GRAIN SA
GRAAN SA

November
2011

PULA IMVULA

Grain SA magazine for developing producers

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Role players in the programme: Seated in front, form the left, is Lawrence Luthango and Jerry Mthombothi with Jane McPherson. Back, from the left is Johan Kriel, Jurie Mentz, Danie van den Berg, Ian Househam, Tonie Loots and Willie Kotzé.

Developing farmers receive recognition for their excellence

On a beautiful "almost spring" morning in Bloemfontein, developing farmers received the recognition they deserved for contributing to the country's agriculture. "The harvest day" as some of the role players in the programme called it, was a day when Grain SA, as part of their Farmer Development Programme, stopped for a moment to honour the farmers that they work with and to celebrate their hard earned yields.

Jannie De Villiers (CEO-Grain SA) said the vision for developing farmers in South Africa is to make them part of the mainstream economy. "They need to become commercial farmers who can farm for the country and the continent on a sustainable budget." He also acknowledged the farmers for taking the risks that goes with the industry. "Excellence inspires people and it honours God. These upcoming farmers are inspiring the country by showing how diligently you can work the land and deliver something," he said. He also mentioned that it was sad that after 17 years of democracy, they haven't united agriculture yet. "Grain SA will work very hard on achieving just that," he said.

Jenny Mathews (Grain SA) recognised that there have been challenges, "Yes there are days

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Mme Jane says...

It is not often that we have really good news! We are really delighted to be able to tell the readers that we have managed to secure R35 million from the Department of Rural Development and Land Reform (DRDLR) for the recapitalisation of 16 farmers in the Free State.

During 2010, we had discussions with the Department of Agriculture hoping to secure production inputs for the farmers. This came to nothing. However, the good news is that the DRDLR came to hear of our attempts and offered help.

During this year we did a detailed assessment of 16 farms – farmers who have been part of our programme for some years, who have been part of the study groups, farmers days, advanced farmer programme and attended many training courses. We prepared a detailed business plan which includes mechanisation (purchase as well as repair of tractors and implements), fencing and water supply, sheds and buildings, livestock as well as crop production inputs. These plans were submitted and the total budget has been deposited into the Grain SA special bank account opened for this purpose.

All the necessary accounting systems are in place, as well as the detailed implementation plan for each farmer. To date now we have assisted the farmers with the implementation with regard to tractors and implements and are progressing well with the production inputs.

We would like to express our appreciation to the DRDLR for the confidence that they have shown and we assure all those involved that together with the farmers, we hope to make this a success. We look forward to being able to help other farmers in the future.

Developing farmers receive recognition for their excellence

when we feel like we are losing the battle, but today is the day that we celebrate. There are successes, there are farms that have grown from producing one ton per hectare to four tons per hectare, people whose lives are changing through agriculture, not only their own lives but also impacted and changed the lives of others for the better."

Jane McPherson (Grain SA Farmer development programme manager) said South Africa needs a strong agricultural sector and a common and united voice. "We can't have a divided voice in agriculture. We need to have national food security; nobody is going to feed us but the farmers. Agriculture is the cornerstone of our economies, it is an important employer." According to Jane agricultural development is a crucial part in the agricultural sector. She highlighted the importance of developing the farmers as individuals. "To get a united and prosperous sector we must focus on human development. It is not just about money or things, it is about you. We all have needs and agriculture can contribute to some of those needs." She stressed the fact that they want to establish a sense of belonging in these farmers. "It is a process of positive change in a human life. We want to achieve self-reliance and improve on the quality of life."

Jane McPherson encouraged the farmers to share their mistakes. "Behind failures valuable lessons are learnt. When something goes wrong and we don't tell anybody we all end up making the same mistakes instead of learning from each other."

What is Grain SA trying to do in their programme?

The ultimate aim of the programme is to develop capacitated, sustainable, black commercial farmers.

They want to develop commercial grain farmers and to contribute to household and national food security through optimal use of the natural resources available to each farmer. "If you can use your land optimally you can contribute to food security in our country. It's not only about land, not only about machines, markets, money, or skills; it is all of these things. It's a process, not a leap-you don't jump to being a farmer, you grow into being a farmer." McPherson said.

The farmers who received awards this year were categorised under the following:

- Subsistence farmers (those who farm on 1-10 ha); and
- Small holder farmers (those who farm on 10 ha to producing up to 250 tons).

The members of the 250 club (producing more than 250 tons of grain annually) and the 500 club (producing more than 500 tons of grain annually) were also recognised during the function.

ELMARIE SCHOEMAN, PULA/IMVULA CONTRIBUTOR

The sponsors of the function: Diale Mokgojwa (Standard Bank), Dudu Mashile (Monsanto) and Rudy Mostert (Profert).

The nominees in the Small holder farmer category: Wilson Tyelaphantsi, Sandisile Colbert Timakhwe, Caledon Quta (Finalist), Elijah Tefelo Mohapi, Thulane Mduduzi Mbele (Winner), Ben Saul Gininda, Elmon William Mthombothi and Sehere Daniel Makgoana (Finalist).

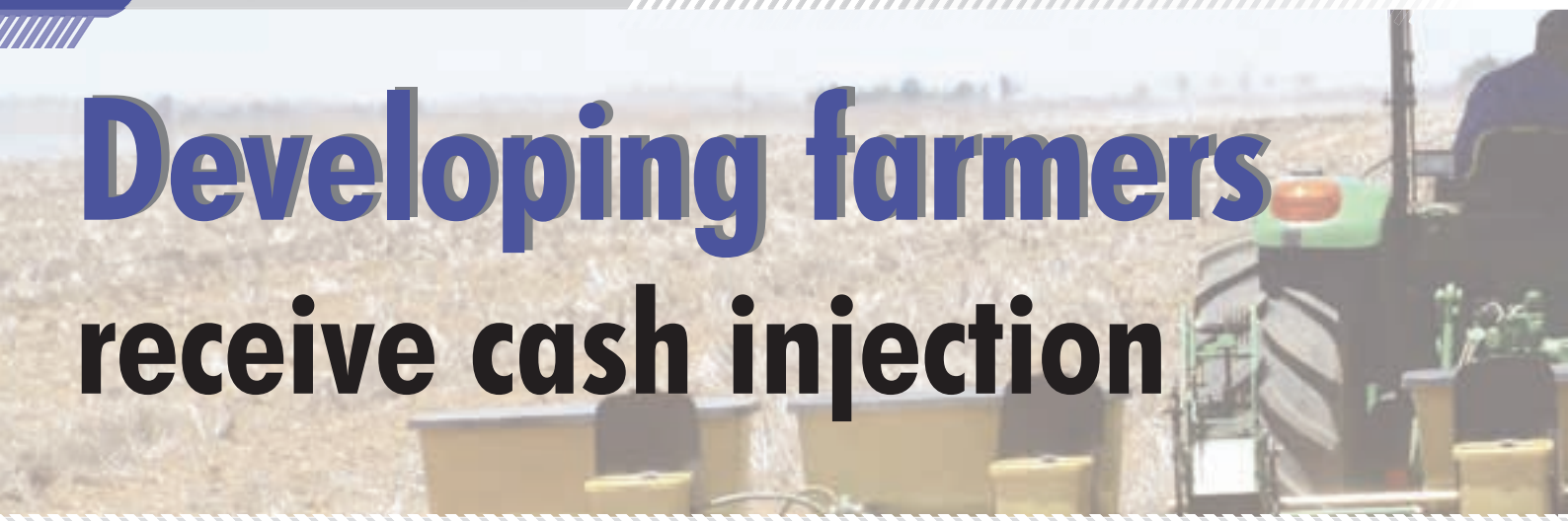
The nominees in the Subsistence farmers category: Mzoliswa Benedict Gxiva, Mbuzeli Spondo (Finalist), Mfaniseni Alpheus Mnculwane (Winner), Bhekithemba Bethuel Mtshali (Finalist), Billy Essential Mthimkhulu and Clinton Mbongiseni.

The members of the 250 Ton club: Mponeng Lidia Lentoro (Free State), Moleleko Jacob Mthimkulu (Free State), Lerato Modise receiving the award on behalf of Siphiwo Gift Mafuleka (Mpumalanga) and Sempe Lucas Mokgethi (North West).

The Small holder farmer of the year: Thulane Mduduzi Mbele.

The members of the 500 Ton club: John Mpau Dipali (Free State), Ruben Moiloa Maphira (Free State), Themba Johannes Congwane (Mpumalanga) and Lerato Modise receiving the reward on behalf of Zodiwe Paul Motshwene.

The Subsistence farmer of the year: Mfaniseni Alpheus Mnculwane.



Developing farmers receive cash injection

As the mission of our farmer development programme is "To develop capacitated black commercial farmers and to contribute to household and national food security", we are very aware of the problems being faced by the farmers. In order to meet our goal, farmers require knowledge and skills, land, mechanisation and production finance. In recent years, the economics of grain production have made it very difficult to develop grain farmers – the cost of inputs has been high and the prices of the grains, low.

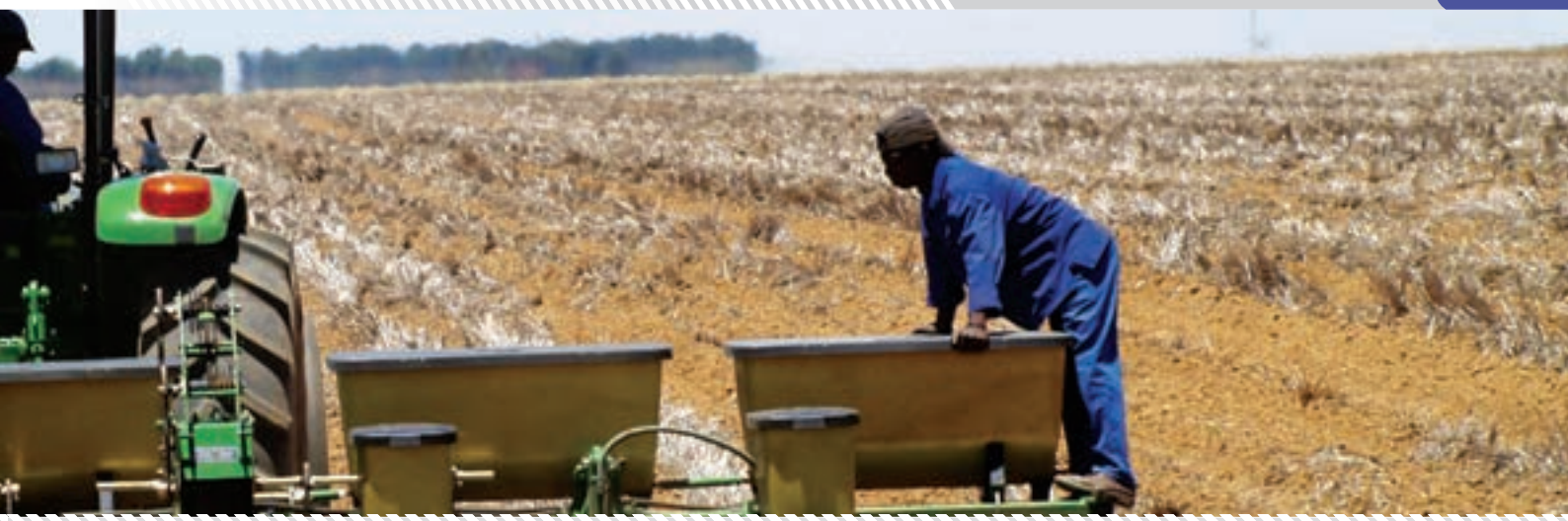
Although we understand fully that farming is business and that a business has to make profits in order to continue, we are also dealing with a situation in which the farmers need to continue to plant crops so that they perfect their skills as farmers. You cannot tell a farmer to "start" and then "stop" – what should he/she do with the land while we wait for conditions to be perfect?

During last year, we tried very hard to get the National Department of Agriculture to assist 152 of our farmers with a grant of R1 500 per hectare toward the very high production costs. Unfortunately, the department did nothing about our request. The department had Ilima Letsema funding which is earmarked for developing grain farmers, but they decided to use this money as they saw fit. (We know that the Gauteng Department of Agriculture delivered the inputs on 11 March 2011 for the crop that should have been planted in November 2010 and we are told that the North West and Free State returned their budget unused). This non-performance is a discussion for another day.

We had a number of discussions with the Department of Rural Development and Land Reform and they indicated that they have recapitalisation money available for farmers who have been the recipients of land reform. This money is available for SLAG, LRAD and PLAS farmers, but unfortunately, it is not available for farmers on communal land (although in our view, rural development should include the communal areas).

After lengthy discussions with the National and Provincial Departments, we agreed to do a pilot project in the Free State and the progress to date is as follows:

1. The department of Rural Development and Land Reform indicated that they had a list of farmers who qualify for recapitalisation.
2. In the Grain SA Producer Development programme, we had a list of farmers who have been part of the development programme for years.
3. We identified farmers who were on the Department's list as well as on our list and decided to do a pilot with those farmers. Our criteria for selection included the following: the farmer must have been part of our programme for at least one year, should have attended at least three training courses, should live on, or very near the farm and should be a bona fide farmer.



4. We visited each farm and did a thorough assessment of the requirements to get this farmer into full production and to enable him/her to make good use of the available natural resources. We prepared a business plan for each farmer which includes purchases of new and used tractors and implements, purchases of livestock, fencing and water supply requirements, tools, soil sampling and 100% of the production inputs for the first year.
5. We drew up an agreement with the DRDLR so that the roles and responsibilities of each role player are clear. This agreement was signed by the two parties.
6. We opened a new bank account for these funds alone – with one of the beneficiaries as a co-signatory.
7. The prepared business plan was discussed in detail with each farmer so that we made sure that the farmer was happy with the contents of the business plan.
8. Each farmer signed his/her business plan.
9. The plans were submitted to the department of RDLR.
10. The funds were deposited into the bank account (R29 258 million).
11. Currently we are drawing up a detailed implementation plan:
    a. Each producer has a mentor.
    b. Each producer has been asked to give the names and contact details of his/her suppliers (so as to build local contacts and strengthen the business relationship).
    c. The results of the soil sample analysis have been entered into our programme so as to verify the recommendations.
    d. Quotations will be obtained wherever possible (other than second hand equipment, tractor and implement repairs and diesel).
    e. Each supplier will be registered on the Cash Focus system. Orders will be made out and all payments made within the framework of the GSA system.

We are very excited about this project because these farmers have had a lot of training on and exposure to grain farming; they have a support system in place; we can assist them to buy the necessary tractors and implements to farm properly; they will have the 100% inputs for the first year; and the prices of grains and oil seeds are promising for this coming season.

With all this in place, we hope to move a lot closer to our goal, which is “To develop capacitated black commercial grain farmers and to contribute to household and national food security”.

JANE MCPHERSON, PROGRAMME MANAGER OF THE GRAIN SA FARMER DEVELOPMENT PROGRAMME

On radio

Do not miss these interesting programmes on radio, which covers issues of interest for developing farmers.

Radio	Weekday	Presented by	Time
Radio Qwaqwa	Thursday	Johan Kriel	19:00 - 20:00
Radio Mafikeng	Thursday	Tonie Loots	19:30
Zululand FM	Saturday	Jurie Mentz	06:10
Ligwalagwala FM	Thursday	Jerry Mthombothi	05:10
Umhlobo Wenene FM	Tuesday	Lawrence Luthango	04:30
Alfred Nzo FM	Monday	Ian Household	19:00 - 20:00

Why plant soy beans?

Soy beans are the world's most important oil seed crop. Soy beans traded on the world markets make up double of any of the eight main oil seeds traded on the world markets. The main oil seeds traded are soy beans, cotton seed, peanut, sunflower, rape seed, flax seed, copra and palm kernel.

Sunflowers and soy beans are the most important oil seeds produced in South Africa. Cotton seed and canola are produced in much lower quantities. Cotton seed production varies from between 15 000 and 32 000 tons per year. Cotton seed production is now less than 4,7% of soy bean seed production. Canola seed production varies between 31 000 tons to 40 000 per annum and has declined from 30% of the soy bean seed production to about 5%.

Production trends and areas planted for sunflowers, soy beans and ground nuts are illustrated in the chart below.

Annual seasonal production of oil seed crops in South Africa in tons					
	Actual	**Actual**	**Actual**	**Actual**	**Projected**
CROP	**2007/2008**	**2008/2009**	**2009/2010**	**2010/2011**	**2011/2011**
Sunflower	872,000	801,000	516,265	861,770	
Soy beans	**282,000**	**516,000**	**566,000**	**708,750**	
Ground nuts	88,800	99,500	88,000	69,420	

Annual seasonal production area planted to oil seed crops in South Africa in hectares					
	Actual	**Actual**	**Actual**	**Actual**	**Projected**
CROP	**2007/2008**	**2008/2009**	**2009/2010**	**2010/2011**	**2011/2011**
Sunflower	564,300	635,800	397,700	642,700	
Soy beans	**165,400**	**237,750**	**311,450**	**418,000**	

Annual extrapolated yield per hectare per ton					
	Actual	**Actual**	**Actual**	**Actual**	**Projected**
CROP	**2007/2008**	**2008/2009**	**2009/2010**	**2010/2011**	**2011/2011**
Sunflower	1,54	1,25	1,29	1,34	1,35
Soy beans	**1,70**	**2,17**	**1,81**	**1,69**	**1,84**
% Extra	**10%**	**73%**	**40%**	**26%**	**36%**

As can be seen from the production trends of soy beans there is an increasing demand for the product. This is definitely a positive signal from the market to the farmer who would like to start producing soy beans or increase his previous production.

What is interesting is the relationship of the average national yields realised between soy beans and sunflowers as can be seen in the chart above. Over four years the yield of soy beans has been 36% more on average than sunflowers.

If you have experienced this yield difference on your farm this factor can be used to calculate the total income realised when doing your gross margin analysis. Always use the production averages realised in your farming operation if the data is available.

The closing prices of the May 2012 futures contracts on the JSE for soya are in the region of R3 600 per ton and for sunflowers about R4 080 per ton. These prices take into consideration all the factors such as oil seed stock levels, rand to dollar exchange rate, weather conditions and future market demand from the feed and other industries for oil cake and oil.

The use of soya oil cake is in the region of 958 000 tons per year and makes up to about 14,75% of the feed rations manufactured in South Africa. Local production of oil cake available to the feed industry is 152 000 from the 387 360 tons produced by local expellers. Local expelling tonnage has risen from the 103 520 tons produced the previous year. Imported soya oil cake is about 989 558 tons. At a cost of R3 200 this importation costs the country some R3,1 billion rand in foreign exchange.

There is thus a huge opportunity for local production of soy beans to be increased. The limiting factor is the oil cake production facilities using hexane to extract the oil and so the capacity of producing high quality soya oil cake demanded by the feed industry is limited.

The approximate composition of soy bean seed is 40% protein, 21% oil, 34% carbohydrates and 5% ash. Soy bean oil cake meal makes up 60% to 70% of the value of soy bean with balance coming from oil.

Soya oil cake is used in the composition of balanced rations in the feeding of chickens in various divisions of the poultry industry, pigs and cattle finishing.

Gross margin comparison

Working on national average yields the gross income from sunflowers per hectare and assuming a R200 transport differential would be calculated as follows:

1,35 tons per hectare x R3 880 per ton = R5 238 income per hectare.

Futures soya prices are quoted at zero differential price so that the calculation for income of soya's using the national average yields would be as follows:

1,84 tons per hectare x R3 600 per ton = R6 624 income per hectare.

The income from soy beans per hectare is thus R1 386 more or 26% more than sunflowers.

Each farmer would have to work out his potential yields after assessing his soil, climate and production system. The silo differential for sunflowers in your area can also be used to calculate a more accurate total income per hectare for your own farm.

Physical production advantages

Other advantages of producing soy beans on your farm are bringing a legume into your crop rotation of wheat, maize, sunflowers and soy beans. This will help in the weed control programme and condition of the soils in the crop rotation.

The soy bean crop has a root crop that can grow at a rate of between 25 mm and 50 mm a day. Soy bean plant roots can reach upto 1,8 metres in a season. The plant can thus help alleviate root compaction and brings nutrients from the soil profile for use by other crops.

Soy bean plants have a symbiotic relationship with the rhizobium bacteria which if well inoculated will form nodules on the roots. These nodules in turn capture nitrogen from the atmosphere and can put back between 20 kg and 70 kg of pure nitrogen into the soil. This organic nitrogen becomes available to the next crop.

The saving of nitrogen in the fertiliser recommendations for the next summer crop will result in substantial savings on the cost of nitrogen. Nitrogen fertiliser costs about R9,50 per kilogram. At a nitrogen fixation level or build up of 50 kg per hectare from active nodulation this could result in a saving of R475 per hectare in future fertilisation costs. Farmers also usually experience increased production in the crops following soy beans.

ARTICLE SUBMITTED BY A RETIRED FARMER

The door is open to strongly consider production of soy beans on your farm.

Soy beans

Soya seed is made up of 38% protein, 18% oil, 15% soluble carbohydrates, 15% fibre, and 14% moisture and minerals. Due to the combination of high protein and oil soy beans are regarded as the world's miracle crop. Nitrogen is a major building block in the production of protein and so soy beans have a high demand for nitrogen compared to other crops.

Nitrogen fixation

Fortunately soy beans have developed a mutually beneficial relationship, known as a symbiotic relationship, where the plant acts as a host or home for a particular bacteria and this bacteria has the ability to collect nitrogen from the atmosphere and in turn makes this available to the plant. Plants that can thus fix nitrogen in the soil are known as legumes.

The atmosphere is 78% nitrogen gas but plants cannot use it directly. Plants can only use nitrogen in the ammonium or nitrate form. The rhizobium bacteria that ensures that the nitrogen is captured from the atmosphere and transferred to the plant is known specifically as Bradyrhizobium Japonicum. The plant supplies the bacterial colony directly with carbohydrates and minerals and the bacteria transforms the atmospheric nitrogen into a form that can be used by the plant.

The bacteria live in compartments called bacteroids of which up to 10 000 make up a nodule. This can be seen as a visible pea sized whitish coloured round mass which is formed on the plant roots.

Soy beans need about 85 kg of nitrogen per ton of seed produced. A crop with an average yield of two tons will need 170 kg of nitrogen per hectare. Biological fixation of nitrogen accounts for between 50% and 80% of the soy beans total crop requirements.

Nodulation and inoculation

A very important aspect of successfully producing soy beans is therefore ensuring that very good to excellent nodulation occurs.

Inoculation is the application of the specific rhizobia bacteria to the soy bean seed before or at planting. Inoculants can be purchased in various forms including liquids, frozen preparations, peat-based, dry powder based and in granular form. Some important factors to remember are:

- Follow the manufactures mixing instructions closely.
- Do not expose inoculated seed to light prior to planting and only mix enough seed for the area that will be planted that day. Always keep the inoculant and inoculated seed out of the sun in a cool shaded area.
- Some seed treatments are toxic to the bacteria. Make sure your seed supplier has not used Captan or PCNB in their seed treatment programme.
- Consider adapting your planter to be able to spray the mixed inoculant directly onto the seed into moist soil behind the seed tyne or coulter disc opener. Such systems and attachments are available at a low price on the local market.
- Do not plant in extreme heat or cold. Ideal soil temperatures for planting are between 15°C and 27°C. In sandy soils in the Western Free State very poor nodulation can occur when planting from October to December from 10h00 to 14h00 in the day due to excessive day heat in this period.
- Inoculate your seed every year even if you have planted soyas on that land the previous season.

– the world's miracle crop

Checking nodulation effectiveness

The farmer should be very attentive at planting time and then begin checking for nodule formation a few weeks after planting. By about five to six weeks after planting the nodule should already be large and active by this time. If nodulation is not good one can examine what factors at planting where not adhered to and so provide answers to the possible problems. The lessons learned can be used to improve the inoculation technique for planting into the current season and the next.

If there is not enough nodulation, supplemental nitrogen will have to be applied to ensure a profitable crop. Use a spade to carefully dig around the plants and to remove the roots and any developing nodules together. Nodules are easily left in the soil if the roots are just pulled out.

There should be 8 to 20 large (2 mm to 4 mm across) sized nodules per plant just prior to the flowering stage. Nodules formed on the tap root are probably a direct result of this season's inoculation and nodules formed on the side roots are formed from bacteria already existing in the soil.

Small white nodules have not started to fix nitrogen yet. Use a pen knife and cut the nodules open. Nodules that are actively fixing nitrogen will be a pink to red colour. Green, brown or mushy nodules are not fixing nitrogen.

Poor nodulation and thus a nitrogen deficiency will show up as individual plants showing a yellowing or light green leaf colouring or rows or patches of discoloured and stunted plants.

Lands should be examined throughout the season to monitor the growth of nodules and the look of the crop. A soy bean crop in correct balance will display strong growth and very dark green leaves.

If you suspect that there is a problem seek advice from your seed company representative or agent and look at some of the probable causative factors given below.

Poor nodulation and thus poor nitrogen fixation can be caused by the following factors:

- New lands with low populations of bacteria.
- Lands containing high levels of residual soil nitrogen from a previous forage legume such as lucern or high manure applications.
- Too dry a soil to sustain the bacteria.
- Flooded or saturated soil conditions lasting seven days or more and so depriving the soil and root nodulation system of air and especially oxygen.
- Soil pH below 5,7 or above 7,3.
- Compacted soils which also reduce the exchange of air between the soil surface and the roots.

ARTICLE SUBMITTED BY A RETIRED FARMER

This special feature is made possible by the contribution of the Oil and Protein Seeds Development Trust.

The use of kraal manure as fertiliser

For centuries farmers have spread livestock manure on the land as a way of improving soil properties and for crop production. In past years, these fertilisers were the main, if not the only source of nutrition for food production. Since organic fertilisers contain relatively low concentrations of nutrients and handling them is labour intensive, they have largely been replaced by inorganic fertilisers as a nutrient source for growing crops.

The economic value of manure is related to its fertiliser replacement value, its organic matter content, its ability to improve soil physical properties and to enhance crop production. Manure has two important effects on soil properties:

1. They supply nutrients; and
2. They enrich the soil with organic matter, which improves the soils' physical properties such as soil structure, water infiltration rate, water holding capacity, soil aeration and soil tilth.

The beneficial effect of organic fertiliser on soil's physical properties has a major advantage over inorganic fertiliser. Wherever possible, manure from animal kraals should be used in gardens and lands.

Many factors affect the concentration of nutrients in manures. The composition of manure depends on the quality of the feed that the animal eats, the richer the feed is in proteins, the richer the manure is in nitrogen. Similarly the more phosphorus and potassium there is in the feed the more there is in the manure. Manure starts to decompose as soon as it is deposited by the animal. If the manure is exposed and allowed to dry out, much of the nitrogen will volatilise (be lost to the air). Potassium may be lost from manure, as a result of leaching by rain.

Approximately 70% - 80% of N, 60% - 65% of P and 80% - 90% of K, fed to animals is excreted in the manure. The high nutrient return in manure permits a recycling of plant nutrients from crop to animal and back to the crop again. To minimise losses of nutrients during storage, manure can be heaped and covered. Manure should not be stored for a long time and should be worked into the soil as soon as possible.

Rough guidelines of Nitrogen (N), Phosphorus (P) and Potassium (K) concentration in cattle manure are N - 1%, P - 0.5% and K - 1.0%.

However, many factors affect the composition of manure, so this is a very rough guideline. The amount of nutrients contained in manure and their eventual uptake by plants will vary from place to place.

The major factors affecting nutrient content are:

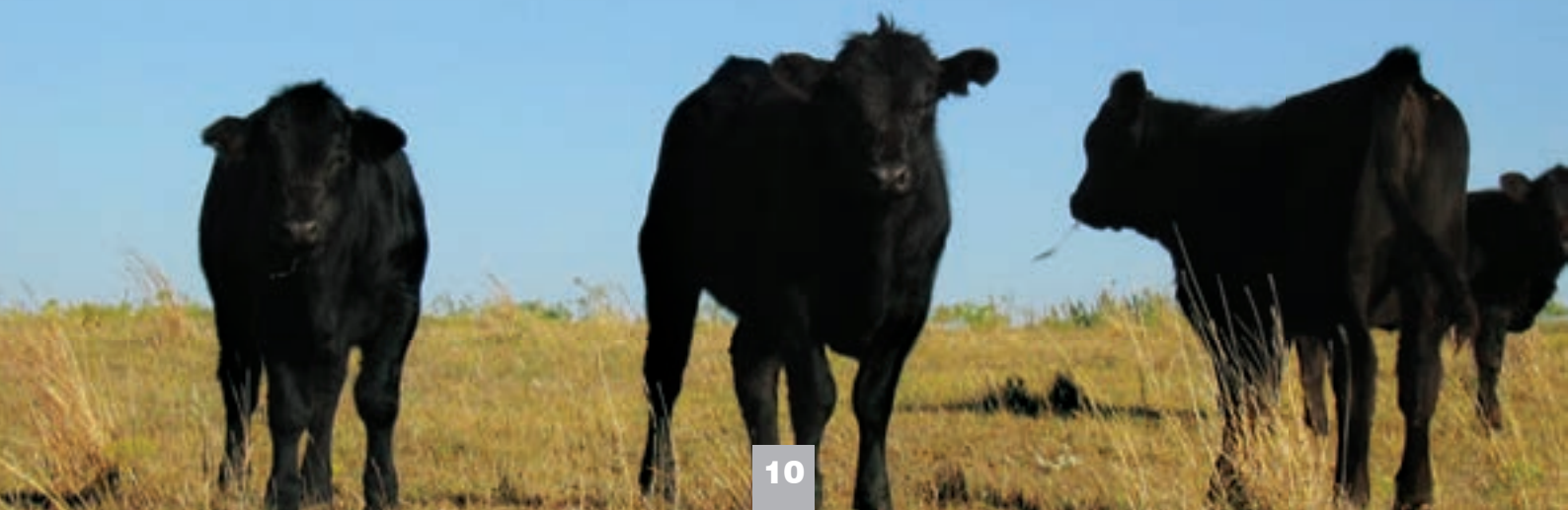
1. Composition of feed ration.
2. Method of manure collection.
3. Method of manure storage.
4. Method and timing of application.
5. Characteristic of soil and crop to which manure is applied.
6. Climate.

Generally for the growing of maize grain, the requirement for a 4T crop is 50 N, 22P and 120 K.

Not all the nutrients in manure are readily available for uptake by the plant. Much of the nitrogen and phosphorus in manures is bound or held by organic matter and only becomes available to the plant when they decay. However all of the potassium in the manure is readily available for uptake by the plant.

In cattle manure only about 20% of the total N and about 40% of the total P becomes available, in the year of application. Using cattle manure, a reasonable application would be 20T/ha or 20kg/10m². This is about a five litre bucket per square metre. This amount of manure would supply a reasonable amount of P and lot of K, but a top dressing of LAN would be required.

Nutrients supplied by manure per kg/ha			
Rate T/ha	**N**	**P**	**K**
5	10	10	50
20	40	40	200



A 50 kg bag of 2:3:2 (38) would contain 5,4 kg N, 8,14 kg P and 5,4 kg K.

So by using the table above, one should be able to determine how much manure would be required to achieve the target yield. The only way one can determine what the soil nutritional status is, is by doing a soil sample, which would indicate how much N, P and K is required.

The effectiveness of manure as a fertiliser is based on the nutrients it contains that are not supplied in adequate amounts by the soil. Therefore, the short-term fertiliser rand value of manure is equal to the cost of the fertiliser that would have to be purchased, had manure not been applied. In lands where the soil levels of P and K indicate that they are in adequate supply, only the fertiliser nitrogen value should be considered.

Lands that are marginally adequate in P and K will require more P and K at a later date, if it were not for manure inputs. Manure may assist in the correction of soil acidity as well as soils with poor physical characteristics such as poor tilth, cloddiness, low infiltration may be improved.

An expenditure that markedly improves nutrient recycling, environmental quality of your management ability, is a good investment.

Usually the ratio of N, P and K in manure does not match the ratio of the amount of these nutrients needed by the crop, therefore, complete utilisation is rarely accomplished. The goal of a well managed crop is to develop a soil fertility program that utilises manure to supply as much of the needed plant nutrients as possible, with commercial fertiliser providing only what is additionally required.

It requires some planning to arrive at the application rate that best fits a particular crop, considering:

1. The nutrient requirement of the crop.
2. The nutrient content of the manure.
3. The application rate of the manure.
4. The quantity of commercial fertiliser needed in addition to the manure.

Timing and method of manure application determines the efficiency of nutrient recycling. Consider these factors when applying manure:

1. Incorporating manure immediately reduces ammonia loss.
2. Applying manure as close to planting as possible to reduce nutrient loss.
3. Manure must be spread uniformly.
4. Avoid over-applications of commercial fertiliser.
5. Soil sample recommendations should be followed to ensure a proper balance of nutrients.
6. Keep a record of nutrient levels of the lands and use this as a basis for adjusting manure applications and soil fertility programs.

IAN HOUSEHAM, PROVINCIAL CO-ORDINATOR OF THE GRAIN SA FARMER DEVELOPMENT PROGRAMME

Preventing spray drift on your crops

MANY FARMERS THESE DAYS PLANT A VARIETY OF CROPS ON THEIR FARMS. IN A FALLOW SYSTEM THAT INCLUDES CROP ROTATIONS OF WHEAT, SUNFLOWERS, SOY BEANS, SORGHUM, MAIZE, POTATOES AND PASTURES MANY DIFFERENT CHEMICALS WILL BE SPRAYED DURING VARIOUS STAGES OF CROP GROWTH DURING THE YEAR.

Farms that are close to urban areas and to high value intensive irrigated crops under shade cloth, perennial fruit trees, vines, vegetables and others, must be very cautious when carrying out a spraying application because the chemicals drift on the wind. Caution must be exercised not to damage other crops on one's own farm and especially your neighbours. A high cost legal claim can be paid in the event that any high value crops are damaged.

Spraying conditions

Farmers must always check the local weather forecasts and conditions before and during spraying. A high wind, too high pump pressure and the wrong nozzles and boom height settings can cause serious spray drift across your own farm into adjoining lands and your neighbour's lands. Some factors to keep in mind are:

- Spraying during high wind and variable weather conditions.
- Spray droplets that are too small.
- Incorrect boom height.
- Too fast travelling speed of the spray unit over the land.
- Chemical products and mixes that evaporate easily during and after spraying.
- Different crops that are planted very close together with no buffer zones between them.
- High operating pressures reduce droplet sizes and increase spray drift.
- Low application rates used with smaller nozzles can also increase the possibility of drift.

At some times of the year spraying conditions will only be ideal during part of the day or night. Contractors with sophisticated GPS and GIS on their machines can spray a large area during a still night.

Always know or point out sensitive areas to your contractor and notify your neighbours that you will be spraying a particular crop using particular chemicals. Your neighbours have the opportunity, before any damage is done, to point out any crops that could be affected.

Assess and reassess weather conditions such as rain and cloud cover and temperature throughout the day or night.

What is the correct temperature to spray?

Digital weather meters that measure the difference between wet bulb thermometer temperature and the dry bulb thermometer temperature are available. The wet bulb temperature is subtracted from the dry bulb

PULA IMVULA

This publication is made possible by the contribution of the Maize Trust.

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PULA IMVULA IS AVAILABLE IN THE FOLLOWING LANGUAGES:
English,
Afrikaans, Tswana, Sesotho, Sesotho sa Leboa, Zulu and Xhosa.

Our aim is to produce the best publication possible. Please direct any comments on the editorial content or presentation thereof, to Jane McPherson.

Preventing spray drift on your crops

to obtain a value measured in degrees centigrade. This known as a Delta T measurement of the prevailing weather conditions.

The meters also have a built in wind impeller that can accurately measure the wind speed. This measurement is directly related to the evaporation or survival of a spray droplet. If this measurement reaches between two and eight it is advisable to stop spraying. In hot weather conditions with low humidity or low moisture content of the air, the droplet will disappear before the plant has had time to absorb the chemical. In very hot dry conditions the droplet might not even reach the leaves of the plants. If the conditions go together with high wind conditions effective spraying becomes impossible.

Low Delta T readings can cause small droplets to remain suspended and not fall onto the weed targets. In hot dry conditions weeds can be so stressed that the uptake of the chemical in the droplets is minimal. In these conditions the percentage weed kill will be low.

The ideal range of from two to eight measured in degrees centigrade can occur between dry bulb temperatures of 0 and 50 degrees celsius and 10% to 80% humidity. In other words ideal spraying can still occur at low temperatures with low relative humidity or at high temperatures with high humidity.

It is virtually impossible to physically assess all these variables unless one has had years of experience of spraying in the correct conditions. As can be realised it is advisable to buy a Delta T meter so that accurate measurement can be made during the operation and when each tank of spray has been emptied between fills. The right decision of whether to continue or stop can then be made at any time during the day or night.

Taking the prevailing temperature into account the basic rules are:

- Don't spray during daytime in hot low wind speeds when there is a high updraft of air. One can observe this condition from looking at any smoke stacks in the area.
- Don't spray at night in low wind speed or at dusk with calm clear skies as there is a risk of spraying off target.
- Do spray in the mornings or night when there is a light cool breeze which will be ideal for optimum spraying conditions.

ARTICLE SUBMITTED BY A RETIRED FARMER