# PULA IMVULA

GRAIN SA
GRAAN SA

**JANUARY 2016**

*>> GROWING FOOD >> GROWING PEOPLE >> GROWING PROSPERITY >>*

PANNAR®

# PULA IMVULA


***Editorial team***

**GRAIN SA: BLOEMFONTEIN**
Suite 3, Private Bag X11, Brandhof, 9324
7 Collins Street, Arboretum
Bloemfontein
▸ 08600 47246 ◂
▸ Fax: 051 430 7574 ◂ www.grainsa.co.za

**EDITOR IN CHIEF**
***Jane McPherson***
▸ 082 854 7171 ◂ jane@grainsa.co.za

**EDITOR AND DISTRIBUTION**
***Liana Stroebel***
▸ 084 264 1422 ◂ liana@grainsa.co.za

**DESIGN, LAYOUT AND PRINTING**
***Infoworks***
▸ 018 468 2716 ◂ www.infoworks.biz

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Sesotho sa Leboa, Zulu and Xhosa.


***Grain SA Farmer Development Programme***


**DEVELOPMENT CO-ORDINATORS**

***Danie van den Berg***
Free State (Bloemfontein)
▸ 071 675 5497 ◂ danie@grainsa.co.za

***Johan Kriel***
Free State (Ladybrand)
▸ 079 497 4294 ◂ johank@grainsa.co.za
▸ Office: 051 924 1099 ◂ Dimakatso Nyambose

***Jerry Mthombothi***
Mpumalanga (Nelspruit)
▸ 084 604 0549 ◂ jerry@grainsa.co.za
▸ Office: 013 755 4575 ◂ Nonhlanhla Sithole

***Jurie Mentz***
Mpumalanga/KwaZulu-Natal (Louwsburg)
▸ 082 354 5749 ◂ jurie@grainsa.co.za
▸ Office: 034 907 5040 ◂ Sydwell Nkosi

***Graeme Engelbrecht***
KwaZulu-Natal (Louwsburg)
▸ 084 582 1697 ◂ graeme@grainsa.co.za
▸ Office: 034 907 5040 ◂ Sydwell Nkosi

***Ian Household***
Eastern Cape (Kokstad)
▸ 078 791 1004 ◂ ian@grainsa.co.za
▸ Office: 039 727 5749 ◂ Luthando Diko

***Liana Stroebel***
Western Cape (Paarl)
▸ 084 264 1422 ◂ liana@grainsa.co.za
▸ Office: 012 816 8057 ◂ Hailey Ehrenreich

***Du Toit van der Westhuizen***
North West (Lichtenburg)
▸ 082 877 6749 ◂ dutoit@grainsa.co.za
▸ Office: 012 816 8038 ◂ Lebo Mogatlanyane

***Julius Motsoeneng***
North West (Taung)
▸ 072 182 7889 ◂ julius@grainsa.co.za





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## NKGONO JANE SAYS...

# IN THIS ISSUE...

So many people will have taken leave over the holiday period but you, the farmers, will have worked hard to ensure that the nation has food. How blessed we are to have farmers who are prepared to give up so much for us – we salute you for your hard work!

In the media we hear a lot about 'transformation' – what is this thing called 'transformation'? In the dictionary it is described as 'change for the better'. All the work that we do in this programme is aimed at transformation – we want to make changes that will improve the lives of our members, the food security in South Africa, land use, enable black farmers to use the land they have, attain higher yields, reduce production costs, skill and equip people to run their own farming businesses, disseminate information and excite children about the entire agricultural sector – all aimed at making a change for the better.

People are generally afraid of change and so they resist it – they like to go on doing what they have always done because they feel safe. Changing brings stress and this is not comfortable. This is true of farmers too who often resist trying new and modern production practices and preferring to do what their fathers did. In our programme we are trying to guide everyone to the most modern, sustainable, cost effective and safe way of producing food for our nation. Through all the different activities, farmers are exposed to modern ways which can really make a change for the better.

At the time of writing this message, there has been no rain in the summer crop production areas – everyone is worried about the season ahead. By now we will know whether or not you were able to plant your crops. Fortunately for the nation, farmers are optimistic and positive people who are prepared to risk a lot so as to grow crops. We hope that this year will bring rewards to you which will enable you to plant again next year. May we never forget that farmers feed – people and animals rely on farmers for their food.

It is January and the insects will be very active in your crops – please be diligent in scouting for problems – your attention to the crops could save your crop.

Be Blessed.



# Look out for these diseases in maize

Maize can be very susceptible to many different diseases. We are noticing this more and more as our cultivars and varieties are becoming more advanced. In the past maize cultivars were developed for resilience and resistance where now the biggest focus is on yield and production in our attempt to ensure food security.


There are certain cultivars that have been developed to be resistant to certain diseases; this however is no longer the primary focus of modern day genetics. This is not a bad thing; it does however mean that we need to be aware of the different maize diseases and it also means that we should always be on the lookout for their occurrence in our crops. There is always something that we can do to mitigate the damage that they can cause. In the same way that our maize cultivars have been developed for production; our chemicals have also been advanced for the effective control in diseases and pests in our crops.

Plant diseases are primarily caused by fungi, bacteria and viruses. They can spread very quickly and can cause terrible damage if you do not put the correct control measures in place. Fungi, bacteria and viruses can affect all the different parts of the plant including the roots, stems, leaves and the cobs. The latter can have the largest affect on yield when it comes to harvesting the crop, the maize grade will also be affected negatively.

Diseases in maize require certain environmental conditions to develop. If conditions are favourable and the disease is present in the host plant then it will start to develop and take over the plant. It will consume energy intended for leaf and grain production and ultimately it will suffocate the plant. Once disease is present in a single plant it can be spread to surrounding plants by wind blowing bacterial spores which will settle on leaves and stems and start to take destructive action in the next plant.

Bacteria, fungi and viruses which cause disease can remain present in a land for many years, but if environmental conditions are not favourable then they will not develop. A disease which occurs in a specific area in a specific season may be absent in the same area the following season if the conditions are not favourable.

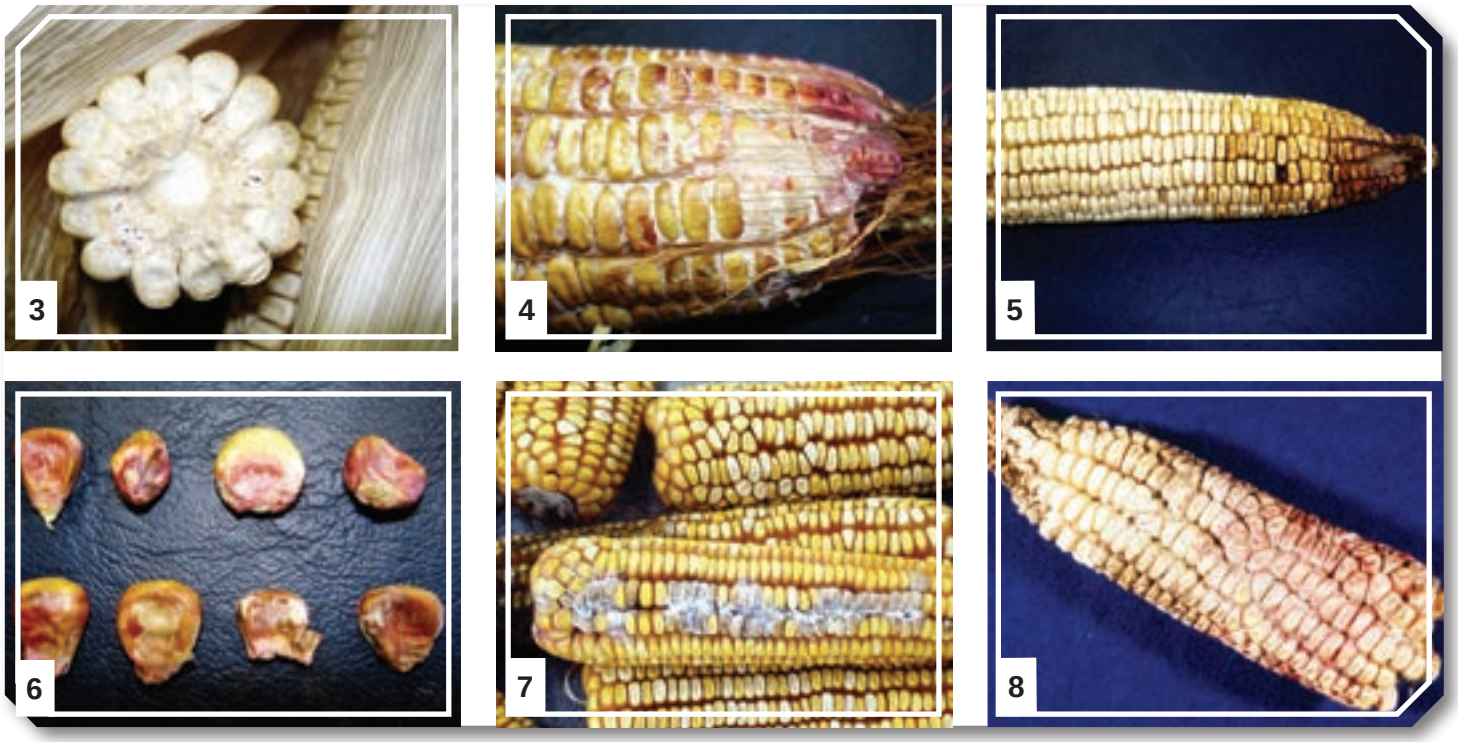


*Photo 1 - 8: Plant diseases can spread very quickly and cause severe yield losses.*

Before the planting season starts we need to have a plan of action for disease control. The cost of these control measures is always a big factor. The most cost effective measure for disease management is preventative.

- Understand the crop you are planting and the diseases which occur in your area.
- If there is a cultivar available on the market which is resistant to a disease which occurs in your area then it will be wise to plant that cultivar.
- Include a bacterial and fungal remedy in your chemical spray program which will assist to neutralise much of the existing fungi and bacteria living on the residue in the land.
- If you practice no-tillage and you are noticing increased occurrence of certain disease then it may be a good idea to do a once off working of the soil. Some diseases are harboured on the stubble or residue on the land and by tilling the soil these can be neutralised.
- Crop rotation is also good practice as some diseases can only survive on specific host plants. By rotating your crop you can increase the period that a disease needs to survive for before a suitable host is planted again.
- Plant your crop at the correct time. As the season changes so does the climatic conditions. If you can plant in a time frame when the environmental conditions are not suitable for disease development then it will be most beneficial for your plants.

> *"Before the planting season starts we need to have a plan of action for disease control.*

## Some common diseases to look out for

***Gray leaf spot***

This disease often occurs in humid areas when leaves are exposed to long periods of wetness.

***Be on the lookout for rust in your crops.***

The disease is identified by lesions which are small elongated brown-grey spots which grow parallel to the veins. There are reports of increased incidence of grey leaf spot in minimum tillage systems.

***Leaf blight***

There are a number of different types of blights. Blight usually occurs first on the lower leaves and increases in number as the plant develops. Blight can lead to complete burning of the foliage. Blight occurs especially in areas where high humidity and moderate temperatures prevail during the growing season. It can lead to significant economic damage.

***Ear rot and stalk rot***

There are various types of rot that cause the rotting of the lower stem and the spaces between the maize kernels. This results in lodging and yield reduction. Most of the rotting diseases occur when the conditions are moist. These diseases produce toxins which are a threat to human and animal health.

## Conclusion

These are just a few of the many diseases to be on the lookout for. You never know when a disease will appear as environmental conditions are always changing. The key is to always be actively inspecting your crops in order to take action if something occurs. Always keep in mind that the best method of disease control is to take preventative measures before the season starts.

***Article submitted by Gavin Mathews, Bachelor in Environmental Management. For more information, send an email to gavmat@gmail.com.***

## Pula Imvula's Quote of the Month

*"If you don't like something change it; if you can't change it, change the way you think about it".*

~ Mary Engelbreit

# What to expect from the inspector...

*An example of safety clothes that should be worn.*

In previous articles regarding labour management we have discussed the management and record keeping of this aspect. Should you have employees, even if it is only one person, you are required by law to adhere to the requirements of the relevant legislation. To complicate matters, in South Africa labour matters are regulated by ten laws.

Of these, the most important ones from day to day, for our discussion are:

- Basic Conditions of Employment Act (BCEA), 75 of 1997 in conjunction with Sectoral Determination 13 for Agriculture;
- Compensation for Occupational Injury and Disease Act, 130 of 1993;
- Occupational Health and Safety Act, 85 of 1993; and
- Unemployment Insurance Act, 30 of 1996.

To ensure compliance with the abovementioned legislation labour inspectors are appointed by the Department of Labour to undertake inspections at workplaces. They are also to advise employers and employees of their rights and obligations and are also entitled to conduct an inspection of a workplace in case of complaints or accidents.

During an inspection the inspector will check for compliance with the relevant labour legislation. They may request employment contracts, payslips, attendance registers, and personal files of each employee. They could also require proof of registration with the Workman's Compensation Fund and the Unemployment Insurance Fund and proof of the latest payments. They could also check that a summary of each of the following legislations are on display: BCEA; Employment Equity Act; the Occupational Health and safety Act; and that a copy of Sectoral Determination 13 is available for employees. They could also check that your disciplinary procedure and code are in place.

The labour inspector could also confirm adherence to the Occupational Health and Safety Act: for instance that moving drive chains and belts are sufficiently guarded; that emergency exits from buildings are clearly marked; that fire extinguishers are accessible and functioning properly; that flammable materials are correctly stored and used; that all electrical wires and plugs are properly insulated; that all chemicals are correctly stored and used; that a fully equipped first aid box is available on the premises; that clean and hygienic toilets are available for males and females and that the occurrence of occupational injuries and diseases are reported by the employer to the Department of Labour.

> *"The compliance with labour legislation as required is beneficial to the employer as it minimises the risk of disputes.*

Bear in mind that during an inspection should any non-compliance be detected it could in all probability result in a more thorough inspection and employees may be interviewed by the inspector. It is for your own interest as an employer to adhere to the legislation because non-compliance can implicate fines of between R300 and R1 500 per employee and imprisonment of one to six years.

In the past, employers who did not comply with the legislation were given a grace period, normally three months, to get their labour matters in order before being issued with a non-compliance order if still necessary. Due to recent amendments to the Basic Conditions of Employment Act the grace period has fallen away. Labour inspectors can now issue compliance orders immediately. This is an important change to the legislation with rather negative consequences for employers. Government is quite adamant that employers must comply with the legislation.

Labour inspectors may enter relevant workplaces which include farms at any reasonable time without notice or a warrant, to monitor and enforce compliance with the labour legislation. But they may not enter residential premises without the consent of the owner or tenant.

However, the farming community's right to safety is a most important right. On the contrary certain officials representative of institutions/ departments have a statutory right to access to fulfil their duties. Therefore a safety farm access protocol was negotiated between Agri SA and Government with guidelines for access to farms as a workplace. According to the protocol it is preferred that labour inspectors make an appointment with the owner/manager. Because of their statutory rights, labour inspectors may still access farms without an appointment. Note that only members of Agri SA who displays the necessary notice board at their farm's entrance may exercise any right according to the protocol.

So far we have looked at the rights of labour inspectors. What about the employer? You have the right to verify the identity of the person claiming to be a labour inspector, before granting the person access to the workplace. A labour inspector must be able to present a certificate confirming his/her position as a labour inspector with the Department of Labour, and stating the functions he/she may perform. Without this identification access MUST be denied. Furthermore, a labour inspector may not charge a fee for the inspection or for any advice or assistance. And the labour inspector may only perform the duties as stipulated. Employers also have a right to appeal a compliance order.

The compliance with labour legislation as required is beneficial to the employer as it minimises the risk of disputes. Also everybody is aware and understands what is going on in the workplace and proper communication is enhanced.

***Article submitted by Marius Greyling, Pula Imvula contributor. For more information, send an email to mariusg@mcgacc.co.za.***

# Let us enter 2016 with faith

I would like to wish all our Pula Imvula readers a very happy and prosperous 2016. It seems as if this year will be starting with very big challenges.

The season started very late with almost no rain to enable farmers to commence with the plantings in the North. The drought of 2015 left us with very little soil moisture to begin with. Low yields impact negatively on our income and there were very few farmers who made any profits during the previous season. Even the reliable 'Swartland' in the Western Cape experienced a serious drought.

The weather is probably the biggest risk for a grain farmer. Although one can try to plan around it, you cannot avoid the risk. Even drought insurance is out of reach for most farmers, not just because of the high costs, but because of the high risk to insurance companies and the quotas they use to limit their risk.

New drought resistant cultivars might help us in future and conservation practices will assist us, but we still need rain to produce a crop. What is it that is in our blood as grain farmers

> *"The weather is probably the biggest risk for a grain farmer. Although one can try to plan around it, you cannot avoid the risk.*

that makes us endure under such severe conditions? If you should ask me, I would say it is faith! Faith that the good Lord will send us rain and that He will provide for us. Therefore I wish you lots of faith for 2016. Use all your skills and talk to your mentors, but have faith in our God that He will provide the necessary for you to have decent crops for us to feed the nation.

***Article submitted by Jannie de Villiers, CEO of Grain SA. For more information, send an email to jannie@grainsa.co.za.***

# Key aspects of stalk borer control

The African maize stalk borer larva or in the Latin binomial classification system is known as Busseola fusca and is indigenous to Sub-Saharan Africa.

The larva or caterpillar stage in the life causes major damage to maize and sorghum crops throughout the region and in particular South Africa. It occurs from sea level to production areas at 2 000 metres above sea level.

If not controlled effectively crop losses for large commercial producers as well as small scale farmers can be between 5% and 30%, or more, of the potential yields. Larva damaged kernels in the maize ears allow and facilitate infection by various fungi. At harvest the resulting bad quality of the seed might result in your whole crop being downgraded. At a maize price of R2 800 per ton and an average yield of 4,5 tons per hectare the potential economic damage could range from R630 to R3 780 per hectare.

## Description and life cycle

Please see the life cycle shown in **Figure 1**, so that you can become familiar with the various stages of the African stalk borer so that you can identify various stages of the pest in your own maize lands.

The young larvae or caterpillars lack conspicuous hairs or markings, are creamy white with a distinctive grey tinge and occur sometimes with a pink infusion in colour. The head capsule is dark brown with a yellowish brown body and its breathing hole or spiracles are elongate with black edges. They have four sets of prolegs, all next to each other along the abdomen.

The adult larvae hibernate as pupae in the base of the stem left on the land as stubble during the winter. These will emerge after winter and be the first generation of moths to lay eggs within the sheaths of the leaves of young maize plants less than two month old. The eggs

*An integrated pest management programme is crucial.*

> *The control and management of potential stalk borer infestations should be part of an Integrated Pest Management or IPM system planned and implemented on your farm.*

will hatch after 7 to 10 days and continue the cycle. An emerging larvae feeds for six weeks, then forms a pupae which after an additional three weeks emerges and creates the second generation of moths. In the current drought cycle the first and second generation of moth's flights might be delayed by many weeks.

The adult moths have a wing span of 25 mm to 35 mm, with light brown to dark brown forewings as well as darker markings. The hind wings are white to grey-brown.

The adult moths lay creamy white eggs which darken just before emergence. The eggs are about 0,8 mm - 1 mm in diameter, hemispherical and slightly flattened. When scouting for egg batches or clusters of eggs of between 30 and 100 eggs can be seen under the emerging leaf sheath. It is wise to continually check the leaves of maize crops under two months of age so that an early warning for a possible high infestation can be observed and reacted on early enough.

The moths fly at night at about knee height and will thus land on any maize plants higher than this and lay their eggs in the emerging leaf sheaths.

## Early symptoms

The first signs of early damage usually noticed are the small holes or 'shot' phase caused by the smaller caterpillars on the leaves. These holes resemble the effect that would be caused by the spray of shot gun pellets if shot at an object. If these are observed you probably already have an infection rate that will exceed 10% damage to the crop.

Dead heart is also one of the first symptoms to be noticed by farmers as the central leaves at the top of the plant become drier and withered and may even flop over to the underside of the growing maize plant.

Control must be implemented as soon as possible if the above are observed. It is important that spraying of a contact or systemic chemical be applied before the maize plants become too tall for the use of a tractor mounted spray rig.

## Integrated Pest Management

### *Control measures*

The control and management of potential stalk borer infestations should be part of an Integrated Pest Management or IPM system planned and implemented on your farm. The main goals of IPM are to increase profits by reducing production costs at the same time as keeping pest losses low. Please investigate the possibilities of using a scientific and planned approach for your farming operation and all the different crops planted.

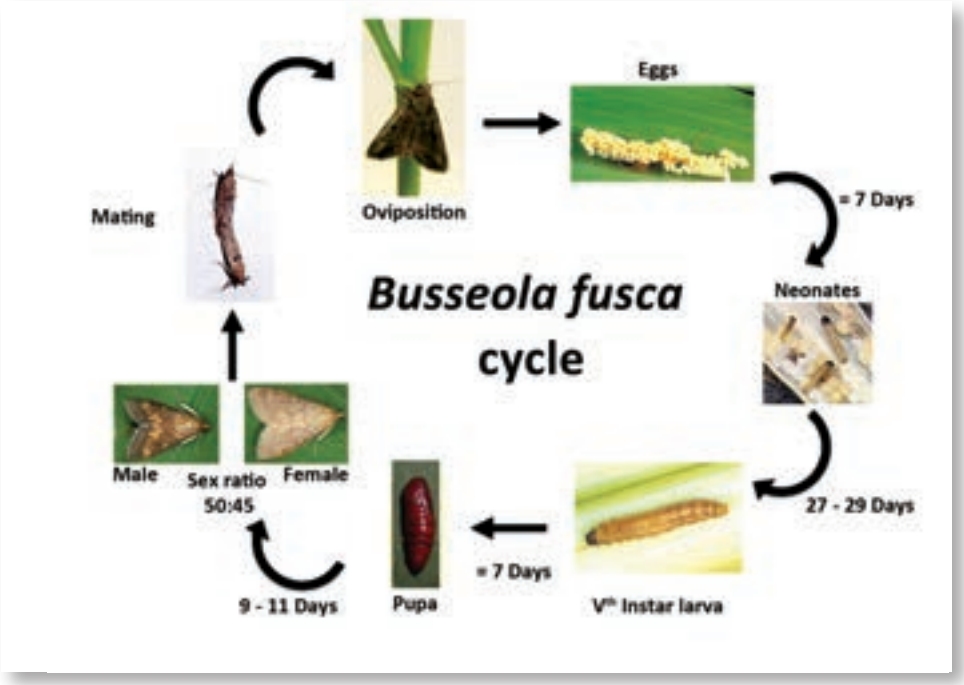


***Figure 1: The life cycle of the African stalk borer.***

The three keys to a successful IPM programme are first to scout, or continuously inspect and systematically evaluate your crops throughout their growth cycle regularly, in order to identify pests. It is important to acquire the knowledge so that the larval, adult and egg forms of various economically importance can be correctly identified.

Secondly, to only take control measures when there is a pest population, or weed infestation, approaches a profit threatening or economic threshold. In the calculations above a 10% infection, which is a rule of thumb threshold for control to be implemented, implies a potential loss of R1 260 per hectare. If total spraying costs are less than this per hectare it would be advisable to control the problem which will also be more cost effective at this stage. Thirdly, when control is required apply the lowest effective amount of pesticide using equipment that is correctly calibrated.

The main control measures include chemical control by contact, direct spraying of the poison on the insects or systemic products that are taken up by the plant and kill the larva deep in the leaves or stem, cultivar choices, cultural practices such as eliminating the over wintering of larvae in the old stalks or biological control.

Chemical costs for contact or systemic chemicals are about R150 per hectare for the chemicals which must include a fixer mix. Even by adding R500 a hectare for applying the chemicals it is economically advantageous to implement control at a 5% threshold infestation rate.

### *Bt – Maize*

The introduction of transgenetic or genetically modified maize cultivars has revolutionised the control of stalk borer infestations with about 72% of the maize cultivars planted to Bt types. Be sure you understand the requirements and need to plant refuge or buffer zones of non Bt maize in blocks or strips through your lands so that resistance to the Bt maize does not build up rapidly. Current research indicates that we are already experiencing resistance by the insects to being effectively controlled by the Bt varieties. Farm responsibly in this regard and try to plan a crop rotation system that allows a change from using genetically modified maize and broad leaved on a continuous cycle. Crop rotations are also important to improve soil and reduce resistance to chemical control of certain weed types.

## Conclusion

Effective and continuous scouting of your newly planted maize crop, in the early growth stages will ensure timely control of any stalk borer infestation and the resulting future yields at harvest time.

***Article submitted by a retired farmer.***

# SUNFLOWERS – a reliable alternative

We are well into the summer months now and still most of South Africa's crop producing regions has received little to no rain at all. This is very concerning. We are certainly experiencing intense drought conditions. This is a difficult position for a farmer to be in as we are faced with a big dilemma.

What should we plant, will we be able to plant, will the drought persist, how will my business survive if we do not get any crops in the soil? Indeed tough times lie ahead, but it is these difficult circumstances which teach us to be resilient and strong.

The planting season which is upon us will be a season where we as farmers will need to think on our feet and adapt to the environmental conditions presented to us. We may need to change plans and develop new and unique strategies to deal with the drought. In this article I would like to discuss the advantages of planting sunflowers in a year like the one we are experiencing.

Perhaps your plan was to plant all of your lands to maize, but now the time is running out. In the warmer maize producing regions of South Africa such as the Free State and North West, many people use Christmas day as the benchmark cut off day for maize planting. If the weather prevents us from getting our pips in the ground before this date then fortunately we do have an alternative option. We can plant sunflowers. Sunflowers are much more resilient to drought conditions and also to cooler weather. This is why we are able to plant later in the season, as cold snaps in autumn will not severely disrupt the maturing process. We can safely plant sunflower from November into February which gives us a big window of opportunity to take advantage of. So when the late rains arrive we can take advantage of that moisture. Depending on variety, sunflowers will mature and develop seeds in between 80 days to 120 days.

*Sunflower showing its resilience.*

*The results of doing things correct.*

Another advantage of planting sunflowers is that their input costs are not as high as maize. This is especially significant in a year when sunflowers are actually your 'fall back' crop which makes the expense of purchasing a second lot of seed a little more manageable. The fertiliser requirements for sunflowers are also not as high compared to that of maize. This does not mean that we should not apply fertiliser. Sunflowers thrive on nitrogen, but as they have a very deep root system it is important to apply it soon after planting. Your previous year's fertiliser program will also come into play as sunflowers draw from the nutrients in the soil from last season. This is an indication of how deep these root systems can go.

Although there are many advantages associated with planting sunflowers, especially in drought years, there are certain factors to be aware of. You should be careful not to plant sunflowers continuously, year after year. This will deplete the soils nutrients and the soil will become very acidic. Rather include it as a rotation crop. Obviously in drought years we are left with very few alternative options. One should also take special care of the crop at the emergence stages. If the soil has formed a crust the plants can have difficulty emerging and will require mechanical assistance to break up the surface crust to assist the seedlings. One should also avoid extremely high temperatures at planting times as this can inhibit the germination process.

Every year has its challenges, and some years will not be successful due to factors which are not in our control. But, if we take advantage of the different crops we have available to us we can attempt to make the best out of a tough situation.

***Article submitted by Gavin Mathews, Bachelor in Environmental Management. For more information, send an email to gavmat@gmail.com.***

# Factors to consider when deciding on canola camps

Crop production in the Western Cape has embraced crop rotation to spread the on-farm risk, increase crop yields and increase effective weed management. Canola forms an integral part of crop rotation for many farmers in both the Swartland and southern Cape.

It is very important for farmers to know the history of each camp on their farm and which crop rotation is used on each camp. There is no rule that a farmer has to implement a single crop rotation across his or her whole farm. Certain crops like lupin prefer a more sandy soil with good drainage, while canola might not perform so well on a sandy soil.

Knowing the history of each camp including the soil type, soil fertility status and weed problems will determine which crops can be planted in rotation. This makes it easier for a farmer to know which camps will be planted to which crop each year. So if your crop rotation system is in place, one would already know at the end of the current season how many hectares of each crop will be planted the following year and that helps with the timely ordering of seed. This is especially true for canola. The seed companies who supply the canola seed have to place their orders at the end of the current season, because the seed has to be produced in Australia and then be shipped here in time for the next planting season. So not knowing beforehand how many hectares of canola, therefore how many kilograms of the variety, you need and placing your order early could result in not getting the best cultivar for your farm.

Deciding which canola cultivar to plant would depend on the on-farm situation and what the farmer wants to achieve. The first step in deciding on your canola seed needs, is to know the weed status of the camp. There are three types of canola, Conventional, Clearfield (CL) and Triazine tolerant (TT), each differing in their use. The difference between the types is based on their ability to handle certain herbicides. In a camp planted to a conventional cultivar, only ACCase inhibitors (Fops and Dims) grass weed herbicides can be applied. In a CL cultivar grass weed, (Fops and Dims) and Cysure (broadleaf and grass herbicide) may be used. In the TT group of cultivars a farmer may use grassweed herbicides (Fops and Dims) and Simazine or Atrazine (broadleaf and grass herbicides). The CL and TT cultivars were bred to be tolerant to specific herbicides and applying any other could kill the crop. Two broadleaf herbicides that can be used in all canola types are Lontril and Lomex.

***When there are serious weed challenges on a camp, the best option is a TT cultivar to help the farmer manage the weed problems more effectively.***

***Knowing the history of each camp including the soil type, soil fertility status and weed problems will determine which crops can be planted in rotation.***

If you do not have any issues with weeds on a camp, the farmer can choose to plant a conventional or CL cultivar (manage the CL cultivar as if it was a conventional) because they

# Soybeans

## Planting and application of fertiliser

Previous Pula Imvula articles have covered various aspects of soybean production in depth and are worth reading if more comprehensive information is required. This article will highlight critical production aspects and actions regarding planting, planning and fertilisation of soybeans.

### Planting

***Cultivar choice***

Soybean cultivars vary in their sensitivity to day length and the heat units required to produce high yields in particular production areas. It is critical to be able to make the correct cultivar choice for those that are suitable for your farm or lands with different heights above sea level in a large farming operation. Average yields for the dry land national cultivar trials show the highest average of 2,17 t/ha in 2010. Make sure that your cultivar choice has a proven yield of at least 2 t/ha and forms pods at least 10 cm above the planting furrow to give yourself the best chance for a high yield in a good rainfall year.

All characteristics such as days to 50% flowering, days to physiological maturity, days to harvest maturity, pod height, plant height, green stem percentage, lodging (plants falling over at maturity) percentage, oil content percentage, crude protein percentage, seed quality, shattering of seed pods after maturity percentage and yields should be assessed to determine the best choice for your farm.

Try to visit as many farms and cultivar trials as you can to make an informed choice. Remember that a cultivar that can perform well in another district and on different soils might do very poorly on your farm. Stick to locally proven varieties but plant small areas to new cultivars so that any improved cultivar that works on your farm can be chosen in future.

If you have kept your own seed have it sieved and graded to ensure uniform planting and depth control. If you are carrying out conservation farming and have chosen glyphosate resistance cultivars make sure that your planter, weed control planning, spray units and spraying capacity is in order.

As this article is being written most production dry land areas do not have enough moisture for the crop to be planted. It is always wise to have a range of medium to short season cultivars in stock in your shed so that if a late planting has to be made an appropriate cultivar is on hand.

> *"It is always wise to have a range of medium to short season cultivars in stock in your shed so that if a late planting has to be made an appropriate cultivar is on hand.*

***Plant population***

Soybean seeds can vary from a mass of 0,12 grams per kernel to 0,18 grams per kernel for commercial seed. Measure or have your seed weighed in 100 per batch and calculate the average mass per kernel. The worldwide consensus for dry land production is to aim for a final stand of 250,000 plants per hectare. This population will give you a maximum potential in most soils as well as provide enough cover for the suppression of weed growth between the rows. 30 kilograms of seed averaging 0,12 grams per kernel or 45 kilograms of seed averaging 0,18 grams per kernel will be required to achieve a final plant population of 250,000 plants per hectare if each one germinates. Allow for at least a 10% emergence loss and adjust the planter settings to 34 kg/ha for the 0,12 gram kernels and about 50 kg/ha for the 0,18 gram kernels for planters that cannot be set for individual seed placement. You might have a kernel size in between these as well and the appropriate corrections must be made.

Calculate what the spacing of seeds within a row is, depending on the row spacing of your

## Factors to consider when deciding on canola camps

are higher yielding than the TT cultivars. If the camp will be a pasture camp the year following the canola and is under-sown with lucerne or medic pastures and have problems with broadleaf weeds, a farmer may choose the CL type.

When there are serious weed challenges on a camp, the best option is a TT cultivar to help the farmer manage the weed problem more effectively. Just note that due to its genetic make-up, the TT cultivars inherently produces less (10% - 30%) than the conventional or CL cultivars.

Once the farmer has decided on the type of canola needed, the next step is to decide on the growth duration of the type. There are short, medium and long season cultivars to choose from. The season is determined by the rainfall distribution in the growing season. If your rain ends early and the area where the canola is produced is a drier area, a short season cultivar will be the best option. The longer the season stays cool and has moisture a longer growth type might be a better option. The final step in choosing the best option for your farm is the specific cultivar and that will determine from which company you order your seed.

Choosing the best cultivar is quite easy, since cultivar trials are planted throughout the canola producing areas and the results from these trials will indicate which cultivar performs best in your area over time. The results of these trials, done by the Western Cape Department of Agriculture and funded by the PRF, are readily available at the end of each production season. This makes it possible to order your seed early enough to ensure that you get what you really want, instead of settling for what is available.

***Article submitted by Dr Johann Strauss and Mr Piet Lombard, Directorate Plant Sciences, Western Cape Department of Agriculture. For more information, send an email to johannst@elsenburg.com or pietl@elsenburg.com.***

Photo: Peet van der Walt

particular planter, so that seed spacing can be physically monitored at planting. You can monitor seed spacing by digging in the rows and exposing the seed and measuring the average distance between planted kernels. Replanting is expensive so make sure that your seed is planted in moisture and not deeper than 25 mm. Only plant under ideal moisture conditions.

## Fertilisation

The debate over whether or not soybeans respond to the application of nitrogen before or during crop growth rages on worldwide. Soybeans need about 85 kg of nitrogen per ton of seed produced. So 170 kg of nitrogen must come from the soil for a 2 t/ha crop. It is thus critical to make sure that your seed is correctly inoculated with a good culture of Rhizobium bacteria to ensure that at least 8 to 20 large rhizobium colony nodules are formed on each plant so that enough nitrogen can be fixed from the air to produce 2 tons of seed yield per hectare.

Soybeans also remove about 8 kg to 9 kg of phosphate (P), 25 kg - 40 kg of potassium (K) and 8 kg of sulphur (S) per ton of seed per hectare.

Have your soils tested so that the correct fertilisation regime can be worked out to compensate for low available potassium or phosphates. The minimum fertiliser to replace 9 kg of phosphate per ton of the target yield can be used as a broad guideline for the mixture to be used. As can be seen soybeans use a lot of potassium and sulphur. It is recommended, for example, that a balanced mixture such as a 150 kg to 200 kg of 2:3:4 (30) mixture containing nitrogen, phosphate, potassium, zinc and sulphur should be applied all at planting. It is critical that the fertiliser is placed 50 mm to the side and 50 mm below the seed so that no adverse effects from the 13,4 kg/ha of nitrogen will be seen. Make sure that your seed has been inoculated with boron and molybdenum as a lack of these micro elements will reduce yields considerably.

## Conclusion

Make the right soybean cultivar choice for your farm and fertilise optimally for your soil fertility and potential so as to give yourself the best chance for a high yielding crop.

***Article submitted by a retired farmer.***

# Integrated crop and pasture-based livestock production systems

This article highlights a specific pasture crop species that can play an imperative role in conservation agriculture (CA) based crop-pasture rotations.

Besides improving the physical, chemical, hydrological and biological properties of the soil, such species, including annual or perennial cover crops, can successfully be used as animal feed.

Livestock production systems are in many ways dependant on the utilisation of pasture species, in this case as a pasture ley crop, and can therefore become an integral component of CA-based crop-pasture rotations. It is imperative however to identify a pasture species fulfilling the requirements of a dual purpose crop, i.e. for livestock fodder and/or soil restoration.

This article focuses on an annual pasture crop commonly used in a short one summer season rotation as a cover crop either succeeding a winter annual species cover crop with green manuring properties or either being succeeded by the latter crop mentioned.

## *Sorghum spp*. (forage sorghum)

Fodder crops are sometimes classified as expensive, because of the annual seedbed preparation and establishment. However, the higher production and palatability of forage sorghum cultivars challenge this statement.

The value of forage sorghums are because they are easy to establish, fast growing and high yielding, palatable summer annual and perennials. Forage sorghums are generally more palatable and nutritious than babala. They have the ability to recover well from defoliation and respond extremely well to fertilisers.

## Annual forage sorghums

These are normally hybrids of crosses between different sorghum types and/or Sudan grass. These hybrids can often have many characteristics which make this species suitable for silage, grazing or even hay.

The annual sorghum is the most commonly planted sorghum. There are however numerous cultivars available each year commercially, and it varies from year to year. This often makes it difficult for the producer to select the most suitable cultivar for his requirements.

## Perennial forage sorghums

These sorghum species can survive between three to five years, all depending on the climate as well as the row spacing in which they are planted. It is also known that the persistence of these species is easily affected by incorrect management practices, especially in low rainfall areas.

## Agro-ecological distribution

Sorghums are well-adapted to regions that do not necessarily have a high rainfall. It can be stated that a rainfall of between 400 mm - 650 mm is more that acceptable for normal production of sorghum. This however, does not restrict their use in higher rainfall areas and/or irrigated land.

The species are very adaptable to a wide range of soil types, but mostly cropped on lower potential soils and are very tolerable of higher levels of salt or alkali. This emphasises their ability to adapt to their growing conditions easily. Sorghum species are more adapted to warmer than cooler climates.

## Management and utilisation

The best possible time to seed forage sorghum is preferably once the spring rains have arrived. The establishment period is thus any time between October and January all depending on the amount of rain received.

If the sorghum is to be used for grazing purposes, it is however recommended that the planting is spread over the planting period, this way optimum utilisation of the available grazing is achieved. It is suggested that the sowing density be determined by the soil type and quality and then ultimately the expected rainfall.

It is advised that sorghum is planted in rows under dryland conditions, and row spacing should be widened according to the dryness of the area. With these seeding conditions in mind, seeding rates can vary between 5 kg/ha - 20 kg/ha. General recommendations for annuals are 7 kg/ha - 10 kg/ha in rows, or 15 kg/ha - 20 kg/ha broadcasted. Perennials are sown at the rate of 12 kg/ha - 15 kg/ha broadcasted and 5 kg/ha - 7 kg/ha in rows.

Soil fertility is an important factor in the optimal production of sorghums, irrespective of their ability to survive in infertile soils. To achieve good production it is essential to maintain soil P levels at 15 mg P/kg soil. As a guideline 15 kg N/ha can be applied at planting, and subsequent top dressings will be determined by the availability of rain and the level of production required.

Top dressings of 35 kg N/ha can be applied once or twice throughout the season. If the crop is grazed it is less important to fertilise with potassium (K), as this element is returned back to the soil via dung. If the crop is used for silage, significant amounts of K are removed and will need to be returned through fertilisation.

> *"This crop with its high growth rate and yield is indicative of a significant amount of organic matter returned back to the soil through root biomass.*

The utilisation of forage sorghum is often challenging, as it has an exponential growth rate and to optimally utilise the quality thereof, it is required to graze it at a height of 30 cm - 60 cm and maintain it at that height to be able to control the growth.

The latter reiterates the recommendation to plant smaller areas at intervals over a period to avoid having all the pasture ready for grazing at the same time. The opportunity also exists to make silage with the excess growth that the animals are unable to graze in time. To ensure good regrowth, the pasture should never be grazed or harvested shorter than 15 cm in height. A combination of rotational grazing and mechanical harvesting should be used to optimally utilise this pasture.

## Management challenges

The most significant challenge that is faced with forage sorghums is the high levels of prussic acid or hydrocyanic acid (HCN) they contain. A high risk exist for livestock to experience some form of prussic (cyanide) poisoning if the animals ingest either new growth or regrowth of plants soon after harvesting or when the plant growth is stunted by frost or drought.

The levels of prussic acid vary in different sorghum species and varieties. One of the main objectives of breeding new cultivars is to reduce the HCN content of these plants.

## Soil conservation and health benefits

A seasonal rotation cover crop, such as forage sorghum, can play an imperative role in improving soil structure, water infiltration, and root penetration. Additional benefits include reduced soil crusting, soil erosion, runoff, and nutrient leaching.

This species can also provide an affordable on-site management option to enhance the inherent soil organic matter through an ex-

*Variable planting dates provide different stages for grazing to facilitate optimal grazing throughout the growing season.*

tremely vigorous root system, and secondly a suitable option to dry out very wet soils that are regularly irrigated either in winter or summer.

## Animal production aspects

This high yielding, fast growing, annual pasture species can produce up to 13 tons of dry matter (DM) per hectare. Research has shown that the grazing capacity for a well-managed (fertilised and grazed) forage sorghum pasture can be between 5 LSU/ha - 10 LSU/ha for approximately 100 days with an average daily gain of 0,73 kg/day - 1,05 kg/day. The crude protein yield of the pasture can vary between 90 g/kg - 150 g/kg DM, all depending on the level of fertilisation and rainfall.

*Forage sorghum ready for silage making.*

## Increased crop diversification with forage sorghum

Forage sorghum is well-suited to be used as an annual cover crop in a crop rotation system due to its strong root system and high biomass production. There are many ways to insert forage sorghum as a cover crop into a crop rotation to increase the diversity. It can be established in a pure stand or in a mixture with other (cover) crops or as a full season crop to maximise its beneficial properties. Forage sorghum can be used for a short period of time in the spring before the cash crop or later in the fall after a main crop has been harvested. In South Africa where crop rotations are mostly very tight, it is often easier to insert a fall cover crop after the harvest of a short season, cash crop or silage, provided there is enough time, nutrients and soil water for it to establish before early fall frosts.

In certain situations an annual cold season legume (or mixture) could be planted directly after termination of the cover crop, such as grazing vetch (*Vicia villosa*), oats and radish,

# Integrated crop and pasture-based livestock production systems

***Forage sorghum ready to graze.***

followed by a cash crop. After killing the cover crop, weeds in the fallow must be controlled to conserve soil water to maximise the benefit of the cover crop. A suitable no-till planter should be used to plant the grain crops directly into the residues of the cover crop, without any other cultivation practice disturbing the soil.

Normal integrated fertiliser (based on soil fertility levels and yield targets), weed and pest control practices should be followed. During the transformation phase after newly established CA grain fields (e.g. during the first few years), a 30% increase in N fertilisers is recommended on maize, due to the immobilisation of N in the soil.

Thereafter the availability of N to the plant should be assessed through an appropriate analysis, and fertiliser application should be adjusted accordingly.

## Conclusion

Integrated livestock production systems can benefit enormously from such a high yielding, fast growing pasture crop. Its low input requirement and ability to adapt to a wide range of conditions, makes this species highly attractive.

Forage sorghum is a good forage crop to use in rotation with other grain crops. If it is not used intensively for silage production for example, but rather extensively as an interim crop for grazing, soil nutrient replenishment will take place.

It is always important to recognise that a pasture ley crop's economic value, irrespective if it is a perennial or annual species, is not visual in monetary terms, as is the case with a cash crop. Its value is rather seen in a saving, i.e. lower requirement for weed control, an inexpensive source of good quality roughage to be converted to animal protein, and subsequently a recycled source of nutrients at a very low cost.

Lastly, this crop with its high growth rate and yield is indicative of a significant amount of organic matter returned back to the soil through root biomass.

> *"Integrated livestock production systems can benefit enormously from such a high yielding, fast growing pasture crop.*

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***Article submitted by Wayne Truter, University of Pretoria, Chris Dannhauser, Grass SA, Hendrik Smith, Grain SA and Gerrie Trytsman, ARC-Animal Production Institute for SA Graan/Grain January 2015. For more information, send an email to Wayne.Truter@up.ac.za, admin@GrassSA.co.za, hendrik.smith@grainsa.co.za or gtrytsman@arc.agric.za.***

# Sound labour practices and relations in the spotlight

## – Chris Schoonwinkel of Wesselsbron

Honesty and openness towards each other – communication – are one of the most important labour practices to be emphasised in his farming operations to Mr Chris Schoonwinkel of the farm Welgegund in the Wesselsbron district (and also management committee member of Grain SA).

'Orders should be given clearly so that everybody knows what the ultimate objective is – whether it is for small or big tasks on the farm,' he says. 'I believe that by giving each worker certain responsibilities for which they alone are accountable, you contribute to the person's development. Trusting the worker to produce or to create is important and they must know and realise this.'

To a question as to how he believes you should treat your staff, he replies without hesitation: 'They are people with needs – talk about them together. Again: Honesty and fairness should figure strongly.'

How does he motivate his staff? 'The ultimate objective on a crop farm is higher productivity, which is reflected in higher yields and, we hope, higher profits. This leads to bigger bonuses.'

Staff on Welgegund receive recognition through bonuses and concessions under certain conditions.

If there are disputes on the farm or conflict has to be resolved, Schoonwinkel uses labour consultants who apply the letter of the law to the employer as well as the employee. 'This keeps everybody satisfied. I must say: The law is very much in favour of the employer too, although the perception is often the reverse.'

And what is his view of the minimum wage?

'It is what it says: A minimum. Workers in our area earn considerably more than that if you include the total package. The large percentage increases every year lead to confusion and conflict. The wage cannot be adjusted by the same rate on the salary scales that the workers already earn.

'I believe that with the salary structure as it is currently, the workers not only care for their own families, but also contribute materially to the economy of the district. The standard of living on the farms has also risen as a result of better wages.

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'Because of my involvement in Grain SA I am aware of the fact that remuneration for different job levels for farm workers in the grain industry is being researched. We look forward expectantly to this, because it could bring to an end the unease that currently exists with all job levels earning more or less the same salary.

'Training and advice on the use of finances are also given to our workers continuously and they reap the fruits of this,' Schoonwinkel explains.

They try to employ more people on the farm by using a rotation system and half-day jobs.

### Tips

Schoonwinkel gives the following tips to fellow producers to get the best from their workers: 'Be honest, fair, just, but above all show empathy. Have an open hand, but know: Money alone cannot buy peace and harmony on a farm. Recognise the people's needs and talk to the workers, but, on the other hand, be strict and disciplined,' he concludes.

***Article submitted by Estie de Villiers, for SA Graan/Grain February 2015. For more information, send an email estiedv@mweb.co.za.***

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***Photo 1: The farm's soccer team – ready for action before a game.***

***Photo 2: Chris Schoonwinkel's wife, Lizette, arranged a special party for Suzan Montewa, who works in her home, and some of her friends when Suzan turned 50.***

***Photo 3: Chris believes that by giving each worker certain responsibilities for which they alone are accountable, you contribute to the person's development.***

# Which row widths are the best?

*An example where 1,52 m row widths were tested against 0,75 m row widths in the 2013/2014 season.*

Have you ever asked yourself: What row width is the best? The aim of this article is not to indicate a preference for any row width, but to emphasise the practical decisions that have to be made with any change. As long as grain/row crops are cultivated, there will always be differences of opinion about row widths.

In practice a system must be selected that complements the physical properties of the soil (such as soil depth, clay content and type of soil), crop rotation system, crop cultivars, tillage and rainfall. An example of this is rows that are not the same width, but are wider for the tractor track in order to keep the tractor wheel compaction as far away from the maize row as possible. This type of system is ideal as a track traffic system with the aid of a GPS driving system. The idea is to keep to the standard operating widths of planters and fit in the tillage and follow-up actions with this system. Changing row widths always involves costs and this can place an unnecessary burden on the farming operations. You should therefore rather try to optimise every aspect of your existing system before incurring major costs to change row widths.

In theory, narrower rows should always give a better yield than wide rows, if one looks only at the row widths. However, we should keep in mind that row width is only one of many agricultural practices that can make a difference to yield. That is why it is important, as was mentioned, that the row widths should support the total cropping. Narrower row widths can, for example, limit the tillage depth and cause a potential crop loss.

Narrower row widths have the advantage of plants being distributed better in the row than with wide row widths (see **Table 1**). Table 1 compares a 2,1 m, 1,5 m, 0,9 m and 0,75 m row widths with different plant establishments for maize.

The moisture usage of a 2,1 m row against an establishment of 20 000 will therefore be considerably higher on the tilled (ripped) row than a 20 000 establishment on a 0,9 m row. There are 4,2 plants per metre with the 2,1 m row width, and 1,5 plants per metre with the 0,9 m row width.

This phenomenon often occurs where the rows are ripped or tilled with chisel ploughs. Moisture loss from wet topsoil is usually also higher with wide row widths because of evapotranspiration. The uncovered soil is therefore exposed to evaporation.

The reverse applies to narrow row widths, where the foliage protects the soil surface and reduces evaporation from the soil surface. When the soil is dry on the surface, the moisture loss with narrow row widths can also be considerable because of a bigger leaf area that is exposed to transpiration, in other words moisture loss from the foliage.

***Table 1: Maize plant distribution in the row for different row widths (cm).***

| Plant establishment | 2,1 m | 1,5 m | 0,9 m | 0,75 m |
|---|---|---|---|---|
| 16 000 | 29,8 | 41,7 | 69,4 | 83,3 |
| 20 000 | 23,8 | 33,3 | 55,6 | 66,7 |
| 24 000 | 19,8 | 27,8 | 46,3 | 55,6 |
| 28 000 | 17,0 | 23,8 | 39,7 | 47,6 |
| 32 000 | 14,9 | 20,8 | 34,7 | 41,7 |
| 36 000 | 13,2 | 18,5 | 30,9 | 37,0 |
| 40 000 | 11,9 | 16,7 | 27,8 | 33,3 |

The choice of row width must complement the crop cultivar and crop rotation system. If crops like sunflower, soybeans and groundnuts are planted, the crop rotation with maize will benefit from a narrower row width of 0,9 m or less. Single-ear maize that is often planted under irrigation or in high-potential drylands should preferably be planted with a narrower row width to ensure that there are enough ears per hectare to achieve the required yield.

The yield can be influenced further by the final plant establishment, plant spacing, heat units, soil moisture, fertiliser, weed pressure, diseases and insect pests. Using genetically modified crops holds a definite advantage for narrower row widths as weed control with glyphosate is effective.

Wider row widths have a major advantage over narrower rows when soils with a low supraterranean fertility are planted, as the same mass of fertiliser is spread over fewer rows and the concentration of the fertiliser band is considerably higher.

The type of fertiliser and amount per hectare must therefore be applied judicially so that fertiliser burn damage is not incurred. **Table 2** indicates the concentration effect of fertiliser on different row widths.

Observations over the past few years indicate that narrower row widths do provide better yields in favourable climate conditions (good rainfall) than wider row widths. A row width of 2,1 m compared to a 1 m row width achieved a lower yield of between 1 ton/ha and 1,5 ton/ha at the same plant establishment over a three-year period with good rainfall. The differences between 1,5 m and 0,9 m should not be so drastic.


Grain SA/Sasol Chemicals (Fertiliser) photo competition

***Table 2: Fertiliser distribution per 100 m in the band (kg) for different row widths (per row).****

| Fertiliser (kg/ha) | 2,1 m | 1,5 m | 0,9 m | 0,75 m |
|---|---|---|---|---|
| 100 | 2,10 | 1,50 | 0,90 | 0,75 |
| 150 | 3,15 | 2,25 | 1,35 | 1,13 |
| 200 | 4,20 | 3,00 | 1,80 | 1,50 |
| 250 | 5,25 | 3,75 | 2,25 | 1,88 |
| 300 | 6,30 | 4,50 | 2,70 | 2,25 |
| 350 | 7,35 | 5,25 | 3,15 | 2,63 |

**Note that the table serves only as illustration. In practice some of the levels cannot be applied because of the risk of fertiliser burn.*


Grain SA/Sasol Chemicals (Fertiliser) photo competition

In the 2011 season the western crop areas received very good rainfall and it was remarkable that the 2,1 m rows (seven feet) handled the wetter conditions better and that the maize recovered more quickly than the narrower row widths.

During the 2012 and 2013 seasons, which were considerably drier than 2011, the 1,5 m row widths in the western crop areas did not have lower yields in the drier soils than the narrower row widths. Reduced tillage also increased considerably, with mainly narrower row widths being preferred by producers to get stubble/material/cover on the soil surface as quickly as possible. Under reduced tillage the narrower row widths are furthermore also suitable for the planting of crops like sunflower and soybeans.

The following important points should be taken into consideration before changes in row widths are considered:

- Stubble management (particularly in the sandy water table soils of the western crop areas).
- Cultivation and track traffic system.
- Crop rotation system.
- Fertilisation.
- Cultivar selection.
- Weed and pest control.
- Capital cost of change.
- Training of staff to understand the new row widths and till them properly.

Consider changing to other row widths, but do so for the right reasons and without neglecting any of the basic practices.

***Article submitted by Kobus van Zyl, Omnia Kunsmis for SA Graan/Grain January 2015. For more information, send an email to kvanzyl@omnia.co.za.***

# Sorghum seed production by smallholder farmers

To achieve food security for the poor at household level, smallholder farmers should be supported to increase food production. Smallholder farmers grow food to directly feed their households; if enabled they can create secure livelihoods for large numbers of people in communities that need it the most.

The Limpopo province, where sorghum is mainly produced by smallholder farmers, faces a major challenge in how to improve production and productivity. In addition to varietal improvement and enhanced crop management, use of quality seed significantly contributes to improved productivity of sorghum.

Open-pollinated varieties are used in Limpopo and other parts of South Africa. Training farmers in community-based seed production can have an impact on farmers' access to seed, provided that seed production costs can be kept lower than those of the formal seed sector and that the quality of the seed produced meets the farmers' expectations.

The ARC-Grain Crops Institute (ARC-GCI) started a sorghum seed production project with a group of smallholder farmers in the Limpopo province with funding obtained from the Department of Agriculture, Forestry and Fisheries (DAFF). The two projects are the Difahlane project, in Makhuduthamaga municipality, where twelve farmers took part; and the Ka-Dikweneng project, located in Lepelle-Nkumpi municipality where four beneficiaries participated.

These two groups of seed growers produced certified seed of sorghum over the last five years assisted by the ARC-GCI and local extension officers. The standards for seed production have been met and enforced by the South African National Seed Organisation (SANSOR), which controls the seed certification scheme.

When producing seed, a producer usually wants to maintain the characteristics of a variety. Cross-pollination between different sorghum varieties must therefore be prevented. Isolating the seed production field from other sorghum fields helps achieve this. If two different varieties are grown next to each other, cross-pollination will occur between the two varieties and the crop grown from such seed will have unwanted characteristics from the other variety.

## Quality control in sorghum seed production

The production and distribution of quality sorghum seed requires diligent efforts both during field production and post-harvest handling. Field inspections are commonly conducted at different crop development stages to ensure quality. The certified seed crop must be inspected at least three times by inspectors affiliated with SANSOR, i.e. during the vegetative growth stage, at flowering and at maturity.

Furthermore, various standard tests for moisture content, germination and physical purity can be conducted to evaluate the quality of the seed. The most common evaluation conducted is germination tests, designed to determine the seed's capacity to germinate and produce normal plants when sown under favourable conditions.

The model scheme adopted for the community-based seed production was a farmers' group producing certified seed and catering for the seed demands of neighbouring producers **(Table 1)**.

***Certified sorghum seed production field at Maila Segolo village, Difahlane Project.***

## Training seed producers

Training courses are offered to individuals in the respective groups. Sometimes field days are conducted to improve awareness of the improved cultivars available and illustrate important aspects of seed production (field selection, planting pattern, weeding and fertiliser rates, and plant protection).

Strong partnerships should be established between community-based farmers' groups/seed producers, extension officers from DAFF, the municipality and district administration and NGOs to promote the use of quality seeds on smallholder farms at municipality and district level

***Article submitted by Nemera Shargie, ARC-Grain Crops Institute for SA Graan/ Grain March 2015. For more information, send an email to ShargieN@arc.agric.za.***

***Table 1: Model scheme for community-based sorghum seed production.***

| | |
|---|---|
| **Seed source** | Basic seed from public sector breeding programme or a seed company; currently ARC |
| **Transport of source seed to seed producers** | PDoA/ARC |
| **Sourcing of other inputs (land preparation, fertiliser and pesticides)** | Seed producers group/some support from public funder |
| **Training of seed producers** | ARC/SANSOR |
| **Certified seed crop – land registration and inspections** | Paid by seed producers group |
| **Quality control** | DAFF Seed Quality lab paid by seed producers |
| **Cleaning, storing, packaging and marketing** | Processing facility at Madzivhandila Agricultural College/seed producers/PDoA |
| **Output** | Certified seed |
| **Sustainability issues** | Who is taking over the role of DAFF/PDoA in the long term? (Financial support for supply of free basic seed, transport, organisation) |
| **Other issues** | Marketing of certified sorghum seeds was a challenge for some seasons, but this current season's demand was high and all seed produced was taken |

# ARRESTED EAR SYNDROME sticks its head out in South Africa

Arrested Ear Syndrome (AES) also called Blunt Ear Syndrome, a relatively unknown phenomenon in South African maize production, has stuck its head out in isolated areas this past season. Some farmers have realised only half of their yield expectation in certain fields due to high incidence of AES.

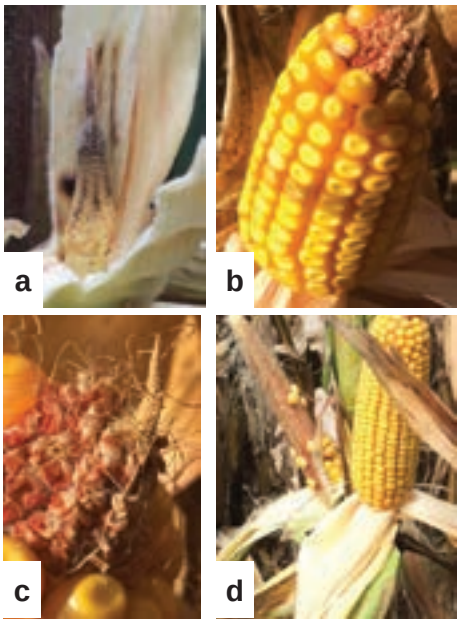
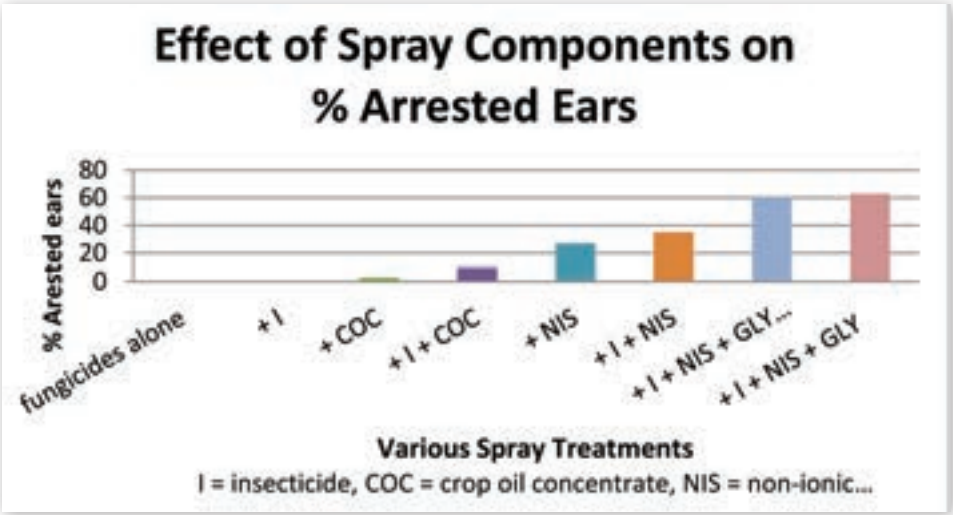



***Photo 1a - d: Arrested Ear Syndrome in the late vegetative growth stages of the maize plant.***

***Graph 1: Graphical representation of AES as a percentage resulting from various crop protection chemicals spray applied at the V14 growth stage on maize.***
*(Source: http://www.agry.purdue.edu/ext/corn/news/articles.08/arrestedears-1209.html)*




While largely unreported in South Africa, this phenomenon has been reported sporadically from the USA corn-belt since the late 1990s. AES is not caused by a pest or disease. It is linked rather to plant stresses at a sensitive stage of ear development causing partial or complete abortion of the ear. This occurs during the late vegetative growth stages of the maize plant. See **Photo 1a - 1d.**

Showing the effect of and various degrees of ear arrest resulting from AES. In Photo 1a the ear has arrested completely and is undeveloped. Photo 1b has partial arrest. The base of the ear is normal but the top two-thirds of the ear are absent. Note the arrested primordial remnant on the tip of the ear in photo 1b. Photo 1c shows a close up of this remnant ear tip. Photo 1d shows an array of AES symptoms observed in a land – from almost normal ears to cobs without kernels to complete arrest.

In all other aspects the maize plant with an arrested ear appears normal. As the season progresses stems and leaves of plants with severe ear arrest will often colour red or purple due to sugar deposition in these organs. The stunting or absence of the ear has a direct impact on the yield potential of the affected land. In lands with a high percentage of arrested ears one would expect the yield loss to be in a similar proportion to that of the AES.

One of the most common theories proposed to explain AES in the USA is cold stress. In particular when associated with a sudden drop in average temperature. Due to the unpredictability of AES the exact cause and timing of the stress event that results in ear arrest has been difficult to determine or replicate, despite various studies that have been undertaken.

In 2007 numerous reports of AES emanated from the Midwest corn-belt in the USA. Researchers from Purdue University investigating some of these incidences noted that a common thread linked many of the reported cases. In nearly all of these cases of AES a pre-tassel application of crop protection chemicals, often including adjuvants, had been applied. In 2008 these researchers designed some demonstration plots to test if these sprays could have increased the incidence of AES. In their demonstration they included three fungicides sprayed alone and in various combinations with insecticides, adjuvants, spray additives and herbicides. The different treatments where then assessed for AES and compared to an unsprayed control block.

From **Graph 1** it would appear that the more components that are added to the spray mix, the higher the rate of AES. Fungicides alone or fungicides plus an insecticide were no different to the unsprayed control from an arrested ear perspective. AES appears to be linked to the presence of non-ionic surfactants (NIS) and crop oil concentrates (COC), both of which are common ingredients in adjuvants, and to multi chemical tank mixes.

The following advice is proposed to help reduce the risk of AES:

- Abide rigorously to crop protection chemical labels.
- Avoid, as far as possible, any sprays between V10 - VT growth stages of the maize plant. If a spray is vital within this window, apply only the chemical required for the intervention. Do not include additional adjuvants or extra crop protection chemicals/ foliar fertilisers to the spray mix.
- Avoid spraying crops that are under climatic (particularly cold) stress.

A final thought: Crop protection chemicals, by design, are applied to protect the crop and maintain its yield potential and, therefore, can be construed as a good thing, however the old adage: 'You can't get too much of a good thing', does not necessarily apply in this instance.

***Article submitted by Grant Pringle, Agronomist: Pannar Seed. For more information, send an email to Grant.pringle@pannar.co.za.***

# Grain SA interviews…

# David Mongoato

This month Ian Household interviewed David Mongoato who farms on Hanover in the Matatiele District. David is not only dedicated and hard working, but is passionate and loves farming. He hopes to be a commercial farmer in the near future.

### Where and on how many hectares are you farming? What do you farm with?

I farm on Hanover in the Matatiele District, in the Eastern Cape Province. I farm on 940 hectares of land, 600 hectares is for grazing and the rest is arable land. I farm with 200 hectares of maize, 50 hectares is under cultivated pastures, of which 13 hectares is lucerne as well as Eragrostis grass.

I also have cattle and sheep and currently I am growing my piggery, where my wife is fully involved. My aim is to have 100 breeding sows in two years time.

### What motivates/ inspires you?

What motivates and inspires me the most is seeing the results of my work growing gradually every year.

### Describe your strengths and weakness

**Strengths**: My strength is my hard work and passion. I farm because I love it but I am also treating farming as a business and not a hobby.
**Weakness**: My weakness is a lack of funding and this is hindering me to grow my business as I would like it to. According to the potential of my farm, I am currently underutilising it, especially when it comes to livestock.

### What was your crop yield when you started farming? What are your respective yields now?

When I started farming my crop yield was between 3,4 t/ha to 4 t/ha. My yield is now between 6 t/ha to 7 t/ha on dry land.

### What do you think was the main contributor to your progress and success?

The main contributor to my success is my dedication and hard work as I still regard myself as one of the employees at Hanover farm and not as the employer.

> *"Two days away from the farm is a disaster…trust me.*

### What training have you received to date and what training would you still like to do?

I have received training in various courses from Grain SA and have attended the following courses:

- Introduction to Maize Production;
- Advanced course in Maize Production;
- Farming for Profit;
- Maintenance course; and
- Business Ethics as well as many other courses.

I am also bettering myself by attending short courses presented at Cedara Collage. I would like to do an Irrigation course as I currently have 60 hectares under pivot irrigation. I would also like to receive training to become computer literate.

### Where do you see yourself in five years time? What would you like to achieve?

In five years time I would like to see myself as a fully fledged commercial farmer, farming with different commodities. My focus will be to slaughter and process pork products on the farm and not only supply the market with piglets.

### What advice do you have for young aspiring farmers?

My advice to other farmers is to encourage them to continue living on the farms and not to leave. They must take farming seriously and see it as a business and not a hobby.

***Article submitted by Ian Household, Development Co-ordinator of the Grain SA Farmer Development Programme, Kokstad. For more information, send an email to ian@grainsa.co.za.***

# The Corner Post

## Knowledge and skills can overcome any obstacle

The 2007 Grain SA Developing Farmer of the Year, Lepati Macaphasa, sadly passed away in August 2015. Fortunately Lepati had a succession plan in place as he thoroughly realised the importance of preparing his successors with the necessary farming knowledge and skills.

Thabo and Motlalepula, his two sons, joined their father in 1994 to learn the ropes of his farming operation. Later on they did most of the farming, which has made it easier for them to continue after his death. Preparations for the season's cropping had already begun when he passed away and much of the financing was already obtained. Although some of the finances have been 'frozen' they are capable of carrying on as the knowledge and skills their father taught them cannot be 'frozen'.

Their farming operation – which is situated between Kestell and Phuthaditjhaba – is a mixed operation with Bonsmaras, sheep and crops. It comprises approximately 450 hectares, of which 123 hectares is arable land and the rest suitable for grazing. The two brothers have already planted about 50 hectares of soybeans. There is also a prepared area of 29 hectares where maize will be planted. Financing and drought conditions will determine what action will be taken on the rest of the land.

Both Thabo and Motlalepula are very proud of what their father achieved in his lifetime and place huge value on the skills and knowledge he invested in them. They would love to follow in his footsteps and receive recognition one day, but at this stage their main focus is on drought survival. 'The farming work is easy. It is what we have always been doing. The unpredictable climate is what makes farming difficult,' Thabo says and adds, 'Funding is often a problem, but it was this way when our father was alive too.' Lepati left them well set up with equipment, tools as well as the necessary skills and knowledge to continue his farming operation. He always expected them to do the work and made sure they worked very hard, but he allowed them to make mistakes as long as they learned from it.

They do not find it difficult to work together on the farm as each does whatever needs to be done. Both their wives are also actively involved in the business. According to their brothers, their sisters, Sarah Modiehi and Nthabiseng Agnes, also know how to farm and work hard. Although not directly involved in the farming, they assist seasonally and when required – usually at planting and harvesting.

Their dream for the future is to expand their farming operations by obtaining more land and become even stronger farmers. At present they manage well, but they plan to increase their production and income to provide a better life for their families. They would like to encourage all farmers' sons to get experience, skills and knowledge from their parents while they are still alive and farming. 'If this is not possible you need to get a farmer who will take you on and teach you,' they added. 'Knowledge and skills cannot be learned from books – you need to get it first hand.'

Unlike their father, the two brothers are not involved in organised agriculture at this stage. 'Previously there were more advantages to be organised as farmers as there was more assistance. Farmers are now left to fend for themselves,' Thabo explains. They agree that their father obtained valuable knowledge and skills through assistance from organisations such as Grain SA. Although they have never been involved in any study groups of Grain SA they would like to join especially if it means improving knowledge and gaining skills.

> *"It is possible to fly without motors, but not without knowledge and skills.*

Thabo and Motlalepula are worried about the future of agriculture in South Africa. They feel it is not seen as an important point to the government and as a result of this lack of support from government a massive need for food production will arise. Another concern is that it seems to them that the young/new farmers do not want to work very hard. If they aren't prepared to invest time into their trade, it will lead to a lack of the necessary skills and knowledge to continue with a farming operation.

Wilbur Wright, one of the fathers of modern aviation, said: 'It is possible to fly without motors, but not without knowledge and skills.' With the knowledge and skills invested in the Macaphasa family we trust that their farming enterprise will reach new heights.

***This month's edition of The Corner Post was written by Louise Kunz, Pula Imvula contributor in collaboration with Graeme Engelbrecht, Grain SA Provincial Coordinator, Louwsburg, KwaZulu-Natal. For more information, send an email to louise@infoworks.biz.***

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