GRAANGIDS
GRAIN GUIDE

JOU KONTAKTE IN LANDBOU/YOUR CONTACTS IN AGRICULTURE

2017

GRAAN SA GRAIN

GRONDSUURHEID

WYS IN JOU WINSTE

Jou voorkeur kalkverskaffer

Grasland se geregistreerde landboukalk is 'n bewese grondsuurneutraliseerder wat oortuigende resultate in jou winste sal lewer. Gesonde grond verseker 'n verbeterde oes van voortreflike gehalte en opbrengs.

Praat met ons om jou kalkregstellings te finansier oor 'n periode van tot en met drie jaar, in samewerking met ons Agri-besigheidsvennote.

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T&V geld

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Uitstaande gehalte en baanbreker strategie

Grasland



INHOUD/*CONTENTS*

PLAAGBEHEER/*PEST CONTROL*

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GELDSAKE/*MONEY MATTERS*

GRAAN SA/*GRAIN SA*



Seriously consider the how and where of reform

Following a season like the past one, agriculture is on everybody's lips again. This time, though, it is for the right reason: Food security. More specifically – affordable food security. During talks about successful land reform with sustainable production, politicians and economists have said that we will be able to import the shortages. A shortage during the past year in the main staple food of the nation, namely white maize, completely contradicted this assumption.

The main reason is affordability. Food inflation literally consumed the disposable income of consumers and we can see this clearly in the rural areas: The consumers are suffering; businesses are suffering; even economists concede that the drought is one of the most important reasons for the low growth rate in South Africa – something they would never have admitted in the past.

Currently, the land-reform debate is relatively quiet, because the government's focus is ostensibly in other places. However, we could actually see the much stronger drive towards sustainable reform during the course of the drought – different to the past. The intensity of the debate and the pressure will presumably only increase with the run-up to the national elections in 2019.

From the past it is evident that that the private sector must drive and probably come up with, these plans more and more. The best plans usually come from practice and not necessarily from the pens of the educated people. There are various examples, particularly in other industries, where partnerships work well – to the benefit of all interest groups. However, in grain farming these examples are still rare.

I urge grain producers to seriously consider how and where they want to reform and even if they can afford to do it. Preferably do it where it can benefit all the interest groups, and not only one.

The past season forces all of us to seriously evaluate and analyse what we want to do in our own farming operations. No place exists for unnecessary practices and expenses producing no return. Analyse your input costs in particular. There are certain things that we were used to doing through the years – with good reason – that now, with improvement and innovation in technology, are no longer cost-effective.

Here the Grain Guide is of immeasurable value. It puts you, as producer, in touch with everything new technology can offer you, as well as with contacts and comparisons. Use this Grain Guide to refresh your know-how regarding new products, practices and technology, lowering input costs without compromising on the outcome or possible performance. However, following many difficult years, take care not to adapt practices to such an extent that you suffer during the easy years. Remember that, just like the weather, agriculture has cycles. Adapt quickly enough to be able to analyse seasons, but slowly enough not to lose that which has proved to be the best practices over the years!

May the Heavenly Father guide and bless you during the coming season!
Happy farming!

Jaco Minnaar
Chairperson: Grain SA

Grain SA wishes you a speedy recovery – on all fronts

Following the destructive drought in the Western Cape and north-western parts of our grain production areas, the hope for a new recovery season is the main thing on everybody's minds. The Western Cape has already shown beautiful signs of recovery, but at the time this article was written, we were still waiting on rain for the summer crops.

The elders allege that it could take a grain producer up to five years to recover after such a cripplingly dry year. I have learnt during the past year that there are always people in the country who care about someone else's suffering. The voluntary hands of support extended towards agriculture from across our communities is something that we will remember for a long time. However, it is unfortunately also true that consumers' memories are short when it comes to certain things, like where food comes from, particularly the fact that when food prices drop, producer prices drop as well.

A recovery year requires you to formulate new plans and reflect carefully on all your expenses in contemplation of taking your business to profitability. Specifically take note of who helped you through the difficult times and did not back away from helping at organised agriculture level. There will invariably be those who made sure they stayed in the background during the drought and who will now come forward to claim your business. As a producer, you will again have the opportunity to decide who will be you partners on the farm. Many of our input providers did not hesitate to take money from their own pockets to support us during the past season. Let us remember that!

Research

Our research focus is nearly always aimed at higher yields. The sustainability of grain

production is important not only to our producers, but makes up an integral part of the country's food security. Our ability to secure new partnerships with the government in order to obtain more funding for research will certainly be crucial. Water will not be important only in the future. That is why the past season has proved that conservation tilling – of whatever nature – is an important element of sustainability. The attempts to start a technology fund, with the idea of bringing seed technology to South Africa, might also promise better yields.

Policy environment

The benefit of the drought was that it again focussed the attention of policymakers on agriculture. More and more people realised just how important rain can be for food prices. When tariffs are being revised or levies are introduced, it is important knowledge that can guide policymakers. Even priorities in connection with new infrastructure were affected by this dry year. Land reform is and will remain a challenge that is not progressing adequately yet. The drought almost completely halted the momentum of the past. However, it is encouraging that all government's initiatives to grow the economy start with agriculture. It is very encouraging that agriculture is still seen as the driving force for economic growth.

In conclusion

Like so many others, Grain SA wants to wish you, as producer, a good year. Even more than that, we want to wish you recovery – to you, your loved ones and the employees on your farm. This includes recovery for relationships, recovery for your land's production capacity and growth in your relationship with your Maker.

Jannie de Villiers
CEO, Grain SA

Handy contact details

Organised agriculture

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Agri SA	*agrisa@agrisa.co.za*	012 643 3400
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Milk Producers Organisation (MPO)	*info@mpo.co.za*	012 843 5600
Transvaal Agricultural Union (TLU SA)	*tlu@tlu.co.za*	012 804 8031
Free State Agriculture	*info@vslandbou.co.za*	051 444 4609

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Department of Trade and Industry	*contactus@thedti.gov.za*	086 184 3384
Department of Agriculture, Forestry and Fisheries	*SteveGAL@daff.gov.za*	012 319 6000
Department of Rural Development and Land Reform	*queries@drdlr.gov.za*	012 312 8911
Department of Mineral Resources	*enquiries@dmr.gov.za*	012 444 3000
Department of Environment Affairs	*callcentre@environment.gov.za*	086 111 2468
Department of Tourism	*callcentre@tourism.gov.za*	012 444 6000
Department of Water and Sanitation	*centralp@dws.gov.za*	012 336 7500
Department of Transport	*KhozaC@dot.gov.za*	012 309 3774
Gauteng Provincial Government	*bmkhize@gpl.gov.za*	011 498 5555
Industrial Development Corporation	*callcentre@idc.co.za*	011 269 3000
International Trade Administration Commission (ITAC)	*ipmatsepane@itac.org.za*	012 394 3591
KwaZulu-Natal Provincial Government	*info@kznlegislature.gov.za*	033 355 7600
Limpopo Provincial Government	*mathivak@premier.limpopo.gov.za*	015 287 6000
Mpumalanga Provincial Government	*premierregistry@prem.mpg.gov.za*	013 766 2494
National Agricultural Marketing Council (NAMC)	*info@namc.co.za*	012 341 1115
National Crop Estimates Committee (NCEC)	*RodneyD@daff.gov.za*	012 319 6507
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Free State Provincial Government	*legislature@fsl.gov.za*	051 407 1100
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Western Cape Provincial Government	*info@wcpp.gov.za*	021 487 1600

Integrated pest control

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Association of Veterinary and Crop Associations of South Africa (AVCASA)	*hettie@avcasa.co.za*	011 805 2000
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Registrar: Act No. 36 of 1947	*gilbertn@nda.agric.za*	012 319 7252
Redbilled Quelea Control Centre	*khulisog@daff.gov.za*	012 309 5823
South African Animal Health Association (SAAHA)	*info@saaha.co.za*	011 805 2000

Agricultural Research Council

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ARC-Grain Crops Institute	*jamesm@arc.agric.za*	018 299 6100
ARC-Institute for Soil, Climate and Water	*adril@arc.agric.za*	012 310 2500
ARC-Institute for Agricultural Engineering	*iaeinfo@arc.agric.za*	012 842 4017
ARC-Irene Animal Improvement Institute	*ulecuona@arc.agric.za*	012 672 9111
ARC-Small Grain Institute	*burgere@arc.agric.za*	058 307 3400
ARC-Onderstepoort Veterinary Institute	*ovi-info@arc.agric.za*	012 529 9111

Fertiliser

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Markets

Animal Feed Manufacturers Association (AFMA)	*admin@afma.co.za*	012 663 9097
Arbitration Foundation of South Africa (AFSA)	*info@arbitration.co.za*	011 320 0600
Agbiz Grain	*lizbe@agbizgrain.co.za*	012 807 3002
National Wool Growers Association (NWGA)	*nwga@nwga.co.za*	041 365 5030
National Chamber of Milling (NCM) – wheat and maize	*info@grainmilling.org.za*	012 663 1660
Perishable Products Export Control Board (PPECB)	*achmadh@ppecb.com*	021 930 1134
SA Soyfood Association (SASFA)	*info@ssa.org.za*	012 807 7600

Continued on p. 8

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Continued from p. 7

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South African Cereals and Oilseeds Trade Association (SACOTA)	*sacotaadmin@afma.co.za*	012 663 9097
South African Grain Information Service (SAGIS)	*info@sagis.org.za*	012 941 2050
Southern African Grain Laboratory (SAGL)	*info@sagl.co.za*	012 807 4019
Red Meat Producers Organisation (RPO)	*admin@rpo.co.za*	012 348 1933

Tractors, harvesters and implements

South African Agricultural Machinery Association (SAAMA)	*agfacts@worldonline.co.za*	011 453 7249
South African Institute of Agricultural Engineers (SAIAE)	*boeboe@saili.co.za*	012 842 4043

Seed

South African National Seed Organisation (SANSOR)	*lukeshni@sansor.co.za*	012 472 9518

Trusts and foundations

Maize Trust	*l-loperation@mweb.co.za*	012 807 3958
Oil and Protein Seeds Development Trust (OPDT)	*info@opot.co.za*	011 234 3400/1
Protein Research Foundation (PRF)	*maria@proteinresearch.net*	011 234 3400
Sorghum Trust	*l-lagric@mweb.co.za*	012 333 3429
Winter Cereal Trust	*simon.letsoalo@wctrust.co.za*	012 007 1200

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Cedara College of Agriculture (KwaZulu-Natal)	*johan.vanveenendal@kzndae.gov.za*	033 355 9314
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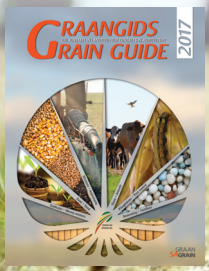
University of Stellenbosch	*info@sun.ac.za*	021 808 9111
University of Venda	*communications@univen.ac.za*	015 962 8000
University of KwaZulu-Natal	*enquiries@ukzn.ac.za*	031 260 1111
University of Zululand	*JanseVanRensburgD@unizulu.ac.za*	035 902 6798
University of South Africa	*infoservices@unisa.ac.za*	012 429 3111

Emergency numbers

Petrol and diesel spillage		
• Spill Response Team	*info@marlowsa.com*	011 280 4160
• Drizit SA	*drizit@iafrica.com*	031 274 2300
• Enviroserv	*clientservices@enviroserv.co.za*	080 019 2783
• Rapid Spill Response	*info@rapidspillresponse.com*	080 017 2743
Chemical spillage		
• Griffon Poison Information Centre	*nesher@tiscali.co.za*	082 446 8946
• South African Petroleum Industry Association (SAPIA)	*info@sapia.co.za*	011 783 7664
Fire		
• Fire Protection Association of South Africa (FPASA)	*library@fpasa.co.za*	011 397 1618/9



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Conversion tables and formulae

WEIGHT

Wheat and soybeans

1 bushel of wheat or soybeans	= 60 lb
	= 27,216 kg
	= 0,0272 metric tons
	= bu x 0,027216
Bushels to metric tons	36,74371 bu wheat or soybeans
One metric ton is equal to:	
Wheat: bu/acre x 0,06725	= metric tons/hectare

Maize and sorghum

1 bushel of maize or sorghum	= 56 lb
	= 25,4012 kg
	= 0,0254 metric tons
	= bu x 0,025400
Bushels to metric tons	39,3679 bu maize and sorghum
One metric ton is equal to:	
Maize: bu/acre x 0,06277	= metric tons/hectare

Barley

1 bushel of barley	= 48 lb
	= 21,772 kg
	= 0,0218 metric tons
	= bu x 0,021772
Bushels to metric tons	45,9296 bu of barley
One metric ton is equal to:	
Barley: bu/acre x 0,05380	= metric tons/hectare

Oats

1 bushel of oats	= 32 lb
	= 14,515 kg
	= 0,0145 metric tons
	= bu x 0,014515
Bushels to metric tons	68,8944 bu of oats
One metric ton is equal to:	
Oats: bu/acre x 0,03587	= metric tons/hectare

TEMPERATURE

°F	°C
32	0
40	4,4
50	10
60	15,6
70	21,1
75	23,9
85	29,4
95	35
100	37,7
105	40

C = 5/9 (F - 32) F = 9/5 (C + 32)

FOR CONVERSION; MULTIPLY BY…

Foot to metre	: 0,3048
Metre to foot	: 3,281
Metre to yard	: 1,094
Gallon to litre	: 4,546
Litre to gallon	: 0,22
Morgen to hectare	: 0,8565
Kilometre to mile	: 0,6214
Mile to kilometre	: 1,609
Pound to kilogram	: 0,4536
Pound to gram	: 453,6

AREA OF LAND EQUIVALENTS

1 hectare	= 2,4710 acres
1 square mile	= 640 acre (259 hectares)
1 acre	= 0,404694 hectares
	= 43,560 square feet
	= 4,4800 square yards

OTHER

1 kilogram = 2,204622 pound
1 quintal = 100 kg
1 metric ton = 10 quintal
= 1 000 kg

1 TON (METRIC TON) IS EQUAL TO

= 1 cubic metre of water
= 1 000 litres
= 10 hundredweights
= 10 quintals

METRIC WEIGHT AND CONVERSION

100 kilogram = 1 quintal
1 kilogram = 2,240 622 lb
1 quintal = 220,462 lb

ESTIMATED CAPACITY OF RESERVOIRS (IN LITRES)

DIAMETER IN METRES	DEPTH IN METRES				
	1,2 m	1,5 m	1,8 m	2,1 m	2,4 m
3	8 600	10 760	12 900	15 000	17 200
3,6	12 200	15 300	18 300	21 800	24 400
4,2	16 650	20 800	25 000	29 200	33 300
4,8	21 700	27 200	32 600	37 900	43 400
6	34 000	42 500	51 000	59 400	68 000
7,5	53 000	66 000	75 600	92 700	108 000
9	76 500	95 500	114 700	134 000	150 200
10,5	104 000	130 000	155 800	182 000	207 900
12	126 000	170 000	203 500	237 000	271 000
13,5	172 000	241 000	257 500	300 000	344 000
15	212 000	266 000	318 200	372 000	425 000
16,5	257 000	321 000	385 000	450 000	514 000
18	306 000	382 000	458 000	534 000	610 000

MOISTURE CONTENT ON DELIVERY

Grain is seldom sold at the standard moisture content. When the moisture content is greater than the standard, the weight of the grain is discounted to make provision for the additional moisture.

The following moisture content standards are used as condition for the delivery of commodities at silos:

	Delivered	Agreed standard
Sorghum	≤ 14%	12,5% – dry
Wheat	≤ 13%	
Maize	≤ 14%	12,5% – dry
Soybeans	≤ 13%	12% – dry
Sunflowers	≤ 10%	9% – dry
Groundnuts	≤ 7%	
Canola	≤ 8%	
Barley	≤ 13%	
Oats	≤ 13%	

For example: Maize is delivered at a moisture content of 14%.

Formula: $\frac{(100\% - \text{delivery }\%)}{(100\% - \text{standard }\%)}$

$= \frac{(100\% - 14\%)}{(100\% - 12{,}5\%)}$

$= \frac{86\%}{87{,}5\%}$

$= 0{,}9828$

By multiplying the weight of the grain delivered by 0,9828, the weight of the maize is calculated at a moisture content of 12,5%, for example the weight of a load of maize of 32 000 kg delivered at 14% moisture is (32 000 kg x 0,9828) 31 449,6 kg @ 12,5% moisture content.

Rainfall calendar 2017

	JAN	FEB	MAR	APR	MAY	JUN
1	Sun	Wed	Wed	Sat	Mon	Thur ◐
2	Mon	Thur	Thur	Sun	Tues	Fri
3	Tues	Fri	Fri	Mon ◐	Wed ◐	Sat
4	Wed	Sat ◐	Sat	Tues	Thur	Sun
5	Thur ◐	Sun	Sun ◐	Wed	Fri	Mon
6	Fri	Mon	Mon	Thur	Sat	Tues
7	Sat	Tues	Tues	Fri	Sun	Wed
8	Sun	Wed	Wed	Sat	Mon	Thur
9	Mon	Thur	Thur	Sun	Tues	Fri ○
10	Tues	Fri	Fri	Mon	Wed ○	Sat
11	Wed	Sat ○	Sat	Tues ○	Thur	Sun
12	Thur ○	Sun	Sun ○	Wed	Fri	Mon
13	Fri	Mon	Mon	Thur	Sat	Tues
14	Sat	Tues	Tues	Fri	Sun	Wed
15	Sun	Wed	Wed	Sat	Mon	Thur
16	Mon	Thur	Thur	Sun	Tues	Fri
17	Tues	Fri	Fri	Mon	Wed	Sat ◐
18	Wed	Sat ◐	Sat	Tues	Thur	Sun
19	Thur	Sun	Sun	Wed ◐	Fri ◐	Mon
20	Fri ◐	Mon	Mon ◐	Thur	Sat	Tues
21	Sat	Tues	Tues	Fri	Sun	Wed
22	Sun	Wed	Wed	Sat	Mon	Thur
23	Mon	Thur	Thur	Sun	Tues	Fri
24	Tues	Fri	Fri	Mon	Wed	Sat ●
25	Wed	Sat	Sat	Tues	Thur ●	Sun
26	Thur	Sun ●	Sun	Wed ●	Fri	Mon
27	Fri	Mon	Mon	Thur	Sat	Tues
28	Sat ●	Tues	Tues ●	Fri	Sun	Wed
29	Sun		Wed	Sat	Mon	Thur
30	Mon		Thur	Sun	Tues	Fri
31	Tues		Fri		Wed	

● *New moon* ◐ *First quarter* ○ *Full moon* ◑ *Last quarter*

JUL	AUG	SEP	OCT	NOV	DEC	
Sat ◑	Tues	Fri	Sun	Wed	Fri	1
Sun	Wed	Sat	Mon	Thur	Sat	2
Mon	Thur	Sun	Tues	Fri	Sun ○	3
Tues	Fri	Mon	Wed	Sat ○	Mon	4
Wed	Sat	Tues	Thur ○	Sun	Tues	5
Thur	Sun	Wed ○	Fri	Mon	Wed	6
Fri	Mon ○	Thur	Sat	Tues	Thur	7
Sat	Tues	Fri	Sun	Wed	Fri	8
Sun ○	Wed	Sat	Mon	Thur	Sat	9
Mon	Thur	Sun	Tues	Fri ◑	Sun ◑	10
Tues	Fri	Mon	Wed	Sat	Mon	11
Wed	Sat	Tues	Thur ◑	Sun	Tue	12
Thur	Sun	Wed ◑	Fri	Mon	Wed	13
Fri	Mon	Thur	Sat	Tues	Thur	14
Sat	Tues ◑	Fri	Sun	Wed	Fri	15
Sun ◑	Wed	Sat	Mon	Thur	Sat	16
Mon	Thur	Sun	Tues	Fri	Sun	17
Tues	Fri	Mon	Wed	Sat ●	Mon ●	18
Wed	Sat	Tues	Thur ●	Sun	Tues	19
Thur	Sun	Wed ●	Fri	Mon	Wed	20
Fri	Mon ●	Thur	Sat	Tues	Thur	21
Sat	Tues	Fri	Sun	Wed	Fri	22
Sun ●	Wed	Sat	Mon	Thur	Sat	23
Mon	Thur	Sun	Tues	Fri	Sun	24
Tues	Fri	Mon	Wed	Sat	Mon	25
Wed	Sat	Tues	Thur	Sun ◑	Tues ◑	26
Thur	Sun	Wed	Fri	Mon	Wed	27
Fri	Mon	Thur ◑	Sat ◑	Tues	Thur	28
Sat	Tues ◑	Fri	Sun	Wed	Fri	29
Sun ◑	Wed	Sat	Mon	Thur	Sat	30
Mon	Thur		Tues		Sun	31

● New moon ◐ First quarter ○ Full moon ◑ Last quarter

Agricultural management strategies for climate change

Strategies and actions to adapt to climate change will be needed in multiple areas in the agricultural sector. **Farms will need to be managed differently to reduce the risks posed by climate change.** *It will be crucial for producers to maximise gains and minimise losses of water, either from rainfall or irrigation.*

In cropping systems, climate change and variability may affect soil health and plant growth through:

- Reduced or erratic rainfall and more frequent and severe periods of drought that lower the capacity of soils to make water and nutrients available to plants.
- More intense rainfall events that increase the risk of soil erosion by water and wind (through rain splash, accelerated runoff, strong winds).
- Increased heat waves and soil surface temperatures with greater rates of mineralisation of soil organic matter (SOM).

One of the most important sets of tools in our adaptation tool box will be innovative conservation agriculture (CA) systems and practices that improve soil health. Producers are encouraged to practise CA for multiple reasons, such as to improve productivity, minimise soil erosion, alleviate compaction and provide fodder for livestock, but it is also a primary tool for adapting to and mitigating the impacts of climate change. Reducing greenhouse gas emissions and sequestering carbon per kilogram of a given output might well be, for food security and agriculture, one of the main targets and opportunities. The following CA practices can be used by producers to simultaneously protect the productive capacity of land, the environment and sequester carbon:

- **Increase soil water-holding capacity by improving SOM content**. SOM is vital, particularly in sandy and silty soils, to produce soil aggregation, as it acts as a binding agent drawing together and holding individual soil particles into soil aggregates. A well-aggregated (structured) soil, particularly the topsoil where SOM is commonly greatest, has far greater ability to conduct, store and release to plants rain and irrigation water. SOM can retain about twenty times its weight in water. Higher SOM content will also make crops more resilient to drought by retaining additional water.
- **Use no-till planting to reduce soil disturbance, breakdown of SOM and soil structure, consequently losing less water through evaporation**. Specialised no-till planters, especially disc planters, minimise soil disturbance and soil degradation.

- **Increase organic soil surface cover**. Retained crop residues, in time, are a major contributor to increased SOM levels. With heavier rainfall, the increase in soil cover will help to increase infiltration rates, prevent water runoff, soil erosion, loss of valuable nutrients and loss of water through evaporation. Surface cover also buffers the soil against temperature extremes. Generation of adequate biomass (>6 t ha^{-1} yr^{-1} crop residues or at least 70% ground cover) and vigorous root development are crucial to adequately cover the soil surface and re-build SOM. Up to 70% of soil water could be lost from bare soil through evaporation only.
- **Using 'cover crops' to ensure year-round soil cover for protection against wind and water erosion**. These cover crops may be grown in the 'off season' between major cash crops to hold and protect soil and build SOM, biological diversity and soil structure for the benefit of subsequent 'cash' crops. Additionally, cover crops may be sown with cash crops such as maize (e.g. through relay- or intercropping), to provide year round soil protection of what is commonly bare soil, provide a 'catch crop' to capture rainwater, reduce water runoff and maximise infiltration; as well as enrich the topsoil through increased SOM and nutrient cycling. Careful selection, timing and management of the cover crop ensures minimal competition for stores of soil moisture between the cash and cover crops, and the selection of Nitrogen-fixing crops (grass/legume pastures) may help enhance soil fertility and subsequent yields of the main cash crop. Incorporate drought tolerant crops or cultivars into the cropping system where possible.
- **Diversify and lengthen cropping systems that enhance the build-up of SOM and soil structure**. Longer crop rotations or long-term (perennial) ley cropping and the use of shrubs and trees can also help break up pest and weed cycles, thereby reducing input costs and enhancing the soil's productive capacity. Utilising these crops with an ultra-high stock density grazing system has proven to be a very effective tool to accelerate the build-up of SOM.
- **Consider biological ameliorants such as biochar to improve soil health**. Biochar is a charcoal by-product created by burning biomass at slow and low heat. Appropriate biological ameliorants could have a number of benefits as a soil amendment, including improving nutrient adsorption and availability, improved habitat for soil microbes, soil tilth and improved soil water holding capacity. In addition, it is a means of sequestering carbon into the soil.
- **Engage in irrigation practices that improve water-use efficiency**. In many regions that already rely on irrigation, the climate is expected to become drier and create new demand for water-saving irrigation practices. In addition to conducting regular maintenance and audits on existing systems, many producers are recycling water, changing to drip systems and using precision irrigation to target specific areas of their fields with the exact amount of water needed.

Climate change poses real and substantial challenges for agriculture globally – challenges that the status quo is unlikely to meet. Effective adaptation management strategies offer the agriculture sector ways to manage risk and increase production while simultaneously improving soil, water, air quality, and biodiversity.

CA is a fundamental change in doing agriculture – it is NOT business as usual. Correctly applied CA is the core of a climate smart agriculture (CSA) – it can be complemented and combined with

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HANDLE INSPECTIONS FROM THE DEPARTMENT OF LABOUR LIKE THIS

In terms of the Basic Conditions of Employment Act ('the Act'), an inspector from the Department of Labour can visit and enter any place of work at any reasonable time without a warrant to determine if an employer adheres to the provisions of the applicable labour legislation. However, when the workplace is a residence, the inspector may only enter and investigate if the owner consents or if the inspector obtained prior authorisation from the Labour Court.

An inspector has several powers during these investigations, which include the following:
- The right to question any person regarding the work performed.
- To require any person in the workplace to provide information regarding the workplace in terms of the provisions of the applicable labour legislation. They may also require this information to be given under oath or confirmation.
- To inspect or copy any document or record relevant to the provisions of the applicable labour legislation. The documents can also be removed – if necessary – to enable the inspector to make copies.

Employers should be careful of people illegally impersonating inspectors from the Department of Labour and who specifically try to sell notices, posters, products and information to employers – often at ridiculous prices. These people falsely pretend to employers that their notices are outdated and that they should get new ones. Employers should note that the year in which the legislation is issued does not change with amendments to the act. In this way, for example, the Basic Conditions of Employment Act, Act 75 of 1997, is not outdated. The year 1997 stays unchanged, even if new amendments to the act are promulgated.

Employers have the right to request proper identification from the inspector:
- All inspectors should be in possession of an appointment certificate, which they have to present on request.
- The certificate should state which legislation the inspector is allowed to investigate, as well as the functions the inspector may exercise.
- The employer may also contact the Department of Labour to confirm the appointment.

Which legislation plays a role?

The purpose of the inspector's investigation is to determine if the employer complies with the requirements of applicable labour legislation with respect to the following:
- Basic Conditions of Employment Act
- Sectoral Determination 13 (applicable to the agricultural sector)
- Compensation for Occupational Injuries and Diseases Act
- The Employment Equity Act
- The Occupational Health and Safety Act
- Unemployment Insurance Act (UIF)

Aspects that the inspector will check on during an inspection by the Department of Labour

During an inspection, the inspector investigates certain aspects to determine if the employer complies with the requirements of the appropriate labour legislation. Generally the inspector

will request copies of contracts of employment and payslips, or even conduct interviews with the employees. Other aspects include the following:

- Proof that the employer is registered with the Unemployment Insurance Fund and the Compensation Commissioner and that the payments are up to date.
- That all work-related injuries and illnesses are reported to the Department of Labour.
- That notices with summaries of the Basic Conditions of Employment Act, the Employment Equity Act and the Occupational Health and Safety Act (if the employer employs more than five employees) are posted in areas to which employees have regular access. A copy of Sectoral Determination 13 (relevant to the agricultural sector) also has to be available to the employees.
- Proof that the employer pays at least the minimum wage.
- That an occupational health and safety representative and committee are appointed – if necessary. Proof of the minutes of the meetings held by this committee will be requested.
- Proof that the employees received training to identify health and safety risks.
- Proof that the employer keeps an attendance register of the employees' working hours.
- Whether there is a properly equipped first aid kit on the premises.
- Whether bathroom facilities for men and women are clean and hygienic.

Consequences of non-compliance

If the inspector concludes that the employer does not comply with the relevant legislation, they can issue an order of specific performance which, if not fulfilled, could be enforced by the Labour Court. Various fines, including jail time, can also be given to employers who do not comply with the applicable labour legislation.

Adv Ernst Richter SC, AEO

Agricultural management strategies for climate change

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other approaches to farming, such as organic farming, agroforestry, crop-livestock-integration, which only with the basic principles of CA will comply on all elements of a climate smart conservation agriculture.

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Dr Hendrik Smith, conservation agriculture facilitator, Grain SA

Which type of employment contract should I use?

The employment contract forms the basis of the relationship between the employer and the employee and affirms in writing the conditions of employment agreed upon during the interview. ***It is extremely important for the employer to implement the correct employment contract and make sure that the content adheres to relevant labour legislation.***

It is critical for employers to understand that a contract of employment cannot be changed or undone unilaterally. Prior discussions that led to the creation of the contract are usually irrelevant if they are not embodied in the terms of the contract. The contract also cannot contain terms that are contradictory, or less favourable than the terms of the applicable legislation – such terms are invalid and illegal.

Employers generally use the following types of contracts:

Verbal contracts

A verbal contract is valid, but it is very difficult, in most cases impossible, to prove the specific terms of the contract. Employers are therefore urged to not make use of verbal contracts. The Labour Relations Act also provides that fixed-term contracts for longer than three months, entered into with an employee earning less than the income threshold (currently R205 433,33 per annum), must be in writing.

Contracts with independent contractors

By law, an independent contractor is not regarded as an employee. Contracts entered into with independent contractors are similar to those with ordinary service providers and are regulated by civil law and actions. The Act, as well as various court judgments, determines that employees appointed as independent contractors and employed as regular employees should be seen as employees and not as independent contractors – despite the contract concluded with them. Employers are encouraged to get expert advice before these types of contracts are entered into or terminated.

Fixed-term contracts

A fixed-term contract is a contract that is automatically terminated in the following circumstances:

- Following a set period – for example from 1 January 2016 until 30 June 2016.
- With the occurrence of a specific event, for example when the employee was appointed to perform a specific service and the client terminates the service delivery agreement.
- With the termination of a specific project or task, for example the ending of a harvest.

Amendments to the Labour Relations Act, which came into effect on 1 January 2016, made material changes to fixed-term contracts. Among other things, the legislation provides that employees earning less than the income threshold (currently R205 433,33 per annum) and employed by the employer for longer than three consecutive months, must be appointed in terms of a written fixed-term contract. The reason for not appointing the employee permanently should be clearly stipulated in the contract. If the reason is no longer valid and the employee's contract is extended, the employee is regarded as a permanent employee. Employees appointed on a fixed-term contract for longer than two years are also entitled to a severance package similar to retrenched employees. However, there are employers who are excluded from these provisions – including employers with fewer than ten employees.

Permanent contracts

Most employees are appointed with permanent contracts. Ordinarily the contract can only be terminated once the employee reaches retirement age, dies, resigns, is dismissed due to misconduct or poor job performance or in the case of retrenchment. Ensure that the contract contains the following terms:

- A description of the parties, including addresses and contact details.
- The place of work, position of the employee, duties of the employee and policies applicable to the employee. The contract should also specifically state if the employer requires the employee to work in more than one work place.
- Any sectoral determination applicable to the parties (Sectoral Determination 13 is applicable to the agricultural sector).
- The date on which the employee was appointed.
- Any previous periods of employment with another employer that could be relevant to the current employment contract.
- The employee's working hours and the way in which the employee's salary and overtime will be calculated.
- Any other compensation, for example accommodation or medical contributions, to which the employee will be entitled.
- The periods and manner in which the employee will be paid (for example daily, weekly or monthly).
- Any deductions made from the employee's salary.
- The leave to which the employee will be entitled.
- The recommended retirement age of the employee.
- Terms regarding a probationary period, if necessary.
- Notice periods applicable to termination.
- Any restraint of trade applicable to the employment contract.

Employers should manage the business risks on a daily basis to ensure the profitability and sustainability of the business. The application of labour legislation is regarded as a specialist field and we therefore recommend that employers outsource labour risk to experts who can provide guidance if necessary and limit legal liability. In this way the employer is in a position to concentrate on his primary business: Agriculture.

Adv Ernst Richter SC, AEO

FARM SAFETY – questions that can save your life

Security status is a theme that is very topical these days and should be revisited regularly. Measure yourself against these questions and do something about the weaknesses. ***Being alert, observant and prepared will definitely help you in a difficult situation.***

- Is there an emergency plan for different incidents and does everybody know what to do then?
- Do you, your family and workers still apply the safety measures and do you practise the emergency plan regularly?
- Do you have a protocol in place to deal with, for example, uninvited visitors who come looking for work?
- Do you have a protocol in place to check and verify the identification of uninvited and invited visitors?
- Do you tend to follow a specific routine, for example, do you always stop in the same place when you come from town?
- Is there an early warning system for your farm and is it still effective?
- Are you always on the lookout for strangers on your farm?
- Will your employees report strangers and strange vehicles on your farm?
- Do you inform the community of possible suspect persons or vehicles in the area?
- Is the attitude of your employees such that they will protect your family if you are not there?
- Do you handle as little cash as possible and do your workers know that there is no real cash in the house or office?
- Do you approach all strangers with the necessary caution? (You never know whether they are armed or not.)
- Is the security fence still effective in combating undesirable access?
- Are the security doors and gates and burglar bars of your houses still effective and adequate?
- Is there a security gate in your home that can effectively separate the bedrooms from the rest of the house and do you lock this gate at night?
- Do you have a dog that sleeps in the house at night?
- Are the security lights and alarm system still effective and in working order?
- Are the guard dogs and alternative warning mechanisms still effective?
- Do you have alternative communication systems in addition to the landline or personal cellphones (for example, contact with the neighbours and the police or a hidden cellphone in a room)?
- Do your and your family's cellphones, as well as the hidden cellphone, contain a list of whom to contact in the case of an incident?
- Are the areas around your gates and at T junctions open so that a surprise attack is difficult to launch?
- Is your garden laid out in such a way that there are no easy hiding places?
- Do you have unique plans to ensure your safety and to outsmart criminals?

These are only a few questions to get your thoughts going. Every producer's circumstances and farming operation are unique, so put together your own complete list and be prepared!

Pietman Botha, agricultural consultant

SAAD/*SEED*

Steps to address seed quality problems

Undesirable seed quality can affect the success of your crop. It is important to address the problem as soon as possible to ensure it is done effectively.

If you suspect or experience any problems with seed quality, you should take the following steps:

- Contact the representative from whom the seed was bought as soon as possible and insist on an investigation on site. Also keep a record of dates and conversations.
- Gather and write down as much information as possible, take photos or make videos to refer back to later.

If the problem is not resolved, do not wait too long before considering the steps below:

- Contact an independent scientist to do an investigation on site.
- Inform Grain SA if the seed company cannot provide the required attention and solutions for the relevant problems.

If a producer still suspects that there are problems with the seed he planted after the matter was taken up with the representative and the company that provided the seed, he can contact the Department of Agriculture, Forestry and Fisheries. This department will carry out a trade control investigation in terms of the Plant Improvement Act.

Producers are recommended to keep record of batch code numbers, as reference samples of all seed batches are available for dispute investigations from the relevant registered seed laboratories where quality controls are carried out. When purchasing seed, request the germinating percentage for the seed lot concerned. Producers are advised to retain the actual bag containing all the necessary traceable information for reference purposes.

Contact persons

Eastern Cape regional representatives:
Gerald Jack: Port Elizabeth, 041 484 2725
Felicity Daniels: Port Elizabeth, 041 484 2725

Free State regional representative:
Zanele Buhlungu: Bloemfontein, 051 406 0967

Gauteng regional representative:
Christo Botha: Pretoria, 012 319 6139

Western Cape regional representative:
Christo Gouws: Stellenbosch, 021 809 1709

Corné Louw, senior economist: Inputs, Grain SA

Treatment of seed essential

Seed companies do not guarantee the quality of seed if the seed treatment is not done by the seed company itself, or by a registered chemical supplier that uses equipment and processes that are ISO accredited. The treatment for rhizobia is excluded.

If a chemical supplier handles the treatment, he must be able to ensure that the treatment will not affect the germination. The chemicals used must also be registered in terms of Act No. 36 of 1947 and preferably be recommended by the seed company for the cultivar concerned.

It is therefore recommended that producers who do not purchase treated seed but prefer to have it treated later, do this in collaboration with the seed company concerned.

Dr Gerhard Verdoorn says the following:

Agrochemicals are sometimes wrongly used for seed treatment to combat the effect of gerbils. This creates the risk of negatively affecting seed germination, and it can also cause environmental damage when seed is spilt during planting and eaten by birds and animals. When gerbils have to be controlled, there are proven management plans that include rodenticides, and producers are therefore advised to follow these management plans.

Corné Louw, senior economist: Inputs, Grain SA

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Estimating yield in a nutshell

Research on the methods for determining accurate hail damage is conducted and refined continuously by financial institutions. New fields are continuously studied and existing procedures are tested and amended to keep pace with inter alia new cultivars and changing farming techniques. This research is never regarded as completed.

One area that is studied in depth is the determination of crop yields or crop estimates. Certain formulae are developed and adjusted, but a thorough knowledge of, among other things, the farming branch and region remains important in determining a crop yield.

The following information should be used only as guidelines. However, it can be useful when producers want to estimate the potential crop yield. Keep in mind that there are many variables that can affect the accuracy of a crop or yield estimate. The closer you come to harvest time, the more accurate are the determinations that can be made, because the chance is smaller of major variables occurring. One of the most critical factors is the kernel mass. It not only varies considerably from one season to the next, but also within one season. Even after the crop is ready for harvest, factors like ear rot and other pathogens can affect the kernel mass.

The guidelines are as follows:

1 Wheat

With wheat a good average seed count is approximately:
Dryland: 3 500 seeds/100 g.
Irrigation: 3 000 seeds/100 g.

Two general practices, sowing and planting, are described separately to determine yields.

1.1 Sowing or planting wheat in very narrow rows

1.1.1 Firstly, the number of ears or stalks per square metre (m^2) is determined.

1.1.2 The average number of seeds per ear is determined by counting the seeds in a sample of wheat ears, including small and big ears in proportion. If the seeds cannot yet be counted, a good average count for the cultivar concerned can be used.

1.1.3 The following formula can be used to calculate the yield where wheat was sown:

Dryland: $\dfrac{\text{Ears or stalks per } m^2 \text{ x seeds per ear}}{3\ 500} = \text{t/ha}$

Irrigation: $\dfrac{\text{Ears or stalks per } m^2 \text{ x seeds per ear}}{3\ 000} = \text{t/ha}$

1.2 Wheat planted in distinguishable rows

1.2.1 Determine the row width as follows: The distance over ten row spaces is measured, in other words from row one to row eleven, and the distance thus obtained is divided by ten to determine the row width.

EXAMPLE
Distance over ten row spaces = 3,5 m
Row width is $\dfrac{3{,}5\text{ m}}{10} = 0{,}35\text{ m}$

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Estimating yield in a nutshell

Continued from p. 23

1.2.2 The number of ears or stalks in the row over a distance of 3 m is counted.
1.2.3 The number of seeds per ear is determined by counting a sample of ears, which includes small and large ears in proportion. If the seeds cannot yet be counted, a good average count for the cultivar concerned can be used.
1.2.4 The formula below can be used to calculate the yield where wheat has been planted in distinguishable rows.

$$\frac{\text{Ears or stalks per 3 m x seeds per ear}}{\text{Row width (m) x 3 x 3 500}} = \text{t/ha (yield)}$$

$$\frac{\text{Ears or stalks per 3 m x seeds per ear}}{\text{Row width (m) x 3 x 3 000}} = \text{t/ha (yield)}$$

2 Maize

2.1 A guideline of 0,28 g/kernel can be used for the average kernel mass of maize where the seeds can be counted in order to calculate the potential crop.
2.2 When the seeds cannot be counted, 120 g to 180 g per ear, depending on the establishment and occurrence of multiple ears, can be used.
2.3 First determine the average number of ears per 10 m. When the plants are in the vegetative stage, factors like the establishment, multiple ears and the sprouting ability of the plants must be taken into account.
2.4 Determine the average mass in gram per ear.
2.5 The formula below can now be used to calculate the yield.

$$\frac{\text{Number of ears per 10 m}}{1\,000} \times \frac{\text{Grams per ear}}{\text{Row width}} = \text{t/ha (yield)}$$

3 Sunflower

3.1 Use the following guidelines to determine the average seed mass per head at a young stage before the seeds on the head can be counted.

ESTABLISHMENT/PLANTS/HA	GRAMS SEED/HEAD
50 000	34
40 000	41
30 000	48
20 000	55
10 000	62

3.2 Use the following method to count the seeds per head:
3.2.1 Measure the diameter of the head.
3.2.2 Measure the diameter of the centre seed set if applicable.
3.2.3 Count the number of seeds per 10 cm^2 and divide this number by 10 to obtain the number of seeds per cm^2.
3.2.4 Calculate the productive area as follows:

Diameter of head = 15 cm
Diameter of centre seed set = 5 cm

Total area	= 15 x 15 x 0,79	= 177,75 cm^2
Unproductive area	= 5 x 5 x 0,79	= 19,75 cm^2
Productive area	= 177,75 cm^2 - 9,75 cm^2	= 158,00 cm^2

Continued on p. 29

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Estimating yield in a nutshell

Continued from p. 26

3.2.5 Multiply the number of seeds per square centimetre (cm^2) by the productive area to get the number of seeds per head.
3.2.6 Multiply the number of seeds on the head with the average mass per seed to obtain the mass of the head. Use a mass of 0,04 g/seed as guideline.
3.3 Count the number of heads per 10 m.
3.4 Measure the row width.
3.5 Use the following formula to calculate the yield:

$$\frac{\text{Number of heads per 10 m}}{1\ 000} \times \frac{\text{Grams per head}}{\text{Row width}} = \text{t/ha (yield)}$$

4 *Dry beans and soybeans*

Follow the steps below to do a crop estimate for dry beans and soybeans:

4.1 Determine the number of plants per 10 m and the average row width.
Plants/10 m ÷ row width x 1 000 = plants/ha
4.2 Determine the average number of pods per plant and seeds per pod.
Soybeans: ± 1,8 seeds/pod: Mass: ± 0,16 g/seed
Dry beans: Seeds/pod and mass/seed vary according to cultivar:
Small white canning types: Mass: ± 0,19 g/seed
Red speckled types: Mass: ± 0,47 g/seed
4.3 Allocate a mass per plant using the above guidelines, but always keep the following in mind:
– Evenness of plant establishment and plant height.
– General appearance and colour of the plants.
– Moisture conditions (drought or waterlogged).
– Weed, insect and disease control.

4.4 Plant establishment guidelines:

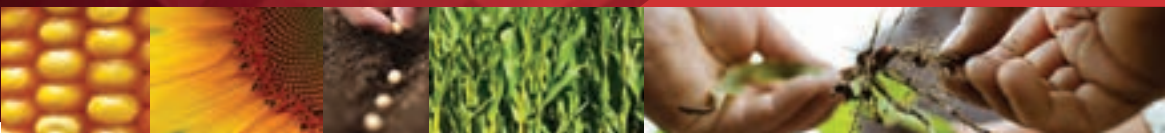
Dry beans:	**Large seed types**	**Small seed types**
Eastern areas:	± 120 000	150 000 +
Central areas:	± 100 000	± 140 000 - 150 000
Western areas:	± 80 000 - 100 000	± 120 000 - 140 000
Soybeans:		
Eastern areas:	± 300 000 - 400 000	
Central areas:	± 280 000 - 300 000	
Western areas:	± 280 000 - 300 000	

4.5 Now calculate the yield with the following formula:
Plants/10 m ÷ row width x mass/plant (g/plant) ÷ 1 000 = t/ha
4.6 Make provision for losses during the harvesting process as follows:
– Adjust the calculated yield for dry beans by a factor of 80%.
– Adjust the calculated yield for soybeans by a factor of 85%.
– Also remember to take the height of the harvester blade into account for soybeans.

5 *Grain sorghum*

Guidelines for grain sorghum: In the first place you work only on the plant population where plants are still young and there are therefore no ears with kernels that can be used for the yield estimate. Then follow the method that is used when kernels can be counted.

Continued on p. 32



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Estimating yield in a nutshell

Continued from p. 29

Where only plant establishment can be taken into account, the following guidelines are applicable:

- Bitter varieties require 120 000 plants/ha for an LBY of 4,0 ton/ha. You can also take ± 40 g/plant where plant establishment is 120 000 plants/ha.
- Sweet varieties require 140 000 plants/ha for the same LBY. You can also take ± 30 g/plant where plant establishment is 120 000 plants/ha.
- In difficult seasons you should preferably work conservatively.

Where actual ears and seed count are taken into account, the following guidelines are applicable:

1. Ear count/10 m: $\frac{\text{Are/10 m/3 rye}}{3} = \frac{xx}{3}$ = xx ears/10 m

2. Row width: $\frac{\text{Distance measured across rows}}{\text{number of row spaces}}$ = xx m = xx m

3. Weight/plant: Select five representative ears. Select and remove three branches (side ears) from the top, middle and bottom of each ear. Count the number of kernels on each branch and note this down.

EAR NUMBER	1	2	3	4	5		
Top branch							
Middle branch							
Bottom branch						TOTAL	
Total							÷ 15 = xx kernels/branch

Count the number of branches on the five ears, add the 15 used above, divide by five to get the average number of branches/ear and multiply this by the number of kernels/branch to obtain the number of kernels/ear.

Kernels/ear = branches on 5 ears + 15 ÷ 5 X xx kernels/branch = xx kernels/ear

Weight/ear (g) = xx kernels/ear X 0,019* g/kernel = xx g/ear

* Adjust the 0,019 g/kernel according to conditions.

4. Crop yield: xx ears/10 m ÷ row width (m) X weight/ear (g/ear) ÷ 1 000 = xx t/ha

= xx ears/10 m ÷ xx m X xx g/ears ÷ 1 000 = xx t/ha

6 *General comments*

It is important that the masses above be regarded only as guidelines and that you realise that they can be affected by factors like appearance of the plant, climate, region, cultivar, etc.

Kobie de Beer, manager: Insurance Services (Crop), Santam Agriculture, Bloemfontein

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Calibrate your planter correctly

*Successful cropping has developed into a highly specialised process. Planters play an extremely important role in the process – **particularly with respect to the accurate spacing of plants and the plant depth of seed. The accurate dispensing of fertiliser is also important.***

1 The function of a planter

A planter has the following basic functions:

- It opens the fertiliser furrow up to the correct depth for fertiliser placement.
- Correct measuring of calibrated fertiliser and placement.
- It opens the seed furrow up to the correct depth for seed placement.
- Correct measuring and placement of seed.
- Closing of seed and fertiliser furrows.
- Compaction of the soil for effective soil to seed contact.

The above functions must all take place simultaneously and their effectiveness should not be speed sensitive.

2 Seed dispensing

The primary function of planters is to dispense seed correctly. Seed can be dispensed in the following ways:

- Conventional horizontal tray dispenser.
- Tray dispenser dispensing at an angle.
- The finger-wheel dispenser.
- The vacuum tray dispenser.

Tray dispensers are still used, but because seed grading is no longer that accurate, vacuum dispensers and finger-wheel dispensers are used increasingly.

3 Dispensing and placement of fertiliser

Fertiliser is dispensed as granules or in liquid form. Granular fertiliser is dispensed positively with a star-wheel or worm dispenser.

Liquid fertiliser is dispensed with a squeeze pump, or – these days – with a special liquid fertiliser pump.

4 Calibration of the planter

When a planter is calibrated, wheel slippage of the planter drive wheels is an important component to take into account.

It is important to calibrate the planter in the field to be planted to compensate for wheel slippage. Different soils will cause different wheel slip percentages.

4.1. Calibration of fertiliser

Fertiliser dispensing can be calibrated as follows:

- Mark out a distance of 10 m in the field.
- Catch the fertiliser from one of the fertiliser delivery tubes in a suitable container across the 10 m distance, while the planter moves at a normal working speed.

Continued on p. 36

Calibrate your planter correctly

Continued from p. 35

- Weigh the fertiliser caught in the container.
- The fertiliser delivery in kg/ha can be calculated as follows:

$$\frac{\text{Mass of fertiliser delivered over 10 m in grams}}{\text{Planter's row spacing in metres}}$$

- Repeat the process with the other planter rows to ensure that the delivery is the same.
- If the delivery has to be changed, the gear combinations between the drive wheels of the fertiliser mechanism should preferably be changed rather than increasing or decreasing the delivery.

4.2. Calibration of seed

Seed dispensing can be calibrated as follows:

- Mark out a distance of 10 m in the field.
- Set the plant depth so that the seed is placed on the soil.
- Plant at the normal plant speed over the measured distance of 10 m.
- Count the number of seeds delivered in a row over the distance of 10 m.
- Calculate the plant population in number of seeds/ha as follows:

$$\frac{\text{1 000 x number of seeds counted over 10 m}}{\text{Planter's row spacing in metres}}$$

- If the plant population must be changed, change the gear combinations as indicated on the calibration table of the planter.
- If there are many double seed deliveries or seed is not delivered at all, make sure that the right tray has been selected for the seed size for tray planters. The correct vacuum delivery for vacuum planters should be checked. Finger-wheel planter dispensing mechanisms should be serviced.

Johan van Biljon, SAIAE

Op die voorvoet van SAADTEGNOLOGIE

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Dawie du Plessis *(Noordkaap, Sentraal Vrystaat)*	071 852 1707
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Notes

WERKTUIE/*IMPLEMENTS*

BE ON THE LOOKOUT FOR QUALITY PRECISION SERVICES

The most common precision services that are currently on offer in South Africa are chemical precision and soil surveys, with remote sensing probably being the next generation. A number of aspects determine the quality and value of precision services.

Chemical precision

Chemical precision services involve soil samples being drawn in a grid pattern and analysed and chemical maps then being produced. The aim is the differential correction of deficiencies and imbalances.

Grid pattern

In the process of sampling soil for chemical precision in dryland or irrigation crop cultivation, points in a grid pattern are distributed across the field with the aid of a GPS. This is usually done in a grid of 1 ha (100 m intervals) or 2 ha (144 m intervals). The 1 ha grid is usually used in irrigation fields and areas with significant soil differences within a relatively short distance of less than 200 m. This applies especially in undulating landscapes. In regions where the soil is more homogeneous, like in many of the flat landscapes covered with wind-blown sand, the 2 ha grid pattern is more common. Sometimes an even wider grid pattern, including a 3 ha (173 m intervals) and a 4 ha grid (200 m intervals), is used. However, when the grid pattern is wider than 2 ha, the interpolated distribution of the chemical characteristics becomes increasingly unreliable.

Sampling

Chemical soil properties change three-dimensionally (horizontally and vertically) and can vary a lot within 1 m and also geographically across a field. Sampling should attempt to capture the variation in the position of sampling adequately by sampling the nutritional zone of the plant as well as possible. The principle is that the analysis is just as good as the sample that was drawn. A poorly representative sample will lead to a poorly representative analysis and chemical recommendation map.

The sampling method should be defined in the report so that the user of the report can interpret it correctly. A relatively large composite sample of about 5 kg should be taken initially. If the soil sample includes the fertilisation zone of the crop, the fertilisation band should be included in proportion to the rest of the nutritional zone. This is usually done with a soil auger with a diameter of 75 mm to 100 mm by taking five to seven subsamples and mixing them thoroughly in a clean container (an old fertiliser bag or pool chlorine bucket does not work). The final point sample should then be constituted from a number of small subsamples from the mixed sample in the container. Each point sample is analysed separately and fully.

It is a good practice to take subterranean samples (deeper than 400 mm) to identify subterranean acidification should it occur. A composite subterranean sample of the field is often taken, but sometimes individual samples are taken at some of the sampling points too.

Continued on p. 41

Landini

VERVAARDIG IN ITALIË

Aggressiewe trekkrag waar dit hoort - op die grond

Landforce

Daar is twee modelle in die Landini Landforce reeks:
die Landforce 115 (82 kW) en die Landforce 125 (88 kW).
Die model hier vertoon is die Landforce 125 RPS *(reverse power shuttle)*
KENMERKE:

- **BetaPower viersilinder TIER 3 enjin, turbo-aangejaag, direkte brandstofinspuiting en tussenverkoeling.**
- **Driespoed-kragskakelratkas met kruiprat 48 vorentoe- en 16 truratte met elektro-hidrouliese spoelkas (*reverse power shuttle) [RPS]***
- **Kragaftakker met spoedkeuse van 540/1000 rpm**
- **Geslote hidrouliese stelsel met drie dubbelaksie-afstandbeheerkleppe en 'n pomplewering van 90 liter/min**

Landpower

Techno Modelle in die reeks:
125 Techno (86 kW), 135 Techno (96 kW), 145 Techno (104 kW), 165 Techno (116 kW)
Toptronic Modelle in die reeks:
135 Toptronic (98 kW), 145 Toptronic (104 kW), 165 Toptronic (116 kW)
KENMERKE:
Techno Modelle:

- **Betapower sessilinder enjins, turbo-aangejaag met tussenverkoeling**
- **Basiese sesspoed gesinchroniseerde driegang-ratkas met kruiprat 36 vorentoe- en 36 truratte, gesinchroniseerde spoelkas.**
- **Kragaftakker met elektro-hidrouliese inskakeling en spoedkeuse van 540/1 000 rpm**
- **Meganies-beheerde driepunthyser met drie afstandbeheerkleppe.**

Toptronic Modelle:

- **Betapower sessilinder enjins, turbo-aangejaag met tussenverkoeling**
- **Basiese sesspoed gesinchroniseerde driegang-ratkas met drie kragskakelratte per rat en kruiprat 108 vorentoe- en 36 truratte met 'n elektro-hidrouliese spoelkas**
- **Kragaftakker met elektro-hidrouliese inskakeling en spoedkeuse van 540/1 000 rpm**
- **Elektro-hidrouliese driepunthyser met drie afstandbeheerkleppe**

7 Reeks

Daar is drie modelle in die Landini 7 Reeks:
die Landini 7-175 (121 kW), Landini 7-190 (130 kW) en die 7-215 (138 kW).
KENMERKE:

- **Betapower sessilinder, 24-klep, turbo-aangejaag, 6,7 liter enjins met drukbuisinspuiting en lug-tot-lugtussenverkoeling.**
- **"Pro Drive-ratkas met spoelkas en kruiprat verskaf 40 vorentoe- en 40 truratte deur 'n sesgang-ratkas met vier kragskakels per gang.**
- **(Eco 40) 40 km/u teen verminderde enjinspoed.**
- **Kragaftakker met elektro-hidrouliese inskakeling en spoedkeuse van 540/540E/1000/1000E rpm.**
- **Elektronies-beheerde hysstelsel, drie afstandbeheerkleppe en 'n hidrouliese pompvloeitempo van 90 liter/min.**

SKAKEL U NAASTE HANDELAAR VIR MEER INLIGTING OF KONTAK:
HOOFKANTOOR: 011 914 1700, KAAPPROVINSIE: 060 987 0502
LIMPOPO / MPUMALANGA: 079 211 2506, VRYSTAAT / NOORDWES:
082 879 9550, KWAZULU-NATAL / OOS-KAAP: 082 907 4336
Webblad: www.argosa.co.za Epos: landini@argosa.co.za

ARGO Industrial (Pty) Ltd.

BE ON THE LOOKOUT FOR QUALITY PRECISION SERVICES

Continued from the back of the Implements tab page

Analysis of samples

Leading laboratories in South Africa are affiliated with AgriLASA (Agri Laboratory Association of Southern Africa), which handles the quality control for laboratories in South Africa. These laboratories use analytical methods that have been calibrated for South African conditions. Soil samples should be sent to such a laboratory. Usually the pH, acid saturation, P, K, Ca, Mg and Na levels are reported, but sometimes also S, exchangeable Al^{3+}, micro elements and other appropriate values. Analysis laboratories must specify in their report which analytical methods were used to determine each nutrient element.

It does not really help producers to send samples to foreign laboratories. They use other methods (extractants) to determine the nutrient status. Their recommendations have also been developed for their soils and their specific climate, and differ drastically from the locally developed norms.

Processing of data

Raw data is captured in software programmes (GIS = geographical information systems) and integrated with the global positioning system (GPS) points. Point data is then interpolated to calculate values for any position in the field between the sampling points and this is then known as a surface. The accuracy of the interpolated data depends to a great extent on the statistical models with which the interpolation is done. Service providers should use recognised models.

Report

A report is then compiled, containing at least the maps of the respective analysis parameters. In addition, prescription maps for correcting deficiencies can be included. Sometimes a written report is presented in which the analysis parameters are interpreted and discussed, with recommendations for corrections.

Prescription maps

The final product comprises prescription maps for the differential correction of deficiencies and imbalances. Strictly speaking, these prescription maps must be compiled by or under the supervision of a SARNAP-registered soil scientist or agronomist. The prescription maps are then captured with the software (data chip) of differential equipment in agricultural implements, which apply the ameliorants as required across the field, as needed per area. It is also possible to implement prescription maps in agricultural implements without differential equipment. This is done by loading the prescription map on a mobile GPS and then physically marking the zones in the field. The spreading can then be done in increments by an ordinary spreader without GPS equipment. This is not completely differential, but a good second prize.

Soil surveys

Soil surveys involve mapping the distribution of soil types occurring on the farm and using this as basis for deducing field capacity or potentials. Soil surveys are carried out by SARNAP-registered soil scientists to adjust crop production practices differentially according to soil types and derivatives.

Continued on p. 44

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BE ON THE LOOKOUT FOR QUALITY PRECISION SERVICES

Continued from p. 41

Soil survey process

Like with the taking of precision samples, a grid pattern is distributed across the field with the aid of a GPS. The grid size is usually the same as for precision samples. Point observations are usually done with the aid of a mechanical soil auger or manual soil auger by determining the soil type at each GPS point and indicating the soil properties on the GPS and/or on an enlarged aerial photograph of the farm. Soil borders should be indicated on the aerial photograph during the mapping process by indicating visible soil differences in the field on the map and by correlating soil differences by way of aerial photograph interpretation with the topography of the field and drawing this on the aerial photograph.

It is also good practice to describe additional soil properties in profile holes in the dominant soil units. Soil samples are taken of the different soil horizons and analysed as representative of the soil unit concerned.

Map processing and report

The soil borders drawn in on the aerial photograph are captured in a geographical computer programme (GIS) and all the chemical analysis data and physical soil data (texture data) are linked to the GPS points as point data. A soil map is now processed, indicating the geographical spread of soil types in the farm on the basis of a soil legend. A report should be drafted on the basis of the soil map, containing, among other things, the aim, methods, results and discussion of the soil survey.

Application maps

Different application maps are compiled with the survey data as basis. Examples are potential maps that indicate the differences in yield potential for different crops, with prescription maps for differential fertilisation recommendations on the basis of the potential differences, as well as the varying plant establishment. These prescription maps are then loaded into differential equipment in agricultural implements, which apply the prescription as required across the field, as needed per area.

Yield maps

Self-propelled combine harvesters are now relatively commonly equipped with yield monitors. As the harvester harvests, the yield is captured at GPS points on the on-board computer. This data can be downloaded to a computer programme, which indicates the yield differences in different colours. Yield data can be processed further to indicate zones with higher and lower yield in different colours. These digitals maps can, in turn, be loaded onto GPSs to navigate to patches with poorer yield. The cause of the poorer yield can be investigated and steps can be taken to correct these if possible. Prescription maps can then be written from here to the differential equipment on agricultural implements.

Remote sensing

Satellite images and low-altitude images taken with drones are used increasingly in agriculture. They are used with particular success in intensive crops like orchards. Producers must only ensure that this data contains GPS co-ordinate data (ground proofing), otherwise this is just a pretty picture of the relevant field. Applications are not yet in common use in dryland grain production, but are more successful in grains under irrigation. The art is to 'translate' the numerical values of the data squares (pixels) to crop growth differences. A data square is a square on a digital map and also a geographical square. Four corners of the data square contain the geographical co-ordinates on the basis of a specific size, e.g. 50 cm x 50 cm or 5 m x 5 m, with a single value or different values included. A digital map consists of a large number of such data squares. These are converted to a valuable application map with the aid of mathematical correlations and a GIS programme. For this, a specific value in a data square must be correlated with an agronomic observation like grain yield. Because vegetation is influenced by such a complex set of factors, such correlations are something of a challenge. The next challenge is to process the enormous amount of data for large areas. The integration of high levels of agronomic, geographical and computer expertise is required for this.

Conclusion

The delivery of precision services requires high-level expertise and skill. It also involves the integration of soil, agronomic and geographical knowledge and skills to produce an integrated product. The final product must be able to quantify the proven aspects of the crop production process in order to increase the biological productivity and the profitability and reduce the risks and pollution. In the end the financial outlay for the service must be covered by increased profitability. Good quality precision services usually involve excellence.

Martiens du Plessis, manager: Precision Farming, NWK Limited, and
Eduard Hoffman, chairperson: Department of Soil Science, Stellenbosch University

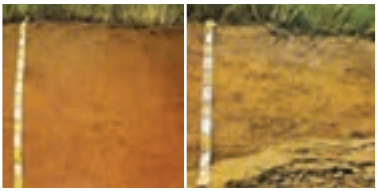
Tillage of soils in South Africa summarised

The wide variety of soil types found in the crop areas of South Africa makes it difficult to provide standard prescriptions for tillage. This wide variety is attributed particularly to the great variation in soil properties, climate and the accompanying production potential. ***However, if the soils are grouped according to the specific climate zone and texture classes, a few general tillage guidelines can be provided.***

Summer rainfall of between 400 mm and 550 mm per year

1 Red and yellow sandy soils with less than 6% clay in the topsoil

This group is found mainly in the central production areas (Western Free State, North West and Northern Cape) and comprise wind-deposited soils with less than 6% clay in the topsoil, less than 8% clay in the subsoil and an apedal (single-grained) structure. Hutton and Clovelly soils are the main soil types in this class. These soils are extremely vulnerable to wind erosion and subsoil compaction, fertility is low, as is the water retention capacity in the absence of a barrier layer. However, soil types that lack a barrier layer, like the Avalon, Kimberley and Molopo soils, have a higher water retention capacity within the root zone.

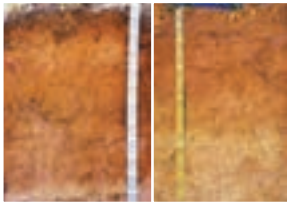


Hutton and Clovelly

In order to combat wind erosion and soil-borne plant diseases and to ensure good root development, mulch tillage combined with a deep ripper action, controlled track traffic and a good crop rotation system are recommended as the most sustainable system in these soils. The depth of the water table can be managed with the aid of a fallow system to the extent that it is kept about 1 200 mm from the soil surface. In seasons with excessively high rainfall the plant establishment can be increased, and a catch crop can even be used to lower the levels.

2 Red and yellow sandy soils with 6% to 18% clay in the topsoil

These soils mostly have a poorly developed structure in the topsoil and consequently have strong crust-forming properties that lead to poor aeration and infiltration. The most common soils in this group are the Clovelly, Hutton, Bainsvlei, Bloemdal, Avalon, Pinedene and Kimberley soils. These soils are also subject to compaction, and if the clay content of the topsoil is less than 10%, there is also a risk of wind erosion.



Bainsvlei and Bloemdal

The recommended practices in these soils are conventional clean tillage, combined with a ripper action of approximately 350 mm deep where soil compaction is a problem. As crust formation is the single biggest problem in these soils, regular shallow tillage after rain is required to ensure good infiltration. However, tillage practices like mulch tillage can be applied to this soil, provided primary tining to a depth of 300 mm forms part of the system. In the shallow, stony soils of the winter rainfall areas (Western and Southern Cape) tining at a depth of 150 mm before or during planting should be adequate.

3 Soils with between 18% and 25% clay in the topsoil

Because of the higher clay content of these soils the structural grade is usually moderate or stronger. This group contains a large variety of soils like the Valsrivier, Sepane, Oakleaf

Continued on p. 49

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Bothaville	Mega Agri	(056) 515 - 1677
Bredasdorp	Overberg Agri	(028) 425 - 5859
Brits	Obaro	(012) 252 - 3393
Bultfontein	Mega Agri	(051) 853 - 1009
Caledon	Overberg Agri	(028) 214 - 3849
Cradock	OVK	(048) 881 - 2894
Christiana	Mega Agri	(082) 801 - 5484
Delmas	Brookfield plant + sales	(082) 461 - 9053
East London	Tractorworld	(043) 731 - 2100
Ermelo	Vir Die Boer	(017) 004 - 0066
George	Haddad Tractors	(044) 878 - 1132
Hopetown	OVK	(053) 203 - 9231
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Kirkwood	Tractor Land	(042) 230 - 0071
Kroonstad	Kroonstad Trekker Dienste	(056) 213 - 2297
Ladybrand	Maluti Agri	(082) 451 - 4573
Lichtenburg	Cerealis Precision	(018) 632 - 0362
Middelburg	Farmquip	(071) 659 - 9702
Modderrivier	NC Farming Supplies	(082) 992 - 0276
Mokopane	Die Groenspan	(015) 491 - 4835
Mooi River	Magritrade	(033) 904 - 0052
Moorreesburg	Overberg Agri	(022) 433 - 8334
Ottosdal	Rudolph Agri	(018) 571 - 0209
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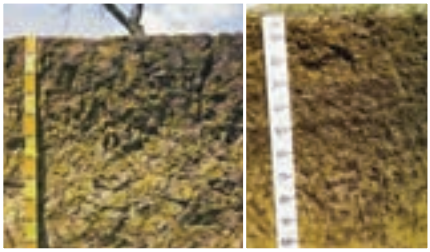
Tillage of soils in South Africa summarised

Continued from p. 46

and Tukulu soils, which are regarded as marginal for crop farming due to the lower infiltration ability, higher run-off and high evaporation losses.

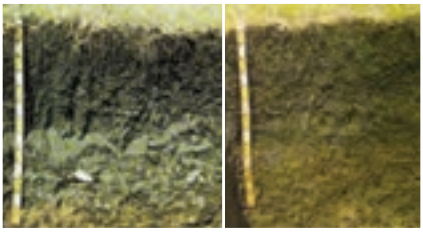


Valsrivier and Sepane

These soils are mainly used to plant sunflower and grain sorghum, and mulch tillage with winged tine implements provides good results. Primary tillage of 200 mm or shallower with a chisel plough is mostly adequate.

4 *Soils with more than 25% clay in the topsoil*

This group, comprising vertic or melanic soils, mainly has a dark colour and an organic carbon content that varies between 0,5% and 4%, with a well-developed structure in the topsoil. Soil types include (but are not limited to) the Arcadia, Rensburg, Bonheim and Inhoek soil structures.



Arcadia and Rensburg

These soils are quite resistant to wind and water erosion and are excellently suited to no-till practices. However, these soils are regarded as marginal for dryland crop farming in the long term.

Summer rainfall of between 550 mm and 700 mm per year

1 *Red and yellow well-drained sandy soils with less than 20% clay in the topsoil*

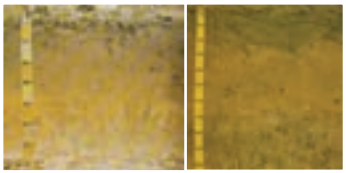
The main soil types in this group include the Hutton, Clovelly and Avalon soils and are suitable for growing most crops. Soil acidification is the biggest problem with these soils and regular liming is essential.

Avalon

Both conventional and mulch tillage practices are recommended for these soils. When mulch tillage is used in sandy soils with less than 10% clay in the topsoil, a deep ripper action combined with controlled track traffic is recommended. Crop rotation is also essential to retain the biological soil quality.

2 *Yellow and grey soils with plinthic and gley subsoils*

The soils in this group (e.g. the Westleigh, Pinedene, Longlands and Kroonstad soils) are characterised by wet subsoil during periods of high rainfall. In dry years they can deliver good crops, while they tend to become waterlogged during wet periods. The wet soil conditions make it difficult to control weeds, while self-sowing and soil acidification are also a significant problem.



Westleigh and Pinedene

Continued on p. 50

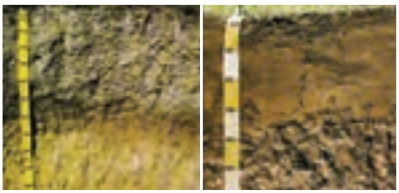
Tillage of soils in South Africa summarised

Continued from p. 46

Contour tillage along slopes and mulch tillage render good results in these soils. Controlling weeds and self-sowing through shallow tining is usually very ineffective and additional chemical herbicides are recommended.

3 *Brown and grey soils with dry clayey subsoils*

The main soils in this group are Valsrivier, Swartland, Sterkspruit and Estcourt. These soils are extremely vulnerable to water erosion.



Swartland and Sterkspruit

Strict control of run-off water through contours and mulch tillage is essential to control erosion. However, the long-term production potential of these soils is low and they should generally rather be used for planted pasture or feed production.

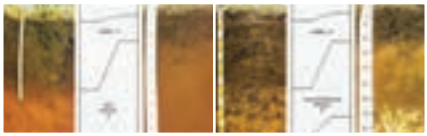
4 *Dark clayey soils*

These dark soils have a well-developed structure and very high inherent fertility. They are characterised particularly by a dense cover of natural grasses in the untilled state. Soil types in this group include Bonheim, Milkwood and Arcadia These soils are very suitable for no-till practices, but the best use for this group is probably no tillage at all.

Bonheim and Milkwood

Summer rainfall of more than 700 mm per year

According to the aridity index classification and international standards this climate zone is the only one in South Africa that is suitable for dryland crop production. However, the biggest part of this climate zone is mountainous and is used for forestry. Inanda, Hutton, Magwa, Clovelly and Avalon are examples of soils in these areas.



Inanda and Magwa

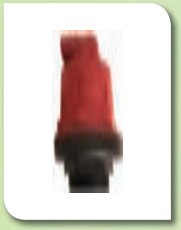
Where these soils are used for crop production, mulch or no-till practices are very successful. However, regular liming is necessary to maintain high yield levels. The biological quality of the soils is maintained through crop rotation.

References

1. MVSA *Bemestingshandleiding*. 2007). Hoofstuk 1.10: Grondbewerking en bewerkingsriglyne.
2. Prof ATP Bennie. 4 June 2001. *Die herstel van volhoubare graanproduksie* – Volume VI: Die produksie-omgewing. Hoofstuk 2: Grondbenutting vir droëland kontantgewasproduksie. (Compiled for GSA)

Dr Louis Ehlers, manager: Agricultural Services, Omnia Fertiliser – a division of the Omnia Group (Pty) Ltd

Perfekte oplossings in besproeiingsbestuur



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Where does one start with precision farming?

Precision farming involves the area-specific adaptation of production techniques on the basis of geographical data on chemical, physical and morphological soil properties, but also other geographical production data like yield data and growth indices gathered through remote sensing. The ultimate aim is to run the farm in a sustainable manner.
But where do you start?

Conversion to precision farming does not necessarily have a specific starting point and course, but all the methods have the gathering of geographically linked data that affects production in common. The availability and cost of geographical data and equipment on implements usually play a significant role at the start of the conversion. Geographical data refers to specific points on the ground and for this reason contains two co-ordinates. The co-ordinates have a longitude and latitude and sometimes also contain the altitude. The data is stored in a geographical database and can contain various other data elements too. Examples of these can be: Soil depth, texture, water retention capacity, yield and plant nutritional status. Satellite images and other remote-sensing images also contain geographical data, while images obtained from aeroplanes and drones do not necessarily contain this.

1 Yield data

Yield data is gathered by yield monitors in combine harvesters. As the combine harvester drives across the field and harvests, the yield is continuously determined and captured in a geographical database at global positioning system (GPS) points. After the data has been processed, yield maps of the fields are generated with the aid of geographical information systems (GIS), and the areas where the crop yield was higher and lower are clearly indicated with, for example, different colours. The lower yield areas, as obtained from the GIS, are then investigated to determine the possible causes of the reduced yield. Production practices are then adjusted to eliminate the yield-reducing factors in these areas so that the whole field can yield according to its potential.

If the combine harvester is equipped with a yield monitor, it can be employed for precision farming, and this is a meaningful starting point. However, the data must be processed to meaningful interpretable yield maps.

2 Growth indices

Remote sensing with the aid of satellite images, images from manned aeroplanes and unmanned aeroplanes (drones) are increasingly used to obtain digital images of fields. These images must contain geographical data to be used meaningfully in a GIS. Images are usually taken in serial format during the growing season. These are then processed electronically in a GIS to produce, among other things, growth indices (NDVI) throughout the growing season. Areas with differences in the relative crop growth are indicated in different colours in this specific application, so that areas where the crop growth is lower can be identified. These lower-yielding areas in the relevant field can be visited with the aid of a GPS and studied to identify the possible causes of poorer crop growth during the season.

Growth indices are a relatively affordable but also **easy starting point because the data is processed by the supplier of the service to a final product.**

3 Chemical soil properties

The geographical spread of chemical soil properties is done by way of grid sampling. Soil samples are taken at GPS points, placed in a grid pattern across the field. The soil sample for each GPS point is packaged separately and analysed by a laboratory. The raw data is fed into a GIS by the service provider and thus

linked to the GPS points to generate maps of the geographical spread of the plant nutrients available in the soil. Imbalances are then corrected differentially across the field according to the need of each square in the field (usually 20 m x 20 m).

This is a very popular starting point for precision farming, probably because the service is freely available from various service providers and is well marketed. It also provides a rapid return on the investment because it directly addresses plant nutrition, which strongly correlates to crop performance.

4 Pedological and physical soil properties

Pedology involves the study of the origin and classification of soils. The morphology of soil types differs geographically over short distances in fields and these differences affect vegetation and crop performance directly. Information like water retention capacity, drainage, the incidence of shallow water tables, leaching of plant nutrients, natural fertility, texture, structure, compactability, stoniness and tillability is fed into a GIS so that further calculations can be carried out with the data. During soil surveys the relevant soil properties are identified and recorded by a soil scientist with the aid of soil drills at GPS points. Soil maps are then generated with GIS, indicating the soil types as soil bodies on the farm. These soil properties are interpreted by the soil scientist to indicate areas with different potentials and applications in the fields. These maps are then processed further with the aid of GIS to user maps that can be loaded on the tractor's precision screen to adjust the application of seed and plant nutrients to the capacity of the field.

This is a quite complicated facet of precision farming that requires advanced and relatively expensive equipment on the tractor and implement. Some producers do start their foray into precision farming with this technology.

5 Precision soil cultivation

Soil compaction and water infiltration are two major aspects of successful grain production. Controlled track traffic and the effective management of soil cultivation systems with the aid of GPS technology and automatic steering systems unlock possibilities for effectively managing soil compaction. The degree and depth of soil compaction is measured with a penetrometer. This data enables you to exactly determine the required depth of soil cultivation. The method of breaking up soil compaction must be adjusted to the entire production system so that the crop is always established in soil that is sufficiently loose within the norms. The ideal is also for the soil not to be compacted again where you intend planting in future. Track traffic can be successfully controlled over a number of years with the aid of GPS technology and automatic steering systems. In this system the entire field is properly loosened, but preferably not the tractor tracks. All the implements that will be required in the course of the season are adapted to follow these tracks and work only as widely as the planter, or multiples thereof.

The main benefits of this system are that:

1. Aggressively deep tillage is eliminated or drastically reduced.
2. The crop is always located in uncompacted soil.
3. Water infiltration is promoted.
4. There is a possibility of enriching the zones that are planted regularly with plant nutrients.
5. Mechanisation costs are significantly reduced.
6. This is also the ideal system to combine with minimum tillage and no-till.

Most new tractors of more than 120 kW have GPS technology as standard issue, which paves the way for driving precisely, cultivating precisely and planting in exactly the right place. Farming systems should be adapted to utilise this technology for optimum production and it is a logical point of departure when a new tractor is purchased.

6 Other techniques

Technology is also available to make more accurate top dressing possible. Advanced sensors on implements using measurements of the chlorophyll activity (green colour spectrum

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PRECISION FARMING SUPPLIERS IN SA

It is not always that easy to reach the right person quickly when you work with big companies. Below is a list of the contact details of the main suppliers in order to make the search for precision farming systems and services a little easier:

Company	Contact person	Number	Email
John Deere	Vikar Sheopershad	071 461 3996	*SheopershadVikar@JohnDeere.com*
New Holland SA	Rudi du Toit	073 081 8279	*RudiD@northmec.co.za*
Northmec	Rudi du Toit	073 081 8279	*RudiD@northmec.co.za*
Raven	Jaco Stemmet	082 771 7541	*jaco@agrisolutions.co.za*
Ronin Precision	Steven Deysel	011 608 3666	*steven@roninsystemsolution.co.za*
Farming Systems (Trimble en	Hanno Truter	082 319 2301	
DICKEY-John)	Jaco Viviers	071 763 1797	*jaco@roninpfs.com*
Sitech Southern Africa	Hanno Truter	082 319 2301	*htruter@clmps.com* of *hannotruter@sitech.co.za*
Topcon	Christo Helm	083 233 5497	*chelm@topcon.com*

Jim Rankin, Agfacts

Problems with after-sales service

If members of Grain SA receive poor after-sales service from mechanisation dealers, they can contact Corné Louw, senior economist: Inputs, Grain SA, or Grain SA at 086 004 7246.

Where does one start with precision farming?

Continued from p. 53

of the leaves of the crop) in the crop are used for this purpose. The sensors measure the colour of the leaves of the crop and the application system decides on the basis of the green colour spectrum of the leaves to apply, for example, nitrogen differentially according to pre-programmed parameters.

Weed sprays can also be equipped with sensors to identify weed plants in order to spray only where the weed is present. An example of this technology involves four-wheeled robots moving through vineyards and identifying the weeds with the aid of video cameras and then spraying only the weed with a small herbicide sprayer.

If pests occur only in certain areas of a field, those areas can sometimes be identified by way of remote sensing, or by physically scouting the field and capturing the area with the aid of a GPS.

Martiens du Plessis, manager: Precision Farming, NWK Limited

Paraffin contamination of diesel

If producers suspect that there are problems with the quality of diesel, particularly in cases of possible paraffin contamination, they can contact the South African Revenue Services (SARS) to monitor this:

Contact

Gregory Marks
National Group Manager
021 413 8938
gmarks@sars.gov.za

Tim la Fontaine
Operational Specialist: Excise
012 422 6919
tlafontaine@sars.gov.za

If producers want to test their diesel themselves, they can visit the website *www.dieseltesting.co.za*, or call 087 575 3568 to purchase the testing instruments.

Corné Louw, senior economist: Inputs, Grain SA

Keep thorough record of your diesel consumption

The Customs and Excise Act (No. 91 of 1964) requires, among other things, that a logbook of diesel consumption must be kept.

It is critical for producers to keep a strict record of their diesel consumption. Agri SA and Grain SA commented on what a logbook should look like, but have received no further information in this regard from SARS yet. In the meantime producers are recommended to record the minimum information currently required by law in a logbook that is available from major distribution points. The logbook should contain the following information:

- Date on which the diesel was added.
- Quantity of diesel added.
- Description of the vehicle.
- Timer or km reading before and after use.
- Reason for which diesel was consumed. (It is important to check which activities qualify for the diesel rebate.) Click on the link below and page down to part 3. (It is in Schedule 6, Part 3.)

IMPORTANT: Grain SA appeals to its members and other grain producers to handle the rebate that agricultural producers receive on diesel according to the prescribed rules. If large-scale irregularities arise, agriculture might lose this diesel rebate.

Corné Louw, senior economist: Inputs, Grain SA

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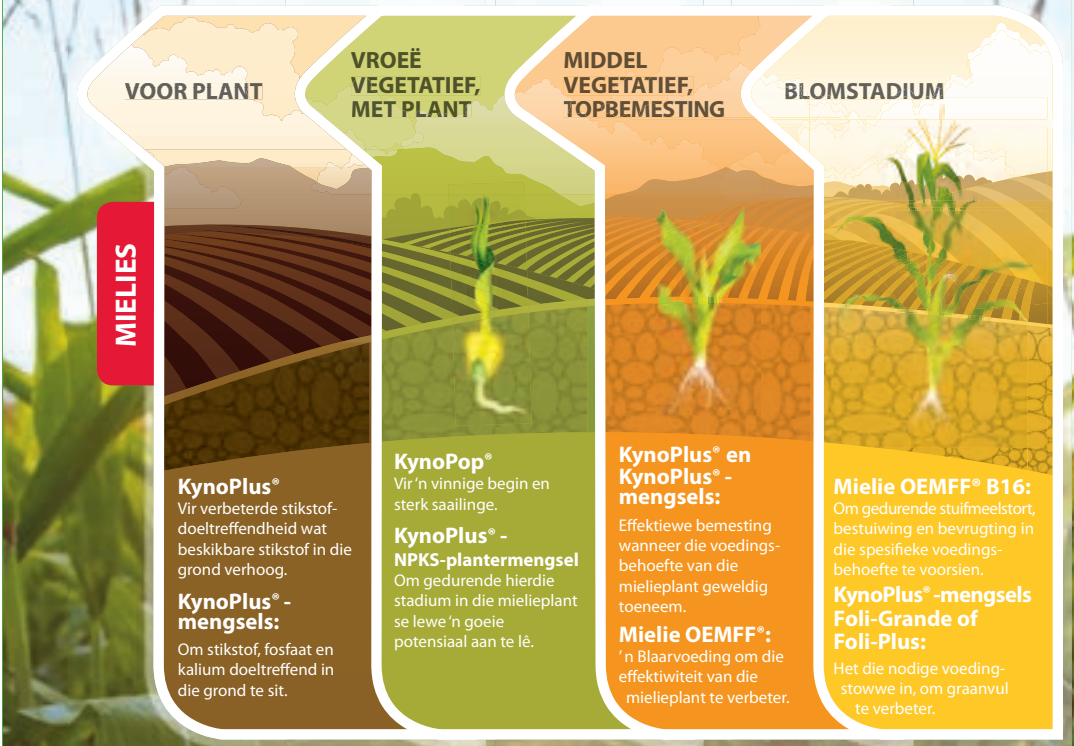
BEMESTING/*FERTILISER*

Independent analysis laboratories in South Africa

Laboratory	Contact number	Discipline
Absolute Science (Pty) Ltd Waltloo, Pretoria	012 803 0331	Fertiliser and water
Acacia Operations Services (Laboratory), Umbogintwini	031 949 2082/9	Fertiliser
Agri Enviro Lab, Bethal	017 647 1150/1	Fertiliser
Agrilab, Tzaneen	015 307 6790	Soil and plants
ALS Analysis and Inspection-Durban (Pty) Ltd	031 301 1257	Fertiliser
ALS Inspection South Africa (Pty) Ltd, Richards Bay	035 797 9415	Fertiliser
ARC-Institute for Industrial Crops (ARC-IIC), Rustenburg	012 427 9999	Soil and plants
ARC-Institute for Soil, Climate & Water (ISCW), Pretoria	012 310 2500	Soil, plants, fertiliser and water
ARC-Institute for Tropical & Subtropical Crops, Nelspruit	013 753 7000	Soil, water and plants
ARC-Small Grain Institute, Bethlehem	058 307 3501	Soil
Bemlab (Pty) Ltd, Strand	021 853 1490	Soil, plants, fertiliser and water
Bosveld Phosphate Laboratory, Phalaborwa	015 780 6170	Fertiliser and water
Chem Nutri Analytical, Kempton Park	011 316 8800	Plants
DARD: Soil Analytical Services, Pietermaritzburg	033 355 9456	Plants, soil and water
Department of Agronomy Soil Science Lab, Alice	040 602 2139	Soil, plants, fertiliser and water
Department of Plant Production & Soil Sciences, Pretoria	012 420 3213	Plants, water and soil
Directorate Research Support Services: Soil, plant and water laboratory, Elsenburg	021 808 5111	Soil, plants and water
Döhne Analytical Services, Stutterheim	043 683 1240	Soil and plants
DCELS, Dolphin Coast, Kwadukuza	087 353 9754	Soil
Eco Analytica, Potchefstroom	018 293 3900	Soil and water
Fortcox College of Agriculture and Forestry, King William's Town	040 653 8035	Soil
Glen Soil Analysis Lab, Glen	051 861 8647	Soil
Soil and environmental laboratory, Potchefstroom (GEOLAB)	083 379 6540	Soil
Institute for Commercial Forestry, Scottsville	033 386 2314	Soil
Intertek Agricultural Laboratory, Bapsfontein	011 964 1004	Soil, plants, fertiliser and water

Continued on p. 61

Voeding volgens **plantontwikkeling**



A15244/SAGG

Met Kynoch se innoverende en pasmaak-produkte kan jy bemesting toedien volgens jou mielieplante se behoeftes en groeistadiums. So verseker Kynoch dat jou **mielieplante kry wat hul nodig het, wanneer hul dit die nodigste het**. Boonop het jy gemoedsrus, omdat jy weet, met Kynoch op jou plaas van meet af aan, haal jy net die beste uit jou mielies en is jy verseker van verbeterde doeltreffendheid in graankwaliteit en opbrengspotensiaal.

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Britten		
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Dolomiet	$CaCO_3$ - 52% $MgCO_3$ - 18%	B472
Gips	Potchefstroom**	B2119
GrassTop 20	20% Potchefstroom Gips / Britten Dolomietmengsel	B472,B 2119
Nut-Cal (Kal/Gips)	50% Potchefstroom Gips / Britten Kalsietmengsel	B702, B2119
Buhrmansdrif		
Kalsiet	$CaCO_3$ - 80% $MgCO_3$ - 1%	B2521
Lovedale		
Kalsiet	$CaCO_3$ - 80% $MgCO_3$ - 1% (Buhrmansdrift)	B2521
Dolomiet	$CaCO_3$ - 48% $MgCO_3$ - 22% - Bevat ± 3% F (Marico)	B591
Gips	Potchefstroom**	B2119
GrassTop 20	20% Potchefstroom Gips / Marico Dolomiet Mengsel	B591, B2119
Hi-Mag40	CaCO3 – 44% MgCO3 – 40% (Bereken)	B591, B2520
Marico		
Dolomiet	$CaCO_3$ - 48% $MgCO_3$ - 22% - Bevat ± 3% F	B591

Nut-Cal HiMag GrassTop

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Independent analysis laboratories in South Africa

Continued from the back of the Fertiliser tab page

Laboratory	*Contact number*	*Discipline*
Intertek Environmental, Durban	031 552 8149	Water
KL Analytical Services T/A Labserve, Nelspruit	013 752 4745	Plants
M & L Laboratory Services, Johannesburg	011 661 7926	Fertiliser
Madzivhandila College of Agriculture, Thohoyandou	015 962 7200	Soil
Modderfontein Laboratory Services (Pty) Ltd, Modderfontein	011 457 1801	Water and fertiliser
NviroTek Laboratories, Hartbeespoortdam	012 252 7588	Soil, plants, fertiliser and water
SA Sugar Research Intstitute (SASRI), Mount Edgecombe	031 508 7436	Plants, soil and fertiliser
SA National Parks, Skukuza	013 735 4458	Soil, plants and water
SCI-BALAB, Kaapstad	021 418 0325	Soil and water
SGS Agricultural Services, Somerset West	021 852 7899	Soil, plants, fertiliser and water
Tompi Seleka College Soil and Water Analytical Laboratory, Marble Hall	013 264 5300	Soil
UP NUTRILAB, University of Pretoria	012 420 3269	Plants
University of Venda	015 962 8431	Soil
Wynland Laboratories, Wellington	021 873 3514	Soil, plants and water
In-house laboratories		
Omnia Fertilizer/Kunsmis, Sasolburg	016 970 7411	Soil, water and fertiliser
Foskor, Richard's Bay	035 761 5140	Fertiliser and water
Foskor, Phalaborwa	015 789 2434	Fertiliser and water
Kimleigh Technologies, Potchefstroom	018 293 1028	Fertiliser and animal feeds

The above is a list of the laboratories that are members of AgriLASA. These laboratories participate in an inter-laboratory control scheme for each discipline to which they belong. The latter schemes are co-ordinated by AgriLASA. The schemes are the best way for laboratories to verify their results. Each laboratory's achievements can be requested from the laboratory by producers or institutions who want to do business with the laboratory.

Dailena Pienaar, chairman: AgriLASA Executive Management

Agricultural lime and gypsum sources in South Africa

CALCITE SOURCES

Location	Name	Company	Contact number
Central			
Barkley West	Ulco	SA Lime & Gypsum	086 010 3515
Barkley West	Ulco	Kalkor	011 721 3141
Barkley West	Ulco	H Pistorius & Co	012 342 1075
Buhrmansdrif	Prolime	SA Lime & Gypsum	086 010 3515
Buhrmansdrif	Prolime Precision Lime	SA Lime & Gypsum	086 010 3515
Buhrmansdrif	Buhrmansdrif	Grasland Ondernemings	018 464 7820
Christiana	Britten	Grasland Ondernemings	018 464 7820
Daniëlskuil	Daniëlskuil	Kalkor	011 721 3141
Daniëlskuil	Daniëlskuil	H Pistorius & Co	012 342 1075
Glaudina	Glaudina	H Pistorius & Co	012 342 1075
Immerpan	Inca	SA Lime & Gypsum	086 010 3515
Immerpan	Inca	Kalkor	011 721 3141
Immerpan	Inca	H Pistorius & Co	012 342 1075
Immerpan	Inca	PBD Boeredienste	012 343 8220
Lichtenburg	Lovedale	Grasland Ondernemings	018 464 7820
Marble Hall	Marble Hall	SA Lime & Gypsum	086 010 3515
Marble Hall	Marble Hall	Limecor	079 107 5463
Ngodwana	Sappi	Kalkor	011 721 3141
Ngodwana	Ngodwana	H Pistorius & Co	012 342 1075
Northam	Northam	SA Lime & Gypsum	086 010 3515
Northam	Agri-Lime	Kalkor	011 721 3141
Olifantsfontein	Olifantsfontein Calcite	SA Lime & Gypsum	086 010 3515
Port Shepstone	Idwala Kulu CAG	SA Lime & Gypsum	086 010 3515
Sasolburg	Wolwehoek Precision Lime	SA Lime & Gypsum	086 010 3515
Springs	MFA-Sappi	PBD Boeredienste	012 343 8220
Vereeniging	Panfontein	SA Lime & Gypsum	086 010 3515
Witbank	Hiqua	Kalkor	011 721 3141
Witbank	Hiqua	H Pistorius & Co	012 342 1075
Witbank	Hiqua	PBD Boeredienste	012 343 8220

Location	Name	Company	Contact number
Cape			
Albertinia	Resiesbaan	SA Lime & Gypsum	086 010 3515
Albertinia	Resiesbaan	Nitrophoska	028 713 1508
Bredasdorp	Aghydrate	SA Lime & Gypsum	086 010 3515
Bredasdorp	Bredasdorp	SA Lime & Gypsum	086 010 3515
Bredasdorp	Karsrivier	Nitrophoska	028 713 1508
Bredasdorp	Bredasdorp	P&B Kalkwerke	028 424 1157
Moorreesburg	Titan Lime	SA Lime & Gypsum	086 010 3515
Saldanha	Saldanha	VDM	022 714 4212
Vredendal	Vredendal	SA Lime & Gypsum	086 010 3515
Vredendal	Vredendal	Cape Lime	023 626 3190

DOLOMITE SOURCES

Location	Name	Company	Contact number
Central			
Christiana	Britten	Grasland Ondernemings	018 464 7820
Clayville	Dolomite and soil improver	H Pistorius & Co	012 342 1075
Henley-on-Klip	Meyerton	PBD Boeredienste	012 343 8220
Immerpan	Leo Dolomiet	Kalkor	011 721 3141
Immerpan	Leo Dolomiet	H Pistorius & Co	012 342 1075
Immerpan	Leo Dolomiet	PBD Boeredienste	012 343 8220
Lichtenburg	Lovedale	Grasland Ondernemings	018 464 7820
Lyttelton	Lyttelton	Limecor	079 107 5463
Marble Hall	Dolomiet	SA Lime & Gypsum	086 010 3515
Marble Hall	Limecor Marble Hall	Kalkor	011 721 3141
Marble Hall	Marble Hall	PBD Boeredienste	012 343 8220
Marble Hall	Marble Hall	Limecor	079 107 5463
Meyerton	Meyerton	SA Lime & Gypsum	086 010 3515
Meyerton	Limecor Meyerton	Kalkor	011 721 3141
Meyerton	Meyerton	Limecor	079 107 5463
Middelburg	Calmasil & Dolotop	SA Lime & Gypsum	086 010 3515
Middelburg	Calmasil	Kalkor	011 721 3141
Middelburg	Calmasil	H Pistorius & Co	012 342 1075
Middelburg	Calmasil	PBD Boeredienste	012 343 8220
Modderfontein	Clayville	Kalkor	011 721 3141
Olifantsfontein	Olifantsfontein Dolomite	SA Lime & Gypsum	086 010 3515
Olifantsfontein	Olifantsfontein Dolotop	SA Lime & Gypsum	086 010 3515
Orkney	Vaarbrug	PBD Boeredienste	012 343 8220
Port Shepstone	Idwala Kulu DAG	SA Lime & Gypsum	086 010 3515
Pretoria	Mooiplaas	SA Lime & Gypsum	086 010 3515
Pretoria	Mooiplaas	Kalkor	011 721 3141
Pretoria	Mooiplaas	H Pistorius & Co	012 342 1075
Springs	Springs	SA Lime & Gypsum	086 010 3515
Springs	Atoll	Kalkor	011 721 3141
Zeerust	Ottoshoop Dolomite	SA Lime & Gypsum	086 010 3515
Zeerust	Ottoshoop Dolotop	SA Lime & Gypsum	086 010 3515
Zeerust	Marico	Grasland Ondernemings	018 464 7820

Location	Name	Company	Contact number
Cape			
Moorreesburg	Bridgetown	SA Lime & Gypsum	086 010 3515
Robertson	Langvlei	SA Lime & Gypsum	086 010 3515
Robertson	Langvlei	Cape Lime	023 626 3190
Vredendal	Vredendal	SA Lime & Gypsum	086 010 3515
Vredendal	Vredendal	Cape Lime	023 626 3190

Continued on p. 67

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Voordele van Bekalking

- *Verhoog die pH van die grond.*
- *Verbeter voedingstofopname.*
- *Goedkoop bron van kalsium en magnesium.*

Magnesium	calcium	sulfur	silicon
12	20	16	14
Mg	**Ca**	**S**	**Si**
24 305	40.078	32.066	28.086

Inligtingstegnologie

- *Hou kliënte op hoogte van bestellings per e-pos en SMS.*
- *Bestellings kan aanlyn geplaas word.*

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Agricultural lime and gypsum sources in South Africa

Continued from p. 63

GYPSUM SOURCES

Location	Name	Company	Contact number
Central			
Christiana	Britten	Grasland Ondernemings	018 464 7820
Daniëlskuil	Daniëlskuil	Kalkor	011 721 3141
Lichtenburg	Lovedale	Grasland Ondernemings	018 464 7820
Middelburg	Middelburg	SA Lime & Gypsum	086 010 3515
Midrand	Chloorkop	SA Lime & Gypsum	086 010 3515
Midrand	Chloorkop	Kalkor	011 721 3141
Midrand	Chloorkop	H Pistorius & Co	012 342 1075
Midrand	Chloorkop	PBD Boeredienste	012 343 8220
Olifantsfontein	Chloorkop	SA Lime & Gypsum	086 010 3515
Potchefstroom	Potchefstroom Sifted & Unsifted	SA Lime & Gypsum	086 010 3515
Potchefstroom	Potchefstroom	Kalkor	011 721 3141
Rustenburg	Phokeng	SA Lime & Gypsum	086 010 3515
Rustenburg	Phokeng	Kalkor	011 721 3141
Rustenburg	Phokeng	H Pistorius & Co	012 342 1075
Rustenburg	Phokeng	PBD Boeredienste	012 343 8220

Location	Name	Company	Contact number
Cape			
Ceres	Kolkiesrivier	SA Lime & Gypsum	086 010 3515
Moorreesburg	Titan Gypsum	SA Lime & Gypsum	086 010 3515
Vanrhynsdorp	Vanrhynsdorp	SA Lime & Gypsum	086 010 3515
Yzerfontein	Yzerfontein	SA Lime & Gypsum	086 010 3515

MAGNESIUM SOURCES

Location	Name	Company	Contact number
Central			
Malelane	Magnesite-gromag	SA Lime & Gypsum	086 010 3515
Olifantsfontein	Magnesium oxide	SA Lime & Gypsum	086 010 3515
Malelane	Magnesite	Kalkor	011 721 3141
Malelane	Magnesite	H Pistorius & Co	012 342 1075

FEED LIME SOURCES

Location	Name	Company	Contact number
Bredasdorp	Voerkalk	P&B Kalkwerke	028 424 1157
Buhrmansdrif	Prolime Feedlime	SA Lime & Gypsum	086 010 3515
Buhrmansdrif	Prolime Grit 2 - 4 mm	SA Lime & Gypsum	086 010 3515
Northam	VKF	Agrilime	014 536 9900
Northam	Grit	Agrilime	014 536 9900
Northam	AL 0 - 1 000	Agrilime	014 536 9900

Petru Fourie, research co-ordinator and production cost analyst, Grain SA

Kontak jou area landboukundige of MBFi hoofkantoor op +27 (0) 82 738 0080 of orders@mbfi.co.za vir meer inligting op die en ander produkte.

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Macro nutrient element deficiencies in maize

Nitrogen (N)
- Deficiencies in young plants are usually accompanied by a pale, light-yellow-green appearance.
- In older plants, a characteristic yellowed reverse V shape occurs on the leaves (**Photo 1**).
- The ear shows a characteristic kernel-free sharp point (**Photo 2**).

Phosphate (P)
- Where the soil is very low in phosphate, the leaves, and particularly the edge of the leaf, develop a characteristic purple colour.
- Phosphate deficiencies occur mainly in younger plants.

Potassium (K)
- Potassium deficiencies in mature plants are indicated by the thin, yellowed edges of leaves. Sometimes the edges die off.
- Potassium deficiencies usually occur on the lower, older leaves.
- Kernels on the upper part of the ear are poorly filled and appear shrunken.

Magnesium (Mg)
- Magnesium deficiencies usually cause light yellow stripes on the lower leaves, which later produce a beaded effect with round, dead spots.
- Magnesium deficiencies usually occur in more acidic soils.
- A high potassium content in the soil can induce a magnesium deficiency in the plant, displaying as light-green stripes on the leaf.

Sulphur (S)
- A sulphur deficiency usually displays as a light yellowing of the leaves in young plants (**Photo 3**).

Photo 1: The characteristic inverted V on a mature maize leaf that indicates a nitrogen deficiency.

Photo 2: Incomplete filling of an ear of maize due to a nitrogen deficiency.

Photo 3: Yellowing of leaves due to a sulphur deficiency in a young maize plant.

André Nel and William Deale, ARC-GCI, Potchefstroom


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Report poor fertiliser quality quickly

If you suspect or experience problems with fertiliser quality, follow the steps below:

1. Contact the fertiliser representative from whom you bought the fertiliser and insist on an investigation on site. Also keep a record of the dates and conversations.
2. Gather and write down as much information as possible, take photos or make videos to refer back to later.
3. Try to retain as many sealed bags as possible in case samples have to be taken at a later stage.

If the problem is not resolved, do not wait too long before considering the steps below:

1. Contact an independent scientist to do an investigation on site.
2. Inform Grain SA if the fertiliser company cannot provide the required attention and solutions for the relevant problems.

It is extremely important for fertiliser samples to be taken correctly. Fertiliser samples for testing fertiliser quality can be taken by William Deale in collaboration with the fertiliser company. Producers can contact Grain SA, FERTASA or William Deale directly in this regard to take and analyse samples for quality testing. William's contact details are 083 947 2389 or *wideale@gmail.com*.

The samples must be taken in accordance with the prescriptions on pages 62 to 67 of the Regulations to Act No. 36 of 1947. Die The Regulations are available on the FERTASA website: *http://www.fertasa.co.za/Regulations/31-65.pdf*

If a producer still suspects that there are problems with the fertiliser he purchased after the matter was taken up with the fertiliser company, he can contact Grain SA or lodge a complaint directly with the Registrar of Act No. 36 of 1947.

Corné Louw, senior economist: Inputs, Grain SA

ZINCHEM

Sinksulfaat-monohidraatkorrels

Zinchem is trots om aan te kondig dat die sinksulfaat-monohidraat van 2016 in korrelvorm beskikbaar sal wees.

Die sinksulfaat-monohidraatkorrels – B621 – met 34% Zn en B3987 met 28% Zn sal ook ronde korrels (2-5 mm) beskikbaar wees

Zinchem, Suid-Afrika se vooraanstaande vervaardiger en verskaffer van mikro-elemente, gaan Sinksulfaatkorrels in 2016 loods. Alhoewel die sinksulfaat van Zinchem al vir jare kommersieel beskikbaar is, word dit nou vir die komende seisoen die eerste keer as korrels verkoop.

Ons raai verder aan dat produsente moet aandring dat vermengers kyk na die korreltegnologie in vermengings.

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PLAAGBEHEER/*PEST CONTROL*

Five of the ten main alien trees in South Africa

Invader plants – and particularly alien trees – are a growing problem in South Africa. It would be easy to pass it off as the natural flow of things – if these plants did not have such a major economic impact on farming operations. Allegedly, 20 million hectares of land in South Africa have already been taken over by invader plants – 10 million hectares by alien trees. If all these trees were to be combined to represent 100% invasion, they would cover 1,7 million hectares – an area bigger than Gauteng. The effect of these alien trees on the eco system and eco-system services is enormous. Usually, they first displace the indigenous vegetation, reduce the biodiversity, increase the fire hazard, change the course of streams and often use a lot of water – to mention only a few disadvantages. Much has been done to try and control these alien trees – the Working for Water programme has already cleared more than 2 million hectares. However, if one considers the rapid invasion of the trees, as well as the fact that they have few if any natural enemies that can control them, the control programmes are only a drop in the ocean. It is therefore the duty of every farmer to actively control these plants where they occur – not only to preserve the eco system, but also because it re-invests millions of rands in eco-system services.

The five of the top ten alien trees mentioned here are not necessarily the biggest problem plants in your area. They are, however, a problem in terms of the area they have invaded, as well as the volume of water they consume.

Acacia cyclops A. Cunn. ex G. Don

Rooikrans or red eye wattle is an evergreen, rounded shrub or small tree that branches out low, at the bottom of the stem. It can become between 1,5 m and 4,0 m tall. This plant is indigenous to South-Western Australia and was brought to South Africa in 1886 – mainly to stabilise dunes. It grows primarily in sandy and loam soils and prefers sunny habitats. It is moderately frost resistant, but handles droughts well. It grows relatively slowly and takes seven to ten years to reach maturity. Habitats that have already been invaded by this tree include fynbos, spaces between plantations, dunes, road reserves and water courses. The seed of the plant is interesting because it is surrounded by a double row of red or orange succulent stems. The negative aspects of rooikrans include the following: They compete for light, space, water and nutrients; change the landscape and habitat; displace and replace the indigenous vegetation and change the sediment dynamics of sand dunes. The seed is a contaminant – where it occurs it forms an obstruction (vision and access), and the tree consumes large volumes of water. This tree is known to have invaded **1 855 792 ha** already. If all the trees are placed in one spot, they would occupy **339 153 ha**. The estimated annual water consumption of rooikrans is **487 million m^3**.

Biological control agents occur on this plant and have a very effective control action – they should therefore always be the first choice for controlling this plant. Fire or mechanical control (cutting down trees) can be used to control these trees, as they seldom regrow. If the trees are cut down, it should be done close to the soil surface. Young seedlings of this plant can also be pulled out by hand. Various chemicals are registered to control this plant and they can be used effectively in combination with mechanical control to get rid of the plants. According to the CARA Act, rooikrans is a category 2 plant – it therefore has an economic use, but the plants may occur only in demarcated areas, and with the necessary permission. According to NEMBA (National Environmental Management Biodiversity Act), rooikrans is a category 1b plant – it is therefore an alien species that should be controlled, removed and destroyed if possible. No trading in this plant may take place.

Acacia cyclops

2 *Acacia saligna* (Labill.) H.L. Wendl

The Port Jackson willow is indigenous to Australia and is described as a perennial shrub or small tree that can grow to between 3 m and 7 m tall. It grows in a variety of soil types and occurs particularly in disturbed areas or road reserves. It has an extensive root system comprising a well-developed taproot and several shallow, lateral roots. This tree grows rapidly and its useful life is between 15 and 20 years. Many seeds are produced per plant and they are also the main propagation mechanism.

Acacia saligna

The negative aspects of the Port Jackson willow include the following: it competes for light, space, water and nutrients; it displaces indigenous vegetation quickly; it changes the landscape and habitat; the seed is a contaminant; obstruction – dense stands restrict the movement of animals; in water and river courses it causes an obstruction to water flow; it forms an obstruction in terms of vision; consumes large quantities of water; reduces the grazing capacity and biodiversity if dense stands occur. The total hectares invaded by this tree is **1 852 155 ha**. If all these trees were to be placed in one spot, they would occupy **108 004 ha**. The calculated annual water consumption of this tree is **171 million m³**.

A rust fungus and seed-eating snout beetle act as biological control agents on the plants – the bio-agents are very effective and should be employed as the first control mechanism. Although very hot fires can cause the tree to die, it is not recommended as control method, as fire will promote seed germination. Mechanical control alone is not recommended, as sprouting will occur. Various chemicals are registered to control the plant and can be useful in combination with mechanical control. According to the CARA Act the Port Jackson willow is classified as a category 2 plant – it may occur only in a demarcated area if permission for this has been obtained. (Any plants outside the demarcated area must be controlled.) If the landowner does not have permission, it must be controlled. According to NEMBA it is a category 1b plant – it is therefore an alien species that should be controlled, removed and destroyed if possible. No trading in this plant may take place.

3 *Lantana camara L.*

Lantana originally comes from Central and South America. It is an erect to spreading thorny shrub. It has a well-developed root system and does not display specific habitat preferences – it therefore occurs in various areas in a variety of soil types. Propagation of the lantana is usually through seeds that are often disseminated by birds, but new plants can also develop from the rhizomes. It is globally regarded as one of the major weed species.

Lantana camara

The negative aspects of lantana are the following: It competes for light, space, water and nutrients; it displaces grasses; it inhibits the growth of grass (is allelopathic); it changes the landscape and habitat, particularly if it occurs in dense stands; it is toxic to animals; it is thorny; the seed is a contaminant; it causes obstruction (access, cultivation, vision); increases erosion; reduces soil binding; forms impenetrable stands; reduces the grazing capacity and biodiversity if in dense stands and reduces the biodiversity of invertebrates in the soil. Lantana invasion covers about **2 235 395 ha** – if this area is condensed so that the trees represent 100% invasion, it would cover **69 211 ha**. The calculated annual water consumption of lantana is **97 million m³**. Various

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Science For A Better Life

11/2016/GG

Five of the ten main alien trees in South Africa

Continued from p. 77

biological control agents were released on lantana, but the success of the bio-agents varies, as more than 50 different types of lantana occur. Fire as control measure is not effective, as aggressive sprouting will occur afterwards. Mechanical control should be applied only in combination with chemicals, as mechanical control alone also causes sprouting. Various chemicals are registered for controlling the plant. According to the CARA Act lantana is a category 1 plant – the landowner must therefore control it. According to NEMBA it is a category 1b plant – it is therefore an alien species that should be controlled, removed and destroyed if possible. No trading in this plant may take place.

4 *Acacia mearnsii* De Wild.

Black wattle is an evergreen, unbranched tree that grows between 5 m and 10 m tall. This tree is indigenous to Australia and Tasmania and was brought to South Africa for, among other things, timber poles, shelter and firewood. It primarily grows in light to medium-textured soils and can also occur in shallow soils. The root system of the tree is described as shallow but extensive. Lateral roots can occur up to 20 m from the mother plant. Because of the shallow root system it is not very drought resistant and is also only moderately frost resistant. The tree produces an enormous number of seeds that can survive in the soil for years. Habitats where it occurs already include grasslands, fynbos, plantations/forests and savanna. The negative aspects of the black wattle include the following: it competes for light, space, water and nutrients; changes the landscape and habitat; displaces and replaces the indigenous vegetation; reduces the biodiversity of the invertebrates in the soil; reduces water flow; increases the fire hazard (causes very hot fires) and reduces the grazing capacity of pastures. This tree is known to have invaded **2 477 278 ha** already. If all the trees are placed in one spot, they would occupy **131 341 ha**. The estimated annual water consumption of black wattle is **576 million m³**.

Acacia mearnsii

Biological control agents occur on this plant. Their effectiveness varies between moderate and extensive – they should therefore always be employed as first control mechanism. Some of the bio agents work only on the stumps of trees that have already been cut down to prevent sprouting. Fire will destroy the young seedlings, but not large trees – it will only stimulate sprouting and will also lead to seed germination. If mechanical control (cutting down of trees) is used, the roots must also be removed, as new plants can grow from the roots. Various chemicals are registered to control this plant and they can be used effectively in combination with mechanical control to get rid of the trees. According to the CARA Act, black wattle is a category 2 plant – it therefore has an economic use, but the plants may occur only in demarcated areas and with the necessary permission. According to NEMBA black wattle is a category 2 plant – it is therefore an alien species with the potential to invade. It has commercial value, but can be cultivated in demarcated areas only with the necessary permits and permission.

5 *Acacia dealbata* Link

Silver wattle is a thornless, evergreen, rapidly growing tree that becomes between 5 m and 15 m tall. This tree is indigenous to Australia and Tasmania and was brought to South Africa in the 1880s for, among other things, its shade, as a windbreak, and for the tannin. It grows in a wide variety of well-drained types of soil and is reasonably drought resistant. The root system of the tree is described as moderate to deep and extensive. Lateral roots can occur up to 22 m from the mother plant. Like the black wattle, the tree produces an enormous number of seeds that can survive in the soil for years. Habitats in which it already occurs include grasslands, road reserves and river banks.

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Five of the ten main alien trees in South Africa

Continued from p. 79

The negative aspects of the silver wattle include the following: It competes for light, space, water and nutrients; changes the landscape and habitat; displaces and replaces the indigenous vegetation; reduces water flow; increases the fire hazard (causes particularly hot fires); reduces the grazing capacity of pastures and consumes a lot of water. It is not known exactly how many hectares have already been invaded by this tree, but according to literature the invasion is already significant. The estimated annual water consumption of the silver wattle is **248 million m³**.

Acacia dealbata

A biological control agent (seed eater) occurs on this plant and its effectiveness is described as moderate. Fire stimulates seed germination and if it is used regularly, it can destroy the seed reserves in the soil. The negative effects of regular fires for the soil and other vegetation should be kept in mind, however. Mechanical control as the only method of control is not very effective, as the trees sprout aggressively after control. Various chemicals are registered to control this plant and they can be used effectively in combination with mechanical control to get rid of the trees. According to the CARA Act the silver wattle is a category 1 plant in the Western Cape (it must therefore be controlled), while it is a category 2 plant in the rest of South Africa. In the rest of the country this tree therefore has economic value, but the plants may occur only in demarcated areas, with the necessary permission. The NEMBA classification of silver wattle is also as a category 2 plant – it is therefore an alien species that has the potential to invade, but it also has commercial value and may be cultivated in demarcated areas with the necessary permits and permission.

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Dr Franci Jordaan, Grazing Division, Technology Development and Transfer, Potchefstroom

Tank mixtures can affect the effectiveness of weed control

Most of the time producers underestimate the impact a tank mixture of agrochemicals has on crop production.

The seed of most seed companies is treated with fungicide and/or insecticide or both and is sold like that to producers. There are also various products on the market that can be used as plant growth regulators to promote emergence and arrangement. Furthermore it is a common practice among maize producers to plant with pre-emergence herbicides. Therefore, several instances can arise where different agrochemicals are mixed with one another. However, these products must be mixed strictly according to registration prescriptions. Product labels of herbicides contain a section where the "mixability" is addressed to prevent agrochemicals from being mixed together randomly.

Disadvantages of unregistered tank mixtures:

- Products are inconsistent and precipitate, foam and/or thicken.
- This causes clogging of spray equipment.
- Herbicide is not a homogenous solution.
- Herbicide dosage is affected (too high or too low).
- Too little herbicide reaches the target plant (weed).
- Ineffective weed control.
- Crop damage right after administration.
- Delayed effect on crop - probably only visible later in season (yield losses/quality of yield influenced)
- Extended aftereffect in soil.
- Risk of any damage borne by the producer himself.

Important to remember:

- Tank water must be corrected if pH is too low or too high.
- 'Hard water' (e.g. high sodium and/or calcium levels in water) can prevent herbicide for dissolving effectively in water.
- Sequence in which agrochemicals must be mixed in tank mixtures: WG>GR>WP>SC>CS>EC>SL
- The formulation of a herbicide is an indication of the solubility of a product in water.
- Where products are mixed, first dissolve small amounts of the products in water and mix well before mixing with the rest of the tank water (already prepared) (particularly granular formulae).
- Certain herbicides can be successfully (and in accordance with registration) mixed with an insecticide, but as a rule fungicides cannot be mixed with herbicides.
- The addition of any other products like growth regulators and additives (penetrators, wetting agents) must be done very carefully.
- Only registered products with indications on their labels may be added and mixing instructions must be followed at all times.

For further enquiries, contact Elbé Hugo at 018 299 6298 or send an email to *HugoE@arc.agric.za*.

Elbé Hugo, ARC-GCI

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We create chemistry

Is it time for a gerbil campaign?

If you have not yet encountered gerbils, it will definitely happen at some stage. All grain producers must be aware of the possible occurrence of gerbils in their production areas.

1. Be on the lookout for burrows with a diameter of 60 mm in the headland and on the sides of cultivated fields. If you find such holes, it is definitely time for an anti-gerbil campaign.
2. Gerbils must be hit hard when they are at their most vulnerable, namely at the end of winter in the summer rainfall areas and at the beginning of autumn in the winter rainfall areas. This is when the animals are hungry and will react the best to rodenticide bait.
3. Only registered anticoagulant rodenticides registered for gerbils, as well as zinc phosphide and aluminium phosphide, may be used. Anything else – for instance aldicarb and carbofuran – will not have the desired effect and it is also a criminal offence under Act No. 36 of 1947 to use such substances.
4. The anticoagulants must be administered in 750 mm long 75 mm irrigation pipes: string three or four cubes on a thin wire and then hide the wax cubes inside the pipe, where the gerbils can eat them and other animals cannot reach them. Place the bait pipes 50 m apart around the field, or even within the field where there are colonies. Supplement every fourth day until the population has been eradicated. Pick up dead gerbils and bury them.
5. Zinc phosphide can be used as ready-to-use bait or producers can prepare their own bait: Soak cull maize in water until it germinates. Dry quickly and then mix according to instructions on the label with zinc phosphide and cooking oil. Use the same pipe as for the anticoagulants and place two tablespoons of the bait in the pipes, every 50 m around the field. Such bait can also be placed directly in the burrows (use a 25 mm pipe and a funnel), and close up the burrows. Zinc phosphide kills them quickly and the animals seldom die above ground. Under no circumstances should you distribute the bait across the fields with fertiliser dispensers or plant seed that has been treated in this manner! This would be totally ineffective and holds the risk of poisoning.
6. Bait drums can also be used: Cut a 210 litre drum in half and plant it level with the ground. Fill one-third with water and sprinkle sunflower seeds on the water. The gerbils drown when they jump into the drum to eat the seeds.
7. Plant seats for owls and raptors. One pole 2,4 m tall every 50 m, and one pole 1,4 m tall every 50 m. Sprinkle seed around the pole in the late afternoon so that it attracts the gerbils and the owls can hunt them. Also construct an owl box: One owl box per 50 ha is sufficient.
8. Plant a bait crop of cull seed in the headland at the same time the crop is planted. The bait crop should be densely planted so that the gerbils prefer to eat there rather than in the crop itself.
9. Where conservation tillage is implemented, the risk of gerbil infestation is almost 100%, as the abolishing of deep tillage means that the colonies are no longer destroyed. Such fields where gerbils flourish should be ploughed thoroughly and deeply once every four years.
10. For a complete management plan for gerbils, email a request to *nesher@tiscali.co.za*.

Dr Gerhard H Verdoorn (Griffon Poison Information Centre and Association of Veterinary and Crop Associations of South Africa [AVCASA])

graan

OPLOSSINGS 2015

KLEINGRAANGESIN 2016

KLEINGRAANGESIN 2017

Galmano® Reg. Nr. L9363 [Wet Nr. 36 van 1947]. **Galmano®** bevat Fluquinconazole (Skadelik). **Nativo®** Reg. Nr. L8942 (Wet Nr. 36 van 1947). **Nativo®** bevat Tebuconazole en Trifloxystrobin (Versigtig). **Prosaro®** Reg. Nr. L8510 (Wet Nr. 36 van 1947). **Prosaro®** bevat Prothioconazole en Tebuconazole (Versigtig). **Prosper® Trio** Resolve® Reg. Nr. L9083 (Wet Nr. 36 van 1947). **Prosper® Trio** bevat Spiroxamine, Tebuconazole en Triadimenol (Skadelik). **Redigo®** Reg. Nr. L8616 (Wet Nr. 36 van 1947). **Redigo®** bevat Prothioconazole (Versigtig). **Resolve®** Reg. Nr. L8708 [Wet Nr. 36 van 1947). **Resolve®** bevat Pyrasulfotole, Bromoxynil en Mefenpyr di-ethyl (Skadelik). **Sakura®** Reg. Nr. L9082 (Wet Nr. 36 van 1947). **Sakura®** bevat Pyroxasulfone (Skadelik). **Contans®** Reg. Nr. L10157 (Wet Nr. van 1947). **Contans®** bevat Coniothyrium minitans. **Aviator® Xpro** Reg. Nr. L10089 [Wet Nr. 36 van 1947]. **Aviator® Xpro** bevat Bixafen en Prothioconazole (Skadelik). **Galmano®, Nativo®, Prosaro®, Prosper® Trio, Redigo®, Resolve®, Sakura®, Aviator® Xpro en Contans®** is geregistreerde handelsmerke van Bayer AG, Duitsland. Gebruik slegs volgens etiketaanwysings.

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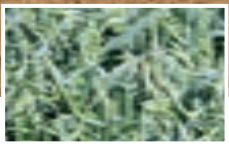

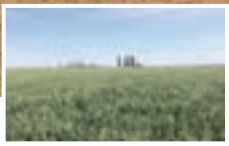

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Responsible use of pesticides in short

As agriculturists we must use agricultural substances or pesticides responsibly – to such an extent that we are able to produce sufficient, safe and affordable food and fibre for the country without affecting the health of people and the environment.

There is an entire pack of anti-pesticide mutts baying about the producers and how they poison everything, but they are seldom able to place any proof of their allegations on the table. Here is some hay to chew on, and yes, some will digest easily, but some will require a lot of chewing. I call these the ten commandments of responsible pesticide use:

1 Plan your production season carefully and purchase only the pesticides and volumes that you will definitely need. If the agent offers anything at a cheap price and you purchase unnecessary products, they will only accumulate.

2 Buy only registered pesticides from recognised dealers, in other words agents associated with CropLife South Africa's member companies, in order to ensure that they are of a good quality and legal. If a pesticide does not contain a registration number on the front panel of the label, it is illegal in South Africa. Such a registration number starts with a capital L, followed by four numbers (e.g. L1234) and Act No. 36 of 1947.

3 Store your pesticides in a proper storage place that has walls, a roof, ventilation, lighting and locking doors. Many malicious poisonings occur with agricultural substances stolen from producers and often it is the producer's own animals that die from them.

4 Study the label of each agricultural substance carefully and apply it strictly according to the prescriptions. Regulation No. R1716 of 26 July 1992 warns that using an agricultural substance for any purpose or in any manner other than that indicated on the label is a criminal offence in terms of Act No. 36 of 1947.

5 Provide your farmworkers with basic training on the safe and responsible use of pesticides. This will lead to more effective and responsible use as well as better production.

6 Wear protective clothing, for example a face mask, a cloth cap, long sleeves, long trousers and gloves when mixing and applying pesticides (this applies to the tractor driver who will spray the pesticide as well). Protect yourself against possible splatter, mists and oral intake of pesticides and spray mixtures.

7 Calibrate the spraying equipment so that the correct dosage of the pesticide is applied. This includes checking spray heads to make sure that they are not worn or blocked. Spray pressure must also be correct, as must the engine revolutions of the tractor and the speed at which the tractor moves.

8 Pesticides must be applied only if the weather is favourable. If the southeaster is blowing or the Highveld thunder clouds are looming, or if it is so hot that everything just evaporates, stop applying the pesticide. The wind may blow the pesticide mists across to the neighbour's potato fields and that might get you into trouble.

Continued on p. 92

Publications of the Agricultural Research Council (ARC)

Publications available from the ARC-GCI

1. Compact disk (CD) on the production of maize, pests and diseases.
2. *Laserskyf (CD) oor die produksie van mielies, peste en siektes.*
3. Field guide for sorghum pests/*Veldgids vir sorghumplae.*
4. *Sorghum-produksiehandleiding.*
5. *Sonneblomproduksie: 'n Bestuursgids vir die eenprodusent.*
6. Production of soybeans/*Produksie van sojabone.*
7. *Produksie van grondbone ("Grondbone – Altyd 'n wenner").*
8. Revised common weeds in Southern Africa/*Algemene onkruide in Suidelike Afrika.*
9. *Mielie-inligtingsgids (MIG) – jaarliks opgedateer.*

For more information or to obtain an order form, contact Mary James on 018 299 6100/6253 or send an email to *jamesm@arc.agric.za*.

Available from the ARC-SGI in English or Afrikaans

1. *Veldgids vir die identifikasie van koringinsekte in Suid-Afrika.*
2. Wheat Diseases in South Africa.
3. *Handleiding vir die produksie van kleingrane in die somerreënvalgebied (jaarliks opgedateer).*
4. *Handleiding vir die produksie van kleingrane in die winterreënvalgebied (jaarliks opgedateer).*
5. Guidelines for the production of small grains in the summer rainfall region (updated annually).
6. Guidelines for the production of small grains in the winter rainfall region (updated annually).

For orders, contact Elri Burger on 058 307 3400/19 or send an email to *burgere@arc.agric.za* or post your order to the ARC-Small Grain Institute, Private Bag X29, Bethlehem, 9700.

Responsible use of pesticides in short

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9 After pesticide containers have been emptied, they should be rinsed at least three times with one-third volume clean water, and the rinse water must be added to the spray tank. Containers should then be dried in the sun and preferably cut full of holes or cut up completely before being supplied to plastics recyclers. See *www.avcasa.co.za* for the list of recyclers.

10 Avoid malicious abuse of pesticides, for example poisoning animals that may cause damage. This is not only illegal and inhumane, but also creates a secondary poison risk for other animals. Poisoning has already seriously affected some species like vultures and the agricultural community is blamed for this.

Contact Dr Gerhard Verdoorn at 082 446 8946 or *nesher@tiscali.co.za*.

Dr Gerhard H Verdoorn (Griffon Poison Information Centre and Association of Veterinary and Crop Associations of South Africa [AVCASA])

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The ABCs of purchasing inputs

The use of untested input resources and the purchasing of input resources from unknown distributors expose producers to great risks every year. Take note of the following tips when purchasing and using input resources:

- Make sure that the input provider is a recognised company with a proven record.
- Ensure as far as possible that all recommendations are provided in writing and store these copies safely.
- Try to keep a record of all purchases as far as possible.
- Check the quality of the input resource. For seed the germination of the seed lot concerned can be requested, for example.
- Seed treatment should be done by the seed company itself or with certified seed treatment equipment.
- When purchasing agrochemicals:
  - Make sure that the input resource is registered for the purpose for which it is being used.
  - Make sure that the company whose input resource is being used is a member of CropLife.
  - Make sure that the distribution company is a member of CropLife and that the agent is qualified.
- Consult the 2016 MIG publication of the ARC-Grain Crops Institute.

As a rule, use small control sites to test new input resources before using them on a large scale.

As far as Rhizobia bacteria are concerned, it is important to use only registered (L registration in terms of Act No. 36 of 1947) input resources. The product concerned must also preferably be recommended by the seed company whose seed is being planted. Do not use new products on a large scale.

As far as prices are concerned, make sure that you pay the best market-oriented price. Obtain at least three quotes where possible and do not just accept the first and best price. Members are free to contact Grain SA with respect to input price trends.

Important when purchasing soil amendments, foliar nutrition and organic substances

The action of these input resources is not in question, but producers must note that some of these input resources have not been properly tested or registered in terms of Act No. 36 of 1947. When considering using such an input resource, you should therefore note the following:

- Make sure it has been registered in terms of Act No. 36 of 1947.
- Insist on long-term statistical and preferably independent local test results.
- Never use such an input resource on a large scale immediately, but rather use it for small-scale strip trials that can be assessed statistically to measure the performance of the input resource.
- Determine whether it is cost effective to use the input resource.

Grain SA is of the opinion that this type of input resource must first be tested statistically by a recognised independent local institution for sustainable production improvement with respect to economic benefit before it can be registered and marketed.

Corné Louw, senior economist: Inputs, Grain SA

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For more information please contact the registration holder:

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Solutions for the Growing World

Steps to report queleas

The Agricultural Pests Act (Act No. 36 of 1983) declare queleas and locusts to be pests. The Department of Agriculture, Forestry and Fisheries is responsible for controlling them.

The complainant may contact one of the resource conservation inspectors (see contact numbers below) with the information regarding the correct sleeping and breeding area and permission for access where necessary and report the queleas. An appointment will be made to inspect the sleeping or breeding area in the company of the complainant.

CONTACT DETAILS TO REPORT PESTS		
PERSON	TELEPHONE NUMBER	CELL NUMBER
Contact details for queleas:		
John Tladi Deputy Director: Migrating Pests	012 309 5743	082 457 3741
Khuliso Gangashe Assistant Director	012 309 5823	072 231 2192
Colin Burke	012 309 5826	082 451 4861
Luka Geertsema	012 309 5824	082 457 3742
Prudence Majozi	012 309 5866	076 655 1466
Vincent Makhari	012 309 5877	073 175 3843
Contact details for locusts:		
Gert Greyvenstein Migrating Pests Officer: De Aar		082 451 4860
Contact details for army worms:		
John Tladi Deputy Director: Migrating Pests	012 309 5743	082 457 3741

Corné Louw, senior economist: Inputs, Grain SA

Procedure to report poor quality agrochemicals

If you suspect or experience problems with the quality of agrochemicals, take the following steps:

- Contact the representative from whom the agrochemicals were bought as soon as possible and insist on an investigation on site. Also keep a record of dates and conversations.
- Gather and write down as much information as possible, take photos or make videos to refer back to later.

Consider the following steps if the problem is not solved (do not wait too long with this):

- Contact an independent scientist to do an investigation on site.
- Inform Grain SA if the chemical company cannot provide the required attention and solutions for the relevant problems.

Corné Louw, senior economist: Inputs, Grain SA

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VILLA CROP PROTECTION

DIERE/*ANIMALS*

Beef cattle selection for effective production

Beef cattle, like other branches of farming, must produce the maximum high-quality sustainable outputs with the minimum outputs – without harming the environment.

Effective cows are the foundation of profit. The qualities that contribute to effectiveness are the following:

- Early reproduction (early in the calving season), calving ease and early reconception.
- Enough milk to ensure a heavy weaner.
- Low cow maintenance (mature body weight).
- Adequate post-weaning growth rate and retention of condition.

The commercial beef producer can improve the production effectiveness by:

- Getting rid of unproductive cows – both those that do not calve and those that produce poor calves.
- Ensuring that the next generation of replacement animals performs better than their mothers.

This means that well-adapted bulls that will give the replacement progeny a better average must be used. Selection pressure must be applied more strictly with replacement bulls. Apply the following rules:

- Know where you are going with your cattle herd.
- Know what the shortcomings of your own female animals are.
  - Are there calving problems?
    - If these occur only with the calves of certain bulls, then it is the fault of the bull. Sell it.
    - If it occurs in all the cows, regardless of the bulls, the fault lies with the cows. Purchase bulls to correct the problem.
  - Are the weaners too light even though the cows had sufficient feed?
    - If it is a general problem, the cows do not have milk. Purchase bulls to correct the problem.
    - If the calves of only certain bulls are light, the problem lies with the bull. Replace the bull.
- Insist on the BLUP breeding values of bulls and use these to select bulls that increase the genetic merit of the herd.
- Consider bulls that will make a difference to the effectiveness of future breeding cows by checking the following properties (summarised in an economic value, namely 'cow value'):
  - Female reproduction (breeding values for age, first calf and calf interval – summarised in a single fertility value).
  - Calving ease.
  - Milk.
  - Pre-weaning growth rate (growth vigour).
  - Upkeep (on the basis of mature body weight).
- Furthermore, the properties required from the bull itself and in which his progeny should excel, should also be emphasised:
  - Scrotum circumference.
  - Post-weaning and feedlot growth rate (GDT), as well as feed efficiency – summarised in an economic value like 'growth value'.

The BLUP breeding values provide the guidelines for selecting different animals and to support you in selecting the right bull for your operations. **Table 1 and Table 2** are catalogue examples of bulls that were offered at a public auction recently. The five factors that contribute profit for cows, namely calving ease, milk, calf growth, upkeep, fertility and growth qualities (as 'growth value') are also indicated in the catalogue.

	CALVING EASE **		MILK ***	CALF GROWTH ****	UPKEEP **☼		GROWTH TEST					FERTILITY ***			COW VALUE ****	GROWTH VALUE ****	PRODUC-TION VALUE ****
Selection W	82 30		109 64	123 60	97 34								106 26				
	Birth weight	Birth Mat.	Milk	Weaning weight	Post-weaning	Mature weight	GDT	Kleiber	VOV	Length	Height	SC	AFC	ICP			
BV index	86	90	109	123	123	103	124	96,04	-	127	132	97	109	104	124 41	121 68	124 46
Estimated BV	2,31 33	0,32 26	6,6 54	23,7 60	38,6 59	31 34	183 64	131 64	-	57 71	35 74	10,1 72	-14 34	-65 19			
Measure-ments	-			- (-)	- (-)	- (-)	100	10,91	-	1 366	1 245	285			Semen donor: No Tests: TB and CA free Inoculation: Blackleg, botulism and anthrax		
	Remarks: -																

Table 1: Genetic merits of Bull 1 as indicated in the catalogue at a recent auction.

	CALVING EASE **☼		MILK ***	CALF GROWTH ***	UPKEEP ***		GROWTH TEST					FERTILITY ***			COW VALUE ***	GROWTH VALUE ***	PRODUC-TION VALUE ***
Selection W	98 31		108 45	104 51	100 17								106 26				
	Birth weight	Birth Mat.	Milk	Weaning weight	Post-weaning	Mature weight	GDT	Kleiber	VOV	Length	Height	SC	AFC	ICP			
BV index	97	100	108	104	103	100	105	-	-	101	106	115	105	99	105 35	106 39	106 36
Estimated BV	1,5 33	-,05 28	6,4 45	14,3 51	22,9 36	27 17	108 37	90 37	-	28 40	17 42	20,4 41	-10,4 36	-5,1 23			
Measure-ments	-			212 (91)	341 (91)	423 (93)	-	-	-	-	-	-			Semen donor: No Tests: TB and CA free Inoculation: Blackleg, botulism and anthrax		
	Remarks: -																

Table 2: Genetic merits of Bull 2 as indicated in the catalogue at a recent auction.

The following is revealed by an analysis of the genetic merits of **Bull 1**:

- He will breed excellent weaners with a good pre-weaning growth rate (four stars and a 123 genetic index mark for calf growth – therefore pre-weaning growth).
- His good genetic value for milk means that his daughters will also wean heavy calves (three stars with a genetic index mark of 109 for milk).
- He will breed fertile daughters with his genetic index mark of 106 – therefore three stars. Both his genetic merit of 109 for 'age at first calving' (AFC) and 'inter-calving period' (ICP) of 104 are above average for the breed.
- His daughters' mature body weight will be a bit heavier and will therefore require a bit more upkeep than the breed average (two-and-a-half stars and a genetic index of 97).
- As his genetic figure for calving ease is below the breed average (82 genetic index with two stars), he is not recommended for covering heifers, but rather adult cows.
- This bull will also breed a progeny with an excellent growth rate in the feedlot, as is reflected by the outstanding 'growth value'. The genetic merit indicates a breeding value index of 121 (four stars) – therefore 21 index marks above the active animals in the breed.

Bull 2 is also one with excellent genetic merit. Although his genetic merit for pre-weaning ('calf growth' – 104 with three stars) and post-weaning ('growth value' – 106 with three stars) growth, as well as 'milk' (108 with three stars), are considerably better than the breed average, Bull 1 is better in these respects than Bull 2. However, Bull 2 has other advantages over Bull 1, namely that he can be used for heifers because the genetic merit for calving ease is at breed average (two-and-a-half stars out of five, with a breeding value index of 98). This particular breed is known for smaller calves at birth. Furthermore, his daughters will not require more upkeep – with a genetic merit for breeding mature body weight daughters (100 breeding value index with three stars). Over and above the fact that his sons will have above-average vigour (GDT index of 105), they will not fall short with respect to scrotum circumference (SC) (115 breeding value index). The progeny of Bull 2 will also mature later – as is reflected in the shoulder height breeding value index ('height') of 106 (compared to Bull 1's value of 132). This is in line with the mature body weight breeding values ('mat. weight') of the two bulls.

These examples serve as proof that bulls can be selected judiciously if the buyer understands what the figures mean. For more information, contact the writer at 082 331 9923 or *japie@studbook.co.za*.

Japie van der Westhuizen, SA Stud Book and Animal Improvement Association

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Management guidelines for beef cattle

Guidelines for licks

An example of a basic lick programme for the central Free State and North West (the eastern Highveld can start a month earlier)

Month	Type of lick		
	Cows/bulls	Replacement heifers (8 to 12 months)	Steers (8 to 12 months)
January	Summer lick		
February	Summer lick		
March	Summer lick		
April	Transition lick		
May	Transition lick		
June	Winter lick	Production lick	Production lick
July	Winter lick	Production lick	Production lick
August	Winter lick	Production lick	Production lick
September	Winter lick	Production lick	Production lick
October	Winter lick	Production lick	Production lick
November	Summer lick	Production lick	Production lick
December	Summer lick	Production lick	Production lick

Typical lick intakes

Summer salt-phosphate		100 g - 240 g/animal/day
Transition lick	10% - 20% RP	200 g - 800 g/animal/day
Winter lick	40% - 50% RP	400 g - 600 g/animal/day
Production lick	25% - 30% RP	1 000 g - 1 500 g/animal/day

These remain guidelines. Talk to your livestock scientist to compile the right lick programme for your area.

Carrying capacity and dry material intake

LSU for cattle with different frame sizes (Meissner et al., 1983).

Class	Small frame		Medium frame		Large frame	
	Weight	LSU	Weight	LSU	Weight	LSU
Bull	600	1,36	600	1,38	650	1,63
Cow, dry (3 years)	400	1,01	450	1,13	500	1,27
Cow, dry (mature)	500	1,10	525	1,21	550	1,32
Cow, pregnant (3 years)	400	1,01	450	1,13	500	1,27
Cow, pregnant (mature)	500	1,10	525	1,21	550	1,32
Cow, with calf (3 years)	400	1,22	450	1,40	500	1,66
Cow, with calf (mature)	500	1,42	525	1,55	575	1,82
Weaner	180	0,44	200	0,53	225	0,64
Ox (18 months)	300	0,75	350	0,90	400	1,09
Ox (mature)	490	1,10	550	1,22	585	1,33

Basic norms for the number of cows that a farm with a carrying capacity of 100 LSU can carry with different production systems:

Weaner system:	1 medium-frame cow = 1,7 LSU = 58 cows for the farm
Steer system (18 months):	1 medium-frame cow = 2,2 LSU = 45 cows for the farm
Ox system (30 months):	1 medium-frame cow = 3,1 LSU = 32 cows for the farm

Voluntary daily dry material intakes (DMI)

Meissner et al (1983) work on an average DMI of 2,5% of body mass for growing animals. If moisture content and hay wastage are included, the average roughage intake (hay) is approximately 3,0% of body mass.

For lactating animals the average DMI is 3,0% (2,7% - 3,3%) of body mass. If moisture content and hay wastage are included, the average roughage intake (hay) is approximately 3,5% of body mass.

Health management

An example of a basic vaccination programme for a spring calf system:

Cattle: Spring calf season		
Vaccination	**Animals to be vaccinated**	**Month of vaccination**
Lumpy skin disease, Rift Valley fever	Bulls, cows and replacement heifers	Before calving (Jul/Aug)
Blackleg/botulism/anthrax or multiclostridial vaccine + anthrax	Bulls, cows, replacement heifers and suckling calves	Autumn/before weaning (Apr)
Contagious abortion	Replacement heifers	S19 – before the age of 8 months (Feb/Mar) RB51 – before weaning (Mar/Apr), repeat twice before heifers are mated for the first time
*BVD/respiratory diseases	Cows, replacement heifers and suckling calves	6 to 8 weeks before mating season (Nov/Dec) Before weaning (Mar/Apr)
NB. All animals that are vaccinated with an inactivated (dead) vaccine for the first time must receive a booster three to six weeks later (as prescribed by the manufacturer) to be effective!		
*NB: Make sure in what cases 'live' or 'dead' vaccines can/should be used and the correct positioning of this to prevent possible losses/damage.		

Check with your vet to make sure the programme is right for your operations and your area.

Internal parasites that regularly occur in cattle:

Type of worm or name of parasite	**Month of occurrence**	**Animals affected by the parasite**	**Active ingredients required to treat animals (due to limited space only the main active ingredients are mentioned)**
Roundworms (cattle bankrupt-worm, wireworm, nodular worm)	Summer months	All, but particularly immature animals	Macrocyclic lactone, white substances (albendazole, etc.), laevamisole
Liver fluke	Summer months strategic treatment Apr/May and Aug/Sept Tactical treatment Dec/Jan	All	Immature and mature stages: Triclabendazole Early immature and mature stages: clorsulon, nitroxynil, closantel, albendazole, rafoxanide, oxyclozanide
Conical fluke	Apr to Aug	All	Resorantel, oxyclozanide
Tapeworm	Whole year	Suckling calves	Prasikwantel, Niklosamied
Coccidia	Whole year	Young calves (3 weeks +)	Diclazuril, toltrazuril

Take the necessary dung sample, have it analysed and ask the assistance of experts to optimise your dosing programme.

Pietman Botha, agricultural consultant

WHAT DOES A FUNCTIONAL FEMALE ANIMAL LOOK LIKE?

Female beef cattle deserve special acknowledgement, because they represent approximately 97% of the breeding herd and they transform grass, shrubs and crop residue into a nutritious product for humans.

Requirements for a functional female animal

A functional beef cow should meet four requirements:
1. She needs to have a beneficial functional appearance.
2. A cow needs to be adaptable to her surroundings.
3. She needs to maintain a high reproduction rate.
4. A female animal should produce sufficient milk and high-weight weaners.

These requirements are discussed briefly below.

1 *Functional appearance*

The hormonal balance of an animal determines its appearance. Approximately 10% of a new heifer group will show visible reproductive weakness. Cows that skip may have developed a hormone imbalance. Evaluate and eliminate animals showing a poor functional appearance. A highly fertile cow and heifer are beautifully feminine, with a narrow face and neck and a smooth, shiny coat. Older cows display a wedge shape.

Female animals that have low fertility have a rough, dull coat and the front part of their body is deeper (in other words the wedge is the wrong way around), with under-developed genitals. These animals tend to have longer legs, with longer periods between calves. Heifers that are in heat regularly have developed udders that are visible. A functional udder is important. Bottle weaners should be culled.

A medium bone structure and frame size are ideal. Sound hooves are important in the sandy areas. A black hoof with a beneficial heel depth is the best combination.

2 *Adaptability*

A breeder must have a clear understanding of the way in which each environmental effect influences the animals and which animals react the best to each effect.

Beef cattle, for example, are comfortable at temperatures that vary between -1°C and 27°C. Their body temperature is 38,6°C. As soon as temperatures exceed 27°C, it becomes important for the animal to possess certain adaptation characteristics to enable her to maintain her body temperature. If the animal is unable to do this, her appetite declines and she does not do well. Important characteristics are a smooth, shiny coat, a thick, loose hide and adequate sweat glands. The conformation is respiratory, i.e. deep, slightly flatter forequarters so that more of its skin becomes an area for heat radiation. Animals in moderate areas are metabolic, with a round conformation through the ribs to retain heat.

Animals that are not adapted to the higher temperatures will breathe more rapidly (normal is 26 - 30 breaths per minute) and the foetus will resorb more easily, which has a negative effect on reproduction.

3 *Reproduction*

The birth of a healthy calf each year beats all other selection objectives as far as value is concerned. Cows not in calf must be held back as soon as the calving percentage drops below 75%.

It is more beneficial to select cows with a shorter gestation period. Their calves will be lighter at birth, with no negative effects on the uterus. They will therefore become pregnant again more easily. Cows that calve early in the calving season usually have a shorter pregnancy.

Management practices that benefit reproduction

- *Mating of heifers*
  Heifers should be mated 21 days before the cow herd. They should all be pregnant before the older cows are serviced. This constitutes a more beneficial use of herd bulls.
- *Mating of first-calf cows*
  If heifers are mated earlier, they will calve earlier and it will be beneficial to mate them earlier again, with the heifers. It has been found that if this is not done, the stronger sucking of a larger calf places them in anoestrus. They therefore do not become pregnant. In herds where this procedure was followed, the pregnancy among first-calf cows increased from 65% to 80%.

4 Milk production and weaning weight

A cow should produce sufficient milk so that the calf reaches at least 40% of her body weight. The national average of all breeds is 42,9% – calculated from a weaning weight of 213 kg and a cow weight of 496 kg at weaning age. The milk of the mother is responsible for 67% of the weaning weight from natural pastures, and the growing ability of the calf is responsible for 33%.

In a normal season bull calves will be 7% heavier than heifer calves at weaning age. Heavier calves require more milk than lighter calves because they drink more often and more aggressively. Bull calves also drink more regularly than heifer calves.

Bull calves on average consume 0,6 kg more milk per day than heifer calves. Over a period of 210 days they therefore consume 126 kg more milk than heifer calves.

If we assume that bull calves weigh 240 kg on weaning and the mother produces 1 260 kg of milk during 210 days of lactation, the cow produces a total of 1 500 kg of milk and meat (weaner). If she weighs 500 kg, it is three times her own weight. These figures illustrate what an asset the female animal is in the beef cattle industry.

The management of the cow herd and the heifer herd is therefore very important, because they have to produce heavy calves and must also become pregnant again.

The beef cattle industry requires breeding cows and heifers that produce economically effectively at high levels – with the correct functional appearance, beneficial adaptability, high reproduction rate and beneficial milk production and weaning weight.

For more information, contact the writer at 083 637 0189.

DJ Bosman, agricultural consultant

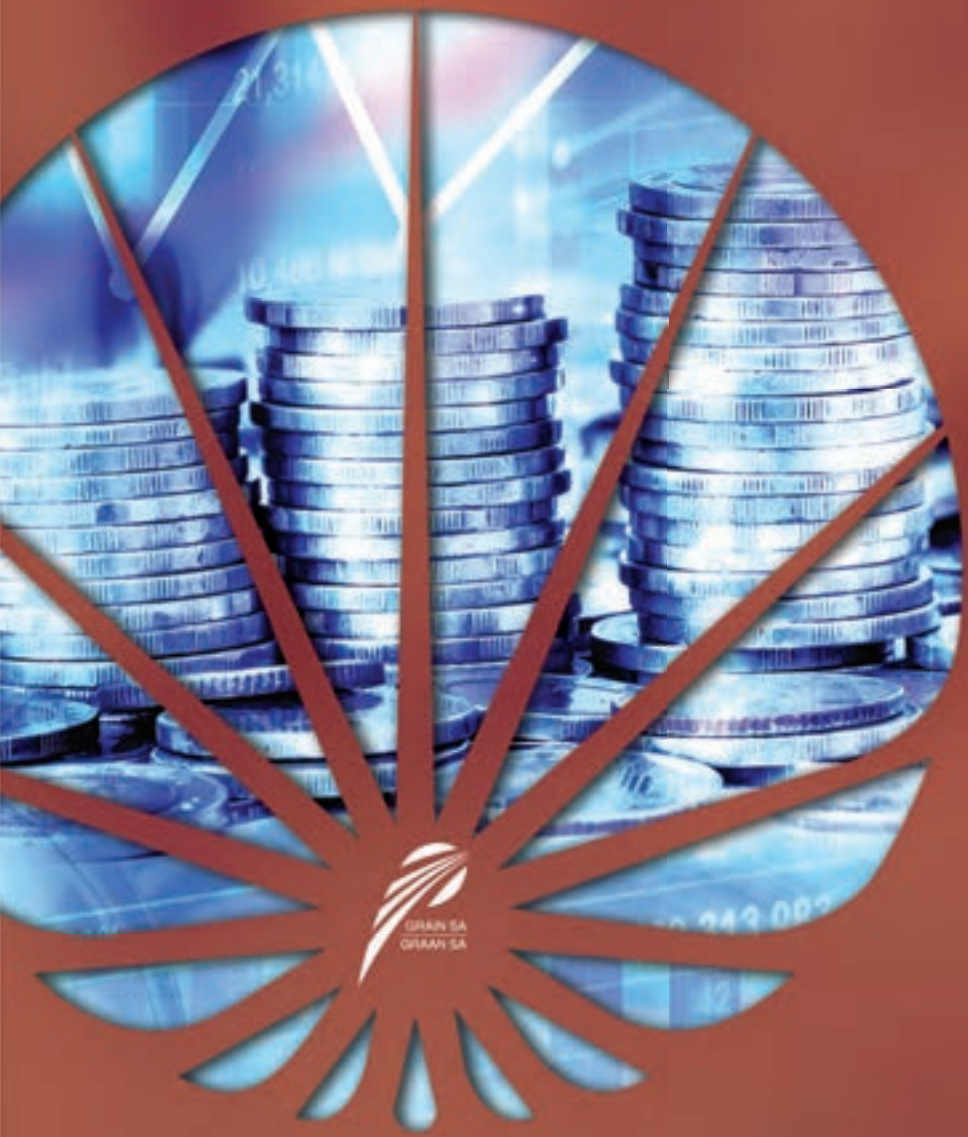
INDEPENDENT FEED ANALYSIS LABORATORIES IN SOUTH AFRICA

Laboratories	*Contact number*
Animal & Poultry Science, School of Agricultural Sciences & Agribusiness, University of KwaZulu-Natal	033 260 5158
Animal Production Feed Laboratory (Elsenburg), Department of Agriculture, Western Cape	021 808 5229
ARC-Irene Analytical Services (ANPI)	012 672 9292
Agri Enviro Lab, Bethal	017 647 1150
ALS Analysis and Inspection-Durban (Pty) Ltd	031 301 1257
Animal Nutrition Laboratory, University of the Free State, Bloemfontein	051 401 2382
Bio-Industrial Services CC, Edenvale	011 822 8135
Chem Nutri Analytical, Kempton Park	011 316 8800
DARD: Soil Analytical Services, Pietermaritzburg	033 355 9456
Department of Animal Science, University of Stellenbosch	021 808 4741
Deltamune, Lyttleton	012 664 5730
Food & Beverage Laboratory, CSIR, Cape Town	021 658 2770
Intertek Agricultural Laboratory, Bapsfontein	011 964 1004
Intertek Oil, Chemical & Agri, Durban	031 274 8000
Labworld, a division of AFGRI Operations Limited, Isando	011 977 7748
M & L Laboratory Services, Southdale	011 661 7926
Modderfontein Laboratory Services (Pty) Ltd, Modderfontein	011 457 1801
Nitrulab, Irene	083 384 9142
Nvirotek Laboratories, Hartbeespoortdam	012 252 7588
Quantum Analytical Services (Pty) Ltd, Malmesbury	022 487 1285
SABS Commercial SOC Ltd, Food and Water Chemistry, Pretoria	012 428 6868
Southern African Grain Laboratory, Pretoria	012 807 4019
UP Nutrilab, Department of Animal and Wildlife Sciences, University of Pretoria	012 420 3269
In-house laboratories	***Contact number***
Crown Chickens, Uitenhage	041 365 6048
Nutrifeeds, Viljoenskroon	056 344 2200
RCL Foods, Malelane	013 791 1393
RCL Foods, Hammersdale	031 736 7420
Tongaat Hullet Starch, Isando	011 458 5146
Voermol Feeds, Maidstone	032 439 5864
Kimleigh Technologies, Potchefstroom	018 293 1028

The above is a list of the laboratories that are members of AgriLASA. These laboratories participate in an inter-laboratory control scheme for each discipline to which they belong. The latter schemes are co-ordinated by AgriLASA. The schemes are the best way for laboratories to verify their results. Each laboratory's achievements can be requested from the laboratory by producers or institutions who want to do business with the laboratory.

Dailena Pienaar, chairman: AgriLASA Executive Management

GELDSAKE/*MONEY MATTERS*



Grain marketing calendar for 2017

1. Crop estimates committee and SAGIS dates for 2017

Monthly information

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
SAGIS monthly data	25	24	27	26	25	27	25	25	27	25	24	21
Crop estimates committee	6	3	3	7	5	2	7	4	1	6	3	1
Supply and demand committee	26	10 & 28	28	25	12 & 26	28	26	29	28	26	28	19

Weekly information

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
SAGIS weekly bulletin			2			1		3			2	
	5	2	9	6	4	8	6	11	7	5	9	7
	12	9	16	13	11	15	13	17	14	12	16	X
	19	16	23	20	18	22	20	24	21	19	23	X
	26	23	30	28	26	29	27	31	28	26	30	X

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
SAGIS weekly import and export data	5				3			1		3		
	10	7	7	4	9	6	4	8	5	10	7	5
	17	14	14	11	16	13	11	15	12	17	14	X
	24	21	22	19	23	20	18	22	19	24	21	X
	31	28	28	25	30	27	25	29	27	31	28	X

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
SAGIS weekly producer delivery data			1		4			2			1	
	6	1	8	5	10	7	5	10	6	4	8	6
	11	8	15	12	17	14	12	16	13	11	15	X
	18	15	23	20	24	21	19	23	20	18	22	X
	25	22	29	26	31	28	26	30	28	25	29	X

Notes
All publications are released after 12:00 on the scheduled date
X = No publication will be released in that week

2. JSE dates for contracts

Dates for main trading months

(100 tons of white and yellow maize and 10 tons of wheat, sunflower, soybeans and sorghum)
These contracts are typically offered one year before their maturity date, although they can also be offered earlier if there is a demand for them.

MATURITY MONTH	FIRST POSITION DAY	FIRST NOTICE DAY	LAST NOTICE DAY	LAST TRADING DAY	FIRST DELIVERY DAY	LAST DELIVERY & CLEARING DAY	OPTION MATURITY DATE
Sept 2016	30/08/2016	31/08/2016	26/09/2016	23/09/2016	01/09/2016	27/09/2016	25/08/2016
Dec 2016	29/11/2016	30/11/2016	23/12/2016	22/12/2016	01/12/2016	27/12/2016	24/11/2016
Mar 2017	27/02/2017	28/02/2017	27/03/2017	24/03/2017	01/03/2017	28/03/2017	22/02/2017
May 2017	26/04/2017	28/04/2017	25/05/2017	24/05/2017	02/05/2017	26/05/2017	21/04/2017
Jul 2017	29/06/2017	30/06/2017	25/07/2017	24/07/2017	03/07/2017	26/07/2017	26/06/2017
Sept 2017	30/08/2017	31/08/2017	22/09/2017	21/09/2017	01/09/2017	26/09/2017	25/08/2017
Dec 2017	29/11/2017	30/11/2017	21/12/2017	20/12/2017	01/12/2017	22/12/2017	24/11/2017
Jul 2018	28/06/2018	29/06/2018	25/07/2018	24/07/2018	02/07/2018	26/07/2018	25/06/2018

Dates for all fixed monthly contracts
These contracts are offered 40 business days before the actual delivery month.
(Notice A1372)

MATURITY MONTH	OFFER	FIRST POSITION DAY	FIRST NOTICE DAY	LAST NOTICE DAY	LAST TRADING DAY	FIRST DELIVERY DAY	LAST DELIVERY DAY
Oct 2016	05/08/2016	29/09/2016	30/09/2016	25/10/2016	24/10/2016	03/10/2016	26/10/2016
Nov 2016	06/09/2016	28/10/2016	31/10/2016	24/11/2016	23/11/2016	01/11/2016	25/11/2016
Jan 2017	03/11/2016	29/12/2016	30/12/2016	25/01/2017	24/01/2017	03/01/2017	26/01/2017
Feb 2017	02/12/2016	30/01/2017	31/01/2017	22/02/2017	21/02/2017	01/02/2017	23/02/2017
Apr 2017	03/02/2017	30/03/2017	31/03/2017	21/04/2017	20/04/2017	03/04/2017	24/04/2017
Jun 2017	31/03/2017	30/05/2017	31/05/2017	26/06/2017	23/06/2017	01/06/2017	27/06/2017
Aug 2017	05/06/2017	28/07/2017	31/07/2017	25/08/2017	24/08/2017	01/08/2017	28/08/2017
Oct 2017	03/08/2017	28/09/2017	29/09/2017	25/10/2017	24/10/2017	02/10/2017	26/10/2017
Nov 2017	05/09/2017	30/10/2017	31/10/2017	24/11/2017	23/11/2017	01/11/2017	27/11/2017

JSE carcass contract months

1. Trading calendar for beef carcass contracts

MATURITY MONTHS	CONTRACT	LAST TRADING DAY/MATURITY DAY (Second Wednesday of the maturity month)	CLEARING DAY (Two business days after last trading day)
Sept 2016	BEEF	14/09/2016	16/09/2016
Dec 2016	BEEF	14/12/2016	19/12/2016
Mar 2017	BEEF	08/03/2017	10/03/2017
Jun 2017	BEEF	14/06/2017	19/06/2017
Sept 2017	BEEF	13/09/2017	15/09/2017
Dec 2017	BEEF	13/12/2017	15/12/2017

2. Trading calendar for all constant month contracts
The contracts are listed on the first Wednesday of the calendar month before the contract month
(Note 275/2016)

MATURITY MONTHS	CONTRACT	LAST TRADING DAY/MATURITY DAY (Second Wednesday of the maturity month)	CLEARING DAY (Two business days after last trading day)
Oct 2016	BEEF	12/10/2016	14/10/2016
Nov 2016	BEEF	09/11/2016	11/11/2016
Jan 2017	BEEF	11/01/2017	13/01/2017
Feb 2017	BEEF	08/02/2017	10/02/2017
Apr 2017	BEEF	12/04/2017	18/04/2017
May 2017	BEEF	10/05/2017	12/05/2017
Jul 2017	BEEF	12/07/2017	14/07/2017
Aug 2017	BEEF	08/08/2017	11/08/2017
Oct 2017	BEEF	11/10/2017	13/10/2017
Nov 2017	BEEF	08/11/2017	10/11/2017

Luan van der Walt, economist, Grain SA

Internet and social media links

International and local websites

Australian Sorghum and Canola Prices:
http://www.sfe.com.au/content/prices/rtp15SFUS.html

CBOT futures price: Maize:
http://www.cmegroup.com/trading/agricultural/grain-and-oilseed/corn.html

CBOT futures price: Soybeans:
http://www.cmegroup.com/trading/agricultural/grain-and-oilseed/soybean.html

CBOT futures price: Wheat:
http://www.cmegroup.com/trading/agricultural/grain-and-oilseed/wheat.html

Dalian Commodity Exchange, China:
www.dce.com.cn/portal/cate?cid=1261736328100

Dow Jones Industrial General Index:
http://www.google.com/finance?client=ob&q=INDEXDJX:DJI

FAO Global Information and Early Warning System:
http://www.fao.org/GIEWS/english/index.htm

Gold and Brent crude oil price:
http://www.fin24.com/Markets/

FAO Food Price Index:
http://www.fao.org/worldfoodsituation/foodpricesindex/en/

Grain SA:
www.grainsa.co.za

Global GDP Forecasts/Economic forecasts:
http://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?order=wbapi_data_value_2010%20wbapi_data_value%20wbapi_data_value-last&sort=asc

Maize:
http://www.scoop.it/t/maize

Weather Outlook:
http://www.wxmaps.org/pix/prec10.html

Weather Outlook and Rainfall data:
http://www.rmd.co.za/

JSE MTM price report:
http://www.jse.co.za/DownloadFiles.aspx?RequestedNode=DownloadableDocuments/Safex/amdmtm

SAGIS:
www.sagis.org.za

SAGL:
www.sagl.co.za

South African Grain and Oilseed Market Group:
http://www.linkedin.com/groups?gid=4617140&trk=my_groups-b-grp-v

Twitter:
https://twitter.com/

Exchange rates:
http://www.oanda.com/currency/live-exchange-rates/

World Agricultural Supply and Demand Report:
http://www.usda.gov/oce/commodity/wasde/

NewsNow:
http://www.newsnow.co.uk/h/Industry+Sectors/Agriculture/Agricultural+Commodities

Twitter

Arlan Suderman	@ArlanFF101
Hendrik Smith	@Healthy_Soils
Graan SA	@GrainSA
Luan van der Walt	@Luan_vd_Walt
Wessel Lemmer	@WesselLemmer
Wandile Sihlobo	@WandileSihlobo
Agrimoney	@agrimoney
USDA	@usda
AMIS	@AMISoutlook
Tom Farms	@TomFarms
ABARES	@ABARES
Dalevest	@Dalevest_Live
BVG	@BVG_Trading

Luan van der Walt, economist, Grain SA

GRAAN SA/*GRAIN SA*

Vision

Grain SA is acknowledged by key role-players nationally and internationally to be the grain producers' only and official mouthpiece, and because of its proven expertise and leadership role in the grain industry, it is the leading supplier of industry-strategic services to South African grain producers.

Mission

Through its activities Grain SA provides industry-strategic support to grain producers in South Africa in order to promote sustainable profitability.

Executive Committee

Preline Swart (vice-chairperson) [1] • Jaco Minnaar (chairperson) [2]
Andries Theron (vice-chairperson) [3] • Anton Botha [4]
Chris Schoonwinkel [5] • Jannie de Villiers (chief executive officer) [6]
Victor Mongoato (co-opted member) [7] • Derek Mathews [8]

Grain SA's Executive per region

REGION 1
VACANT
Buhrmannsdrif, Coetzersdam, Kameel, Louwna, Madibogo, Mafikeng, Mareetsane, Piet Plessis, Setlagole, Stella and Vryburg

REGION 2
JOZEPH DU PLESSIS
– 082 578 7616
Amalia, Migdol and Schweizer-Reneke

REGION 3
DEON BERGH
– 082 316 3115
Bloemhof, Christiana, Hartswater, Jan Kempdorp, Leeudoringstad, Makwassie, Vaalharts, Warrenton and Wolmaransstad

REGION 4
DANIE REICHEL
– 083 271 0124
Biesiesvlei, Groot-Marico, Lichtenburg, Rooigrond, Vermaas and Zeerust

REGION 5
DEREK MATHEWS
– 082 878 0056
Barberspan, Delareyville and Sannieshof

REGION 6
NIËL ROSSOUW
– 082 417 4810
Bospoort, Coligny, Hartbeesfontein, Klerksdorp, Orkney, Ottosdal and Stilfontein

REGION 7
SAREL HAASBROEK
– 082 454 7410
Carletonville, Derby, Fochville, Koster, Krugersdorp, Randfontein, Rysmierbult, Swartruggens, Syferbult, Tarlton, Ventersdorp and Westonaria

REGION 8
JOSEPH SWANEPOEL
– 083 759 2373
Brits, Dwaalboom, Ellisras, Hammanskraal, Koedoeskop, Magaliesburg, Northam, Pretoria, Rustenburg and Thabazimbi

Continued on p. 112

Grain SA's Executive per region

Continued from p. 111

REGION 9
KALLIE SCHOEMAN
– 082 388 1001
Balfour, Balmoral, Bronkhorstspruit, Cullinan, Delmas, Devon, Edenvale, Eloff, Greylingstad, Grootvlei, Heidelberg, Kempton Park, Kendal, Nigel, Ogies, Rayton, Springs and Sundra

REGION 10
RYK PRETORIUS
– 082 853 8307
Amersfoort, Amsterdam, Badplaas, Barberton, Breyten, Carolina, Chrissiesmeer, Davel, Ermelo, Iswepe, Morgenzon, Perdekop, Volksrust and Wakkerstroom

REGION 11
BART HARMSE
– 083 327 4172
Arnot, Belfast, Blinkpan, Hendrina, Kaapmuiden, Komatipoort, Laersdrif, Lydenburg, Machadodorp, Middelburg, Nelspruit, Ohrigstad, Steelpoort, Stoffberg, Waterval-Boven, Witbank, Witrivier and Wonderfontein

REGION 12
RUDOLF FOURIE
– 082 388 1234
Bethal, Charl Cilliers, Kinross, Kriel, Leandra, Leslie, Platrand, Secunda, Standerton and Trichardt

REGION 13
WILLEM GROOTHOF
– 082 938 9093
Alldays, Alma, Dendron, Groblersdal, Haenertsburg, Louis Trichardt, Marble Hall, Naboomspruit, Nylstroom, Pienaarsrivier, Pietersburg, Platrand, Potgietersrus, Radium, Roedtan, Settlers, Tuinplaas, Vaalwater and Warmbad

REGION 14
RALF KÜSEL
– 082 944 0720
Bergville, Bloedrivier, Colenso, Dannhauser, Dundee, Eshowe, Estcourt, Glencoe, Greytown, Harding, Kokstad, Kranskop, Ladysmith, Matatiele, Melmoth, Mooirivier, New Hanover, Newcastle, Normandien, Paulpietersburg, Piet Retief, Pietermaritzburg, Sheepmoor, Underberg, Utrecht, Vryheid and Winterton

REGION 15
EMILE DE KLERK
– 082 440 8300
Cornelia, Frankfort, Memel, Oranjeville, Tweeling, Villiers and Vrede

REGION 16
LOUIS CLAASSEN
– 082 490 1721
Deneysville, Heilbron, Koppies, Meyerton, Parys, Sasolburg, Vanderbijlpark, Vereeniging and Vredefort

REGION 17
THEO FERREIRA
– 082 775 7371
Aberfeldy, Bethlehem, Clarens, Daniëlsrus, Harrismith, Kestell, Paul Roux, Slabberts, Verkykerskop and Warden

REGION 18
NEIL CLAASSEN
– 082 493 6295
Arlington, Lindley, Petrus Steyn and Reitz

REGION 19
JACO BREYTENBACH
– 083 631 9559
Aliwal-Noord, Clocolan, Excelsior, Ficksburg, Fouriesburg, Hobhouse, Ladybrand, Marquard, Senekal, Smithfield, Thaba Nchu, Tweespruit and Verkeerdevlei

REGION 20
ANTON BOTHA
– 083 274 1924
Bloemfontein, Boshof, Brandfort, Bultfontein, Dealesville, Dewetsdorp, Hertzogville, Reddersburg and Winburg

REGION 21
CHRIS SCHOONWINKEL
– 082 492 7308
Hoopstad and Wesselsbron

REGION 22
WILLIE MARAIS
– 082 820 0722
Allanridge, Edenville, Hennenman, Kroonstad, Odendaalsrus, Steynsrus, Theunissen, Ventersburg, Virginia and Welkom

REGION 23
COBUS VAN COLLER
– 082 561 6375
Potchefstroom, Vierfontein and Viljoenskroon

REGION 24
HANNES HAASBROEK
– 082 566 9765
Bothaville

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Grain SA's Executive per region

Continued from p. 113

REGION 25
GERHARD BRUWER
– 082 878 5422
Calvinia, Douglas, Edenburg, Fauresmith, Groblershoop, Hopetown, Jacobsdal, Jagersfontein, Kenhardt, Kimberley, Koffiefontein, Luckhoff, Petrusburg, Petrusville, Philippolis, Prieska, Springfontein, Trompsburg, Upington and Vanderkloof

REGION 26
ANDRÉ KIRSTEN
– 083 226 8749
Ceres, Clanwilliam, Hopefield, Malmesbury, Montagu, Piketberg, Robertson, Vanrhynsdorp, Vredenburg, Vredendal and Worcester

REGION 27
RICHARD KRIGE
– 082 316 3230
Bredasdorp, Caledon, George, Heidelberg Cape, Knysna, Mossel Bay, Oudtshoorn, Riversdal and Swellendam

REGION 28
MASELI LETUKA
– 072 170 9923
Eastern Free State: Phuthaditjhaba and surrounding areas

REGION 29
GIFT MAFULEKA
– 072 847 8402
Mpumalanga: Bronkhorstspruit and surrounding areas

REGION 30
RAMODISA MONAISA
– 071 974 6878
North West Province: Mahikeng and surrounding areas

REGION 31
ISRAEL MOTLHABANE
– 082 961 2208
Northern Free State: Wesselsbron and surrounding areas

Co-opted Member
VICTOR MONGOATO
– 072 801 2350

Co-opted Member
FRANCOIS MINNAAR
– 082 571 5176

Chairpersons of specialist working groups and committees

Jaco Minnaar
Maize

Andries Theron
Winter Cereals
Remuneration Committee
NAMPO Geboue (Pty) Ltd
Marketing Working Group

Victor Mongoato
Agricultural
Development

Theo Ferreira
Editorial Committee

Cobus van Coller
NAMPO Harvest Day
Committee
Conservation Agriculture
Working Group

Fanie van Zyl
Audit Committee

Hannes Haasbroek
Production/Input

Willem Groothof
Sorghum

Francois Minnaar
Groundnuts

Jozeph du Plessis
Sunflowers and
Soybeans

Richard Krige
Barley (National Barley
Commodity Committee)

Koos Blanckenberg
Canola Specialist
Committee

RD Erasmus
Barley (Southern Barley
Commodity Committee)

Frikkie Maree
Barley (Northern Barley
Commodity Committee)

Grain SA external representation

1. TRUSTS

1.1 MAIZE TRUST

- White maize: Derek Mathews
- Yellow maize: Chris Schoonwinkel

1.2 OIL AND PROTEIN SEEDS DEVELOPMENT TRUST (OPDT)

- Commercial producers:
  Anton Botha (Chief Delegate)
  Jozeph du Plessis (Alternate)
- Developing producers:
  Ramodisa Monaisa (Chief Delegate)
  Israel Motlhabane (Alternate)

1.3 SORGHUM TRUST

- Producers: Willem Groothof
- Processors: Louis Claassen

1.4 WINTER CEREALS TRUST

- Wheat: Andries Theron
- Barley: Jannie de Villiers

1.5 SASOL RESEARCH TRUST

Jaco Breytenbach
Jannie de Villiers

2. FORUMS

2.1 OILSEED FORUMS

- Sunflower and Soybean Forum:
  Hannes Haasbroek (Sunflower)
  Vacant (Soybean)
  Joseph Swanepoel (Alternate)
- Groundnut Forum:
  Francois Minnaar (Chief Delegate)
  Gerhard Bruwer (Alternate)

2.2 WHEAT FORUM

Andries Theron
Jannie de Villiers

2.2.1 Steering committee:
Jannie de Villiers

2.3 SORGHUM FORUM

Willem Groothof (Chief Delegate)
Louis Goosen (Alternate)

2.4 MAIZE FORUM

Chris Schoonwinkel
Jannie de Villiers

2.4.1 Steering committee:
Jannie de Villiers (Chief Delegate) en Marinda Visser (Alternate)

3. ADVISORY COMMITTEES/TECHNICAL COMMITTEES (RESEARCH)

3.1 OILSEED ADVISORY COMMITTEE (OAC) FOR OILSEED TRUST

- Commercial producers:
  Jozeph du Plessis (Chief Delegate)
  Anton Botha (Alternate)

- **Developing producers:**
  Israel Motlhabane (Chief Delegate)
  Ramodisa Monaisa (Alternate)
- **Priority committee:**
  Marinda Visser (Functionary)

3.2 TECHNICAL COMMITTEES WINTER CEREALS FOR WINTER CEREAL TRUST

3.2.1 Wheat technical committee
Andries Theron
Richard Krige

3.2.2 Barley technical committee
RD Erasmus
Frikkie Maree

3.2.3 SABBI (Barley Research):
RD Erasmus – Southern production regions
Frikkie Maree – Northern production regions

4. AGRI SA

4.1 GENERAL COUNCIL
Jaco Minnaar
Andries Theron
Preline Swart
Jannie de Villiers

4.2 COMMODITY CHAMBER
Jaco Minnaar
Andries Theron
Preline Swart
Chris Schoonwinkel
Jannie de Villiers

4.3 FUNCTIONAL COMMITTEES

4.3.1 Natural resources
Gift Mafuleka

4.3.2 Labour and social
Andries Theron
Derek Mathews

4.3.3 Strategic agriculture development committee
Jaco Minnaar
Jannie de Villiers
Derek Mathews
Victor Mongoato

4.3.4 Commercial
Jaco Minnaar
Chris Schoonwinkel

4.3.5 Law and order
Maseli Letuka

4.3.6 Image building
Dirk Strydom
Alzena Gomes

5. PROVINCIAL AGRICULTURAL UNIONS

5.1 FREE STATE AGRICULTURE
General Council
Anton Botha (Chief Delegate)
Theo Ferreira (Alternate)

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Grain SA external representation

Continued from p. 117

5.2 KWAZULU-NATAL AGRICULTURAL UNION (KWANALU)
General Council
Ralf Küsel (Chief Delegate)

5.3 MPUMALANGA AGRICULTURE
General Council
Rudolf Fourie (Chief Delegate)
Bart Harmse (Alternate)

5.4 TAU SA
General Council
Joseph Swanepoel (Chief Delegate)
John Rankin (Alternate)

5.5 AGRI NORTH-WEST
General Council
Danie Reichel (Chief Delegate)
Jozeph du Plessis (Alternate)

5.6 AGRI NORTHERN CAPE
Executive Committee
Gerhard Bruwer

5.7 AGRI WESTERN CAPE
Commodity Chamber
Richard Krige (Chief Delegate)
André Kirsten (Alternate)
Preline Swart (Alternate)

5.8 AGRI LIMPOPO
General Council
Willem Groothof

5.9 AGRI EASTERN CAPE
General Council
Victor Mongoato (Chief Delegate)
Thabang Tshephe (Alternate)

5.10 AGRI GAUTENG
General Council
Sarel Haasbroek
Gift Mafuleka

6. OTHER COMMITTEES AND BOARDS OF DIRECTORS

6.1 SOY PRF WORKING GROUP
Andries Theron

6.2 CANOLA PRF WORKING GROUP
Koos Blanckenberg (Chairperson: Western Cape Canola Working Group)

6.3 SAGL
Derek Mathews (wheat)
Marinda Visser (maize)
Hannes Haasbroek (soybeans)
Jannie de Villiers (alternate director)

6.4 SAFEX ADVISORY COMMITTEE (JSE)
Chris Schoonwinkel (Chief Delegate)
Dirk Strydom (Alternate 1)
Theo Ferreira (Alternate 2)

6.5 SACTA
Andries Theron (Director)
Marinda Visser (Director)
Jannie de Villiers (alternate director)

Grain SA membership = economic welfare

Grain SA is an autonomous and voluntary industry organisation acting collectively in the interests of the economic welfare of the grain producers of South Africa and is the combined voice of grain producers to address commodity matters and issues with the government and other role-players in the industry.

Who can become a member of Grain SA?

Ordinary members (natural persons), trusts and any legal entities who produce grain for marketing, pay the prescribed membership fee and commodity levy to Grain SA and underwrite the objectives of Grain SA.

What does membership of Grain SA offer me as producer?

The ten-point plan for complete peace of mind

1. Obtain all possible information on your production costs and space, as well as on your input and production environment.
2. Remain up to date on the availability, quality and price of inputs.
3. Obtain information on the most recent research, technological development and production practices that will ensure effective and profitable production.
4. Know your policy environment and be aware of changes with respect to legislation.
5. Obtain information on the local and international market and trade environments.
6. Be up to date at all times on bilateral and multilateral trade agreements.
7. Become part of the NAMPO Harvest Day, and familiarise yourself with the most recent agricultural products, technology and services. Yes, visit all input providers on the same premises.
8. Subscribe to the magazine, *SA Graan/Grain*, which reports objectively on current affairs and provides information strategic to the industry on a monthly basis.
9. Make sure that you are part of the commercial grain producer's only and official mouthpiece, where you are represented by proven experts.
10. By becoming a member of Grain SA you also gain access to Momentum's financial welfare solution for members and their farm workers.

How is membership obtained?

Any producer who produces grain may obtain membership by merely completing the authorisation form that is available from Grain SA. As soon as Grain SA has received the authorisation form, it is handed to the collection agent concerned to deduct the levy and the producer is registered on the system as a member.

What is the current levy per ton?

The current levies (excluding VAT) per ton are as follows: Maize: R2,50, wheat: R3,00, sunflower: R5,00, groundnuts: R10,00, soybeans: R5,00, sorghum: R2,50, canola: R4,00 and barley: R3,00.

Full payment: A minimum of R1 000 (excluding VAT) is prescribed for full membership.

Linked members: If more than one person is involved in a farming operation, such persons can function as linked members.

Continued on p. 120

Grain SA membership = economic welfare

Continued from p. 119

How is the levy collected?

The commodity levy is collected in two ways:

Collection agents

Grain SA has concluded agreements with agricultural businesses and other grain off-takers in terms of which these institutions, for an agency fee of 5%, recover the commodity levy for Grain SA as collection agents. This makes it easy for producers to ensure that their commodity levy is paid over. The levy per ton is collected on all grains at the first point of delivery and the collection agent will only deduct the levy as long as the member agrees to this.

Amandel Graan

Direct deposit

If a member delivers to an agricultural company or grain off-taker that does not collect and pay over the commodity levy, the member can pay the commodity levy to Grain SA himself by means of a cheque, a direct deposit at the bank or an electronic transfer. Members who make direct or electronic deposits must email the proof of payment plus the member's details to Patricia Mahlatsi at *patricia@grainsa.co.za*.

Grain SA's account details are as follows:
Account holder: Grain SA
Bank: Absa
Account number: 790 810 007
Branch code: 334136 (632005 electronically)

Member involvement

Member involvement is the key to a dynamic organisation, and Grain SA invites every member to participate actively in the activities of the organisation, among other things by regularly attending branch and regional meetings. At these meetings members are given direct feedback on the activities of the organisation. Remember: It is your organisation and we want to be of service to you.

AUTHORISATION: GRAIN INDUSTRY LEVY

Hereby I (full name and surname) _____

Preferred name: _____ Farm name: _____ District: _____

ID number _____ authorise Grain SA to collect a commodity levy, as approved by the Grain SA Congress under Article 15.2 and Regulation R3 of the Constitution, on all grain produced and delivered by me personally or by the legal entities I represent. The current levy per ton **(VAT exclusive)** on each commodity amounts to: **Maize R2,50, wheat R3,00, sunflower R5,00, soybeans R5,00, groundnuts R10,00, sorghum R2,50, canola R4,00 and barley R3,00**

I hereby confirm that Grain SA will make use of a variety of Agents as listed to collect these levies at the first point of delivery. I hereby authorise such Agent to collect the levy and to deposit it, after I have complied with my obligations towards the Agent, and I also confirm that I or the legal entities which I represent, have no right of recovery whatsoever against any Collection Agent in terms of this authorisation.

I further confirm that Grain SA will inform me in writing when the levy per ton is changed and I accept that the collection of such levy shall remain valid until I cancel it in writing with Grain SA. I also undertake to personally deposit the levy applying to the grain I deliver at an institution who isn't currently a collection agent of Grain SA, to Grain SA.

Legal entities under which I will produce and trade:

LEGAL ENTITY ON WHICH DELIVERED	AGRICULTURAL BUSINESS NAME (Where you deliver and trade)	DELIVERY NUMBER

ALL INFORMATION WILL BE TREATED CONFIDENTIALLY.

POSTAL ADDRESS:

POSTAL CODE:

CELL NO:

TEL NO (HOME):

FAX:

EMAIL ADDRESS:

INDICATE THE STUDY GROUP AND/OR FARMER'S ASSOCIATION WHERE YOU PARTICIPATE

SIGNATURE:

DATE:

CROPS PRODUCED	HECTARES

BANKING DETAILS:
Account holder: Grain SA,
Absa Bank, Branch code: 632 005,
Account number: 790 810 007

SEND FORM TO:
Patricia Mahlatsi
Fax: 012 807 3166
Email: *patricia@grainsa.co.za*

GRAIN SA
GRAAN SA

GRAIN SA CONTACT PERSONS
– ready to help

Executive Management team

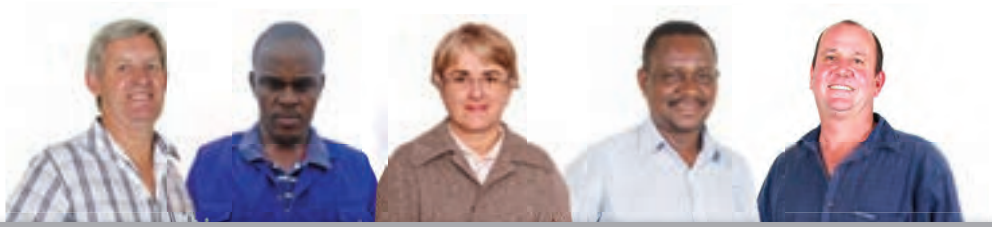
Christa Herbst (manager: Financial Services) – *christa.herbst@grainsa.co.za*
Nico Vermaak (manager: Corporate Services) – *nicov@grainsa.co.za*
Jannie de Villiers (CEO) – *jannie@grainsa.co.za*
Dr Dirk Strydom (manager: Grain Economy and Marketing) – *dirks@grainsa.co.za*
Dr Marinda Visser (manager: Research and Policy Centre) – *marinda@grainsa.co.za*
Jane McPherson (programme manager: Farmer Development) – *jane@grainsa.co.za*

Grain Economy and Marketing

Luan van der Walt (agricultural economist) – *luan@grainsa.co.za*
Michelle Mokone (agricultural economist) – *michelle@grainsa.co.za*
Corné Louw (senior economist: Inputs) – *corne@grainsa.co.za*
Dr Dirk Strydom (manager: Grain Economy and Marketing) – *dirks@grainsa.co.za*
Toit Wessels (assistant manager: Nampo and Marketing) – *toit@grainsa.co.za*
Dirk Kotze (member marketing and communications officer) – *dirk@grainsa.co.za*
Alzena Gomes (public relations officer) – *alzena.gomes@grainsa.co.za*

Petru Fourie (research co-ordinator and production cost analyst) – *petru@grainsa.co.za*
Dr Marinda Visser (manager: Research and Policy Centre) – *marinda@grainsa.co.za*
Dr Hendrik Smith (conservation agriculture facilitator) – *hendrik.smith@grainsa.co.za*

Research and Policy Centre



Farmer Development

Dr Willie Kotzé (operations manager: Farmer Development programme) – *willie@grainsa.co.za*
Sinelizwi Fakade (development co-ordinator) – *sinelizwi@grainsa.co.za*
Jane McPherson (programme manager: Farmer Development) – *jane@grainsa.co.za*
Jerry Mthombothi (development co-ordinator) – *jerry@grainsa.co.za*
Ian Househam (development co-ordinator) – *ian@grainsa.co.za*

Du Toit van der Westhuizen (development co-ordinator) – *dutoit@grainsa.co.za*
Graeme Engelbrecht (development co-ordinator) – *graeme@grainsa.co.za*
Jurie Mentz (development co-ordinator) – *jurie@grainsa.co.za*
Johan Kriel (development co-ordinator) – *johank@grainsa.co.za*
Julius Motsoeneng (development co-ordinator) – *julius@grainsa.co.za*
Liana Stroebel (development co-ordinator) – *liana@grainsa.co.za*

A prosperous and united agricultural sector is what we dream of

The Farmer Development Programme's goal is to ensure sustainable production on every hectare of arable land in South Africa – irrespective of the size of the land. To this end training and on-farm support is given to developing farmers.

The programme, which was introduced in 2000, establishes a platform for healthy and sustainable transformation on a broad base. Through funding by the Maize Trust, the Oil and Protein Seeds Development Trust, the Winter Cereal Trust, the Sorghum Trust, the ARC and the AgriSETA, the programme has made a huge difference to the economic viability of developing farmers. From the 2016/2017 year, the funding of the Maize Trust has been reduced drastically and we have been fortunate to be assisted by Monsanto, Afgri, Pioneer, Sasol Base Chemicals, Senwes and Pannar so as to be able to keep all the offices open. The programme is proud to have 9 588 black farmers in its 164 study groups and eleven branches (Lichtenburg, Taung, Nelspruit, Bloemfontein, Ladybrand, Louwsburg, Dundee, Kokstad, Maclear, Mthatha and Paarl).There are 123 new era commercial farmers (producing more than 250 tons of grain), 684 smallholder farmers (from 10 ha to 100 ha of arable land), 276 potential commercial farmers (on >100 ha of arable land) as well as 8 545 subsistence farmers (on less than 10 ha of land).

In our efforts to develop knowledge of the farmers at all levels, we continue to support the farmers through study group meetings, demonstration trials and farmers days, the Farmer of the Year competition, the advanced farmer programme, training courses, and a monthly newsletter (*Pula Imvula*). It is our belief that investment in the people is what is going to bring sustainability to the process of agricultural transformation.

A prosperous and united agricultural sector is within our reach. Sustainable production on each hectare is quite possible if we address the real barriers that we are facing. Land tenure and soil rectification, extension support, tractors and mechanisation, production loans, knowledge and mentoring – we have the solutions to the problems and if we could unite the sector, we could build the agricultural dream so many of us are dreaming!

Enquiries about the programme can be directed to the co-ordinator in your area:

Johan Kriel	Free State (Ladybrand)	079 497 4294
Jerry Mthombothi	Mpumalanga (Nelspruit)	084 604 0549
Jurie Mentz	KwaZulu-Natal/Mpumalanga (Louwsburg)	082 354 5749
Graeme Engelbrecht	KwaZulu-Natal (Dundee)	082 650 9315
Ian Househam	Eastern Cape (Kokstad)	078 791 1004
Sinelizwi Fakade	Eastern Cape (Mthatha)	071 519 4192
Liana Stroebel	Western Cape (Paarl)	084 264 1422
Du Toit van der Westhuizen	North West (Lichtenburg)	082 877 6749
Julius Motsoeneng	North West (Taung)	076 182 7889
Willie Kotzé	Operations manager: Grain SA Farmer Development Programme	082 535 5250

Children encouraged to make agriculture their career choice

We are privileged to receive funding from the Maize Trust, the Winter Cereal Trust and the AgriSETA to implement a schools programme. In our modern society, children are no longer aware of agriculture's value as a source of food, fibre and energy as well as for career choices. Our message to them is: 'Without agriculture, you would be naked, hungry and thirsty.'

Enquiries about the programme can be directed to Dr Willie Kotzé (operations manager: Grain SA Farmer Development Programme) on 082 535 5250.

Grain SA's mouthpiece and your knowledge partner

The magazine published monthly by Grain SA, SA Graan/Grain*, not only supplies current and specialised subject matter to members, but also serves as the organisation's mouthpiece.* SA Graan/Grain *is representative of all the oilseeds and grain commodities and the editorial content focuses on relevant subjects and important issues.*

Grain SA finds it important to continuously communicate with its members and *SA Graan/Grain* is mailed directly to grain producers and key role-players in agriculture every month. Various agricultural colleges, government institutions, universities and libraries also receive copies of this semi-commercial magazine. *SA Graan/Grain* is available as an online version in a flipping book format. Visit *http://www.grainsa.co.za/sagrain*.

SA Graan/Grain is accredited by the Audit Bureau of Circulations (ABC), which means that the magazine's circulation figures are measured and audited independently. This semi-commercial magazine is a cost-effective national advertising medium offering an effective, efficient platform for advertisers. Relevant monthly focus supplements offer additional opportunities to advertisers – allowing them an opportunity to share information about their products and services with readers.

SA Graan/Grain Focus on themes for 2017

January	Grain Guide
February	Groundnuts
	Canola
March	Seed
	Eastern regional focus (Gauteng, Mpumalanga, Limpopo, KwaZulu-Natal)
	Weed control on winter grains
	ARC cultivar supplement (winter grains)
April	Grain SA's NAMPO Harvest Day
May	Western regional focus (Free State, North West, Northern Cape)
	Weapons and hunting
June	Looking back at NAMPO Harvest Day
	Grain (handling/ acquisition/storing and logistics)
July	Fertilisation
August	Implements and equipment
	Soybeans
September	Integrated pest control
October	Winter grain regional focus (Southern and Western Cape)
	Irrigation
November	ARC cultivar supplement (maize, sunflowers and soybeans)
	Outdoors and travel
December	General

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GRAAN SA
"Organiseerders van die NAMPO Oesdag"
www.nampo.co.za
GRAAN SA se
NAMPO OESDAG
16 - 19 Mei 2017

Notes

Notes

2017

January

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2018

January

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September

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October

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November

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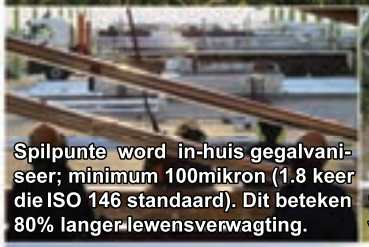
AGRICO Spilpunte & Lineêre Besproeiers

Met uitstaande standaard eienskappe en verskeie opsies:

NUUT: Internetbeheer



Spilpunte word in-huis gegalvaniseer; minimum 100mikron (1.8 keer die ISO 146 standaard). Dit beteken 80% langer lewensverwagting.

"Windsaver" masjiene is stabiel en vir 4 jaar gewaarborg teen omwaai.

"Cablesaver" beperk kabel diefstal. Die kabel loop binne-in die pyp en word nie maklik bygekom nie.

"Autoflush" spoel die spilpunt wanneer die pomp aankom.

Die AGRICO 3-been senter met sy wye voetspoor is besonder stewig.

AGRICO naatlose diens: Opmeet, ontwerp, vervaardiging, aflewering, oprigting en naverkopediens.

NAVRAE: Alfred Andrag ☎ 082 824 1214 ☎ 021 950 4111 950 4203 alfred.andrag@agrico.co.za

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