanga
Size: 800 ha
Type of farming operation: Mixed (plants maize, soybeans and dry beans and owns cattle, sheep and goats)

GRAIN SA'S CONTRIBUTION

- Joined Grain SA in 2016
- Chairman of the Bethamoya Study Group

Training courses completed:
- Introduction to maize
- Introduction to dry beans
- Introduction to soybeans
- Mycotoxins
- The welding and painting courses

A mentor's view:
Jurie Mentz, regional development manager at the Louwsburg office, says ThokoZani is a very energetic, hardworking young farmer who is always eager to learn. 'As chairman of the Bethamoya Study Group, he plays a leading role and sets an example for other farmers in the area when it comes to maize production. He is also always willing to help the other farmers in the group. This young farmer is making a big impact on his fellow farmers and the community at Bethamoya.'

Jurie Mentz

A programme that is changing lives

Communication is key for success

SOUTH AFRICAN FARMERS EITHER OWN OR HAVE ACCESS TO LAND THROUGH VARIOUS TENURE ARRANGEMENTS. THE AIM OF THE GRAIN SA/PHAMA GRAIN PHAKAMA (PGP) FARMER DEVELOPMENT PROGRAMME IS TO EQUIP INDIVIDUALS.

All activities undertaken within this programme are tailored with the specific intention of transferring knowledge and skills. Every activity in the Farmer Development Programme (FDP) is designed to target as many farmers as possible in a meaningful way, *inter alia* via the following communication mediums:

Study group meetings: Here farmers have access to information and expert advice. The study groups bring the farmer development footprint to key grain-growing regions. This is where the relationship starts. The FDP team gets to know the farmers and the farmers learn to trust the team. It creates opportunities to identify unique challenges and opportunities in a specific region. It also ensures that there is appropriate transfer of information – both theoretical and practical. Mentors and managers can be instrumental in updating farming systems and changing lives. A total of 33 study group meetings were held in April.

Demonstration trials: Grain SA works with agribusinesses who are willing to donate to these important projects. Local farmers are also involved in the planning and preparation of trial plots – many also contribute to the project themselves. The team shows them why things must be done in a specific way. This is a wonderful learning opportunity, as farmers learn best from seeing with their own eyes, in their own location. Then they also change more willingly to implement more effective farming operations and improve their enterprise profitability. During the 2022/2023 summer season, 16 trial plots were planted.

Farmers' days: These gatherings are organised to allow farmers to see the trial plots, to learn from experts such as Grain SA and industry representatives, and to build their own agricultural support networks. Five farmers' days were held in April.

Support to advanced farmers: A need was identified to support advanced developing farmers who have grown beyond study groups. Those are farmers who are almost farming independently but will benefit from a year's intensive one-on-one mentoring. They now receive individualised support and are frequently visited. The team made 152 farm visits in April.

Pula/Imvula: The monthly newsletter is an important tool towards facilitating the widespread dissemination of information. It is published in five languages – English, IsiZulu, Xhosa, Sesotho and Setswana.

Training courses: Skills development in agriculture is an investment in the future. Six training courses were held in April.

Farmer of the Year: Through this competition, role models are identified who serve to inspire others. The Grain SA team paid a visit to twelve potential Farmer of the Year candidates in the four categories during April.

Schools programme: This initiative recognises the potential of the youth to make a significant impact on the agricultural sector – if they can be alerted to the urgent need for them to participate as future farmers or in other careers in agriculture. The team visited 20 schools in April, where DVD presentations were done to senior secondary pupils to create greater awareness about agriculture.

AT GRASS ROOTS

At study groups, members not only get theoretical knowledge but can also see first-hand what must be done in the field.

Trial plots like this sunflower field trial plot which was planted in 2022 near Kokstad, offer a wonderful learning opportunity for farmers.

Advanced farmers like Thobani Ntonga receive one-on-one mentoring.

Through the Schools Programme, Grain SA is trying to motivate the youth to get involved in agriculture.

Inspiring farmers through knowledge

FARMERS' days provide an opportunity to get farmers together – along with a network of input suppliers, service providers and support groups, including leaders from the different government departments. Demonstration trial sites are often visited, where information can be exchanged with other farmers, input supply companies, local extension officers and other sector stakeholders who are strategically invited to these days.

During April the following farmers' days were held:

- In the Senekal district, 62 farmers visited the farm Astoria near Senekal in the Eastern Free State on 14 April. This event was sponsored by Bayer and Farmsol. The farmers were especially interested in the lecture at the soil pit, as root development, compaction layers and soil health are so important today.
- Bayer also sponsored a farmers' day at Gibsons Farm in the Normandien area in KwaZulu-Natal. This event, which took place on 18 April, was coordinated by the Dundee office. Information regarding no-till farming and crop production was received well by the 42 farmers who attended the event.
- On 19 April, 53 farmers attended the farmers' day at Milnedale near Dannhauser in KwaZulu-Natal. Bayer was the sponsor of this event and the arrangements were coordinated by the Dundee office. Apart from agricultural practices, the lectures also focussed on the importance of good administration and running an efficient farm office.
- John Deere and Grain SA joined forces to coordinate a farmers' day at Stoneybrook in the Kokstad area in KwaZulu-Natal on 20 April. The main objective of this event was to introduce John Deere Financing to the farmers. The attending farmers were eager to learn more about John Deere tractors and equipment.
- The fifth farmers' day in April was held on 21 April at Zaaiplaas near Sehlakoane in Limpopo. Representatives from Bayer, Kynoch, the Forestry and Agricultural Biotechnology Institute (FABI) and the Department of Agriculture shared their knowledge with the 61 attendees.

Bayer representative Shadrack Mabuza talks about cultivar selection with the farmers at Zaaiplaas.

Farmers listen attentively to a discussion about tractors and equipment at Stoneybrook.

Programme SUPPORTS GROWTH

GRAIN SA'S Farmer Development Programme, which functions under the name *Phahama Grain Phakama* (PGP), is an agricultural development agency that prioritises and supports people who desire to improve their farming practices and upskill themselves to become better farmers.

The team uses several strategies to meet grain farmers around the country and find meaningful ways to facilitate knowledge transfer and skills development.

A key ingredient to the programme is building networks and partnerships with other stakeholders. PGP aims to:

- Meet farmers and earn their trust by demonstrating willingness to walk the extra mile in supporting them.
- Strengthen relationships between farmers and the agribusiness networks around them.
- Stay informed about political and policy developments that affect the environment, so that farmers can operate successfully.
- Act as a watchdog to ensure that the farmer is treated fairly and has the best opportunity to get optimal performance from the available resources.

PGP uses a variety of interactive methods to assist farmers to become better farmers.

We were there!

NAMPO 2023 was an experience enjoyed by all. Here are some of the highlights and a few of the visitors who enjoyed the largest agricultural show in the Southern Hemisphere. ■


















Photos by Lizel Snyman.