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PULA IMVULA

GROWING FOOD • PEOPLE • PROSPERITY

GRAIN SA MAGAZINE FOR DEVELOPING FARMERS

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Editorial team

GRAIN SA: PRETORIA
PO Box 74087
Lynnwood Ridge
0040
■ 08600 47246
■ www.grainsa.co.za

MANAGING EDITOR
Sandile Ngcamphalala
■ 082 862 1991 ■ Office: 012 943 8296
■ sandile@grainsa.co.za

EDITOR AND DISTRIBUTION
Liana Stroebel
■ 084 264 1422 ■ Office: 012 943 8285
■ liana@grainsa.co.za

PUBLISHING PARTNER
INFOWORKS MEDIA PUBLISHING
Assistant editor – Louise Kunz
■ louise@infoworks.biz
Team leader – Johan Smit
■ 082 553 7806 ■ Office: 018 468 2716
■ johan@infoworks.biz
Publishing – Elizma Myburgh, Joritha Hechter

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Grain SA Farmer Development Programme

DEVELOPMENT CO-ORDINATORS
Johan Kriel
Free State (Ladybrand)
■ 079 497 4294 ■ johank@grainsa.co.za
Jerry Mthombothi
Mpumalanga (Nelspruit)
■ 084 604 0549 ■ jerry@grainsa.co.za
■ Office: 012 943 8289 ■ Smangaliso Zimbili
Jurie Mentz
Mpumalanga/KwaZulu-Natal (Louwsburg)
■ 082 354 5749 ■ jurie@grainsa.co.za
■ Office: 012 943 8218
Graeme Engelbrecht
KwaZulu-Natal (Dundee)
■ 082 650 9315 ■ graeme@grainsa.co.za
■ Office: 012 943 8287 ■ Nkosinathi Mazibuko
Luke Collier
Eastern Cape (Kokstad)
■ 083 730 9408 ■ luke@grainsa.co.za
■ Office: 012 943 8280 ■ Luthando Diko
Liana Stroebel
Western Cape (Paarl)
■ 084 264 1422 ■ liana@grainsa.co.za
■ Office: 012 943 8285 ■ Hailey Ehrenreich
Du Toit van der Westhuizen
North West (Lichtenburg)
■ 082 877 6749 ■ dutoit@grainsa.co.za
■ Office: 012 943 8290 ■ Lebo Mogatlanyane
Cwayita Mpotyi
Mthatha
■ 078 187 2752 ■ umthata@grainsa.co.za
■ Office: 012 943 8277

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A WORD FROM...

Jurie Mentz

IF THERE IS ONE LESSON I LEARNED ABOUT AGRICULTURE (WHICH CAN ALSO BE APPLIED TO LIFE IN GENERAL) IS THAT WHEN YOU ONLY TALK ABOUT SOMETHING, YOU ARE HEADING IN THE WRONG DIRECTION, BUT TO ACTUALLY DO SOMETHING MEANS YOU ARE ON THE RIGHT TRACK.

Successful farming means an elimination of risks. You must always try and be ahead of the problem and not react because of a problem – like a farmer driving around his fields. If you react because of the problem, you end up chasing the problem.

It is also true that there will always be new problems that the farmer needs to learn from so that he does not make the same mistakes twice. A farmer cannot do the same thing each year and expect a different outcome.

If you only have a small amount of money available, it is wise to rather plant a smaller area than to try and use that amount of money to plant a larger area. This is an infamous trap into which you may fall if you are not careful. Be as productive as possible on your piece of land before trying to go bigger without enough funds.

There is a Zulu saying *Indlela ibuzwa kwa bapambili*. Roughly translated it means that you should ask those that are ahead of you about the road on which you are travelling. A few examples of these are:

- Neighbours who know the climate, soil types and weather conditions of the particular area.
- Various input providers who are all too willing to help you reach your goal.
- Resources which are easily available via the internet.
- Attend any course, farmer's day and study group meeting of which you are aware.

When we are talking farming, the road less travelled does not make the difference; the difference is made by knowledge of what to expect and an eagerness to do something about it. ■

Harvesting at the **RIGHT TIME** is vital

TIMELY HARVESTING WILL ENSURE THAT THE POTENTIAL MAXIMUM YIELD AND INCOME OF THE CROPS CAN BE FULLY REALISED AS SOON AS POSSIBLE AFTER THE STAGE OF PHYSIOLOGICAL MATURITY HAS BEEN REACHED.

The harvesting of maize, sunflowers and soybeans involves the consideration of some of the same factors common to each crop.

- The proper planning for the storage or delivery of a crop is as important as the optimum time for harvesting.
- Possible seed losses by harvesting too late must be minimised.
- Any adverse weather conditions such as too much rain, wind or hail damage on the mature crop have a huge impact on your yield.
- Continuous overcast conditions can promote fungus, aflatoxin and other infestations in the seed heads.
- Try to minimise damage from pests, insects, birds and animals.
- Reduce the risk of fire damage to your crop.
- Lately the possibility of theft of your hard-won crop has also become a high-risk factor in South Africa.

CONSIDERATIONS FOR MAIZE

The whole plant and various leaf growth stages can be described from planting to tasselling or silking. The number of days for each phase differs for each cultivar. The reproductive phases cover pollination, seed or kernel development, grain filling as nutrients are transported to the cob and physiological maturity as well as the end of growth for the maximum size and weight of each seed. This phase can take about 63 days for a total of 119 days from seedling emergence to physiological maturity.

> *The percentage (%) moisture content of the seed can be monitored by taking samples of cobs.*

Physiological maturity is defined as the moment that the plant and seed will no longer grow or increase in weight. The mature plant and seed will then begin to dry off until harvesting occurs. The time period depends on cultivars planted, growth or heat units received, and general weather conditions including rainfall, onset of the first frosts and humidity of the air during this period.

The plant indicator for physiological maturity is found by examining the seed to find a black kernel layer formation at the base of the kernel. This can be seen by splitting the seed from top to bottom with a sharp knife to look for the black line formation.

It is important to walk through the lands and take note of when this stage has been reached. The percentage (%) moisture content of the seed can be monitored by taking samples of cobs, removing the kernels and having them tested at your local silo or using your own tester. The rate of moisture loss from the kernels can be measured and so monitored as it falls from about 35% to 14% during the next 40 days or more.

The planning date for combining can then be estimated to ensure that your own combine is ready for the harvesting operation, or that you have notified a contractor as to the areas and possible dates for the commencement of harvesting.

If you farm in an area of high humidity, planning must be done if you plan for the crop to be dried on the farm (if you have enough floor space available), or commercially when you deliver to a registered silo.

Otherwise, combining must be delayed until the crop is below 14% moisture. It can take another three weeks or more to drop from 18% to below 14%. Some silos will dry the maize seed below 14% if the temperatures will exceed 30°C during the estimated storage period.

If you have suitable cribs or other facilities the cobs can be harvested at 18% moisture and stored to be milled and used later. However, if the cobs do not have enough airflow through the storage area in high humidity areas, the danger of aflatoxin infection in the cobs will be highly increased.

CONSIDERATIONS FOR SUNFLOWERS

The vegetative stages, with the number of leaves formed as a guide, can take place over 35 days or more from planting. This includes germination, seed establishment and early leaf development. The leaves will continue to grow and develop. Unlike maize, the bud formation occurs early on and the whole plant with stem, leaves and flowering head continue and is known as the flowering bud stage. Additional phases are flowering and seed development.

Physiological maturity is then reached with the head going from green to yellow and then brown. A total of about 155 days from planting to physical maturity is usually required. Physiological maturity is identified when the bracts surrounding the sunflower head change to brown with the moisture percentage still being at about 30% to 40 %.

The ideal time to start harvesting is before the heads are totally dry when the seed is about 9% to 10% moisture. At 7% moisture the shattering losses can be high. The seed moisture percentage must be closely monitored so that the crop can be harvested as soon as possible.

Uncleaned and newly combined seed can have fungus developing within 24 hours if the seed is above 9% moisture and the harvested seed is just offloaded onto a shed floor.

Photo: Jenny Mathews

A timely harvest is important to avoid losses and will further help to maximize potential grain yield.

CONSIDERATIONS FOR SOYBEANS

The growth phases for soybeans go through emergence to the fifth open leaf stage. The reproductive phase begins with the start of pod formation and ends with the drying of the plants, pods and seeds. At physical maturity 95% of the pods have become yellow brownish, tan or tawny pod colour.

Another five to ten days of drying weather are required after physiological maturity for the average moisture levels of the beans to be less than 15%. Harvesting and storage can be started when the seeds are at an ideal 13% moisture.

Soybeans can be of determinate or indeterminate growth habits. The determinate plants stop growing and flowering when a certain reduced daylight length occurs. The plants therefore reach a maximum size with pods that mature over a short period. Indeterminate soybean cultivars continue to grow, flower and produce pods until triggered to stop by a certain genetically determined shortening daylight length period.

Up to 75% of all flowers created may abort before pod setting starts.

The plants can have a range of from emergence of 43 to 65 days to 50% flowering with a range of 127 to 143 days to harvest maturity. Long season cultivars planted in September or October can take ten to 14 days or more to emerge if a cold spell is experienced. Experience has shown that soybeans can 'hold back' in a dry period during the flowering period.

It is critical to continuously monitor the moisture percentage from when the seeds reach their minimum size and rapidly start to lose moisture. A combine must be available a least a week before the optimum harvesting moisture of 13% might be reached. If the pods are too dry more than 15% to 20% of a crop can be lost due to pre-combining shattering and the harvesting process itself.

CONCLUSION

When deciding on maize, sunflower or soybean cultivars make sure you know the estimated number of days for the vegetative and reproductive periods. Physical maturity and the ideal harvesting moisture percentages can then be closely monitored. ■

RICHARD MCPHERSON, AGRIBUSINESS AND PROJECT MANAGEMENT CONSULTANT

MAIZE STOVER is a valuable commodity

BY OPTIMISING THE STOVER, A FARMER IS ESSENTIALLY INCREASING THE BENEFITS AND PROFITABILITY OF HIS MAIZE PRODUCTION CYCLE. WITH PROFIT MARGINS UNDER PRESSURE, EVERY MAIZE FARMER NEEDS TO DECIDE ON HOW BEST TO CAPITALISE ON THE STOVER LEFT IN THE FIELD.

Maize stover consists of the leaves, stalks and cobs of the maize plants left in a field after harvest. It is a valuable commodity and maize farmers should definitely always plan to use the stover in some way, or alternatively trade it.

Some landowners who lease lands out to other farmers may stipulate that they want access to the land post-harvest so they can benefit from the stover on the field. In this instance the farmer who has leased the field must be aware of the value of the stover and there should be some trade off in the land rent agreement.

UTILISING THE STOVER

The different ways of utilising the stover for maximum benefit are grazing it on the land or removing it off the land.

The most economical way of utilising the stover is by allowing your livestock to graze the stover off the land. It can be grazed efficiently by cattle and sheep but there will be a measure of wastage because at the same time the cattle are trampling the stover into the field. The cost benefit in this instance is there is no spend on fuel or labour to remove any stover off the land. The disadvantage of running cattle on a field is they will likely need to graze in the fields for an extended period of time. In this instance the farmer has to make a judgement call because this essentially prevents the farmer from working the lands and preparing the soil as early as possible for the next season – working the fields in winter can be very beneficial for the next crop.

Maize stover is an excellent source of feed and a wonderful way of growing your livestock through the winter months. The animals will definitely gain condition and thrive on maize stover compared to those that are overwintered on dry grasslands or veld. Some farmers even plan for this and will buy in animals specifically to eat the maize stover then sell them again after a few months because of the promise of excellent weight gain from running them on maize stover.

When a landowner does not have the option of an extended period of using the field post harvest, it is possible to bale the maize stover and remove it from the land. This involves mechanical costs as the stover has to be chopped, raked and baled. The farmer will need to make the sum – the more stover left on the field means the process is more easily justified. The benefit is that with this method, the maximum tonnage available can be removed off the fields. It can then be sold or mixed into feed rations for livestock – or even be fed as is, with animals eating the bales in a more convenient place. The harvesting of the maize stover should be done as soon as possible after the grain has been harvested. There will be a steady decrease in quality of feed stock the longer it is left to lie on the fields as sugar and protein content decreases and fibre increases.

There is however also a disadvantage to baling the stover that the farmer must keep in mind and weigh up his costs and options. By removing the stover off the fields completely, the soil is left more exposed to possible wind erosion and top soils will be blown away. For this reason, some farmers prefer to allow the maize stover to break down and decompose on the field, leaving it untouched, and so add to the mulch and organic material in the soil. This is the approach that a no-till or minimum-till farmer would most likely take, as the idea is to mulch and build up organic material in the soil. Clearly in this scenario no livestock should graze on these fields. This is unfortunately a huge challenge for maize farmers who are expected to allow any village livestock to graze on their lands during winter months.

Every farmer should take time to consider his best options and decide how to capitalise on the value that maize stover presents. We can't afford to neglect to utilise this product optimally, that would be wasteful. ■

Photo's: Grain SA team

Maize stover is an often under-utilised commodity but it is a valuable feed source and should be seen to be a valuable addition to a feeding programme.

JENNY MATHEWS,
MANAGEMENT AND DEVELOPMENT
SPECIALIST AND EDUCATOR

Let's look at local sunflower market trends

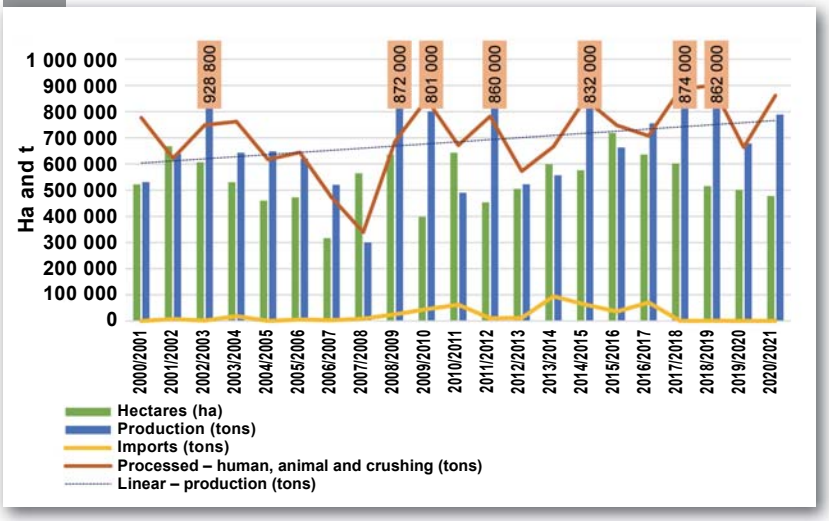
OVER THE YEARS SUNFLOWER HAS GAINED THE REPUTATION OF AN IDEAL CROP TO GROW UNDER LOW-INPUT AND MARGINAL CROPPING CONDITIONS, WITH CONSISTENT YIELDS UNDER ADVERSE CONDITIONS. IN CERTAIN PRODUCTION REGIONS, SUNFLOWERS ARE, HOWEVER, LEFT AS A LAST RESORT, WAITING UNTIL THE VERY LAST DAY TO PLANT.

South African sunflower production has remained relatively flat over the past two decades, with a visible decline in area planted over the past five years (**Graph 1**). In the period under review, South Africa produced decent sunflower crops, including seven-peaks above the 800 000 ton mark.

Fundamentally, when prices increase towards import parity levels, expansion occurs, but this typically causes a correction in the market and prices to decline to export parity levels. Consequently, profitability deteriorates and producers start cutting back on the sunflower area. According to the Crop Estimates Committee (CEC), the third production forecast for 2021 sunflower seed is estimated to drop by almost 9% to 696 290 tons compared to the final estimate of 788 500 tons for 2020. The area estimate for sunflower seed is 477 800 hectares, about 4,5% lower than the previous season, while the expected yield is 1,46 t/ha.

The bulk of sunflower seeds are crushed for edible oils and human consumption, and a small portion for animal feed. Due to the higher oil yield of sunflower seed, it is mainly used for human consumption. Sunflower meal, a by-product of the oil extraction process, is sold to local animal feed manufacturers, as it is generally regarded as a low-value product that does not compare well to soybean meal in terms of nutritional value and fibre content.

1 ***Sunflower hectares, production and imports.***



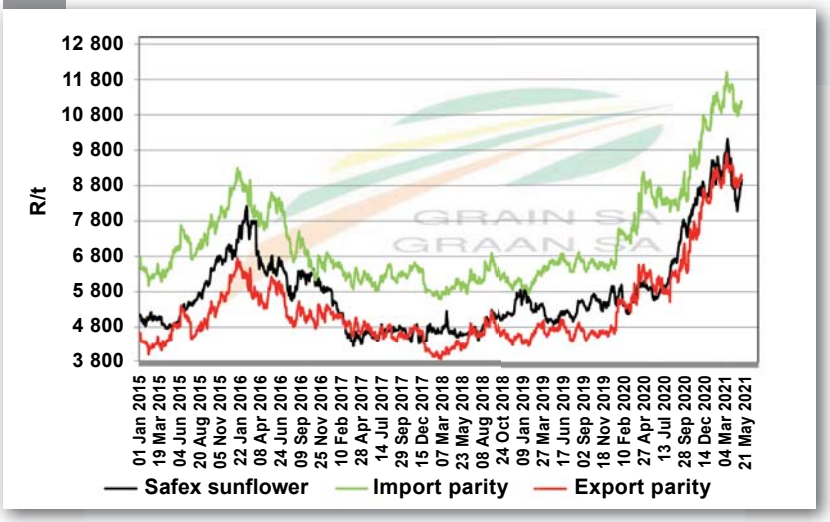
Source: SAGIS

Sunflower processing has been fluctuating over the years, but trending upward (Graph 1). Demand for sunflower exports is minimal. Over the past five years, sunflower imports have decreased significantly and this can be attributed to the increased crushing capacity locally and the use of locally produced sunflower. During years of lower sunflower production, the activities at crushing plants are reduced and the refineries import more crude oil, as it is more cost-effective than importing sunflower seeds.

Local sunflower seed prices have been trading at export parity levels from the beginning of 2020 (**Graph 2**), putting downward pressure on the area planted. Sunflower seed prices are supported by increased export parity price levels, mainly driven by higher global oilseed prices and a relatively weak domestic exchange rate. As a result, local sunflower seed prices are currently trading 42% higher than a year ago from an average of R6 000/t in April 2020, to R8 500/t in April 2021.

If prices continue on an upward trajectory, it can be expected that the sunflower area will move back to the trend line and increase for the 2021/2022 marketing season. As the season continues, it is expected that sunflower seed prices will continue to trade at export parity levels, influenced by the international price of oilseeds, which have reached new highs and the sharp rise in the prices of sunflower oil has limited the demand. South Africa's volatile exchange rate, is also something to keep an eye on. ■

2 ***Prices of EU sunflower seed delivered in Randfontein.***



Source: Grain SA

IKAGENG MALULEKE, AGRICULTURAL ECONOMIST AT GRAIN SA

IMPROVE your leadership skills

THE MEDIA HAS BOMBARDED US WITH REPORTS OF POOR PERFORMANCE OF A NUMBER OF DIFFERENT INSTITUTIONS IN OUR COUNTRY THE PAST FEW MONTHS. A LACK OF LEADERSHIP HAS BEEN QUOTED AS A REASON FOR THE POOR PERFORMANCE. BUT WHAT IS LEADERSHIP AND WHAT CAN BE DONE TO IMPROVE IT?

How do you become a leader? A leader can be chosen or appointed. Or you become a leader when you decide to establish your own farming business. Being a leader provides the person with the power and authority to lead and to manage.

Whilst attending to the management tasks of planning, organising, implementing and control of his business the owner/manager is also the leader. As leader he must take decisions, communicate, delegate work, coordinate sections, motivate his people and maintain discipline. To lead is the most important management activity. The performance of any organisation, small or large, is directly related to the quality of its leadership. A big problem is that good managers are not necessarily good leaders.

Leadership is the ability to inspire, influence and motivate others to get work/actions/tasks/activities done willingly and in good spirit to achieve specific objectives. Therefore a leader is the one to influence other people to do what needs to be done to achieve the objectives of the specific organisation. As the leader the owner/manager must set certain activities in motion especially regarding the implementing of plans. In your business you are the one to influence your employees to willingly and in good spirit do what needs to be done to achieve the objectives of your business.

When considering the so-called failures of institutions as reported, one will most commonly identify a lack of implementing plans properly as a reason. This originates from the leadership that does not succeed in influencing those responsible to implement the plans of an institution properly.

A GOOD LEADER

Why can leaders not always influence people to act? Consider the following to determine a possible reason for the lack of leadership.

A good leader has the following attributes:

- **Integrity**: This is the most important quality of a good leader. Your conduct is ethical. You are honest and live what you teach. You honour your word and do what you promise.
- **Enthusiasm** and **positivity**: Nobody wants to follow a leader who has no drive or interest in what he is doing. You must show that you have a healthy interest in the work and others will soon follow suit.
- **A capacity for hard work**. You must show a willingness to pay the price of success: long hours and hard work.
- Good **human relation skills**. You are interested in your employees' needs and problems and make genuine efforts to improve conditions for them.
- A sense of **responsibility**. You admit mistakes and do not attempt to pass the buck.
- **Confident** to take decisions. You can weigh up the facts, take a decision, stand by it, and see that it is implemented.
- **Good communications skills**. You know how to get the message across to ensure that misunderstanding and mistakes are eliminated.
- **Respectful** other people. This is portrayed by the way you communicate and act with others. 'Sticks and stones may break bones, but words will break hearts.' Do not belittle an employee.

BECOME A BETTER LEADER

To improve your leadership, remember that as a leader, you will at times be required to make decisions that will be unpopular. You cannot satisfy everyone at all times. Be decisive, stand by your decisions, and gain the respect of others.

Resist pulling rank by telling your subordinates that you are the boss and that they must do as you say.

Show courage and persistence. Do not back down from trouble and opposition but stick to your guns and have confidence in your own convictions.

Be fair and consequent. Treat all your employees the same way especially when maintaining discipline. Favouritism is a sure way to trouble and destruction of team spirit. Treat people the way you would like to be treated.

Be genuine. If you do not know the answer to a problem, admit it. Then make sure that you get the answer as soon as possible. Trying to be a know-all will only isolate you from your employees, whereas asking for their opinions will make for better human relations and possibly better solutions. ■

MARIUS GREYLING,
INDEPENDENT AGRICULTURAL
MANAGEMENT CONSULTANT

Good advice
for choosing fertiliser

THE PERFORMANCE AND YIELD OF A MAIZE CROP IS DIRECTLY RELATED TO THE CLIMATE SOIL AND FERTILISATION. SOIL TEST RESULTS ARE NEEDED IN ORDER TO DETERMINE THE NUTRIENT REQUIREMENTS AND THE CORRECT APPLICATION THEREOF.

WHAT MAIZE NEEDS FOR EFFECTIVE GROWTH

For optimal yield, it is essential that the maize plant grows rapidly once the germination is complete. In order for rapid growth to take place, the required amount of nutrients need to be available. Maize needs nitrogen (N), phosphorus (P) and potassium (K) for effective growth and crop yield. These nutrients are essential for grain production and do not usually occur in sufficient quantities in the soil.

- Nitrogen is the most important nutrient and role-player in the growth, yield and quality of maize crops. Nitrogen fertiliser is essential to promote good leaf growth.
- Phosphorus is essential for root development and growth of the maize plant, as it directly affects the growth tips of the plant.
- Potassium fulfils a number of roles in maize plants like regulating the water content (beneficial in periods of draught), the transportation of sugar from the leaves and maintaining the plant rigidity.

CHOOSING FERTILISER

In cases where there are no soil test results available and you don't have a fertiliser representative to guide you, the Fertiliser Association of Southern Africa (FERTASA) regularly publish the fertiliser withdrawal figures per crop. See **Table 1** for the plant nutrients withdrawal figures of maize. This table is a broad guideline and does not take into account aspects like denitrification and phosphate fixation. It is not the best way to determine the fertiliser programme, only a guideline. Rather consult an expert for an optimal fertiliser programme.

There are a number of different types of fertilisers available, for example 13:7:10(30), 15:8:4(27), 20:7:3(30) and urea (46:0:0) more. The question is which one will suit your requirement.

It is important to understand what the meaning of the numbers on the fertiliser bag is. Let us for example take the 13:7:10(30). The first three numbers are always the ratio between N:P:K in that order. The number in the bracket is the concentration of the ingredient in the bag. In this case it means that only 30% of the bag is fertiliser. The rest is a filler to bind the ingredients together. **Table 2** is an explanation of the information in the 13:7:10(30) as an example.

In the decision what fertiliser to apply, it is important to calculate the P:K ratio needed as well as the P:K ratio of the fertiliser. In Table 1, in the case of the 4 ton yield information, 60:12:16 the P:K ratio is 75% (12 ÷ 16) and the ratio of the 13:7:10(30) fertiliser the ratio is 70% (7 ÷ 10). The 15:8:4(27) the P:K ratio is 200% (8/4). If only these two fertilisers are available the 13:7:10(30) will be the best option.

To decide how much fertiliser to apply we know that we need 16 kg potassium. In total 160 kg 13:7:10(30) is needed. To calculate this 16 ÷ concentration ÷ K ratio in the fertiliser. In this case 16 ÷ 30% ÷ 33.3% = 160 kg fertiliser per hectare.

With the application of 160 kg 13:7:10(30) fertiliser there will be 20,78 kg nitrogen 11,18 kg phosphorus and 16 kg potassium applied. It is clear that there is a shortage of 39,22 kg N. This nitrogen shortage can be corrected with a topdressing application which can be done by applying 85 kg urea. By doing it this way the fertiliser needed to be applied can be calculated.

PIETMAN BOTHA, INDEPENDENT AGRICULTURAL CONSULTANT

1 ***Plant nutrients withdrawal figures of maize at different yield for planning.***

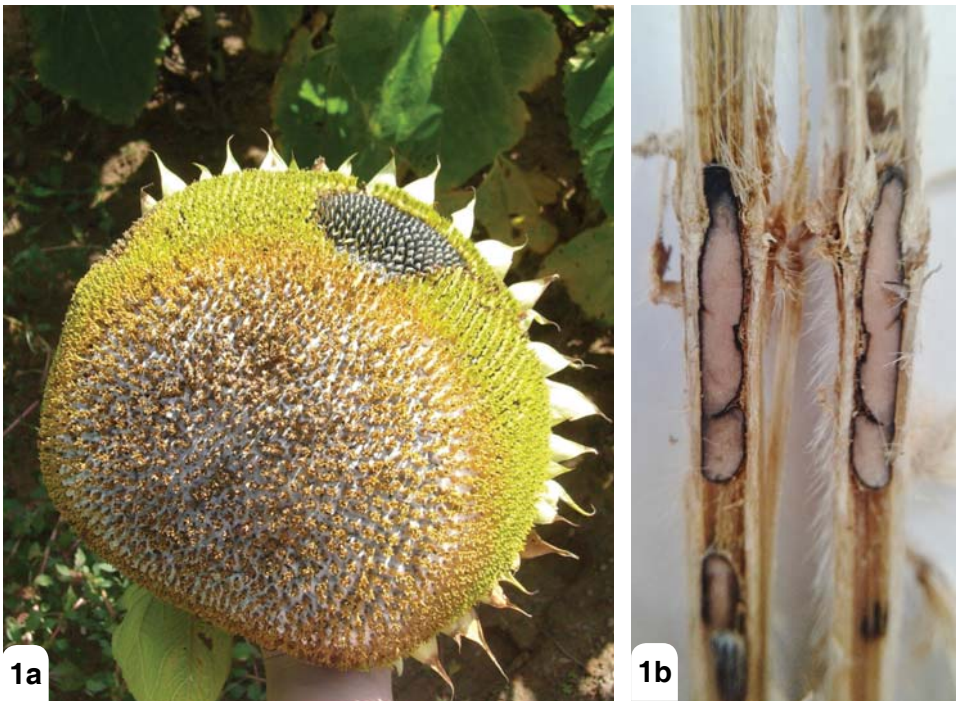
Plant nutrients	Per t	Per 4 t	Per 6 t
Nitrogen (N)	15 kg	60 kg	90 kg
Phosphorus (P)	3 kg	12 kg	18 kg
Potassium (K)	4 kg	16 kg	24 kg

2 ***Explanation of the 13:7:10(30) fertiliser information.***

	N	P	K	Concentration
N:P:K ratios	13	7	10	30%
Ratio of N:P:K	13 ÷ (13 + 7 + 10) = 43,3%	7 ÷ (13 + 7 + 10) = 23,3%	10 ÷ (13 + 7 + 10) = 33,3%	100 x 30% = 300 kg fertiliser
Amount of NPK in 1 000 kg fertiliser	300 x 0,433 = 130 kg	300 x 0,233 = 70 kg	300 x 0,333 = 100 kg	700 kg filler

Ensure that SCLEROTINIA does not RUIN THE CROP

SCLEROTINIA STEM ROT CAUSES A LOT OF DAMAGE TO CROPS, PARTICULARLY SOYBEAN AND SUNFLOWER, AND CAN RESULT IN SIGNIFICANT YIELD LOSSES. THE *SCLEROTINIA SCLEROTIORUM* FUNGUS CAUSE THE DISEASE. IN SOUTH AFRICA, THE MOST IMPORTANT CROPS AFFECTED BY THIS DISEASE ARE SUNFLOWER, SOYBEAN AND CANOLA.



Mycelium at the back of a sunflower head (a) and in a soybean stem (b).

HOSTS

Sclerotinia diseases affect over 500 plant species. This includes oilseed crops (sunflower, soybean and canola), vegetable crops (cabbage, cauliflower, butternut, hubbard squash, peppers, tomatoes, peas) as well as legumes (dry beans). It is very important to know that weeds, such as Tall *khakibos*, common cosmos and common blackjack are also hosts to Sclerotinia.

SYMPTOMS

The visible symptoms are dependent on the host growth stage. Seedling wilting may occur, although Sclerotinia stem and head rot frequently develop at flowering and pod or seed filling stages. Brown water-soaked lesions are initial symptoms observed that become covered with white cotton-like mycelium (this is the fungal growth observed) on sunflower heads (**Photo 1a**) and soybean pods as well as in and on the stems of both sunflower. and soybean (**Photo 1b**).

The white mycelium on the face of sunflowers eventually develops into a net of black sclerotia, the survival structure and is from where the pathogen gets its name. As the disease matures, a shredded appearance, with sclerotia between plant fibres can be observed in sunflower specifically. This fungus can also infect the subterranean crown and form sclerotia within the lower stem of sunflower and soybean.

CAN I MANAGE THIS DISEASE?

Control of the Sclerotinia diseases is very difficult. The fungus forms hard survival structures (introduced earlier as sclerotia) which can survive in the soil for up to twelve years if environmental conditions are favourable.

Because there are so many different plants which get Sclerotinia, it is difficult to control the disease with crop rotation. One crop which does not get Sclerotinia is maize. Because the sclerotia can survive in the soil for so long, crop rotation sequences with non-hosts need to be done for much longer than just a year or two to try to decrease the disease incidence and persistence of the pathogen in the soil.

There are very few fungicides available in South Africa, and these need to be applied at the right time. South African soybean and sunflower cultivars are all susceptible to Sclerotinia, but the degree of disease is different on the cultivars.

At the end of the day, there is no single way of controlling Sclerotinia. From now on, you need to manage the pathogen presence to make sure the incidence stays low. Getting rid of the disease will take many years, if it's even possible to completely eradicate all sources of the inoculum.

WHAT TO DO IF YOU FIND SCLEROTINIA IN YOUR FIELD

- Remember in which fields or parts of the field Sclerotinia occurred and plant a non-host crop in the next year.
- Remove any weeds in the area which may have Sclerotinia.
- Buy certified seed.
  - o Sclerotia can be transmitted via seed. SANSOR-approved seed limits the possible spread of sclerotia, by only allowing a small number of sclerotia within the seed.
- Planting dates are important. Planting earlier in the season can help plants reach maturity before conditions are conducive to Sclerotinia. However, this is dependent on the cultivar being determinate or indeterminate in the case of soybean.
- Decrease plant population densities.
  - o The canopy formed by plants like soybean are thought to create a microclimate underneath the leaves which favours disease development. A dense canopy also makes it difficult for chemical control to reach the fungus.

More articles are available on the webpage *http://sclerotinia.co.za/*. Producers can also reach out to Dr Lisa Rothmann (*CoetzeeLA@ufs.ac.za*) or Dr Miekie Human (012 943 8207) if they have more questions. ■

ARTICLE COMPILED BY THE SOUTH AFRICAN SCLEROTINIA RESEARCH NETWORK

Protect your machinery by CHOPPING SUNFLOWER RESIDUE

PLANT RESIDUES PROTECT THE SURFACE OF THE SOIL AGAINST THE SUN, WIND AND HEAVY DOWNPOURS OF RAIN THAT WOULD NORMALLY WASH PRECIOUS TOPSOILS AWAY. MANY FARMERS UTILISE THE RESIDUE IN SOME WAY OR OTHER, EITHER AS FEEDSTOCK OR MATERIAL THAT ENRICHES THE SOILS.

A calculated decision must be made by the farmer in which he or she weighs up the benefits of grazing the feedstock against leaving the organic matter to increase the stability of the soil and improve water infiltration rates. However the bigger and thicker stalks of crops like sunflower and cotton can cause problems during tilling and planting operations. The stems and stalks of such crops do not break down fast enough and can clog machinery and damage tyres. It is therefore preferable to chop sunflower stalks left behind on the lands in preparing for the next growing season.

Sunflower stover is an undervalued feed source. While the stalks have little feeding value, there are always some sunflower heads left behind after the combining process. These heads have a high protein content and are excellent source of feed for grazing animals. A lot of farmers will therefore choose to graze the fields for a while until the heads have mostly been consumed before chopping the remainder of the sunflower crop residue.

CHOPPING THE SUNFLOWER STALKS

Farmers like to chop with a purpose designed stalk chopper soon after the harvest is taken off the land. The drier the stalks are, the better they break up and disintegrate. However if the stalks are still fairly wet when the crop is harvested, it is advisable to leave the stalks to dry off for a few weeks. This will occur naturally quite rapidly once the harvest is done and the plants have been damaged during the combining process.

Some farmers skip the chopping process and rather disc the lands with a heavy duty disc harrow. This however does not chop the stalks as effectively and they are not broken down small enough. It can hamper the pre-planting primary cultivation processes. If the long sunflower stalks are left in the lands, they can clog the machines such as vibroflex or rippers causing unnecessary stoppages. The mounds of stalks make piles in the field and are a problem when the farmer is trying to create a seed bed.

> *If the long sunflower stalks are left in the lands, it can clog the machines.*

Another matter that needs consideration is the level of weed infestation in the sunflower field post-harvest. Often when late rains have fallen (as they have indeed done this 2021 season), weeds flourish and establish themselves in the fields.

Once the harvest is completed, these weeds need to be removed otherwise they will negatively impact the moisture levels in the soils. This could also make it difficult to do winter soil preparation as well as increase the weed seedbank in those fields.

Treatment of weeds is commonly done by doing a winter spray programme or otherwise a disking process must follow on after the stalks have been chopped. Weed control is important at every stage of the life cycle of the field. ■

JENNY MATHEWS, MANAGEMENT AND DEVELOPMENT SPECIALIST AND EDUCATOR

After harvesting the sunflower crop, the fields can be grazed before chopping the stalks to prevent damage to your equipment.
Photo: Jenny Mathews

Get the most OUT OF THE SOIL

SOIL SAMPLING IS THE BASIS OF ALL OPTIMAL FERTILISER AND LIME RECOMMENDATIONS. THE MAIN OBJECTIVE OF THE LIMING OR FERTILISER PROGRAMME IS TO CORRECT THE SOIL CHEMICAL RESTRICTION IN THE MOST ECONOMICALLY VIABLE MANNER TO PRODUCE MAXIMUM OUTPUT.

With soil potential, soil sampling and laboratory analyses for nutrients results known it is possible to determine the optimal liming or fertiliser programme. If soil sampling is not done correctly the results will not reflect the status in the soil and then the optimal yield will not be reached.

Because of the band placing of fertiliser and because cultivation practices usually do not mix the fertiliser effectively throughout the soil, plant nutrients are usually not distributed evenly throughout the soil. It is thus vital to take care that soil samples are taken correctly.

There is more than one method to take soil samples and it is important to discuss this with the fertiliser representative before taking the samples.

Method 1 is recommended where residual nutrients and soil acidity are distributed homogeneously, for example in uncultivated soils or where residual bands have been removed by tillage not ploughing. Normally this method will not be used.

For less than 50 ha at random 20 to 40 topsoil (0 - 150 mm) sub-samples are needed. Make use of a 75 mm diameter soil auger. Five sub-samples for the deeper increments (150 mm - 300 mm, and 300 mm - 600 mm) that are taken at random over the same area is sufficient. If nitrogen analyses are required, separate but single samples taken from 0 - 600 mm depth, should be taken.

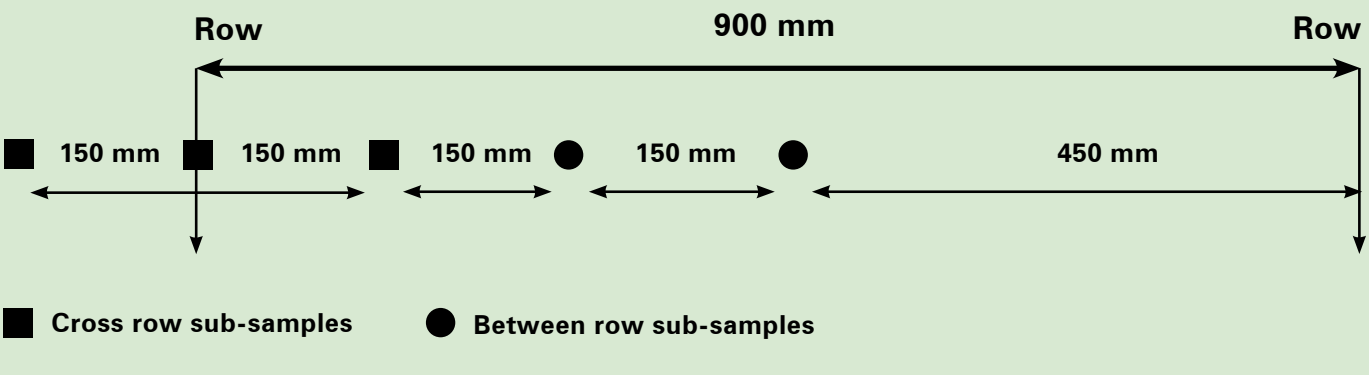
Method 2 is used most of the times and is recommended for conditions where residual nutrients and soil acidity are not

METHODS TO TAKE SOIL SAMPLES

The Fertiliser Handbook gives excellent guidelines on methods to take soil samples. Some important aspects are highlighted here:

1. The reliability of a soil analysis depends on how representatively the soil samples were taken on a field.
2. If a field consists of more than one soil form, a soil sample should be taken from each soil form because the yield potential may differ between the soil forms.
3. Topsoil and sub soil samples must be taken. Topsoil samples are taken from 0 to 150 mm and sub soil samples from 150 to 600 mm.
4. One representative sample for every 50 ha should be sufficient, but more samples is better.
5. Each sample should consist of at least 20 sub-samples taken randomly throughout the land unit or soil form.
6. Sub-samples should be properly mixed before a representative sample is taken.
7. It is not necessary to take more than five sub-samples per land unit when sub-soils are sampled.
8. In the case of precision farming samples are taken in a predetermined grid, for homogeneous soils one sample per 5 ha will be sufficient, but usually one sample per one or two hectares is required.
9. Smart sampling is a process where specific locations are identified to take soil samples to examine a certain problem. Satellite images, yield monitor data and physical inspections are used to identify the sites for sampling.

1 *A soil sampling method for conditions where residual nutrients and soil acidity are not homogeneously distributed.*



homogeneously distributed. This will normally be after harvesting and before the first tillage operation is done.

This method is applicable to most grain producing areas, since most fertilisers are banded at planting and are usually followed by an N fertiliser top-dressing. Orders for especially lime should be placed well in advance of the first tillage operation. The fertiliser order can be placed later but remember first order will receive first delivery. (Method 2 is published in the *Maize Information Guide*).

Representative samples of a 300 mm wide band over maize rows are analysed separately from between-row samples, as illustrated for a row width of 900 mm in **Figure 1**.

In total 5 samples are taken three cross the row and two within the row.

Cross row sub-samples (■): The three samples are taken across the row so that the fertiliser band can be sampled. The three samples represent a band of ±300 mm.

Between row sub-samples (●): Two samples are taken in this area. One soil sample is taken exactly in the middle of two rows (450 mm from the row for a row width of 900 mm). A second soil sample is taken exactly in the middle of the cross row sub-sample (■) and the between row sub-sample (●) – 300 mm from the plant row for a row width of 900 mm.

Make sure that the same tool is used to take the sample. Depth increments are the same as for the previous method, namely 0 - 150 mm, 150 mm - 300 mm and 300 mm - 600 mm. The sampling procedure is repeated five times per 50 ha soil unit. The five 0 - 150 mm samples are mixed thoroughly and one subsample taken from the mixture for analysis. The same procedure is followed for the 150 mm - 300 mm and 300 mm - 600 mm samples.

Soil samples must be handled correctly and should be air-dried or frozen if N analysis is required and samples cannot be delivered to the laboratory within 24 hours. Samples should in all instances not be exposed to direct sunlight. A soil mass of between 500 g and 1 kg is required for each sample for analysis.

For more information contact Pietman Botha at 082 759 2991 or your local fertiliser representative. ■

PIETMAN BOTHA, INDEPENDENT AGRICULTURAL CONSULTANT

WORDS OF WISDOM

Go to the people. Live with them. Learn from them. Love them. Start with what they know. Build with what they have. But with the best leaders, when the work is done, the task accomplished, the people will say, "We have done this ourselves."

~ LAO TZU

SEEDLING DISEASES
lead to poor establishment

SUNFLOWER IS GROWN IN MANY PARTS AROUND THE GLOBE AND IS CONSIDERED ONE OF THE MOST IMPORTANT OILSEED CROPS IN THE WORLD. IT IS ALSO AN IMPORTANT CROP IN SOUTH AFRICA. THE MOST IMPORTANT PRODUCTION AREAS ARE IN THE FREE STATE, LIMPOPO AND NORTH WEST.

Poor establishment is a major yield-limiting factor of sunflower production in South Africa. Although the contribution of other factors, such as seedling vigour, seedbed preparation and soil temperature, have been investigated, prior to the current study no information on the role of seedling diseases as a production constraint in sunflower production in South Africa was available. This study was initiated to determine the role of seedling diseases in poor establishment of sunflower seedlings locally.

AREAS SURVEYED AND SAMPLING

Field trials were established with untreated and treated (fludioxonil, mefenoxam and thiamethoxam) cultivar PAN 7120 CL seed during 2014/2015 and 2015/2016 at six localities in the Free State, Limpopo, Mpumalanga and North West. Sampling was conducted six weeks after planting and seedlings were also sampled from producers' fields in these provinces. Both seedlings and soil were collected from each sampling site for isolations and glasshouse bioassays.

DISEASE SYMPTOMS

Lesions were often observed on hypocotyls and cotyledons of seedlings, and cotyledons were sometimes totally rotten (**Figure 1a** and **1b**). Dead seedlings or seedlings dying, and pre-emergence damping-off were quite rare (**Figure 1c** and **1d**). However, stunted seedlings (**Figure 1e**) were recorded at all localities, and these seedlings often displayed root rot symptoms and the tap roots were often stunted (**Figure 1f** and **1g**).

PATHOGENS ASSOCIATED WITH DISEASED SEEDLINGS

Isolations were made from diseased seedlings that were collected from all the areas sampled. At least 31 fungal genera, which included more than 94 fungal species, were obtained from diseased cotyledons, hypocotyls and roots. A large number of isolates representing each species from the different genera were tested to determine their importance in causing disease on sunflower seedlings under glasshouse conditions. The effects of the standard seed treatment against the pathogens that were identified, were also evaluated. The most important pathogens were species within *Alternaria*, *Diaporthe*, *Fusarium*, *Macrophomina*, *Pythium* and *Rhizoctonia* which caused pre- and post-emergence damping-off, hypocotyl/stem rot, a reduction in growth and root rot.

Alternaria species were isolated from seedlings from all localities. *Alternaria alternata* and *A. tenuissima* were obtained from seedlings. The predominant species isolated was *A. alternata* and very few *A. tenuissima* isolates were obtained. The *Alternaria* spp. were more frequently isolated from seedlings from untreated seed than treated seed and were significantly more frequently isolated from the cotyledons and hypocotyls than the roots. Glasshouse tests showed that *A. alternata* was the more aggressive of the two species, with certain isolates causing significant root rot (although at low severities). Neither of the two species significantly reduced survival of seedlings or caused a reduction in growth when planted in soil infested with the pathogen (**Figure 2a**).

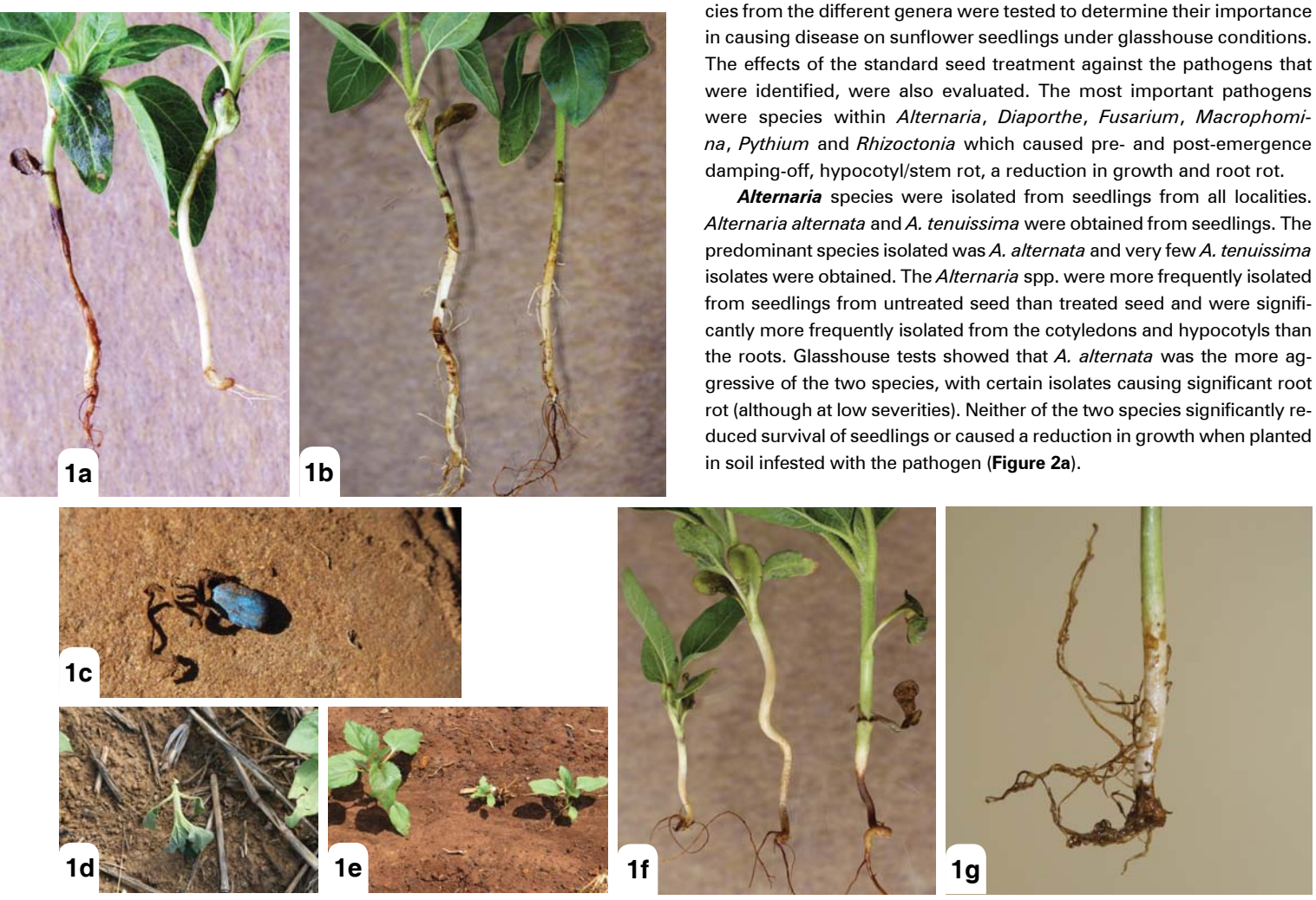
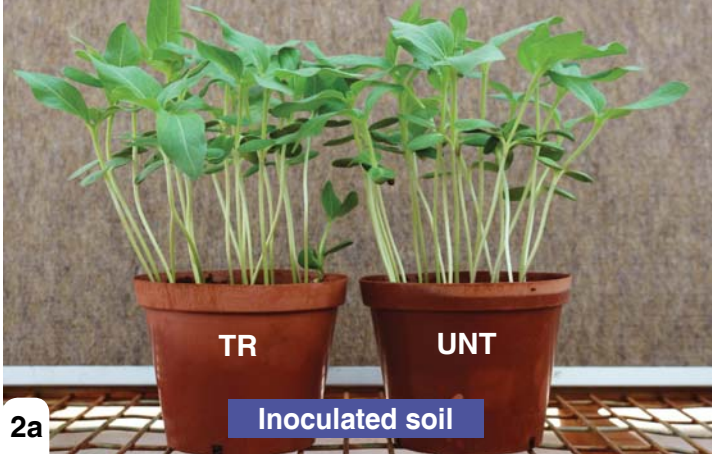


Figure 1: Lesions on hypocotyls and roots and rotten cotyledons (a and b). Damping-off of seedlings: Pre-emergence (c) and post-emergence damping-off (d). Stunted seedlings (e). Root rot of seedlings (f), and stunted tap root with root rot (g).



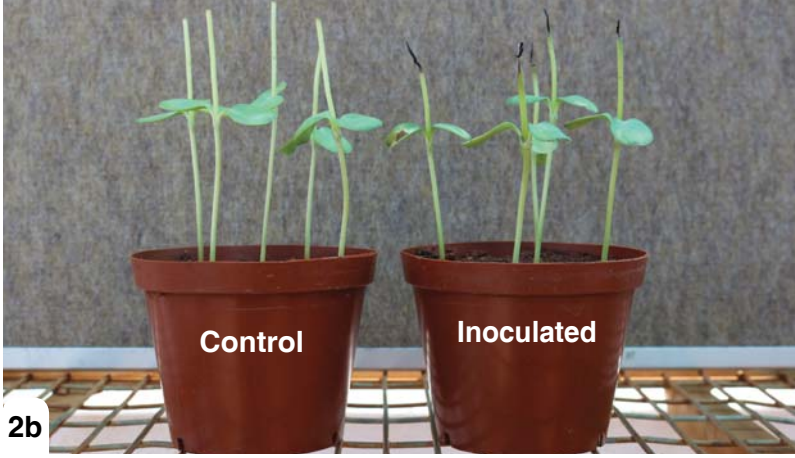
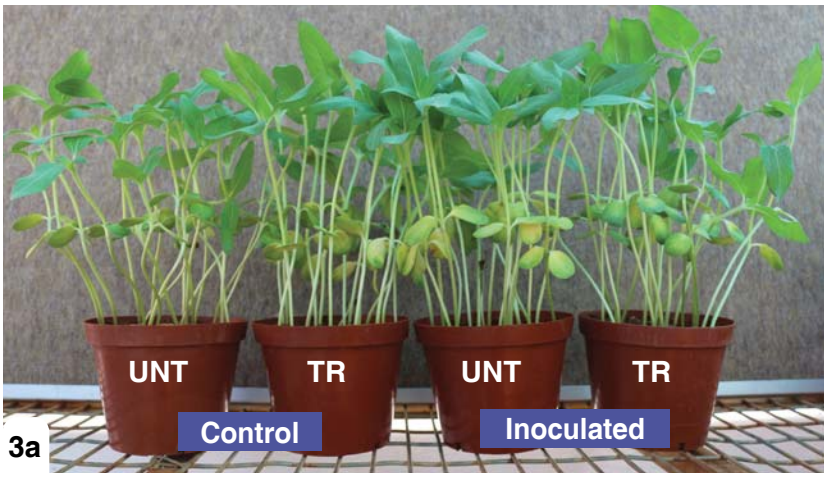


Figure 2: Effect of *Alternaria alternata* on survival of seedlings planted in soil inoculated with the fungus and planted to treated (TR) and untreated (UNT) seed (a) and stem lesions caused by the fungus under glasshouse conditions (b).



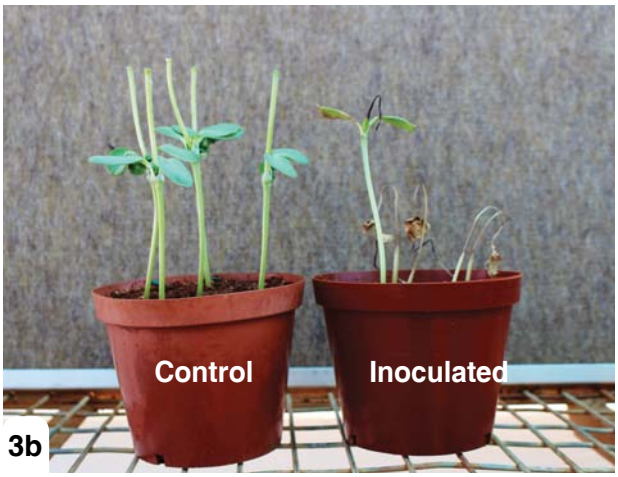


Figure 3: Effect of *Diaporthe gulyae* on survival of seedlings planted in soil inoculated with the fungus and planted to untreated (UNT) and treated (TR) seed (a) and stem lesions caused by the fungus under glasshouse conditions (b).

Many of the isolates also caused lesions on stems (**Figure 2b**). Seed infected with *A. alternata* and tested by the ARC-PHP under glasshouse conditions did not reduce seedling survival. *Alternaria alternata* was also reported by other researchers to cause leaf blight of sunflower in South Africa.

Diaporthe species were isolated from seedlings collected. They were more prominent on seedlings in North West compared to the other three provinces and were also significantly more frequently obtained from hypocotyls than cotyledons or roots of seedlings. Seed treatment did not affect the incidence of these fungi in seedlings. Four species were obtained and one of these is currently being described as a new species. *Diaporthe gulyae* was the most frequently isolated species and also the most virulent when tested for pathogenicity on seedlings under glasshouse conditions. The fungus did not affect seedling survival or growth and also did not cause root rot (**Figure 3a**). However, it caused quite severe die-back of stems of seedlings under glasshouse conditions (**Figure 3b**). The isolation of these fungi from sunflower seedlings may have important implications not only for seedling health, but also for stem canker on older plants.

Fusarium species/species complexes were one of the predominant groups obtained from the seedlings and occurred on seedlings in all the provinces. At least 38 *Fusarium* species or species complexes were isolated from sunflower seedlings. The most frequently isolated species were species complexes of *Fusarium incarnatum–equiseti* (FIESC), *F. oxysporum* (FOSC) and *F. solani* (FSSC). FIESC was isolated more frequently from cotyledons than hypocotyls and roots, whereas FOSC and FSSC were isolated much more frequently from the roots than cotyledons or hypocotyls of seedlings and incidences were higher on seedlings from untreated than treated seed.

Many of the species caused a slight reduction in survival and low root rot severities. However, a species within the *Fusarium solani* species complex caused a significant reduction in survival and growth and severe root rot that killed the seedlings. Seed treatment was not effective to manage this pathogen (**Figure 4a** and **4a** on page 16). Certain of the *Fusarium* species, also caused a stunting of the taproots of seedlings (**Figure 4c** on page 16).

Macrophomina *phaseolina* was frequently isolated from seedlings – significantly more frequently from roots than cotyledons and hypocotyls. There was no difference in the incidence of the fungus on seedlings from treated and untreated seed planted in field trials. The fungus was frequently obtained from localities in the Free State, Limpopo and North West. Glasshouse tests evaluating 50 isolates for their ability to cause disease on seedlings, showed that the fungus, except for one isolate, did not cause a reduction in survival and caused more severe aboveground symptoms than root rot.

The seed treatment significantly improved survival of seedlings in soil infested with the isolate that caused a reduction in survival and root rot of seedlings (**Figure 5a** and **5b** on page 16). It is known that *M. phaseolina* can be both soil- and seedborne, is an important pathogen of sunflower and can cause charcoal rot and root rot. If seedborne, the fungus can reduce germination and vigour of sunflower seed and cause damping-off and seedling blight. The seed used in the ARC-PHP trials were tested and were not infested with the fungus.

Pythium species were obtained from seedlings from all provinces and more frequently from seedling roots than cotyledons and hypocotyls. There was no significant difference in the incidences of *Pythium* spp. in seedlings from treated and untreated seed. Six *Pythium* species were obtained from the seedlings that were collected, with the most virulent species being *P. irregulare* and *P. ultimum* var. *ultimum*. *Pythium irregulare* significantly reduced survival and growth of seedlings (**Figure 6a** on page 16) and caused cotyledon and root rot (**Figure 6b** on page 16) and *P. ultimum* var. *ultimum* only caused root rot, but significantly less than *P. irregulare*.

Although seed treatment significantly improved survival and growth and reduced cotyledon and root rot of seedlings in soil inoculated with

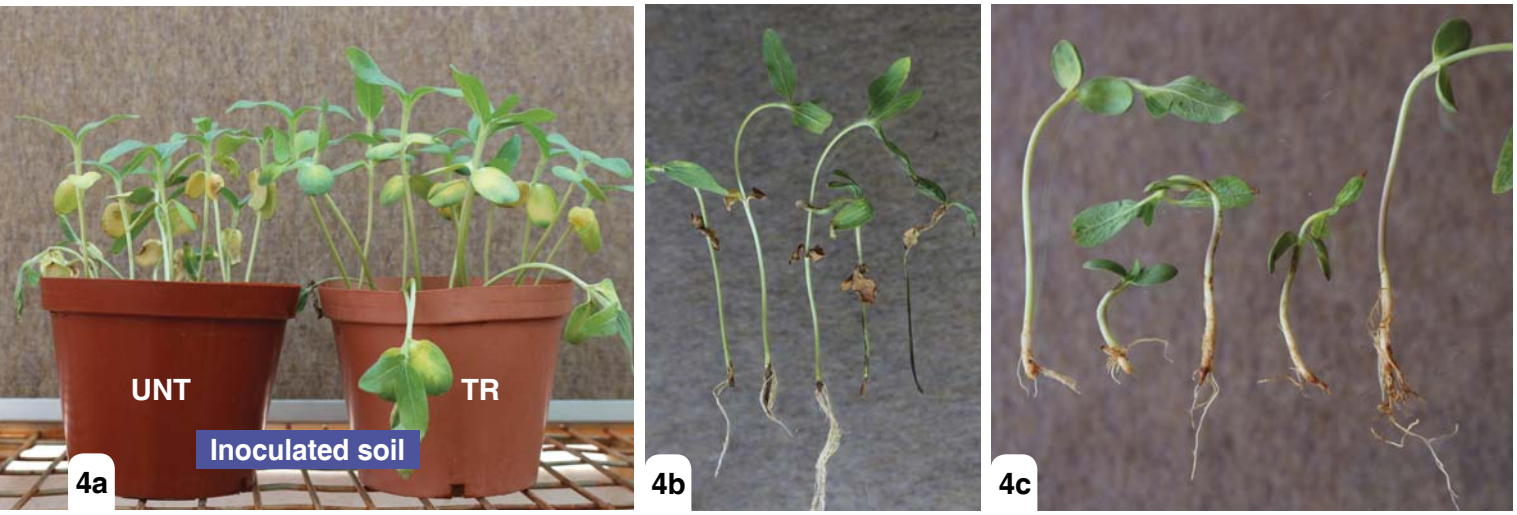


Figure 4: Effect of a species within *Fusarium solani* species complex on survival and growth of seedlings planted in soil inoculated with the fungus and planted to untreated (UNT) and treated (TR) seed (a). Root rot caused by the fungus under glasshouse conditions (b) and root rot and stunting of tap roots caused by *Fusarium andiyazi* (c).

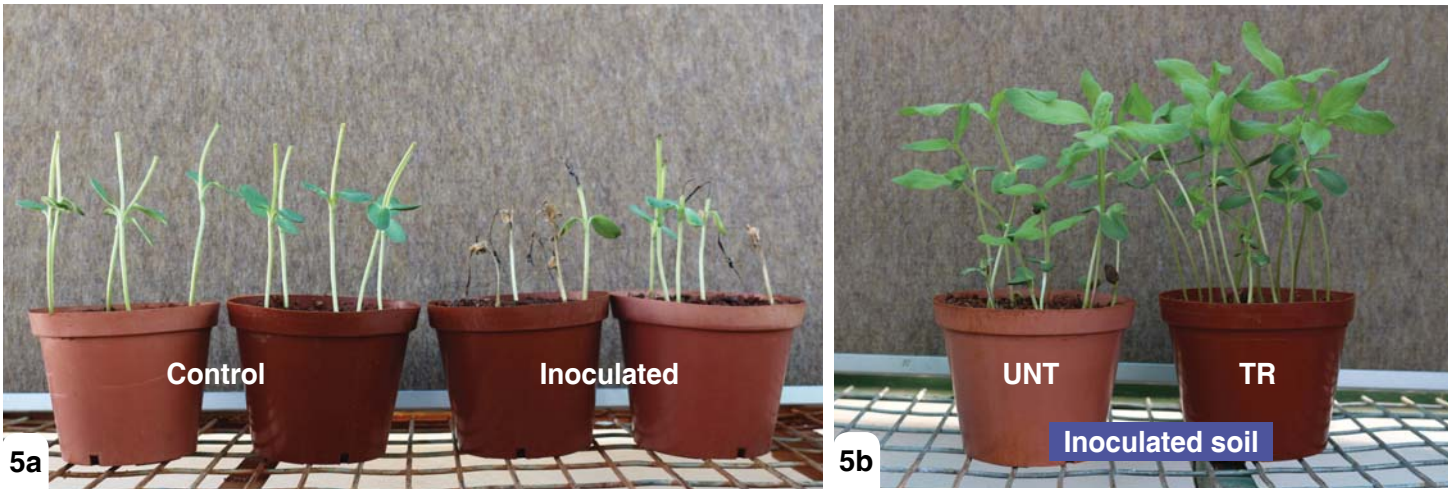


Figure 5: Stem lesions caused by *Macrophomina phaseolina* under glasshouse conditions (a) and survival of seedlings in soil inoculated with the fungus and planted to untreated (UNT) and treated (TR) seed (b).

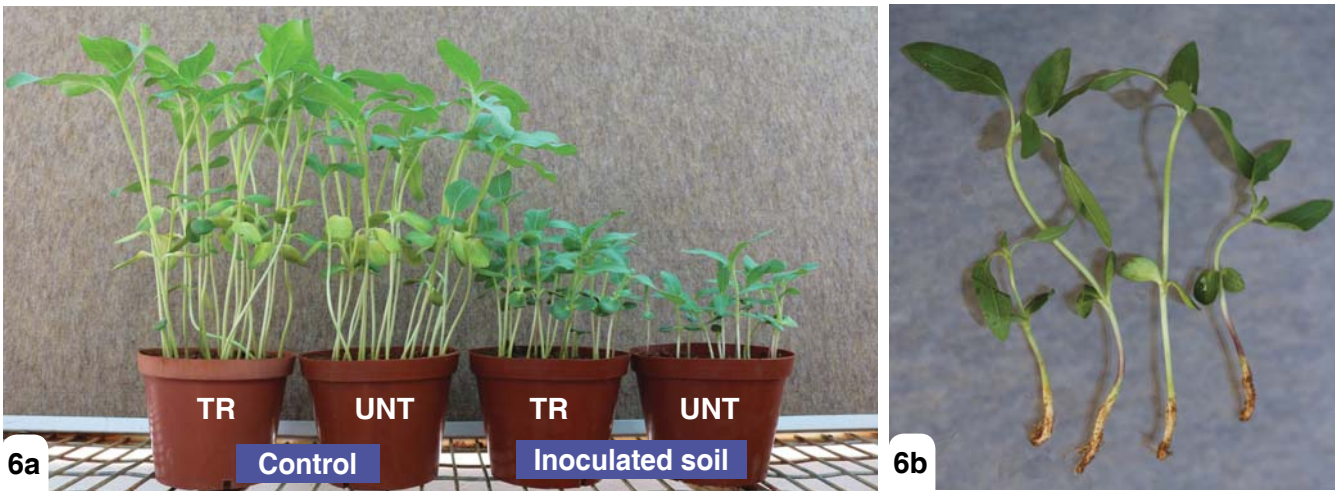


Figure 6: Effect of *Pythium irregulare* on survival and growth of sunflower seedlings in soil inoculated with the fungus and planted to treated (TR) and untreated (UNT) seed under glasshouse conditions (a) and root rot and stunting of tap roots caused by the fungus (b).

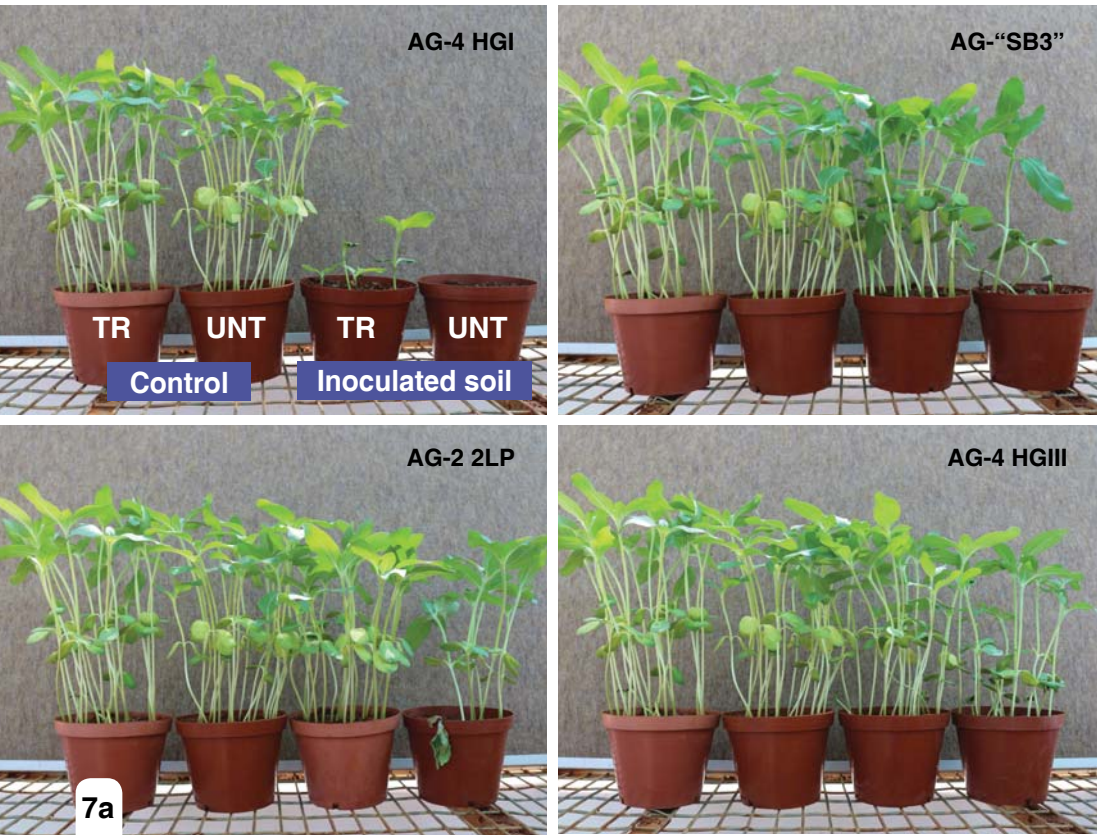


Figure 7a: Effect of different anastomosis groups of *Rhizoctonia solani* on survival and growth of seedlings in soil inoculated with the fungus and planted to treated (TR) and untreated (UNT) seed.

Figure 7b: Root rot and stunting of seedlings caused by *Rhizoctonia solani* 'SB3'.

P. irregulare, seedlings from treated seed were still stunted (Figure 6a). Information on *Pythium* spp. as pathogens of sunflower seedlings in other countries is very limited. Information thus far showed that it is possible that *Pythium* spp., especially *P. irregulare*, is one of the pathogens that may contribute to the stunted growth of sunflower seedlings that is quite common in many sunflower fields.

Rhizoctonia anastomosis groups were obtained from all the localities sampled. There was no difference in the incidence of *Rhizoctonia* obtained from seedlings from treated and untreated seed. These fungi were isolated from cotyledons, hypocotyls and roots of seedlings. 14 *Rhizoctonia* anastomosis groups were obtained from sunflower seedlings and four of these were pathogenic on sunflower seedlings, namely AG 2-2LP, AG 4 HGI, AG 4 HGIII and an unidentified anastomosis group temporarily labelled as SB3.

These anastomosis groups caused a severe reduction in survival of seedlings and hypocotyl and root rot, with AG 4 HGI and SB3 being the most virulent (**Figure 7a** and **7b**). The seed treatment was quite effective in controlling AG 2-2LP, AG 4 HGIII and SB3. However, although the seed treatment improved survival and reduced hypocotyl and root rot of seedlings in soil inoculated with AG 4 HGI, it was still not satisfactory.

CONCLUSION

The results of the surveys and glasshouse studies showed that many fungal species including important pathogens are associated with sunflower seedlings and that certain fungi were more prevalent in certain localities than others. It clearly shows that seedling diseases are caused by a complex of pathogens. These can significantly reduce the survival and growth of seedlings as well as cause cotyledon, hypocotyl and root rot and can therefore contribute to poor establishment. Pathogenicity studies identified the most important pathogens.

Many of the pathogens identified have a broad host range and cannot be controlled with crop rotation. Since crop rotation is such an important part of conservation agriculture, crops that are susceptible to some of the same pathogens such as maize, sunflower and soybean are often rotated in the same field. Effective seed treatments can play a significant role as part of an integrated management strategy to protect sunflower against pathogens with a broad host range. The results obtained from seed treatment trials under glasshouse conditions showed that although the standard seed treatment (which targets a broad range of pathogens) is effective against many of the pathogens, it is unfortunately not effective against all of the virulent pathogens that were identified. Proper establishment of seedlings is very important to improve yield and an essential component of sustainable production. Research is therefore currently conducted to evaluate a range of seed treatments to identify the most effective treatment that will target most of the important pathogens responsible for poor establishment of sunflower seedlings in South Africa.

ACKNOWLEDGEMENTS

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SANDRA LAMPRECHT, THABO PHASOANA, ANUSHKA GOKUL AND CHRIS SPIES, ARC-PLANT HEALTH AND PROTECTION (ARC-PHP), SOILBORNE PLANT DISEASES UNIT, STELLENBOSCH. FIRST PUBLISHED IN SA GRAAN/GRAIN AUGUST 2020

Better chance for profit with these beef systems

THE LIVESTOCK INDUSTRY, LIKE MANY OTHER INDUSTRIES, SUFFERS UNDER CONDITIONS THAT LEAD TO LOWER PROFITS. EFFICIENCY AND EFFECTIVENESS MUST BE INCREASED THROUGHOUT TO LIMIT COSTS AND THUS HAVE A BETTER CHANCE TO MAKE A PROFIT.

Marketing is just as important as production, especially in the cattle industry, where production is very seasonal by nature. Within the seasonality of production, the supply during marketing is high, which will in turn influence prices. Therefore it is important for producers to know how much it will cost them to produce meat and if it is worth it to adapt their system.

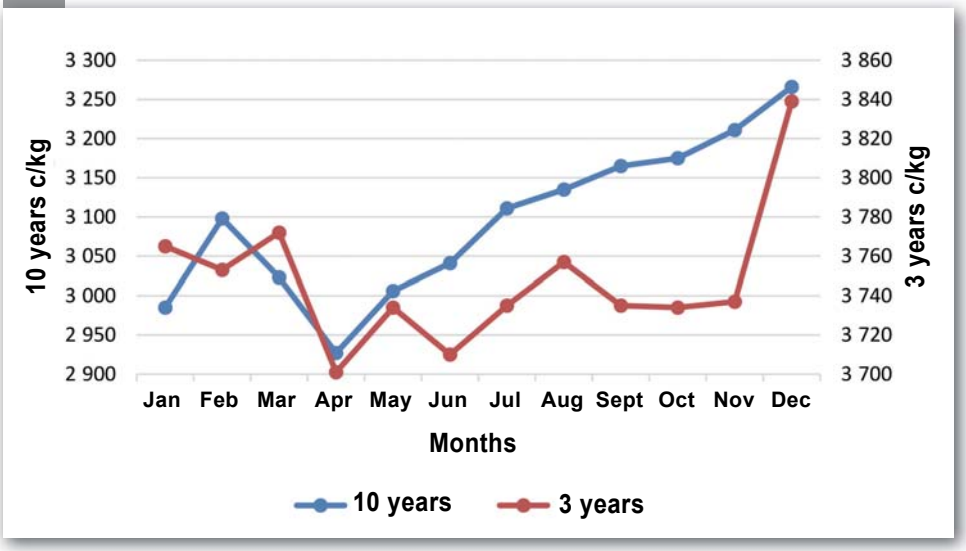
Producers often reflect on how to increase the profitability of the stock component. Should there not perhaps be a shift to another stock production system? Comparing systems is usually not that simple, and incomplete information can probably result in the wrong answers. It is important to have all the information available and to interpret the data correctly.

GET THE BASICS IN PLACE

Apart from the type of production system, the basic aspects of stock farming should be and remain in place. They include the following:

- Sufficient roughage must be available at all times – in other words there should be enough food throughout the year.
- The right supplementary feed to balance the needs of the animals and the feed is important.
- Production should take place in cycle with the resources.
- Sufficient clean water is vital.
- Timeous and preventive disease and parasite control should be implemented.
- Do not replace too many cows, but also do not wait too long to do it.

1 ***The long-term trends of producers' beef prices for C grades.***



Source: AMT

DIFFERENT CATTLE PRODUCTION SYSTEMS

The cattle systems that should be compared with one another are a typical weaner system, an 18-month marketing system, a 36-month ox system and then the new weaner system (where April weaners are wintered and are then sold just after winter to be finished for the Christmas market). Each system is unique – the rules, herd composition, marketing times and risks all vary.

Droughts are part of South African agriculture, therefore the cattle system is often used as the 'farm's bank'. This means that if the grain component struggles, the cattle take over, and if the grain is very profitable, cattle are bought to reduce tax. In a severe drought, as is currently experienced in the country, producers are forced to decide whether cattle should be sold or fed. Unfortunately, only the weather will determine whether the decision was right or wrong.

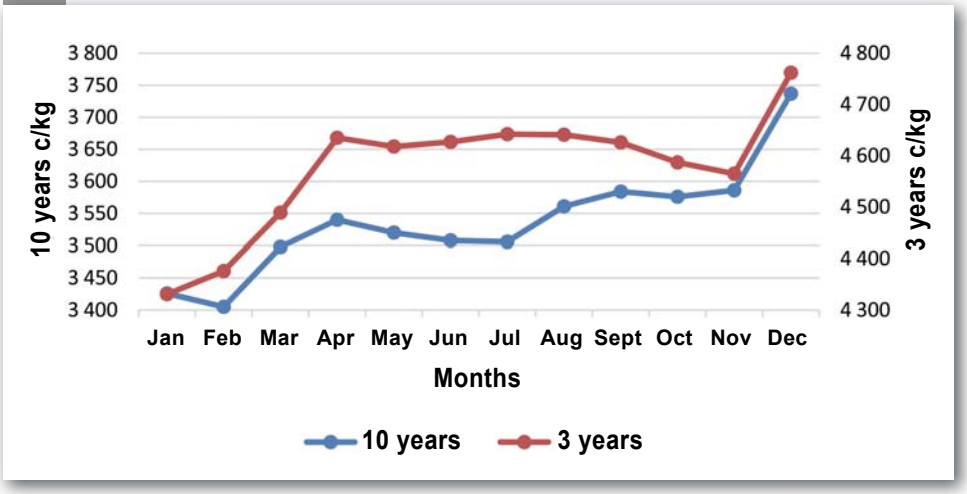
Each cattle system handles the same climate risks in a different manner – and therefore the drought will have a different effect on each of the systems. In a drought year a portion of the cows in the weaner system will have to be sold, while only a portion of the calves in the other systems can be sold. The prices and available buyers of the animals that will have to be sold will also differ. It is common knowledge that the cows in a weaner system would be more difficult to sell and will be sold at lower prices. With the other systems the calves can be removed from the veld relatively easily and fed or sold to feedlots. When the drought is broken, the next setback will hit the weaner system. In order to get the farm into full production again, cows will have to be bought or heifers will have to be held back. Again, this is an unplanned expense and the animals will also be bought at a higher price than the one for which they were sold.

The effectiveness of the systems differs dramatically. In the weaner system the cows produce the only source of income, namely the calves. If the cows have a low calving percentage, for whatever reason, the profitability will be significantly affected. A high calving and weaning percentage is a prerequisite for profitability at all times. It remains a challenge, but it is possible to maintain a calving percentage of more than 90% over time. The source of income of the other systems is not only the cows, but also the calves that have been produced and are growing already. These calves have to grow as well as possible and mortality has to be limited. Usually these calves were born on the farm and their mortality should generally be low. The production risks in these systems are therefore much lower than in a weaner system. This has a major effect on the profitability of the system. The weaners in the weaner system should be sold within a certain period, otherwise there will be price penalties and the producing cows' food is consumed. The other systems have a margin of freedom where marketing is concerned, but the animals should also be sold within a specific time, otherwise a feed flow problem will develop.

1 *Budgeted gross margin determination of different production systems in Mpumalanga in the 2019/2020 production year.*

	36-month marketing system	18-month marketing system	Traditional weaner marketing system	Post-winter weaner marketing system
	Per average LSU	Per average LSU	Per average LSU	Per average LSU
Calving percentage	85%	85%	85%	85%
Gross production value	R5 197,15	R5 962,66	R5 764,05	R5 764,05
Directly apportionable variable costs				
Fodder and licks	R1 904,10	R1 721,70	R1 298,95	R1 607,09
Dosage	R105,84	R103,71	R86,09	R105,40
Vaccination	R119,41	R138,64	R148,98	R148,98
Other injections (trace minerals and medicine)	R55,07	R55,86	R54,36	R54,36
Dip	R40,09	R37,73	R36,90	R43,41
Other (ear tags, gas, etc.)	R 14,11	R15,37	R11,19	R14,55
Casual labour used	R14,87	R14,92	R15,58	R15,58
Machinery, tractors and diesel	R131,25	R131,63	R147,01	R147,01
Veterinarian and consultants	R393,75	R394,89	R396,13	R396,13
Equipment	R43,75	R43,88	R44,01	R44,01
Cattle purchases	R350,00	R438,77	R440,14	R440,14
Production credit interest	R195,58	R185,83	R160,76	R181,00
Total directly apportionable variable costs	R3 455,32	R3 282,93	R2 840,10	R3 197,67
Gross margin	R1 741,83	R2 679,72	R2 923,95	R2 566,38

2 *The long-term trends of producers' beef prices for A grades.*



Source: AMT

CRITICAL SUCCESS FACTORS

Although the systems differ, the critical success factors of the different systems remain the same. Cows must produce and the calving and weaning percentages and weaning weights must be carefully managed. The cattle numbers should continually remain inside the carrying capacity of the grazing. If there is a shortage of feed, the production will suffer. Licks must be adapted to the need of the animals and the supply of the veld. They should not be regarded as a source of feed, but as supplementary feed. The intake of the licks should be according to expectations to ensure that the animals consume the required elements. Yet, the licks should increase the profitability of the system, otherwise there is no sense in using them. The health of the animals should always be good and both internal and external parasites should be managed timeously and preferably preventatively. Taking regular dung samples can contribute towards determining the dosing and its effectiveness.

The herd composition of the different stock systems differs dramatically. A farm that can carry approximately 100 large-stock units (LSU) will be able to carry approximately 60 cows in a weaner system, while it will be able to carry approximately 44 cows in an 18-month marketing system and only 32 cows in a 36-month marketing system. The rest of the carrying capacity will be taken up by replacement animals, calves or growing animals.

Better chance for profit...

PRICE TRENDS

Different systems have their own marketing times and different types of animals will be marketed. The spring-calf weaning system will market mainly weaners and old animals in April, while the 18-month system will deliver mainly finished 400 kg cattle to the market from March to May. In the 36-month marketing system fully grown, finished oxen will be supplied to the market from October to December. Different prices definitely apply during these times and it is important to take the supply and demand in the market into account.

The C grades are usually cheaper when old cows are sold. It makes sense to rather sell the old cows later and to first add value to them.

The price of A grades definitely also follows certain trends. It is low in January and February and then steadily increases until April, where it then increases until Christmas. Keep that in mind when A grades are marketed. The main driver for this is the supply of and demand for meat.

As is indicated in **Graph 3**, it is clear that there is a connection between the general meat price trend and the production cycle of weaners. Prices are low during times when there is an over-supply of cattle and it increases when there is a shortage. As can be seen in in the graph, the general weaner prices from March to June are low, and then start to rise again towards December.

However, the price of stock is not determined only by supply and demand, but also by other aspects like the general status of the economy, the maize price and the price of poultry, to name but a few.

PROFITABILITY

It is generally accepted that weaner systems produce the lowest profitability. Given this information, it is clear that the profitability per system, except for the 36-month system, does not vary a lot. From that we can conclude that the farming system involved does not necessarily affect the profit dramatically.

If the 18-month marketing system is used, it is important to ensure a market for the finished animals. Remember: you have to compete with other meat producers who supply their animals to the consumers and butchers on a monthly basis. It would be good practice to agree with a meat buyer beforehand to purchase market-ready animals.

3 ***Price trend for weaners.***

Source: AMT

As far as the production in the system is concerned, the livestock you farm with will be able to produce finished animals before the animals start to shed. If the animals shed first and only then finish, the price of meat will be negatively affected, and the profitability of the system will decrease.

If the weaners are sold after the winter, it is important to ensure that the expected price increase and mass increase will be able to service the additional feed account. You should therefore make sure of this before you elect to keep back the weaners for marketing at a later stage.

Taking everything into account, it is not really the choice of the system that determines the profitability of the stock farming, but rather the effectiveness and production of the system being followed. By increasing the effectiveness and production of the current system and perhaps making minor marketing adjustments, the profitability can increase dramatically.

The replacement policy with respect to cows is another aspect that requires more attention. If cows are replaced too quickly, more replacement animals have to be carried – and they take the place of animals who have to produce. However, if the cows are kept in the herd for too long, the productivity of the herd will definitely be harmed. Breed plays a role here. The cows of some breeds remain productive for longer, while those of other breeds have to be replaced sooner. Make sure what the cow effectiveness of the herd is and use this as the norm to establish when the cows have to be replaced. This has an enormous impact on profitability. ■

PIETMAN BOTHA, INDEPENDENT AGRICULTURAL CONSULTANT. FIRST PUBLISHED IN SA GRAAN/GRAIN AUGUST 2020

SA Graan Grain

THE CORNER POST

VIEWPOINT

FANIE PIENAAR
Inspiration leads to discovery

RONALD REAGAN, 40TH PRESIDENT OF THE UNITED STATES OF AMERICA (USA), SAID: 'THE GREATEST LEADER IS NOT NECESSARILY THE ONE WHO DOES THE GREATEST THINGS. IT IS THE ONE WHO GETS THE PEOPLE TO DO THE GREATEST THINGS.' PART OF THE SUCCESS OF GRAIN SA'S FARMER DEVELOPMENT PROGRAMME IS THAT THE TEAM HAS MANY GREAT LEADERS WHO ARE INSPIRING OTHERS TO ACHIEVE GREAT SUCCESS.

Fanie Pienaar, trainer for the Free State and North-West areas, is a fifth-generation farmer from Clocolan in the Free State, who became involved in the programme through some of its passionate leaders. He is still a full-time farmer and has to carefully plan the training sessions around his own farming activities.

BORN FARMER BECOMES PASSIONATE TEACHER

Fanie grew up on a farm in the Winburg area, where he started learning about farming almost before he could walk and talk. He later farmed on rental land in the Ficksburg area for 20 years, before moving his family and farming operation to the family farm near Clocolan. Here he manages a mixed farming operation, where soya and maize form the core of the crop production.

Fanie's wife, Elizabeth, is also a farmer. Their three daughters – aged 8, 11 and 15 – share their parents' passion and are therefore also involved in the farming activities.

Initially he wasn't aware that teaching is his other passion, but being a good neighbour has led to this discovery. Fanie's path crossed with that of his neighbour, Isaac Khuto, when he was a relatively new farmer with little equipment. When Fanie discovered that Isaac, whose fields were clean and ploughed, could not plant as he did not own a planter, he offered to do the planting for him. Since then a friendship developed between those two passionate farmers.

Isaac, who was a finalist in Grain SA's Developing Grain Producer of the Year in 2008, said in an article in *Farmer's Weekly* of 9 February 2009 that Fanie's advice was critical to his transformation from a beginner farmer to a recognised developing farmer.

Through Isaac's nomination for the competition, the Grain SA Farmer Development team became aware of Fanie's support and paid him a visit. 'They told me I was a mentor to Isaac. This was actually the first time that I had heard of a mentor. However, I did not see it as mentorship. In my eyes I was only helping a fellow farmer who loved what he was doing as much as I did.'

Teaching was ignited as a new passion during his first presentation at one of the sessions of the provincial coordinator, Johan Kriel, at a farmers' day in Ladybrand. 'I thoroughly enjoyed sharing my knowledge with others and it gave me quite an energy boost.' For Fanie the planting courses (for soya, maize, sunflower, sorghum and groundnuts) are always a highlight. 'These sessions are my favourites, as I have experience in this field and can really share my own knowledge with the farmers.' Other courses such as welding, tractor maintenance, business ethics and 'Farming for profit' all form part of the curriculum compiled by Grain SA.

> *He sees it as his duty to stay involved in the programme and to contribute in closing this generation gap.*

'Apart from a passion for your subject and a knowledge of people, language skills are the most important skills to be an effective trainer,' says Fanie, who is fluent in Sotho. He can speak, read, write and even pray in Sotho. The farmers who know Fanie and are in regular contact with him, are always first to apply when he advertises a course.

KNOWLEDGE IS POWER

Fanie has noticed that the farmers are very keen to improve their agricultural practices through knowledge. 'They believe that knowledge is important and have started realising that the wrong information will derail their efforts,' he shares.

On his own farm, Fanie practises minimum tillage and wants to progress to no-till practices. Many farmers who have formed a close bond with him, have got on board with these practices after witnessing the results. However, he is sensitive to the more senior farmers who firmly believe in the older way of doing things. 'I would never force my practices on someone and try to help every farmer as best I can.'

He loves sharing in the excitement of farmers who are making progress and achieving success – whether it is increasing their yield or reaching their goal of purchasing their own land. The fact that very few younger family members are involved in farming, concerns Fanie. 'People who were born in 1940, are attending the courses. Where are the young people?'

He sees it as his duty to stay involved in the programme and to contribute in closing this generation gap – in getting the youth excited about agriculture.

To have people trust him enough to implement what he is teaching, has become one of the most satisfying experiences in his life. Fanie doesn't mind if farmers ask challenging questions. This way he can help them to discover what best suits their farming style. 'As long as they remember that to get the right answer, they must ask the right question!' he says. ■

LOUISE KUNZ,
PULA IMVULA CONTRIBUTOR

A programme that is changing lives

Telling OUR OWN STORY first-hand

THE 2020/2021 SUMMER CROPPING SEASON HAS BEEN SOMEWHAT MORE REWARDING THAN USUAL. THE SEASON HAS FOR MOST REGIONS, BEEN A GOOD ONE. SO MANY FARMERS ARE ABLE TO REJOICE AT THE REWARDS FOR THEIR LABOURS UNLIKE THE DROUGHT YEARS WE HAVE BECOME MORE FAMILIAR WITH.

Some parts have however had a little too much rain. This is not something the farmers will grumble too much about – they just need to learn how better to manage the problems that arose, like contouring fields better and improving the organic matter in their soils so run off is not too damaging.

While so many of us have had to be careful about making unnecessary trips to see the fields around the country because of the COVID-19 pandemic, the Grain SA team whilst taking necessary precautions, are on the go. They have been busy visiting farmers, troubleshooting issues, monitoring the fields, training and holding study group meets and more recently doing new season planning with farmers who are starting to look at budgets and ordering for their next season crops.

During April:

- Our team made **80 farm visits** to give tailor made support to individual farmers.
- They also **visited 76 study groups** to give training and to visit the small scale farmers' fields to monitor crop progress.
- Grain SA trainers held **eight training courses** around the country.

This is a rewarding experience because it is at grass roots that we can see the impact we are making. We see individual growth; we enjoy the inspiration the farmers have after seeing the successful results of doing the right thing at the right time and in the right way.

A group of farmers ready to expand their agricultural knowledge at the Pixley Ka Seme Study Group meeting at Daggakraal.

It is also an opportunity for us to encourage other farmers and explain why there are successes in one field yet still poor results in a neighbouring land. For example, we highlight the importance of maintaining healthy soils through lime spreading and soil correction through good fertilisation. We also emphasise the importance of weed control – even at harvest or immediately post-harvest – as we consistently aim to reduce residual seed banks and also limit weed growth that may steal water and nutrients from the soils that could rather be saved and available to our next crops in the field.

AT GRASS ROOTS

Farmer Queen Mahoa was encouraged during a farm visit to keep up the good work as her field was clean of weeds and there were no gaps between the crops.

When the team visited farmer Mabel Molete's farm, the crop looked good and weeds were well-controlled. Mabel's son can be seen in the field.

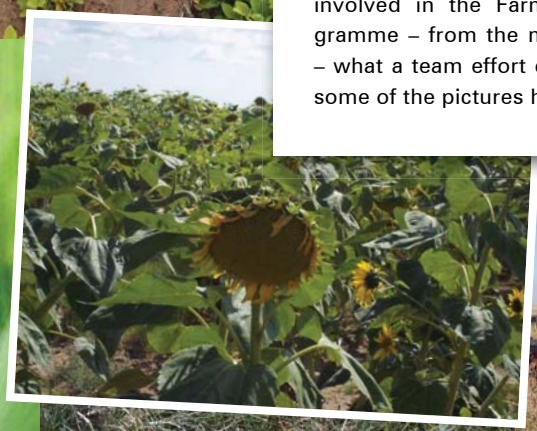
Farmer Sifiso Michael Mnisi had a meeting with Jurie Mentz, provincial coordinator to measure fields and plan the new season.

Courses to EQUIP our farmers

TRAINING is an important aspect of the work we do. It has been challenging to roll out our training programme as planned, but we have done so by restricting the numbers and practising the correct protocols at the venues. To balance the theory and practical experience lessons, courses are held inside and outdoors. The average course runs over five days and is concluded with a test. Successful learners receive a certificate.

These eight courses took place during April – all sponsored by the Maize Trust:

- Farming for profits with trainer Agnes Mndawe: 25 learners
- Mechanization management with trainer Neil Kirk: 17 learners
- Mechanization management with trainer Elias Dladla: 26 learners
- Business ethics with trainer Timon Filter: 18 learners
- Introduction to maize production: with trainer Eric Wiggill: 23 learners
- Tractor and farm implement maintenance with trainer Eric Wiggill: 21 learners
- Farming for profits with trainer Timon Filter: 24 learners
- Business ethics with trainer Chris de Jager: 7 learners



We shall come rejoicing, bringing in the sheaves

THE Grain SA team took photographs during their **80 farm visits** to show everyone involved in the Farmer Development Programme – from the manager to the farmers – what a team effort can produce. We share some of the pictures here.

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