

# South African Soybean Crop



*Quality Report*  
*2014/2015 Season*

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***Compiled and issued by:***

**The Southern African Grain Laboratory NPC**

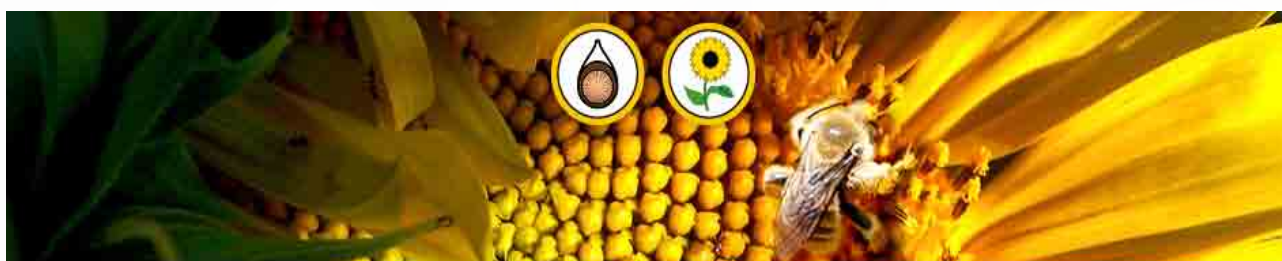
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# SOUTH AFRICAN COMMERCIAL SOYBEAN QUALITY FOR THE 2014/2015 SEASON



## Acknowledgements

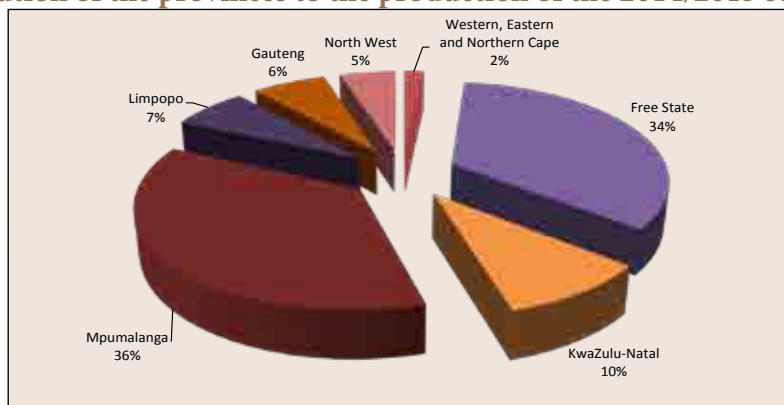
*With gratitude to:*

- *The Oil & Protein Seed Development Trust for its financial support in conducting this survey.*
- *Agbiz Grain and its members for their cooperation in providing the samples to make the survey possible.*
- *The Crop Estimates Committee (CEC) of the Department of Agriculture, Forestry and Fisheries for providing production related figures.*
- *South African Grain Information Service (SAGIS) for providing supply and demand figures relating to soybeans.*

## Introduction

The highest South African soybean crop ever was produced during the 2014/2015 season. The final commercial figure as overseen by the National Crop Estimates Liaison Committee (CELC) is 1 070 000 tons. The final calculated crop figure was adjusted upward by 10 150 tons (0.96%). The commercial soybean crop increased by almost 13% (122 000 tons) from the 2013/2014 season. The major soybean-producing provinces, contributing 70.6% of the total crop, were Mpumalanga and the Free State.

### Graph 1: Contribution of the provinces to the production of the 2014/2015 soybean crop



*Figures provided by the CEC.*

During the harvesting season, a representative sample of each delivery of soybeans at the various silos was taken according to the prescribed grading regulations. The sampling procedure for the samples used in this survey is described on page 25. One hundred and fifty composite soybean samples, representing the different production regions, were analysed for quality. The samples were graded, milled and analysed for moisture, crude protein, crude fat, crude fibre and ash content. Fifteen randomly selected samples were analysed to quantitatively determine the presence of genetically modified soybeans.

The goal of this crop quality survey is the compilation of a detailed database, accumulating quality data collected over several seasons on the national commercial soybean crop, which is essential in assisting with decision making processes. The data reveal general tendencies, highlight quality differences in the commercial soybeans produced in different local production regions and provide important information on the quality of commercial soybeans intended for export.

This is the fourth annual soybean crop quality survey performed by The Southern African Grain Laboratory NPC (SAGL). SAGL was established in 1997 on request of the Grain Industry. SAGL is an ISO 17025 accredited testing laboratory and participates in a number of proficiency testing schemes, both nationally and internationally, as part of our ongoing quality assurance procedures to demonstrate technical competency and international comparability.

The results of this survey are available on the SAGL website ([www.sagl.co.za](http://www.sagl.co.za)). The hard copy reports are distributed to all the Directly Affected Groups and interested parties. The report is also available for download in a PDF format from the website.

In addition to the quality information, production figures (obtained from the Crop Estimates Committee (CEC)) relating to hectares planted, tons produced and yields obtained on a national as well as provincial basis, over an eleven season period, are provided in this report. SAGIS (South African Grain Information Service) supply and demand information over several years is provided in table and graph format.

The 2014/15 Report of the National Soybean Cultivar Trials conducted by the ARC-Grain Crops Institute in Potchefstroom is also included in this report, as is the national grading regulations as published in the Government Gazette No. R.478 of 20 June 2014.

## Production

Soybeans are the most important oilseed crop produced in South Africa. Since the 2007/2008 season a steady increase in hectares planted has been observed as producers became aware of the benefit of soybeans in crop rotation programs, especially as part of conservation agriculture. Soybeans also have lower input needs compared to other commodities like maize and wheat.

The 2014/2015 production season was extremely trying for farmers with wet and dry periods alternating outside the normal patterns. Despite this fact, the area utilized for soybean production increased from 502 900 hectares in the previous season to 687 300 hectares this season. The significant impact of the drought experienced this season, is shown by comparing the 37% increase in area, with the 13% increase in production, resulting in a yield decrease of 1.89 t/ha in 2013/2014 to 1.56 t/ha.

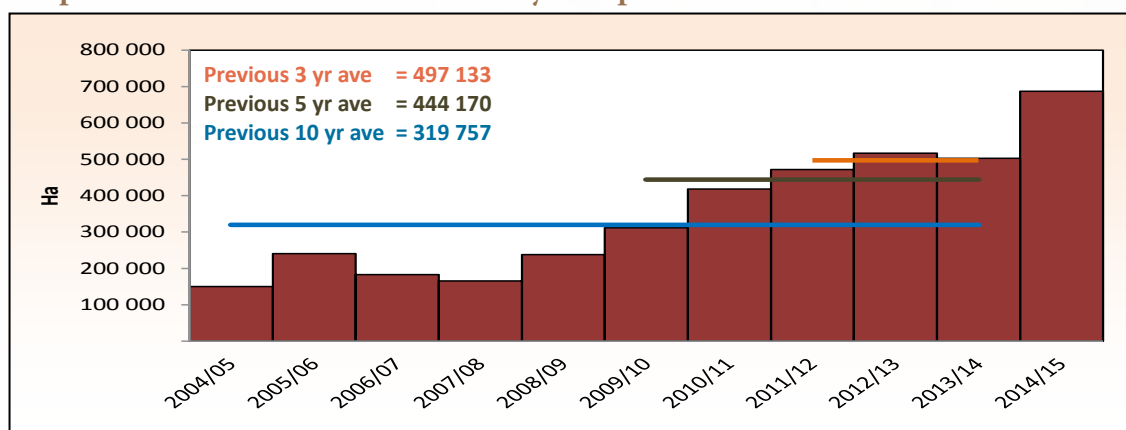
Province	Type of production	2014/2015			2013/2014		
		Hectares planted, ha	Crop, tons	Yield, t/ha	Hectares planted, ha	Crop, tons	Yield, t/ha
Western Cape	Dryland	-	-	-	-	-	-
	Irrigation	800	1 600	2.00	-	-	-
	Total	800	1 600	2.00	-	-	-
Northern Cape	Dryland	-	-	-	-	-	-
	Irrigation	4 000	14 000	3.50	3 900	14 040	3.60
	Total	4 000	14 000	3.50	3 900	14 040	3.60
Free State	Dryland	290 000	321 000	1.11	192 100	320 000	1.67
	Irrigation	15 000	45 000	3.00	8 900	32 000	3.60
	Total	305 000	366 000	1.20	201 000	352 000	1.75
Eastern Cape	Dryland	1 500	2 100	1.40	2 000	3 600	1.80
	Irrigation	-	-	-	-	-	-
	Total	1 500	2 100	1.40	2 000	3 600	1.80
KwaZulu-Natal	Dryland	27 000	55 650	2.06	22 400	54 500	2.43
	Irrigation	15 000	47 250	3.15	12 600	43 500	3.45
	Total	42 000	102 900	2.45	35 000	98 000	2.80
Mpumalanga	Dryland	239 500	372 700	1.56	198 400	321 600	1.62
	Irrigation	5 500	17 200	3.13	4 600	13 400	2.91
	Total	245 000	389 900	1.59	203 000	335 000	1.65
Limpopo	Dryland	9 000	15 000	1.67	4 200	6 750	1.61
	Irrigation	15 000	57 000	3.80	17 800	59 250	3.33
	Total	24 000	72 000	3.00	22 000	66 000	3.00
Gauteng	Dryland	23 000	44 500	1.93	15 000	27 860	1.86
	Irrigation	7 000	24 500	3.50	5 000	19 500	3.90
	Total	30 000	69 000	2.30	20 000	47 360	2.37
North West	Dryland	28 000	28 000	1.00	10 200	17 000	1.67
	Irrigation	7 000	24 500	3.50	5 800	15 000	2.59
	Total	35 000	52 500	1.50	16 000	32 000	2.00
RSA	Dryland	618 000	838 950	1.36	444 300	751 310	1.69
	Irrigation	69 200	231 050	3.34	58 600	196 690	3.36
	Total	687 300	1 070 000	1.56	502 900	948 000	1.89

Figures provided by the CEC.

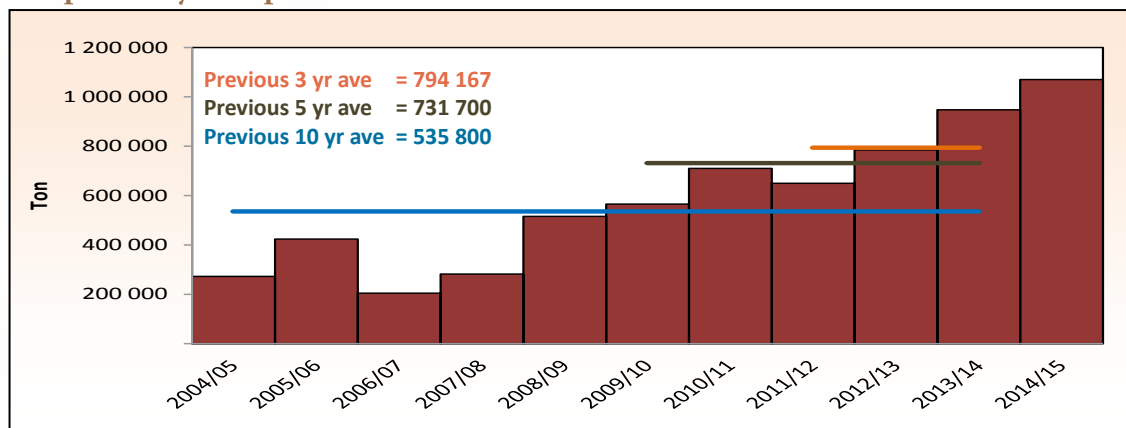
According to the *BFAP Baseline, Agricultural Outlook 2015 – 2024*, the area utilized for soybean production in South Africa is projected to continue its increasing trend over this baseline period. By 2024 the area under soybean cultivation is expected to surpass 1 million hectares and the production projected to surpass 2.1 million tons.

The 2014/2015 soybean crop in Argentina and Brazil being larger than expected, resulted in global oilseed production exceeding previous records for the second consecutive season. Soybeans represent more than half of the world oilseed production. According to the *World Agricultural Supply and Demand Estimates Report (WASDE)* an estimated 318.80 million metric tons of soybeans were produced during the 2014/2015 season. The United States contributed 34%, Brazil 30% and Argentina 19% to this total. The world soybean production during the 2015/2016 season is projected to be 320.51 million metric tons.

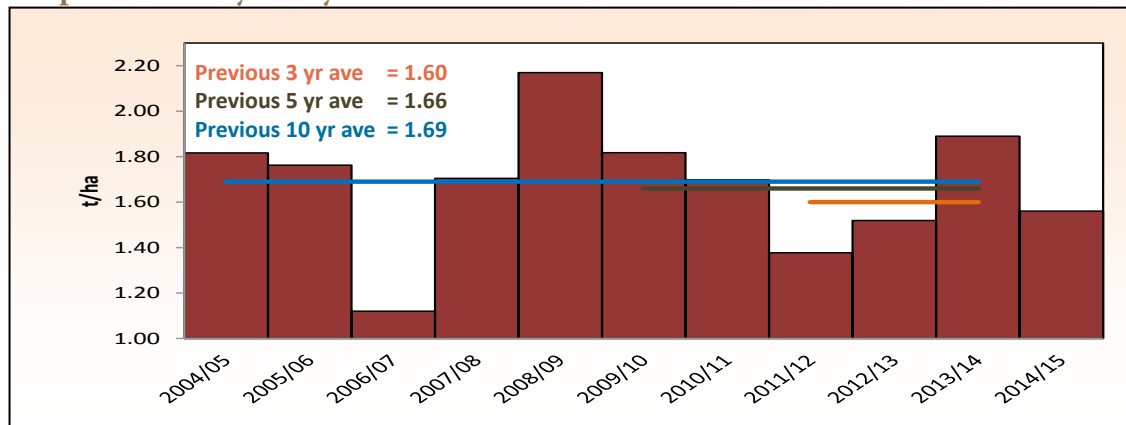
**Graph 2: Total RSA area utilized for soybean production from 2004/05 to 2014/15**



**Graph 3: Soybean production in RSA from 2004/05 to 2014/15**

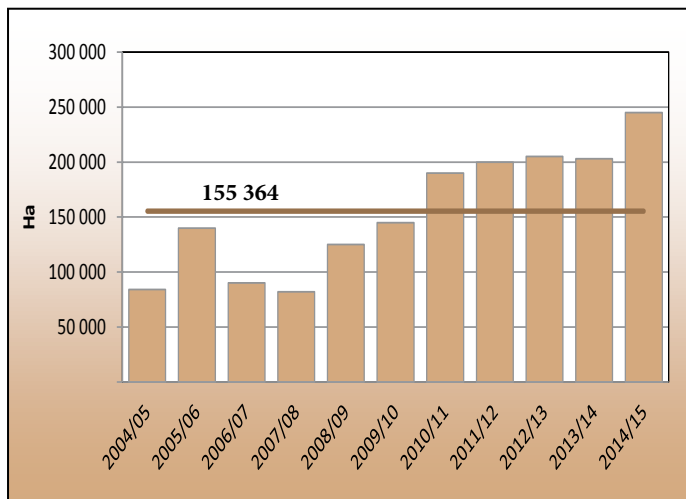


**Graph 4: RSA soybean yield from 2004/05 to 2014/15**

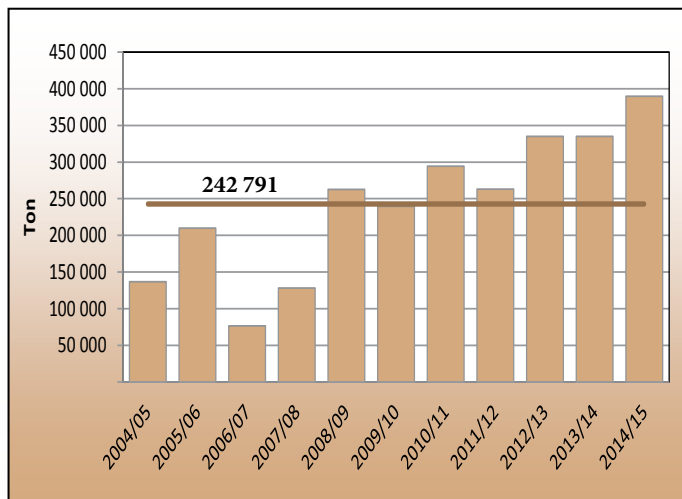


Figures provided by the CEC.

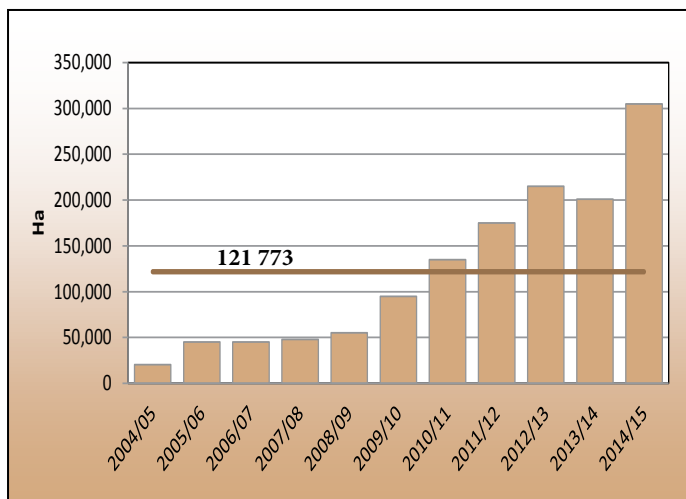
**Graph 5: Area utilized for soybean production in Mpumalanga since 2004/05**



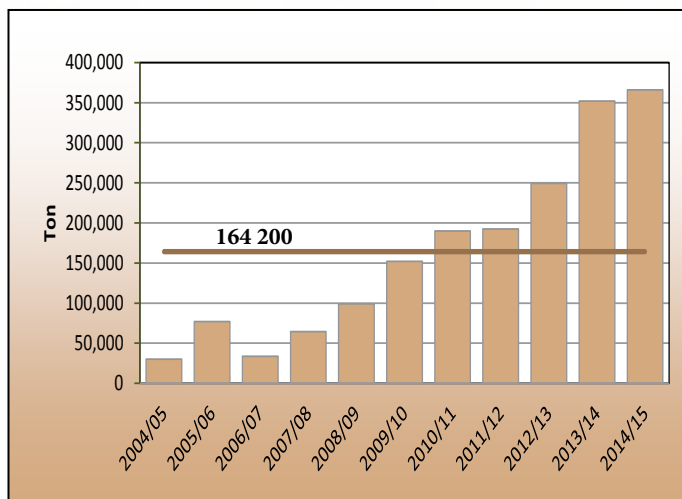
**Graph 6: Soybean production in Mpumalanga since 2004/05**



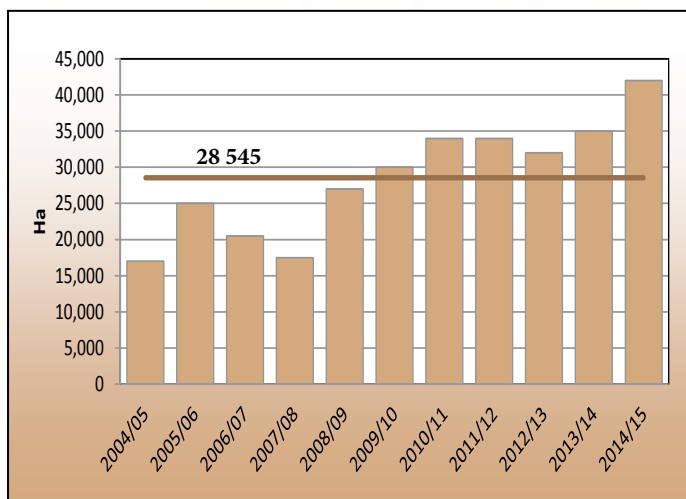
**Graph 7: Area utilized for soybean production in the Free State since 2004/05**



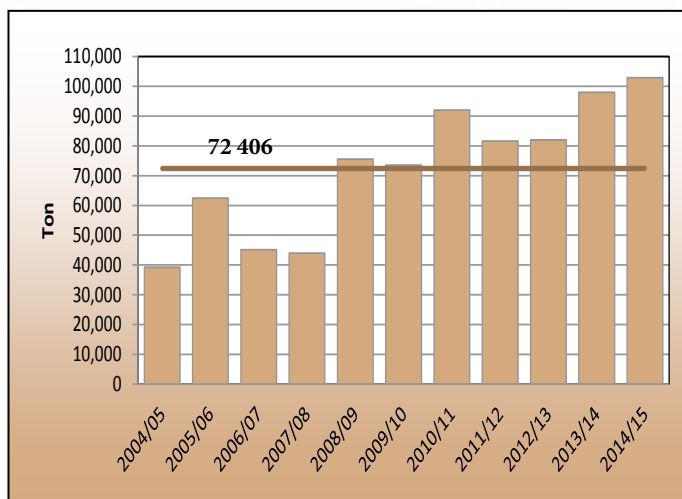
**Graph 8: Soybean production in the Free State since 2004/05**



**Graph 9: Area utilized for soybean production in KwaZulu-Natal since 2004/05**



**Graph 10: Soybean production in KwaZulu-Natal since 2004/05**



Figures provided by the CEC.

— Eleven year average

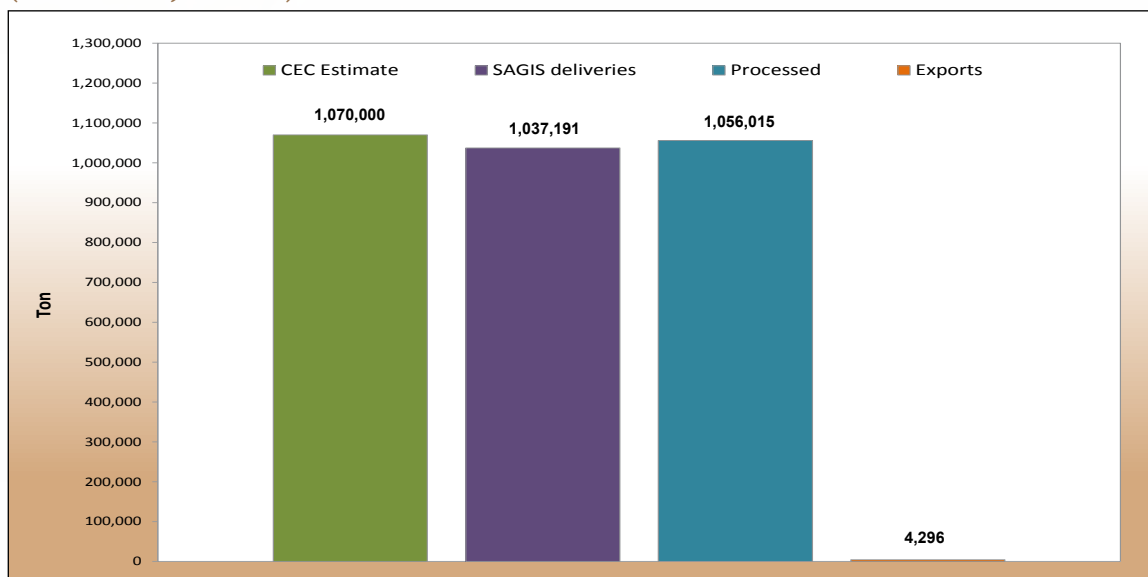
## Supply and Demand

The soybean marketing season dates from March to end of February. According to SAGIS supply and demand figures for the 2015/2016 marketing season to date (March 2014 to January 2015), imports increased by more than 20 000 tons to 124 981 tons. South Africa remain a net importer of vegetable oils. Of the 1 056 015 tons of soybeans processed to date, 2.1% was used for human consumption, 10.8% for animal feed as full fat soya and 87.1% was crushed to produce oil or oilcake. The amount of soybeans crushed so far increased with 6.7% (58 083 tons) compared to the 2014/2015 season.

According to *BFAP Baseline*, just over 800 000 tons of soybean oilcake will have been produced locally during 2015, which constitutes 63% of the projected consumption of just over 1.2 million tons. The balance of the demand will be imported. The total crushing capacity derived from dedicated soybean crushers locally is estimated at 1.75 million tons. More than half of the consumed soybean oilcake will have been produced locally for the second successive year (2015). By 2024, domestic soybean oilcake production is projected to exceed 1.6 million tons, which represents 87% of the total projected soybean oilcake consumption of 1.8 million tons. An expansion of 35% in domestic demand over the next decade implies that South Africa will remain a net importer of soybean oilcake despite the increase in local production.

4 296 tons of soybeans/products have been exported so far this season compared to the 576 tons in the previous season. Globally, soybean exports during the 2014/2015 season amounted to 125.88 million metric tons with the United States and Argentina each exporting approximately 40% of this figure. Argentina was the third largest exporter of soybeans (8% of the total). The projected world soybean exports for the 2015/2016 currently stands at 129.85 million metric tons. China remains the largest importer of soybeans followed by the European Union and Japan. Argentina and Brazil are the largest exporters of soybean meal as well as soybean oil (*WASDE*).

**Graph 11: Soybean supply and demand overview for the current marketing season (Mar 2015 - Jan 2016)**



Information provided by SAGIS.



**SOYBEANS: SUPPLY AND DEMAND TABLE BASED ON SAGIS' INFO (TON)**

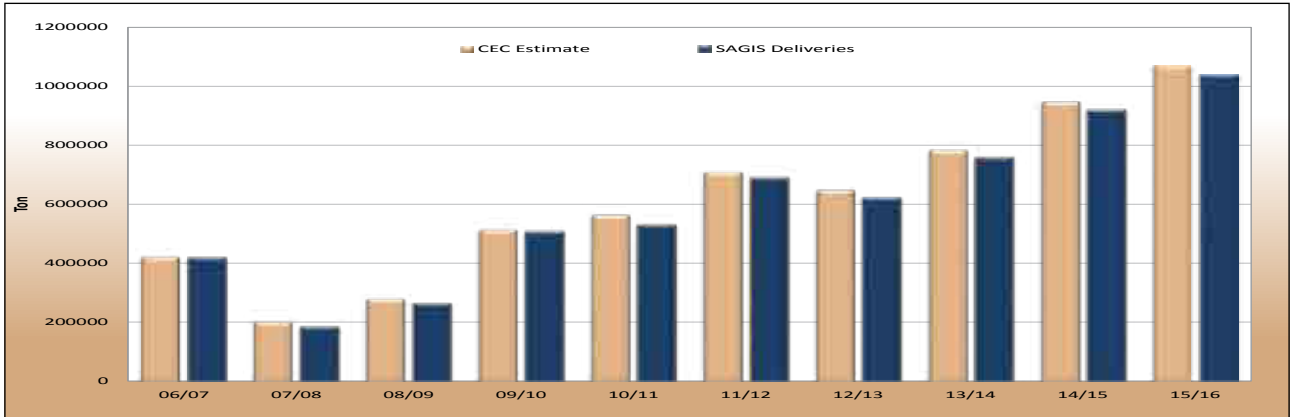
	Season (Mar - Feb)																	Publication date: 2016-02-24					10 Year average
	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Current Season Mar - Jan					
<b>CEC (Crop Estimate)</b>	174,800	148,700	209,700	202,400	136,500	220,000	272,500	424,000	205,000	282,000	516,000	566,000	710,000	650,000	784,500	948,000	1,070,000	1,070,000	535,800				
<b>SUPPLY</b>																							
Opening stock (1 Mar)	51,000	31,400	27,800	37,500	77,000	34,300	77,700	49,500	86,600	57,800	48,700	56,000	46,200	225,800	68,639	61,806	63,704	63,704	77,875				
Prod deliveries	186,600	153,300	228,000	216,700	126,300	217,900	265,200	419,100	185,400	264,000	508,200	531,500	690,300	621,892	759,146	919,723	1,037,191	1,037,191	516,446				
Imports	36,200	71,600	14,600	36,000	24,400	23,300	9,700	5,000	132,100	4,200	3,100	600	300	300	3,256	102,977	124,981	124,981	26,153				
Surplus	0	0	0	0	400	0	0	3,900	3,300	900	700	1,500	1,800	1,698	2,572	0	8,648	8,648	1,637				
<b>Total Supply</b>	<b>273,800</b>	<b>256,300</b>	<b>270,400</b>	<b>290,200</b>	<b>228,100</b>	<b>275,500</b>	<b>352,600</b>	<b>477,500</b>	<b>407,400</b>	<b>326,900</b>	<b>560,700</b>	<b>589,600</b>	<b>738,600</b>	<b>849,690</b>	<b>833,613</b>	<b>1,084,506</b>	<b>1,234,524</b>	<b>1,234,524</b>	<b>622,111</b>				
<b>DEMAND</b>																							
Processed*	199,100	215,800	216,000	196,700	180,300	184,100	285,200	380,200	341,800	260,300	337,400	406,900	451,300	615,272	742,104	1,005,548	1,056,015	1,056,015	482,602				
-human	11,700	16,200	16,600	21,700	20,800	16,700	24,600	24,200	21,900	28,400	28,800	31,000	31,000	25,913	24,860	25,319	22,395	22,395	26,599				
-animal feed (full fat soya)	92,500	130,500	154,200	143,000	128,500	134,500	199,600	216,600	179,900	109,300	181,800	191,800	150,200	137,407	155,654	118,598	113,906	113,906	164,086				
-crush (oil/oilcake)	94,900	69,100	45,200	32,000	31,000	32,900	61,000	139,400	140,000	122,600	126,800	184,100	270,100	451,952	561,590	861,631	919,714	919,714	291,917				
Withdrawn by producers	2,900	2,700	2,600	3,400	3,800	2,400	3,000	4,900	3,000	4,300	4,800	4,300	4,100	4,463	3,877	1,975	2,270	2,270	3,872				
Released to end-consumers	300	1,100	4,900	6,200	1,800	2,600	3,400	1,900	900	1,200	900	3,700	3,400	2,757	2,825	2,886	2,629	2,629	2,387				
Seed for planting purposes	10,000	1,200	1,000	3,000	2,600	2,600	2,400	2,600	1,400	3,100	5,300	4,900	5,200	5,700	5,295	5,111	7,577	7,577	4,101				
Net receipts(-)/disp(+)	24,800	1,600	7,000	1,400	-200	1,100	1,500	300	1,600	1,300	3,200	1,900	1,600	0	2,316	1,924	-665	-665	1,564				
Deficit	2,400	3,300	0	600	0	2,000	600	0	0	0	0	0	0	0	0	2,782	0	0	338				
Exports	2,000	2,800	1,400	1,900	5,500	3,000	7,000	1,000	900	8,000	153,100	121,700	47,200	152,616	15,390	576	4,296	4,296	50,748				
<b>Total Demand</b>	<b>241,500</b>	<b>228,500</b>	<b>232,900</b>	<b>213,200</b>	<b>193,800</b>	<b>197,800</b>	<b>303,100</b>	<b>390,900</b>	<b>349,600</b>	<b>278,200</b>	<b>504,700</b>	<b>543,400</b>	<b>512,800</b>	<b>780,808</b>	<b>771,807</b>	<b>1,020,802</b>	<b>1,072,122</b>	<b>1,072,122</b>	<b>545,612</b>				
<b>Ending Stock (28 Feb)</b>	<b>32,300</b>	<b>27,800</b>	<b>37,500</b>	<b>77,000</b>	<b>34,300</b>	<b>77,700</b>	<b>49,500</b>	<b>86,600</b>	<b>57,800</b>	<b>48,700</b>	<b>56,000</b>	<b>46,200</b>	<b>225,800</b>	<b>68,882</b>	<b>61,806</b>	<b>63,704</b>	<b>62,402</b>	<b>62,402</b>	<b>76,499</b>				
- processed p/month	16,600	18,000	18,000	16,400	15,000	15,300	23,800	31,700	28,500	21,700	28,100	33,900	37,600	51,300	61,842	83,796	96,001	96,001	40,224				
- months' stock	1.9	1.5	2.1	4.7	2.3	5.1	2.1	2.7	2.0	2.2	2.0	1.4	6.0	1.3	1.0	0.8	1.7	1.7	2				

Note: \* 1997/98-2007 updated May - Jul 2007

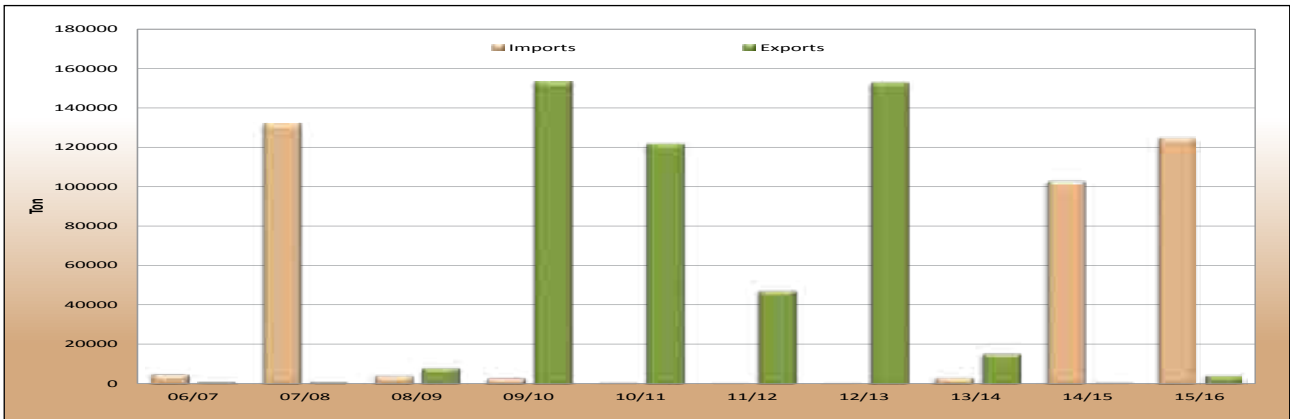
Note: Figures in red: opening stock and ending stock difference

Note: \*\*\* Figures for current season up to date

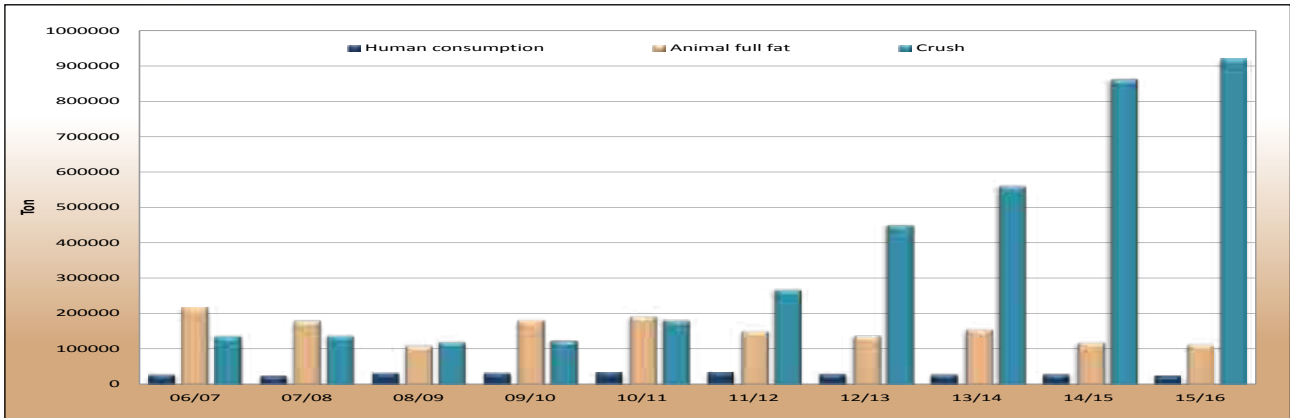
**Graph 12: Soybeans: CEC Estimate vs SAGIS deliveries over 10 marketing seasons**



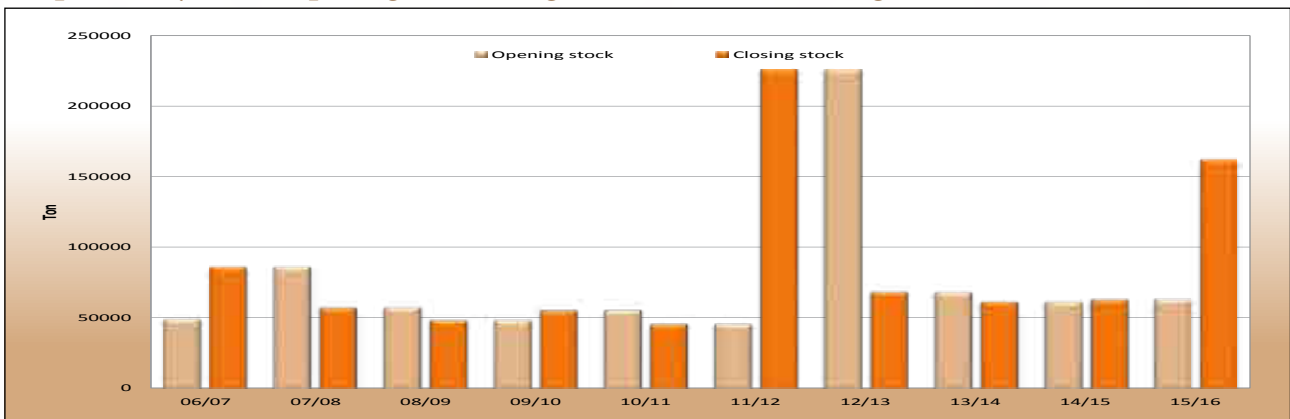
**Graph 13: Soybeans: Imports and Exports over 10 marketing seasons**



**Graph 14: Soybeans: Consumption and Processed over 10 marketing seasons**



**Graph 15: Soybeans: Opening and closing stock over 10 marketing seasons**



Information provided by SAGIS.

## RSA Production Regions

The RSA is divided into 9 provinces as illustrated in Figure 1.

**Figure 1: RSA Provinces**



*Provincial map with gratitude to SIQ.*

The 9 provinces are divided into 36 grain production regions.

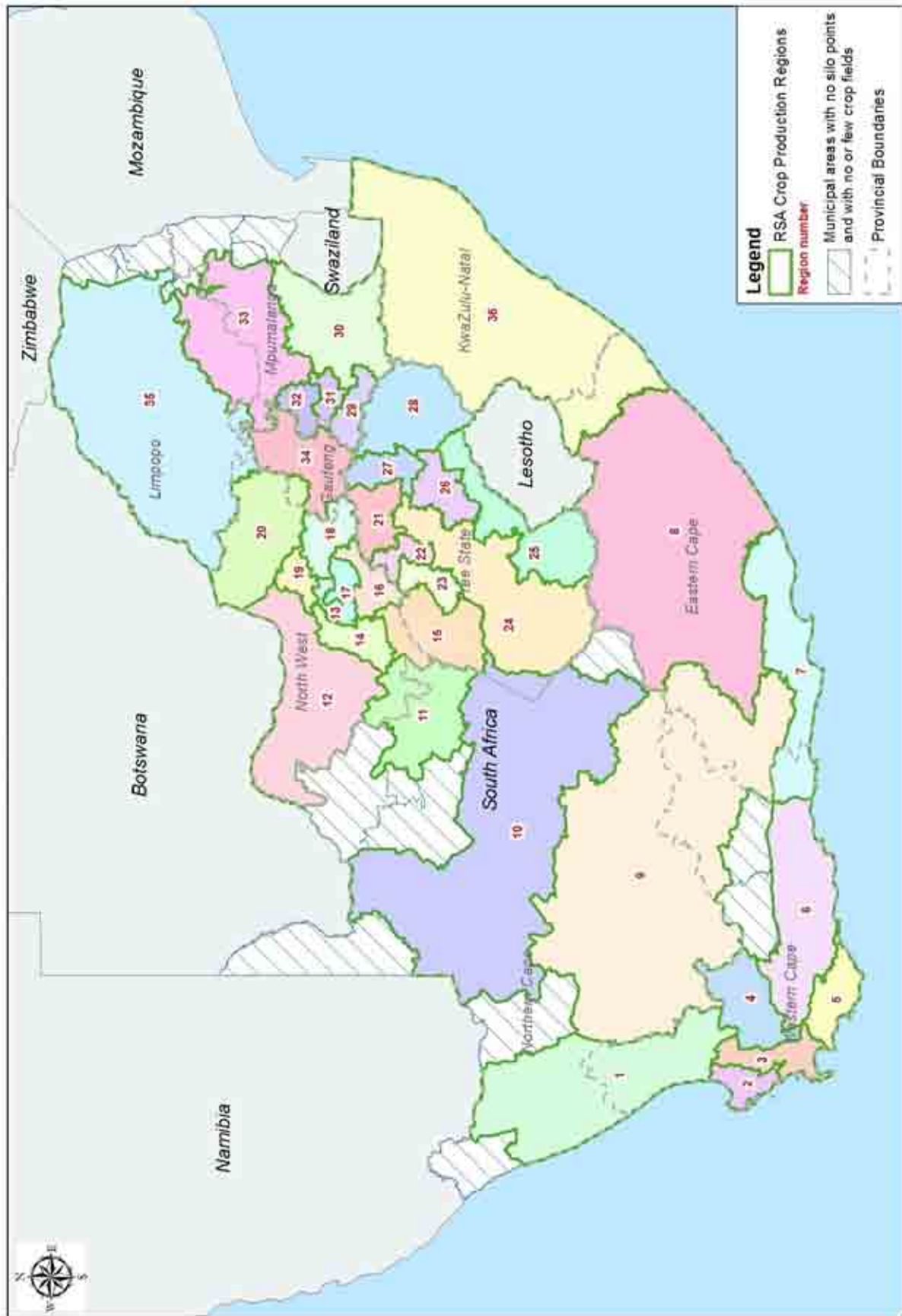
The regions are distributed as follows:

- Region 1: Namakwaland
- Regions 2 and 3: Swartland
- Regions 4 to 6: Rûens
- Regions 7 and 8: Eastern Cape
- Region 9: Karoo
- Region 10: Griqualand West
- Region 11: Vaalharts
- Regions 12 to 20: North West
- Regions 21 to 28: Free State
- Regions 29 to 33: Mpumalanga
- Region 34: Gauteng
- Region 35: Limpopo
- Region 36: KwaZulu-Natal

Please see the Crop Production Regions map on the next page.

The production regions from which soybeans have been received for the crop quality survey of the 2014/2015 production season, are named and described on pages 17 to 24 (in the header of the quality data per region tables.) The silo/intake stands as well as the type of storage structure per region are provided.

Figure 2: RSA Crop Production Regions



Regional map with gratitude to Agbiz Grain and SiQ.



## Soybean Crop Quality 2014/2015 – Summary of results

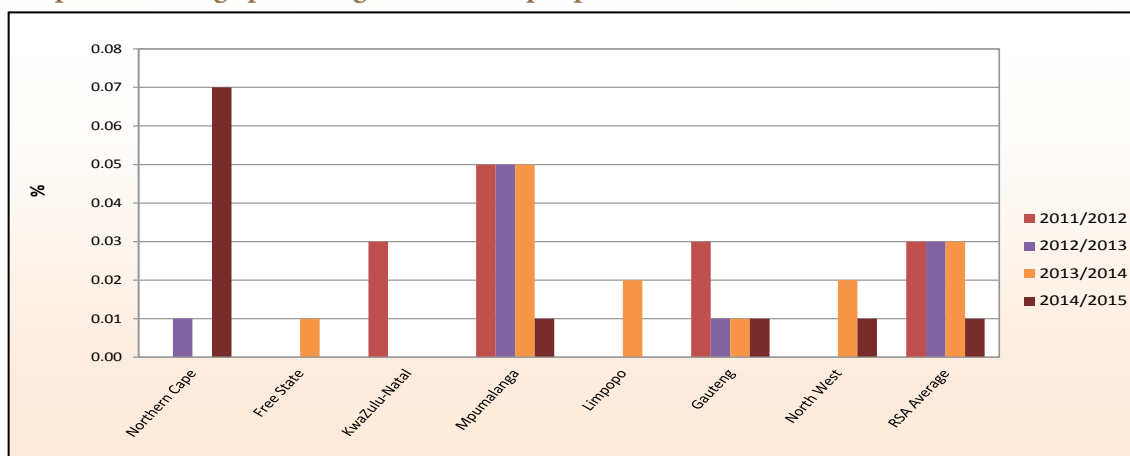
Eighty-seven percent (131) of the 150 samples analysed for the purpose of this survey were graded as Grade SB1 and 19 of the samples were downgraded to COSB (Class Other Soya Beans). During the previous two seasons, 12% (2013/2014) and 5% (2012/2013) of the samples were downgraded to COSB.

- One of the 19 samples was downgraded as a result of the percentage foreign matter, including stones, other grain and sunflower seed present in the sample exceeding the maximum permissible deviation of 5%.
- Five samples were downgraded as a result of the percentage other grain present in the samples exceeding the maximum permissible deviation of 0.5%.
- Two samples were downgraded as a result of the percentage sunflower seed present in the samples exceeding the maximum permissible deviation of 0.1%.
- One sample was downgraded as a result of the percentage soiled soybeans in the sample exceeding the maximum permissible deviation of 10%.
- Six of the samples were downgraded as a result of the presence of poisonous seeds (*Datura sp.*) exceeding the maximum permissible number, namely 1 per 1000 g.
- One sample was downgraded as a result of the presence of poisonous seeds (*Ipomoea purpurea Roth.*) exceeding the maximum permissible number, namely 7 per 1000 g.
- One sample was downgraded for exceeding both maximum permissible number of poisonous seeds (*Datura sp.* and *Ipomoea purpurea Roth.*).
- The remaining two samples were downgraded as a result of a combination of one or more of the following deviations exceeding the maximum permissible deviation: percentage other grain, defective soybeans and parts of soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve as well as poisonous seeds.

According to the South African soybean grading regulations, the determination of the percentage wet pods in a consignment shall be done on a working sample of at least 10 kg of soybeans from a representative sample of the consignment. Due to practical considerations the samples received at the SAGL from the grain storage companies is typically  $\pm 5$  kg. Pods were found in 22 of the 150 samples graded, all of these pods were dry on receipt at the SAGL. The percentage of these pods in the samples ranged from 0.14% to 0.63% based on a working sample size of at least 200 g. Eleven samples contained pods, not identifiable as wet pods according to the definition, in percentages exceeding the wet pod maximum permissible deviation of 0.2%.

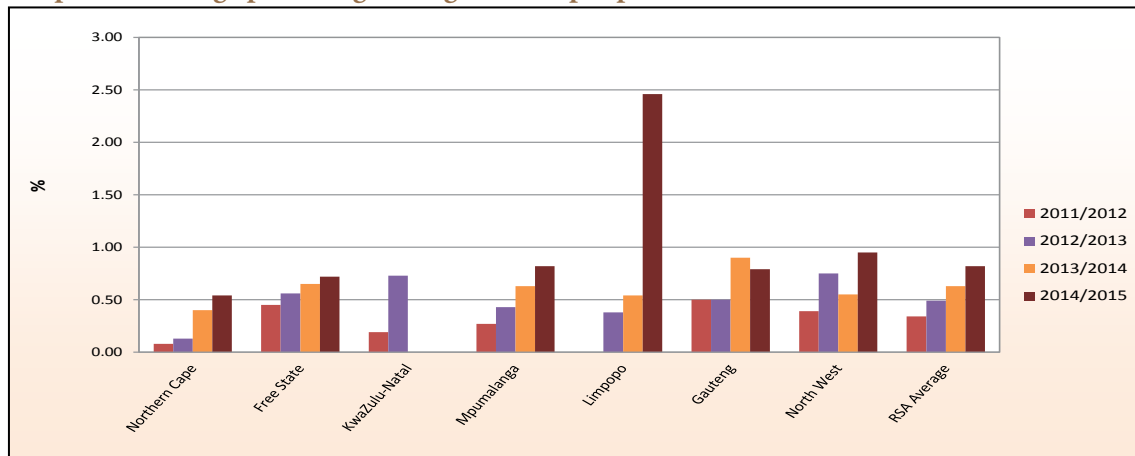
Based on the samples received for this crop survey, Sclerotinia did not pose any problems. The highest percentage of Sclerotinia observed (0.20%) was on a sample from Mpumalanga, which is well below the maximum permissible level of 4%. During this season, the samples from the Northern Cape had the highest weighted average percentage Sclerotinia (0.07%). The national weighted average percentage this season was 0.01% compared to the 0.03% of the previous three seasons. See Graph 16.

**Graph 16: Average percentage Sclerotinia per province over four seasons**



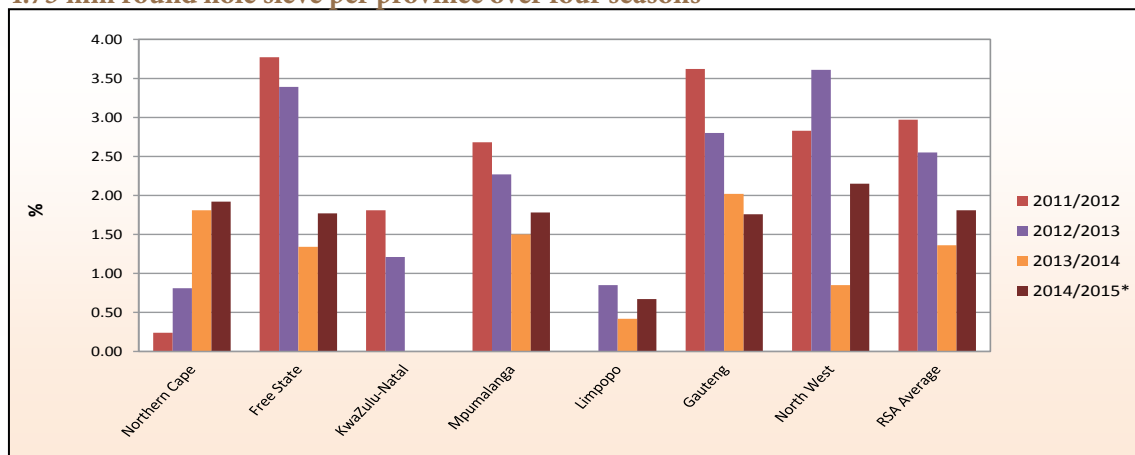
Limpopo province's two samples had the highest average percentage foreign matter. The weighted average percentage foreign matter in the rest of the samples ranged from 0.54 in the Northern Cape to 0.95 in North West province. Please refer to Graph 17.

**Graph 17: Average percentage foreign matter per province over four seasons**



North West province (18 samples) reported the highest weighted average percentage soybeans and parts of soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, namely 2.15% and Limpopo (2 samples) the lowest at 0.67%. Mpumalanga province with the highest number of samples (77) reported an average of 1.78%. The Free State province averaged 1.77% (42 samples). The national weighted average percentage increased from 1.36% last season to 1.81% this season. Please see Graph 18. No samples were received from KwaZulu-Natal for the 2014/2015 season.

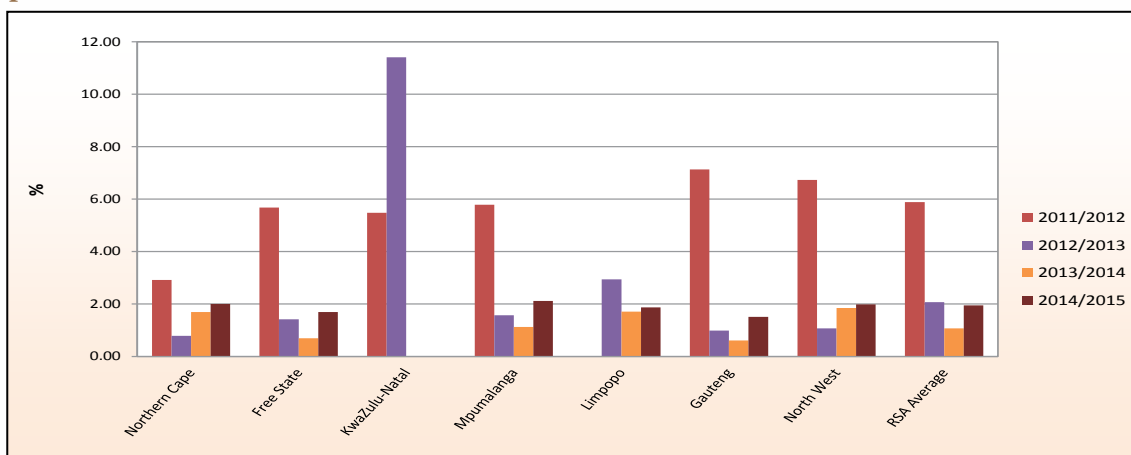
**Graph 18: Average percentage soybeans and parts of soybeans which pass through the 4.75 mm round hole sieve per province over four seasons**



\*Please note that the 2014/2015 results represent soybeans and parts of soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve.

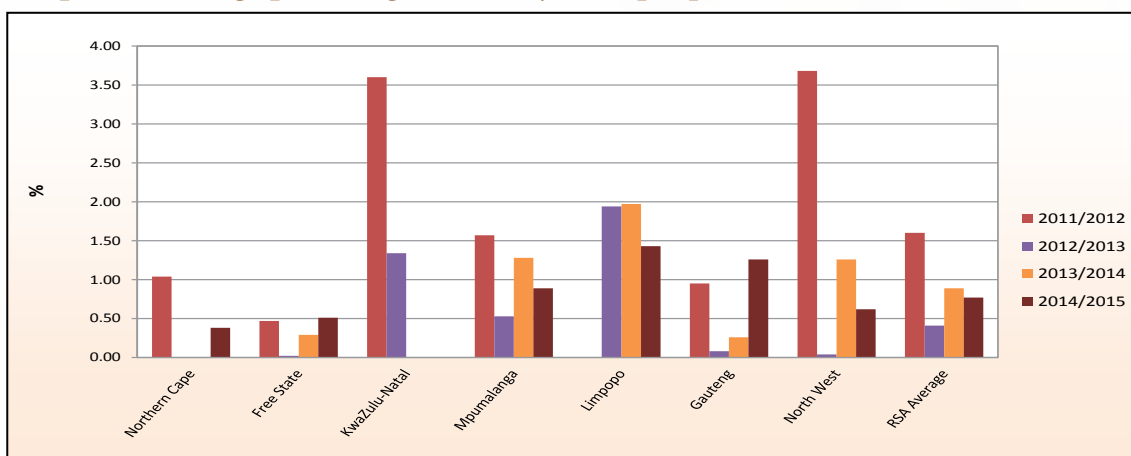
Eight samples were submitted from Gauteng province and the lowest weighted average percentage defective soybeans on the 4.75 mm sieve were reported on these, namely 1.51%. Mpumalanga province reported the highest percentage of 2.12, followed by the Northern Cape and North West provinces with 2.00 and 1.99 respectively. The national weighted average increased from 1.07% in the previous season to 1.95% this season. Please see Graph 19.

**Graph 19: Average percentage defective soybeans on the 4.75 mm round hole sieve per province over four seasons**



The RSA weighted average percentage soiled soybeans of 0.77% is lower than the 0.89% of the previous season but higher than the weighted average (0.41%) of the 2012/2013 season. Average weighted percentages per province ranged from 0.38 in the Northern Cape to 1.43 in Limpopo. Please see Graph 20. This season one sample from Mpumalanga had a soiled soybean percentage exceeding the maximum permissible deviation of 10%, none above the limit were observed during the 2013/2014 season.

**Graph 20: Average percentage soiled soybeans per province over four seasons**

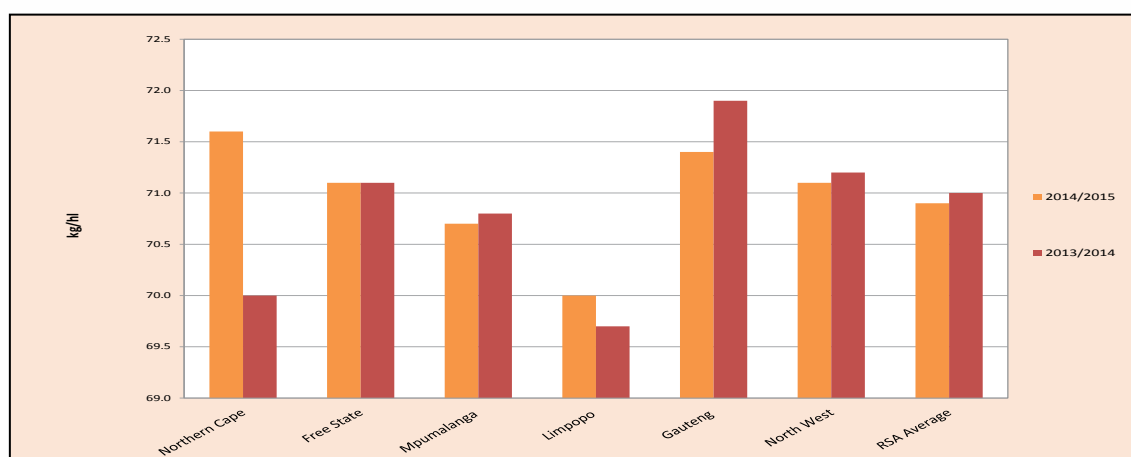


Test weight does not form part of the grading regulations for soybeans in South Africa. An approximation of the test weight of South African soybeans is provided in Table 2 for information purposes. The g/1 L filling weight of the 150 soybeans samples was determined by means of the Kern 222 apparatus. The test weight was extrapolated by means of the following formulas obtained from the Test Weight Conversion Chart for Soybean of the Canadian Grain Commission:  $y = 0.1898x + 2.2988$  (291 to 350 g/0.5 L) and  $y = 0.1895x + 2.3964$  (351 to 410 g/0.5 L). Please see also Graph 21 for a comparison of the test weight per province over the last two seasons.

Province	Test weight, kg/hl					
	2014/2015 Season			2013/2014 Season		
	Weighted average	Range	No. of samples	Weighted average	Range	No. of samples
Northern Cape (Regions 10 - 11)	71.6	71.2 - 71.9	3	70.0	69.8 - 70.2	2
Free State (Regions 21 - 28)	71.1	67.0 - 72.7	42	71.1	66.6 - 73.6	51
Mpumalanga (Regions 29 - 33)	70.7	63.3 - 78.2	77	70.8	68.3 - 74.7	66*
Limpopo (Region 35)	70.0	69.3 - 70.8	2	69.7	68.5 - 70.5	3
Gauteng (Region 34)	71.4	69.5 - 72.4	8	71.9	71.5 - 73.1	7
North West (Region 12 - 20)	71.1	68.8 - 72.2	18	71.2	69.4 - 73.1	20
<b>RSA Average</b>	<b>70.9</b>	<b>63.3 - 78.2</b>	<b>150</b>	<b>71.0</b>	<b>66.6 - 74.7</b>	<b>149</b>

\* One sample with an outlier value was not taken into account for calculation purposes.

**Graph 21: Comparison of the test weight per province over two seasons**



The nutritional component analyses, namely crude protein, - fat, - fibre and ash are reported on a dry/moisture-free basis (db) for the current as well as the three previous surveys. For comparison purposes the national 'as is' basis results are provided in Table 3. These 'as is' values were calculated using the weighted national average values.

**Table 3: Comparison of weighted average nutritional component values on a dry and 'as is' basis over four seasons**

Season	2014/2015		2013/2014		2012/2013		2011/2012	
Moisture, % (17hr, 103°C)	7.0		7.1		7.2		6.8	
<b>Moisture basis</b>	<b>Dry basis</b>	<b>As is</b>	<b>Dry basis</b>	<b>As is</b>	<b>Dry basis</b>	<b>As is</b>	<b>Dry basis</b>	<b>As is</b>
Crude protein, %	39.89	37.10	39.84	37.01	40.63	37.70	39.42	36.74
Crude fat, %	19.3	17.9	19.7	18.3	18.8	17.4	18.7	17.4
Ash, %	4.64	4.32	4.66	4.33	4.65	4.32	4.62	4.31
Crude fibre, %	6.4	6.0	6.1	5.7	-	-	-	-
<b>No. of samples</b>	<b>150</b>		<b>150</b>		<b>150</b>		<b>100</b>	

The weighted average crude protein content this season was 39.89%, comparing very well with the 39.84% of the previous season. Mpumalanga showed the highest weighted average crude protein content of 40.44% and Limpopo the lowest of 36.16%. The weighted average crude fat percentage decreased from 19.7% in 2013/2014, to 19.3% this season. The samples from Limpopo had the highest weighted average crude fat content of 23.6%. The lowest average fat content was observed in Gauteng with 18.9%.

The national weighted average ash content did not vary significantly over the four seasons that this survey has been conducted, 4.64% this season compared to the 4.66% 4.65% and 4.62% for the previous three seasons. Samples from the Northern Cape and Limpopo tend to show higher ash contents over seasons. The weighted average percentage crude fibre varied from 4.9% in Limpopo to 7.5% in the Northern Cape. The RSA weighted average was slightly higher this season (6.4%), compared to 6.1% the previous season.

Graphs 22 to 25 on page 14 provide comparisons between provinces for the above mentioned components.

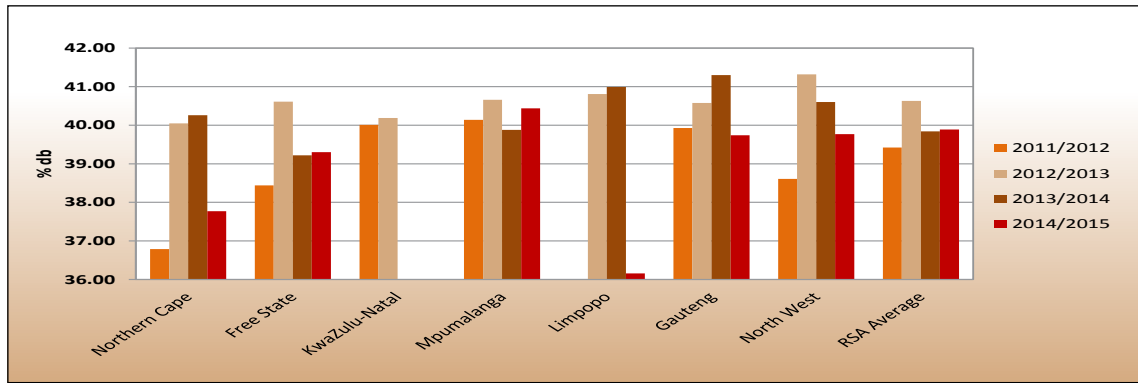
A summary of the RSA Soybean Crop Quality averages of the 2014/2015 season compared to those of the 2013/2014 season, is provided in Table 4 on page 15.

All fifteen samples tested for genetic modification (GM), tested positive for the presence of the CP4 EPSPS trait (Roundup Ready®). Please refer to the results in Table 5 on page 16 of this report.

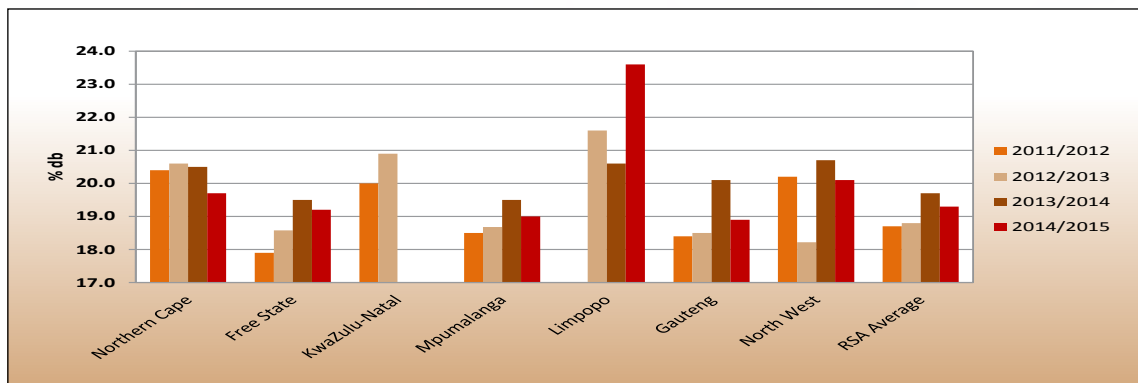
Please see pages 17 to 24 for the average soybean quality per region.



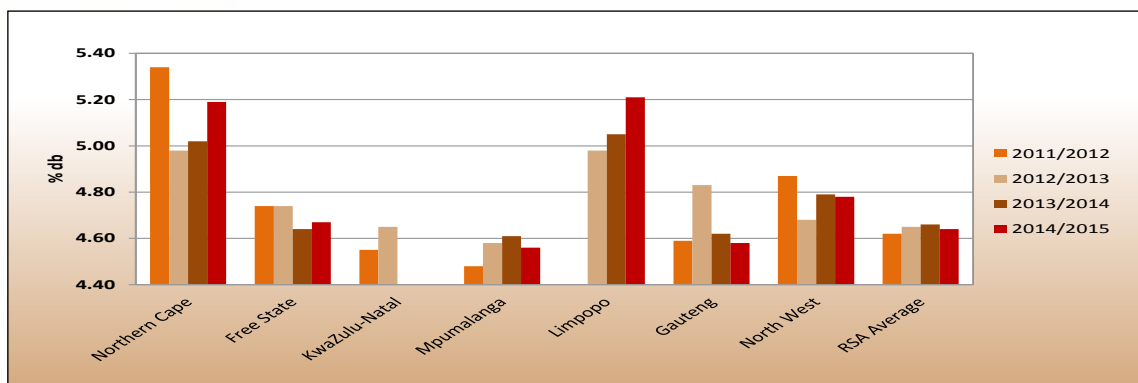
Graph 22: Average crude protein content per province over four seasons



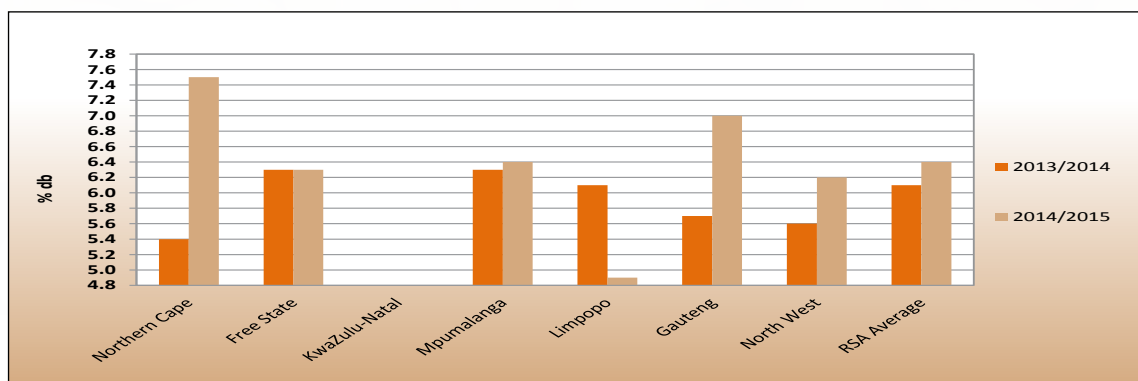
Graph 23: Average crude fat content per province over four seasons



Graph 24: Average ash content per province over four seasons



Graph 25: Average crude fibre content per province over two seasons



**Table 4: South African Soybean Crop Quality Averages 2014/2015 vs 2013/2014**

Class and Grade Soya	2014/2015			2013/2014		
	SB1	COSB	Average	SB1	COSB	Average
<b><u>Grading:</u></b>						
(A) Wet pods, %	0.00	0.00	0.00	0.00	0.00	0.00
(B) Foreign matter, including stones, other grains, sunflower seeds and stones: Provided that such deviations are individually within the limits specified in items (c), (d), and (e), %	0.71	1.56	0.82	0.48	1.72	0.63
(C) Other grain, %	0.07	0.65	0.14	0.06	0.84	0.15
(D) Sunflower seed, %	0.00	0.03	0.01	0.01	0.05	0.01
(E) Stones, %	0.04	0.04	0.04	0.03	0.00	0.03
(F) Sclerotinia, %	0.01	0.01	0.01	0.02	0.04	0.03
*(G) Soybeans and parts of soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	1.56	3.48	1.81	-	-	-
(G) Soybeans and parts of soybeans which pass through the 4.75 mm round hole sieve, %	-	-	-	1.25	2.17	1.36
(H) Defective soybeans on the 4.75 mm round hole sieve, %	1.95	1.94	1.95	0.98	1.80	1.07
(I) Soiled soybeans, %	0.72	1.07	0.77	0.92	0.64	0.89
(J) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	0.72	1.58	0.83	0.51	1.76	0.66
Poisonous seeds ( <i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i> )	0	2	0	0	3	0
Poisonous seeds ( <i>Argemone mexicana L.</i> , <i>Convolvulus sp.</i> , <i>Ipomoea purpurea Roth.</i> , <i>Lolium temulentum</i> , <i>Xanthium sp.</i> )	0	2	0	0	0	0
Undesirable odour	No	No	No	No	No	No
Live insects	No	No	No	No	No	No
<b>Number of samples</b>	<b>131</b>	<b>19</b>	<b>150</b>	<b>132</b>	<b>18</b>	<b>150</b>
<b><u>Chemical analysis:</u></b>						
Moisture, % (17hr, 103 °C)	7.0	7.1	7.0	7.1	7.2	7.1
Protein, % (db)	40.05	38.84	39.89	39.80	40.15	39.84
Fat, % (db)	19.2	19.6	19.3	19.7	20.0	19.7
Ash, % (db)	4.63	4.72	4.64	4.66	4.70	4.66
Crude Fibre, % (db)	6.4	6.2	6.4	6.2	5.8	6.1
<b>Number of samples</b>	<b>131</b>	<b>19</b>	<b>150</b>	<b>132</b>	<b>18</b>	<b>150</b>

\*As per Dispensation REF NO 20.4.14.1 of 06 March 2015, the 1.8 mm slotted sieve is used in conjunction with the prescribed 4.75 mm round hole sieve.

## Genetic Modification (GM)

The majority of soybeans produced/grown in South Africa is genetically modified, an estimated 92% of the area planted to soybeans in SA was GM. These soybeans have tolerance to herbicides (chemical products used to destroy weeds, but not the crop plants).

The SAGL screened 15 of the crop samples to test for the presence of CP4 EPSPS (Roundup Ready).

The crop quality samples received by the SAGL are composite samples per class and grade, made up of individual deliveries to grain silos.

SAGL used the EnviroLogix QuickComb kit for bulk soybeans to quantitatively determine the presence of genetically modified soybeans.

All of the samples tested positive for the presence of CP4 EPSPS.

GMO Protein/Trait	Event	Trade name/Brand
CP4 EPSPS	GTS40-3-2 MON89789	Roundup Ready®

The detection range for the CP4 EPSPS trait is 0.125% to 3%. The limit of quantification (LOQ) is therefore 0.125% and values higher than 3% is reported as >3.0%.

The Coefficient of Variation for this analysis is 20%.

Table 5: GM results for the 2014/2015 season		
Region	Class and grade	CP4 EPSPS, %
10	SB1	>3.0
11	SB1	2.8
14	SB1	>3.0
17	SB1	>3.0
20	SB1	>3.0
24	COSB	>3.0
25	SB1	>3.0
28	SB1	>3.0
29	SB1	2.7
30	SB1	>3.0
31	SB1	>3.0
32	SB1	2.4
33	SB1	>3.0
34	SB1	>3.0
35	COSB	>3.0
<i>Average of samples ≤ 3.0%</i>		<b>2.6</b>
<i>Number of samples</i>		<b>15</b>

## SOUTH AFRICAN REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(10) Griqualand-West Region				(11) Vaalharts Region				(12) North-West Western Region			
Silo/Intake stands (Type of storage)	Douglas (Bags/Bins) Havenga Brug (Bins) Luckhoff (Bins) Marydale (Bins) Modderrivier (Bags/Bins/Bulk) Morgenzon (Bins) Oranjerivier (Bins/Bunkers) Prieska (Bins/Bunkers/Dams) Rietrivier (Bins) Trans Oranje (Bags/Bins/Bunkers)				Barkly-Wes (Bins/Bulk) Hartswater (Bins) Jan Kempdorp (Bags/Bins/Bunkers) Magogong (Bins)				Blaauwbank (Bins) Buhmannsdrif (Bins) Kameel (Bins) Mareetsane (Bins) Vryburg (Bins)			
<b><u>Grading:</u></b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>
(a) Wet pods, %	0.00	-	-	-	0.00	0.00	0.00	0.00	0.00	-	-	-
(b) Foreign matter, including stones, other grains, sunflower seeds and stones: Provided that such deviations are individually within the limits specified in items (c), (d), and (e), %	0.65	-	-	-	0.48	0.33	0.63	0.21	1.38	-	-	-
(c) Other grain, %	0.00	-	-	-	0.18	0.00	0.36	0.25	0.22	-	-	-
(d) Sunflower seed, %	0.00	-	-	-	0.00	0.00	0.00	0.00	0.17	-	-	-
(e) Stones, %	0.22	-	-	-	0.00	0.00	0.00	0.00	0.00	-	-	-
(f) Sclerotinia, %	0.14	-	-	-	0.04	0.00	0.08	0.06	0.00	-	-	-
(g) Soybeans and parts of Soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	2.32	-	-	-	1.72	1.46	1.97	0.36	1.50	-	-	-
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	2.69	-	-	-	1.65	1.55	1.74	0.13	2.75	-	-	-
(i) Soiled Soybeans, %	0.79	-	-	-	0.17	0.00	0.33	0.23	0.87	-	-	-
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	0.79	-	-	-	0.52	0.33	0.71	0.27	1.38	-	-	-
Poisonous seeds ( <i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i> )	0	-	-	-	0	0	0	0	0	-	-	-
Poisonous seeds ( <i>Argemone mexicana L.</i> , <i>Convolvulus sp.</i> , <i>Ipomoea purpurea Roth.</i> , <i>Lolium temulentum</i> , <i>Xanthium sp.</i> )	1	-	-	-	0	0	0	0	0	-	-	-
<b>Number of samples</b>	<b>1</b>				<b>2</b>				<b>1</b>			
<b><u>Chemical analysis:</u></b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>
Moisture, % (17 hr, 103 °C)	8.3	-	-	-	6.5	6.4	6.5	0.07	7.7	-	-	-
Crude protein, % (db)	40.56	-	-	-	36.37	34.51	38.23	2.63	38.79	-	-	-
Crude fat, % (db)	19.6	-	-	-	19.8	19.7	19.8	0.07	19.4	-	-	-
Ash, % (db)	5.17	-	-	-	5.20	5.08	5.32	0.17	4.90	-	-	-
Crude Fibre, % (db)	7.4	-	-	-	7.6	6.8	8.4	1.13	7.1	-	-	-
<b>Number of samples</b>	<b>1</b>				<b>2</b>				<b>1</b>			



## SOUTH AFRICAN REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(14) North-West Southern Region				(15) North-West South-Eastern Region				(16) North-West Central Eastern Region			
Silo/Intake stands (Type of storage)	Amalia (Bins) Barberspan (Bins) Delareyville (Bins) Excelsior (Bins) Geysdorp (Bins) Hallatshope (Bins) Migdol (Bins) Nooitgedacht (Bins) Taaibospan (Bins) Schweizer-Reneke (Bins)				Bloemhof (Bins) Christiana (Bins) Hertzogville (Bins) Hoopstand (Bins) Kingswood (Bins) Kruising (Bunkers) Poppieland (Bunkers)				Bamboesspruit (Bins) Leeudoringstad (Bins) Makwassie (Bins) Regina (Bins) Strydpoort (Bins) Wolmaransstad (Bins)			
<b><u>Grading:</u></b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>
(a) Wet pods, %	0.00	0.00	0.00	0.00	0.00	-	-	-	0.00	-	-	-
(b) Foreign matter, including stones, other grains, sunflower seeds and stones: Provided that such deviations are individually within the limits specified in items (c), (d), and (e), %	0.66	0.27	0.98	0.34	0.32	-	-	-	0.48	-	-	-
(c) Other grain, %	0.04	0.00	0.14	0.07	0.00	-	-	-	0.00	-	-	-
(d) Sunflower seed, %	0.01	0.00	0.03	0.02	0.00	-	-	-	0.02	-	-	-
(e) Stones, %	0.00	0.00	0.00	0.00	0.00	-	-	-	0.09	-	-	-
(f) Sclerotinia, %	0.00	0.00	0.00	0.00	0.00	-	-	-	0.00	-	-	-
(g) Soybeans and parts of Soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	1.42	0.32	1.96	0.75	0.70	-	-	-	1.45	-	-	-
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	2.15	1.54	2.82	0.57	0.79	-	-	-	1.66	-	-	-
(i) Soiled Soybeans, %	0.16	0.00	0.42	0.20	0.41	-	-	-	0.30	-	-	-
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	0.66	0.27	0.98	0.34	0.32	-	-	-	0.48	-	-	-
Poisonous seeds ( <i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i> )	0	0	0	0	0	-	-	-	0	-	-	-
Poisonous seeds ( <i>Argemone mexicana L.</i> , <i>Convolvulus sp.</i> , <i>Ipomoea purpurea Roth.</i> , <i>Lolium temulentum</i> , <i>Xanthium sp.</i> )	0	0	0	0	0	-	-	-	0	-	-	-
<b>Number of samples</b>	<b>4</b>				<b>1</b>				<b>1</b>			
<b><u>Chemical analysis:</u></b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>
Moisture, % (17 hr, 103 °C)	7.8	7.1	8.4	0.63	7.7	-	-	-	7.0	-	-	-
Crude protein, % (db)	39.54	38.90	39.81	0.43	37.72	-	-	-	39.50	-	-	-
Crude fat, % (db)	20.9	19.7	21.9	1.05	20.5	-	-	-	19.1	-	-	-
Ash, % (db)	4.85	4.73	5.16	0.21	4.73	-	-	-	4.97	-	-	-
Crude Fibre, % (db)	6.4	4.6	8.8	1.97	7.9	-	-	-	7.7	-	-	-
<b>Number of samples</b>	<b>4</b>				<b>1</b>				<b>1</b>			

## SOUTH AFRICAN REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(17) North-West Central Northern Region (Ottosdal)				(18) North-West Central Region (Ventersdorp)				(20) North-West Eastern Region			
Silo/Intake stands (Type of storage)	Boschpoort (Bags/Bins/Bulk) Hartbeesfontein (Bins) Kleinharts (Bins) Melliodora (Bins) Ottosdal (Bins) Rostrataville (Bins) Vermaas (Bins) Werda (Bins)				Bodenstein (Bins) Buckingham (Bins) Coligny (Bins) Enselspruit (Bins) Makokskraal (Bins) Potchefstroom (Bins) Ventersdorp (Bins)				Battery (Bins) Brits (Bins) Boons (Bins) Derby (Bins) Koster (Bins) Swartruggens (Bins) Syferbult (Bins)			
<b><u>Grading:</u></b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>
(a) Wet pods, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(b) Foreign matter, including stones, other grains, sunflower seeds and stones: Provided that such deviations are individually within the limits specified in items (c), (d), and (e), %	1.06	0.85	1.23	0.19	0.70	0.23	1.54	0.73	1.41	0.11	4.62	1.83
(c) Other grain, %	0.21	0.00	0.47	0.24	0.08	0.00	0.23	0.13	0.10	0.00	0.21	0.10
(d) Sunflower seed, %	0.04	0.01	0.09	0.04	0.03	0.00	0.08	0.05	0.00	0.00	0.01	0.00
(e) Stones, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.10	0.04
(f) Sclerotinia, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.13	0.06
(g) Soybeans and parts of Soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	2.87	1.66	5.15	1.97	1.86	0.93	3.16	1.16	3.02	0.23	6.38	2.80
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	2.50	1.85	2.83	0.56	1.97	1.46	2.70	0.65	1.72	1.22	2.26	0.47
(i) Soiled Soybeans, %	0.23	0.14	0.37	0.12	0.67	0.08	1.70	0.89	1.24	0.14	4.47	1.82
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	1.06	0.85	1.23	0.19	0.70	0.23	1.54	0.73	1.45	0.11	4.75	1.88
Poisonous seeds ( <i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i> )	0	0	0	0	0	0	0	0	0	0	0	0
Poisonous seeds ( <i>Argemone mexicana L.</i> , <i>Convolvulus sp.</i> , <i>Ipomoea purpurea Roth.</i> , <i>Lolium temulentum</i> , <i>Xanthium sp.</i> )	0	0	0	0	0	0	0	0	0	0	1	0.45
<b>Number of samples</b>	<b>3</b>				<b>3</b>				<b>5</b>			
<b><u>Chemical analysis:</u></b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>
Moisture, % (17 hr, 103 °C)	7.2	6.7	7.8	0.55	7.0	6.5	8.0	0.84	7.3	7.1	7.5	0.15
Crude protein, % (db)	39.31	38.55	39.75	0.66	40.71	39.14	42.23	1.55	40.31	39.06	41.12	0.80
Crude fat, % (db)	19.6	17.8	20.8	1.59	18.8	17.7	19.3	0.92	20.8	19.9	21.8	0.86
Ash, % (db)	4.76	4.63	4.92	0.15	4.64	4.39	4.97	0.30	4.77	4.41	5.13	0.32
Crude Fibre, % (db)	6.2	5.0	6.9	1.07	6.4	6.0	6.7	0.36	5.2	4.3	7.8	1.45
<b>Number of samples</b>	<b>3</b>				<b>3</b>				<b>5</b>			

## SOUTH AFRICAN REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(21) Free State North-Western Region (Viljoenskroon)				(22) Free State North-Western Region (Bothaville)				(23) Free State North-Western Region (Bultfontein)			
Silo/Intake stands (Type of storage)	Attie (Bins) Groenebloem (Bins) Heuningspruit (Bins) Koppies (Bins) Rooiwal (Bins) Vierfontein (Bins) Viljoenskroon (Bins) Vredefort (Bins) Weiveld (Bins)				Allanridge (Bins) Bothaville (Bins) Mirage (Bins) Odendaalsrus (Bins) Schoonspruit (Bins) Schuttendraai (Bins) Misgunst (Bunkers)				Bultfontein (Bins) Losdoorns (Bins) Protespan (Bins) Tierfontein (Bins) Wesselsbron (Bins) Willemsrus (Bins)			
<b><u>Grading:</u></b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>
(a) Wet pods, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-
(b) Foreign matter, including stones, other grains, sunflower seeds and stones: Provided that such deviations are individually within the limits specified in items (c), (d), and (e), %	0.68	0.58	0.81	0.12	0.43	0.32	0.54	0.11	0.63	-	-	-
(c) Other grain, %	0.22	0.00	0.46	0.23	0.11	0.00	0.34	0.20	0.37	-	-	-
(d) Sunflower seed, %	0.02	0.00	0.05	0.03	0.01	0.00	0.02	0.01	0.00	-	-	-
(e) Stones, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-
(f) Sclerotinia, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-
(g) Soybeans and parts of Soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	1.51	0.61	2.44	0.92	1.46	1.26	1.62	0.18	3.24	-	-	-
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	3.18	2.78	3.62	0.42	2.37	1.84	2.72	0.47	2.00	-	-	-
(i) Soiled Soybeans, %	0.83	0.64	1.02	0.19	0.73	0.06	1.68	0.85	0.17	-	-	-
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	0.68	0.58	0.81	0.12	0.43	0.32	0.54	0.11	0.63	-	-	-
Poisonous seeds ( <i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i> )	0	0	0	0	0	0	0	0	0	-	-	-
Poisonous seeds ( <i>Argemone mexicana L.</i> , <i>Convolvulus sp.</i> , <i>Ipomoea purpurea Roth.</i> , <i>Lolium temulentum</i> , <i>Xanthium sp.</i> )	0	0	0	0	0	0	0	0	0	-	-	-
<b>Number of samples</b>	<b>3</b>				<b>3</b>				<b>1</b>			
<b><u>Chemical analysis:</u></b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>
Moisture, % (17 hr, 103 °C)	6.9	6.6	7.5	0.49	6.8	6.4	7.4	0.55	6.5	-	-	-
Crude protein, % (db)	38.42	37.61	39.63	1.07	38.03	37.22	38.51	0.71	38.13	-	-	-
Crude fat, % (db)	19.0	18.8	19.3	0.29	19.8	19.3	20.6	0.70	19.8	-	-	-
Ash, % (db)	4.85	4.77	4.96	0.10	4.77	4.73	4.82	0.05	4.85	-	-	-
Crude Fibre, % (db)	6.9	6.7	7.3	0.32	7.0	6.6	7.5	0.46	6.6	-	-	-
<b>Number of samples</b>	<b>3</b>				<b>3</b>				<b>1</b>			

## SOUTH AFRICAN REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(24) Free State Central Region				(25) Free State South-Western Region				(26) Free State South-Eastern Region			
Silo/Intake stands (Type of storage)	Bloemfontein (Bins) Brandfort (Bins) De Brug (Bins) Geneva (Bins) Hennenman (Bins) Kroonstad (Bins) Petrusburg (Bins) Theunissen (Bins) Van Tonder (Bins) Welgeleë (Bins) Winburg (Bins)				Bethlehem (Bins) Clocolan (Bins) Ficksburg (Bins) Fouriesburg (Bins) Marseilles (Bins) Modderpoort (Bins) Slabberts (Bins) Tweespruit (Bins) Westminster (Bins)				Arlington (Bins) Kaallaagte (Bins) Libertas (Bins) Marquard (Bins) Meets (Bins) Monte Video (Bins) Senekal (Bins) Steynsrus (Bins)			
<b><u>Grading:</u></b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>
(a) Wet pods, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(b) Foreign matter, including stones, other grains, sunflower seeds and stones: Provided that such deviations are individually within the limits specified in items (c), (d), and (e), %	0.33	0.17	0.63	0.26	0.74	0.22	1.71	0.58	1.83	1.24	2.42	0.83
(c) Other grain, %	0.07	0.00	0.14	0.07	0.12	0.00	0.27	0.11	0.47	0.10	0.84	0.52
(d) Sunflower seed, %	0.00	0.00	0.00	0.00	0.02	0.00	0.14	0.05	0.09	0.04	0.14	0.07
(e) Stones, %	0.06	0.00	0.18	0.10	0.05	0.00	0.20	0.08	0.18	0.00	0.35	0.25
(f) Sclerotinia, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(g) Soybeans and parts of Soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	3.56	1.84	4.55	1.49	1.98	0.00	4.21	1.58	3.20	2.51	3.89	0.98
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	1.83	1.30	2.48	0.60	1.07	0.48	2.79	0.82	1.01	0.86	1.15	0.21
(i) Soiled Soybeans, %	0.07	0.00	0.22	0.13	0.19	0.00	0.53	0.24	0.07	0.00	0.14	0.10
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	0.33	0.17	0.63	0.26	0.74	0.22	1.71	0.58	1.83	1.24	2.42	0.83
Poisonous seeds ( <i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i> )	3	0	5	2.65	0	0	0	0	4	0	7	4.95
Poisonous seeds ( <i>Argemone mexicana L.</i> , <i>Convolvulus sp.</i> , <i>Ipomoea purpurea Roth.</i> , <i>Lolium temulentum</i> , <i>Xanthium sp.</i> )	0	0	0	0	0	0	0	0	0	0	0	0
<b>Number of samples</b>	<b>3</b>				<b>7</b>				<b>2</b>			
<b><u>Chemical analysis:</u></b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>
Moisture, % (17 hr, 103 °C)	6.5	6.5	6.5	0.00	7.3	7.1	7.4	0.10	7.8	7.7	7.8	0.07
Crude protein, % (db)	36.43	34.83	38.57	1.93	38.51	35.34	40.47	1.71	38.38	37.25	39.50	1.59
Crude fat, % (db)	19.3	17.9	20.0	1.18	17.3	15.1	21.2	1.95	17.6	17.5	17.7	0.14
Ash, % (db)	5.09	4.77	5.28	0.28	4.75	4.53	4.89	0.13	4.73	4.70	4.75	0.04
Crude Fibre, % (db)	6.7	6.2	7.7	0.84	7.6	5.1	8.6	1.18	8.2	8.1	8.2	0.07
<b>Number of samples</b>	<b>3</b>				<b>7</b>				<b>2</b>			

## SOUTH AFRICAN REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(27) Free State Northern Region				(28) Free State Eastern Region				(29) Mpumalanga Southern Region			
Silo/Intake stands (Type of storage)	Gottenburg (Bins) Heilbron (Bins) Hoogte (Bins) Mooigeleë (Bins) Petrus Steyn (Bins) Wolwehoek (Bins)				Afrikaskop (Bins/Bunkers) Ascent (Bins)      Vrede (Bins) Cornelia (Bins)      Warden (Bins) Daniëlsrus (Bins)      Windfield (Bins) Eeram (Bins) Frankfort (Bins) Harrismith (Bins) Jim Fouché (Bins) Kransfontein (Bins/Bunkers) Memel (Bins) Reitz (Bins) Tweeling (Bins) Villiers (Bins/Bulk)				Balfour (Bins) Greylingstad (Bins) Grootvlei (Bins) Harvard (Bins) Holmdene (Bins) Leeuspruit (Bins) Platrand (Bins) Standerton (Bins) Val (Bins)			
<b><u>Grading:</u></b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>
(a) Wet pods, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(b) Foreign matter, including stones, other grains, sunflower seeds and stones: Provided that scuh deviations are individually within the limits specified in items (c), (d), and (e), %	0.63	0.43	1.01	0.33	0.73	0.05	6.38	1.39	0.61	0.12	1.10	0.35
(c) Other grain, %	0.11	0.00	0.22	0.11	0.02	0.00	0.29	0.07	0.04	0.00	0.44	0.13
(d) Sunflower seed, %	0.03	0.02	0.05	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.01
(e) Stones, %	0.05	0.00	0.10	0.05	0.01	0.00	0.11	0.03	0.00	0.00	0.00	0.00
(f) Sclerotinia, %	0.00	0.00	0.00	0.00	0.01	0.00	0.10	0.02	0.02	0.00	0.20	0.06
(g) Soybeans and parts of Soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	1.40	0.45	2.97	1.37	1.35	0.00	8.27	1.75	2.03	0.34	4.10	0.94
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	1.57	0.74	2.79	1.08	1.66	0.40	5.15	1.08	2.98	0.84	4.36	1.16
(i) Soiled Soybeans, %	1.21	0.24	2.40	1.10	0.56	0.00	2.30	0.59	0.25	0.00	0.84	0.23
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	0.63	0.43	1.01	0.33	0.73	0.05	6.38	1.39	0.63	0.12	1.10	0.35
Poisonous seeds ( <i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i> )	0	0	0	0	0	0	3	0.67	0	0	0	0
Poisonous seeds ( <i>Argemone mexicana L.</i> , <i>Convolvulus sp.</i> , <i>Ipomoea purpurea Roth.</i> , <i>Lolium temulentum</i> , <i>Xanthium sp.</i> )	0	0	0	0	0	0	0	0	0	0	2	0.62
<b>Number of samples</b>	<b>3</b>				<b>20</b>				<b>12</b>			
<b><u>Chemical analysis:</u></b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>
Moisture, % (17 hr, 103 °C)	6.9	6.4	7.7	0.72	6.6	6.3	7.8	0.32	6.6	6.4	7.2	0.26
Crude protein, % (db)	41.49	40.44	43.52	1.76	40.15	37.56	42.12	1.25	40.73	38.10	42.44	1.14
Crude fat, % (db)	18.3	17.4	19.1	0.85	20.0	17.9	22.6	1.33	18.3	17.1	20.0	0.80
Ash, % (db)	4.69	4.51	4.87	0.18	4.52	4.23	4.72	0.14	4.53	4.42	4.68	0.08
Crude Fibre, % (db)	5.8	4.8	6.4	0.87	5.4	4.4	6.1	0.49	6.9	4.7	7.9	0.96
<b>Number of samples</b>	<b>3</b>				<b>20</b>				<b>12</b>			



## SOUTH AFRICAN REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(30) Mpumalanga Eastern Region				(31) Mpumalanga Central Region				(32) Mpumalanga Western Region			
Silo/Intake stands (Type of storage)	Amersfoort (Bins) Carolina (Bins) Davel (Bins) Eerstelingsfontein (Bunkers) Ermelo (Bins) Estancia (Bins) Lothair (Bins) Maizefield (Bins) Mkondo (Bins) Morgenzon (Bins) Overvaal (Bins) Sandspruit (Bunkers) Panbult (Bins)				Bakenlaagte (Bunkers) Brakfontein (Bunkers) Bethal (Bins) Devon (Bins) Kinross (Bins/Bunkers) Klipfontein (Bunkers) Leslie (Bins) Palmietfontein (Bunkers) Trichardt (Bins) Vaalkrantz (Bunkers)				Argent (Bins/Bunkers) Dryden (Bins) Endicott (Bins) Eloff (Bins) Hawerklip (Bins) Kendal (Bins) Ogies (Bins)			
<b><u>Grading:</u></b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>
(a) Wet pods, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(b) Foreign matter, including stones, other grains, sunflower seeds and stones: Provided that such deviations are individually within the limits specified in items (c), (d), and (e), %	0.66	0.10	1.90	0.42	1.07	0.18	2.77	0.63	0.84	0.49	1.42	0.29
(c) Other grain, %	0.17	0.00	2.30	0.51	0.18	0.00	1.57	0.45	0.09	0.00	0.26	0.10
(d) Sunflower seed, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(e) Stones, %	0.04	0.00	0.55	0.13	0.05	0.00	0.41	0.12	0.03	0.00	0.08	0.04
(f) Sclerotinia, %	0.00	0.00	0.02	0.00	0.02	0.00	0.11	0.04	0.05	0.00	0.18	0.06
(g) Soybeans and parts of Soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	2.21	0.27	22.30	3.88	1.53	0.47	4.03	1.11	1.76	0.84	2.34	0.46
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	2.21	0.62	4.98	1.05	1.67	1.08	2.51	0.38	1.55	0.46	2.81	0.85
(i) Soiled Soybeans, %	0.90	0.00	4.55	1.19	0.39	0.00	1.26	0.43	0.60	0.00	1.02	0.36
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	0.66	0.10	1.92	0.42	1.09	0.18	2.85	0.66	0.89	0.55	1.44	0.28
Poisonous seeds ( <i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i> )	0	0	2	0.37	0	0	0	0	1	0	4	1.46
Poisonous seeds ( <i>Argemone mexicana L.</i> , <i>Convolvulus sp.</i> , <i>Ipomoea purpurea Roth.</i> , <i>Lolium temulentum</i> , <i>Xanthium sp.</i> )	0	0	2	0.53	0	0	3	0.89	4	0	16	6.50
<b>Number of samples</b>	<b>30</b>				<b>12</b>				<b>8</b>			
<b><u>Chemical analysis:</u></b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>
Moisture, % (17 hr, 103 °C)	6.6	6.1	8.0	0.46	7.4	6.5	7.9	0.54	7.2	6.6	7.7	0.37
Crude protein, % (db)	40.71	38.90	44.00	1.27	40.57	39.25	42.38	0.95	39.94	38.62	41.09	0.89
Crude fat, % (db)	19.3	16.6	21.8	1.51	18.5	16.6	20.7	1.05	17.9	16.9	19.0	0.86
Ash, % (db)	4.48	4.27	4.85	0.13	4.55	4.41	4.82	0.11	4.55	4.45	4.63	0.07
Crude Fibre, % (db)	5.8	4.5	8.0	1.07	6.8	5.1	8.6	1.10	7.3	6.8	8.0	0.40
<b>Number of samples</b>	<b>30</b>				<b>12</b>				<b>8</b>			

## SOUTH AFRICAN REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(33) Mpumalanga Northern Region				(34) Gauteng				(35) Limpopo			
Silo/Intake stands (Type of storage)	Arnot (Bins) Driefontein (Bins) Lydenburg (Bins) Marble Hall (Bins) Middelburg (Bins) Pan (Bins) Stoffberg (Bins) Wonderfontein (Bins)				Bloekomspruit (Bins) Bronkhorstspuit (Bins) Glenroy (Bins) Goeie Hoek (Bins) Kaalfontein (Bins) Kliprivier (Bunkers) Meyerton (Bunkers) Middelvlei (Bins) Nigel (Bins) Oberholzer (Bins) Pretoria Wes (Bins) Raathsvlei (Bins) Vogelvallei (Bunkers)				Alma (Bins) Lehau (Bins) Naboomspruit (Mookgophong) (Bins) Northam (Bins) Nutfield (Bins) Nylstroom (Modimolle) (Bins) Potgietersrus (Mokopane) (Bins) Roedtan (Bins) Settlers (Bins) Warmbad (Bela-Bela) (Bins)			
<b><u>Grading:</u></b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>
(a) Wet pods, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(b) Foreign matter, including stones, other grains, sunflower seeds and stones: Provided that such deviations are individually within the limits specified in items (c), (d), and (e), %	1.09	0.20	4.07	0.99	0.79	0.30	1.66	0.51	2.46	0.67	4.24	2.52
(c) Other grain, %	0.09	0.00	0.38	0.13	0.19	0.00	0.64	0.23	2.03	0.30	3.75	2.44
(d) Sunflower seed, %	0.00	0.00	0.01	0.00	0.03	0.00	0.18	0.06	0.00	0.00	0.00	0.00
(e) Stones, %	0.10	0.00	0.88	0.26	0.01	0.00	0.06	0.03	0.00	0.00	0.00	0.00
(f) Sclerotinia, %	0.00	0.00	0.04	0.01	0.01	0.00	0.06	0.02	0.00	0.00	0.00	0.00
(g) Soybeans and parts of Soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	0.91	0.11	2.10	0.70	1.76	0.61	3.39	1.06	0.67	0.58	0.76	0.13
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	1.94	0.64	3.74	1.03	1.51	0.68	2.66	0.70	1.87	1.27	2.47	0.85
(i) Soiled Soybeans, %	1.92	0.00	10.80	3.29	1.26	0.00	4.56	2.01	1.43	0.45	2.40	1.38
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	1.09	0.20	4.11	1.00	0.80	0.30	1.66	0.51	2.46	0.67	4.24	2.52
Poisonous seeds ( <i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i> )	0	0	1	0.26	0	0	3	1.06	1	0	1	0.71
Poisonous seeds ( <i>Argemone mexicana L.</i> , <i>Convolvulus sp.</i> , <i>Ipomoea purpurea Roth.</i> , <i>Lolium temulentum</i> , <i>Xanthium sp.</i> )	0	0	1	0.26	0	0	0	0	0	0	0	0
<b>Number of samples</b>	<b>15</b>				<b>8</b>				<b>2</b>			
<b><u>Chemical analysis:</u></b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>	<b>ave</b>	<b>min</b>	<b>max</b>	<b>stdev</b>
Moisture, % (17 hr, 103 °C)	7.6	7.1	8.2	0.37	7.3	6.5	8.0	0.43	8.5	7.1	9.9	1.98
Crude protein, % (db)	39.84	37.88	42.14	1.17	39.74	38.18	41.03	1.12	36.16	31.68	40.63	6.33
Crude fat, % (db)	20.2	18.2	21.2	0.84	18.9	17.6	20.4	1.08	23.6	21.1	26.1	3.54
Ash, % (db)	4.76	4.37	5.19	0.27	4.58	4.37	4.72	0.11	5.21	4.89	5.52	0.45
Crude Fibre, % (db)	6.2	4.5	7.6	0.96	7.0	5.9	7.7	0.50	4.9	4.6	5.2	0.42
<b>Number of samples</b>	<b>15</b>				<b>8</b>				<b>2</b>			

# METHODS

## **SAMPLING PROCEDURE:**

A working group determined the procedure to be followed to ensure that the crop quality samples sent to the SAGL by the various grain silo owners, were representative of the total crop.

Each delivery was sampled as per the grading regulations for grading purposes.

After grading, the grading samples were placed in separate containers according to class and grade.

After 80% of the expected harvest had been received, the content of each container was divided with a multi slot divider in order to obtain a 3 kg sample. (This was done for each class and grade separately).

If there were more than one container per class and grade, the combined contents of the containers were mixed thoroughly before dividing it with a multi slot divider to obtain the required 3 kg sample.

The samples were marked clearly with the name of the depot, the bin/bag/bunker number(s) represented by each individual sample as well as the class and grade and were then forwarded to the SAGL.

## **GRADING:**

Full grading was done in accordance with the Regulations relating to the Grading, Packing and Marking of Soybeans intended for sale in the Republic of South Africa (No. R 478 of 20 June 2014) as well as Industry-wide dispensations REF NO 20.4.14.1 dated 06 March 2015 and 12 March 2015 regarding the use of the 1.8 mm slotted sieve and the 4.75 mm round hole sieve during the grading of soybeans.

Please see pages 75 to 84 of this report.

## **TEST WEIGHT:**

Test weight provides a measure of the bulk density of grain and oilseeds.

Test weight does not form part of the grading regulations for soybeans in South Africa. An approximation of the test weight of South African soybeans is provided in this report for information purposes. The g/1 L filling weight of the soybean samples was determined by means of the Kern 222 apparatus. The standard working procedure was followed. The test weight was extrapolated by means of the following formulas obtained from the Test Weight Conversion Chart for Soybean of the Canadian Grain Commission:  $y = 0.1898x + 2.2988$  (291 to 350 g/0.5 L) and  $y = 0.1895x + 2.3964$  (351 to 410 g/0.5 L).

## **CHEMICAL ANALYSIS:**

### **Milling**

Prior to the chemical analyses, the soybean samples were milled on a Retch ZM 200 mill fitted with a 1.0 mm screen.

### **Moisture**

The method prescribed under the ISTA International Rules for Seed Testing, Section 9, latest edition was used to determine the moisture content of the soya samples. This method determines moisture content as a loss in weight of a sample when dried in an oven at 103 °C for 17 hours.

### **Crude protein**

The Dumas combustion analysis technique was used to determine the crude protein content, according to AACCI method 46-30.01, latest edition.

This method prescribes a generic combustion method for the determination of crude protein. Combustion at high temperature in pure oxygen sets nitrogen free, which is measured by thermal conductivity detection. The total nitrogen content of the sample is determined and converted to equivalent protein by multiplication with a factor of 6.25 to obtain the crude protein content.

### **Crude fat**

In-House method 024 was used for the determination of the crude fat in the samples. After sample preparation the fat is extracted by petroleum ether with the aid of the Soxhlet extraction apparatus, followed by the removal of the solvent by evaporation and weighing the dried residue thus obtained. The residue is expressed as % crude fat.

### **Ash**

Ash is defined as the quantity of mineral matter which remains as incombustible residue of the tested substance, after application of the described working method. In-house method No. 011, based on AACCI method 08-02.01 Rapid (Magnesium Acetate) method, was used for the determination. The samples were incinerated at  $700 \pm 10$  °C in a muffle furnace for 45 minutes.

### **Crude fibre**

In-House method 020 was used for the determination of the crude fibre in the samples. Crude fibre is the loss on ignition of the dried residue remaining after digestion of the sample with 1.25% Sulphuric acid ( $H_2SO_4$ ) and 1.25% Sodium hydroxide (NaOH) solutions under specific conditions.

### **GMO (Genetically Modified Organisms):**

The EnviroLogix QuickComb kit for bulk soybeans was used to quantitatively determine the presence of genetically modified soybeans. The kit is designed to extract and detect the presence of certain proteins at the levels typically expressed in genetically modified bulk soybeans. The procedure prescribed in the EnviroLogix – QuickScan Instruction Manual, latest edition was followed. Results were scanned and interpreted quantitatively with the EnviroLogix QuickScan system.



## CERTIFICATE OF ACCREDITATION

*In terms of section 22(2) (b) of the Accreditation for Conformity Assessment, Calibration and Good Laboratory Practice Act, 2006 (Act 19 of 2006), read with sections 23(1), (2) and (3) of the said Act, I hereby certify that:-*

**SOUTHERN AFRICAN GRAIN LABORATORY NPC**  
**Co. Reg. No.: 1997/018518/08**

**Facility Accreditation Number: T0116**

is a South African National Accreditation System accredited Testing laboratory  
provided that all SANAS conditions and requirements are complied with

This certificate is valid as per the scope as stated in the accompanying schedule of accreditation  
Annexure "A", bearing the above accreditation number for

### CHEMICAL AND PHYSICAL ANALYSIS

The facility is accredited in accordance with the recognised International Standard

**ISO/IEC 17025:2005**

The accreditation demonstrates technical competency for a defined scope and the operation of a  
laboratory quality management system

While this certificate remains valid, the Accredited Facility named above is authorised to use the  
relevant SANAS accreditation symbol to issue facility reports and/or certificates



  
Mr R Josias

Chief Executive Officer

Effective Date: 01 November 2014

Certificate Expires: 31 October 2019



## ANNEXURE A

## SCHEDULE OF ACCREDITATION

Facility Number: T0116

<p><b><u>Permanent Address of Laboratory:</u></b> Southern African Grain Laboratory (NPC) Grain Building 477 Witherite Road The Willows 0040</p> <p><b><u>Postal Address:</u></b> Postnet Suite # 391 Private Bag X 1 The Willows 0041</p> <p>Tel: (012) 807-4019 Fax: (086) 216-7672 E-mail: <a href="mailto:info@sagl.co.za">info@sagl.co.za</a></p>	<p><b><u>Technical Signatories:</u></b></p> <p>Ms J Nortjé (All) Ms M Fourie (In-house method 012) Ms M Hammes (Chemical) Ms A de Jager (Nutrients &amp; Contaminants) Ms W Louw (In-House Methods 001, 002, 003, 010, and 026) Ms D Moleke (Rheological) Ms I Terblanche (Rheological) Ms H Meyer (Chemical, Nutrients, Contaminants &amp; Grading) Ms J Kruger (Chemical, excluding In-house method 012) Mr L Badenhorst (Grading) Ms P Modiba (Chemical) Ms M Motlanthe (In-house method 001, 003)</p> <p><b><u>Nominated Representative:</u></b> Ms S du Preez</p> <p><b><u>Management Representative:</u></b> Ms W Louw</p> <p>Issue No.: 24 Date of Issue: 04 March 2015 Expiry Date: 31 October 2019</p>	
<p align="center"><b>Materials / Products Tested</b></p>	<p align="center"><b>Type of Tests / Properties Measured, Range of Measurement</b></p>	<p align="center"><b>Standard Specifications, Equipment / Technique Used</b></p>
<p><b><u>CHEMICAL</u></b></p> <p><b>Ground Barley</b></p> <p><b>Cereal and cereal products specifically- wheat, rice, (hulled paddy), barley, millet, rye and oats as grains, semolina and flour</b></p> <p><b>Flour, semolina, bread, all kind of grains and cereal products, and food products (except those that are sugar coated)</b></p>	<p>Moisture (Oven Method)</p> <p>Moisture (Oven Method)</p> <p>Moisture (Oven method)</p>	<p>Analytical EBC Method 3.2, Latest Edition (2hour; 130°C)</p> <p>ICC Std No.110/1, Latest Edition (90 min; 130°C) (2 hour, 130°C)</p> <p>AACCI 44-15.02, Latest Edition (1hour; 130°C) (72 hour, 103°C)</p>

Original Date of Accreditation: 01 November 1999

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Field Manager

## ANNEXURE A

Facility No.: T0116  
Date of Issue: 04 March 2015  
Expiry Date: 31 October 2019

Materials / Products Tested	Type of Tests / Properties Measured, Range of Measurement	Standard Specifications, Equipment / Technique Used
<b>All flours, cereal grains, oilseeds and animal feeds</b>	Nitrogen and protein (Combustion method - Dumas)	AACCI 46-30.01, Latest Edition
<b>Food stuff</b>	Dietary fibre (total)	In-house method 012
<b>Food stuff and feeds</b>	Carbohydrates (by difference) (calculation) Energy value (calculation) Total digestible nutrition value (calculation)	SOP MC 23
<b>Food stuff and feeds</b>	Determination of ash	In-house method 011
<b>Wheat kernels</b>	Moisture (Oven method)	Government Gazette Wheat Grading Regulation, Latest Edition (72 hour, 103°C)
<b>Flours of grains, e.g. barley, oats, triticale, maize, rye, sorghum and wheat; oilseeds like soybeans and sunflower, feeds and mixed feeds and foodstuffs</b>	Crude Fat (Ether extraction by Soxhlet)	In-house method 024
<b>Meal and flour of wheat, rye, barley, other grains, starch containing and malted products</b>	Falling number	ICC No 107/1, Latest Edition
<b><u>NUTRIENTS &amp; CONTAMINANTS</u></b>		
<b>Vitamin fortified food and feed products and fortification mixes grain based</b>	Vitamin A as all trans Retinol (Saponification) (HPLC)	In-house method 001
<b>Vitamin fortified food and feed products and fortification mixes grain based</b>	Thiamine Mononitrate (HPLC) Riboflavin (HPLC) Nicotinamide (HPLC) Pyridoxine Hydrochloride (HPLC)	In-house method 002
<b>Vitamin fortified food and feed products and fortification mixes grain based</b>	Folic Acid (HPLC)	In-house method 003

Original Date of Accreditation: 01 November 1999

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**Field Manager**

## ANNEXURE A

Facility No.: T0116  
Date of Issue: 04 March 2015  
Expiry Date: 31 October 2019

Materials / Products Tested	Type of Tests / Properties Measured, Range of Measurement	Standard Specifications, Equipment / Technique Used
<b>Grain based food and feed products (fortified and unfortified) and fortification mixes</b>	Total sodium (Na) Total Iron (Fe) Total zinc (Zn)	In-house method 010
<b>Food and feed</b>	Multi-Mycotoxin: - Aflatoxin G <sub>1</sub> , B <sub>1</sub> , G <sub>2</sub> , B <sub>2</sub> and total - Deoxynivalenol (DON), 15-ADON - Fumonisin B <sub>1</sub> , B <sub>2</sub> , B <sub>3</sub> - Ochratoxin A - T2, HT-2 - Zearalenone	In-house method 026
<b><u>GRADING</u></b>		
<b>Maize</b>	Defective kernels (white maize/yellow maize)	Government Gazette Maize Regulation, Latest Edition
<b>Cereal as grains (wheat, barley, rye and oats)</b>	Hectolitre mass (Kern222)	ISO 7971-3, Latest Edition
<b>Wheat</b>	Screenings	Government Gazette Wheat Grading Regulation, Latest Edition
<b><u>RHEOLOGICAL</u></b>		
<b>Wheat flour</b>	Alveograph (Rheological properties)	ICC No 121, Latest Edition
<b>Flours</b>	Farinograph (Rheological properties)	AACCI 54.02, Latest Edition (Rheological behaviour of Flour Farinograph: Constant Flour Weight procedure)
<b>Hard, soft and durum wheat, (flour and whole wheat flour)</b>	Mixograph (Rheological properties)	Industry Accepted Method 020 (based on AACCI 54-40.02, Latest Edition Mixograph Method)

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**Field Manager**



Instituut vir Graangewasse  
Landbounavorsingsraad  
Potchefstroom

Grain Crops Institute  
Agricultural Research Council  
Potchefstroom

Republiek van Suid Afrika  
Republic of South Africa

**VERSLAG VAN DIE NASIONALE  
SOJABOON KULTIVARPROEWE/  
2014/15  
REPORT OF THE NATIONAL  
SOYBEAN CULTIVAR TRIALS**

Verantwoordelike beampte:  
Responsible officer:  
AS de Beer



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## 1 INTRODUCTION

The National Soybean Cultivar Trials (project M101/62) were planted for the 37<sup>th</sup> successive year this past growing season. A total of 22 trials were planted at 20 localities, illustrated in the locality list.

### 1.1 AIM

The aim of the project was primarily the following:

- (i) To compare cultivars for agronomic and economic performance;
- (ii) to test the adaptability of cultivars and new releases for specific areas and cultivation practices.

## 2 MATERIALS AND METHODS

### 2.1 GENERAL

The trials were planted as randomized block designs (Rows & columns) using three replications with 30 cultivars. Cultivar characteristics are shown in Table 1.

Each trial plot consisted of four, 5 m rows. Four metres were harvested from each of the middle two rows, in order to avoid border effects. Soil form, fertilization and weed control are indicated together with row spacing in Table 2. All seeds were inoculated with Bradyrhizobium japonicum bacteria at planting.

The localities where trials were planted represent a wide range of climatic conditions. Trials were carried out on the ARC and Departmental Research Stations as well as on privately owned farms. Observations were recorded by responsible officers and collaborators as indicated in the list of collaborators. Planting time and cultivation practice were executed to correspond with that of commercial plantings in the specific areas. Rainfall and irrigation are indicated in Table 3. Note that rainfall is only recorded from October to April and not for the specific growing season of a trial.

## 2.2 OBSERVATIONS

A brief definition of some of the observations in the trials is as follow:

- 2.2.1 Date of flowering: The time at which one fully open flower per plant was observed across 50% of the plots.
- 2.2.2 Date of harvest maturity: When 95% of the pods for a given plot had turned brown.
- 2.2.3 Length of growing season: The number of days from date of planting to date of maturity.
- 2.2.4 Plant height: The average height in centimeter (cm) of plants from the soil surface to the growth point at maturity.
- 2.2.5 Pod height: The average height in centimeter (cm) of the lowest pods on the plant from soil surface at maturity.
- 2.2.6 Green stem: The percentage green stems at harvest rated on a 1 (normally mature) to 5 (more than 80% green stems) scale.
- 2.2.7 Lodging: Lodging at time of harvest was rated on the following scale:
- 1 = No lodging
  - 2 = Few lodging, will not hamper mechanical harvesting
  - 3 = Few lodging, lodging less than what will hamper mechanical harvesting
  - 4 = Few lodging, will hamper mechanical harvesting, with yield loss
  - 5 = Fair number of plants lodged, will hamper mechanical harvesting, with yield loss
  - 6 = Many plants lodged, will hamper mechanical harvesting, with yield loss

- 7 = A large number of plants lodged, will hamper mechanical harvesting, with yield loss
- 8 = Nearly all plants lodged, will hamper mechanical harvesting, yield loss
- 9 = All plants lodged, will hamper mechanical harvesting, yield loss

2.2.8 Shattering: Measured at time of harvest and three weeks later. Shattering is reported on a scale of 1 (no shattering) to 5 (more than 91-100% pods shattered).

2.2.9 100 seeds mass: Determined on an air dry basis from a randomly selected sample retained on a 4,75 mm standard grading screen.

2.2.10 Undesirable seed: The mass of undesirable seed was determined in a random 100 g sample with seed size greater than 4,75 mm (excluding mechanical damaged seeds).

2.2.11 Protein and oil percentage: The determinations were done on a sample with whole seeds (moisture free) and a variation can be expected.

2.2.12 Seed yield: Four metres of the two centre rows were harvested by hand at soil level and threshed. Seed moisture was determined and seed yield calculated on a basis of 12,5% moisture content.

## 2.3 THE EVALUATION OF TRIALS

The yield data of the individual trials were subjected to analysis of variance (ANOVA) with a randomized complete block design used. From the components of variance the following parameters were calculated, viz:  $C_e$ , (error coefficient of variation);  $C_g$ , (genetic coefficient of variation);  $t$ , (repeatability of plot yield or intra class correlation coefficient) and  $t_n$ , (repeatability of mean yield).

The diagnostic value of these parameters may be illustrated as follows:

The  $t$  parameter as defined above relates to the repeatability of plot means over replications, and is interpreted in the same way as the normal correlation coefficient, i.e. the greater the concurrence of plot values per entry over replications the closer  $t$  will strive towards unity. The standard error  $SE(t)$  calculated for a particular  $t$ -value indicates the accuracy for the estimate of  $t$ .

The  $t_n$  parameter relates to the repeatability of entry cultivar means, and can be defined as the relationship of genetic variance (the variance of true yield of entries) to the total variance of observed means. In cultivar trials this parameter is useful only when the number of replications between trials varies, where this is not the case, the  $t$ -value is sufficient.

The localities with coefficient of variance higher than 25% were rejected from the analysis.

The trial means versus the cultivar means is plotted. A regression line is then fitted with the trial means as  $x$  variable and cultivar means as predictor variable. Out of the regression estimates the yield probability percentage above the mean for each cultivar at different yield potentials is then calculated and presented in a table as a guideline for the use of different cultivars under different circumstances.

### 3 DISCUSSION OF RESULTS

#### 3.1 GENERAL

The rainfall and irrigation data are shown in Table 3. Sporadic early rains limited the ideal planting period. Most of the soybean production areas also experienced sporadic hail storms resulted in the replanting of four (4) trials. Drought during the pod filling stage also contributed to below average yield.

A total of four (4) of the 22 trials (18%) could not be included in the report compared to the five (5) out of 21 trials (23.8%) in the 2013/14 season.

The following trials could not be included in the report for the following reasons:

- 1 Hoopstad – High CV due to hail during harvesting.
- 2 Greytown – Destroyed by a hail storm.
- 3 Koedoeskop – Low yield due to a low plant count caused by malfunctional planter.
- 4 Stoffberg – First and replanting destroyed by hail.

As in the previous seasons the evaluation of the trials was based on a number of parameters. No conclusion can be made on a single parameter.

## 3.2 DISCUSSION OF TABLES

### 3.2.1 Days to flowering (Table 4), physiologically mature (Table 5) and length of the growing season (Table 6)

The number of days from planting to flowering (Table 4) is an effective measure for the grouping of cultivars because the relative order of rank for this characteristic is repeated to a great extent over localities and years. As expected the average days to flowering was the shortest in the warm areas (40 days at Atlanta and 46 in Brits) and the longest in the cooler areas (82 days at Kokstad).

The number of days to physiological maturity is shown in Table 5. The longest average days to maturity was experienced at Delmas (157 days).

The number of days to harvest maturity (Table 6) was used to determine the length of the growing season of a cultivar. The number of days to harvest maturity is however, more dependent on climatic changes and planting date for soybeans and, the number of days to flowering is therefore a more reliable maturity grouping criterion.

### 3.2.2 Plant height (Table 7)

The indeterminate cultivar DM 6.8i RR (MG 6.8) showed a mean plant height of 106 cm (highest) in the cool area compared to 57 cm (lowest) of the semi-determinate cultivar LS 6444 R (MG 4) in the moderate region and LS 6261 R (MG 6.0) in the

warm area. Plant height for cultivars with an indeterminate growth habit was in general higher than those with a determinate growth habit.

The average plant height between localities varied from a mean of 48 cm at Migdol to 101 cm at Delmas.

### 3.2.3 Pod height (Table 8)

The variation in pod and plant height between cultivars is linked with the length of the growing season of a cultivar. The determinate cultivars PHB 95 Y 20 R (MG 5.2) and LS 6466 R (MG 6.0) and PAN 1614 R (MG 6.2) an indeterminate cultivar showed a mean pod height of 13 cm in the moderate area, while PAN 6164 R (MG 6.0) also had an average pod height of 13 cm in the cool areas.

LS 6444 R (MG 4) (semi-determinate) who as for the third (3) season had the lowest reading of 6 in the cool, moderate and warm regions. Considerable harvest losses can occur due to low pod height; thus pod height is an important factor influencing cultivar choice. Differences in pod height between localities can mainly be attributed to differences in row width and climate. The fact that the trials are being harvested by hand, it might favour the yield figures, and may be worth while looking at the yield percentage above the 7.5 cm combine harvesting height.

### 3.2.4 Lodging (Table 9)

The highest lodging occurred in the trial for the second (2) consecutive year at Delmas. The highest lodging figures was reported for PAN 1623 R, DM 6.2i RR, LS 6164 R and DM 6.8i RR in the cool and moderate production areas with the highest number of 5.

### 3.2.5 Green stem (Table 10)

A lot of green stem was reported for the third consecutive year at Groblersdal. The cultivar NS 5909 R, showed a high tendency for green stem, across all three climatic regions. Plants also retained their leaves that could hamper the harvesting process.



### 3.2.6 Shattering 3 weeks after harvesting (Table 11)

The highest shattering occurred on the Potchefstroom Irrigation and Potchefstroom PD1 Dryland trials in the moderate production area. Limited shattering were recorded at Middelburg, Brits and Kinross.

### 3.2.7 Number of plants (Table 12)

Enough certified seed was provided to establish 400 000 plants ha<sup>-1</sup> for the irrigation and high rainfall areas and 350 000 for dryland. The low plant numbers at Groblersdal were due to pigeon damage and very high temperatures just after planting.

### 3.2.8 Percentage undesirable seed (Table 13)

The lowest mean of 0.58% undesirable seeds was recorded for the cool region. The range varied from 1.35% at Brits to 0.10% at Cedara.

### 3.2.9 Mass (g) 100<sup>-1</sup> seeds (Table 14)

The variation in seed mass among localities ranged between 12.97 g 100<sup>-1</sup> seeds at Dundee to 19.06 g 100<sup>-1</sup> seeds at Groblersdal. The highest seed mass was recorded for PAN 6240 R across all climatic regions, while LS 6444 R as last season had the smallest seed for the most part across all areas.

### 3.2.10 Oil percentage (Table 15)

LS 6146 R had, like the three previous seasons, the highest average oil percentage for all the regions (21.63% cool, 21.66% moderate, 23.54% warm) The lowest oil percentage was recorded for PHB 95 Y 20 R for the cool (18.13%) and moderate (20.18%) areas.

### 3.2.11 Crude Protein percentage (Table 16)

The crude protein is negatively correlated to the oil percentage thus LS 6444 R had

had for the past two seasons the lowest crude protein for all regions (36.87% cool, 36.85% moderate and 38.37% warm). PHB 95 Y 20 R had the highest figure for the cool area (40.13%) and (38.29%) for the moderate area.

### 3.2.12 Profat (Table 17)

The inclusion of this table in the report was requested by Dr Erhard Bredendam as the total value of oil and protein is a much better indicator for the selection of a cultivar than the single oil or protein factor. PHB 94 Y 80 R had the highest average profat value for all the regions. PHB 95 Y 20 R 00 had a percentage above 64% in the warm regions.

### 3.2.13 Yield (Table 18)

Due to the sensitivity of soybean cultivars to environmental conditions, it is preferable to divide the soybean production areas into cool, moderate and warm regions. A better yield can be established by choosing a cultivar suitably adapted for a specific region. It is also necessary to use data from more than one year to select between cultivars. Due to the significant cultivar and locality interaction, conclusions on cultivar performance should not be made from average yield data alone. The mean yield over localities has therefore been omitted.

## 4 INTERPRETATION OF YIELD RESULTS

### 4.1 INTRODUCTION

A stated aim of the national soybean cultivar trials is the evaluation of cultivars for their adaptability to a potential production area, and for their yield performance. Adaptability is especially important because of the fact that soybean cultivars are known to be restricted in terms of recommended production area. This fact is also demonstrated by the results discussed in this report.

Because of genotypic restriction in adaptability the statistical analysis of data over all trial entries and localities tend to demonstrate strong interaction components which

confound interpretation. Interaction makes genotype rankings at one site inapplicable to another site. The larger the interaction the more information is lost if interaction is not analysed effectively. This will be a lesser problem for homogeneous areas than for non-homogeneous areas. However, a purpose of the national trials is to identify homogeneous areas or homogeneous growing conditions based on cultivar performance. Localities were therefore grouped together based on past research experience and with the assistance of photo thermal charts provided by the Institute for Soil, Climate and Water. Localities were grouped in cool, moderate and warm production areas.

#### 4.2 YIELD PROBABILITY AND YIELD (Tables 19, 20, 21, 22, 23 & 24)

A minimum number of successful trials per climatic area are needed to calculate saved yield probability values. Yield probability tables are set up for cool-, moderate and warm regions, if enough data is available.

Yield probability of a cultivar is the chance to get an above average yield at a particular yield potential. For instance, if the yield probability of a cultivar, at a particular yield potential equals 60%, the chance to get a yield above the mean of all cultivars is 60% with a 40% chance of obtaining a yield below the mean.

PAN 1454 R and LS 6453 R showed an above average yield probability (Table 19) for the low to medium yield potential, (cool area), while LS 6248 R and PAN 1583 R had an above average yield probability in the medium to high yield potential range for the same climatic region. For the moderate area PAN 1583 R and LS 6161 R showed above average figures over the whole production potential range. LS 6161 R also performed above average for the warm areas.

**Lokalliteite, medewerkers en adresse van kultivarproewe soos beplan vir, 2014/15**  
**Localities, co-operators and addresses of the cultivar trials , 2014/15**

Nr No	Lokalliteit Locality	Adres van proeflokaliteit Address of trial locality	Tel. no. Tel. nr.	Verantwoordelike beampte Responsible officer
1	Atlanta	JH Steenkamp P/bus 1022 Atlanta Slagkraal Brits 0250	072 606 5094	G Engelbrecht
2	Bethlehem	Kleingraan Instituut Bethlehem 9700	082 375 8999	L Bronkhorst & E Maree
3	Brits	Hartebeespoort Nav. Stasie Posbus 1261 Brits 0250	082 375 8999	L Bronkhorst & T Kruger
4	Cedara	Cedara P/bag X9059 Pietermaritzburg 3200	033-355 9495/072 241 9182	J Arathoon
5	Clocolan	G Hugo van Niekerk Kroon Clocolan 9735	082 375 8999	L Bronkhorsten & E Maree
6	Delmas-Pannar	Pannar Saad Navorsingsplaas Posbus 439 Delmas 2210	013-665 8524/082 969 1981	A Mathebula
7	Dundee	Dundee Navorsingstasie Posbus 626 Dundee 3000	034 212 479/076 953 3587	M Buthelezi
8	Glen	Glen Proefplaas Bloemfontein 9300	082 375 8999	L Bronkhorst, J Richter & E Maree
9	Greytown	Pannar Proefplaas Posbus 19 Greytown 3250	033-413 9639	A Jarvie
10	Greytown Kranskop	Umvoyuna Farm Posbus 755 Greytown 3250	033-417 1494(6)/082 558 1766	P Herbst
11	Grobiersdal-Loskop	Loskopproefplaas Posbus 1367 Grobiersdal 0470	013-262 3042/083 274 1951	C Fourie
12	Hoopstad	R Taljaard Posbus 120 Hoopstad 9479	082 375 8999	L Bronkhorst
13	Kinross	Vosstoffel Boerdery Posbus 80 Kinross 2270	082 375 8999	L Bronkhorst
14	Koedoeskop	Sanleohan Trust Plaas Rietfontein Koedoeskop 0361	083 625 4906	R van Niekerk
15	Kokstad	Research Station P/Bag X501 Kokstad 4700	039 727 2105/072 778 8785	MP Skhakhane
16	Kroonstad	Hoërskool Kroonstad Kroonstad 9500	082 375 8999	L Bronkhorst, N Schultz & E Maree
17	Middelburg	G Anderson Postnet Suite 15 P/Bag 1866 Middelburg 1050	082 375 8999	L Bronkhorst
18	Migdol	Koos Bezuidenhout Posbus 90 Migdol 2775	082 375 8999	L Bronkhorst
19-21	Potchefstroom	IGG Proefplaas Privaatsak X1251 Potchefstroom 2520	018-299 6366/082 375 8999	L Bronkhorst
22	Stoffberg	Piet Prinsloo Posbus 107 Stoffberg 1056	082 375 8999	L Bronkhorst

**Tabel 1 Sojaboonsoad eienskappe en inligting oor verskaffers, 2014/15**  
**Table 1 Soybean seed characteristics and information about agents, 2014/15**

Kultivar Cultivar	Volwassenheids- groeperings Maturity Group	Groeiwyse Growth habit *1	Hilum kleur Hilum colour *2	Blomkleur Flower colour *3	Haarkleur Pubescence *4	Op varieteits lys On variety list	Verskaffer Agent	Telersregte Breeding rights
LS 6240 R	4.0	SD	BL	W	W	JAYES	Linkseed	JAYES
LS 6444 R	4.0	SD	BL	W	G	JAYES	Link Seed	JAYES
PAN 1454 R	4.3	I	BL	P	B	JAYES	Pannar	JAYES
LS 6146 R	4.4	I	BL	P	G	JAYES	Link Seed	JAYES
PHB 94 Y 80 R	4.8	I	LB	P	W	JAYES	Pioneer	JAYES
LS 6248 R	4.8	SD	BL	W	W	JAYES	Link Seed	JAYES
NS 5009 R	5.0	I	B	W	T	JAYES	K2	NEE/NO
DM 5.1i RR	5.1	I	S	W	W	JAYES	GDM Seeds	JAYES
PHB 95 Y 20 R	5.2	D	BL	P	G	JAYES	Pioneer	JAYES
PAN 1583 R	5.0	D	LB	P	G	JAYES	Pannar	JAYES
PAN 1664 R	5.3	D	LB	P	G	JAYES	Pannar	JAYES
DM 5953 RSF	5.3	I	IB	P	W	JAYES	GDM Seeds	JAYES
LS 6453 R	5.0	SD	BL	W	T	JAYES	Link Seed	JAYES
PAN 1521 R	5.7	I	IB	P	G	JAYES	Pannar	JAYES
PAN 1500 R	5.8	I	IB	P	G	JAYES	Pannar	JAYES
NS 5909 R	5.9	I	IB	P	G	JAYES	K2	NEE/NO
PHB 96 T 06 R	6.0	I	KL	W	G	JAYES	Pannar	NEE/NO
LS 6466 R	6.0	D	B	P	G	JAYES	Link Seed	JAYES
PAN 1666 R	6.1	I	BL	W	B	JAYES	Pannar	JAYES
PAN 1623 R	6.1	I	KL	W	G	JAYES	Pannar	JAYES
LS 6261 R	6.0	SD	BL	P	T	JAYES	Link Seed	JAYES
DM 6.2i RR	6.2	I	LB	P	G	JAYES	GDM Seeds	JAYES
LS 6164 R	6.0	D	LB	W	G	JAYES	Link Seed	JAYES
LS 6161 R	6.3	D	IB	P	B	JAYES	Link Seed	JAYES
PAN 1614 R	6.2	I	B	W	G	JAYES	Pannar	NEE/NO
NS 6448 R	6.4	SD	LB	P	G	JAYES	K2	NEE/NO
DM 6.8i RR	6.8	I	B	P	G	JAYES	GDM Seeds	JAYES
NS 7211 R	7.2	D	LB	W	G	JAYES	K2	NEE/NO
PAN 1729 R	7.3	I	KL	W	G	JAYES	Pannar	JAYES

\*1 D - Bepaald/determinate I - Onbepaald/indeterminate SD - Semi-Bepaald/semi determinate

\*2 BL - Swart/black IB - Onvolledig swart/imperfect black  
 LB - Ligbruin/buff G - Grys/grey

\*3 P - Pers/purple W - Wit/white

\*4 B - Bruin/brown G - Grys/grey  
 T - Geelbruin/Tawny

B - Bruin/brown  
 KL - Kleurloos/buff

W - Wit/white

**Tabel 2 Algemene inligting aangaande grond en verbouingspraktieke by die onderskeie proeflokaleite van die kultivarproewe, 2014/15**  
**Table 2 General information in connection with soil and cultivation practices at the different trial localities, 2014/15**

Lokaleite Locality	Plantdatum Date of planting	Grondvoorm Soil type	Grond ontleding Soil analysis		Bemesting Fertilization				Spasiëring Spacing (cm)	Onkruid beheer Weed control	Koördinate van lokaleite Co-ordinate of localities	
			pH (H <sub>2</sub> O)	P	K	N	P	K			S	E
Atlantia/B	03/12/14	-	-	-	-	-	-	-	45	-	S25.37851	E27.57087
Bethlehem/D	30/10/14 28/11/14	Avalon	6.51	62	125	4.2	2.52	0	90	Strongam, Agill, Round-up, skoffel	S28.16378	E28.30721
Bris/B	02/12/14	Arcadia	7.56	12	248	0	15.2	0	75	Strongam, Agill, Round-up, skoffel	S25.59088	E27.76057
Cedara/D	04/11/14	Hutton	5.53	12	208	0	2.1	0	45	Hammer, Metalochlor 800, skoffel	S29.54846	E30.26421
Clocolan/D	07/11/14	-	5.02	9	103	5.32	11.45	9	90	Strongam, Agill, Round-up, skoffel	S28.90864	E27.60007
Delmas/D	04/11/14	Hutton	6.00	35	185	No fertilization done			91	Metolochlor 960, Broadstrike	S26.14488	E28.70768
Dundee/D	05/12/14	Hutton	5.35	41	278	0	3.8	0	45	Dual Gold, Basagran, Agill	S28.14398	E30.30740
Glen/B	25/11/14	Hutton	7.76	21	135	3.92	12.81	0	75	Strongam, Agill, Round-up	S28.92912	E26.32643
Greytown/D	25/11/14	Hutton	-	-	-	-	-	-	75	-	S29.06227	E30.58662
Greytown Kranskop/D	14/11/14	Hutton	5.14	17	20	0	21	0	90	Felgan Gold, Classic	S28.96683	E30.86403
Grobiersdal/B	03/12/14 17/12/14	Avalon	6.59	9	270	-	-	-	75	Strongam, Agill, Round-up	S25.17845	E29.38762
Hoopstad	08/11/14	-	7.09	23	168	6.72	7.14	0	75	Strongam, Agill, Round-up, skoffel	S27.89980	E25.82096
Kinross/D	12/11/14	-	5.62	52	230	2.8	2.31	-	75	Strongam, Agill, Round-up, skoffel	S26.36788	E29.12537
Koedoeskop/B	10/12/14	-	7.36	34	395	-	-	-	75	-	S24.89571	E27.50410
Kokstad/D	04/11/14	-	4.90	14	183	-	-	-	45	Dual Gold	S30.54817	E29.41589
Kroonstad/D	24/11/14	-	-	-	-	-	-	-	90	Strongam, Agill, Round-up, skoffel	S27.60994	E27.22540
Middelburg/D	19/11/14	-	Boer werk op globale monster			-	-	-	75	Strongam, Agill, Round-up, skoffel	S25.68314	E29.73461
Migdol/D	07/11/14 22/12/14	-	6.13	32	180	5.32	2.52	0	90	-	S26.97137	E25.61150
Potchefstrroom/B	14/11/14	Hutton	6.59	6	350	0	18.27	0	75	Strongam, Agill, Round-up, skoffel	S26.73633	E27.05886
Potchefstrroom/D	14/11/14	Hutton	5.84	32	323	0.28	2.52	0	90	Strongam, Agill, Round-up, skoffel	S26.73633	E27.05886
Potchefstrroom/D	05/12/14	Hutton	5.84	32	323	0.28	2.52	0	90	Strongam, Agill, Round-up, skoffel	S26.73633	E27.05886
Stoffberg/D	20/11/14 19/12/14	-	5.81	14	145	0	10.61	0	75	Strongam, Agill, Round-up, skoffel	S25.43707	E29.85423

- Inligting nie beskikbaar/information not available



**Table 3 Reënval en besproeiing vir die verskillende lokaliteite (mm), 2014/15**  
**Table 3 Rainfall and irrigation at the different localities (mm), 2014/15**

Lokaleiteit Locality	Maandelikse reënval (mm) Monthly rainfall (mm)												Totaal Total *	Besproeiing Irrigation	Totaal Total **
	Okt	Nov	Des	Jan	Feb	Mrt	Apr								
Bethlehem	12.7	186.18	102.87	134.62	29.72	145.03	27.43	638.55	0	638.55					
Brits	12	110	123	80	50	40	14	429	300	729					
Cedara	88	133	125	119	72	83	58	678	0	678					
Delmas	62.6	90.6	25.1	81	58.8	65.8	36.6	420.5	0	420.5					
Dundee	17.5	78	214.5	149	40	41.5	10.5	551	0	551					
Glen	13	181	79	88	36	74	22	493	416	909					
Greytown Kranskop	48	66	73	133	132	43	27	522	0	522					
Groblersdal	49	56.5	168.5	215	56	45	8	598	315	913					
Kokstad	86.5	101	83.6	96	139.5	65.7	59.5	631.8	0	631.8					
Middelburg	54.86	131.83	267.72	100.84	103.38	113.54	11.94	784.11	0	784.11					
Potchefstroom B	14.48	90.17	114.55	139.19	55.63	104.65	28.96	547.63	420	967.63					
Potchefstroom Drg PD1	14.48	90.17	114.55	139.19	55.63	104.65	28.96	547.63	0	547.63					
Potchefstroom Drg PD2	14.48	90.17	114.55	139.19	55.63	104.65	28.96	547.63	0	547.63					

\* Vir reënval/For rainfall

\* Vir reënval en besproeiing/For rainfall and irrigation

**Tabel 4 Die aantal dae vanaf plant tot 50% blomstadium van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2014/15**  
**Table 4 The number of days from planting to 50% flowering stage of the different soybean cultivars at the different trial localities, 2014/15**

Kultivar	Koel/Cool						Matig/Moderate						Warm									
	Bethlehem	Clocolan	Delmas	Kinross	Kokstad	Middelburg	Gem/Mean	Glen	Kranskop	Kroonstad	Migdol	Potchetstroom	Bespr	Potchetstroom	PD1 Drg	Potchetstroom	PD2 Drg	Gem/Mean	Atlanta	Brits	Gem/Mean	
LS 6240 R	56	60	57	57	62	55	58	56	44	51	34	49	50	43	47	32	37	35				
LS 6444 R	49	61	57	55	62	49	56	56	42	52	34	48	48	41	46	33	37	35				
PAN 1454 R	50	62	58	64	62	49	58	56	44	54	48	48	47	39	48	33	37	35				
LS 6146 R	51	59	61	55	62	49	56	56	42	51	34	48	46	42	46	32	37	35				
PHB 94 Y 80 R	55	61	64	64	62	55	60	56	49	51	34	51	51	45	48	34	39	37				
LS 6248 R	68	83	78	77	90	71	78	69	65	68	53	66	62	53	62	35	48	42				
NS 5009 R	55	63	59	64	62	55	60	60	42	52	34	52	51	40	47	34	37	36				
DM 5.1i RR	50	57	58	55	62	49	55	56	42	51	50	49	46	40	48	34	37	36				
PHB 95 Y 20 R	72	86	84	81	94	76	82	69	71	69	34	64	67	64	63	37	50	44				
PAN 1583 R	69	84	78	77	87	70	78	69	63	59	50	61	60	53	59	36	47	42				
PAN 1664 R	60	85	79	77	87	69	76	69	62	59	50	61	60	52	59	36	47	42				
DM 5953 RSF	55	61	66	64	62	55	61	56	47	52	45	50	48	42	49	34	37	36				
LS 6453 R	67	78	78	77	85	69	76	69	62	59	53	62	60	51	59	41	47	44				
PAN 1521 R	69	87	79	78	90	76	80	69	65	68	55	64	65	60	64	40	49	45				
PAN 1500 R	66	86	83	79	90	76	80	69	71	70	55	65	65	60	65	44	49	46				
NS 5909 R	60	86	86	83	90	76	80	60	74	59	55	66	66	62	63	45	50	48				
PHB 96 T 06 R	73	82	85	83	90	76	81	69	74	69	42	66	68	62	64	42	45	44				
LS 6466 R	69	83	83	77	85	71	78	69	65	70	57	64	65	56	64	42	51	46				
PAN 1666 R	69	83	82	77	87	70	78	69	71	68	57	65	65	58	65	44	49	47				
PAN 1623 R	67	83	82	77	90	76	79	69	68	70	50	65	65	61	64	45	49	47				
LS 6261 R	69	77	79	77	94	69	78	65	65	67	50	65	61	51	60	40	45	43				
DM 6.2i RR	70	83	83	77	87	76	79	69	69	70	50	65	63	50	62	46	49	48				
LS 6164 R	65	83	78	77	87	76	78	69	65	67	53	63	63	53	62	42	47	45				
LS 6161 R	67	87	79	83	90	76	80	69	69	69	52	64	65	54	63	42	48	45				
PAN 1614 R	74	84	83	81	90	85	83	69	69	68	57	66	67	62	65	46	49	48				
NS 6448 R	71	87	83	77	90	85	82	69	65	70	45	62	65	62	63	-	49	49				
DM 6.8i RR	71	82	83	78	92	85	82	69	75	70	48	66	64	57	64	47	48	47				
NS 7211 R	71	83	84	77	92	76	81	69	69	70	50	65	66	60	64	47	48	48				
PAN 1729 R	75	89	87	83	101	85	87	74	75	71	57	71	73	64	69	46	53	50				
Standaard	68	83	82	77	90	69	78	69	69	71	52	63	64	62	64	47	50	49				
Gem/Mean	64	78	76	74	82	69	74	65	62	63	48	60	60	53	59	40	46	43				

**Tabel 5 Die aantal dae vanaf plant tot fisiologiesryp stadium van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2014/15**  
**Table 5 The number of days from planting to physiological maturity of the different soybean cultivars at the different trial localities, 2014/15**

Kultivar	Koel/Cool								Matig/Moderate								Warm		
	Bethlehem	Ciocolan	Delmas	Kinross	Kokstad	Middelburg	Gem/Mean	Cedara	Dundee	Greytown	Kroonstad	Migdol	Potchefstroom	Potchefstroom	Potchefstroom	Potchefstroom	Gem/Mean	Brits	Gem/Mean
LS 6240 R	112	124	154	125	134	88	123	143	89	120	109	81	116	116	111	111	111	101	101
LS 6444 R	109	124	132	125	132	117	123	143	88	118	109	81	125	116	111	111	111	93	93
PAN 1454 R	109	130	146	128	134	119	128	149	93	120	112	100	124	116	108	115	115	135	135
LS 6146 R	109	124	131	125	134	117	123	145	90	118	109	105	124	116	111	115	115	98	98
PHB 94 Y 80 R	109	129	134	125	132	117	124	144	92	116	109	81	116	116	111	111	111	98	98
LS 6248 R	126	146	160	140	156	132	143	151	98	130	129	115	125	129	124	125	107	107	
NS 5009 R	112	126	135	125	134	117	125	143	90	118	112	81	124	116	108	112	98	98	
DM 5.1i RR	112	124	136	125	134	117	125	142	90	120	109	100	124	116	108	114	98	98	
PHB 95 Y 20 R	138	158	171	154	158	117	149	156	96	130	143	118	132	145	124	131	118	118	
PAN 1583 R	126	158	164	154	154	146	150	151	98	130	143	118	136	116	124	127	107	107	
PAN 1664 R	137	154	162	154	152	146	151	152	100	130	143	109	138	116	124	127	107	107	
DM 5953 RSF	112	130	133	125	132	117	125	148	91	120	112	100	116	116	111	114	98	98	
LS 6453 R	109	144	156	140	154	132	139	153	96	125	143	115	124	124	124	125	107	107	
PAN 1521 R	124	144	162	142	156	132	143	155	97	131	129	112	132	132	124	127	101	101	
PAN 1500 R	138	154	158	154	154	146	151	154	98	130	131	119	138	132	124	128	107	107	
NS 5909 R	137	158	161	154	156	146	152	163	98	135	143	114	138	132	128	131	135	135	
PHB 96 T 06 R	138	158	166	154	158	146	153	164	98	139	143	109	132	145	120	131	107	107	
LS 6466 R	126	158	164	154	156	146	151	156	98	125	112	117	136	141	124	126	135	135	
PAN 1666 R	138	116	166	142	156	135	142	156	98	130	127	115	132	132	124	127	108	108	
PAN 1623 R	109	146	163	140	163	132	142	158	98	125	127	109	136	145	124	128	118	118	
LS 6261 R	124	146	161	140	160	132	144	158	98	130	116	111	136	132	124	126	98	98	
DM 6.2i RR	126	144	164	154	158	132	146	158	97	127	129	111	141	132	124	127	118	118	
LS 6164 R	138	144	169	142	158	146	150	159	97	137	133	115	138	132	124	129	107	107	
LS 6161 R	138	158	162	154	154	146	152	160	98	127	143	115	132	145	124	131	135	135	
PAN 1614 R	138	154	171	154	158	132	151	159	96	133	143	112	136	143	124	131	118	118	
NS 6448 R	124	158	163	154	160	146	151	143	98	136	143	112	132	145	120	129	135	135	
DM 6.8i RR	124	158	164	140	164	156	151	165	99	139	143	103	136	145	136	133	135	135	
NS 7211 R	138	130	161	154	163	146	149	162	96	136	143	109	141	145	128	132	135	135	
PAN 1729 R	138	130	164	154	165	132	147	165	98	141	143	115	138	145	136	135	135	135	
Standaard	124	158	162	140	156	135	146	158	97	131	127	113	132	141	124	128	101	101	
Gem/Mean	125	143	157	142	151	132	142	154	96	128	129	107	131	131	121	125	113	113	113

**Table 6 Die aantal dae vanaf plant tot oesstadium van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2014/15**  
**Table 6 The number of days from planting to maturity of the different soybean cultivars at the different trial localities, 2014/15**

Kultivar	Koel/Cool						Matig/Moderate						Warm							
	Bethlehem	Clocolan	Delmas	Kinross	Kokstad	Middelburg	Gem/Mean	Cedara	Dundee	Glen	Greytown	Kroonstad	Migdol	Potchetstroom Bespr	Potchetstroom PD1 Drg	Potchetstroom PD2 Drg	Gem/Mean	Brits	Groblersdal	Gem/Mean
LS 6240 R	124	144	157	140	146	132	141	171	113	135	131	129	112	129	124	133	131	124	126	125
LS 6444 R	124	144	157	140	146	132	141	171	131	135	130	129	112	129	131	119	132	107	129	118
PAN 1454 R	129	144	168	140	146	137	144	171	128	135	130	129	112	127	124	128	132	124	129	126
LS 6146 R	124	144	157	140	146	132	141	171	120	135	130	129	118	127	143	114	132	114	140	127
PHB 94 Y 80 R	124	144	147	140	146	132	139	171	124	135	130	129	112	127	124	133	132	129	126	128
LS 6248 R	145	177	178	154	176	153	164	171	129	155	149	143	123	153	146	137	145	147	149	148
NS 5009 R	124	144	157	140	146	132	141	171	115	135	131	129	123	132	131	133	133	118	147	133
DM 5.1i RR	124	144	157	140	146	132	141	171	122	135	131	129	112	134	131	133	133	118	129	123
PHB 95 Y 20 R	159	178	178	165	185	160	171	178	129	170	151	162	139	149	154	137	152	153	147	150
PAN 1583 R	159	178	178	165	176	153	168	171	135	163	149	162	129	157	150	137	150	135	144	140
PAN 1664 R	159	178	178	165	157	160	166	171	129	163	149	162	123	149	150	137	148	135	156	145
DM 5953 RSF	138	144	157	147	146	137	145	171	120	135	130	129	114	132	124	133	132	124	131	128
LS 6453 R	138	158	178	154	157	141	154	171	129	148	149	143	129	145	150	137	145	124	138	131
PAN 1521 R	152	178	178	154	176	146	164	171	132	170	149	143	129	145	154	137	148	129	147	138
PAN 1500 R	159	178	178	165	176	153	168	174	132	163	151	162	134	157	154	137	152	141	160	151
NS 5909 R	159	178	178	175	176	167	172	181	135	170	152	162	129	157	154	137	153	153	160	157
PHB 96 T 06 R	159	178	168	175	176	167	170	181	138	170	151	162	129	157	154	137	153	147	138	143
LS 6466 R	159	178	178	175	176	167	172	171	132	163	151	143	126	157	154	137	148	153	147	150
PAN 1666 R	159	178	178	175	176	160	171	174	135	153	149	143	129	153	158	137	148	147	144	146
PAN 1623 R	159	178	178	165	176	153	168	174	132	148	151	149	129	153	154	137	148	141	151	146
LS 6261 R	145	178	178	154	176	146	163	174	129	155	152	143	129	149	150	137	147	124	156	140
DM 6.2i RR	159	178	178	175	176	153	170	174	138	170	151	162	134	157	158	137	153	147	160	154
LS 6164 R	159	178	178	175	176	160	171	171	132	160	152	162	129	157	154	137	150	147	143	145
LS 6161 R	159	178	178	165	157	167	167	178	135	163	151	156	129	157	150	137	151	141	138	140
PAN 1614 R	159	178	178	165	176	160	169	181	130	170	152	156	129	153	154	137	151	129	156	143
NS 6448 R	159	178	178	175	176	160	171	171	132	170	152	162	129	157	158	138	152	147	156	151
DM 6.8i RR	159	178	178	175	185	167	174	181	138	170	151	162	144	157	158	151	157	153	156	154
NS 7211 R	159	178	178	175	185	167	174	181	140	160	152	162	139	157	158	145	155	153	156	154
PAN 1729 R	159	178	178	175	185	167	174	181	138	170	151	162	144	157	158	151	157	153	156	154
Standaard	152	178	178	154	176	167	168	171	129	155	149	162	129	145	146	137	147	129	151	140
Gem/IMean	148	168	172	160	167	152	161	174	130	155	145	149	127	147	147	136	146	136	145	141

Table 7 Die planthoogte (cm) van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2014/15  
 Table 7 The plant height (cm) of the different soybean cultivars at the different trial localities, 2014/15

Kultivar	Koel/Cool						Matig/Moderate						Warm								
	Bethlehem	Clocolan	Delmas	Kinross	Kokstad	Middelburg	Gem/Mean	Cedara	Dundee	Glen	Greytown	Kroonstad	Migdol	Potchefstroom	Potchefstroom Bespr	Potchefstroom PD1 Drg	Potchefstroom PD2 Drg	Gem/Mean	Brits	Groblersdal	Gem/Mean
LS 6240 R	65	63	79	70	70	67	69	42	62	63	53	70	38	68	68	61	62	58	68	50	59
LS 6444 R	53	63	71	68	64	73	65	42	65	68	45	58	44	68	68	65	58	57	67	53	60
PAN 1454 R	82	85	96	84	90	83	87	57	78	87	55	85	51	85	85	73	73	72	83	65	74
LS 6146 R	83	72	84	85	90	75	82	52	66	80	53	78	49	82	82	65	78	67	73	56	65
PHB 94 Y 80 R	63	63	78	63	65	65	66	48	60	72	45	60	43	75	75	62	63	59	78	58	68
LS 6248 R	82	63	114	74	105	81	87	59	56	60	60	87	54	83	83	73	79	70	86	58	72
NS 5009 R	65	63	76	70	72	60	68	46	59	68	50	65	48	73	73	67	69	61	72	56	64
DM 5.11RR	65	57	76	55	74	57	64	38	59	75	40	62	40	80	80	63	70	59	77	64	71
PHB 95 Y 20 R	80	70	89	80	105	80	84	39	69	87	80	60	53	83	83	80	80	70	75	61	68
PAN 1583 R	67	77	109	59	100	83	82	37	66	78	72	52	37	83	70	69	63	63	72	51	61
PAN 1664 R	65	68	85	75	90	67	75	35	63	77	65	45	38	73	69	72	60	60	72	49	60
DM 5953 RSF	70	68	82	60	65	67	69	48	57	85	53	68	42	77	66	67	63	63	85	64	74
LS 6453 R	73	70	100	78	110	77	85	58	62	82	62	78	48	78	68	70	67	67	78	62	70
PAN 1521 R	77	67	100	72	95	79	82	66	65	98	72	80	47	85	68	68	80	73	93	63	78
PAN 1500 R	72	72	98	77	90	78	81	50	57	92	70	63	42	75	73	69	66	66	82	44	63
NS 5909 R	82	78	110	60	95	88	86	56	59	95	65	65	52	91	77	80	71	71	88	66	77
PHB 96 T 06 R	80	80	113	78	120	87	93	54	65	88	75	70	57	89	74	87	73	73	83	64	74
LS 6466 R	80	82	126	85	125	87	98	69	68	100	80	90	40	95	85	85	79	79	98	78	88
PAN 1666 R	80	73	120	76	115	93	93	60	63	88	68	88	44	95	68	65	71	71	81	68	75
PAN 1623 R	83	77	109	72	95	81	86	62	53	98	70	83	43	89	69	78	72	72	85	63	74
LS 6261 R	60	60	92	45	85	69	69	47	45	75	60	60	45	68	67	61	59	59	63	50	57
DM 6.21RR	77	73	102	78	100	80	85	54	71	95	70	70	53	91	69	76	72	72	93	61	77
LS 6164 R	75	75	122	73	120	83	91	56	63	98	75	67	50	90	81	74	73	73	97	62	79
LS 6161 R	75	65	106	74	110	82	85	62	48	95	70	77	52	78	70	74	70	70	87	60	73
PAN 1614 R	95	80	116	73	105	81	92	64	67	103	80	73	52	86	75	81	76	76	83	63	73
NS 6448 R	85	67	107	63	100	73	82	41	55	90	80	67	50	79	68	85	68	68	82	53	68
DM 6.81RR	90	98	133	85	140	93	106	71	70	112	70	87	57	104	82	98	83	83	102	81	92
NS 7211 R	68	68	93	80	100	72	80	41	68	87	80	63	48	80	79	82	70	70	88	48	68
PAN 1729 R	95	83	123	73	110	87	95	61	71	100	85	75	58	93	88	97	81	81	95	56	75
Standaard	77	70	111	82	90	80	85	58	60	103	67	72	57	92	77	68	73	73	98	71	85
Gem/Mean	75	72	101	72	97	78	82	52	62	87	66	71	48	83	72	75	68	68	83	60	71

Table 8 Die peulhoogte (cm) van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2014/15  
 Table 8 The pod height (cm) of the different soybean cultivars at the different trial localities, 2014/15

Kultivar	Koel/Cool										Matig/Moderate								Warm		
	Bethlehem	Clocolan	Delmas	Kinross	Kokstad	Middelburg	Gem/Mean	Cedara	Dundee	Glen	Greytown	Kroonstad	Migdol	Potchefstroom Bespr	Potchefstroom PD1 Drg	Potchefstroom PD2 Drg	Gem/Mean	Brits	Groblersdal	Gem/Mean	
LS 6240 R	9	8	11	9	7	8	9	5	4	10	8	9	5	9	10	8	8	8	2	5	
LS 6444 R	5	8	7	8	4	7	6	6	6	9	5	6	6	7	7	6	6	9	3	6	
PAN 1454 R	12	14	12	9	5	9	10	9	11	11	5	13	5	13	8	9	9	10	4	7	
LS 6146 R	10	10	10	11	5	7	9	6	5	12	5	12	6	9	8	10	8	7	2	5	
PHB 94 Y 80 R	9	7	11	8	4	8	8	5	4	9	6	6	5	10	8	7	7	9	4	6	
LS 6248 R	12	9	17	11	5	10	11	10	17	13	14	11	7	10	11	11	11	10	3	7	
NS 5009 R	8	8	9	9	3	9	8	6	3	9	10	9	4	9	9	8	7	8	4	6	
DM 5.1iRR	8	6	9	9	5	8	8	5	7	31	4	9	7	8	7	8	10	8	3	6	
PHB 95 Y 20 R	11	10	14	11	6	10	10	8	23	16	25	7	8	11	9	8	13	9	3	6	
PAN 1583 R	8	10	20	9	4	9	10	8	20	11	16	2	2	10	6	9	9	9	3	6	
PAN 1664 R	7	9	13	8	7	9	9	7	20	12	16	1	3	9	7	8	9	9	3	6	
DM 5953 RSF	10	8	8	9	4	8	8	6	8	12	7	8	4	11	7	9	8	8	2	5	
LS 6453 R	9	10	10	11	3	10	9	8	14	12	12	9	6	10	9	9	10	9	4	7	
PAN 1521 R	9	9	17	9	5	9	10	10	18	17	18	10	9	9	9	8	12	13	4	8	
PAN 1500 R	9	10	15	9	6	9	10	10	17	16	15	8	4	8	10	8	11	10	3	7	
NS 5909 R	10	12	18	8	6	12	11	10	18	19	15	8	7	11	9	11	12	7	4	6	
PHB 96 T 06 R	8	12	11	8	6	7	9	8	17	13	15	9	9	11	9	8	11	8	4	6	
LS 6466 R	10	12	12	7	6	9	9	11	22	16	15	11	5	12	12	12	13	12	4	8	
PAN 1666 R	9	9	18	8	6	12	10	10	16	15	15	12	6	12	8	8	11	10	4	7	
PAN 1623 R	10	10	9	10	6	9	9	8	18	13	15	9	5	10	8	10	11	10	3	6	
LS 6261 R	6	7	10	7	5	9	7	8	17	12	14	8	6	10	10	9	10	12	3	8	
DM 6.2iRR	11	9	8	9	6	11	9	9	20	15	15	9	8	12	10	10	12	9	4	6	
LS 6164 R	10	12	29	10	4	11	13	8	20	16	15	8	7	9	10	9	11	10	4	7	
LS 6161 R	9	7	10	10	5	11	9	10	16	14	15	10	8	8	9	11	11	10	3	7	
PAN 1614 R	13	12	20	8	8	10	12	9	20	18	23	9	8	8	11	10	13	14	4	9	
NS 6448 R	9	9	22	8	7	10	11	6	17	16	25	9	8	10	10	10	12	9	4	6	
DM 6.8iRR	13	15	17	8	8	9	12	13	15	18	14	10	5	13	9	10	12	7	4	6	
NS 7211 R	9	9	10	9	7	8	9	8	22	15	11	7	6	10	10	10	11	9	3	6	
PAN 1729 R	13	12	20	8	7	11	12	8	20	17	20	10	6	9	11	10	12	9	4	7	
Standaard	10	9	19	11	6	9	11	8	15	15	14	9	9	10	8	10	11	15	4	10	
Gem/Mean	10	10	14	9	5	9	9	8	15	14	14	9	6	10	9	9	10	10	3	7	



**Table 9 Omvalwaarnemings (1-5) van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2014/15**  
**Table 9 Lodging dat (1-5) of the different soybean cultivars at the different trial localities, 2014/15**

Kultivar	Koel/Cool					Matig/Moderate							Warm						
	Bethlehem	Clocolan	Delmas	Kinross	Middelburg	Gem/Mean	Cedara	Dundee	Glen	Kroonstad	Mitgdl	Potchestroom Bespr	Potchestroom PD1 Drg	Potchestroom PD2 Drg	Gem/Mean	Brits	Groblersdal	Gem/Mean	
LS 6240 R	1.00	1.00	1.67	1.00	1.00	1.13	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
LS 6444 R	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PAN 1454 R	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
LS 6146 R	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHB 94 Y 80 R	1.00	1.00	2.00	1.00	1.00	1.20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
LS 6248 R	1.00	1.00	4.67	1.00	1.00	1.73	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
NS 5009 R	1.00	1.00	1.33	1.00	1.00	1.07	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
DM 5.1i RR	1.00	1.00	2.67	1.00	1.00	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHB 95 Y 20 R	1.00	1.00	3.33	1.00	1.00	1.47	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PAN 1583 R	1.00	1.00	1.67	1.00	1.00	1.13	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PAN 1664 R	1.00	1.00	1.67	1.50	1.00	1.23	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
DM 5953 RSF	1.00	1.00	2.67	1.00	1.00	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
LS 6453 R	1.00	1.00	3.67	1.00	1.00	1.53	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PAN 1521 R	1.00	1.00	3.00	1.00	1.00	1.40	1.00	1.00	2.00	1.00	1.00	1.00	1.00	1.00	1.13	1.00	1.00	1.00	1.00
PAN 1500 R	1.00	1.00	3.00	1.00	1.00	1.40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
NS 5909 R	1.00	1.00	3.33	1.00	1.00	1.47	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHB 96 T 06 R	1.00	1.00	2.67	1.00	1.00	1.33	1.00	1.00	1.33	1.00	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00
LS 6466 R	1.00	1.00	3.00	1.00	1.00	1.40	1.00	1.00	1.33	1.00	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00
PAN 1666 R	1.00	1.00	2.67	1.50	1.00	1.43	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PAN 1623 R	1.00	1.00	5.00	1.00	1.00	1.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
LS 6261 R	1.00	1.00	2.00	1.00	1.00	1.20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
DM 6.2i RR	1.00	1.00	5.00	1.00	1.00	1.80	1.00	1.00	1.67	1.00	1.00	1.00	1.00	1.00	1.08	1.00	1.00	1.00	1.00
LS 6164 R	1.00	1.00	5.00	2.00	1.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
LS 6161 R	1.00	1.00	3.33	1.50	1.00	1.57	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PAN 1614 R	1.00	1.00	2.67	1.00	1.00	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
NS 6448 R	1.00	1.00	2.33	1.50	1.00	1.37	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
DM 6.8i RR	1.00	1.00	5.00	2.00	1.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
NS 7211 R	1.00	1.00	2.33	1.50	1.00	1.37	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PAN 1729 R	1.00	1.00	3.00	1.50	1.00	1.50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Standaard	1.00	1.00	4.00	1.00	1.00	1.60	1.00	1.00	1.33	1.00	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00
Gem/Mean	1.00	1.00	2.86	1.17	1.00	1.40	1.00	1.00	1.09	1.00	1.00	1.00	1.00	1.00	1.01	1.00	1.00	1.00	1.00

Table 10 Greenstem (1-5) van die verskillende soja boonkultivars by die verskillende proef lokaliteite, 2014/15  
 Table 10 Greenstem (1-5) of the different soybean cultivars at the different trial localities, 2014/15

Kultivar	Koel/Cool					Matig/Moderate								Warm					
	Bethlehem	Clocolan	Delmas	Kinross	Middeburg	Gem/Mean	Cedara	Dundee	Glen	Kroonstad	Migdal	Potchefström	Bespr	Potchefström PD1 Drg	Potchefström PD2 Drg	Gem/Mean	Brits	Groblersdal	Gem/Mean
LS 6240 R	1.67	2.33	1.00	1.67	1.67	1.67	1.00	1.00	2.33	2.33	1.33	1.67	2.33	2.33	3.33	1.92	1.00	1.33	1.17
LS 6444 R	1.00	2.33	1.00	3.00	1.00	1.67	1.00	1.00	1.00	2.33	1.00	2.00	2.33	2.33	3.67	1.79	1.67	3.67	2.67
PAN 1454 R	1.33	3.00	1.33	1.67	2.67	2.00	1.00	1.00	1.00	2.67	1.00	4.00	2.33	2.33	3.33	2.04	3.00	5.00	4.00
LS 6146 R	1.33	1.67	1.00	2.33	1.00	1.47	1.00	1.00	1.00	1.67	1.33	3.33	2.00	2.00	2.00	1.67	1.67	2.33	2.00
PHB 94 Y 80 R	1.33	2.67	2.67	3.33	2.00	2.40	1.33	1.00	1.00	4.00	1.00	3.33	2.67	4.67	4.67	2.38	3.33	5.00	4.17
LS 6248 R	1.67	1.00	1.00	3.67	1.33	1.73	1.00	1.00	1.67	3.33	1.67	5.00	4.33	3.33	2.67	2.67	3.33	5.00	4.17
NS 5009 R	2.00	3.00	1.67	3.33	2.33	2.47	1.67	1.00	3.00	2.33	1.00	4.00	4.33	5.00	5.00	2.79	1.33	5.00	3.17
DM 5.11 RR	1.33	2.67	1.00	3.00	2.00	2.00	1.00	1.00	3.00	2.67	1.00	3.33	3.33	3.33	4.67	2.50	1.33	5.00	3.17
PHB 95 Y 20 R	1.00	1.00	1.00	2.33	2.00	1.47	1.00	1.00	2.33	2.33	3.00	3.67	4.67	3.33	3.33	2.67	4.67	3.67	4.17
PAN 1583 R	1.00	1.00	1.00	3.33	2.00	1.67	1.00	1.00	1.33	3.33	1.67	5.00	4.33	3.00	2.58	2.58	2.33	5.00	3.67
PAN 1664 R	1.00	1.00	1.00	3.00	1.33	1.47	1.33	1.00	1.33	3.67	1.67	4.00	4.67	3.33	2.63	2.63	2.00	2.67	2.33
DM 5953 RSF	1.00	3.00	1.00	2.67	1.33	1.80	1.00	1.00	1.67	2.00	1.00	3.67	2.67	4.33	2.17	2.17	1.33	5.00	3.17
LS 6453 R	1.67	3.00	1.00	3.00	1.67	2.07	1.00	1.00	2.67	2.67	1.00	3.67	4.00	3.67	2.46	2.46	2.33	2.67	2.50
PAN 1521 R	1.00	1.33	1.00	2.33	1.33	1.40	1.00	1.00	2.67	3.33	1.33	4.67	5.00	2.33	2.67	2.67	2.33	5.00	3.67
PAN 1500 R	1.00	1.00	1.00	3.67	2.67	1.87	1.00	1.00	3.67	3.00	2.00	4.67	5.00	4.67	3.13	3.13	3.00	5.00	4.00
NS 5909 R	1.00	1.67	1.00	3.33	3.67	2.13	1.00	1.00	2.67	2.00	2.33	5.00	5.00	4.00	2.88	2.88	4.67	5.00	4.83
PHB 96 T 06 R	1.00	1.00	1.33	3.33	1.67	1.67	1.00	1.00	2.67	1.67	1.67	4.67	4.67	3.67	2.63	2.63	2.33	5.00	3.67
LS 6466 R	1.00	1.00	1.00	3.67	2.67	1.87	1.00	1.00	1.67	4.00	1.67	4.67	4.67	4.00	2.83	2.83	5.00	3.67	4.33
PAN 1666 R	1.00	1.67	1.00	4.00	2.00	1.93	1.00	1.00	1.33	3.67	1.67	5.00	5.00	5.00	2.96	2.96	4.33	5.00	4.67
PAN 1623 R	1.00	1.00	1.00	2.67	3.00	1.73	1.00	1.00	1.33	3.33	1.33	5.00	5.00	4.67	2.83	2.83	2.67	5.00	3.83
LS 6261 R	1.67	1.00	1.00	3.33	2.00	1.80	1.00	1.00	2.33	3.67	1.00	4.67	5.00	4.00	2.83	2.83	2.33	5.00	3.67
DM 6.21 RR	1.00	1.33	1.00	1.33	3.00	1.53	1.00	1.00	3.33	3.67	1.67	5.00	5.00	4.67	3.17	3.17	4.00	5.00	4.50
LS 6164 R	1.00	1.33	1.00	2.67	3.33	1.87	1.00	1.00	3.33	2.00	1.00	4.67	4.33	3.33	2.58	2.58	3.67	3.67	3.67
LS 6161 R	1.00	1.00	1.00	2.67	1.00	1.33	1.00	1.00	3.33	2.00	1.67	5.00	5.00	4.67	2.92	2.92	3.67	3.67	3.67
PAN 1614 R	1.00	1.33	1.00	1.67	3.67	1.73	1.00	1.00	2.33	2.33	1.33	5.00	5.00	4.67	2.83	2.83	2.67	2.67	2.67
NS 6448 R	1.00	1.67	1.00	2.67	1.33	1.53	1.00	1.00	2.33	1.67	1.33	4.33	4.67	3.00	2.42	2.42	3.33	4.00	3.67
DM 6.81 RR	1.67	1.67	1.00	1.67	3.67	1.93	1.00	1.00	1.33	2.67	2.00	4.67	4.67	4.00	2.67	2.67	4.33	4.00	4.17
NS 7211 R	1.00	1.33	1.00	1.33	3.33	1.60	1.00	1.00	2.00	2.67	2.00	5.00	5.00	3.33	2.75	2.75	4.00	3.67	3.83
PAN 1729 R	1.00	1.67	1.33	2.33	3.00	1.87	1.00	1.00	3.33	1.67	1.00	4.33	4.67	3.00	2.50	2.50	5.00	3.67	4.33
Standaard	1.00	1.00	1.00	1.00	1.33	1.07	1.00	1.00	3.00	1.00	1.00	3.33	4.00	3.67	2.25	2.25	2.00	4.00	3.00
Gem/Mean	1.19	1.66	1.11	2.67	2.17	1.76	1.04	1.00	2.20	2.66	1.46	4.21	4.18	3.81	2.57	2.57	2.96	4.14	3.55

Tabel 11 Oopsporing (1-5) van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2014/15  
 Table 11 Shattering (1-5) of the different soybean cultivars at the different trial localities, 2014/15

Kultivar	Koel/Cool						Matig/Moderate						Warm	
	Bethlehem	Clocolan	Kinross	Middelburg	Gem/Mean	Glen	Migdol	Potchetstroom Bespr	Potchetstroom FD1 Drg	Potchetstroom FD2 Drg	Gem/Mean	Brits	Gem/Mean	
LS 6240 R	4.00	2.00	1.00	1.00	2.00	1.33	5.00	5.00	4.00	4.00	3.87	1.00	1.00	
LS 6444 R	5.00	5.00	2.00	2.00	3.50	1.67	5.00	5.00	5.00	5.00	4.33	2.00	2.00	
PAN 1454 R	4.00	3.00	1.00	1.00	2.25	2.00	5.00	5.00	5.00	5.00	4.40	1.00	1.00	
LS 6146 R	1.00	3.00	1.00	1.00	1.50	1.00	4.00	5.00	5.00	4.00	3.80	1.00	1.00	
PHB 94 Y 80 R	3.00	5.00	1.00	1.00	2.50	1.67	5.00	5.00	5.00	5.00	4.33	1.00	1.00	
LS 6248 R	5.00	2.00	1.00	1.00	2.25	1.67	5.00	5.00	5.00	5.00	4.33	1.00	1.00	
NS 5009 R	5.00	1.00	1.00	1.00	2.00	1.00	5.00	5.00	5.00	4.00	4.00	1.00	1.00	
DM 5.1i RR	5.00	5.00	2.00	1.00	3.25	3.00	5.00	5.00	5.00	5.00	4.60	1.00	1.00	
PHB 95 Y 20 R	1.00	1.00	1.00	1.00	1.00	1.00	4.00	5.00	2.00	1.00	2.60	1.00	1.00	
PAN 1583 R	1.00	1.00	1.00	1.00	1.00	1.00	5.00	2.00	3.00	2.00	2.60	2.00	2.00	
PAN 1664 R	1.00	1.00	1.00	1.00	1.00	1.00	5.00	2.00	5.00	4.00	3.40	1.00	1.00	
DM 5953 RSF	2.00	2.00	1.00	1.00	1.50	1.00	5.00	4.00	4.00	5.00	3.80	1.00	1.00	
LS 6453 R	5.00	1.00	3.00	1.00	2.50	1.00	4.00	4.00	5.00	5.00	3.80	2.00	2.00	
PAN 1521 R	1.00	3.00	1.00	1.00	1.50	1.00	1.00	1.00	2.00	2.00	1.40	1.00	1.00	
PAN 1500 R	1.00	1.00	1.00	1.00	1.00	1.00	1.00	4.00	2.00	2.00	2.00	1.00	1.00	
NS 5909 R	1.00	1.00	1.00	1.00	1.00	1.00	4.00	4.00	5.00	2.00	3.20	1.00	1.00	
PHB 96 T 06 R	1.00	1.00	1.00	1.00	1.00	1.00	2.00	4.00	3.00	1.00	2.20	1.00	1.00	
LS 6466 R	3.00	3.00	1.00	1.00	2.00	1.33	5.00	5.00	5.00	5.00	4.27	1.00	1.00	
PAN 1666 R	1.00	5.00	1.00	1.00	2.00	1.00	3.00	3.00	3.00	4.00	2.80	1.00	1.00	
PAN 1623 R	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	3.00	2.00	1.60	1.00	1.00	
LS 6261 R	5.00	4.00	1.00	2.00	3.00	1.33	4.00	5.00	5.00	5.00	4.07	2.00	2.00	
DM 6.2i RR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	3.00	1.00	1.60	1.00	1.00	
LS 6164 R	1.00	1.00	1.00	1.00	1.00	1.00	3.00	5.00	5.00	5.00	3.80	1.00	1.00	
LS 6161 R	1.00	3.00	1.00	1.00	1.50	2.00	3.00	4.00	5.00	5.00	3.80	1.00	1.00	
PAN 1614 R	1.00	1.00	1.00	1.00	1.00	1.33	4.00	2.00	2.00	1.00	2.07	1.00	1.00	
NS 6448 R	1.00	1.00	1.00	1.00	1.00	1.67	5.00	5.00	5.00	2.00	3.73	1.00	1.00	
DM 6.8i RR	1.00	1.00	1.00	1.00	1.00	1.00	5.00	2.00	3.00	1.00	2.40	1.00	1.00	
NS 7211 R	4.00	3.00	1.00	1.00	2.25	1.00	5.00	5.00	5.00	3.00	3.80	1.00	1.00	
PAN 1729 R	1.00	1.00	1.00	1.00	1.00	1.00	1.00	5.00	1.00	1.00	1.80	1.00	1.00	
Standaard	1.00	3.00	1.00	1.00	1.50	1.00	1.00	3.00	3.00	2.00	2.00	1.00	1.00	
Gem/Mean	2.27	2.20	1.13	1.07	1.67	1.27	3.70	3.90	3.93	3.27	3.21	1.13	1.13	

Tabel 12 Die plantelling (x 1000) van die verskillende sojaboonkultivars by die verskillende proeflokaleite, 2014/15  
 Table 12 The number of plants (x 1000) of the different soybean cultivars at the different trial localities, 2014/15

Kultivar	Koel/Cool										Matig/Moderate										Warm		
	Bethlehem	Ciocolan	Delmas	Kinross	Kokstad	Middelburg	Gem/Mean	Cedara	Dundee	Glen	Greytown	Kroonstad	Migdol	Potchefstroom	Bespr	Potchefstroom	PD1 Drg	Potchefstroom	PD2 Drg	Gem/Mean	Brits	Groblersdal	Gem/Mean
LS 6240 R	203	207	191	290	243	266	233	176	164	281	315	208	111	232	128	214	203	264	75	170			
LS 6444 R	202	200	234	289	220	307	242	143	198	299	311	192	144	254	185	219	216	286	113	199			
PAN 1454 R	201	228	228	266	281	240	241	192	221	311	330	223	156	233	171	235	230	292	87	189			
LS 6146 R	230	209	212	294	231	299	246	196	198	284	319	211	143	236	193	234	224	236	105	170			
PHB 94 Y 80 R	218	219	232	249	265	306	248	203	190	285	307	231	166	263	140	235	224	282	86	184			
LS 6248 R	200	213	228	264	256	287	241	184	232	228	315	231	162	286	224	260	236	251	138	194			
NS 5009 R	209	219	198	263	241	297	238	220	170	249	330	199	117	213	175	234	212	269	94	182			
DM 5.1i RR	203	214	168	140	204	287	203	124	165	293	267	209	165	273	169	210	208	261	111	186			
PHB 95 Y 20 R	207	215	240	271	224	289	241	155	170	222	315	193	161	281	222	234	217	192	141	166			
PAN 1583 R	207	181	226	267	243	266	231	152	182	223	285	204	175	299	232	246	222	240	106	173			
PAN 1664 R	219	213	207	275	206	234	225	135	208	219	293	184	129	325	235	243	219	227	113	170			
DM 5953 RSF	230	225	211	266	264	268	244	158	186	339	385	217	190	272	172	243	240	288	88	188			
LS 6453 R	201	223	233	279	231	298	244	169	188	256	311	225	134	272	231	213	222	251	99	175			
PAN 1521 R	194	235	230	260	260	292	245	190	198	212	330	203	194	286	217	258	232	299	106	203			
PAN 1500 R	188	242	277	265	271	274	253	173	194	240	356	210	128	283	230	245	229	261	67	164			
NS 5909 R	247	243	204	259	264	286	251	115	174	268	333	181	161	307	230	240	223	273	147	210			
PHB 96 T 06 R	194	203	193	274	181	266	218	115	156	186	267	206	128	268	226	215	196	271	61	166			
LS 6466 R	213	223	200	247	271	272	238	169	199	257	352	255	153	298	235	266	243	316	119	218			
PAN 1666 R	238	217	186	275	217	266	233	146	181	200	341	213	135	294	244	239	222	227	101	164			
PAN 1623 R	196	234	190	272	257	269	236	170	200	223	374	199	133	287	242	249	231	275	100	188			
LS 6261 R	182	212	226	125	243	238	204	148	187	226	393	217	180	278	234	226	232	272	138	205			
DM 6.2i RR	231	221	228	287	275	283	254	131	183	263	300	181	126	306	231	229	217	293	128	211			
LS 6164 R	214	210	334	228	277	277	257	157	206	213	370	180	180	291	231	240	230	276	93	185			
LS 6161 R	180	193	172	283	215	266	218	152	189	294	319	210	153	266	217	233	226	256	93	175			
PAN 1614 R	233	245	242	271	272	283	258	132	207	229	404	201	197	297	225	220	235	278	118	198			
NS 6448 R	226	239	245	252	271	254	248	150	163	229	404	211	202	297	223	263	238	296	158	227			
DM 6.8i RR	242	255	232	282	265	278	259	187	143	242	304	184	152	299	219	240	219	249	97	173			
NS 7211 R	237	224	245	273	289	237	251	193	187	242	367	214	124	288	240	230	232	295	107	201			
PAN 1729 R	212	240	356	208	241	277	256	141	173	229	374	213	125	281	240	231	223	274	86	180			
Standaard	227	213	259	209	241	220	228	135	197	227	341	201	197	291	246	220	228	279	116	198			
Gem/Mean	213	220	228	256	247	273	239	160	187	249	334	207	154	279	214	235	224	268	106	187			

\*Groblersdal se ondergemiddelde syfers kan toegeskryf word aan 'n baie laat aanplanting in Desember en lae plantestand.

\*Below average figures for Groblersdal due to late planting and low plant population.

Tabel 13 Persentasie ongewenste sade van die verskillende soja boonkultivars by die verskillende proef lokaliteite, 2014/15  
 Table 13 Percentage undesirable seed of the different soybean cultivars at the different trial localities, 2014/15

Kultivar	Koel/Cool								Matig/Moderate								Warm				
	Bethlehem	Ciocolan	Delmas	Kinross	Kokstad	Middelburg	Gem/Mean	Cedara	Dundee	Glen	Kranskop	Kroonstad	Migdal	Potchetstream Bspr	Potchetstream PD1 Drg	Potchetstream PD2 Drg	Gem/Mean	Atlanta	Brits	Groblersdal	Gem/Mean
LS 6240 R	0.70	1.50	0.00	0.00	0.00	0.80	0.50	0.00	1.50	0.40	0.70	2.00	0.80	1.00	1.30	1.40	1.01	0.30	1.60	0.50	0.80
LS 6444 R	1.40	1.90	0.00	0.70	0.10	0.30	0.73	0.00	1.90	0.10	1.00	1.10	0.30	1.40	0.90	0.80	0.83	0.60	1.40	0.10	0.70
PAN 1454 R	1.00	1.10	0.30	0.30	0.00	0.20	0.48	0.23	1.19	1.20	1.00	1.90	1.00	0.40	2.00	1.20	1.12	0.50	0.70	0.50	0.57
LS 6146 R	0.90	1.50	0.20	1.00	0.00	0.30	0.65	0.09	0.70	0.50	0.80	2.10	0.90	2.00	2.50	1.10	1.19	0.30	0.60	1.30	0.73
PHB 94 Y 80 R	0.30	0.60	0.10	0.80	0.00	0.50	0.38	0.00	1.20	0.30	0.50	1.80	0.90	1.10	2.70	2.10	1.18	0.90	1.30	0.60	0.93
LS 6248 R	0.10	0.80	0.70	0.20	0.50	0.20	0.42	0.00	2.80	0.50	0.00	0.60	0.60	0.60	1.80	0.60	0.83	0.50	3.50	1.80	1.93
NS 5009 R	0.70	0.30	0.20	0.00	0.10	0.30	0.27	0.00	0.70	0.90	0.80	1.70	0.40	1.10	0.90	2.20	0.97	0.70	0.80	0.60	0.70
DM 5.1i RR	1.30	1.50	0.00	0.00	0.00	0.10	0.48	0.30	0.40	0.90	1.90	1.50	0.70	1.60	1.30	0.30	0.99	0.50	0.60	1.80	0.97
PHB 95 Y 20 R	0.40	0.80	0.40	0.30	0.30	0.80	0.50	0.45	0.80	1.20	0.90	0.20	0.20	1.40	1.10	0.20	0.72	0.90	2.10	1.10	1.37
PAN 1583 R	0.30	0.20	0.40	1.20	0.60	0.10	0.47	0.00	1.20	0.80	1.20	0.30	0.50	0.40	1.90	0.60	0.77	1.00	0.70	0.80	0.83
PAN 1664 R	0.30	0.70	0.10	0.60	1.90	0.60	0.70	0.00	0.40	1.50	0.50	0.90	0.40	0.40	3.10	0.00	0.80	1.00	0.70	1.50	1.07
DM 5953 RSF	0.70	0.90	0.30	1.40	0.50	0.30	0.68	0.15	1.00	0.30	1.30	2.30	0.60	1.30	2.30	1.10	1.15	1.20	0.70	1.50	1.13
LS 6453 R	0.60	1.10	0.50	1.00	1.90	0.10	0.87	0.00	0.20	1.50	0.60	1.00	0.20	0.70	0.30	0.40	0.54	0.10	0.50	1.10	0.57
PAN 1521 R	0.10	0.30	0.40	4.40	1.00	0.30	1.08	0.10	1.20	0.30	1.30	1.70	0.10	1.00	1.70	0.60	0.89	0.90	0.90	1.30	1.03
PAN 1500 R	0.20	0.20	0.30	0.70	0.20	0.30	0.32	0.00	0.20	0.50	1.00	0.00	0.40	0.20	1.30	0.50	0.46	1.10	1.20	1.50	1.27
NS 5909 R	0.00	0.90	0.80	0.40	0.70	0.40	0.53	0.00	0.40	0.80	1.20	0.30	0.60	1.00	0.30	0.40	0.56	1.30	1.30	1.50	1.37
PHB 96 T 06 R	0.10	0.50	0.60	1.20	1.20	0.70	0.72	0.00	0.50	1.80	1.00	0.40	0.90	0.70	0.10	0.50	0.66	0.80	1.30	1.70	1.27
LS 6466 R	0.20	1.60	0.40	0.40	0.20	0.60	0.57	0.10	2.40	0.90	0.80	1.50	0.50	2.10	2.20	0.60	1.23	1.70	3.10	1.60	2.13
PAN 1666 R	0.20	0.60	0.00	0.90	0.30	0.50	0.42	0.00	1.00	1.30	1.20	1.40	6.00	0.80	1.90	0.80	1.60	0.30	1.10	0.20	0.53
PAN 1623 R	0.20	0.50	0.30	1.00	0.60	0.90	0.58	0.40	0.30	2.10	0.80	0.10	0.20	0.90	0.70	0.70	0.69	0.20	0.80	1.90	0.97
LS 6261 R	1.00	0.40	0.70	0.50	1.20	0.20	0.67	0.00	0.40	2.00	1.10	0.00	0.20	0.90	1.90	0.40	0.77	1.20	1.30	1.60	1.37
DM 6.2i RR	0.30	1.00	0.30	0.30	1.10	0.20	0.53	0.10	0.40	1.10	1.40	0.10	0.00	0.60	0.80	0.00	0.50	0.00	2.30	0.40	0.90
LS 6164 R	0.40	0.70	1.20	0.20	0.50	0.20	0.53	0.00	0.50	0.90	1.50	0.30	1.00	1.60	0.80	0.50	0.79	0.00	2.20	1.20	1.13
LS 6161 R	0.10	0.70	0.00	1.90	1.70	0.80	0.87	0.00	0.00	0.80	0.90	0.30	0.20	0.30	0.70	0.50	0.41	0.10	0.60	1.20	0.63
PAN 1614 R	0.00	0.50	0.10	1.20	0.40	0.30	0.42	0.20	0.71	0.40	1.00	0.30	0.00	0.40	0.80	0.20	0.45	0.00	1.60	1.00	0.87
NS 6448 R	0.50	0.60	1.20	1.10	1.00	0.00	0.73	0.30	0.40	1.60	1.90	0.30	0.10	0.90	2.00	0.70	0.91	-	1.20	2.30	1.75
DM 6.8i RR	0.30	1.10	0.00	0.60	0.20	0.60	0.47	0.00	0.90	1.90	1.60	0.20	0.40	1.50	0.70	0.60	0.87	0.70	1.70	0.80	1.07
NS 7211 R	0.30	0.90	1.60	0.90	0.50	0.30	0.75	0.60	0.50	1.80	2.40	0.00	0.70	1.20	0.30	1.00	0.94	0.90	1.80	1.80	1.50
PAN 1729 R	0.20	1.00	0.50	0.40	0.20	1.10	0.57	0.00	0.70	2.40	2.00	0.30	0.20	0.70	0.30	0.30	0.77	1.00	1.00	1.70	1.23
Standaard	0.90	0.10	0.50	1.10	0.50	0.50	0.60	0.10	0.00	1.30	1.00	0.40	0.50	1.40	1.10	0.80	0.73	0.70	1.80	1.60	1.37
Gem/Mean	0.46	0.82	0.40	0.82	0.58	0.42	0.58	0.10	0.82	1.07	1.11	0.83	0.65	0.99	1.32	0.70	0.84	0.67	1.35	1.22	1.09

Table 14 Massa van 100 sade (g) van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2014/15

Table 14 Mass 100 seeds (g) of the different soybean cultivars at the different trial localities, 2014/15

Kultivar	Koel/Cool										Matig/Moderate						Warm				
	Bethlehem	Clocolan	Delmas	Kinross	Kokstad	Middelburg	Gem/Mean	Cedara	Dundee	Glen	Greytown	Kroonstad	Migdol	Potchetstroom Bespr	Potchetstroom PD1 Drg	Potchetstroom PD2 Drg	Gem/Mean	Atlanta	Brits	Groblersdal	Gem/Mean
LS 6240 R	18.83	17.57	20.43	16.55	17.47	17.13	18.00	21.80	14.40	19.83	22.70	19.07	17.60	15.73	16.20	19.43	18.53	20.23	20.63	21.73	20.87
LS 6444 R	14.90	13.53	15.20	13.25	14.27	14.27	14.24	17.33	10.63	16.00	19.10	15.03	13.40	13.10	11.33	14.93	14.54	16.80	13.47	17.70	15.99
PAN 1454 R	17.23	15.23	17.83	15.45	15.53	16.20	16.25	20.00	13.77	18.67	20.50	15.90	14.17	14.93	14.00	17.37	16.59	20.23	18.27	18.17	18.89
LS 6146 R	14.73	13.87	15.07	13.85	13.97	13.67	14.19	17.13	11.27	16.33	19.60	14.43	15.03	13.37	12.17	15.07	14.93	16.07	15.23	15.97	15.76
PHB 94 Y 80 R	16.77	15.07	17.50	15.65	15.07	15.47	15.92	18.87	13.27	17.87	19.90	16.17	15.20	14.73	14.67	16.87	16.39	19.40	18.53	16.93	18.29
LS 6248 R	14.77	15.17	14.97	13.85	12.80	13.43	14.16	15.67	12.07	17.10	14.50	15.87	14.23	15.37	13.57	15.97	14.93	15.40	18.17	18.63	17.40
NS 5009 R	17.20	16.73	17.10	14.45	16.60	16.03	16.35	19.83	13.10	18.97	20.10	17.33	16.47	17.43	14.97	18.90	17.46	19.10	17.70	19.33	18.71
DM 5.1 RR	15.97	12.01	17.10	15.40	14.53	16.87	15.31	17.23	11.20	16.90	21.60	15.63	14.27	14.23	14.27	15.93	15.70	17.40	16.83	16.93	17.06
PHB 95 Y 20 R	15.50	14.37	16.20	13.15	14.97	14.50	14.78	18.30	12.97	15.90	15.20	16.33	14.70	14.43	15.97	17.20	15.67	16.60	20.47	18.30	18.46
PAN 1583 R	15.67	15.27	14.90	13.15	13.67	13.70	14.39	17.27	12.47	16.83	15.20	17.13	15.17	16.10	13.87	16.90	15.66	16.23	17.47	17.83	17.18
PAN 1664 R	15.67	15.87	14.73	12.75	13.90	14.03	14.49	17.90	12.17	17.33	15.90	18.30	15.73	15.00	13.60	16.80	15.86	16.83	17.37	20.50	18.23
DM 5953 RSF	16.60	16.30	15.73	14.20	13.60	14.23	15.11	17.57	11.53	17.50	17.20	14.57	14.33	15.17	12.97	16.87	15.30	15.90	17.37	17.83	17.03
LS 6453 R	14.00	14.67	15.03	12.95	12.80	14.17	13.94	17.27	11.67	15.10	14.80	14.17	14.50	14.57	13.50	15.50	14.56	15.77	16.30	17.30	16.46
PAN 1521 R	15.07	16.97	15.67	15.10	15.43	14.37	15.43	17.37	12.77	19.63	15.90	18.17	15.63	15.60	17.47	19.07	16.84	15.03	18.40	20.37	17.93
PAN 1500 R	16.23	16.20	16.43	14.30	14.40	14.40	15.33	16.93	12.53	17.70	16.40	17.13	14.90	17.47	15.63	17.77	16.27	14.90	19.03	20.20	18.04
NS 5909 R	16.70	15.53	16.93	13.65	15.17	15.50	15.58	18.03	13.60	17.43	15.50	16.30	15.13	16.43	17.30	17.10	16.31	15.47	18.20	21.07	18.24
PHB 96 T 06 R	13.80	14.47	15.87	13.65	13.20	14.83	14.30	18.37	13.83	16.70	15.00	15.93	15.77	15.93	16.63	16.40	16.06	15.30	19.07	20.37	18.24
LS 6466 R	17.60	17.07	17.77	15.15	14.77	18.13	16.75	18.90	12.90	18.37	16.70	16.07	15.50	16.87	15.60	17.77	16.52	16.17	20.53	20.27	18.99
PAN 1666 R	15.33	14.87	17.23	13.20	14.47	13.97	14.84	17.60	12.13	17.63	15.90	14.70	14.50	15.80	14.00	17.67	15.55	15.43	17.60	17.83	16.96
PAN 1623 R	14.03	14.83	16.77	13.25	14.87	13.90	14.61	15.30	13.13	15.03	14.80	15.40	15.27	16.53	16.30	17.90	15.52	15.47	17.20	16.80	16.49
LS 6261 R	14.70	15.13	16.33	14.60	15.27	14.30	15.06	18.73	13.33	17.93	17.70	17.00	15.87	16.63	15.43	18.33	16.77	16.80	17.07	18.30	17.39
DM 6.21 RR	17.30	16.47	17.63	15.85	15.30	17.00	16.59	18.63	16.03	19.03	18.00	18.33	16.17	18.20	17.00	19.13	17.84	17.93	19.57	20.13	19.21
LS 6164 R	14.43	14.57	15.23	13.80	13.90	13.67	14.27	15.63	12.70	16.30	15.80	16.30	14.03	15.93	15.03	16.57	15.37	14.87	16.50	17.97	16.44
LS 6161 R	13.23	14.23	15.77	12.70	13.10	13.90	13.82	16.70	13.73	14.90	14.90	14.80	12.83	15.67	14.87	16.13	14.95	13.57	18.37	16.97	16.30
PAN 1614 R	15.63	14.63	16.77	13.25	14.90	13.47	14.78	17.20	13.47	16.57	15.40	15.13	14.23	15.87	16.30	17.07	15.69	15.33	18.30	18.50	17.38
NS 6448 R	16.50	15.87	16.43	13.35	14.23	14.47	15.14	17.53	13.27	16.87	15.00	17.03	15.57	17.50	17.47	18.53	16.53	-	20.27	20.60	20.43
DM 6.81 RR	16.70	16.53	17.73	15.40	15.10	16.20	16.28	18.00	14.07	18.17	16.40	18.33	16.80	18.20	18.40	19.57	17.55	16.07	19.93	20.43	18.81
NS 7211 R	15.37	14.73	16.87	13.75	15.00	15.67	15.23	19.90	12.77	17.40	17.30	17.90	15.70	17.20	15.47	16.93	16.73	16.30	21.77	22.80	20.29
PAN 1729 R	14.50	14.00	16.77	14.00	13.13	15.17	14.59	17.20	14.60	17.00	15.20	16.33	14.90	17.10	18.17	17.30	16.42	15.23	23.33	21.03	19.87
Standaard	15.67	16.23	15.60	15.45	14.23	15.23	15.40	18.37	13.60	17.90	15.80	17.30	15.73	15.60	15.93	19.37	16.62	14.97	18.90	21.13	18.33
Gem/Mean	15.69	15.27	16.45	14.17	14.52	14.93	15.17	17.89	12.97	17.30	16.93	16.40	15.11	15.89	15.27	17.34	16.12	16.37	18.39	19.06	17.99

Table 15 Oil percentage on moisture free basis of the different soybean cultivars by die verskillende proef lokaliteite, 2014/15

Kultivar	Koel/Cool										Matig/Moderate						Warm							
	Bethlehem	Clocolan	Delmas	Kinross	Kokstad	Middelburg	Gem/Mean	Cedara	Dundee	Glen	Greytown	Kroonstad	Migdol	Potchetstream	Bespr	Potchetstream	Pd1 Drg	Potchetstream	Pd2 Drg	Gem/Mean	Atlanta	Brits	Groblersdal	Gem/Mean
LS 6240 R	20.17	20.00	22.00	19.80	19.98	20.53	20.41	21.28	20.90	20.41	20.20	19.21	21.10	21.85	20.74	21.09	20.75	20.70	20.63	20.70	20.63	20.70	24.30	21.88
LS 6444 R	21.20	19.10	22.40	20.40	21.63	21.57	21.05	21.39	21.30	21.25	20.80	21.03	21.73	23.12	22.02	21.44	21.56	23.30	20.90	23.30	20.90	23.30	25.30	23.17
PAN 1454 R	20.03	20.20	21.60	20.10	20.84	21.39	20.69	20.51	22.00	20.26	20.80	20.75	21.57	22.56	22.26	21.07	21.31	22.80	21.12	22.80	21.12	22.80	23.90	22.61
LS 6146 R	21.49	20.40	24.00	21.20	21.51	21.16	21.63	21.83	22.60	21.69	20.80	20.34	21.87	22.58	21.02	22.25	21.66	23.40	21.92	23.40	21.92	23.40	25.30	23.54
PHB 94 Y 80 R	19.93	18.60	21.00	19.70	20.29	20.38	19.98	20.46	22.90	20.15	20.40	20.73	20.71	21.68	22.10	20.37	21.06	22.20	20.99	22.20	20.99	22.20	22.80	22.00
LS 6248 R	19.52	17.50	20.20	19.50	20.64	20.75	19.69	20.85	20.60	19.60	20.00	20.17	21.12	21.81	21.24	21.59	20.78	21.90	20.37	21.90	20.37	21.90	23.20	21.82
NS 5009 R	19.69	18.90	22.10	19.60	20.67	20.62	20.26	19.96	20.70	19.52	19.60	19.81	21.22	20.86	21.35	20.13	20.35	21.70	19.58	21.70	19.58	21.70	22.70	21.33
DM 5.1 RR	20.96	19.60	22.50	20.10	21.87	20.80	20.97	21.71	22.80	21.31	20.70	20.27	21.85	22.47	22.97	22.42	21.83	21.70	21.30	21.70	21.30	21.70	25.10	22.70
PHB 95 Y 20 R	18.70	15.50	19.40	18.20	18.06	18.90	18.13	19.35	22.20	18.61	20.00	20.08	20.42	21.02	19.53	20.43	20.18	23.10	20.90	23.10	20.90	23.10	22.30	22.10
PAN 1583 R	19.21	17.10	21.00	19.00	19.57	20.00	19.31	20.93	19.80	20.49	20.90	20.35	21.90	20.37	19.67	20.77	20.58	22.40	21.59	22.40	21.59	24.30	22.76	
PAN 1664 R	19.37	17.60	20.40	20.10	19.50	19.96	19.49	20.35	20.60	20.50	20.60	20.70	21.43	20.18	19.87	20.34	20.51	20.30	20.87	20.30	20.87	22.80	21.32	
DM 5953 RSF	20.75	19.50	21.50	20.90	20.73	21.16	20.76	21.28	19.10	20.39	21.60	21.15	21.38	23.17	21.93	21.14	21.24	20.80	20.24	20.80	20.24	20.80	22.80	21.28
LS 6453 R	19.31	18.40	20.60	19.30	19.88	20.57	19.68	19.54	23.00	19.80	19.50	20.84	21.80	21.23	21.19	20.55	20.83	20.00	20.58	20.00	20.58	23.70	21.43	
PAN 1521 R	19.52	17.70	21.10	19.40	19.65	19.35	19.45	20.33	21.90	19.64	20.40	19.75	21.41	21.33	19.60	20.43	20.53	20.40	20.23	20.40	20.23	23.50	21.38	
PAN 1500 R	19.23	18.10	19.90	19.30	19.29	19.24	19.18	19.22	21.30	19.37	19.70	19.95	21.41	20.97	20.76	20.44	20.35	19.80	20.40	19.80	20.40	23.10	21.10	
NS 5909 R	19.94	18.70	21.10	19.10	20.52	20.28	19.94	21.35	22.00	21.01	21.30	21.33	21.13	21.32	21.39	21.70	21.39	21.80	21.09	21.80	21.09	24.20	22.36	
PHB 96 T 06 R	19.62	18.40	21.40	20.80	20.44	20.42	20.18	21.43	22.40	20.72	21.40	21.10	20.88	22.87	21.99	22.06	21.65	21.00	22.40	21.00	22.40	23.80	22.40	
LS 6466 R	19.81	17.70	20.00	19.70	20.90	19.28	19.57	20.55	18.50	20.21	20.30	20.06	20.81	20.52	21.40	21.97	20.48	19.80	20.09	19.80	20.09	23.80	21.23	
PAN 1666 R	19.67	18.50	21.70	20.40	19.44	19.45	19.86	21.31	19.20	20.03	20.20	20.56	21.03	22.45	19.46	21.14	20.60	20.60	20.82	20.60	20.82	23.30	21.57	
PAN 1623 R	19.30	18.10	20.40	21.70	19.39	19.95	19.81	20.58	22.80	20.06	20.60	20.69	21.50	21.24	21.47	20.42	21.04	20.30	20.04	20.30	20.04	24.30	22.47	
LS 6261 R	19.11	18.40	21.20	19.30	19.60	19.47	19.51	20.46	21.50	20.71	20.20	19.95	21.09	20.90	19.50	20.92	20.58	20.30	20.04	20.30	20.04	24.30	21.55	
DM 6.2i RR	19.37	17.00	19.50	18.90	18.66	18.61	18.67	19.73	20.20	19.04	20.60	20.07	20.37	19.77	19.44	19.98	19.91	20.60	20.02	20.60	20.02	24.10	21.57	
LS 6164 R	19.89	16.40	19.90	19.70	19.19	20.54	19.27	20.84	20.80	20.67	20.30	21.20	21.56	21.70	21.66	20.80	21.06	20.80	21.98	20.80	21.98	23.80	22.19	
LS 6161 R	19.02	18.30	20.80	20.80	19.26	19.95	19.69	20.24	22.10	19.80	20.70	20.97	22.02	21.61	21.86	21.48	21.20	20.70	21.67	20.70	21.67	25.70	22.69	
PAN 1614 R	19.66	17.80	20.90	20.00	19.30	20.82	19.75	20.55	20.20	20.11	20.20	21.17	20.96	21.33	20.89	21.22	20.74	21.30	21.63	21.30	21.63	25.20	22.71	
NS 6448 R	19.47	18.80	20.90	21.20	20.18	20.60	20.19	21.11	19.30	20.21	20.70	22.05	21.63	21.84	19.63	21.19	20.85	-	21.93	-	21.93	24.60	23.27	
DM 6.8i RR	18.74	16.30	21.30	19.20	18.77	19.39	18.95	20.57	19.90	18.98	20.90	19.62	19.97	20.73	20.15	19.52	20.04	21.10	21.62	21.10	21.62	22.80	21.84	
NS 7211 R	18.38	15.20	19.20	20.00	18.73	19.57	18.51	19.74	20.10	18.55	21.20	19.26	19.31	20.78	21.60	19.99	20.06	20.80	21.23	20.80	21.23	24.30	22.11	
PAN 1729 R	19.41	18.30	19.80	19.90	20.57	19.52	19.58	20.70	22.80	19.40	21.00	20.62	21.56	21.15	20.27	20.27	20.86	21.30	20.70	21.30	20.70	22.50	21.50	
Standaard	19.76	17.40	20.90	19.60	20.44	20.72	19.80	20.34	22.20	20.19	20.40	20.83	20.42	21.24	20.22	20.63	20.72	20.60	19.89	20.60	19.89	22.00	20.83	
Gem/Mean	19.67	18.12	20.96	19.90	19.98	20.17	19.80	20.62	21.19	20.09	20.53	20.49	21.17	21.49	20.91	20.93	20.82	21.26	20.96	21.26	20.96	23.79	22.02	



**Tabel 16 Ru-proteïenpersentasie op vogvrre basis van die verskillende soja boonkultivars by die verskillende proef lokaliteite, 2014/15**  
**Table 16 Percentage crude protein on moisture free basis of the different trial localities, 2014/15**

Kultivar	Koel/Cool										Matig/Moderate							Warm								
	Bethlehem	Clocolan	Delmas	Kinross	Kokstad	Middelburg	Gem/Mean	Cedara	Dundee	Glen	Greytown	Kroonstad	Mgdlol	Potchetstroom	Bespr	Potchetstroom	PD1 Drg	Potchetstroom	PD2 Drg	Gem/Mean	Atlanta	Brits	Groblersdal	Gem/Mean		
	LS 6240 R	40.57	38.10	40.10	37.30	38.66	38.30	38.84	39.06	36.60	40.70	37.00	41.22	38.89	37.89	39.20	37.87	38.71	42.10	41.29	39.30	40.90				
LS 6444 R	37.11	39.90	38.40	36.00	34.04	35.74	36.87	39.02	35.20	37.36	35.05	38.30	37.41	33.78	37.65	37.92	36.85	40.50	39.21	35.40	38.37					38.37
PAN 1454 R	39.16	37.10	39.90	36.10	35.44	37.50	37.53	40.36	33.70	39.54	35.60	38.48	37.85	35.67	36.18	38.84	37.36	41.60	39.96	39.20	40.25					40.25
LS 6146 R	38.00	36.00	36.40	35.10	33.59	37.41	36.08	38.49	33.00	37.50	36.30	39.13	36.93	35.84	37.48	35.55	36.69	40.20	38.03	36.30	38.18					38.18
PHB 94 Y 80 R	40.28	40.40	41.60	37.10	36.51	38.82	39.12	41.92	33.20	40.38	36.20	38.62	40.29	37.82	35.64	38.87	38.10	43.20	40.28	41.10	41.53					41.53
LS 6248 R	38.18	39.40	40.10	36.50	34.99	37.08	37.71	38.81	36.30	40.15	36.10	38.90	40.05	36.91	36.90	34.55	37.63	42.10	41.52	39.40	41.01					41.01
NS 5009 R	40.16	38.30	37.50	37.00	33.13	35.94	37.01	39.92	36.10	40.20	36.60	39.82	37.29	39.28	36.97	37.74	38.21	42.40	42.16	40.75	41.77					41.77
DM 5.1 RR	39.00	38.30	39.00	37.00	31.34	36.43	36.85	37.51	31.80	37.50	35.60	39.38	37.16	35.09	33.35	34.73	35.79	42.80	39.66	36.30	39.59					39.59
PHB 95 Y 20 R	41.15	41.40	42.00	37.80	38.23	40.18	40.13	42.61	32.50	40.56	36.70	39.49	39.12	37.35	40.59	35.66	38.29	40.60	42.06	43.50	42.05					42.05
PAN 1583 R	38.70	38.10	38.60	35.80	34.65	37.07	37.15	39.20	36.80	38.41	34.30	38.91	37.82	36.73	38.71	35.16	37.34	41.60	39.83	37.40	39.61					39.61
PAN 1664 R	37.99	37.50	39.10	32.60	35.60	37.46	36.71	39.52	35.30	37.11	34.90	38.92	38.02	36.95	37.84	34.88	37.05	37.70	40.36	41.80	39.95					39.95
DM 5953 RSF	37.18	37.70	40.50	34.70	33.57	36.29	36.66	38.35	39.20	38.67	34.00	37.26	38.78	33.43	35.38	36.58	36.85	37.80	40.94	42.30	40.35					40.35
LS 6453 R	40.13	38.50	40.90	37.70	35.46	38.77	38.58	41.45	31.60	41.75	37.40	38.30	38.33	37.77	36.88	40.00	38.16	39.40	41.27	40.40	40.36					40.36
PAN 1521 R	38.91	39.00	39.30	36.60	35.94	39.75	38.25	39.77	33.30	40.45	35.50	40.25	37.80	36.75	39.22	38.54	37.95	37.90	40.66	39.20	39.25					39.25
PAN 1500 R	41.54	39.80	42.00	37.10	38.18	41.19	39.97	42.33	35.30	41.76	37.90	40.94	39.90	37.74	35.54	39.08	38.94	39.20	42.50	40.80	40.83					40.83
NS 5909 R	39.47	38.70	39.50	35.50	35.64	39.47	38.05	38.36	32.00	38.34	34.80	38.15	40.29	36.51	37.00	36.83	36.92	36.70	42.18	40.10	39.66					39.66
PHB 96 T 06 R	38.55	38.00	39.70	33.10	34.01	38.84	37.03	38.57	33.60	38.98	34.40	38.24	37.69	33.63	35.13	35.17	36.16	38.00	40.60	39.70	39.43					39.43
LS 6466 R	39.41	39.40	41.00	36.00	34.18	41.60	38.60	39.99	41.30	39.12	36.30	39.81	39.44	38.74	35.51	35.34	38.39	39.20	42.33	39.70	40.41					40.41
PAN 1666 R	39.08	38.40	39.80	35.90	37.32	40.26	38.46	38.63	38.30	39.67	36.10	38.81	39.06	35.66	39.05	37.62	38.10	37.40	41.33	40.70	39.81					39.81
PAN 1623 R	41.01	40.10	42.30	33.20	40.93	40.96	39.75	41.54	33.30	39.92	37.00	41.04	39.72	38.45	38.23	40.08	38.81	38.00	41.19	39.50	39.56					39.56
LS 6261 R	40.46	38.60	39.40	37.40	38.36	40.91	39.19	40.47	34.80	38.42	36.00	40.25	38.44	38.19	40.51	38.08	38.35	38.00	42.07	39.50	39.86					39.86
DM 6.2 RR	39.02	38.40	40.80	38.00	37.95	38.74	38.82	40.00	37.40	40.14	35.00	40.00	37.56	39.48	38.31	36.38	38.25	37.60	42.21	37.70	39.17					39.17
LS 6164 R	38.90	40.10	41.00	36.80	38.25	39.09	39.02	39.48	35.70	38.46	36.00	38.58	39.36	36.17	34.99	36.87	37.29	37.50	40.83	40.10	39.48					39.48
LS 6161 R	40.08	37.40	40.50	34.10	39.12	39.55	38.46	40.57	35.40	41.28	35.50	39.40	37.37	36.98	35.67	38.28	37.83	37.70	39.96	34.60	37.42					37.42
PAN 1614 R	38.71	39.50	40.10	34.90	37.91	38.23	38.23	39.94	36.80	38.31	36.10	37.68	37.95	37.30	38.69	37.86	37.85	36.00	39.88	35.60	37.16					37.16
NS 6448 R	40.17	36.80	40.10	34.70	36.63	39.34	37.96	38.57	38.90	37.65	35.90	37.98	39.22	36.52	39.77	38.13	38.07	-	41.57	39.40	40.49					40.49
DM 6.8 RR	38.68	37.50	39.80	35.00	35.18	38.84	37.50	38.31	35.40	38.07	34.40	39.31	36.55	35.54	38.01	37.75	37.04	36.40	39.61	39.00	38.34					38.34
NS 7211 R	40.57	38.60	39.70	34.20	35.71	39.90	38.11	40.72	36.70	39.46	34.10	40.94	40.36	37.34	34.34	38.06	38.00	37.60	41.68	38.50	39.26					39.26
PAN 1729 R	38.05	37.00	40.60	36.20	31.77	39.89	37.25	38.90	31.30	38.97	34.40	38.04	37.20	35.61	38.14	39.48	36.89	37.30	42.02	42.30	40.54					40.54
Standaard	38.82	38.80	40.10	36.50	33.30	38.12	37.61	40.08	31.60	40.09	35.70	38.77	39.93	37.14	38.69	36.71	37.63	37.80	41.01	41.90	40.24					40.24
Gem/Mean	39.30	38.56	39.99	35.86	35.85	38.72	38.05	39.75	35.08	39.30	35.70	39.16	38.53	36.74	37.32	37.29	37.65	39.11	40.94	39.38	39.83					39.83

Tabel 17 Gemiddelde van die olie-en proteien persentasie saamgevoeg (Protolie), 2014/15  
Table 17 Average of the oil and protein percentage joined (Protat), 2014/15

Kultivar	Koel/Cool										Matig/Moderate										Warm			
	Bethlehem	Clocolan	Delmas	Kinross	Kokstad	Middelburg	Gem/Mean	Cedara	Dundee	Glen	Greytown	Kroonstad	Migdol	Potchetstroom	Bespr	Potchetstroom	Pd1 Drg	Potchetstroom	Gem/Mean	Atlanta	Brits	Groblersdal	Gem/Mean	
LS 6240 R	60.74	58.10	62.10	57.10	58.64	58.83	59.25	60.34	57.50	61.11	57.20	60.43	59.99	59.74	59.94	59.94	58.96	59.47	62.80	61.92	63.60	62.77		
LS 6444 R	58.31	59.00	60.80	56.40	55.67	57.31	57.92	60.41	56.50	58.61	55.85	59.33	59.14	56.90	59.67	59.36	59.36	58.42	63.80	60.11	60.70	61.54		
PAN 1454 R	59.19	57.30	61.50	56.20	56.28	58.89	58.23	60.87	55.70	59.80	56.40	59.23	59.42	58.23	58.44	59.91	58.67	64.40	61.08	63.10	62.86			
LS 6146 R	59.49	56.40	60.40	56.30	55.10	58.57	57.71	60.32	55.60	59.19	57.10	59.47	58.80	58.42	58.50	57.80	58.36	63.60	59.95	61.60	61.72			
PHB 94 Y 80 R	60.21	59.00	62.60	56.80	56.80	59.20	59.10	62.38	56.10	60.53	56.60	59.35	61.00	59.50	57.74	59.24	59.16	65.40	61.27	63.90	63.52			
LS 6248 R	57.70	56.90	60.30	56.00	55.63	57.83	57.39	59.66	56.90	59.75	56.10	59.07	61.17	58.72	58.14	56.14	58.41	64.00	61.89	62.60	62.83			
NS 5009 R	59.85	57.20	59.60	56.60	53.80	56.56	57.27	59.88	56.80	59.72	56.20	59.63	58.51	60.14	58.32	57.87	58.56	64.10	61.74	63.45	63.10			
DM 5.11 RR	59.96	57.90	61.50	57.10	53.21	57.23	57.82	59.22	54.60	58.81	56.30	59.65	59.01	57.56	56.32	57.15	57.62	64.50	60.96	61.40	62.29			
PHB 95 Y 20 R	59.85	56.90	61.40	56.00	56.29	59.08	58.25	61.96	54.70	59.17	56.70	59.57	59.54	58.37	60.12	56.09	58.47	63.70	62.96	65.80	64.15			
PAN 1583 R	57.91	55.20	59.60	54.80	54.22	57.07	56.47	60.13	56.60	58.90	55.20	59.26	59.72	57.10	58.38	55.93	57.91	64.00	61.42	61.70	62.37			
PAN 1664 R	57.36	55.10	59.50	52.70	55.10	57.42	56.20	59.87	55.90	57.61	55.50	59.62	59.45	57.13	57.71	55.22	57.56	58.00	61.23	64.60	61.28			
DM 5953 RSF	57.93	57.20	62.00	55.60	54.30	57.45	57.41	59.63	58.30	59.06	55.60	58.41	60.16	56.60	57.31	57.72	58.09	58.60	61.18	65.10	61.63			
LS 6453 R	59.44	56.90	61.50	57.00	55.34	59.34	58.25	60.99	54.60	61.55	56.90	59.14	60.13	59.00	58.07	60.55	58.99	59.40	61.85	64.10	61.78			
PAN 1521 R	58.43	56.70	60.40	56.00	55.59	59.10	57.70	60.10	55.20	60.09	55.90	60.00	59.21	58.08	58.82	58.97	58.49	58.30	60.89	62.70	60.63			
PAN 1500 R	60.77	57.90	61.90	56.40	57.47	60.43	59.15	61.55	56.60	61.13	57.60	60.89	61.31	58.71	56.30	59.52	59.29	59.00	62.90	63.90	61.93			
NS 5909 R	59.41	57.40	60.60	54.60	56.16	59.75	57.99	59.71	54.00	59.35	56.10	59.48	61.42	57.83	58.39	58.53	58.31	58.50	63.27	64.30	62.02			
PHB 96 T 06 R	58.17	56.40	61.10	53.90	54.45	59.26	57.21	60.00	56.00	59.70	55.80	59.34	58.57	56.50	57.12	57.23	57.81	59.00	63.00	63.50	61.83			
LS 6466 R	59.22	57.10	61.00	55.70	55.08	60.88	58.16	60.54	59.80	59.33	56.60	59.87	60.25	59.26	56.91	57.31	58.87	59.00	62.42	63.50	61.64			
PAN 1666 R	58.75	56.90	61.50	56.30	56.76	59.71	58.32	59.94	57.50	59.70	56.30	59.37	60.09	58.11	58.51	58.76	58.70	58.00	62.15	64.00	61.38			
PAN 1623 R	60.31	58.20	62.70	54.90	60.32	60.91	59.56	62.12	56.10	59.98	57.60	61.73	61.22	59.69	59.70	60.50	59.85	59.20	63.11	63.80	62.04			
LS 6261 R	59.57	57.00	60.60	56.70	57.96	60.38	58.70	60.93	56.30	59.13	56.20	60.20	59.53	59.09	60.01	59.00	58.93	58.30	62.11	63.80	61.40			
DM 6.21 RR	58.39	55.40	60.30	56.90	56.61	57.35	57.49	59.73	57.60	59.18	55.60	60.07	57.93	59.25	57.75	56.36	58.16	58.20	62.23	61.80	60.74			
LS 6164 R	58.79	56.50	60.90	56.50	57.44	59.63	58.29	60.32	56.50	59.13	56.30	59.78	60.92	57.87	56.65	57.67	58.35	58.30	62.81	63.90	61.67			
LS 6161 R	59.10	55.70	61.30	54.90	58.38	59.50	58.15	60.81	57.50	61.08	56.20	60.37	59.39	58.59	57.53	59.76	59.03	58.40	61.63	60.30	60.11			
PAN 1614 R	58.37	57.30	61.00	54.90	57.21	59.05	57.97	60.49	57.00	58.42	56.30	58.85	58.91	58.63	59.58	59.08	58.58	57.30	61.51	60.80	59.87			
NS 6448 R	59.64	55.60	61.00	55.90	56.81	59.94	58.15	59.68	58.20	57.86	56.60	60.03	60.85	58.36	59.40	59.32	58.92	-	63.50	64.00	63.75			
DM 6.81 RR	57.42	53.80	61.10	54.20	53.95	58.23	56.45	58.88	55.30	57.05	55.30	58.93	56.52	56.27	58.16	57.27	57.08	57.50	61.23	61.80	60.18			
NS 7211 R	58.95	53.80	58.90	54.20	54.44	59.47	56.63	60.46	56.80	58.01	55.30	60.20	59.67	58.12	55.94	58.05	58.06	58.40	62.91	62.80	61.37			
PAN 1729 R	57.46	55.30	60.40	56.10	52.34	59.41	56.84	59.60	54.10	58.37	55.40	58.66	58.76	56.76	58.41	59.75	57.76	58.60	62.72	64.80	62.04			
Standaard	58.58	56.20	61.00	56.10	53.74	58.84	57.41	60.42	53.80	60.28	56.10	59.60	60.35	58.38	58.91	57.34	58.35	58.40	60.90	63.90	61.07			
Gem/Mean	59.05	56.85	61.04	55.79	56.10	58.85	57.95	60.39	56.42	59.44	56.30	59.67	59.71	58.28	58.28	58.19	58.52	60.59	61.86	63.10	61.89			

**Tabel 18 Die saadopbrengs van elke kultivar by die verskillende lokaliteite, 2014/15**  
**Table 18 The seed yield of the cultivars at the different localities, 2014/15**

Kultivar	Koel/Cool										Matig/Moderate										Warm		
	Bethlehem	Ciocolan	Delmas	Kinross	Kokstad	Middelburg	Gem/Mean	Cedara	Dundee	Glen	Greytown	Kroonstad	Middel	Potchetstroom	Potchetstroom	Potchetstroom	Potchetstroom	Gem/Mean	Atlanta	Brits	Groblersdal	Gem/Mean	
LS 6240 R	2221	1230	4793	2050	2963	3063	2720	2896	1755	3792	2121	1760	1010	1625	1037	1382	1931	4331	3200	1983	3171		
LS 6444 R	2427	884	3917	1570	2613	3346	2459	2615	1318	3140	2116	1644	1394	1776	860	912	1753	4165	2651	2074	2963		
PAN 1454 R	2610	1171	4494	1806	2906	3629	2769	3546	1647	3545	1328	1981	1302	2250	972	1364	1993	4399	3732	2202	3445		
LS 6146 R	1943	1090	3808	2056	2819	3166	2480	3405	1661	3239	2228	1740	1125	1819	792	1901	1990	4928	2650	2157	3245		
PHB 94 Y 80 R	2471	1465	5642	1727	2876	3575	2959	3740	1320	3296	1211	1725	1358	2141	961	1079	1870	4401	3940	2245	3528		
LS 6248 R	2631	1286	3687	1499	2387	3067	2426	3922	1896	3421	2770	2254	1267	2637	1262	2029	2384	4640	2228	2218	3029		
NS 5009 R	2482	1311	4361	1597	2984	3234	2662	3666	2046	4012	1322	2027	1313	1979	991	1640	2111	4622	2738	1794	3052		
DM 5.1i RR	2554	1306	3907	878	2755	3225	2437	2332	1352	3237	1148	1852	1311	2336	924	1291	1754	4802	3199	2940	3647		
PHB 95 Y 20 R	2622	1080	3909	1188	2378	2625	2300	2875	1380	2590	2104	1703	1551	1802	1387	2090	1942	4237	2600	1852	2897		
PAN 1583 R	2556	1372	4778	1370	2391	2732	2533	3033	1605	3622	2435	2190	1169	2633	1437	2607	2303	4299	2979	1854	3044		
PAN 1664 R	2814	1158	4052	1475	1892	2855	2374	3086	1590	3624	2549	2118	1138	3735	1223	2401	2385	3988	3048	1866	2967		
DM 5953 RSF	3892	1199	5090	1977	3483	3618	3210	3961	1677	4944	1613	2099	1703	2895	1197	1628	2413	4361	3151	2607	3373		
LS 6453 R	2604	1524	2554	1578	1994	2871	2188	3685	1434	2845	2239	2303	1421	2030	1019	1567	2060	4318	2788	1913	3006		
PAN 1521 R	3033	1112	4039	1768	2115	2806	2479	4421	1726	3528	2621	2222	1380	2202	1418	2370	2432	4632	4303	2437	3791		
PAN 1500 R	2694	1008	4214	1442	2457	2654	2411	3502	1432	3319	2096	1906	1457	2771	1454	2340	2253	4195	2699	1881	2925		
NS 5909 R	3230	1263	4019	748	2367	2497	2354	3007	1359	3492	1840	1948	1344	3622	1876	2575	2340	4738	2698	2274	3236		
PHB 96 T 06 R	2583	1284	3695	887	2603	2922	2329	2815	1293	2903	2160	1964	1347	2321	1671	2686	2129	4220	2300	1660	2727		
LS 6466 R	2397	1188	3731	645	2503	2586	2175	4145	1229	3197	2440	2486	1411	2081	1422	2280	2299	3871	3112	2211	3064		
PAN 1666 R	2432	1226	4335	1275	2382	2249	2316	3192	1101	3001	2112	2123	1059	2347	1121	1883	1993	4426	2899	1627	2984		
PAN 1623 R	2556	1394	3636	1583	2918	2726	2469	3698	1730	3591	2732	2487	1840	2727	1553	2430	2532	4701	3215	2309	3409		
LS 6261 R	2301	1240	3704	715	1853	2633	2074	3588	1747	3287	2661	2926	1440	2399	1184	1716	2328	4635	2806	1694	3045		
DM 6.2i RR	2628	1751	3857	1275	2685	2728	2487	3629	1922	3386	2280	2475	1638	2513	1304	2089	2360	4548	3012	2501	3354		
LS 6164 R	2612	1206	3482	1042	1777	2566	2114	3831	1659	2497	2385	1901	1246	2787	1572	2448	2259	4091	2618	2230	2980		
LS 6161 R	2296	1327	3433	988	1652	2897	2099	4195	1370	3273	2632	2391	1567	2464	1902	2383	2464	3960	3397	2208	3188		
PAN 1614 R	2787	1124	4160	1069	2639	2184	2327	3299	1512	2789	2110	2368	1276	2118	1606	2188	2141	4170	2798	1716	2895		
NS 6448 R	3029	1596	4399	819	2657	2505	2501	2994	1473	2871	2379	2023	1532	2842	1383	2910	2268	-	3110	2662	2886		
DM 6.8i RR	3105	1525	4013	970	2873	2170	2443	4141	984	3411	2501	2838	1457	3146	2129	1912	2502	4302	3315	2317	3311		
NS 7211 R	2860	1559	3911	946	2590	2703	2428	3433	1247	3274	2216	2426	1184	2718	1943	2115	2284	4226	3534	2517	3425		
PAN 1729 R	2406	1147	3543	959	1843	2650	2091	3708	1609	2506	2120	1724	1606	3142	1976	2230	2291	3509	3129	2039	2892		
Standaard	2911	1333	3806	1535	2277	2882	2457	3466	1474	3881	2220	2587	1382	2962	2170	2404	2505	4716	3706	2502	3641		
Gem/Mean	2656	1279	4032	1315	2488	2845	2436	3461	1518	3317	2156	2140	1374	2494	1392	2028	2209	4360	3052	2150	3171		
KV/CV	11.9	22.2	13.3	13.4	13.1	10.1		14.5	21.3	17.5	13.9	18.3	23.4	24.3	22.8	14.4		6.6	13.6	18.9			

**Tabel 19 Opbrengstwaarskynlikheid (%) van kultivars geëvalueer in 2012/13, 2013/14 en 2014/15 vir die koeler droëland produksiegebiede by verskillende opbrengspotensiaal**  
**Table 19 Yield probability (%) of cultivars evaluated in 2012/13, 2013/14 and 2014/15 for the cooler dryland production areas at different yield potentials**

Kultivar Cultivar	Opbrengspotensiaal/Yield potential (t/ha)									
	1	1.5	2	2.5	3	3.5	4	4.5		
LS 6444 R	77	69	59	47	35	25	18	13		
PAN 1454 R	89	84	76	65	51	37	26	18		
LS 6146 R	76	70	62	53	43	33	26	20		
LS 6248 R	30	40	52	66	77	85	90	94		
PAN 1583 R	23	34	49	65	78	88	93	96		
PHB 95 Y 20 R	38	38	38	38	39	40	41	42		
PAN 1666 R	43	44	45	47	48	50	52	53		
PAN 1664 R	20	29	40	53	67	78	85	90		
LS 6164 R	15	22	32	45	59	72	81	87		
LS 6161 R	37	41	45	51	56	62	66	70		
LS 6453 R	90	83	70	53	35	20	10	6		
PAN 1500 R	11	20	31	48	65	80	88	94		
LS 6261 R	37	39	40	43	44	47	49	51		
PAN 1614 R	20	24	30	37	45	53	60	67		

**Tabel 20 Saadobrenings (kg/ha<sup>-1</sup>) van kultivars gedurende die 2013/14 en 2014/15 groeiseisoen ten opsigte van die verskillende lokaliteite wat in die koeler produksiegebiede geleë is**  
**Table 20 Seed yield (kg/ha<sup>-1</sup>) of cultivars during the 2013/14 and 2014/15 growing season for the cooler localities situated in the cooler production areas**

Kultivar Cultivar	2013/14						2014/15						
	Bethlehem	Delmas	Kinross	Kokstad	Middelburg	Gem/Mean	Bethlehem	Clocolan	Delmas	Kinross	Kokstad	Middelburg	Gem/Mean
Sonop	3657	3325	4012	2948	2664	3321	-	-	-	-	-	-	-
LS 6444 R	3688	3117	1923	3146	1408	2656	2427	884	3917	1570	2613	3346	2459
PAN 1454 R	2547	3458	2592	2904	2025	2705	2610	1171	4494	1806	2906	3629	2769
LS 6146 R	2923	4798	2286	2539	2177	2944	1943	1090	3808	2056	2819	3166	2480
LS 6248 R	3561	3720	3910	3516	1905	3323	2631	1286	3687	1499	2387	3067	2426
PAN 1583 R	3960	3424	4002	3081	3079	3509	2556	1372	4778	1370	2391	2732	2533
Highveld Top	2963	3906	3478	3476	2892	3343	-	-	-	-	-	-	-
Knap	3069	4535	2503	2771	2413	3058	-	-	-	-	-	-	-
PHB 95 Y 20 R	1948	3939	3051	2552	2469	2792	2622	1080	3909	1188	2378	2625	2300
PHB 95 Y 40 R	2784	4033	3791	3151	3817	3515	-	-	-	-	-	-	-
PAN 1666 R	3438	2650	3305	3485	3021	3180	2432	1226	4335	1275	2382	2249	2316
PAN 1664 R	3441	3799	3409	2944	2861	3291	2814	1158	4052	1475	1892	2855	2374
LS 6164 R	3795	4186	3747	3173	2908	3562	2612	1206	3482	1042	1777	2566	2114
Dundece	2096	4108	2769	2809	2557	2868	-	-	-	-	-	-	-
Marula	2721	4109	2431	2899	2926	3017	-	-	-	-	-	-	-
LS 6161 R	3444	4161	3828	3284	2620	3467	2296	1327	3433	988	1652	2897	2099
Egret	2214	4307	2725	1933	2839	2803	-	-	-	-	-	-	-
Heron	2679	4391	2377	2571	2689	2941	-	-	-	-	-	-	-
Ibis 2000	1966	3768	2440	2468	2572	2643	-	-	-	-	-	-	-
LS 6453 R	3271	2508	3803	3133	2596	3062	2604	1524	2554	1578	1994	2871	2188
PAN 1500 R	3830	3610	3472	3126	3219	3452	2694	1008	4214	1442	2457	2654	2411
LS 6261 R	3559	3394	3919	2980	2855	3342	2301	1240	3704	715	1853	2633	2074
PAN 1614 R	3778	4871	3524	1846	3261	3456	2787	1124	4160	1069	2639	2184	2327
LS 6240 R	3185	5133	1594	2809	2691	3082	2221	1230	4793	2050	2963	3063	2720
PHB 94 Y 80 R	3310	4712	2568	3207	2143	3188	2471	1465	5642	1727	2876	3575	2959
PAN 1521 R	3729	5024	4323	3054	2829	3792	3033	1112	4039	1768	2115	2806	2479
PHB 96 T 06 R	3466	5474	3802	3169	3203	3823	2583	1284	3695	887	2603	2922	2329
S 722/61E	1797	2606	-	2469	1698	2143	-	-	-	-	-	-	-
PAN 1623 R	3574	4664	3875	3479	3053	3729	2556	1394	3636	1583	2918	2726	2469
DM 6.21RR	3037	4772	3528	2969	2784	3418	2628	1751	3857	1275	2685	2728	2487
PAN 1729 R	2095	3955	3326	2626	2282	2857	2406	1147	3543	959	1843	2650	2091
NS 5009 R	-	-	-	-	-	-	2482	1311	4361	809	2984	3234	2530
DM 5.1iRR	-	-	-	-	-	-	2554	1306	3907	878	2755	3225	2437
DM 5953 RSF	-	-	-	-	-	-	3892	1199	5090	1977	3483	3618	3210
NS 5909 R	-	-	-	-	-	-	3230	1263	4019	748	2367	2497	2354
LS 6466 R	-	-	-	-	-	-	2397	1188	3731	645	2503	2586	2175
NS 6448 R	-	-	-	-	-	-	3029	1596	4399	819	2657	2505	2501
DM 6.8iRR	-	-	-	-	-	-	3105	1525	4013	970	2873	2170	2443
NS 7211 R	-	-	-	-	-	-	2860	1559	3911	946	2590	2703	2428
Gem/Mean	3081	4015	3211	2920	2660	3170	2647	1277	4040	1280	2495	2844	2431

**Tabel 21 Opbrengstwaarskynlikheid (%) van kultivars geëvalueer in 2012/13, 2013/14 en 2014/15 vir die matige droëland produksiegebiede by verskillende opbrengspotensiaal**

**Table 21 Yield probability (%) of cultivars evaluated in 2012/13, 2013/14 and 2014/15 for the moderate dryland production areas at different yield potentials**

Kultivar Cultivar	Opbrengs potensiaal/Yield potential (t/ha)							
	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5
LS 6444 R	14	16	17	20	23	27	31	35
PAN 1454 R	24	29	35	41	48	54	60	65
LS 6146 R	40	35	31	27	24	21	19	18
LS 6248 R	64	61	58	55	51	48	45	42
PAN 1583 R	73	73	71	70	68	66	63	61
PHB 95 Y 20 R	68	57	46	34	24	17	12	8
PAN 1666 R	32	37	44	51	58	64	70	74
PAN 1664 R	50	57	64	71	77	81	84	87
LS 6164 R	80	74	66	57	46	38	30	24
LS 6161 R	71	74	77	79	80	81	81	82
LS 6453 R	45	40	34	29	25	22	19	18
PAN 1500 R	59	55	51	47	43	39	36	33
LS 6261 R	52	60	68	75	81	85	88	90
PAN 1614 R	61	62	63	64	64	65	64	64

**Tabel 22 Saadobrenings (kg/ha<sup>-1</sup>) van kultivars gedurende die 2013/14 en 2014/15 groeiseisoen ten opsigte van die verskillende lokaliteite wat in die matige produksiegebiede geleë is**  
**Table 22 Seed yield (kg/ha<sup>-1</sup>) of cultivars during the 2013/14 and 2014/15 growing season for the various localities situated in the moderate production areas**

Kultivar	2013/14										2014/15															
	Cedara	Glen	Greytown	Greytown	Kranskop	Hoopstad	Migdol	Potchetstroom	Bespr	Potchetstroom	Stoffberg	Gm/Mean	Cedara	Dundee	Glen	Greytown	Kranskop	Kroonstad	Migdol	Potchetstroom	Bespr	Potchetstroom	Potchetstroom	Potchetstroom	Gem/Mean	
Sonop	4138	4288	3009	2067	3423	3420	3544	1774	2533	3133																
LS 6444 R	3979	4686	2041	1983	2396	2090	2320	1183	1412	2454																
PAN 1454 R	4321	3828	2679	1886	2840	2571	2267	1568	2331	2677																
LS 6146 R	3583	4750	2062	2323	2959	2169	1975	1600	1576	2555																
LS 6248 R	4339	4207	2516	2489	2549	3415	3695	1997	2001	3023																
PAN 1583 R	4268	4272	2671	2391	2430	2949	3143	2150	3054	3036																
Highveld Top	4663	4537	2590	1983	2681	3722	3461	2232	2248	3124																
Knap	4464	4556	2724	1857	3142	3477	2941	1494	2566	3025																
PHB 95 Y 20 R	3934	4097	3068	2061	2547	2058	3286	2163	2563	2864																
PHB 95 Y 40 R	4293	3648	2658	1913	2580	3065	3284	1802	3019	2918																
PAN 1666 R	3841	3326	3269	1753	2297	3028	3719	1933	2672	2871																
PAN 1664 R	4590	3866	2632	2198	2401	2277	4692	1759	2633	3005																
LS 6164 R	4023	3163	3073	2545	2216	2793	4262	1762	2573	2934																
Dundee	4220	4294	2917	1739	3133	3757	3935	2080	2597	3186																
Marula	4288	4354	3253	2365	3317	3566	3341	2083	2581	3239																
LS 6161 R	4360	3163	3167	2528	2334	3168	4090	2632	2550	3110																
Egret	3640	3316	2917	2120	1898	2236	4012	1574	3167	2765																
Heron	4579	3888	3403	2314	1868	2476	3455	1901	2451	2926																
Ibis 2000	3657	3073	2895	1120	2404	3099	3872	2206	2727	2784																
LS 6453 R	3832	4330	2883	2365	2716	3232	2906	1441	1995	2833																
PAN 1500 R	3799	4054	2507	1162	2786	3310	3085	1961	2786	2828																
LS 6261 R	4500	5195	2542	2386	3105	3373	3783	1601	2409	3211																
PAN 1614 R	4110	3961	3141	2346	3675	3182	3000	1766	2502	3076																
LS 6240 R	4403	4126	2061	2129	4118	2269	2419	1756	1268	2728																
PHB 94 Y 80 R	3868	4838	1974	1717	3584	2322	3912	1345	1743	2811																
PAN 1521 R	4094	3727	2657	2333	2595	3521	4490	2017	3061	3166																
PHB 96 T 06 R	4058	2906	3154	2516	2725	3079	4041	2171	2581	3026																
S 722/61E	4369	3215	2808	1629	2350	3809	2371	1423	2412	2709																
PAN 1623 R	4324	4426	3078	2426	3248	3557	3650	1756	2839	3256																
DM 6.21 RR	4679	3012	2848	1916	2814	3202	3659	1674	2632	2937																
PAN 1729 R	4247	3686	3123	2541	1809	2823	3150	1759	2459	2844																
NS 5009 R																										
DM 5.11 RR																										
DM 5953 RSF																										
NS 5909 R																										
LS 6466 R																										
NS 6448 R																										
DM 6.81 RR																										
NS 7211 R																										
Gem/Mean	4176	3961	2778	2100	2734	3001	3412	1825	2450	2937																



**Tabel 23 Opbrengswaarskynlikheid (%) van kultivars geëvalueer in 2012/13, 2013/14 en 2014/15 vir die warm besproeiing produksiegebiede by verskillende opbrengspotensiaal**

**Table 23 Yield probability (%) of cultivars evaluated in 2012/13, 2013/14 and 2014/15 for the warm irrigation production areas at different yield potentials**

Kultivar Cultivar	Opbrengs potensiaal/Yield potential (t/ha)							
	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5
LS 6444 R	21	21	21	22	23	25	27	30
PAN 1454 R	37	38	39	41	42	44	46	48
LS 6146 R	38	37	35	35	34	34	34	34
LS 6248 R	62	59	55	51	47	42	39	35
PAN 1583 R	53	54	54	55	55	56	56	57
PHB 95 Y 20 R	29	34	40	48	56	64	70	76
PAN 1666 R	61	58	54	51	47	43	39	37
PAN 1664 R	59	59	59	59	58	58	57	57
LS 6164 R	65	64	62	60	58	56	53	51
LS 6161 R	80	80	79	78	77	75	72	70
LS 6453 R	51	50	48	47	46	45	43	43
PAN 1500 R	68	60	48	37	25	18	11	8
LS 6261 R	38	44	51	59	66	73	78	82
PAN 1614 R	62	60	58	56	54	51	48	46

**Tabel 24 Saadopbrengs (kg/ha<sup>-1</sup>) van kultivars gedurende die 2013/14 en 2014/15 groeiseisoen ten opsigte van die verskillende lokaliteite wat in die warm produksiegebiede geleë is**  
**Table 24 Seed yield (kg/ha<sup>-1</sup>) of cultivars during the 2013/14 en 2014/15 growing season for the various localities situated in the warm production areas**

Kultivar Cultivar	2013/14			2014/15			
	Brits	Groblersdal	Gem/Mean	Atlanta	Brits	Groblersdal	Gem/Mean
Sonop	2779	2532	2656	-	-	-	-
LS 6444 R	2676	2501	2588	4165	2651	2074	2963
PAN 1454 R	2602	1766	2184	4399	3732	2202	3445
LS 6146 R	2753	2758	2755	4928	2650	2157	3245
LS 6248 R	3396	2326	2861	4640	2228	2218	3029
PAN 1583 R	2494	2370	2432	4299	2979	1854	3044
Highveld Top	2675	2198	2436	-	-	-	-
Knap	3357	2641	2999	-	-	-	-
PHB 95 Y 20 R	2962	1785	2373	4237	2600	1852	2897
PHB 95 Y 40 R	3329	2677	3003	-	-	-	-
PAN 1666 R	2823	2163	2493	4426	2899	1627	2984
PAN 1664 R	2766	2642	2704	3988	3048	1866	2967
LS 6164 R	2998	3314	3156	4091	2618	2230	2980
Dundee	2864	2694	2779	-	-	-	-
Marula	2661	2489	2575	-	-	-	-
LS 6161 R	3169	2637	2903	3960	3397	2208	3188
Egret	3081	3415	3248	-	-	-	-
Heron	1871	2770	2320	-	-	-	-
Ibis 2000	2552	2754	2653	-	-	-	-
LS 6453 R	3635	2544	3090	4318	2788	1913	3006
PAN 1500 R	2737	2257	2497	4195	2699	1881	2925
LS 6261 R	3555	2445	3000	4635	2806	1694	3045
PAN 1614 R	3412	3262	3337	4170	2798	1716	2895
LS 6240 R	2827	2322	2575	4331	3200	1983	3171
PHB 94 Y 80 R	2358	2259	2308	4401	3940	2245	3528
PAN 1521 R	3876	2707	3291	4632	4303	2437	3791
PHB 96 T 06 R	3424	2092	2758	4220	2300	1660	2727
S 722/6/1E	2418	1752	2085	-	-	-	-
PAN 1623 R	3619	3503	3561	4701	3215	2309	3409
DM 6.2i RR	3607	2325	2966	4548	3012	2501	3354
PAN 1729 R	2922	2095	2509	3509	3129	2039	2892
NS 5009 R				4622	2738	1794	3051
DM 5.1i RR				4802	3199	2940	3647
DM 5953 RSF				4361	3151	2607	3373
NS 5909 R				4738	2698	2274	3236
LS 6466 R				3871	3112	2211	3064
NS 6448 R				-	3110	2662	2886
DM 6.8i RR				4302	3315	2317	3311
NS 7211 R				4226	3534	2517	3425
Gem/Mean	2974	2516	2745	4347	3029	2138	3154

**Tabel 25 Saamgevatte inligting van al die lokaliteite in die koel produksiegebiede, 2014/15**  
**Table 25 Summarised information for all the localities in the cool production areas, 2014/15**

Kultivar/ Cultivar	Dae tot blom/ Days to flowering	Fisiologies ryp/ Physiological mature	Oes datum/ Harvest date	Planthoog te/Plant height (cm)	Peulhoog te/ Pod height (cm)	Omval/ Lodging (1-5)	Groen stam/ Green stem (1-5)	Opspring/ Shattering (1-5)	Planttelling/ Number of plants	Ongewenste sade/ undesirable seed %	Massa 100 sade/ Mass 100 seeds (g)	Olle/Oil %	Ru-proteien/ Crude protein %	Opbrengs/ Yield (kg/ha)
LS 6240 R	58	123	141	69	9	1.13	1.67	2.00	233	0.50	18.00	20.41	38.84	2720
LS 6444 R	56	123	141	65	6	1.00	1.67	3.50	242	0.73	14.24	21.05	36.87	2459
PAN 1454 R	58	128	144	87	10	1.00	2.00	2.25	241	0.48	16.25	20.69	37.53	2769
LS 6146 R	56	123	141	82	9	1.00	1.47	1.50	246	0.65	14.19	21.63	36.08	2480
PHB 94 Y 80 R	60	124	139	66	8	1.20	2.40	2.50	248	0.38	15.92	19.98	39.12	2959
LS 6248 R	78	143	164	87	11	1.73	1.73	2.25	241	0.42	14.16	19.69	37.71	2426
NS 5009 R	60	125	141	68	8	1.07	2.47	2.00	238	0.27	16.35	20.26	37.01	2662
DM 5.1i RR	55	125	141	64	8	1.33	2.00	3.25	203	0.48	15.31	20.97	36.85	2437
PHB 95 Y 20 R	82	149	171	84	10	1.47	1.47	1.00	241	0.50	14.78	18.13	40.13	2300
PAN 1583 R	78	150	168	82	10	1.13	1.67	1.00	231	0.47	14.39	19.31	37.15	2533
PAN 1664 R	76	151	166	75	9	1.23	1.47	1.00	225	0.70	14.49	19.49	36.71	2374
DM 5953 RSF	61	125	145	69	8	1.33	1.80	1.50	244	0.68	15.11	20.76	36.66	3210
LS 6453 R	76	139	154	85	9	1.53	2.07	2.50	244	0.87	13.94	19.68	38.58	2188
PAN 1521 R	80	143	164	82	10	1.40	1.40	1.50	245	1.08	15.43	19.45	38.25	2479
PAN 1500 R	80	151	168	81	10	1.40	1.87	1.00	253	0.32	15.33	19.18	39.97	2411
NS 5909 R	80	152	172	86	11	1.47	2.13	1.00	251	0.53	15.58	19.94	38.05	2354
PHB 96 T 06 R	81	153	170	93	9	1.33	1.67	1.00	218	0.72	14.30	20.18	37.03	2329
LS 6466 R	78	151	172	98	9	1.40	1.87	2.00	238	0.57	16.75	19.57	38.60	2175
PAN 1666 R	78	142	171	93	10	1.43	1.93	2.00	233	0.42	14.84	19.86	38.46	2316
PAN 1623 R	79	142	168	86	9	1.87	1.73	1.00	236	0.58	14.61	19.81	39.75	2469
LS 6261 R	78	144	163	69	7	1.20	1.80	3.00	204	0.67	15.06	19.51	39.19	2074
DM 6.2i RR	79	146	170	85	9	1.80	1.53	1.00	254	0.53	16.59	18.67	38.82	2487
LS 6164 R	78	150	171	91	13	2.00	1.87	1.00	257	0.53	14.27	19.27	39.02	2114
LS 6161 R	80	152	167	85	9	1.57	1.33	1.50	218	0.87	13.82	19.69	38.46	2099
PAN 1614 R	83	151	169	92	12	1.33	1.73	1.00	258	0.42	14.78	19.75	38.23	2327
NS 6448 R	82	151	171	82	11	1.37	1.53	1.00	248	0.73	15.14	20.19	37.96	2501
DM 6.8i RR	82	151	174	106	12	2.00	1.93	1.00	259	0.47	16.28	18.95	37.50	2443
NS 7211 R	81	149	174	80	9	1.37	1.60	2.25	251	0.75	15.23	18.51	38.11	2428
PAN 1729 R	87	147	174	95	12	1.50	1.87	1.00	256	0.57	14.59	19.58	37.25	2091
Standaard	78	146	168	85	11	1.60	1.07	1.50	228	0.60	15.40	19.80	37.61	2457
Gem/Mean	74	142	161	82	9	1.41	1.76	1.67	239	0.58	15.17	19.80	38.05	2436

**Tabel 26 Saamgevatte inligting van al die lokaliteite in die matige produksiegebiede, 2014/15**  
**Table 26 Summarised information for all the localities in the moderate production areas, 2014/15**

Kultivar/ Cultivar	Dae tot blom/ Days to flowering	Fisiologies ryp/ Physiological mature	Oes datum/ Harvest date	Planthoog te/Plant height (cm)	Peulhoog te/ Pod height (cm)	Omval/ Lodging (1-5)	Green stam/ Green stem (1-5)	Opspring/ Shattering (1-5)	Planttelling/ Number of plants	Ongewenste sade/ undesirable seed %	Massa 100 sade/ Mass 100 seeds (g)	Olie /Oil %	Ru-proteien/ Crude protein %	Opbrengs/ Yield (kg/ha)
LS 6240 R	47	111	131	58	8	1.00	1.92	3.87	203	1.01	18.53	20.75	38.71	1931
LS 6444 R	46	111	132	57	6	1.00	1.79	4.33	216	0.83	14.54	21.56	36.85	1753
PAN 1454 R	48	115	132	72	9	1.00	2.04	4.40	230	1.12	16.59	21.31	37.36	1993
LS 6146 R	46	115	132	67	8	1.00	1.67	3.80	224	1.19	14.93	21.66	36.69	1990
PHB 94 Y 80 R	48	111	132	59	7	1.00	2.38	4.33	224	1.18	16.39	21.06	38.10	1870
LS 6248 R	62	125	145	70	11	1.00	2.67	4.33	236	0.83	14.93	20.78	37.63	2384
NS 5009 R	47	112	133	61	7	1.00	2.79	4.00	212	0.97	17.46	20.35	38.21	2111
DM 5.1i RR	48	114	133	59	10	1.00	2.50	4.60	208	0.99	15.70	21.83	35.79	1754
PHB 95 Y 20 R	63	131	152	70	13	1.00	2.67	2.60	217	0.72	15.67	20.18	38.29	1942
PAN 1583 R	59	127	150	63	9	1.00	2.58	2.60	222	0.77	15.66	20.58	37.34	2303
PAN 1664 R	59	127	148	60	9	1.00	2.63	3.40	219	0.80	15.86	20.51	37.05	2385
DM 5953 RSF	49	114	132	63	8	1.00	2.17	3.80	240	1.15	15.30	21.24	36.85	2413
LS 6453 R	59	125	145	67	10	1.00	2.46	3.80	222	0.54	14.56	20.83	38.16	2060
PAN 1521 R	64	127	148	73	12	1.13	2.67	1.40	232	0.89	16.84	20.53	37.95	2432
PAN 1500 R	65	128	152	66	11	1.00	3.13	2.00	229	0.46	16.27	20.35	38.94	2253
NS 5909 R	63	131	153	71	12	1.00	2.88	3.20	223	0.56	16.31	21.39	36.92	2340
PHB 96 T 06 R	64	131	153	73	11	1.04	2.63	2.20	196	0.66	16.06	21.65	36.16	2129
LS 6466 R	64	126	148	79	13	1.04	2.83	4.27	243	1.23	16.52	20.48	38.39	2299
PAN 1666 R	65	127	148	71	11	1.00	2.96	2.80	222	1.60	15.55	20.60	38.10	1993
PAN 1623 R	64	128	148	72	11	1.00	2.83	1.60	231	0.69	15.52	21.04	38.81	2532
LS 6261 R	60	126	147	59	10	1.00	2.83	4.07	232	0.77	16.77	20.58	38.35	2328
DM 6.2i RR	62	127	153	72	12	1.08	3.17	1.60	217	0.50	17.84	19.91	38.25	2360
LS 6164 R	62	129	150	73	11	1.00	2.58	3.80	230	0.79	15.37	21.06	37.29	2259
LS 6161 R	63	131	151	70	11	1.00	2.92	3.80	226	0.41	14.95	21.20	37.83	2464
PAN 1614 R	65	131	151	76	13	1.00	2.83	2.07	235	0.45	15.69	20.74	37.85	2141
NS 6448 R	63	129	152	68	12	1.00	2.42	3.73	238	0.91	16.53	20.85	38.07	2268
DM 6.8i RR	64	133	157	83	12	1.00	2.67	2.40	219	0.87	17.55	20.04	37.04	2502
NS 7211 R	64	132	155	70	11	1.00	2.75	3.80	232	0.94	16.73	20.06	38.00	2284
PAN 1729 R	69	135	157	81	12	1.00	2.50	1.80	223	0.77	16.42	20.86	36.89	2291
Standaard	64	128	147	73	11	1.04	2.25	2.00	228	0.73	16.62	20.72	37.63	2505
Gem	59	125	146	68	10	1.01	2.57	3.21	224	0.84	16.12	20.82	37.65	2209

**Tabel 27 Saamgevatte inligting van al die lokaliteite in die warmer produksiegebiede, 2014/15**  
**Table 27 Summarised information for all the localities in the warmer production areas, 2014/15**

Kultivar/ Cultivar	Dae tot blom/ Days to flowering	Fisiologies ryp/ Physiological mature	Oes datum/ Harvest date	Plant height (cm)	Plant height (cm)	Peul height (cm)	Omval/ Lodging (1-5)	Groen stam/ Green stem (1-5)	Opspring/ Shattering (1-5)	Planttelling/ Number of plants	Ongewenste sade/ undesirable seed %	Massa 100 sade/ Mass 100 seeds (g)	Olie /Oil %	Ru-proteien / Crude protein %	Opbrengs/ Yield (kg/ha)
LS 6240 R	35	101	125	59	5	1.00	1.17	1.00	1.00	170	0.80	20.87	21.88	40.90	3171
LS 6444 R	35	93	118	60	6	1.00	2.67	2.00	2.00	199	0.70	15.99	23.17	38.37	2963
PAN 1454 R	35	135	126	74	7	1.00	4.00	1.00	1.00	189	0.57	18.89	22.61	40.25	3445
LS 6146 R	35	98	127	65	5	1.00	2.00	1.00	1.00	170	0.73	15.76	23.54	38.18	3245
PHB 94 Y 80 R	37	98	128	68	6	1.00	4.17	1.00	1.00	184	0.93	18.29	22.00	41.53	3528
LS 6248 R	42	107	148	72	7	1.00	4.17	1.00	1.00	194	1.93	17.40	21.82	41.01	3029
NS 5009 R	36	98	133	64	6	1.00	3.17	1.00	1.00	182	0.70	18.71	21.33	41.77	3052
DM 5.11 RR	36	98	123	71	6	1.00	3.17	1.00	1.00	186	0.97	17.06	22.70	39.59	3647
PHB 95 Y 20 R	44	118	150	68	6	1.00	4.17	1.00	1.00	166	1.37	18.46	22.10	42.05	2897
PAN 1583 R	42	107	140	61	6	1.00	3.67	2.00	2.00	173	0.83	17.18	22.76	39.61	3044
PAN 1664 R	42	107	145	60	6	1.00	2.33	1.00	1.00	170	1.07	18.23	21.32	39.95	2967
DM 5953 RSF	36	98	128	74	5	1.00	3.17	1.00	1.00	188	1.13	17.03	21.28	40.35	3373
LS 6453 R	44	107	131	70	7	1.00	2.50	2.00	2.00	175	0.57	16.46	21.43	40.36	3006
PAN 1521 R	45	101	138	78	8	1.00	3.67	1.00	1.00	203	1.03	17.93	21.38	39.25	3791
PAN 1500 R	46	107	151	63	7	1.00	4.00	1.00	1.00	164	1.27	18.04	21.10	40.83	2925
NS 5909 R	48	135	157	77	6	1.00	4.83	1.00	1.00	210	1.37	18.24	22.36	39.66	3236
PHB 96 T 06 R	44	107	143	74	6	1.00	3.67	1.00	1.00	166	1.27	18.24	22.40	39.43	2727
LS 6466 R	46	135	150	88	8	1.00	4.33	1.00	1.00	218	2.13	18.99	21.23	40.41	3064
PAN 1666 R	47	108	146	75	7	1.00	4.67	1.00	1.00	164	0.53	16.96	21.57	39.81	2984
PAN 1623 R	47	118	146	74	6	1.00	3.83	1.00	1.00	188	0.97	16.49	22.47	39.56	3409
LS 6261 R	43	98	140	57	8	1.00	3.67	2.00	2.00	205	1.37	17.39	21.55	39.86	3045
DM 6.2i RR	48	118	154	77	6	1.00	4.50	1.00	1.00	211	0.90	19.21	21.57	39.17	3354
LS 6164 R	45	107	145	79	7	1.00	3.67	1.00	1.00	185	1.13	16.44	22.19	39.48	2980
LS 6161 R	45	135	140	73	7	1.00	3.67	1.00	1.00	175	0.63	16.30	22.69	37.42	3188
PAN 1614 R	48	118	143	73	9	1.00	2.67	1.00	1.00	198	0.87	17.38	22.71	37.16	2895
NS 6448 R	49	135	151	68	6	1.00	3.67	1.00	1.00	227	1.75	20.43	23.27	40.49	2886
DM 6.8i RR	47	135	154	92	6	1.00	4.17	1.00	1.00	173	1.07	18.81	21.84	38.34	3311
NS 7211 R	48	135	154	68	6	1.00	3.83	1.00	1.00	201	1.50	20.29	22.11	39.26	3425
PAN 1729 R	50	135	154	75	7	1.00	4.33	1.00	1.00	180	1.23	19.87	21.50	40.54	2892
Standaard	49	101	140	85	10	1.00	3.00	1.00	1.00	198	1.37	18.33	20.83	40.24	3641
Gern	43	113	141	71	7	1.00	3.55	1.13	1.13	187	1.09	17.99	22.02	39.83	3171

AGRICULTURAL PRODUCT STANDARDS ACT, 1990  
(ACT No. 119 OF 1990)

**REGULATIONS RELATING TO THE GRADING, PACKING AND MARKING OF SOYA BEANS  
INTENDED FOR SALE IN THE REPUBLIC OF SOUTH AFRICA**

The Minister of Agriculture has under section 15 of the Agricultural Product Standards Act, 1990 (Act No. 119 of 1990) --

- (a) made the regulations in the Schedule;
- (b) determined that the said regulations shall come into operation on date of publication; and
- (c) read together with section 3(2) of the said Act, repealed the Regulations published by Government Notice No. R 1178 of 24 November 2000, and R 225 of 06 March 2009.

**SCHEDULE**

**Definitions**

1. In these regulations any word or expression to which a meaning has been assigned in the Act, shall have that meaning and, unless the context otherwise indicates --

**"bag"** means bag manufactured from --

- (a) jute or phormium or a mixture of jute and phormium; or
- (b) polypropylene that complies with SANS 1246: 2012;

**"bulk container"** means any vehicle or container in which bulk soya beans is transported or stored;

**"consignment"** means --

- (a) a quantity of soya beans of the same class, which belongs to the same owner, delivered at any one time under cover of the same consignment note, delivery note or receipt note, or delivered by the same vehicle or bulk container, or loaded from the same bulk storage structure or from a ship's hold; or
- (b) in the case where a quantity referred to in paragraph (a), is subdivided into different grades, each such quantity of each of the different grades;

**"container"** means a bag or a bulk container;

**"defective soya beans"** means soya beans and pieces of beans which --

- (a) have been damaged by frost, heat or weather conditions;
- (b) have been visibly damaged by insects;
- (c) are contaminated by moulds or infected by plant diseases;
- (d) have a distinctly immature form or which are covered with a whitish membrane or where the testa have a green discolouration; and

- (e) when the testa is removed, display discolouration, excluding green discolouration: Provided that soya beans which were damaged by insects in the green pod stage and of which the discolouration as a result of the damage is not larger than half of the surface of the soya beans, shall not be deemed as defective soya beans;

**"foreign matter"** means all matter other than soya beans, glass, coal, dung, or metal and loose seed coats of soya beans as well as pods;

**"frost damaged"** means soya beans with green to brown seed-lobes with a waxy appearance;

**"heat damaged"** means soya beans with light to dark brown seed-lobes in a cross section;

**"insect"** in relation to soya beans, means any live insect which is injurious to stored soya beans, irrespective of the stage of development of the insect;

**"mould infected "** means soya beans that are shrivelled and deformed in appearance with a colour that varies from medium to dark brown, whereby the parts of infected beans are covered in mould;

**"other grains"** kernels or pieces of kernels of wheat, barley, oats, triticale, maize, rye and sorghum;

**"pods"** all whole or damaged soya bean pods;

**"poisonous seeds"** mean seeds or part of seeds of plant species that in terms of the foodstuffs, cosmetics and disinfectants Act, 1972 (Act No. 64 of 1972), may represent a hazard to human or animal health when consumed, including seeds of *Argemone mexicana L*, *Convolvulus spp.*, *Crotalaria spp.*, *Datura spp.*, *Ipomoea spp.*, *Lolium temulentum*, *Ricinus communis* or *Xanthium spp.*;

**"sclerotia"** *Sclerotinia sclerotiorum* is a fungus that produces hard masses of fungal tissue known as sclerotia. The sclerotia vary in size and form and consist of a dark black exterior, a white interior and a rough surface texture;

**"soiled soya beans"** means whole soya beans which do not pass through the 4.75 mm sieve and which are discoloured by soil or any other substance: Provided that if the discolouration is caused by plant material such soya beans shall not be regarded as soiled soya beans;

**"soya beans"** means the threshed seed or a pieces of seeds of the plant *Glycine max* and where the word "soya beans" is used in conjunction with the word "consignment", it includes matter other than soya beans that is included in a consignment;

**"the Act"** means the Agricultural Product Standards Act, 1990 (Act No. 119 of 1990);

**"the 4,75 mm round-hole sieve"** means a sieve --

- (a) with a flat metal sheet of 1.0 mm thickness perforated with round holes of 4,75 mm in diameter that are arranged with the centres of holes at the points of intersection of an equilateral triangular grid with a pitch of 8 mm;
- (b) of which the upper surface of the sieve is smooth;
- (c) the frame of which is at least 40 mm high;
- (d) with the inner width of at least 200 mm and the inner length of at least 300 mm or, in the case of a circular sieve, the inner diameter of at least 278 mm; and
- (e) that fits onto a tray with a solid bottom; and not less than 20 mm above the bottom of the tray; and

**"wet pods"** all whole or damaged soya bean pods with a moisture content higher than the permissible



### Restrictions on sale of soya beans

2. (1) No person shall sell soya beans in the Republic of South Africa --
- (a) unless the soya beans are sold according to the classes set out in regulation 3;
  - (b) unless the soya beans comply with the standards for the class concerned set out in regulation 4;
  - (c) unless the soya beans, where applicable, comply with the grades of soya beans and the standards for grades set out in regulation 5 and 6 respectively;
  - (d) unless the soya beans are packed in accordance with the packing requirements set out in regulation 7;
  - (e) unless the container or sale documents, as the case may be, are marked in accordance with the marking requirements set out in regulation 8; and
  - (f) if such soya beans contain a substance that renders it unfit for human or animal consumption or for processing into or utilisation thereof as food or feed.
- (2) The Executive Officer may grant written exemption, entirely or partially to any person on such conditions as he or she may deem necessary, from the provision of subregulation (1): Provided that such exemption is done in terms of section 3(1) ( c) of the Act.

## PART I

### QUALITY STANDARDS

#### Classes of soya beans

3. There are two classes of soya beans, namely Class SB and Class Other soya beans.

#### Standards for classes of soya beans

4. (1) A consignment of soya beans shall --
- (a) be free from a musty, sour, khaki bush or other undesired odour;
  - (b) be free from any substance that renders it unsuitable for human or animal consumption or for processing into or utilisation as food or feed;
  - (c) contain not more poisonous seeds than permitted in terms of the Foodstuffs, Cosmetics and Disinfectants Act, 1972 (Act No. 54 of 1972);
  - (d) shall be free from stones, glass, metal, coal or dung;
  - (e) with the exception of Class Other soya beans, be free from insects;
  - (f) with the exception of Class Other soya beans, have a moisture content of not more than 13 percent; and
  - (g) shall not exceed the maximum percentage of permissible deviation as determined in the Table in the Annexure for the grade.

- (2) A consignment of soya beans is classified as Class SB if it --
  - (a) consists of any cultivar of soya beans; and
  - (b) complies with the standards for the grade of Class SB soya beans as set out in regulation 5.
- (3) A consignment of soya beans is classified as Class Other soya beans if it does not comply with the standards for Class SB.

#### **Grades for soya beans**

5. (1) Soya beans of Class SB shall be graded as Grade SB1; and
- (2) No grades are determined for Class Other soya beans.

#### **Standards for grades of soya beans**

6. A consignment of soya beans shall be graded as--

Grade SB1 soya beans if the nature of the deviation, specified in column 1 of Table 1 of the Annexure, in that consignment does not exceed the percentage specified in column 2 of the said table opposite the deviation concerned.

### **PART II**

#### **PACKING AND MARKING REQUIREMENTS**

##### **Packing requirements**

7. Soya beans of different classes and grades shall be packed in different containers or stored separately.

##### **Marking requirements**

8. Each container or the accompanying sales documents of a consignment of soya beans shall be marked or endorsed with the class and grade of the soya beans.

### **PART III**

#### **SAMPLING**

##### **Obtaining sample**

9. (1) A representative sample of a consignment of soya beans shall --
  - (a) in the case of soya beans delivered in bags and subject to regulation 10, be obtained by sampling at least ten percent of the bags, chosen from that consignment at random, with a bag probe: Provided that at least 25 bags in a consignment shall be sampled and where a consignment consists of less than 25 bags, all the bags in that consignment shall be sampled; and
  - (b) in the case of soya beans delivered in bulk and subject to regulation 10, be obtained by sampling that consignment throughout the whole depth of the layer, in at least six different places, chosen at random in that bulk quantity, with a bulk sampling apparatus.
- (2) The collective sample obtained in subregulation (1) (a) or (b) shall --

- (a) have a total mass of at least 10 kg; and
- (b) be thoroughly mixed by means of dividing before further examination.

(3) If it is suspected that the sample referred to in subregulation (1)(a) is not representative of that consignment, an additional five percent of the remaining bags, chosen from that consignment at random, shall be emptied into a suitable bulk container and sampled in the manner contemplated in subregulation (1)(b).

(4) If it is suspected that the sample referred to in subregulation (1) (b) is not representative of that consignment, an additional representative sample shall be obtained by using an alternative sampling pattern, apparatus or method.

(5) A sample taken in terms of these regulations shall be deemed to be representative of the consignment from which it was taken.

#### **Sampling if contents differ**

10. (1) If, after an examination of the soya beans taken from different bags in a consignment in terms of regulation 9(1), it appears that the contents of those bags differ substantially --

- (a) all the bags in the consignment concerned shall be sampled in order to do such separation;
- (b) the bags concerned shall be placed separately; and
- (c) each group of bags with a similar content in that consignment shall for the purpose of these regulations be deemed to be a separate consignment.

(2) If, after the discharge of a consignment of soya beans in bulk has commenced, it is suspected that the consignment could be of a class or grade other than that determined by means of the initial sampling, the discharge shall immediately be stopped and the part of the consignment remaining in the bulk container, as well as the soya beans already in the collecting tray, shall be sampled anew with a bulk sampling apparatus or by catching at least 20 samples at regular intervals throughout the whole off loading period with a suitable container from the stream of soya beans flowing in bulk.

#### **Working sample**

11. A working sample shall be obtained by dividing the representative sample of the consignment according to the ICC (International Association of Cereal Science and Technology) 101/1 method.

### **PART IV**

#### **INSPECTION METHODS**

##### **Determination of undesired odours, harmful substances, poisonous seeds, glass, metal, coal, dung and insects**

12. A consignment or a sample of a consignment of soya beans shall be sensorially assessed or chemically analysed in order to determine --

- (a) whether it has musty, sour, khaki bush or other undesired odour;
- (b) whether it contains a substance that renders it unfit for human or animal consumption or for processing into or for utilisation as food or feed;
- (c) whether it contains poisonous seeds;
- (d) whether it contains glass, metal, coal or dung; and

- (e) whether it contains any insects.

#### **Determination of moisture content**

13. The moisture content of a consignment of soya beans may be determined according to any suitable method: Provided that the result thus obtained is in accordance with the maximum permissible deviation for a class 1 moisture meter as detailed in ISO 7700/2 based on result of the 72 hour, 103°C oven dried method [AACC ("American Association of Cereal Chemists") 44-15A].

#### **Determination of percentage of wet pods**

14. The percentage of wet pods in a consignment of soya beans shall be determined as follows:
- (a) Obtain a working sample of at least 10 kg of soya beans from a representative sample of the consignment.
  - (b) Remove all wet pods by hands from the working sample and determine the mass thereof.
  - (c) Express the mass thus determined as a percentage of the mass of the working sample concerned.
  - (d) Such percentage represents the percentage of wet pods in the consignment concerned.

#### **Determination of percentage of other grain, sunflower seed, stones, sclerotia and foreign matter**

15. The percentage of other grain, sunflower seed, stones, *sclerotia* and foreign matter in a consignment of soya beans shall be determined as follows:

- (a) Obtain a working sample of at least 200g soya beans from a representative sample of the consignment.
- (b) Remove all other grain, sunflower seed, stones, sclerotia and foreign matter by hand from the working sample and determine the mass of the other grain, sunflower, seed, stone and foreign matter separately.
- (c) Express each respective mass thus determined as a percentage of the mass of the working sample concerned.
- (d) Such percentages represent the different percentages of other grain, sunflower seed, stones, sclerotia and foreign matter respectively in the consignment concerned.

#### **Determination of the percentage defective soya beans**

16. The percentage of defective soya beans in a consignment of soya beans shall be determined as follows:

- (a) Obtain a working sample of at least 100g soya beans, free of other grain, sunflower seed, stones, sclerotia and foreign matter, from the representative sample of the consignment.
- (b) Sieve the working sample with the 4, 75 mm round-hole sieve by moving the sieve 20 strokes to and fro, alternately away from and towards the operator of the sieve for 20 seconds.
- (c) Remove all defective soya beans from the other soya beans on the 4.75 mm round hole-sieve by hand.

- (d) Determine the mass of the defective soya beans on the 4, 75 mm round-hole sieve and express it as a percentage of the mass of the working sample concerned.
- (e) Such percentage represents the percentage of defective soya beans in the consignment.

**Determination of the soya beans and pieces of beans which pass through the 4, 75 mm round hole sieve**

17. The percentage of soya beans and pieces of soya beans which pass through the 4, 75 mm round hole sieve in a consignment of soya beans shall be determined as follows:

- (a) Determine the mass of the soya beans and pieces of soya beans in the tray as obtained according to regulation 16(a) and (b) and express it as a percentage of the mass of the working sample obtained in regulation 16(a).
- (b) Such percentage represents the percentage soya beans and pieces of soya beans in the consignment which passes through the 4, 75 mm round-hole sieve.

**Determination of percentage of soiled beans**

18. The percentage of soiled soya beans in a consignment of soya beans shall be determined as follows:

- (a) Remove all soiled soya beans from the working sample obtained in regulation 16(a) by hand and determine the mass thereof.
- (b) Express the mass thus determined, as a percentage of the mass of the working sample obtained in regulation 16(a).
- (c) Such percentage represents the percentage of soiled soya beans in the consignment concerned.

**PART V**

**MASS DETERMINATION**

19. The mass of soya beans shall be determined by deducting the actual percentage sclerotia, and foreign matter found during the inspection process from the total mass of the consignment: Provided that the weighing instruments used for the determination of mass shall comply with the requirements of SANS 1649:2001 published in terms of the Trade Metrology Act, 1973 (Act No. 77 of 1973) for the specific class of instrument.

**PART VI**

**OFFENCES AND PENALTIES**

20. Any person who fails to comply with any provision of these regulations shall be guilty of an offence and upon conviction be liable to a fine or imprisonment in accordance with section 11 of the Act.

**ANNEXURE**

**TABLE**

**STANDARDS FOR GRADES OF SOYA BEANS**

Nature of deviations	Maximum percentage permissible deviation (m/m)/
	Grade SB1
1	2
(a) Wet pods	0,2%
(b) Foreign matter, including stones, other grain and sunflower seed: Provided that such deviations are individually within the limits specified in items (c), (d) and (e)	4%
(c) Other grain	0,5%
(d) Sunflower seed	0,1%
(e) Stones	1%
(f) Sclerotia	4%
(g) Soya beans and parts of soya beans which pass through the 4,75 mm round hole sieve	10%
(h) Defective soya beans on the 4,75 mm round hole sieve	10%
(i) Soiled soya beans	10%
(i) Deviation in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items	6%



agriculture,  
forestry & fisheries

Department:  
Agriculture, Forestry and Fisheries  
REPUBLIC OF SOUTH AFRICA

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30 Harvest House, Hamilton Street, Arcadia

**FAX COVER SHEET**

**TO:** AGBIZGRAIN  
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**FROM:** Mr. Mooketsi Mosome  
**TEL:** (012) 319 6334  
**FAX:** (012) 319 6055  
**NO. PAGES:** 1

**E-MAIL:** MooketsiMo@daff.gov.za  
**REF NO:** 20.4.14.1 Dispensations  
**SERIAL NO:**  
**DATE:** 06 March 2015

Subject

**INDUSTRY-WIDE DISPENSATION: THE USE OF THE 1.8MM SLOTTED SIEVE AND THE 4.75MM ROUND HOLE SIEVE DURING THE GRADING OF SOYA BEANS.**

Please refer to your e-mail of the 3rd March 2015.

Permission is hereby granted by the Executive Officer: Agricultural Product Standards in terms of section (3) of the Agricultural Product Standard Act, 1990(Act No. 119 of 1990) to all producers, wholesalers, traders, retailers, importers of Soya Beans, to sell and import Soya Beans whereby the "1.8mm slotted sieve" is used in conjunction with the prescribed 4.75mm sieve round hole sieve: Provided that the prescribed maximum percentage permissible deviations as set out in Annexure with respect to (b) and (i) are increased from 4% to 5% and 6% to 7% respectively.

This permission is subject to the following conditions:

- (a) All other conditions of the regulations shall be complied with.
- (b) It may be withdrawn at any time should a valid complaint received.
- (c) All producers, wholesalers, traders, retailers and importers of Soya Beans indemnify this Directorate and the Department from any detrimental effect, financial or otherwise, which may emanate as a result of this permission.

(d) Termination date: **16 January 2016**

  
**EXECUTIVE OFFICER:**

**AGRICULTURAL PRODUCT STANDARDS ACT (ACT No. 119 OF 1990)**

Copies: Regional Manager: Directorate: Inspection Services





## agriculture, forestry & fisheries

Department:  
Agriculture, Forestry and Fisheries  
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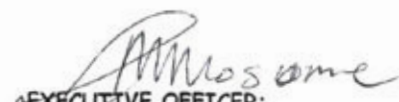
Subject

#### INDUSTRY-WIDE DISPENSATION: USE OF THE 1.8MM SLOTTED SIEVE AND THE 4.75MM ROUND-HOLE SIEVE DURING THE GRADING OF SOYA BEANS

The dispensation granted to AGBIZGRAIN dated 06 March 2015 is hereby amended by correcting the last sentence of paragraph 2 with the following: "Provided that the prescribed maximum percentage permissible deviations as set out in the Annexure with respect to (b) and (j) are increased from 4% to 5% and 6% to 7% respectively."

This permission is subject to the following conditions:

- All other conditions of the relevant local regulations shall be complied with.
- It may be withdrawn at any time should a valid complaint received.
- All producers, wholesalers, traders, retailers and importers of Soyabeans indemnify this Directorate and the Department from any detrimental effect, financial or otherwise, which may emanate as a result of this permission.
- Termination date: 16 January 2016.

  
EXECUTIVE OFFICER:  
AGRICULTURAL PRODUCT STANDARDS

Copies: Regional Managers: Quality Auditing North and South  
Directorate: IS

