PULA IMVULA

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

PULA IMVULA

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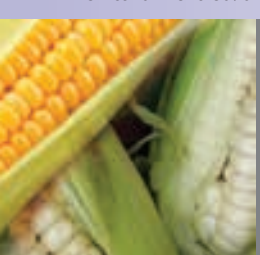

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NKGONO JANE SAYS...

IN THIS ISSUE...

It is not often that I feel despondent about establishing development farmers. However, right now we are really struggling to access production finance for farmers.

We have prepared very detailed business plans for farmers who are really progressing well but still we do not manage to get loans for these farmers. These have been trained and are well supported in the field. The Land Bank, whose responsibility it really is, have a number of excuses as to why they are not assisting more farmers. We recently met with very senior personnel in the Land Bank in Centurion and we came away empty handed – they admit that they do not have the capacity to handle a large number of applications and also that many of their branches do not have the 'appetite' for it. How can it be that the Land Bank does not take responsibility for financing the developing sector? If they do not do it, who is going to do it?

The agribusinesses are financing some farmers but there are far more farmers who are not being assisted – they are assisting some farmers but we must remember that they are profit driven businesses whose appetite for risk is limited. They also are affected by the National Credit Act which makes higher risk lending difficult. The shareholders of the agribusinesses are looking at the 'bottom line' and expect profits – the developing farmers are often a higher lending risk and so their reluctance to fund is understandable. The commercial banks are helping a few farmers but they too have very strict lending criteria.

One of the big fertiliser companies – Omnia – is doing a great job of lending money to farmers at a very low interest rate. This is wonderful and I pray that other private companies will follow suit so that we can indeed transform the sector successfully.

If you are in a position of any influence, please help us to get the message across – the lack of production financing is preventing the sector from achieving the transformation in the sector that we are striving to achieve.

Meet our Commercial Farmer of the Year finalists

PIETER CHABALALA grew up on a farm in Rosendal and went to school in Ficksburg. He is married to Lucy and has five children. After leaving school in 1977 he started working for Sasol as a crane operator. In 1980 he started working for Shell as a truck driver for 10 years after which he was promoted to a supervisor/load controller. He used to deliver diesel to different farmers in the Eastern Free State. Pieter's starting point in agriculture occurred in 2002 when he rented his first farm, Kroonberg, which he bought two years later. He always had a keen interest in agriculture and spoke to the farmers, to which he delivered diesel, about their challenges.

Kroonberg is situated in the Eastern Free State close to Puthaditjhaba. Pieter produces maize, soy beans and dry beans on a total of 305 ha arable land. He has been part of the Grain SA Farmer Development programme for the past eight years and progressed from a small scale farmer a few years back.

Pieter maintains good relationships with other role players in agriculture, is eager to learn and willing to try new ideas. He is very precise in his work and understands all the requirements of being a full-time farmer.

Pieter Chabalala

MICHAEL RAMOHOLI was born on a farm in the Marquard district. Both his parents were farm workers. They were nine children, him being number four and the eldest son. His parents moved to the Wesselsbron district and worked there on a farm. He attended a farm school until he passed Grade 7. His mother insisted that he went to a school in Welkom until he passed Grade 10.

He grew up on a farm, helping out on the farm and watching what his father did, become second nature to him. After leaving school he gained a lot of farming experience

In 1989 Michael started to farm on land he leased from the Welkom Municipality. He had to share grazing rights with other people from the township, which led to a lot of conflict regarding overgrazing and theft. In 2004 he managed to purchase the farm Komma, in the Theunissen district. It is a small farm, 214 ha, which 115 ha of this land is arable and 99 ha natural grazing. Michael is also the chairperson of the Grain SA Masilonyana Study Group at Theunissen.

Michael is married to Dorah and they have four children, all girls. Michael says that he feels he is ready to face the future. He has the knowledge, thank to Grain SA. He needs to prove himself to be a successful, capacitated and independent, big commercial farmer.

Michael Ramoholi

JOB METSWAMERE, born in Rooijantjiesfontein Ga-Maloka which is 30 km from Lichtenburg, got married to his wife Deborah Mokotedi and lives in Klippan with his wife and four daughters. After school he helped his father on his farm for a year after which he enrolled at Taung College of Education to complete his University Diploma in Education in 1988. In 1996 he enrolled and completed a Diploma for Further Education with the College of Education of South Africa which he completed in 1997.

Job got his interest in farming from his father who mentored and taught Job everything he knows about farming. Job plants maize and sunflower and has a livestock component to utilise all his resources effectively. He farms on 135 ha of his own land together with 415 ha of communal land and rents another 100 ha to plant his crops.

He wants to grow bigger and expand his farm into an Abattoir. Job would like to own another farm and wants to create more jobs in his community as unemployment is a major problem in the community that he stays in. He also wants to add more value to his crops and livestock.

Job is a remarkable farmer with sound experience and an eye for new opportunities.

Job Metswamere

RALPH SWART is the first and only finalist from the Western Cape producing wheat, barley, oats, triticale and rooibos tea. He is the eldest of seven children, married to Preline and has six children of his own of which the eldest two, Leaan and Jacques dedicated their careers to the family farming business, Swart Boerdery.

Ralph owns 89 ha of land of which 72 hectares are pastures and 17 ha veldt, while he leases another 1 280 ha land from the Moravian Church of which 1 152 ha is arable. Ralph planted 220 ha wheat (3,2 tons/ha), 100 ha barley (3,5 tons/ha), 250 ha korog (2,5tons/ha) and 40 ha oats (2,2 tons/ha).

Ralph's livestock comprises of 1 500 ewes and 140 Bonsmara cows. Ralph is an exceptional farmer and person. Although he only attended school to Grade 8, he is a very good example to others by showing that if you are willing to learn and work hard, you can do anything. He has a passion for agriculture and is also a very humble person. He is eager to continuously learn and improve his practices and rarely misses a study group meeting, training course or conservation agriculture days which are presented. He is involved, asks questions and tests everything he learns on his own farm and is a true entrepreneur. Ralph is always willing to assist the smaller farmers in his area with equipment and/or advice. He is a family man and always makes a point of it to take his two sons to all events and to give them as much exposure as possible.

Ralph Swart

Article submitted by Landi Kruger, Grain SA Data Administrator/ Economist. For more information, send an email to landi@grainsa.co.za.

The Smallholder Farmer candidates of 2014 are...

LUNGELWA was raised by a farm worker in the Eastern Cape. After completing her schooling she married Vuyani Kama. Lungelwa completed her primary and secondary schooling at the Long Hope Farm School. Lungelwa started farming by buying a small herd of cattle and sheep and struggled to get grazing for them. The Department of Rural Development and Land Reform then made a farm available and also provided a few implements. This helped Lungelwa on the road to commercial farming. The farm given by DRDLR only has 35 ha of arable land but the Kama's have managed to hire an additional 70 ha of good arable land, as well as grazing land from the timber company operating in Ugie (PG Bison). The Kama's have built a lovely home on the farm where they live with their two small children who are also developing a love for farm life.

In order to gain knowledge, Lungelwa joined the Ugie study group and started attending the Grain SA training courses. This year, Lungelwa has planted 100 ha of maize and in some areas the expected yields exceed 8 tons/ha – a magnificent crop! Vusi Ngesi is Lungelwa's provincial co-ordinator.

Lungelwa Kama

DWAALKRAAL CO-OPERATIVE has seven members all of whom were born and grew up on the farm Doornbult near Bossies in the Sannieshof district in the North West Province. All the members of this co-op worked for Mr Andrew Makkink on this farm which was later bought for them by the Department of Rural Development and Agrarian reform in 2011. As they grew up on his farm they worked with everything on his farm and they gained experience from him.

The members of the group have attended various courses which include: Maize and Sunflower Production courses as well as various on farm skills development courses. Du Toit van der Westhuizen is their provincial co-ordinator and assists them whenever needed.

The farm has 150 ha of good arable land and 368 ha of grazing. This year they planted maize and sunflowers (which they do every year in a crop rotation), and they have harvested good yields. The members of this group are proud to be farming profitably now as a result of the knowledge that they gained through the courses they attended, on farm support from their mentor as well as funding through the recapitalisation programme of the Department of Rural development and Agrarian Reform (North West). This group is a wonderful example of what can be achieved if people work together and take good advice – they are well on their way to becoming New Era Commercial Farmers.

Dwaalkraal co-operative

LANGA SIMON MBELE was born in Bergville, KwaZulu-Natal, on 5 February 1952 and grew up there. In 1979 he married Thabile and they are blessed with six children. Langa started his primary education level at Langkloof Primary School and went to Okhahlamba High School where he completed grade 10 in 1973. Langa's starting point in agriculture was in 1992 when he and his brother (Thulani) were renting two farms in QwaQwa. In 1996 the Department of Land Affairs decided to sell both of the farms, when he then bought one of these farms with help from Land Bank. He paid off his loan in 2010. Langa has been part of the Grain SA development programme since 2009 and Jurie Mentz is his provincial co-ordinator.

Langa is a contractor and Chairperson of Okhahlamba Farmers Association and they work with more than 80 small scale farmers who are planting yellow maize under the SAB Project. They also have farmers who mainly concentrate on livestock and they receive support from BKB.

Langa dreams of becoming a commercial farmer who plants 500 ha and owns 500 beef cattle. At this stage he has 60 ha of own arable land and 771 ha of own veld. He also has access to 50 ha of arable land in the communal area near Bergville. This year Langa planted the entire 110 ha to maize and he also managed to plant 12 ha of dry beans.

He diversified his farming enterprise into dairy, beef and crops to ensure a constant cash flow and to spread his risks. Langa uses Round-up Ready technology.

Langa has been keen to adopt new production methods and his practices are improving yearly.

Langa Mbele

WILLEM MODUKANELE was born on 27 July 1939 on a farm in the Bultfontein district. As he was a child of a farm worker, he grew up on a farm. His mother was a domestic worker on the farm. Although they were very poor, they grew up well, always having enough to eat. He attended the little farm school and passed Grade 7. He worked on the farm and in 1963 started to work for Senwes. In 1975 he went to work for BP as a truck driver delivering diesel and petrol to Bultfontein. Doing this he also dreamed of one day having his own farm. He always asked questions as he went about delivering diesel to the farms, soaking up information.

In 2006 Willem bought the farm, LA Riviera in the Theunissen district from Mr PHS Bezuidenhout. This was achieved with the assistance of the Department of Rural Development and Land Reform and as part of the LRAD system. The farm is 170 ha in size. 70 ha are arable land and 100 ha natural grazing.

Willem's biggest challenge has been to gain access to production capital. Willem is a hard-working man and his lands have been neatly cultivated and the fencing on the property is good. Both Willem and his wife are members of the Welkom Study Group. Willem is an engaging man and seems willing to learn as much as he can. He has also attended a number of Grain SA's courses. Willem was part of the Recap Program in the Free State. He now has the irrigation pivot he always dreamed about. His first 22 ha of maize is now growing under irrigation.

Because of Grain SA, Willem survived a lot. He received training and support from Grain SA and with the help of the provincial co-ordinator, Johan Kriel, who is always encouraging Willem when times are hard and is always there when needed. "I am what I am today because of Johan's support and advice", comments Willem.

Willem Modukanele

Article submitted by Jane McPherson, Programme Manager of the Grain SA Farmer Development Programme. For more information, send an email to jane@grainsa.co.za.

Enoch, Gladys and Thoko in line for Subsistence Farmer of the Year award

GLADYS PATHELENI ZONDO was born in Emmaus near Winterton in KwaZulu-Natal on 17 February 1967. She grew up in Emmaus and went to Emmaus Primary School until Grade 4. Gladys has always been self employed by mending and making clothes for the community.

Gladys has access to 3 ha of arable land in the communal area in which she resides. In the past she used to plant the entire area in an attempt to get sufficient maize for the family's staple food for the year. Since using modern production practices, Gladys is able to plant only 0,25 ha of maize to be assured of the 1 ton that her family requires for the year. Gladys has changed her production practice to no-till with chemical weed control and this has made her life much easier as well as providing more food for the family. She is able to use the remainder of the land to grow beans and other vegetables. Jurie Mentz is her Provincial co-ordinator.

Gladys Zondo

ENOCH grew up in the rural areas where his father had a small piece of land, growing maize on a subsistence basis. Enoch worked as farm worker for about 30 years, mainly with sheep and cattle. In 2009, Enoch joined the Donkerhoek Study Group when it was formed and he is a loyal member of the group. He has also attended various training courses. Enoch farms in the Piet Retief area in Mpumalanga and his provincial co-ordinator is Naas Gouws.

This year Enoch has managed to plant 3 ha of maize. He has access to 6 ha but due to a lack of funds he was not able to plant the entire area. The crop has responded well to his management and he is expecting to harvest more than 6 tons/ha.

Enoch Khumalo

THOKO MATHA Mofokeng was born in Emmaus near Winterton in KwaZulu-Natal on 1 January 1952 and also grew up in Emmaus. Thoko started school at Ngwadi Primary School and left in Grade 2. In 2005 Thoko met a local extension officer who taught her about farming and in 2009 she met Mshefane (Jurie Mentz, SA Grain Provinical co-ordinator) who also taught her a lot of valuable things about agriculture. Since then she hasn't looked back.

Thoko is a member of the Emmaus Study Group and has attended training courses for Maize Production. Although Thoko only cultivates 1 ha of maize by hand, she would like to access more land and increase the size of the land that she plants (by hand). Planting by hand was a big challenge but she has now overcome the challenge, as she bought herself a hand held planter and knapsack sprayer and uses Roundup Ready seed.

Article submitted by Jane McPherson, Programme Manager of the Grain SA Farmer Development Programme. For more information, send an email to jane@grainsa.co.za.

Thoko Mofokeng

PLANNING for the season ahead

Planning and preparation are some of the most important responsibilities of a farmer. By doing this we can help to ensure a successful planting season and hopefully a successful crop. Certain things need to be planned in advance. This includes finance arrangements, soil analyses, fertiliser orders, seed orders, chemical orders and fuel orders. There are many advantages to getting these important tasks dealt with early in the pre season.

Finance arrangements

Finance is a pivotal requirement in agriculture. No matter where the input money will be coming from we need to budget and calculate to make sure that our business is being profitable.

Finance can come from various sources such as co-operative financing, bank financing, government financing and in rare cases personal cash. It is important to build a relationship with the institution where you receive your funding from. Make sure that your previous season debts are paid off promptly and fully. A good 'track record' is unbelievably valuable especially in tough times when poor crops are achieved. Your payment history may be the deciding factor which helps you to put another crop in the ground or causes you to have to pack up and seek other ventures.

If your financing is dealt with speedily, it will allow you to have time to process your season's orders quickly and efficiently.

Soil analyses

Once the crop is off and the business of the harvesting time is over then it is once again time to look at the season ahead. Soil samples can be taken at an early stage which can allow us time to analyse the composition of our soil and study what soil requirements there are. Fertiliser companies will do soil samples for you or you can do them on your own and have them analysed at any soil laboratory.

Fertiliser orders

The company which does your soil sampling will analyse the results and give you a recommendation accordingly. As a farmer it is important to make an effort to understand the results and not just to accept whatever the computer printout says. Try to understand why certain elements and minerals are missing in the soil. Ask questions like: What causes this? How can I improve that? What does this mean? Why is there a shortage of this or that?

Farmers work the soil; therefore they need to understand the soil as well as its composition. Once we have received the recommendation and understand what our soils need for the season ahead, then we can place our fertiliser orders. The sooner this is done the better. You can often get good prices if you order early and you will also avoid shortages during the big rush at planting time.

Seed orders

When preparing for the season ahead we need to plan what crops to plant. Most farmers follow the practice of crop rotation. Different crops have different requirements therefore it is good to change the type of crop you plant in a certain land in order to remove and replace different elements into the soil and not just constantly one.

Once you have assessed which lands will be planted with which crop you will need to do some calculations. For example: how many hectares will be planted to maize, sunflowers and soya beans. Once this step is done then you need to look at the different varieties available on the market from the different seed companies. Get the assistance of a seed representative to help you decide which variety will be best suited to your environment. Don't only ask the assistance of a rep, also ask your experienced neighbours and farmers who have a good track record and know what works and what doesn't.

Once you know what you will plant and how much, then using your application rate and the number of seeds or kernels in a bag, then you can calculate how many bags to purchase. Purchasing seed early will also help to avoid shortages close to planting time and will also sometimes be a little cheaper.

Chemical orders

A good chemical program is essential in any cropping operation. A program can be planned long in advance and will be determined by what crop you plant and which cultivar you plant. For example: if you are planting maize which is Roundup Ready then it will be essential to include Roundup products in your spray program. When it comes to spraying it is always important to learn from your previous years mistakes and always work toward having your lands as clean as possible. If you had a problem with water grass in the previous year then you need to look at including something in your program which will minimise this problem. Clean lands contribute hugely to a good crop.

Fuel orders

It is more likely that fuel prices will increase than decrease if we look at recent trends. Therefore, if you have the storage space available on the farm it will be a good idea to order and stock up on fuel ahead of the planting season. You may make a significant saving.

Being a good farmer today means that we need to evolve with the times and continuously work at improving our practices in order to improve our production. Research and planning can play a huge part in developing a successful farming business. As the famous saying goes; "If we fail to plan, then we plan to fail".

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

Grain SA interviews...Samantha Smiles

Samantha Smiles is a developing farmer from the Overberg Region in the Western Cape. Samantha has her goals set on becoming a successful commercial farmer and a role model for the young potential farmers of South Africa.

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

I am currently farming on 87 ha agricultural land in the Elim area within the Cape Agulhas Municipality district. My farming commodities are sheep, pigs, cattle as well as grain for feeding purposes.

What motivates/inspires you?

What inspires me every day is seeing the growing pastures and how it becomes a product that can feed the nation little by little. The small contribution that I can make to ensure that agriculture can become "sexy" to the future generation and to make sure that the youth of today can lead in agricultural development.

Describe your strengths and weaknesses

Strengths: Passion, dedication and I am very hardworking.

Weaknesses: Lack of knowledge in certain areas concerning agricultural production in grain production.

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

I haven't yet harvested to make a profit but have instead been utilising the feed for production to boost the livestock. My prospective yields for the future are 2,8 tons/ha of oats.

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

The main contributor to my progress is the study groups that I have attended. These are not only information sessions but I also find that different farmers share information of the farming processes that takes place on their farms on a daily basis.

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

I have received financial training on how to ensure that I am farming to make a profit as well as to be sustainable. The training that I would still like to do is animal production for sheep and pigs, and I would also like to learn how to plough.

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

In five years time I see myself as a successful commercial farmer. I would like to be a role model for all the youth that would like to become a farmer. I also want to achieve my set goals of becoming so successful that I can help my community to uplift themselves and use the little land they have to their advantage by planting small food gardens for themselves.

What advice do you have for young aspiring farmers?

My advice for the youth is that becoming a farmer is a full time job, but if you have a passion for farming and working in agriculture then it is your time to take the lead and make sure that agriculture becomes the leader in job creation and that will be your contribution towards a better future for our land.

Article submitted by Liana Stroebel, Development Co-ordinator of the Grain SA Farmer Development Programme. For more information, send an email to liana@grainsa.co.za.

Pula Imvula's Quote of the Month

"Challenges are what makes life interesting and overcoming them is what makes life meaningful."

~ Joshua J. Marine

Maintain your planter for optimum performance

It is a good idea to prepare for your planting season in good time. The planter is in fact your most crucial implement on the farm. It determines your crop potential from day one and if any mistakes are made at this stage, they either mean you will need to be replanting at great expense or otherwise risk carrying potential losses right through to harvest time.

A field which is planted with an uneven stand, for either maize or sunflowers, will never produce as well as it potentially could have had it been planted with an ideal plant population which had been well spaced and evenly spread. Variances of yields between ½ ton/ha to up to 2ton/ha are common. This season in particular has found many farmers reporting variations in the yields from between 4 tons/ha and 6 tons/ha in maize fields which had the same rainfall and fertilisation conditions and the agronomists are putting this down to one thing – the stand of the crop.

How does one ensure there is a good stand?

It is necessary to pay close attention to small details early in the season by doing maintenance on all the planters ahead of time so they are ready to run when conditions are ideal.

General planter maintenance

Bearings

Because bearings seem functional and they seem to be turning freely, farmers often make the mistake of going ahead and start planting but in fact this is one of the most common causes of stoppages during the planting process. Replacing bearings in the land is a most frustrating exercise so rather do this before they seize. It is important to remove all coulter (coater) bearings before start of planting. Replace any bearings that seem in any way worn or are found not to be turning freely. In the process check the dust-covers over the bearings and that the seals are intact so as to ensure they are dustproof. This is a major cause for bearings seizing.

Bearings are not cheap which is why farmers tend to try to make them last as long

The wheel is removed to replace wheel bearings that are worn.

as possible but this is often a good example of penny wise and pounds foolish because the costs climb even higher when the planter stands in the land when conditions for planting are ideal – never mind the cost of a special trip to the nearest town just to buy one bearing.

Seed and fertiliser coulter discs

Check that the circumference is correct, i.e. that they have not worn too small as this will cause problems with the depth placement of seed and fertiliser.

Chains

These must be kept in good condition. It is a very good practise to remove all chains from the planter at the end of each season. They should be stored in a dry place so no rust develops and then just before installing them for the new season they can be oiled or even laid in old oil for a few days.

Cogs

Ensure that all the cogs on the planter are moving freely. Check that there are no worn sprockets (teeth) as this will lead to the chain jumping or falling off and will result in uneven seed placements and gaps.

Fertiliser bins

It is an ideal practice to remove all the bins after planting, wash them well and store them indoors as fertiliser is highly corrosive. Metal bins will in particular rust very quickly. With the start of the new season clean the bins and ensure the worms or spirals which move the fertiliser along are clean and move freely before mounting them. It is always a good thing to paint the fertiliser bins as this also prevents corrosion and rusting.

Seed bins

Check that the pipes carrying the seeds are not broken or blocked so that the flow of seed into the furrow is not hampered. Make sure that the springs on the planter unit are intact and check that the tension on the springs is good in order to provide the downward pressure of the planter unit.

Grease points

Check that all the grease points are greased prior to planting and regularly throughout the process to keep everything turning freely.

Planter types

There are 3 main types of planters commonly used namely plate-, finger- and vacuum planters.

Plate planters

The size of the seed you order is very important with plate planters as the seed size must be compatible with the size of the holes on the plates being used. The number of holes on the plate will directly impact the plant population so this must be considered. Check that the planter blade has not worn down too much as this will affect the depth at which the seed will be deposited.

> *"It is clearly critical to harvest time success to maintain and adjust your planter for optimum performance this season.*

Finger planters

- Check the mechanism and that all fingers, springs, belts and tensioning nuts are in good working order.
- Check that the seed pipes and coulters are in good condition and not cracked or broken.
- Fixing weak or broken parts improves accuracy tremendously.

Vacuum planters

- Check hoses. Leaks or crack lead to a lack of suction.
- Adjustment of the vacuum must be made depending on the size of the seed bought. If the seeds are small and the suction is too high (strong) 2 - 3 seeds can be sucked in instead of the desired 1 seed and this will lead to 'clumps' of seed being deposited in the soil. If the suction is too low (weak) or the suction pipes have leaks, then there will be gaps because the seed won't be sucked onto the plates.
- Check the belts especially on the suction fan. They should have good tension and not be perished. If there is any sign of wear they must be replaced as this is the main driver creating the suction.
- Check that the base plate behind the seed plate is not worn out unevenly and need replacing. If it is worn the seed plate will not lie flush against it and there will be a loss of vacuum.

Doing a better job of planting involves maintenance, adjustments, and good decisions by the farmer and the planter operator. If just one kernel of maize out of 12 doesn't emerge, it could mean losses of up to 0,5 ton/ha and too much speed, worn chains and idlers, or poorly maintained seed meters can cause serious spacing deviations. It is clearly critical to harvest time success to maintain and adjust your planter for optimum performance this season.

Article submitted by Jenny Mathews, Pula Imvula contributor. For more information, send an email to jenjonmat@gmail.com.

Pests and diseases in wheat

During a season a number of different insect pests can occur on wheat plants, but not all these pests are equally injurious. The decision to control the pest should be made individually for each pest, and the particular control measure should be chosen to give the best result in both economic and environmental terms.

Insect control

The correct identification of pests is of utmost importance to ensure that the appropriate control measure is followed. (Refer to the field guide: For The Identification of Insects in Wheat, available from the Small Grain Institute in Bethlehem).

Aphids

Five aphid species are commonly found in wheat in the summer rainfall production areas in South Africa. These are the Russian wheat aphid which is the most important with outbreaks occurring annually, while other aphid species include the green bug, the bird cherry oat aphid, the brown ear aphid and the rose grain aphid, all of which occur sporadically.

Other insect pests

The following insects are considered sporadic or secondary pests of small grain in the summer rainfall areas.

- **Brown wheat mite** – these mites are small and dark brown with a slightly oval body. Scouting should be conducted during the day as mites spend the night in or on the soil. Under severe infestations, leaves might turn yellow or bronze resulting in yellow or brown patches appearing in the field. The infestation is usually more pronounced when the wheat plants are under stress and can inhibit the uptake and translocation of systemic insecticides. When scouting, a clean white handkerchief can be placed under the plant and the leaves shaken to dislodge the mites. As this insect may go undetected, it can cause serious losses.
- **False wireworm** – this is the larval stage of a large dark coloured beetle with long legs often seen running over the ground and hiding in plant litter. The larva is the most damaging stage, feeding on seed, roots and seedling stems at or just below the surface of the soil. Adult beetles may damage emerging seedlings.
- **Bollworm** – the adult moths are light brown to grey with a wingspan of about 20 mm, and fly at dawn and dusk, laying their eggs directly on the plant. Young larva feed on the chlorophyll of leaves and later migrates on to the awn to feed on the developing kernels.
- **Black maize beetle** – the adult beetle is black, about 12 mm - 15 mm in length, and capable of extended flight. The beetles are the most damaging stage while their larva survives mostly on organic material in the soil. Adults chew at the base of the seedling stem which result in a reduced stand.
- **Leaf hoppers and maize streak virus** – leaf hoppers infected with maize streak virus can migrate from maize to wheat, carrying the maize streak virus with them. When early planted wheat plants become infected, they become

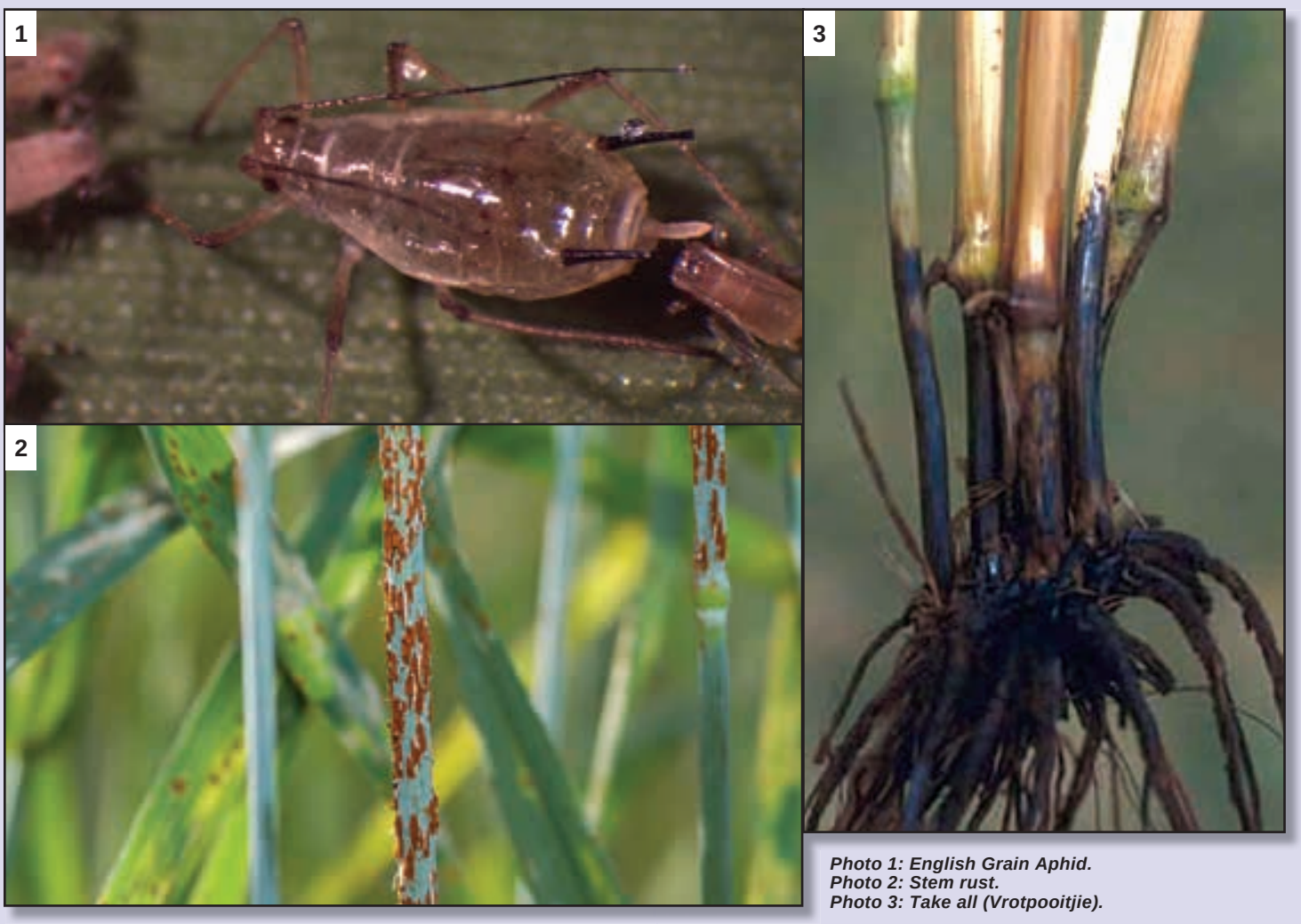

Photo 1: English Grain Aphid.
Photo 2: Stem rust.
Photo 3: Take all (Vrotpooitjie).

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stunted, and the curled leaves show thin, white, longitudinal stripes.

Diseases of wheat

Genetic and chemical methods are used for the control of diseases in wheat. Fungicides are used for chemical control of foliar diseases as well as soil borne diseases such as bunt and loose smut. Much success has already been achieved with the development of cultivars with resistance to stem-, yellow- and leaf rust.

In order to be successful with the use of fungicides for disease control, the following aspects have to be taken into account.

Diseases must be identified correctly. For this purpose please contact the Small Grain Centre in Bethlehem.

- It is recommended that a disease must first be observed in the field before initiating a spray programme.
- In order to choose the appropriate fungicide the disease and causal organism of the disease should be identified correctly.
- The efficacy of fungicides differs and a fungicide registered and effective against the observed disease should be chosen.
- The susceptibility of the particular cultivar to the disease should be considered. In most cases, resistant cultivars will not need fungicide protection, unless new races of the pathogen develop.
- Timing of the application is critical.
- The application of chemicals after flowering is not economical, as significant damage will already have occurred.
- Some fungicides require intervals before harvest or consumption of produce.
- Use enough water so as to ensure adequate coverage of the plant leaves.
- Losses can be minimised by choosing resistant cultivars.

Take all (Vrotpooitjie)

This disease is caused by a fungal pathogen commonly known as Ggt. This disease is most prevalent in the irrigation areas of the Eastern Free State and KwaZulu-Natal and can lead to yield losses of up to 72% if not controlled from the outset. Several factors have been found to promote Take all incidence and these include sandy, alkaline, infertile and poorly drained soils, higher than recommended seeding densities, soils with a high organic matter content, as well as Manganese and Nitrogen deficiencies.

Crown rot

Crown rot occurs when the stem bases of mature plants are infected by numerous fungal pathogens of the genus Fusarium. The symptoms of this disease usually become most evident at flowering or after a period of long moisture stress, when either the entire plant or plant parts suddenly die off. The disease occurs under dryland cultivation conditions particularly in the Central and Western Free State.

Yellow rust or stripe rust

This parasite can only grow in living host material. This pathogen can infect wheat, barley, triticale, rye and some other grass species. Symptoms of the striped rust are usually systemic and bright yellow to orange pustules and appear in linear rows on the leaf.

Leaf rust or brown rust

Leaf rust infects small grains as well as different grass species. Optimum temperatures between 15°C - 22°C and free moisture are needed for rapid development of the disease.

There are several other organisms that cause various diseases in wheat e.g. stem rust, Fusarium head blight, glume blotch, carnal bunt, loose smut, stinking smut, maize streak virus which is transmitted by leaf hoppers which contain the virus within their systems and pass it on to the plant during feeding, and powdery mildew. All of these pathogens require specialised chemical treatment at optimum growth stages under ideal temperature and moisture conditions.

Article adapted from the Wheat Production manual.

Photo 4: Yellow rust or stripe rust.
Photo 5: Aphid.
Photo 6: Aphid.
Photo 7: Leaf rust or brown rust.

IS PRODUCTIVITY IMPORTANT?

Why the emphasis on productivity? As long as the job gets done. No. Farmers are under a severe cost-price squeeze and a way to counter the position, caused by the steady increase of the prices of inputs including minimum wages, is to increase productivity.

Previously it may have taken a specific person using specific resources an hour to complete a specific job. After changing the way the job is done and/or changing the person for instance by training and/or changing the resources, it then takes 40 minutes to do the job. This equates to higher productivity or increased performance. Productivity has to do with how much you get out of a process when compared with how much you put in. The more output you get for your input, the more productive you are.

How do I go about to improve productivity? To get a job done people are involved and they use other resources, therefore JOB = PEOPLE x RESOURCES. Thus, there are three aspects to be considered. It is however not always necessary nor possible to change all three elements at the same time. Sometimes by just changing one or two of the elements an increase in productivity, thus performance, can be achieved.

First of all, let's consider the job. Ask questions about the job – "Why is this job done?", "Is it really necessary to do the specific job?", "Is there not a better way to do the job?", "What difficulties occur when doing the job?" There is always a better way to get a job done. Consider the job carefully and important consult with your employees on ideas to get a job done in a better way. You may be surprised – they can come up with wonderful ideas.

Secondly, address your human resources. To be productive a person must be motivated and have the necessary ability. PERFORMANCE = ABILITY x MOTIVATION.

Ability is influenced by a person's natural talent and training and the resources available. Do your employees have the necessary skills, expertise and knowledge to do the job and are they properly trained? ABILITY = NATURAL TALENT x TRAINING x RESOURCES.

Also expect your staff to do things right the first time, not to waste time (time is money), to look after tools, machinery, equipment, and not to waste resources and inputs.

Motivation is influenced by a person's attitude (could be positive or negative) and commitment. MOTIVATION = ATTITUDE x COMMITMENT.

Very briefly – attend to the motivation of your staff by spelling out the results that must be achieved, give them an opportunity to prove themselves, inform them about their progress, assist them when necessary and reward them according to their contribution. To further advance motivation, communicate regularly with your staff, treat them fairly and apply discipline.

A person milking a cow for the first time will struggle even though he/she may by highly motivated – he/she is inherently fond of cattle and wants to milk the cow. He/she is not trained and might not have adequate resources – a suitable place to milk the cow, a suitable bucket and other equipment. Only after proper training and the provision of suitable resources will this person be productive. Vice versa, a person well trained and provided with proper resources could be rather unproductive (take a long time to milk) when milking cows if he/she does not like working with cattle. He/she is simply not motivated.

Thirdly, consider your resources which could be tools, equipment, machinery, facilities, and so forth. It is important that a job is done using the correct and suitable resources. Furthermore, all resources must be in a good state of repair and maintained as such to get the job done properly in good time. Have you ever attempted to change a wheel of a vehicle without a proper jack or a wheel spanner? What would be the more productive way to move a 1 000 bricks from where they are stacked to where they are needed – carrying them by hand or using a wheelbarrow?

Consider improving productivity by adapting existing resources or improvising something new. Remember "'*n Boer maak 'n plan*". Agricultural magazines (Landbou Weekblad, Farmers Weekly, and others) are full of ideas how to adapt existing tools or equipment or to improvise new resources. At NAMPO you will also come across wonderful ideas.

In conclusion higher productivity (performance) has a positive influence on PROFITS which will benefit employer and employees. By being more productive you may have used fewer employees to do the job, it might have taken less time and needed less resources, all of which will save on costs.

The owner/manager of a farming business must, in order to survive financially, continuously consider all jobs and tasks done as part of the business in order to increase productivity and improve performance.

One thing more to be done: What a challenge to be a farmer!

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

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Know the water infiltration rates in your irrigated wheat

Successful production of wheat under irrigation requires a consideration of many factors including water quality, (which was covered in a previous Pula Imvula article), soil type, specific cultivation practices, application of water at correct intervals, cultivar choice and seeding rate, fertilisation and fertigation, and an integrated pest and weed control programme.

One of the important factors to consider when managing the production of wheat under irrigation is the water infiltration rate.

Water infiltration rate

The infiltration rate or the speed at which water can move through a soil profile will determine the amount of water that can be applied at any one watering event. It is important not to exceed the rate at which the water can be absorbed at the soil surface and within the root zone of the wheat crop. This can result first in puddling in the lower spots in the irrigated area and then runoff of water, which is a scarce and expensive resource, into the surrounding area and then rivers.

Excess water in the soil profile will also lead to leaching of the applied fertiliser, especially nitrogen, and other minerals through the soil and into any nearby streams or rivers. This can cause extensive pollution and overgrowth of algae and other plants.

The soil texture will determine the infiltration rate as well as the soil density, organic matter, stability of the soil surface, old crop residues and the extent of current crop growth which protects the soil surface.

Table 1: Indicative infiltration rates for various soil textures.

Soil texture	RAW (mm/cm)
Sand	13
Loamy sand	12
Sandy loam	10
Light sandy clay loam	7
Sandy clay loam	5
Clay loam	5
Light clay	4
Medium clay	3

Indicative infiltration rates for different soil textures

One of the first priorities of an irrigation farmer is to get to know all the aspects of the soil and soil profiles in his irrigation lands. This knowledge as well as taking soil samples and digging soil profiles is critical to understanding the various soil layers, sand and clay content and to determine if there are any compacted layers that will prevent the water from moving through the soil profile. Compacted layers will also influence the depth and extent of root growth and uptake of the applied fertiliser.

Water infiltration rates will also vary depending on whether the irrigation method is by flood, normal sprinkler, micro irrigation, drip irrigation or centre-pivot irrigation.

It is important to set up your centre-pivot systems with nozzles that produce optimum sized droplets that will not be blown across the land by the wind, evaporate under very hot conditions, and that are not too large as these heavy droplets can compact the soil surface. Your irrigation equipment supplier can show you the various options available.

Some infiltration rates in millimetres per hour (mm/h) for various soil types are given in the **Table 1**. It is very important to test the sand and clay content of the top 150 mm and the 150 mm below the top layer. One can then have an idea of the basic water delivery rate at which your system whether normal or pivot will be set. Practical observation will then determine at what rate your soil, with the wheat crop planted and in the various growth phases, can handle the water applied. If a test is done and there is any runoff the application rate can be reduced accordingly.

The water will be applied for increasing periods of time to match the requirements of the wheat crop especially just before flowering and into heading or ear development.

Pre-planting moisture content

One of the cardinal rules in irrigated wheat production is to water the area to be planted well before the planting date so that the seeds are placed in a soil which has the total soil profile at field capacity. Field capacity is defined by having 50% water and 50% air between the soil particles. It is a point of water soil content where there is no flow of excess water, which can leach nutrients and minerals, from the soil.

In a winter planted wheat environment and with the heat experienced during October and November months the growth of the wheat crop is so fast the rate at which water can be applied cannot compensate for the evapo-transpiration rate of the crop. The farmer must therefore ensure that available water is kept to the maximum throughout the growth period.

Readily available water or RAW

It is important to balance the applied water rate with the soils' ability to absorb the required water. The plant available water is determined by the effective rooting depth of the crop which is about 60 cm in most soils suitable for wheat production with the bulk of roots being in the top 30 cm zone. The RAW content of the soil must be monitored throughout the growth season. Some values in mm of water per centimetre (cm) for various soils can be seen in the **Table 2**. They can be used to estimate the amount of water required to bring the soil into the ideal pre-planting conditions.

Table 2: Some readily available water (RAW) capacities for various soils.

Soil Texture	Infiltration rate in mm/h
Sand	0,38
Loamy sand	0,55
Sandy loam	0,65
Light sandy clay loam	0,74
Sandy clay loam	0,71
Clay loam	0,65
Light clay	0,57
Medium clay	0,41

As can be seen from the table the higher clay content of the soil is able to hold a higher margin of readily available water.

Conclusion

The farmer must know the optimum infiltration rates of the soils in his irrigated wheat lands to be able to manage the water application rates that will be set throughout the growth of his crop.

Article submitted by a retired farmer.

Soil quality, the basis of sustainable agriculture

Crop residues in the soil serve as food source to soil micro-organisms that are essential to the quality of the soil.

Farming with grain today requires expensive inputs like fertiliser and weed control. However, the producer is dependent on his most valuable asset: his soil. In fact, soil houses a dynamic, living ecosystem that in part determines the quality of the soil and is ignored to a great extent.

Good quality soil

Soil quality includes three components, namely physical, chemical and biological properties. In the past the physical and chemical aspects of soil required to successfully cultivate crops were mainly emphasised. However, biology also plays a major role in the interaction between the physical and chemical components.

We know that the soil components of high-quality soil are optimal, i.e. the pH, and that the macro and micro-nutrients are present and balanced. This means that the chemistry, physical and biological properties of all three are in the right proportion.

Healthy soil also contains a large and diverse microbial population. Many of our soils are probably poor with regard to micro-organisms. The diversity and robustness of soil microbial populations depend on the habitat and the quality of their food. The poorer the food quality, the more stressful are the living conditions and the species composition becomes unbalanced. Over the years the food sources of micro-organisms have been restricted by our agricultural practices.

> *"The producer is dependent on his most valuable asset: his soil.*

Plants or crops secrete root secretions and the roots also serve as building blocks for soil organic material. The best-known role of crop

residues is combating erosion, but an equally important role is that it also serves as organic matter for the soil. Where rainfall permits this, cover crops are often cultivated with the express purpose of covering the soil. The cover comprises the organic plant material, which also serves as food for the micro-organisms to form humus at a later stage.

Micro-organisms then feed on the plant residues and absorb minerals like nitrogen, phosphorus and potassium and store them for later provision to the plant when the organic matter dies. They also produce polymers to provide more structure to the soil.

In wetter regions where earthworms occur, they feed on the micro-organisms, aerate the soil and increase water infiltration rates through tunnel forming. We also see that plants grow better in an environment where sufficient oxygen and water are present in the soil, and the nutrients in the soil are continuously recirculated. In healthy soils we also see plants with bigger root systems with more root secretions, which in turn promotes a diverse microbial population.

Life in the soil consists of a wide variety of organisms. Healthy soil contains more beneficial elements than pathogens. The microbial groups occurring in the soil comprise actinomycetes, bacteria, fungi, nematodes, protozoans and algae.

Certain micro-organisms have a beneficial relationship with the crop or plant. The two best known are probably Rhizobium bacteria (group) and mycorrhiza. Rhizobium species are bacteria that associate symbiotically with legumes like beans. The bacteria form nodules on the roots of the host plant, where they bind nitrogen gas from the air. The bound nitrogen can then be supplied to the plant. At the same time the plant provides the Rhizobium bacteria with important minerals and sugars.

The other beneficial micro-organism is mycorrhiza, which also forms associations with the plant roots. Mycorrhiza is derived from the Latin word mycor, which means fungus, and rhiza, which means root. This fungus is found in most soils, but is very host specific. Each plant or crop has its own group of mycorrhiza species.

It has been found that the mycorrhizae can increase the absorption level of roots by between 100 to 1 000 times. The extended network of hyphae make the plant roots more effective when absorbing water and other nutrients like phosphorus and zinc. In turn, the mycorrhiza fungus obtains sugars and other substances from the plant roots.

Although mycorrhizae are mainly known for their nutritional benefits, they also have the benefit of protecting the plant against pathogens like Fusarium, which causes root rot. A by-product of the activity of mycorrhizae is the manufacture of glomalin, a compound that improves soil structure.

Glomalin is basically the glue that binds clay particles together to form larger aggregates. This establishes greater porous spaces in the soil. Naturally, this creates the ideal spaces for plant roots to grow and function.

Low-quality soil

Farming practices can have a dramatic effect on the micro-organism population in the soil. Practices like ploughing disturb and destroy the fungus network in the soil, which can lead to, among other things, a decrease in earthworm numbers.

In the short term mineralisation is promoted to provide nutrition to the plant or crop, but this is not sustainable. Under these conditions bacteria start to dominate, which can lead to mineral losses and leaching.

Bacteria play a critical role in breaking down residues and recycling carbon, nitrogen, phosphorus and other minerals. The presence of live plant roots in the soil in particular stimulates bacterial activity.

Tillage aerates the soil and bacteria flourish because of the increase in oxygen, the crop residues that are worked into the soil, and respiration that increases. Populations increase rapidly, which results in the breakdown of organic matter and the release of nutrients.

The rapid respiration rates cause the soil to lose carbon to the atmosphere and also cause a possible loss of valuable nutrients, which can leach out before the plants can absorb them. As fungi in the soil start to disappear, aggregate formation declines, which increases the soil's tendency to compact.

Oxygen and water infiltration declines, so that root formation is impaired. This means that no food is available for the micro-organisms and earthworms, which could lead to a decline in numbers to the extent that the soil health and quality are reduced.

Monocultural cultivation skews the microbial population by establishing the same groups of micro-organisms in subsequent years, which could lead to higher levels of pathogens in the soil later because antagonistic organisms are absent.

Sometimes agricultural soil, particularly if it has no cover, can be heated to high temperatures by the sun. The top soil is baked hard so that no moisture or oxygen can infiltrate. This causes the micro-organisms in the top soil (where most micro-organisms occur) to die.

> *"Farming practices can have a dramatic effect on the micro-organism population in the soil. Practices like ploughing disturb and destroy the fungus network in the soil, which can lead to, among other things, a decrease in earthworm numbers.*

Building up low-quality soil

First, correct the soil chemistry and physics. Check the basic cations like calcium, potassium, magnesium, sodium and phosphorus, acid saturation and pH.

Acid and alkaline conditions cause many of the plant nutrients to become inaccessible to plants. Most plants prefer neutral to slightly acid soil conditions. These are the optimal conditions for plants to grow. Eliminate compaction with suitable tillage.

Establish no-till or minimum tillage practices if possible. Also start applying crop rotation with suitable crops – legumes in particular promote micro-organisms. Diversification of crops has major benefits for the soil as a result of the root structure and depth of crops.

The root material in the soil profile contains the key to the promotion of soil quality and structure. Cover crops are ideal for this and ensure that the profile is filled with long and short roots. The roots will also promote beneficial micro-organisms and suppress disease-causing pathogens. At farm level the root systems of crops can be monitored and the presence of earthworms can be checked.

These efforts are a step in the right direction to establish and improve the soil quality for increased and sustainable crop cultivation. This is probably impossible to ensure optimum and sustainable effective grain production without giving the required attention to the biology of the soil.

Article submitted by Owen Rhode, ARC-Grain Crops Institute, Potchefstroom, for SA Graan/Grain September 2013. For more information, send an email to RhodeO@arc.agric.za.

Biological control as part of integrated pest management

The interactions between insects and their natural enemies are essential ecological processes that make a major contribution to the control of insect populations. In situations where these natural processes are disturbed potential insect pest populations can develop and grow to the extent that they lead to an infestation.

A pest infestation can occur if an alien species is released in a new geographic area where there are no natural enemies of the species concerned, or if an insecticide destroys the natural enemies. The biggest challenge in such a situation is to address the imbalance.

This can be done by releasing natural enemies again, or by applying conservation biological control. The latter involves the restitution of the environmental conditions so that the natural enemies can increase again.

In perennial crops like planted forests and orchards biological control is more successful, as the environment does not change so drastically and there is ongoing interaction between the insect infestation and the natural enemies.

In annual crops the situation differs as the environment changes and an unstable environment is created where the pest and the natural enemies are separated from each other. This separation can sometimes be reduced by applying better management techniques to protect natural enemies and promoting the stability of the crop system.

The use of natural enemies has long been recognised as a basic element of insect pest control, but too few systems have been studied adequately to gain a proper understanding of the pest/natural enemy interactions that do exist. These types of natural enemies that can be used in biological control include pathogens, predators and parasitoids.

The entomopathogens that have been used for biological control include bacteria, fungi, viruses and nematodes. Examples of sustainable natural insect populations controlled by entomopathogens in crop systems are scarce. The reason for this is that the sustainability of entomopathogens requires a stable environment with favourable conditions to spread and propagate in order to control a pest.

Parasitoids parasitise their host only during immature stages when the larva develops inside


1


2

Photo 1: An example of an entomopathogenic nematode that can control a stalk borer larva. Photo: Dr AP Malan
Photo 2: Predatory earwigs often feed on stalk borer larvae.
Photo 3: Cotesia wasp cocoons after a stalk borer was parasitised.
Photo 4: A fly maggot emerging from a stalk borer larva.
Photo 5: Ground beetles are aggressive predators that often feed on cutworm larvae and stalk borers.

(endoparasite) or on (exoparasite) the host. During larval development in the host the host is usually completely or partially consumed and the parasite larvae become pupae inside or close to the host.

The parasitic fly, *Sturmiopsis parasitica*, is one of many important larval parasitoids that parasitise stalk borers in Africa. Because the host of S. parasitica occurs in sugar cane, maize and sorghum the value of the parasitoids as bio-control agent is high.

Female flies can produce 500 - 900 maggots each. Because of high fertility and with eggs ripening within a few days, a single female fly can spread her maggots across a number of stalk borer tunnel openings. The larval stage in the hosts usually lasts between 12 - 14 days at 26°C, but can last up to 25 days.

The mature maggots then appear from the host larvae. The stage just before the maggots become pupae lasts about 12 hours, and the pupa stage is about 12 - 19 days. The newly formed pupae are reddish brown at first, but acquire a darker colour as the pupa develops, after which the fly appears.

Predators feed on their host during all stages: eggs, larvae, pupae and adults. Each predator requires a number of individuals of the host to reach maturity, on contrast to parasitoids, which require only one host. The immature and mature predators must search for, find and overcome their host, and can feed on it only then.

Predators can be divided into two groups: those with masticating mouths, and those with sucking mouths. However, in general they are not as specialised as the parasitoids. Earwigs and ground beetles are good examples of predators occurring in maize fields and feed on major insect pests.

Biological control by natural enemies of pest insects is an extremely valuable form of control, particularly in the context of integrated pest management. On the whole chemical and biological control are opposing techniques, mainly because so many insecticides also harm natural enemies.

However, it is recommended that preference be given to insecticides that are less toxic to natural enemies or that insecticides be applied in the field when they do not pose a risk for natural enemies.

Article submitted by Dr Annemie Erasmus, ARC-Grain Crops Institute, for SA Graan/ Grain September 2013. For more information, send an email to erasmusa@arc.agric.za

Ephemeral fever under the microscope

Ephemeral fever is an insect-borne viral disease among cattle. The disease starts quickly and usually does not last long.

Affected animals have a fever, are stiff, lie down a lot, are slow to get up and reluctant to move around. In most cases animals recover fully after a few days.

Deaths (2% - 3%) occur in animals that are in a good condition. A dramatic drop in the milk production of high-producing dairy cows causes major financial losses.

Ephemeral fever is one of the most important erosion diseases in the dairy industry in South Africa. Ephemeral fever annually causes millions of rands in losses in the dairy industry in particular. The fertility of infected bulls is affected for a period.

The cause of ephemeral fever

Ephemeral fever is caused by a virus. The virus is transferred to cattle by insects that bite them. Midges (*Culicoides spp*.) and mosquitoes (*Culex* and *Anopheles spp*.) in particular carry the virus (vectors).

Presumably there are other insects that transfer the virus too, but to date they have not been identified. Cattle tissue (meat) and bodily fluids (e.g. nasal discharge) do not play a role in the transfer of the virus between cattle. If an animal dies of ephemeral fever, the lactic acid that forms in the muscle destroys the virus.

When the disease occurs

Ephemeral fever is seasonal. The disease primarily occurs in summer (specifically the second half of summer) and autumn (March to May). Cases have been recorded in winter too.

Ephemeral fever usually occurs after good rainfall (above-average rainfall). If rainfall is poor, only sporadic incidences of ephemeral fever occur. The disease usually disappears after the first frost. Research on how and where the virus hibernates has not yet been conclusive.

Immunity

If an animal contracts ephemeral fever, it usually has lifelong immunity against it afterwards. It has been alleged that ephemeral fever is caused by more than one strain of the virus, but this has not yet been proven.

Ephemeral fever antibodies have been found in buffaloes, waterbuck and hartebeest. Whether these game types play a role in the hibernation of the virus is not yet known.

How the virus causes disease

The virus causes an infection in the smaller blood vessels of the tendons, muscles, joints and skin. The calcium, iron and zinc content of the blood plasma is reduced considerably.

The 'paralysis' that animals experience from ephemeral fever appears similar to that caused by lacteal fever (hypocalcaemia) in dairy cattle. Lacteal fever also causes a reduction in the calcium levels in the blood.

Some animals are permanently paralysed by ephemeral fever. The cause of the spinal cord damage (degeneration) caused by the paralysis is not yet clear. It seems as of pure-bred breeds (e.g. Holstein and Brahman) are more susceptible to ephemeral fever than crossbred animals.

Signs of the disease

The disease occurs in a minor, more severe or severe degree. With the minor degree of the disease the affected animal is depressed, stiff, has a fever for a short while, is unwilling to move, but retains its appetite.

The milk production of dairy cows declines drastically (10% - 95%) for a number of days. Sometimes milk production stops completely. Their condition also deteriorates drastically. The somatic cell count of the milk increases abnormally and the quality of the milk deteriorates.

Most of the affected cows do not return to their original level of milk production. Usually these animals recover completely after a few days. With the more severe degree of the disease the sick animal does not remain in the herd, does not eat, is stiff, develops lameness that affects one leg after the other. It has a nasal and eye discharge and the joints swell.

In some cases the head displays subcutaneous fluid accumulation (oedema). Bulls can be temporarily infertile and produce abnormal sperm. These cases usually recover two to three days after the fever has subsided and the animals have a normal temperature (approximately 38,5ºC).

Antibodies against ephemeral fever have been found in buffaloes. It is not yet clear if buffaloes and other game play a role in the hibernation of the virus causing the disease.

Animals with ephemeral fever are unable to swallow for a while, lie down and cannot get up, can bloat and are sometimes constipated.

As a preventive measure animals should, if possible, not graze or overnight in low-lying areas alongside dams, marshes or pans. Midges and mosquitoes that are active in the summer when it rains well in the above areas infect cattle with ephemeral fever.

The annual vaccination of all animals older than six months with ephemeral fever vaccine during spring (September to November) is one of the main preventive and control measures.

With the severe degree of the disease the sick animal lies with its chest on the ground and cannot get up. Animals that lie for long periods can develop pressure sores and sometimes develop pneumonia. The sick animal cannot swallow, bloats, the rumen stops (rumenal stasis), the animal is constipated, salivates and the head often rests on the flank (side). The animal then changes its lying position from the chest to the side. There are no reflex actions. The animal falls into a coma and dies.

In certain cases the lungs are affected. Rattling sounds are clearly audible in these cases and pneumonia can develop. A small percentage of animals develop lung emphysema with subcutaneous emphysema (accumulation of air) across the back and also other parts of the body.

Cows in the advanced stages of pregnancy can abort. The fertility of the cows is usually not affected. Lactating cows usually have more severe symptoms than dry cows (not in milk). Cattle that recover usually develop good immunity and seldom develop ephemeral fever a second time.

Diagnosis

- The veterinarian bases his initial diagnosis on the sick animal's symptoms, the season of the year and other relevant history that is available.
- Blood samples can be taken from the sick animal and after its recovery to identify antibodies. The blood profile of sick animals shows an increase in white blood cells (neutrophils).
- The diagnosis is confirmed with electron microscopy by the demonstration of the virus causing ephemeral fever in body tissue.

Conditions that can be confused with ephemeral fever

The following conditions demonstrating the same symptoms as ephemeral fever should not be confused with ephemeral fever: Lacteal fever, botulism (caused by *Clostridium botulinum*), blackleg (*Clostridium chauvoei*), neurotoxicosis (ingestion of maize infected by the fungus *Diplodia maydis*), physical injuries, plant poisoning (*Crotalaria* spp., which causes laminitis and claw deformities).

Other lung diseases or conditions should be distinguished from the lung emphysema that is the result of ephemeral fever.

Treatment

- Consult a veterinarian.
- Sufficient rest for the animal. Protect the sick animal against heat stress, wind and cold.
- Good care. Ensure that there is sufficient clean, fresh water and palatable and nutritious food available.
- Hydrate (administer fluids) animals that are dehydrated.
- Administer anti-inflammatories (steroids and non-steroids) to treat inflammation.
- Administer calcium, zinc and iron if possible.
- Do not administer any fluids through the mouth if the swallowing reflex is absent. Administer medicine to get the rumen working and to prevent constipation.

Heavily pregnant cows can abort due to ephemeral fever. This must be distinguished from the abortion caused by brucellosis or other diseases.

The Colicoides midge (photo) in particular and mosquitos transfer the ephemeral fever virus.

Ephemeral fever under the microscope

Prevention and control

- The annual vaccination of all animals older than six months with ephemeral fever vaccine during spring (September to November). It is safe to vaccinate pregnant cows. Ephemeral fever vaccine (live virus vaccine) can be administered together with other bacterial or dead vaccines if necessary. If excessive rain is experienced or expected, a booster (second vaccine) four to six weeks after the first vaccine is recommended (discuss this with your veterinarian). Vaccine for ephemeral fever is not very immunogenic (does not cause very good immunity in the vaccinated animal) and a second vaccination is therefore recommended. The colostrum immunity of the calves of vaccinated cows or cows who had ephemeral fever before protects the calf up to about six months of age.
- Regularly spray the animals with insecticides to help prevent the insects (midges and mosquitoes) from biting the animals.
- Animals should, if possible, not graze or overnight in low-lying areas alongside dams, marshes or pans. Animals should preferably graze in high-lying areas.
- After they have been vaccinated against ephemeral fever, young dairy heifers (6 - 14 months) can be exposed to natural infection before they start producing milk by allowing them to graze in low-lying and water-rich areas. It is ideal for dairy cattle to develop immunity against ephemeral fever before they start producing milk. Consult your veterinarian before implementing this practice.
- Carefully follow instructions for the ephemeral fever vaccine. It is vital for the dissolved vaccine (the mixture of the pill and the 'water phase') and the 'oil phase' to be mixed well by drawing it into and ejecting it from the syringe at least 15 times. If sufficient emulsion does not form, the vaccination will lead to poor or no immunity.

Article submitted by Dr Jan du Preez, managing director, Institute for Dairy Technology, for SA Graan/Grain September 2013. For more information, send an email to jan.dupreez@mpo.co.za.

Our journey towards an emotionally healthy new you

Our journey towards an emotionally healthy new you, starts with a look at how you deal with conflict in your life and the influence it has on you – both at home and in the workplace.

Some of us are good at saying exactly what we mean and understanding precisely what others are saying but in my opinion most of us struggle with the process of getting the message across. And that's exactly what communication is. Communication is simply the act of transferring information from one place to another.

Our feelings, expressions, thoughts and ideas are portrayed by our words but most of what we are saying is being said by our body language and not our words.

It is therefore important to pay attention to body language such as facial expression, tone of voice, gestures, eye contact and even attitude. Not only is it important to listen to WHAT is said, but also HOW it is said. Ask yourself if the body language fits with the spoken words. Always take into account cultural differences, which might lead to misunderstandings in terms of words and body language.

Conflict can be seen as arguments or differences that occur through words and deeds. There are many causes for conflict in our lives, such as different backgrounds, beliefs and opinions, fatigue and stress, personal problems and abuse of power, to name but a few.

Someone once said "Your ability to deal with conflict will determine if it improves or controls your life."

When conflict is dealt with in a negative way it can lead to problems in all areas of your life. How you deal with conflict, is called your conflict management style.

We usually deal with conflict in the following manner:

- Withdrawal in order to avoid the conflict, (nothing gained, nothing lost).
- Forcing the other party to do things our way, using threats or violence. (The forceful party wins the other one loses).
- By smoothing things over and agreeing with the other party (even if we don't) to maintain good relationships at all cost. (The party that tries to smooth things over loses and the other party wins).
- Finding a compromise that will suit both parties involved in the conflict. (This is the so-called "you win some, you lose some" approach).
- Negotiating a new solution aimed at ensuring that both parties will maintain a good relationship and limit compromise on both sides. This of course is seen as the ideal situation. (Win-win situation).

Conflict like many other things in life should be kept under control to be constructive. Remember these words: "Conflict is like a fire. It can keep you warm and can cook your food, but if it gets out of control it can burn your house down." (Nortjé, 1994).

Article submitted by Petra Nel from PROCARE. For more information, send an email to petra@procare.co.za or contact PROCARE at 0861 7762273 or 021 873 0532.

Herbicide resistance – the new quick way of identifying it

Herbicide resistant weeds are a common occurrence in South Africa, especially in the Western Cape. A particularly troublesome weed is ryegrass (Lolium spp.), with billions of Rands already spent towards its control (**Photo 1**).

This input cost is further amplified by the development of herbicide resistant ryegrass biotypes through natural mutation. Often two or three applications of different herbicides at various dosages are applied in an attempt to eradicate the resistant weeds.

This leads to resistance to herbicides from several different modes of action groups in one population, leading to limiting future chemical control options.

Meaning what?

Typically, herbicides are developed to target specific enzymatic/biochemical pathways to act as inhibitors, which ultimately end in plant death. However, the misuse/overuse of herbicides has caused mutations within the different enzyme gene coding regions resulting in resistant ryegrass biotypes. As a result, the herbicides are unable to bind to the target site and are unable to inhibit that specific enzymatic/biochemical pathway, and the plant survives.

A number of these target site mutations for the different enzymatic pathways have been genetically identified and several DNA markers have been developed since 2007 by research groups in Australia and France. These markers can be used to genotype each specific resistant biotype for every specific mutation (**Photo 2**).

The DNA markers are able to distinguish between plants that are heterozygous (Aa) (1 copy – resistant allele) or homozygous (AA) (2 copies – resistant allele) resistant for each specific target site mutation.

What is important for the producer, is if a single ryegrass mother plant is heterozygous (Aa) for a mutation, then 75% of the seed/offspring of that plant will be resistant (Aa and AA) and only 25% susceptible (aa). But, in a homozygous (AA) ryegrass mother plant, all (100%) the seed/offspring will be resistant.

Depending on which mutation, the heterozygous or homozygous state of resistance can exponentially increase the needed dosage of herbicide to achieve 50% mortality. What is most important is that resistant biotypes on average require 10 - 30 times higher herbicide dosages than susceptible types.

A particularly troublesome weed is ryegrass (Lolium spp.), with billions of rands already spent towards its control.

A gel photo of a specific mutation DNA marker: (from left to right) lane 1-100bp DNA ladder, lanes: 2, 6, 9, 12, 14, 16 – 22 = susceptible (aa), lanes: 3, 4, 5 = homozygous (AA) resistant, Lanes: 8, 11, 13 and 15 = heterozygous (Aa) resistant.

Preliminary results on ryegrass biotypes collected during an extensive South African survey in 2006 - 2007, indicate that the resistant biotypes have multiple target site mutations, suggesting a broader resistance problem among ryegrass populations in the Western Cape.

Some mutations recently identified in South Africa are rare in other parts of the world, but fairly common locally, a phenomenon which needs to be documented. The question also arises as to what the extent of the problem is, five years down the line.

These DNA markers can now be used to render a weed resistance allele profiling (WRAP) service to farmers by the ARC-SGI in the form of various packages. Significant time will be saved with this molecular approach; traditionally herbicide resistance is validated in a glasshouse trial through the application of various classes of herbicides, a process taking up to ten weeks.

If fresh ryegrass material is sent to the ARC-SGI, molecular data for each specific resistance mutation can be obtained in only three to five days. A full report with a recommendation on herbicide choice or other alternatives will be sent to the producer concerned. Another significant advantage of this service is the increased accuracy.

For resistance to which herbicides can the ryegrass be screened?

Currently ryegrass biotypes can be submitted to get screened for resistance to herbicides from the ACCase inhibitor (Group A) herbicides, ALS inhibitor (Group B) herbicides and the Group D (bipyridyliums) and Group G (glycine) herbicides. At a later stage SGI will also be able to screen other grass species.

How to get your ryegrass tested for resistance?

Producers are welcome to send ryegrass seedlings or seeds to ARC-SGI, Bethlehem. Seedlings must be kept moist and must preferably be couriered, as it will assure that fresh seedlings arrive in Bethlehem.

Please indicate the GPS-coordinate where the sample was taken. Seeds must be stored in brown paper bags to prevent them from rotting. GPS-coordinates must again be indicated. Seeds/seedlings must be enough for the screening process.

Summary

From the data already obtained from molecular genotyping, specific classes or even a specific herbicide can be recommended to the farmer to target specific resistant ryegrass biotypes, saving producers a vast amount of time and money.

The use of molecular techniques to genotype herbicide resistant ryegrass is a first for South Africa and should lead to improved herbicide resistant weed management.

Article submitted by Hestia Nienaber and Scott Sydenham, ARC-Small Grain Institute, an Institute of the Field Crops Division, Bethlehem, for SA Graan/Grain September 2013. For more information, please contact Hestia Nienaber at 058 307 3420 or send an email to sydenhams@arc.agric.za.

The Corner Post

Opportunities for young learners towards a career in agriculture

Agriculture is the science or practice of farming, including the cultivation of the soil for the growing of crops and the rearing of animals to provide food, wool, and other products. There are thousands of learners who are not aware of the agricultural industry and who are not consciously exposed to any aspects thereof. A career in agriculture is worth considering since there are many facets in the industry that learners can choose from to ensure a rewarding career.

Certain secondary schools offer agriculture as a formal subject. There are also special agricultural high schools in the provinces where learners have to take one or more agricultural subjects. These schools usually have a balanced economic farming unit which has enough agronomic and livestock material for demonstrations and training purposes. At most of them the choice of subjects is wide enough to enable learners to obtain qualifications to enter colleges, technikons or universities where they can further their studies in agriculture.

For a complete list of these schools, as well as information on bursaries and learnerships, contact:
The Chairman, South African Agricultural Training Association (SAATA)
Settlers Agricultural High School,
Private Bag X422, Settlers 0430.
Tel: 014 730 0211 or fax: 014 730 0291
Email: gpviljoen@settlers.co.za
Internet websites: www.school.co.za and http://www.nda.agric.za/doaDev/sideMenu/links/Digest8.htm

Prospective farmers, extension officers, animal health and engineering technicians are trained at the Colleges of Agriculture. Practical training takes up about half of the student's time. The balance is devoted to lectures and demonstrations. Apart from agricultural and related scientific subjects, attention is also paid to training in farm economics and management. In addition to the diploma course, special and short courses are available. Training at all colleges of agriculture have the same status and formal recognition as training at technikons.

Table 1: Addresses of colleges of agriculture

CEDARA COLLEGE OF AGRICULTURE
(KwaZulu-Natal)
The Principal, Private Bag X6008, Hilton, 3245 (PMB)
Tel: 033 355 9304. Fax: 033 355 9303
Email: *vanniekerka@cedara.kzntl.gov.za*

ELSENBURG COLLEGE OF AGRICULTURE
(Western Cape)
The Principal, PO Box 54, Elsenburg, 7607
Tel: 021 808 7691 Fax: 021 884 4319
Email: *training@elsenburg.com*

FORT COX COLLEGE OF AGRICULTURE
(Eastern Cape)
The Principal, PO Box 2187, King William's Town, 5600
Tel: 040 653 1029 Fax: 040 653 8038
Email: *rawumey@iafrica.com*

GLEN COLLEGE OF AGRICULTURE
(Free State)
The Head, Private Bag X01, Glen, 9360
Tel: 051 861 1244 Fax: 051 861 1122
Email: *louise@glen.agric.za*

GROOTFONTEIN COLLEGE OF AGRICULTURE
(National Department of Agriculture)
The Director, Grootfontein ADI., Private Bag X529, Middelburg, 5900
Tel: 049 842 1113 Fax: 049 842 1113
Email: *joan@karoo1.agric.za*

LOWVELD COLLEGE OF AGRICULTURE
(Mpumalanga)
The Principal, Private Bag X11283, Nelspruit, 1200
Tel: 013 753 3064. Fax: 013 755 1110
Email: *mona@laeveld1.agric.za*
Website: http://www.mpu.agric.za

MADZIVHANDILA COLLEGE OF AGRICULTURE
(Limpopo)
The Rector, Private Bag X5024, Thohoyandou, 0950
Tel: 015 962 4586/7/8 Fax: 015 962 1320w

OWEN SITOLE COLLEGE OF AGRICULTURE
(KwaZulu-Natal)
The Principal, Private Bag X20013, Empangeni, 3880
Tel: 0351 951 345. Fax: 0357 951 379
Email: *principl@osca1.kznl.gov.za*

POTCHEFSTROOM COLLEGE OF AGRICULTURE
(North West)
The Head, Private Bag X804, Potchefstroom, 2520
Tel: 018 299 6556. Fax: 018 293 3925
Email: *oplpwn@potch1.agric.za*

TOMPI SELEKA COLLEGE OF AGRICULTURE
(Limpopo)
The Rector, Private Bag X9619, Marble Hall, 0450
Tel: 013 268 9300/1/2 Fax: 013 268 9035

TSOLO COLLEGE OF AGRICULTURE
(Eastern Cape)
The Principal, Private Bag X1008, Tsolo, 5170
Tel: 047 542 0107 Fax: 047 542 0107

Technikons are another option. Three-year national diplomas in agriculture and related disciplines at tertiary level are offered by technikons. Courses usually consist of two years' formal training at the Technikon followed by one year of structured experiential training at an approved employer. Trainee technicians of various government departments are seconded for training, either with full tuition fees and salary, or with a bursary. A maximum contract obligation of three years applies in most cases. A matriculation certificate (or equivalent) is required for entry to these courses. Selection applies for all fields of study.

What are learnerships, internships, short courses, bursaries and distance education?

A learnership is a structured learning process for gaining theoretical knowledge and practical skills in the workplace leading to a qualification registered on the National Qualifications Framework.

An internship is a temporary position with an emphasis on on-the-job training rather than merely employment, and it can be paid or unpaid. Internships provide real world experience to those looking to explore or gain the relevant knowledge and skills necessary to enter their career field. They are relatively short term in nature with the primary focus on getting some on the job training and taking what's learned in the classroom and applying it to the real world. Interns generally have a supervisor who assigns specific tasks and evaluates the interns' overall work.

Short courses entail in-depth training time spent on subjects or parts of a subject and often take four to twelve weeks to complete. A certificate is usually awarded and it may count as credits towards the next qualification of its kind.

For short courses, as well as bursaries and learnerships, learners must apply directly to the respective institutions in **Table 1**.

Bursaries are sums of money awarded by some institutions and may cover tuition, accommodation, books, meals and a monthly allowance. They target the previously disadvantaged and impoverished persons from poverty-stricken and deep rural communities.

Learners who have obtained the National Senior Certificate can also apply for the 2015 bursary programme at the Department of Agriculture, Forestry and Fisheries. It awards a variety of bursaries to qualifying applicants who want to further their studies in the critical scarce skills in the agriculture, forestry and fisheries sectors. They can be contacted on the following address or telephone number:

The Director: Ms Amanda Shokane
Directorate: Sector Education and Training
Department of Agriculture,
Forestry and Fisheries
Private Bag X250
Pretoria
0001
Telephone: 012 310 6000

Distance Education is another option for learning. In response to the changing training needs of professional farmers and agriculturists who cannot attend residential educational institutions, Technikon SA has introduced two nationally accredited training programmes in Agricultural Management. Presented by means of distance education, where the written word is used as the medium of instruction, these programmes are designed to promote the total development of the agriculturist since they are developed in collaboration with leaders in the agricultural industry. Since all Technikon SA's programmes comprise lifelong learning with multiple entry and exit options, each culminating in a nationally recognised qualification, learners may progress in their studies at their own individual pace.

This month's edition of The Corner Post was authored by Dr Lynette du Plessis, Education Consultant. For more information, send an email to lynetteduplessis@ymail.com.

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Taarup 2324 Mounted Disc Mower

- Working Width – 2.40m
- Number of discs - 6
- Number of blades- 12
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- Spring loaded break-away
- Transport folding angle of 90° vertical
- Swath board separating the mown crop from the unmown.

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Taarup 4332, 4336 Trailed Disc Mower Conditioner

Taarup 4332
- Working Width – 3.20m
- Number of discs - 8
- Power Req – 60/80 kW/hp

Taarup 4336
- Working Width – 3.60m
- Number of discs - 9
- Power Req – 70/90 kW/hp

- Duel Action Suspension System • BX Swath Belt
- Semi Swing Steel Tines • Chevron Roller Conditioner

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Cubic Capacity - 8.5 Ton
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• AS85C •
Cubic Capacity - 7 Ton
Lime Capacity - 13 Ton

• AS100C •
Cubic Capacity - 8 Ton
Lime Capacity - 14.5 Ton

• AS35C •
Cubic Capacity - 4 Ton
Lime Capacity - 5.5 Ton

• AS55C •
Cubic Capacity - 6 Ton
Lime Capacity - 8.5 Ton

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