

South African Soybean Crop

**Quality Report
2015/2016 Season**





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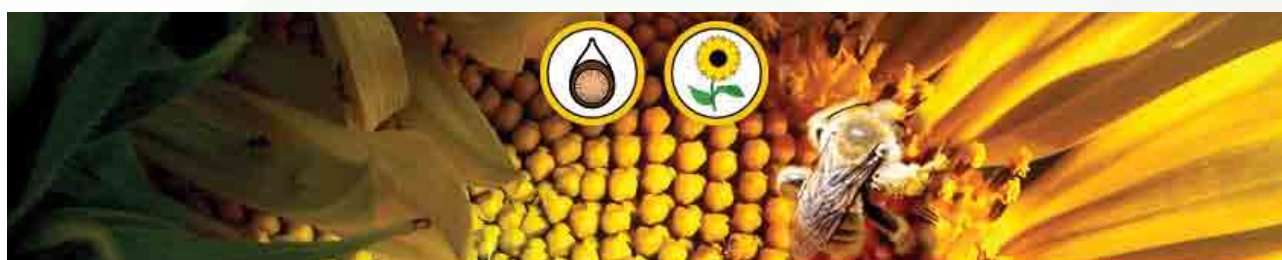
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South African COMMERCIAL SOYBEAN QUALITY FOR THE 2015/2016 SEASON



Acknowledgements

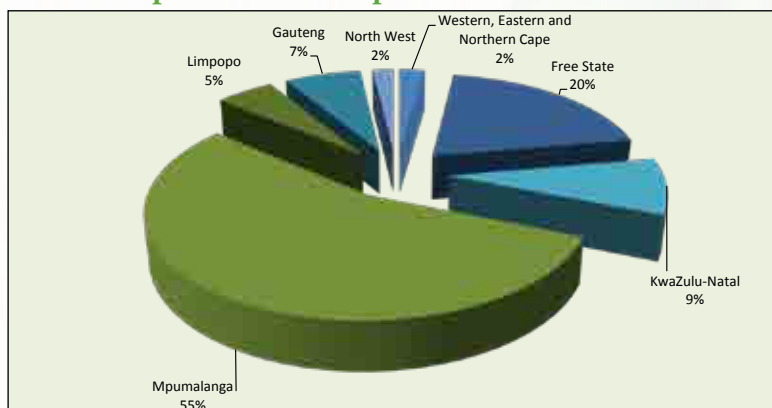
With gratitude to:

- *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 final commercial figure for the soybean crop of the 2015/2016 season as overseen by the National Crop Estimates Liaison Committee (CELC) is 742 000 tons. The final calculated crop figure was adjusted upward slightly by 450 tons (0.06%). The commercial soybean crop decreased by almost 31% (328 000 tons) from the 2014/2015 season. The major soybean-producing provinces, contributing 75.0% of the total crop, were Mpumalanga and the Free State.

Graph 1: Contribution of the provinces to the production of the 2015/2016 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 26. One hundred and forty three 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 when applicable.

This is the fifth 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). 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, including import and export figures over several seasons are provided in table and graph format.

The 2015/16 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, driven mainly by the demand for protein feed in the animal feed industry. Soybeans have benefits to producers in crop rotation programs, especially as part of conservation agriculture, but also due to lower input needs compared to other commodities like maize and wheat.

The extreme drought conditions experienced this season, led to an almost 27% (184 500 ha) decline in soybean production area. Yield was also negatively impacted, resulting in a national yield decrease from 1.56 t/ha in 2014/2015 to 1.47 t/ha. Sunflower production also surpassed soybean production for the first time since the 2010/2011 season.

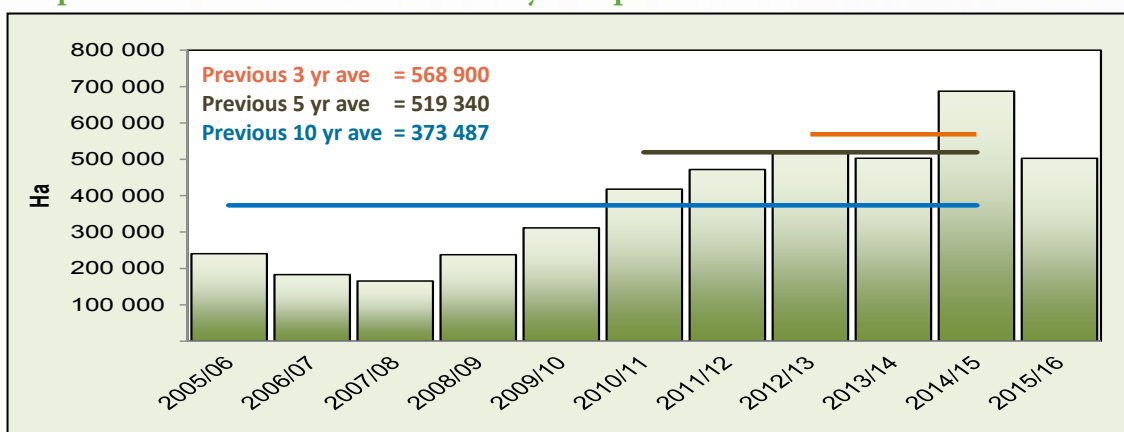
Province	Type of production	2015/2016			2014/2015		
		Hectares planted, ha	Crop, tons	Yield, t/ha	Hectares planted, ha	Crop, tons	Yield, t/ha
Western Cape	Dryland	-	-	-	-	-	-
	Irrigation	800	1 200	1.50	800	1 600	2.00
	Total	800	1 200	1.50	800	1 600	2.00
Northern Cape	Dryland	-	-	-	-	-	-
	Irrigation	4 000	13 600	3.40	4 000	14 000	3.50
	Total	4 000	13 600	3.40	4 000	14 000	3.50
Free State	Dryland	167 900	137 500	0.82	290 000	321 000	1.11
	Irrigation	6 100	10 500	1.72	15 000	45 000	3.00
	Total	174 000	148 000	0.85	305 000	366 000	1.20
Eastern Cape	Dryland	1 500	2 100	1.40	1 500	2 100	1.40
	Irrigation	-	-	-	-	-	-
	Total	1 500	2 100	1.40	1 500	2 100	1.40
KwaZulu-Natal	Dryland	19 000	39 000	2.05	27 000	55 650	2.06
	Irrigation	9 000	27 000	3.00	15 000	47 250	3.15
	Total	28 000	66 000	2.36	42 000	102 900	2.45
Mpumalanga	Dryland	232 300	390 000	1.68	239 500	372 700	1.56
	Irrigation	7 700	18 000	2.34	5 500	17 200	3.13
	Total	240 000	408 000	1.70	245 000	389 900	1.59
Limpopo	Dryland	3 500	2 400	0.69	9 000	15 000	1.67
	Irrigation	12 500	36 000	2.88	15 000	57 000	3.80
	Total	16 000	38 400	2.40	24 000	72 000	3.00
Gauteng	Dryland	20 800	41 600	2.00	23 000	44 500	1.93
	Irrigation	2 200	9 000	4.09	7 000	24 500	3.50
	Total	23 000	50 600	2.20	30 000	69 000	2.30
North West	Dryland	12 500	6 600	0.53	28 000	28 000	1.00
	Irrigation	3 000	7 500	2.50	7 000	24 500	3.50
	Total	15 500	14 100	0.91	35 000	52 500	1.50
RSA	Dryland	457 500	619 200	1.35	618 000	838 950	1.36
	Irrigation	45 300	122 800	2.71	69 200	231 050	3.34
	Total	502 800	742 000	1.48	687 300	1 070 000	1.56

Figures provided by the CEC.

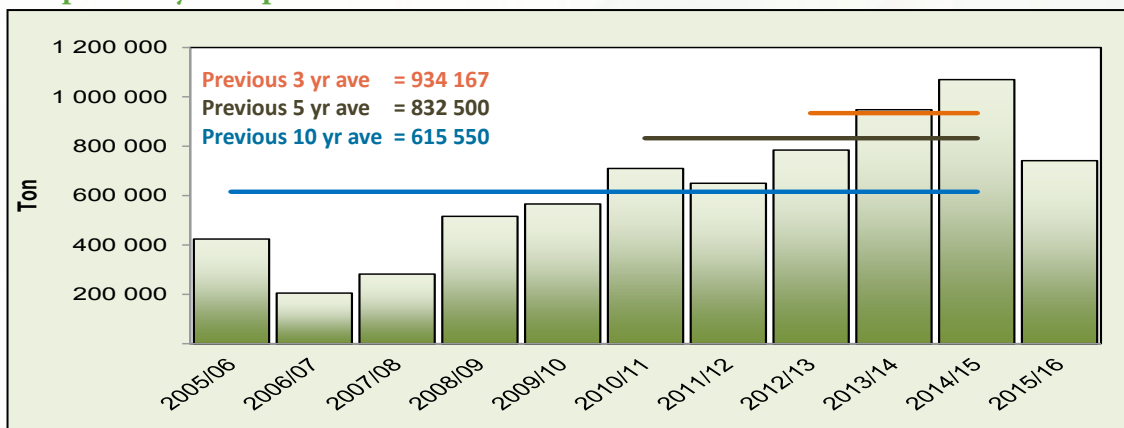
According to the *BFAP Baseline, Agricultural Outlook 2016 – 2025*, a high demand for soybeans arising from expanded crushing capacity, is expected to cause a sharp increase in area utilised for soybean production in 2017, assuming normal rainfall patterns. The expectation is that the area will continue to grow by on average 5% per annum, to just under 1 million hectares by 2025. Production is expected to exceed 2.2 million tons by 2025, providing realisation of the expected increase in production area as well as average growth in yield of 4% per year.

Soybeans account for more than half of the world oilseed production. According to the *World Agricultural Supply and Demand Estimates Report (WASDE - 563)* an estimated 312.81 million metric tons of soybeans were produced during the 2015/2016 season. The United States contributed 34%, Brazil 31% and Argentina 18% to this total. The world soybean production during the 2016/2017 season is projected to be 340.79 million metric tons.

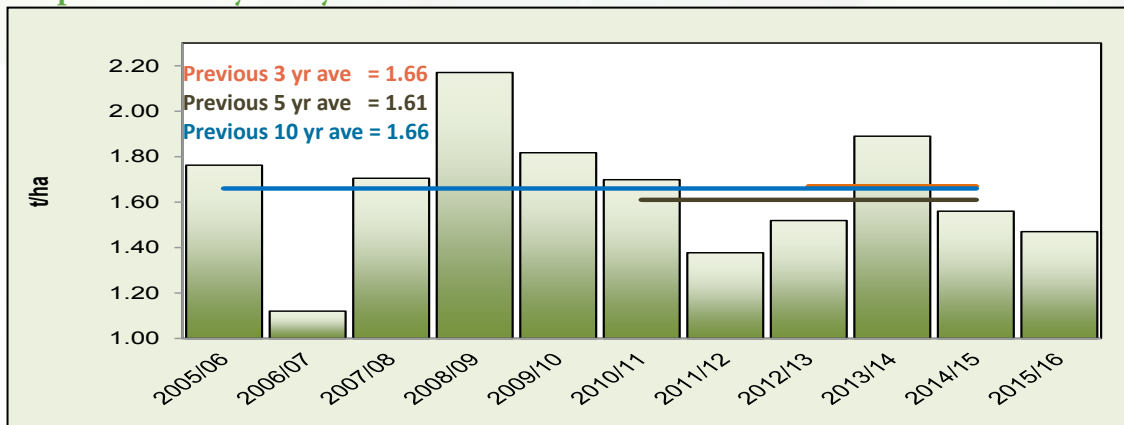
Graph 2: Total RSA area utilised for soybean production from 2005/06 to 2015/16



Graph 3: Soybean production in RSA from 2005/06 to 2015/16

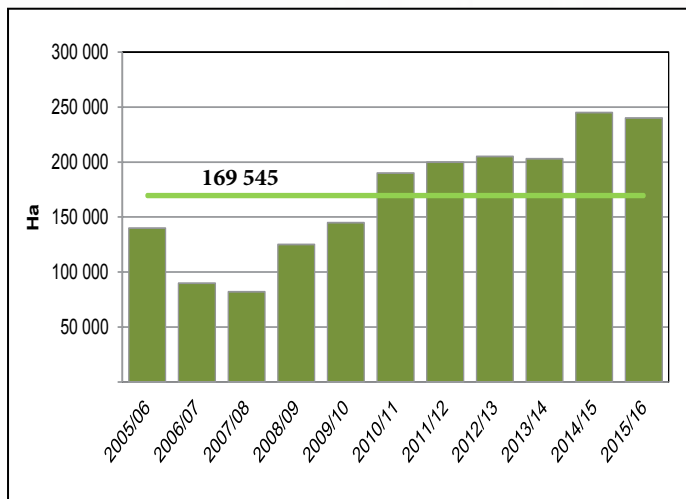


Graph 4: RSA soybean yield from 2005/06 to 2015/16

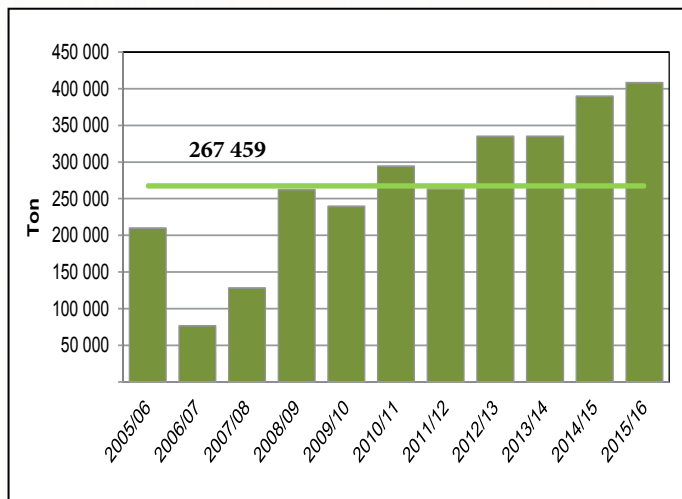


Figures provided by the CEC.

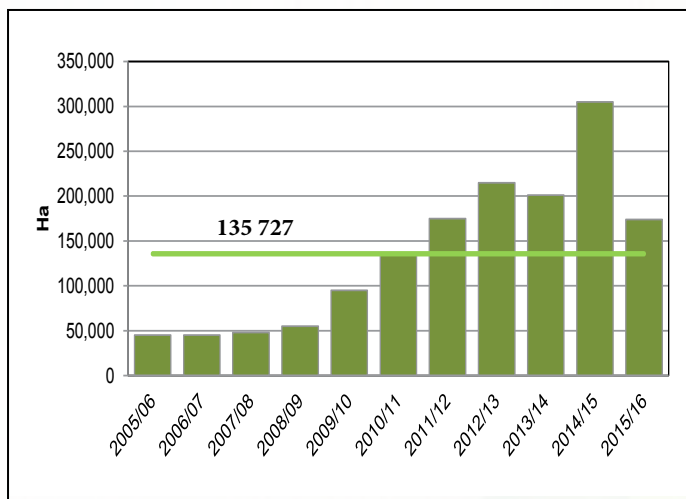
Graph 5: Area utilised for soybean production in Mpumalanga since 2005/06



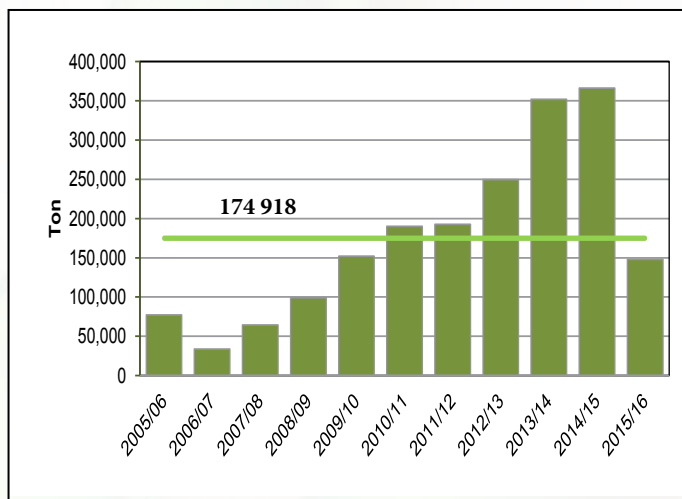
Graph 6: Soybean production in Mpumalanga since 2005/06



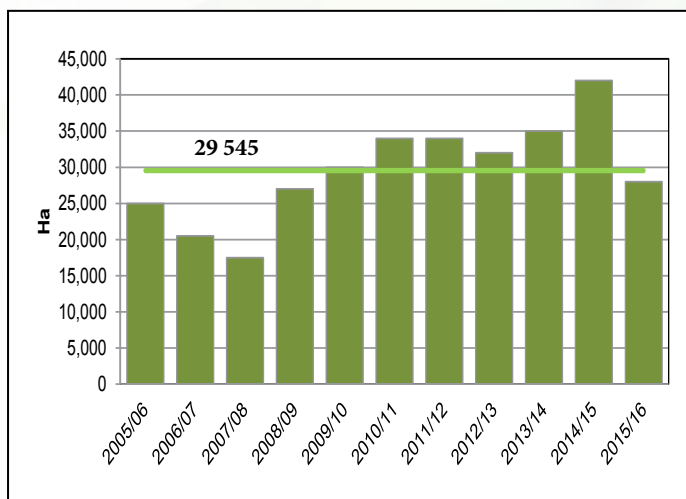
Graph 7: Area utilised for soybean production in the Free State since 2005/06



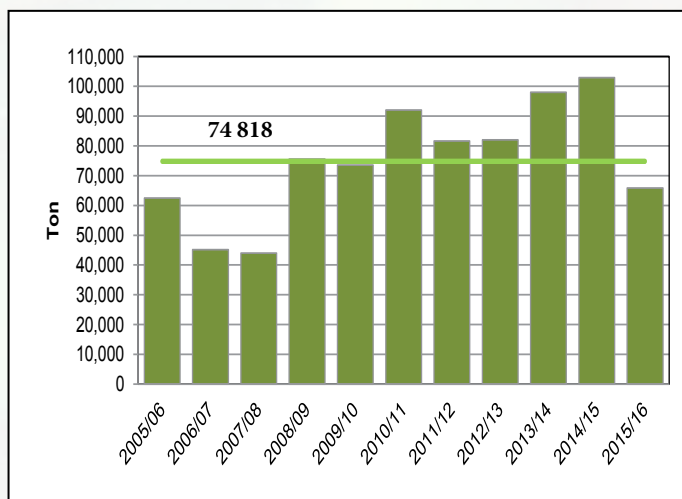
Graph 8: Soybean production in the Free State since 2005/06



Graph 9: Area utilised for soybean production in KwaZulu-Natal since 2005/06



Graph 10: Soybean production in KwaZulu-Natal since 2005/06



Figures provided by the CEC.

— Eleven season average

Supply and Demand

The soybean marketing season dates from March to end of February. According to SAGIS' supply and demand figures for the current marketing season to date (March 2016 to January 2017), imports more than doubled compared to the 124 981 tons of the 2015/2016 season. Of the 928 664 tons of soybeans processed to date, 2.3% was used for human consumption, 10.0% for animal feed as full fat soya and the bulk crushed to produce oil and/or oilcake. Soybean oilcake demand is primarily driven by the feed industry. The quantity of soybeans crushed so far, is 17.6% or 174 082 tons less than the previous season.

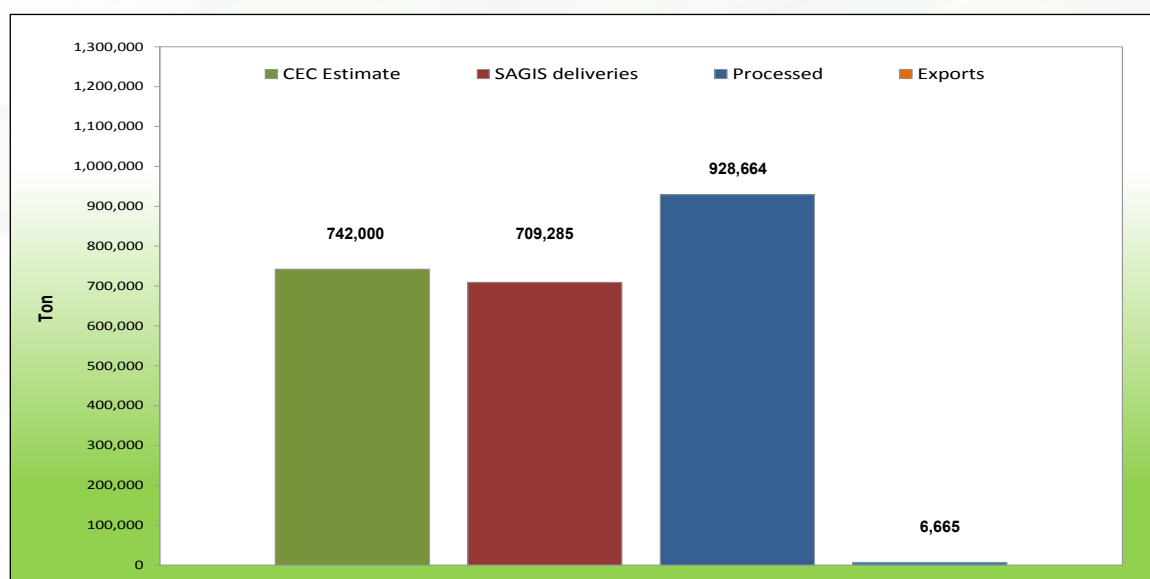
According to *BFAP* Baseline, the total crushing capacity derived from dedicated soybean crushers locally is estimated at 1.75 million tons, when dual capacity plants (plants that can crush both are soybeans and sunflower) are included, this figure increases to 2.5 million tons. Locally produced soybeans were supplemented with imports over the last three seasons since South African producers have been unable to supply sufficient raw product for crushing purposes. It is projected that by 2025 South Africa will be crushing more than 2.1 million tons of soybeans of which only 3% will be imported. By 2025, it is estimated that 90% of the world's soybean production and 84% of other oilseed production will be crushed.

The reduction in the quantity of locally produced soybeans in 2016 due to the drought, is expected to cause a decline in oilcake production, to just under 700 000 tons. Production is however expected to recover to more than 900 000 tons in 2017. Over the period 2016 to 2025, oilcake production is projected to expand rapidly, exceeding 1.6 million tons by 2025, continuously replacing imported products. Imported soybean oilcake is expected to decrease to less than 200 000 tons by the end of this period.

South Africa remains a net importer of vegetable oils. Domestic consumption of palm, sunflower, soya and canola oil during 2015 was estimated at more than one million tons, with palm oil comprising approximately 39%. Soya oil imports are projected to decrease to a mere 36 000 tons by 2025 from 187 000 tons in 2015.

6 665 tons of soybeans/products have been exported so far this season compared to the 4 677 tons in the previous season. Globally, soybean exports during the 2015/2016 season amounted to an estimated 132.13 million metric tons, with the United States and Brazil 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 2016/2017 season currently stands at 141.10 million metric tons. China remains the largest importer of soybeans followed by the European Union and Japan. Argentina and Brazil remain 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 2016 - Jan 2017)



Information provided by SAGIS.

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

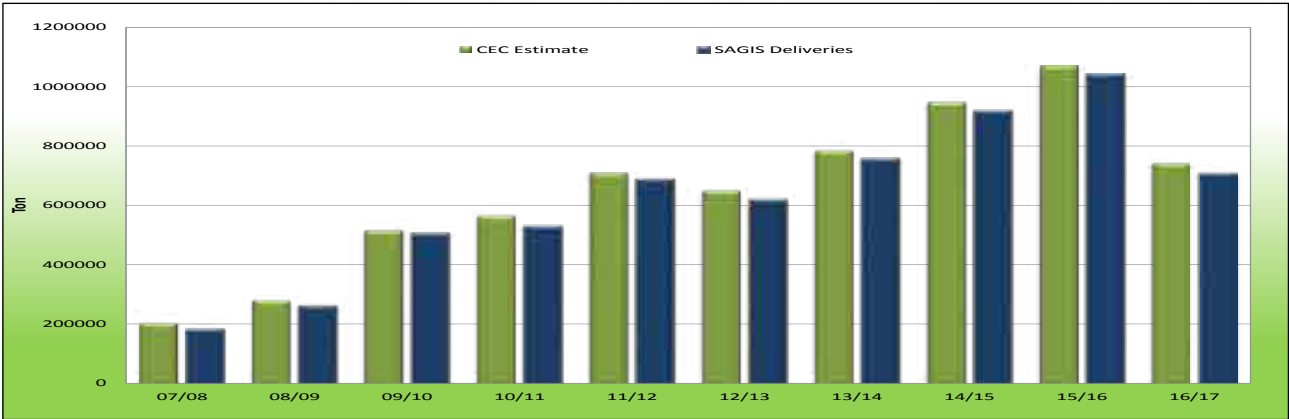
	Season (Mar - Feb)																Publication date: 2017-02-24				Current Season Mar - Jan	10 Year average
	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17					
CEC (Crop Estimate)	148,700	209,700	202,400	136,500	220,000	272,500	424,000	205,000	282,000	516,000	566,000	710,000	650,000	784,500	948,000	1,070,000	742,000	615,550				
SUPPLY																						
Opening stock (1 Mar)	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	89,128	76,475				
Prod deliveries	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	1,042,129	709,285	594,139				
Imports	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	268,995	37,681				
Surplus	0	0	0	400	0	0	3,900	3,300	900	700	1,500	1,800	1,698	2,572	0	10,526	3,501	2,690				
Total Supply	256,300	270,400	290,200	228,100	275,500	352,600	477,500	407,400	326,900	560,700	589,600	738,600	849,690	833,613	1,084,506	1,241,340	1,070,909	710,985				
DEMAND																						
Processed*	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	1,134,110	928,664	567,493				
-human	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	24,323	21,737	26,572				
-animal feed (full fat soya)	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	121,763	92,985	156,302				
-crush (oil/oilcake)	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	988,024	813,942	384,620				
Withdrawn by producers	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	2,393	367	3,811				
Released to end-consumers	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	2,650	1,083	2,312				
Seed for planting purposes	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	5,597	4,618				
Net receipts(-)/disp(+)	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	805	1,590	1,495				
Deficit	3,300	0	600	0	2,000	600	0	0	0	0	0	0	0	0	2,782	0	0	278				
Exports	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	4,677	6,665	50,516				
Total Demand	228,500	232,900	213,200	193,800	197,800	303,100	390,900	349,600	278,200	504,700	543,400	512,800	780,808	771,807	1,020,802	1,152,212	943,966	630,523				
Ending Stock (28 Feb)	27,800	37,500	77,000	34,300	77,700	49,500	86,600	57,800	48,700	56,000	46,200	225,800	68,882	61,806	63,704	89,128	126,943	80,462				
- processed p/month	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	94,509	84,424	47,295				
- months' stock	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	0.9	1.5	2				

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

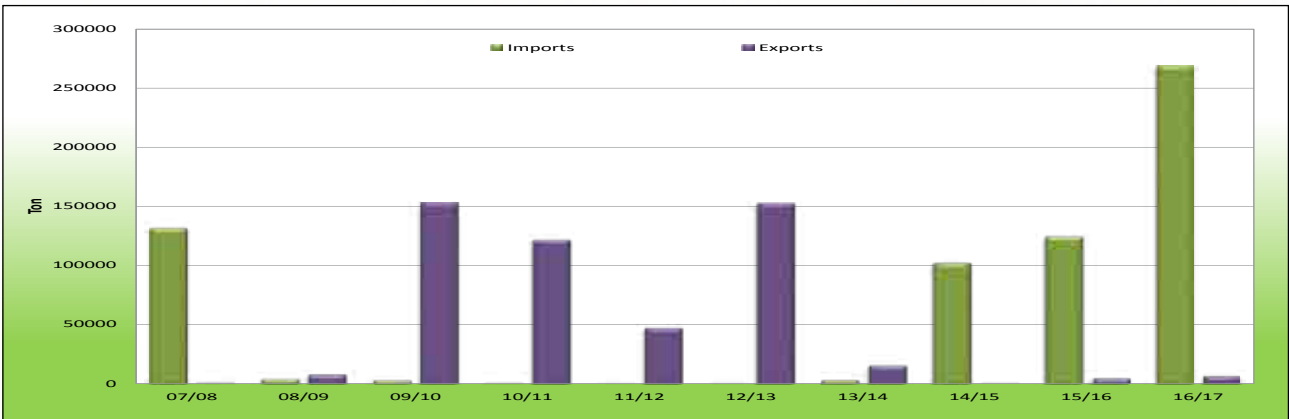
Note: Figures in red: opening stock and ending stock difference

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

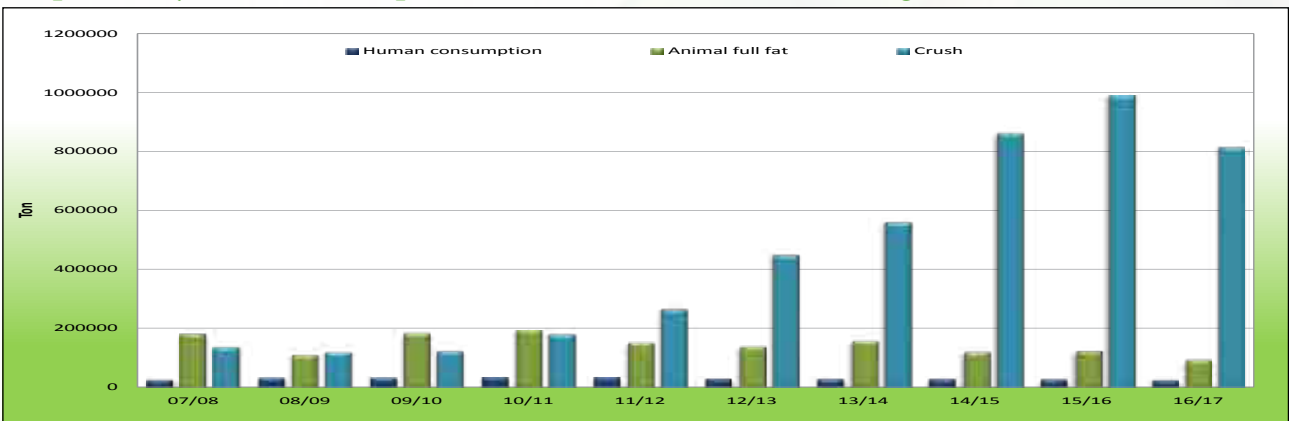
Graph 12: Soybeans: CEC Estimate vs SAGIS deliveries over 10 marketing seasons



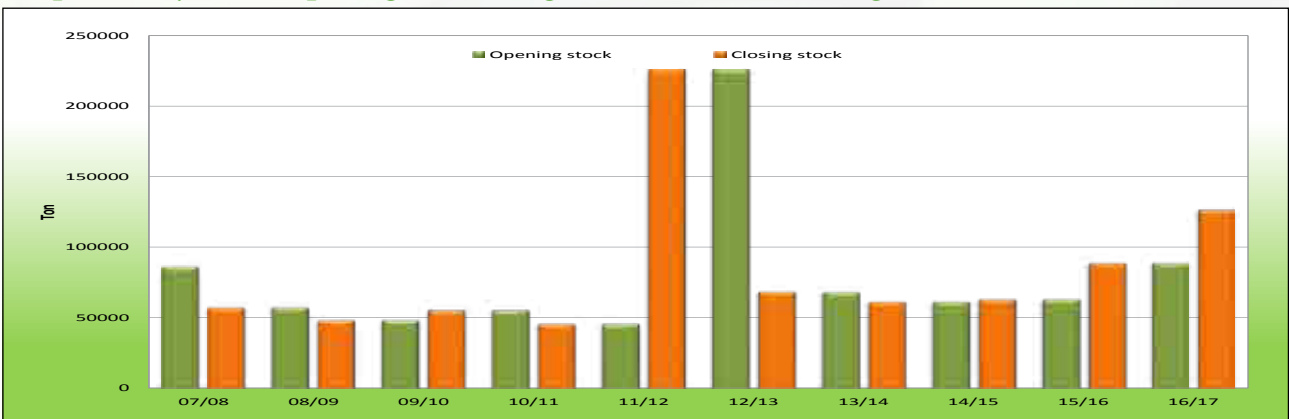
Graph 13: Soybeans: Imports and Exports over 10 marketing seasons



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.

Season	SOYBEANS: IMPORTS FOR RSA PER COUNTRY								
	Brazil	Ethiopia	Malawi	Mozambique	Nigeria	Paraguay	Zambia	Zimbabwe	Total
2014/2015	617,05	0	7,520	202	0	0	25,264	8,286	102,977
2015/2016	59,998	1,648	862	0	0	59,697	2,776	0	124,981
2016/2017	0	2,941	0	0	204	263,576	2,274	0	268,995

Season	SOYBEANS: IMPORTS PER HARBOUR				
	Harbours				
	East London	Durban	Cape	Port Elizabeth	Total
2005/2006	0	3,965	10,329	0	14,294
2006/2007	0	0	10,374	0	10,374
2007/2008	0	71,885	31,433	0	103,318
2008/2009	0	12,004	0	0	12,004
2009/2010	0	0	0	0	0
2010/2011	0	0	0	0	0
2011/2012	0	163	0	0	163
2012/2013	0	344	0	0	344
2013/2014	0	2,661	0	98	2,759
2014/2015	0	61,705	0	0	61,705
2015/2016	0	121,343	0	0	121,343
2016/2017*	0	266,721	0	0	266,721

* Progressive / Progressief Mar / Mrt 2016 - Jan 2017
 Note: Includes Imports/Exports for RSA and Other Countries

Season	SOYBEANS: RSA EXPORTS PER COUNTRY			
	Botswana	Mozambique	Zimbabwe	Total
2014/2015	1	575	0	576
2015/2016	220	4,457	0	4,677
2016/2017	0	2,534	4,131	6,665

Season	SOYBEANS: EXPORTS PER HARBOUR				
	Harbours				
	East London	Durban	Cape	Port Elizabeth	Total
2005/2006	0	2,575	0	0	2,575
2006/2007	0	0	0	0	0
2007/2008	0	0	0	0	0
2008/2009	0	0	0	0	0
2009/2010	0	151,212	0	0	151,212
2010/2011	0	121,243	0	0	121,243
2011/2012	0	40,633	0	0	40,633
2012/2013	0	152,318	0	0	152,318
2013/2014	0	15,044	0	0	15,044
2014/2015	0	0	0	0	0
2015/2016	0	0	0	0	0
2016/2017*	0	0	0	0	0

* Progressive / Progressief Mar / Mrt 2016 - Jan 2017
 Note: Includes Imports/Exports for RSA and Other Countries

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.

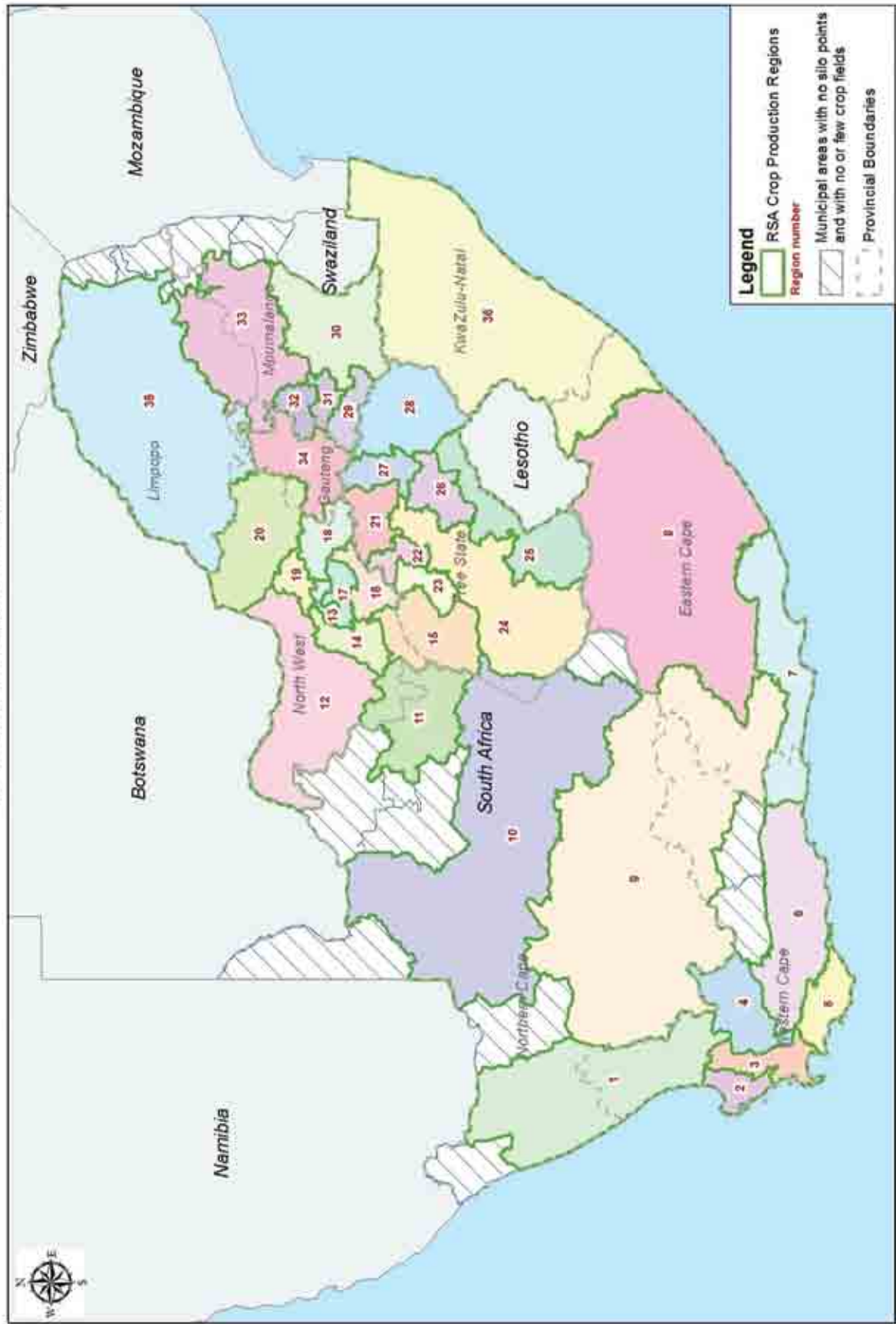
The regions are distributed as follows:

- Region 1: Namakwaland
- Regions 2 and 3: Swartland
- Regions 4 to 6: Rùens
- 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 2015/2016 production season, are named and described on pages 18 to 25 (in the header of the quality data per region tables.) The silo/intake stands per region 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 2015/2016 – Summary of results

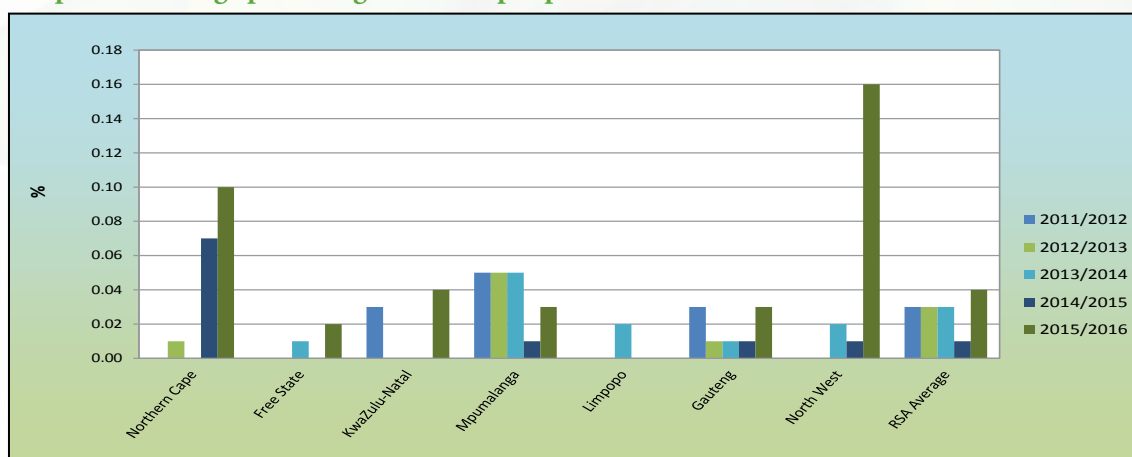
Eighty-nine percent (127) of the 143 samples analysed for the purpose of this survey were graded as Grade SB1 and 16 of the samples were downgraded to COSB (Class Other Soya Beans). During the previous two seasons, 13% (2014/2015) and 12% (2013/2014) of the samples were downgraded to COSB.

- One of the sixteen samples was downgraded as a result of the percentage other grain present in the sample exceeding the maximum permissible deviation of 0.5%.
- One sample was downgraded as a result of the percentage sunflower seed present in the sample exceeding the maximum permissible deviation of 0.1%.
- One sample was downgraded as a result of the percentage stones present in the sample exceeding the maximum permissible deviation of 1%.
- Four 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.
- Four samples were 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 four samples were downgraded as a result of a combination of one or more of the following deviations exceeding the maximum permissible deviation: percentage foreign matter, percentage other grain, the presence of an undesired odour as well as poisonous seeds (*Datura sp.*).

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 ± 5 kg. Pods were found in 12 of the 143 samples graded, all of these pods were green, but not wet according to the definition, upon receipt at the SAGL. The percentage of these pods in the samples ranged from 0.05% to 0.50% based on a working sample size of at least 200 g. Only two samples contained pods, not identifiable as wet pods according to the definition, in percentages exceeding the wet pod maximum permissible deviation of 0.2%.

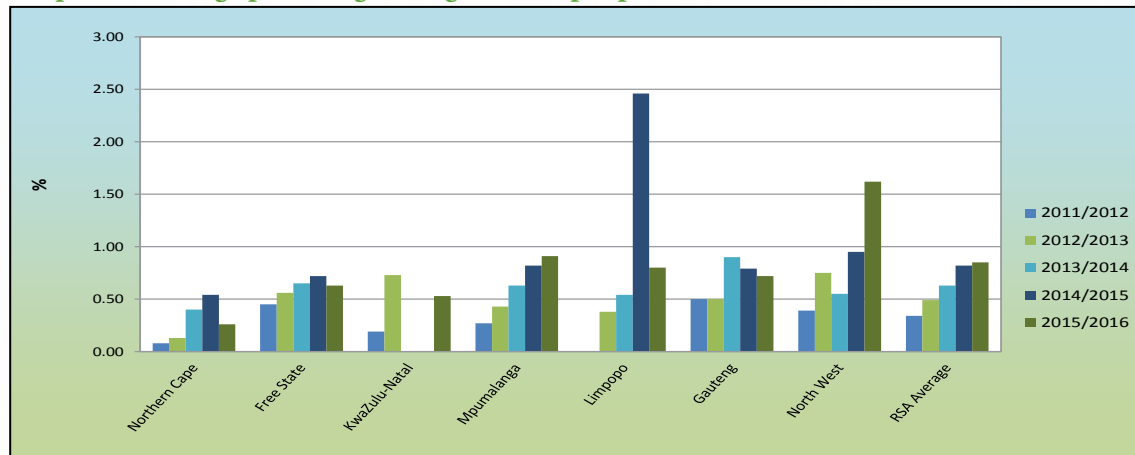
Based on the samples received for this crop survey, *Sclerotinia sclerotiorum* did not pose problems, although the number of samples containing sclerotia increased from 20 in the previous season to 36 this season. The highest percentages of sclerotia observed (0.76% and 0.64%) was on samples from Mpumalanga, followed by a sample from North West with 0.60%. These percentages are however still well below the maximum permissible level of 4%. The national weighted average percentage this season was 0.04% compared to the 0.01% of the previous season. See Graph 16.

Graph 16: Average percentage sclerotia per province over five seasons



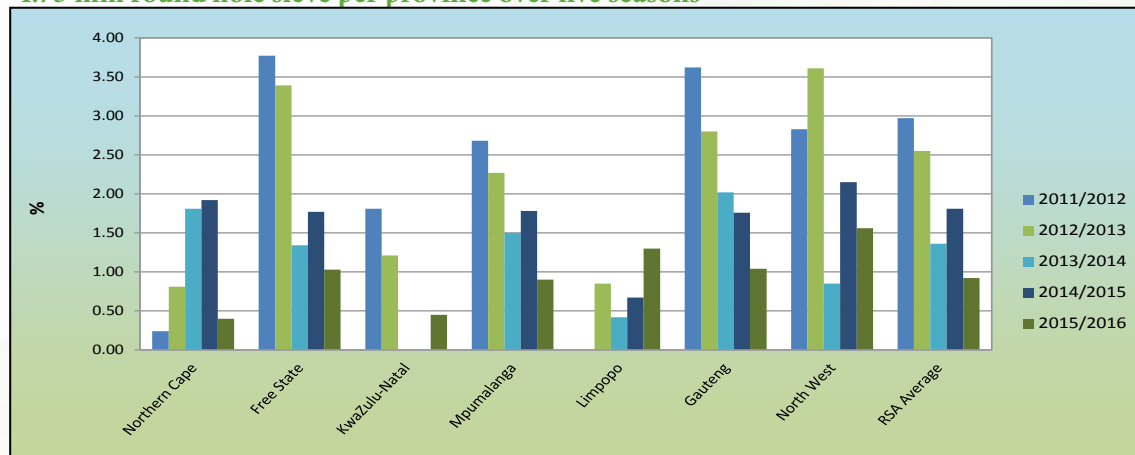
The samples from North West province had the highest weighted average percentage foreign matter (1.62%). The percentage foreign matter in the rest of the samples ranged from 0.26 in the Northern Cape to 0.91 in Mpumalanga. Please refer to Graph 17.

Graph 17: Average percentage foreign matter per province over five seasons



North West province (8 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 1.56% and the sample from the Northern Cape the lowest at 0.40%. Mpumalanga province with the highest number of samples (91) reported an average of 0.90%. The Free State province averaged 1.03% (23 samples). The national weighted average percentage decreased from 1.81% the previous season to 0.92% this season. Please see Graph 18.

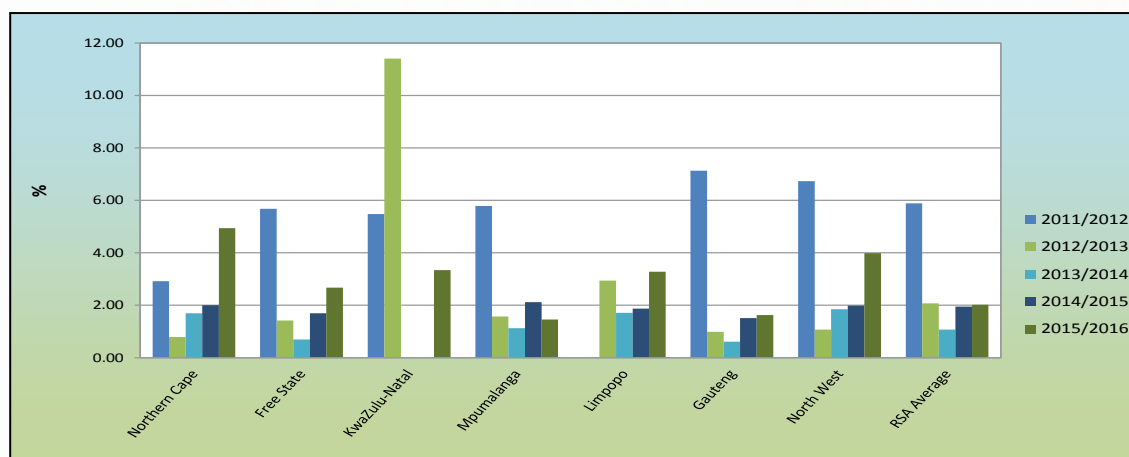
Graph 18: Average percentage soybeans and parts of soybeans which pass through the 4.75 mm round hole sieve per province over five seasons



*Please note that the 2014/2015 and 2015/2016 results represent soybeans and parts of soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve.

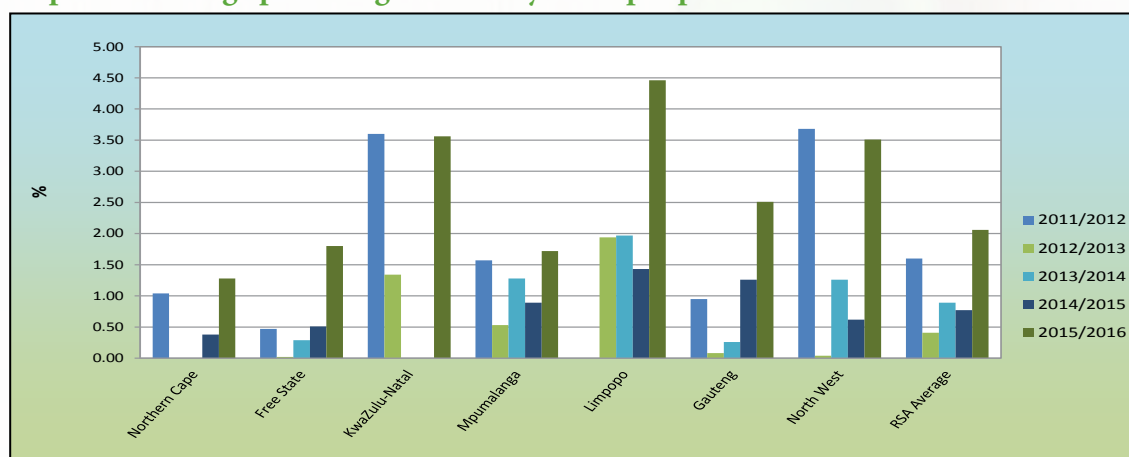
The lowest weighted average percentage defective soybeans on the 4.75 mm sieve were observed on the samples from Mpumalanga, namely 1.46%. The Northern Cape province reported the highest percentage of 4.94, followed by North West and KwaZulu-Natal provinces with 3.99 and 3.34 respectively. The national weighted average increased slightly from 1.95% last season to 2.02% this season. Please see Graph 19.

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



The RSA weighted average percentage soiled soybeans of 2.06% is the highest since this survey was started in the 2011/2012 season (1.60%). The average last season was 0.77%. Average weighted percentages per province ranged from 1.28 in the Northern Cape to 4.46 in Limpopo. Please see Graph 20. Although the number of samples containing soiled soybeans as well as the average percentage soiled soybeans per sample increased significantly, none of the percentages were above the maximum permissible deviation of 10% according to the grading regulations. Last season, one sample from Mpumalanga exceeded this limit.

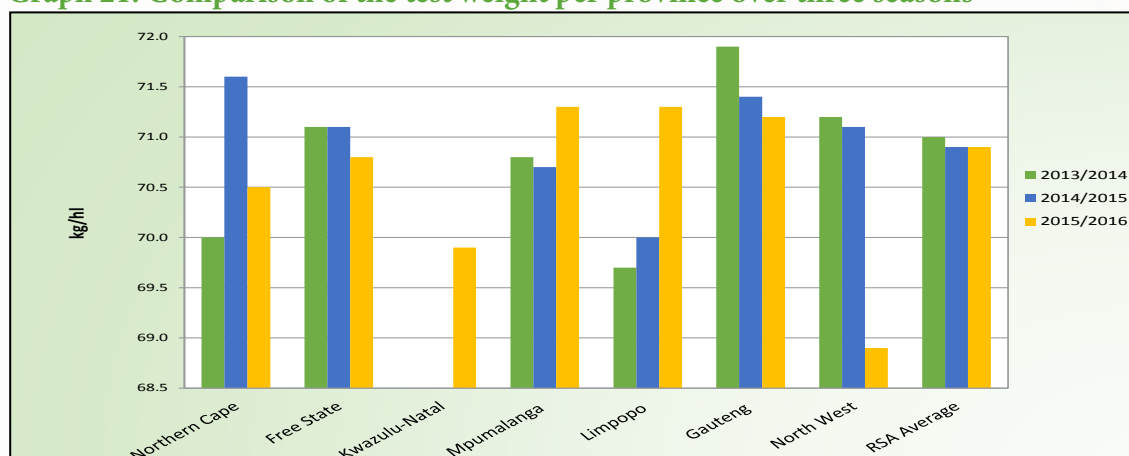
Graph 20: Average percentage soiled soybeans per province over five seasons



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/1L filling weight of the 143 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 three seasons.

Province	Test weight, kg/hl					
	2015/2016 Season			2014/2015 Season		
	Weighted average	Range	No. of samples	Weighted average	Range	No. of samples
Northern Cape (Regions 10 - 11)	70.5	-	1	71.6	71.2 - 71.9	3
Free State (Regions 21 - 28)	70.8	68.5 - 73.0	23	71.1	67.0 - 72.7	42
KwaZulu-Natal (Regions 36)	69.9	67.7 - 71.6	14	-	-	-
Mpumalanga (Regions 29 - 33)	71.3	68.9 - 72.7	91	70.7	63.3 - 78.2	77
Limpopo (Region 35)	71.3	-	1	70.0	69.3 - 70.8	2
Gauteng (Region 34)	71.2	70.6 - 72.2	5	71.4	69.5 - 72.4	8
North West (Region 12 - 20)	68.9	64.9 - 70.5	8	71.1	68.8 - 72.2	18
RSA	70.9	64.9 - 73.0	143	70.9	63.3 - 78.2	150

Graph 21: Comparison of the test weight per province over three 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 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	2015/2016		2014/2015		2013/2014		2012/2013	
Moisture, % (17hr, 103°C)	7.4		7.0		7.1		7.2	
Moisture basis	Dry basis	As is	Dry basis	As is	Dry basis	As is	Dry basis	As is
Crude protein, %	40.22	37.24	39.89	37.10	39.84	37.01	40.63	37.70
Crude fat, %	19.4	18.0	19.3	17.9	19.7	18.3	18.8	17.4
Crude fibre, %	7.3	7.3	6.4	6.4	6.1	6.1	-	-
Ash, %	4.61	4.27	4.64	4.32	4.66	4.33	4.65	4.32
<i>No. of samples</i>	<i>143</i>		<i>150</i>		<i>150</i>		<i>150</i>	

The weighted average crude protein content this season was 40.22%, slightly higher than the 39.89% and 39.84% of the previous two seasons. The sample from the Northern Cape had the highest weighted average crude protein content of 41.56%, with Gauteng reported the lowest average, namely 38.86%. The weighted average crude fat percentage of 19.4% compared very well with the 19.3% in 2014/2015. The samples from KwaZulu-Natal had the highest weighted average crude fat content of 20.6%. The lowest average fat content was observed in Mpumalanga with 19.1%.

The weighted average percentage crude fibre varied from 6.2% in Limpopo to 7.6% in the Northern Cape. The RSA weighted average was higher this season (7.3%), compared to 6.4% the previous season. A small variation of only 0.05% is observed with regards to the national weighted average ash content over the five seasons that this survey has been conducted. This season, the average ash content was 4.61%. Samples from the Northern Cape and Limpopo tend to show higher ash contents over seasons.

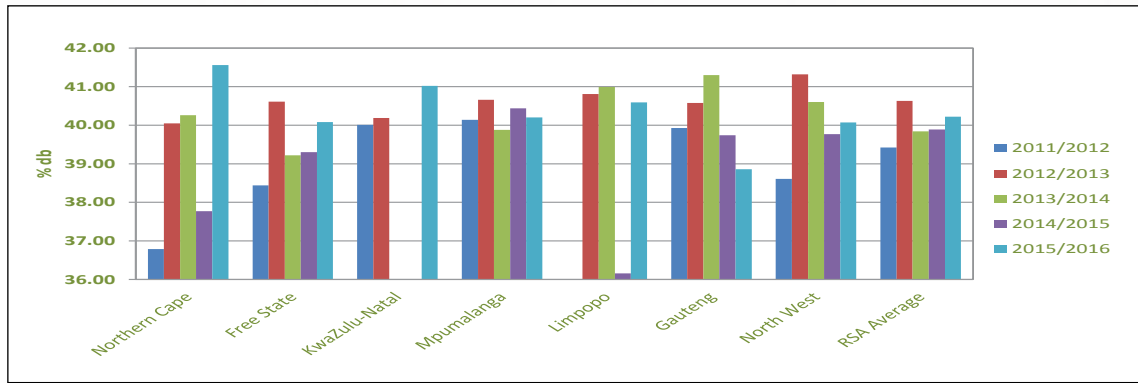
Graphs 22 to 25 on page 15 provide comparisons between provinces over seasons for the nutritional components mentioned above.

A summary of the RSA Soybean Crop Quality averages of the 2015/2016 season compared to those of the 2014/2015 season, is provided in Table 4 on page 16.

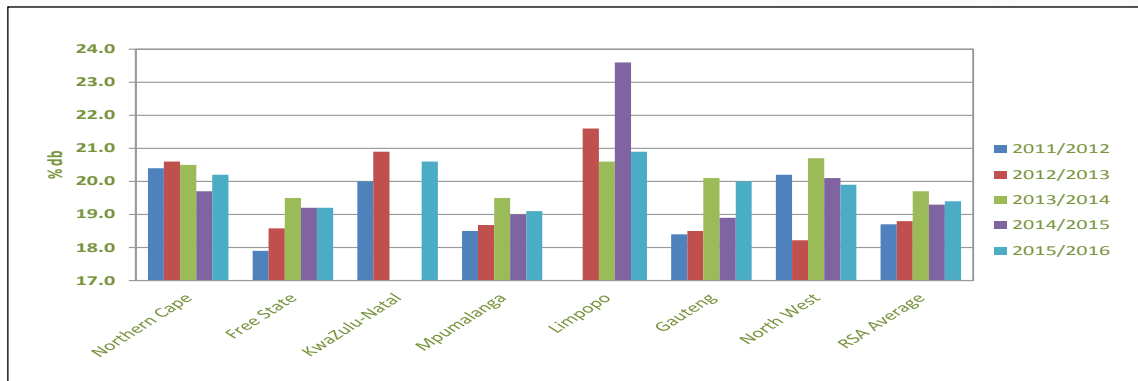
All fifteen samples tested for genetic modification (GM), tested positive for the presence of the CP4 EPSPS trait (Roundup Ready®). Please refer to the results in Table 5 on page 17 of this report.

Please see pages 18 to 25 for the average soybean quality per region.

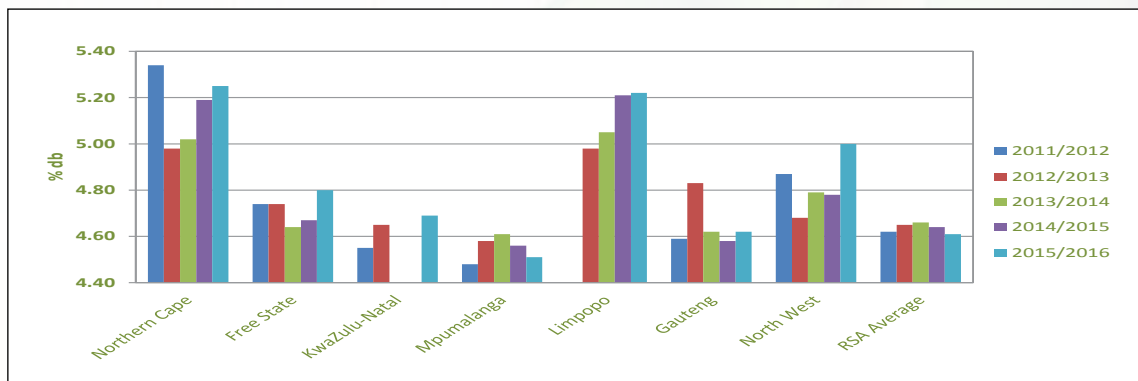
Graph 22: Average crude protein content per province over five seasons



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



Graph 24: Average ash content per province over five seasons



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

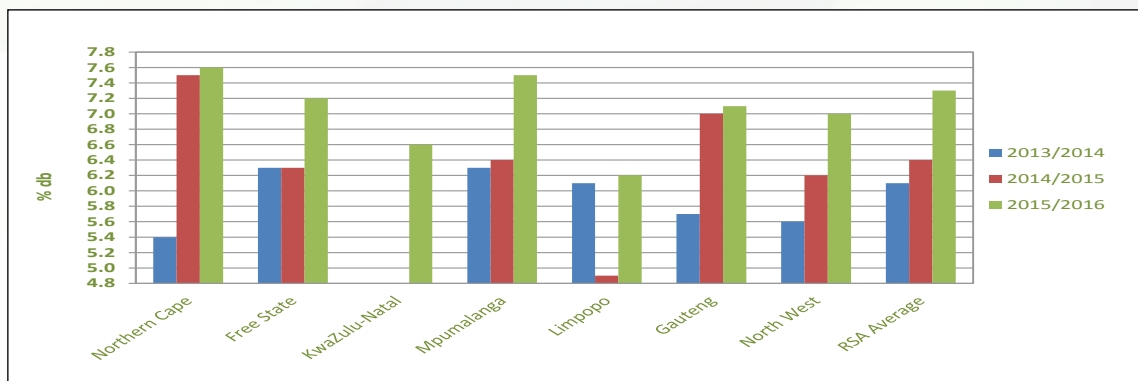


Table 4: South African Soybean Crop Quality Averages 2015/2016 vs 2014/2015

Class and Grade Soya	2015/2016			2014/2015		
	SB1	COSB	Average	SB1	COSB	Average
<u>Grading:</u>						
(A) Wet pods, %	0.00	0.00	0.00	0.00	0.00	0.00
(B) Foreign matter, including stones, other grains and sunflower seeds: Provided that such deviations are individually within the limits specified in items (c), (d), and (e), %	0.66	2.35	0.85	0.71	1.56	0.82
(C) Other grain, %	0.07	1.02	0.17	0.07	0.65	0.14
(D) Sunflower seed, %	0.00	0.08	0.01	0.00	0.03	0.01
(E) Stones, %	0.01	0.13	0.02	0.04	0.04	0.04
(F) Sclerotia, %	0.03	0.09	0.04	0.01	0.01	0.01
(G) Soybeans and parts of soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	0.82	1.67	0.92	1.56	3.48	1.81
(H) Defective soybeans on the 4.75 mm round hole sieve, %	1.95	2.55	2.02	1.95	1.94	1.95
(I) Soiled soybeans, %	1.87	3.56	2.06	0.72	1.07	0.77
(J) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	0.70	2.44	0.89	0.72	1.58	0.83
Poisonous seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	0	2	0	0	2	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	6	1	0	2	0
Undesirable odour	No	No	No	No	No	No
Live insects	No	No	No	No	No	No
Number of samples	127	16	143	131	19	150
<u>Nutritional analysis:</u>						
Moisture, % (17 hr, 103 °C)	7.4	7.7	7.4	7.0	7.1	7.0
Crude Protein, % (db)	40.24	40.08	40.22	40.05	38.84	39.89
Crude Fat, % (db)	19.4	19.6	19.4	19.2	19.6	19.3
Crude Fibre, % (db)	7.3	7.3	7.3	6.4	6.2	6.4
Ash, % (db)	4.60	4.74	4.61	4.63	4.72	4.64
Number of samples	127	16	143	131	19	150

Genetic Modification (GM)

The majority of soybeans produced/grown in South Africa is genetically modified, an estimated 95% of the area planted to soybeans in South Africa was GM. These soybeans have tolerance to herbicides (chemical products used to destroy weeds, but not the crop plants). Worldwide, GM soybeans occupy 80% of the area planted to soybeans.

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 2015/2016 season		
Region	Class and grade	CP4 EPSPS, %
10	SB1	>3.0
12	SB1	>3.0
20	SB1	>3.2
21	COSB	>3.0
25	SB1	>3.0
27	SB1	>3.0
28	SB1	>3.0
29	SB1	>3.0
30	SB1	>3.0
31	SB1	>3.0
32	SB1	>3.0
33	SB1	>3.0
34	SB1	>3.0
35	SB1	>3.0
36	SB1	>3.0
Average of samples		>3.0
Number of samples		15

SOUTH AFRICAN REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(10) Griqualand-West Region				(12) North-West Western Region				(13) North-West Central Region (Sannieshof)			
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)				Blaauwbank (Bins) Buhrmannsdrif (Bins) Kameel (Bins) Mareetsane (Bins) Vryburg (Bins)				Biesiesvlei (Bins) Bossies (Bins) Gerdau (Bins) Oppaslaagte (Bins) Sannieshof (Bins)			
<u>Grading:</u>	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
(a) Wet pods, %	0.00	-	-	-	0.00	-	-	-	0.00	-	-	-
(b) Foreign matter, including stones, other grains and sunflower seeds: Provided that such deviations are individually within the limits specified in items (c), (d), and (e), %	0.26	-	-	-	1.85	-	-	-	0.92	-	-	-
(c) Other grain, %	0.00	-	-	-	0.14	-	-	-	0.08	-	-	-
(d) Sunflower seed, %	0.00	-	-	-	0.00	-	-	-	0.00	-	-	-
(e) Stones, %	0.10	-	-	-	0.00	-	-	-	0.00	-	-	-
(f) Sclerotia, %	0.10	-	-	-	0.12	-	-	-	0.08	-	-	-
(g) Soybeans and parts of Soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	0.40	-	-	-	0.86	-	-	-	1.10	-	-	-
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	4.94	-	-	-	0.86	-	-	-	1.62	-	-	-
(i) Soiled Soybeans, %	1.28	-	-	-	1.00	-	-	-	0.90	-	-	-
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	0.36	-	-	-	1.97	-	-	-	1.00	-	-	-
Poisonous seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	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	-	-	-
Number of samples	1				1				1			
<u>Nutritional analysis:</u>	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
Moisture, % (17 hr, 103 °C)	8.3	-	-	-	7.4	-	-	-	6.6	-	-	-
Crude protein, % (db)	41.56	-	-	-	40.00	-	-	-	40.88	-	-	-
Crude fat, % (db)	20.2	-	-	-	18.7	-	-	-	20.0	-	-	-
Crude Fibre, % (db)	7.6	-	-	-	7.4	-	-	-	6.5	-	-	-
Ash, % (db)	5.25	-	-	-	5.27	-	-	-	4.64	-	-	-
Number of samples	1				1				1			

SOUTH AFRICAN

REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(14) North-West Southern Region				(18) North-West Central Region (Ventersdorp)				(20) North-West Eastern Region			
	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
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)				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)			
<u>Grading:</u>												
(a) Wet pods, %	0.00	-	-	-	0.00	-	-	-	0.00	0.00	0.00	0.00
(b) Foreign matter, including stones, other grains and sunflower seeds: Provided that such deviations are individually within the limits specified in items (c), (d), and (e), %	1.02	-	-	-	4.60	-	-	-	1.15	0.38	2.72	1.10
(c) Other grain, %	0.00	-	-	-	0.10	-	-	-	0.11	0.10	0.12	0.01
(d) Sunflower seed, %	0.00	-	-	-	0.75	-	-	-	0.04	0.00	0.08	0.05
(e) Stones, %	0.00	-	-	-	0.00	-	-	-	0.03	0.00	0.10	0.05
(f) Sclerotia, %	0.00	-	-	-	0.60	-	-	-	0.11	0.00	0.16	0.08
(g) Soybeans and parts of Soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	3.62	-	-	-	1.68	-	-	-	1.30	0.90	1.88	0.45
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	9.16	-	-	-	5.46	-	-	-	3.70	2.40	6.16	1.72
(i) Soiled Soybeans, %	3.82	-	-	-	2.66	-	-	-	4.92	0.60	8.20	3.24
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	1.02	-	-	-	5.20	-	-	-	1.25	0.40	2.88	1.15
Poisonous seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	0	-	-	-	0	-	-	-	3	0	10	5.00
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	-	-	-	5	0	20	10.00
Number of samples	1				1				4			
<u>Nutritional analysis:</u>												
Moisture, % (17 hr, 103 °C)	6.9	-	-	-	6.6	-	-	-	7.3	6.6	8.0	0.73
Crude protein, % (db)	41.41	-	-	-	39.72	-	-	-	39.63	35.91	41.00	2.48
Crude fat, % (db)	18.8	-	-	-	19.2	-	-	-	20.6	20.5	20.7	0.10
Crude Fibre, % (db)	6.2	-	-	-	7.9	-	-	-	6.9	6.5	7.2	0.29
Ash, % (db)	4.65	-	-	-	4.89	-	-	-	5.14	4.91	5.29	0.17
Number of samples	1				1				4			

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)			
	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
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) Misgunst (Bunkers) Odendaalsrus (Bins) Schoonspruit (Bins) Schuttendraai (Bins)				Bultfontein (Bins) Losdoorns (Bins) Protespan (Bins) Tierfontein (Bins) Wesselsbron (Bins) Willemsrus (Bins)			
<u>Grading:</u>												
(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 and sunflower seeds: Provided that such deviations are individually within the limits specified in items (c), (d), and (e), %	1.28	0.44	2.31	0.79	0.40	-	-	-	0.67	0.10	1.23	0.80
(c) Other grain, %	0.13	0.00	0.23	0.10	0.10	-	-	-	0.05	0.00	0.10	0.07
(d) Sunflower seed, %	0.12	0.00	0.30	0.13	0.00	-	-	-	0.00	0.00	0.00	0.00
(e) Stones, %	0.39	0.00	1.55	0.78	0.00	-	-	-	0.00	0.00	0.00	0.00
(f) Sclerotia, %	0.05	0.00	0.20	0.10	0.00	-	-	-	0.05	0.00	0.10	0.07
(g) Soybeans and parts of Soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	2.40	0.90	5.50	2.10	1.80	-	-	-	0.66	0.20	1.12	0.65
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	3.22	1.70	6.25	2.05	1.60	-	-	-	3.22	2.94	3.50	0.40
(i) Soiled Soybeans, %	2.31	1.33	3.25	0.96	0.40	-	-	-	1.50	1.28	1.72	0.31
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	1.33	0.44	2.31	0.81	0.40	-	-	-	0.72	0.20	1.23	0.73
Poisonous seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	1	0	3	1	0	-	-	-	0	0	0	0.00
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	0.00
Number of samples	4				1				2			
<u>Nutritional analysis:</u>												
Moisture, % (17 hr, 103 °C)	7.4	7.2	7.6	0.18	7.3	-	-	-	7.8	7.7	7.8	0.07
Crude protein, % (db)	40.42	40.17	40.72	0.24	38.74	-	-	-	40.71	40.41	41.00	0.42
Crude fat, % (db)	19.2	18.4	20.0	0.66	20.6	-	-	-	18.7	18.4	18.9	0.35
Crude Fibre, % (db)	6.5	6.1	6.9	0.35	5.2	-	-	-	7.3	6.6	8.0	0.99
Ash, % (db)	4.87	4.79	5.01	0.10	4.87	-	-	-	4.94	4.86	5.01	0.11
Number of samples	4				1				2			

SOUTH AFRICAN

REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(24) Free State Central Region				(25) Free State South-Western Region				(26) Free State South-Eastern Region			
	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
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)			
Grading:												
(a) Wet pods, %	0.00	-	-	-	0.00	0.00	0.00	0.00	0.00	-	-	-
(b) Foreign matter, including stones, other grains and sunflower seeds: Provided that such deviations are individually within the limits specified in items (c), (d), and (e), %	0.50	-	-	-	1.02	0.18	2.40	1.20	0.30	-	-	-
(c) Other grain, %	0.08	-	-	-	0.67	0.00	2.00	1.15	0.16	-	-	-
(d) Sunflower seed, %	0.00	-	-	-	0.03	0.00	0.10	0.06	0.08	-	-	-
(e) Stones, %	0.00	-	-	-	0.00	0.00	0.00	0.00	0.00	-	-	-
(f) Sclerotia, %	0.12	-	-	-	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, %	1.12	-	-	-	0.83	0.00	1.40	0.74	0.45	-	-	-
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	4.40	-	-	-	1.50	0.24	2.54	1.17	2.70	-	-	-
(i) Soiled Soybeans, %	1.80	-	-	-	0.67	0.10	1.80	0.98	0.00	-	-	-
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	0.62	-	-	-	1.02	0.18	2.40	1.20	0.30	-	-	-
Poisonous seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	0	-	-	-	0	0	0	0.00	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	0.00	0	-	-	-
Number of samples	1				3				1			
Nutritional analysis:												
Moisture, % (17 hr, 103 °C)	7.6	-	-	-	8.2	7.4	8.6	0.67	7.8	-	-	-
Crude protein, % (db)	40.34	-	-	-	40.66	39.64	42.20	1.36	40.02	-	-	-
Crude fat, % (db)	21.6	-	-	-	18.0	17.3	19.0	0.91	19.5	-	-	-
Crude Fibre, % (db)	7.1	-	-	-	7.2	6.8	7.6	0.40	7.3	-	-	-
Ash, % (db)	4.91	-	-	-	4.66	4.57	4.75	0.09	4.84	-	-	-
Number of samples	1				3				1			

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)			
Grading:	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
(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 and sunflower seeds: Provided that such deviations are individually within the limits specified in items (c), (d), and (e), %	0.68	0.20	1.28	0.55	0.22	0.00	0.50	0.21	0.63	0.06	1.26	0.36
(c) Other grain, %	0.08	0.00	0.16	0.08	0.05	0.00	0.40	0.14	0.10	0.00	0.33	0.12
(d) Sunflower seed, %	0.05	0.00	0.08	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.01
(e) Stones, %	0.00	0.00	0.00	0.00	0.02	0.00	0.12	0.04	0.02	0.00	0.16	0.05
(f) Sclerotia, %	0.00	0.00	0.00	0.00	0.01	0.00	0.10	0.04	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, %	0.68	0.22	1.02	0.41	0.61	0.08	1.40	0.52	0.77	0.08	2.01	0.47
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	5.15	0.36	9.44	4.56	1.68	0.50	4.60	1.38	1.35	0.28	3.56	0.87
(i) Soiled Soybeans, %	1.05	0.80	1.20	0.22	2.73	0.50	7.40	2.44	0.81	0.00	2.66	0.99
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	0.68	0.20	1.28	0.55	0.23	0.00	0.60	0.23	0.63	0.06	1.26	0.36
Poisonous seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	0	0	0	0.00	0	0	0	0.00	0	0	0	0.00
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	0.00	0	0	2	0.71	0	0	0	0.00
Number of samples	3				8				12			
Nutritional analysis:	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
Moisture, % (17 hr, 103 °C)	7.5	7.3	7.7	0.21	7.6	7.2	8.3	0.44	7.1	6.8	7.8	0.35
Crude protein, % (db)	38.71	36.41	40.08	2.01	40.19	38.37	41.96	1.10	40.49	37.71	42.19	1.31
Crude fat, % (db)	19.7	18.3	20.5	1.19	19.1	17.7	21.1	1.08	18.7	17.1	20.5	0.97
Crude Fibre, % (db)	8.3	7.7	8.7	0.53	7.5	6.3	8.1	0.65	7.0	6.1	8.2	0.63
Ash, % (db)	4.86	4.58	5.27	0.36	4.72	4.59	4.91	0.11	4.58	4.42	4.86	0.14
Number of samples	3				8				12			

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) Hendriksvallei (Bunkers) 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)			
<u>Grading:</u>	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
(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 and sunflower seeds: Provided that such deviations are individually within the limits specified in items (c), (d), and (e), %	0.69	0.10	2.63	0.55	1.03	0.12	5.84	1.26	1.85	0.08	9.85	2.48
(c) Other grain, %	0.05	0.00	0.30	0.09	0.38	0.00	5.44	1.23	0.49	0.00	5.40	1.42
(d) Sunflower seed, %	0.00	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(e) Stones, %	0.02	0.00	0.42	0.08	0.00	0.00	0.08	0.02	0.00	0.00	0.00	0.00
(f) Sclerotia, %	0.02	0.00	0.10	0.04	0.01	0.00	0.08	0.03	0.13	0.00	0.76	0.26
(g) Soybeans and parts of Soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	0.92	0.20	4.31	0.70	0.99	0.16	2.22	0.50	0.93	0.18	2.20	0.78
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	1.31	0.34	3.02	0.65	1.75	0.24	4.96	1.26	1.62	0.68	4.10	0.83
(i) Soiled Soybeans, %	1.59	0.00	3.86	1.06	2.02	0.00	5.44	1.79	2.60	0.50	6.39	2.18
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	0.71	0.10	2.63	0.57	1.04	0.12	5.84	1.26	1.98	0.08	9.95	2.54
Poisonous seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	0	0	6	1.07	0	0	0	0.00	1	0	10	2.67
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	10	2.04	0	0	0	0.00	0	0	0	0.00
Number of samples	35				20				14			
<u>Nutritional analysis:</u>	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
Moisture, % (17 hr, 103 °C)	7.4	6.8	7.8	0.28	7.5	7.2	7.9	0.19	7.6	7.4	7.7	0.09
Crude protein, % (db)	40.07	38.24	42.28	1.06	40.43	37.35	42.67	1.32	40.06	38.72	41.09	0.91
Crude fat, % (db)	19.1	17.8	20.6	0.64	19.3	18.0	20.7	0.64	19.3	18.4	20.2	0.52
Crude Fibre, % (db)	7.6	6.5	8.6	0.54	7.4	6.0	8.8	0.82	7.5	6.1	8.6	0.65
Ash, % (db)	4.48	4.18	4.75	0.15	4.48	4.33	4.77	0.12	4.61	4.38	4.81	0.12
Number of samples	35				20				14			

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) Bronkhorstspruit (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)			
<u>Grading:</u>	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
(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 and sunflower seeds: Provided that such deviations are individually within the limits specified in items (c), (d), and (e), %	0.44	0.10	0.98	0.28	0.72	0.23	1.52	0.49	0.80	-	-	-
(c) Other grain, %	0.12	0.00	0.40	0.13	0.22	0.00	0.70	0.30	0.10	-	-	-
(d) Sunflower seed, %	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.08	-	-	-
(e) Stones, %	0.03	0.00	0.26	0.08	0.00	0.00	0.00	0.00	0.00	-	-	-
(f) Sclerotia, %	0.01	0.00	0.06	0.02	0.03	0.00	0.16	0.07	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, %	0.80	0.25	1.52	0.40	1.04	0.70	1.92	0.50	1.30	-	-	-
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	1.28	0.82	2.23	0.48	1.63	0.72	3.42	1.11	3.28	-	-	-
(i) Soiled Soybeans, %	1.41	0.15	6.00	1.70	2.51	0.32	9.74	4.05	4.46	-	-	-
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	0.44	0.10	0.98	0.28	0.75	0.39	1.52	0.45	0.80	-	-	-
Poisonous seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	0	0	0	0.00	0	0	2	0.89	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	0.00	4	0	20	8.94	25	-	-	-
Number of samples	10				5				1			
<u>Nutritional analysis:</u>	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
Moisture, % (17 hr, 103 °C)	7.2	6.8	7.6	0.30	7.4	6.7	8.0	0.48	8.0	-	-	-
Crude protein, % (db)	40.04	37.20	41.40	1.18	38.86	37.71	40.47	1.05	40.59	-	-	-
Crude fat, % (db)	19.2	17.9	21.4	0.94	20.0	19.5	20.5	0.42	20.9	-	-	-
Crude Fibre, % (db)	7.6	6.3	8.6	0.73	7.1	5.9	8.6	1.00	6.2	-	-	-
Ash, % (db)	4.47	4.23	5.15	0.27	4.62	4.45	4.76	0.13	5.22	-	-	-
Number of samples	10				5				1			

SOUTH AFRICAN

REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(36) KwaZulu-Natal			
Silo/Intake stands (Type of storage)	Bergville (Bins/Bunkers) Bloedrivier (Bins) Dannhauser (Bins) Dundee (Bins) Mizpah (Bins) Paulpietersburg (Bins) Pietermaritzburg (Bins) Vryheid (Bins) Winterton (Bins/Bunkers)			
<hr/>				
<u>Grading:</u>	ave	min	max	stdev
(a) Wet pods, %	0.00	0.00	0.00	0.00
(b) Foreign matter, including stones, other grains and sunflower seeds: Provided that such deviations are individually within the limits specified in items (c), (d), and (e), %	0.53	0.16	0.78	0.24
(c) Other grain, %	0.05	0.00	0.16	0.06
(d) Sunflower seed, %	0.00	0.00	0.00	0.00
(e) Stones, %	0.01	0.00	0.10	0.03
(f) Sclerotia, %	0.04	0.00	0.20	0.07
(g) Soybeans and parts of Soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	0.45	0.22	0.85	0.18
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	3.34	1.96	4.86	0.92
(i) Soiled Soybeans, %	3.56	0.58	9.26	2.67
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	0.57	0.16	0.84	0.27
Poisonous seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	0	0	5	1.34
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	20	5.35
Number of samples	14			
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<u>Nutritional analysis:</u>	ave	min	max	stdev
Moisture, % (17 hr, 103 °C)	7.7	7.1	8.1	0.35
Crude protein, % (db)	41.02	39.95	42.34	0.81
Crude fat, % (db)	20.6	19.8	22.1	0.74
Crude Fibre, % (db)	6.6	4.6	7.8	0.88
Ash, % (db)	4.69	4.29	4.99	0.24
Number of samples	14			

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 dispensation REF NO 20/4/14/1 dated 19th January 2016 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 76 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).

NUTRITIONAL 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 ± 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 verify 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

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Issue No.: 26

Date of Issue: 26 January 2017

Expiry Date: 31 October 2019

Material or Products Tested	Type of Tests / Properties Measured, Range of Measurement	Standard Specifications, Techniques / Equipment Used
CHEMICAL		
Ground Barley	Moisture (Oven Method)	Analytical EBC Method 3.2, latest Edition (2 hour; 130°C)
Cereal and cereal products specifically-wheat, rice, (hulled paddy), barley, millet, rye, and oats as grain, semolina and flour	Moisture (Oven Method)	ICC Std No.110/1, Latest Edition (90 min; 130°C) (2 hour; 130°C)
Flour, semolina, bread, all kind of grains and cereal products and food products (except those that are sugar coated)	Moisture (Oven Method)	AACCI 44-15.02, Latest Edition (1 hour; 130°C) (72 hour; 103°C)

Facility Number: T0116

All flours, cereal grains, oilseeds and animal feeds	Nitrogen and protein (Combustion method - Dumas)	AACCI 46-30.01, Latest Edition
Cereal based food stuff	Dietary fibres (Total)	In-house method 012
Food stuff and feeds	Carbohydrates (by difference) (calculation) Energy value (calculation) Total digestible nutritional value (calculation)	SOP MC 23
Food Stuff and feeds	Determination of Ash	In-house method 011
Wheat Kernels	Moisture (Oven Method)	Government Gazette Wheat Regulation, Latest Edition (72 hour, 103°C)
Flours of grains e.g. barley, oats, triticale, maize, rye, sorghum and wheat; oilseeds like soybeans and sunflower, feeds and mixed feeds and foodstuffs	Crude fat (Ether extraction by Soxhlet)	In-house method 024
Meal and flour of wheat, rye, barley, other grains, starch containing and malted products	Falling number	ICC Std 107/1, Latest Edition
NUTRIENTS AND CONTAMINANTS		
Vitamin fortified food and feed products and fortification mixes grain based	Vitamin A as all trans Retinol (Saponification) (HPLC)	In-house method 001
	Thiamine Mononitrate (HPLC) Riboflavin (HPLC) Nicotinamide (HPLC) Pyridoxine Hydrochloride (HPLC)	In-house method 002
	Folic Acid (HPLC)	In-house method 003
Grain based food and feed products (fortified and unfortified) and fortification mixes	Total Sodium (Na) Total Iron (Fe) Total Zinc (Zn)	In-house method 010
Food and feed	Multi-Mycotoxin: -Aflatoxin G ₁ , B ₁ , G ₂ , B ₂ and total -Deoxynivalenol (DON), 15-ADON -Fumonisin B ₁ , B ₂ , B ₃ -Ochratoxin A -T2, HT-2 -Zearalenone	In-house method 026

GRADING

Maize	Defective kernels (White maize/ yellow maize)	Government Gazette Maize Regulation, Latest Edition
Cereal as grains (Wheat, barley, rye and oats)	Hectolitre mass (Kern222)	ISO 7971-3, Latest edition
Wheat	Screenings	Government Gazette Wheat Grading Regulation, Latest Edition

RHEOLOGICAL

Wheat flour	Alveograph (Rheological properties)	ICC Std.121, Latest Edition
Flours	Farinograph (Rheological properties)	AACCI 54.02, Latest Edition (Rheological behaviour of flour Farinograph: Constant Flour Weight procedure)
Hard, soft and durum wheat (flour and whole wheat flour)	Mixograph (Rheological properties)	Industry accepted method 020 (Based on AACCI 54-40.02, Latest Edition Mixograph Method)

Original Date of Accreditation: 01 November 1999

ISSUED BY THE SOUTH AFRICAN NATIONAL ACCREDITATION SYSTEM



Accreditation 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/
2015/16
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 38th successive year this past growing season. A total of 19 trials were planted at 18 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 as well as a Latinized row-column design using three replications with 28 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 (RCBD) as well as a Latinized row-column design.

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

The trial means (x-axis) versus the cultivar means (y-axis) 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.

A yield probability of more than 50% indicated above average yield and a yield probability of less than 50% indicated a below average yield.

3 DISCUSSION OF RESULTS

3.1 GENERAL

The rainfall and irrigation data are shown in Table 3. **Mpumalanga:** The main soybean production areas of the province received more than 80% of the long-term rainfall, however the rainfall was sporadic early in the season. Some areas also experienced a drought just after planting. Normal rainfall figures were recorded during November and December with extremely high temperatures. Most of the area received above average rainfall during January and March, while average temperatures were recorded.

Western production areas for the Free State and North West: The production areas in North West received less than 40% of the average long-term rainfall which was also poorly distributed and accompanied with extremely high temperatures. Due to the drought the trials at Migdol, Hoopstad and Clocolan could not be planted! The dryland trial at Potchefstroom was also planted late during the beginning of December when extreme high temperatures was recorded. Although the eastern areas of the Free State also received below average rainfall the distribution was good and most of the plantings were done on time.

KwaZulu Natal: The Northern and Western areas of KwaZulu Natal received below average rainfall until November with a slight recovery from December onwards.

Two(2) of the trials was terminated at an early stage while three (3) other trials could not be included (high CV%) 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 Dundee –damage by pigeons (terminated).
- 2 Middelburg – High CV%. Low plant counts due to drought just after planting.
- 3 Koedoeskop – Damage by cut and false wire worms (terminated).
- 4 Potchefstroom Irrigation – High CV%. Damage by pigeons.
- 5 Potchefstroom Dryland – High CV%. Late planting and severe drought.

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 (43 days Brits) and the longest in the cooler areas (80 days at Kinross).

The number of days to physiological maturity is shown in Table 5. The longest average days to maturity was experienced at Bethlehem and Kinross (149 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) as the previous season showed a mean plant height of 94 cm (highest) in the cool area compared to 52 cm (lowest) of the semi-determinate cultivar LS 6240 R (MG 4) in the warm region. 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 46 cm at Kroonstad to 103 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 indeterminate cultivars NS 5909 R (MG 5.9), LS 6164 R (MG 6.0; determinate) and PAN 1614 R (MG 6.2) an indeterminate cultivar showed a mean pod height of 14cm in the moderate area, while PAN 6161 R (MG 6.3; determinate) also had an above average pod height in all the areas.

SSS 4945 (tuc) (MG 4.5) (semi-determinate) had the lowest reading of 5, 6 and 4 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. A pod height of at least 7.5 cm (combine harvesting height) is preferable.

3.2.4 Lodging (Table 9)

The highest lodging occurred in the trial as the previous year at Delmas including Bergville this season. The highest lodging figures was reported for DM 6.2i RR and LS 6164 R at Bergville (cool area) and DM 6.8i RR in Delmas.

3.2.5 Green stem (Table 10)

A high percentage of green stem was recorded at Brits, while the cultivar NS 5909 R, LS 6261 R and DM 6.8i RR 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 at Brits in the warm production area. Limited shattering was recorded at Glen and Kinross.

3.2.7 Number of plants (Table 12)

Enough certified seed was provided to establish 400 000 plants ha⁻¹ 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 0.31% undesirable seeds was recorded for the cool region. The range varied from 1.16% at Kroonstad to 0.13% at Kokstad.

3.2.9 Mass (g) 100⁻¹ seeds (Table 14)

The variation in seed mass among localities ranged between 12.40 g 100⁻¹ seeds at Clarens to 17.84 g 100⁻¹ seeds at Greytown Kranskop. The highest seed mass was recorded for LS 6240 R across all climatic regions, while SSS 5449 (tuc), as last season, had the smallest seed across all areas.

3.2.10 Oil percentage (Table 15)

PHB 95 Y 20 R had, the highest average oil percentage for all the regions (14.47%

3.2.11 Crude Protein percentage (Table 16)

LS 6146 R, SSS 4945 (tuc), SSS 5449 (tuc) and DM 5.1i RR had the highest values for all the climate regions.

3.2.12 Profat (Table 17)

The inclusion of this table in the report was requested by Dr Erhard Bredenham 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. SSS 4945 (tuc) had the highest average profat value for all the regions. Both the oil- and protein values are significantly lower than the previous season. However, the values compared well with the 1997/98 and 2009/10 seasons which is also regarded as extreme dry seasons.

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. Thus a 60% probability indicated a 10% change of an above average yield, while a 40% probability indicated a 10% change of getting a below average yield.

PAN 1500 R and PAN 1623 R showed an above average yield probability (Table 19) for the low to medium yield potential, (cool area), while PAN 1521 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 1521 R and PAN 1623 R showed above average figures over the whole production potential range. DM 6.2i RR, PAN 1623 R and PAN 1521 R also performed above average for the warm areas.

Lokalisiteit, medewerkers en adresse van kultivarproewe soos beplan vir, 2015/16
Localities, co-operators and addresses of the cultivar trials, 2015/16

Nr No	Lokalisiteit Locality	Adres van proeflokalisiteit 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 & R Boshoff
2	Bergville	J Jackson Shamrock H4 Bergville 3350	082 388 0311	R Wessels
3	Bethlehem	Kleingraan Instituut Bethlehem 9700	082 375 8999	L Bronkhorst & E Maree
4	Brits	Hartebeespoort Nav. Stasie Posbus 1261 Brits 0250	082 375 8999	L Bronkhorst & T Kruger
5	Cedara	Cedara P/bag X9059 Pietermaritzburg 3200	033-355 9495/079 898 5522	J Arathoon
6	Clarens	D Terblanche Taillefert Clarens 9707	082 388 0311	R Wessels
7	Delmas-Pannar	Pannar Saad Navorsingsplaas Posbus 439 Delmas 2210	013-665 8524/082 969 1981	A Mathebula
8	Dundee	Dundee Navorsingstasie Posbus 626 Dundee 3000	034 212 479/076 953 3587	M Buthelezi
9	Glen	Glen Proefplaas Bloemfontein 9300	082 375 8999	L Bronkhorst, J Richter & E Maree
10	Greytown	Pannar Proefplaas Posbus 19 Greytown 3250	033-413 9639	A Jarvie
11	Greytown Kranskop	Umvoyuna Farm Posbus 755 Greytown 3250	033-417 1494(6)/082 558 1766	P Herbst
12	Groblerdal-Loskop	Loskopproefplaas Posbus 1367 Groblersdal 0470	013-262 3042/083 274 1951	C Fourie
13	Kinross	Vosstoffel Boerdery Posbus 80 Kinross 2270	082 375 8999	L Bronkhorst
14	Koedoeskop	Sanleohan Trust Plaas Riefontein 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
18-19	Potchefstroom	IGG Proefplaas Privaatsak X1251 Potchefstroom 2520	018-299 6366/082 375 8999	L Bronkhorst

Tabel 1 Sojaboonsoad eienskappe en inligting oor verskaffers, 2015/16
Table 1 Soybean seed characteristics and information about agents, 2015/16

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
PAN 1454 R	4.3	I	BL	P	B	JAYES	Pannar	JAYES
SSS 4945 (tuc)	4.5	SD	-	W	-	JAYES	Sensako	JAYES
LS 6146 R	4.4	I	BL	P	G	JAYES	Link Seed	JAYES
PHB 94 Y 80 R	4.8	ID	LB	P	W	JAYES	Pioneer	JAYES
LS 6248 R	4.8	SD	BL	W	W	JAYES	Link Seed	JAYES
SSS 5449 (tuc)	4.9	I	-	P	-	JAYES	Sensako	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	5.2	D	BL	P	G	JAYES	Pioneer	JAYES
DM 5953 RSF	5.3	I	IB	P	W	JAYES	GDM Seeds	JAYES
SSS 5052 (tuc)	5.5	I	-	W	-	JAYES	Sensako	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
LS 6261 R	6.0	SD	BL	W	B	JAYES	Link Seed	JAYES
PHB 96 T 06 R	6.0	I	KL	W	G	JAYES	Pioneer	NEE/NO
PAN 1623 R	6.1	I	KL	W	G	JAYES	Pannar	JAYES
LS 6161 R	6.3	D	IB	P	B	JAYES	Link Seed	JAYES
DM 6.2i RR	6.2	I	LB	P	G	JAYES	GDM Seeds	JAYES
SSS 6560 (tuc)	6.2	I	-	W	-	JAYES	Sensako	JAYES
LS 6164 R	6.0	D	LB	W	G	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

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

*2 BL - Swart/black; IB - Onvolloedig swart/imperfect black; B - Bruin/brown; LB - Ligbruin/buff; G - Grys/grey; KL - Kleurloos/buff

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

*4 B - Bruin/brown; G - Grys/grey; W - Wit/white; T - Taankleurig/Tawny

Tabel 2 Algemene inligting aangaande grond en verbouingspraktike by die onderseke proeflokaleite van die kultivarproewe, 2015/16
Table 2 General information in connection with soil and cultivation practices at the different trial localities, 2015/16

Lokaleite Locality	Plantdatum Date of planting	Grondvorm Soil type	Grond ontleding Soil analysis			Bemesting Fertilization			Spasiëring Spacing (cm)	Onkruid beheer Weed control	Koördinate van lokaleite Co-ordinate of localities	
			pH (H ₂ O)	P	K	N	P	K			Latitude	Longitude
Atlanta/B	09/12/15	Katspruit	6.44	4	292	0	0	0	75	Geen. Slegs geskoffel	25.591916S	27.719345E
Bergville/B	25/11/15	-	4.05	13.7	148.35	-	-	-	90	-	28°43.234"S	29°18.433"E
Bethlehem/D	21/10/15	Avalon	6.54	54	283	3.64	2.52	0	90	Strongarm, Agill, Round-up, skoffel	28°09'36.1"S	028°18'14.9"E
Brits/B	02/11/15	Arcadia	8.01	16	40	1.4	13.86	21	75	Strongarm, Agill, Round-up, skoffel	26°21'31.7"S	029°08'04.5"E
Cedara/D	17/11/15	Hutton	4.63	13	103	0	20	0	45	Dual S Gold, Hammer, Basagran	29°32'10"S	30°16'00"E
Clarens/D	18/11/15	-	4.95	69.4	133.6	-	-	-	90	-	28°23.987"S	28°25.254"E
Clocolan/D	Droogte/Dry	-	4.82	54	78	-	-	-	75	-	-	-
Delmas/D	07/12/15	Sandy loam (Bloemdal)	5.0-5.5	35	-	11.2	0.84	4	90	Flumetsulam, Metolachlor 960, Roundup	26°08'45.7S	028°42'53.7E
Dundee/D	21/12/15	Hutton	3.83	28	174	-	-	-	45	-	-	-
Glen/B	17/11/15	Hutton	7.32	20	150	4.2	13.02	0	75	Strongarm, Agill, Round-up	28°55.747"S	026°19.586"S
Greytown/D	02/12/15	Hutton	-	-	-	-	-	-	75	Metagan Gold, Roundup	-	-
Greytown Kranskop/D	30/11/15	Hutton	-	-	-	0	21	50	90	Felgan Gold, Classic	29°03'40.31'S	30°41'09.95'E
Grobiersdal/B	04/11/15	Avalon	5.92	43	323	0	18.38	0	75	Strongarm, Agill, Round-up	25°10'43.2"S	29°23'16.2"E
Hoopstad	Droogte/Dry	-	7.04	28	130	-	-	-	75	-	-	-
Kinross/D	28/10/15	-	5.62	52	230	2.8	2.31	0	75	Strongarm, Agill, Round-up, skoffel	26°21'31.8" S	029°08'04.4"E
Koedoekop/B	Wurms/Worms	-	-	-	-	-	-	-	52	-	-	-
Kokstad/D	02/12/15	-	4.06	18	116	-	-	-	45	Dual Gold	-	-
Kroonstad/D	08/12/15	-	5.17	32	133	5.04	2.31	0	90	Strongarm, Agill, Round-up, skoffel	27°36'28.9"S	027°14'00"E
Middelburg/D	24/11/15	-	Boer werk op globale monster			-	-	-	75	Strongarm, Agill, Round-up, skoffel	25°41'25.0"S	029°43'48.7"E
Migdol/D	Droogte/Dry	-	5.61	70	218	-	-	-	75	-	-	-
Potchefstroom/B	12/11/15	Hutton	6.61	12	370	0	15.12	0	75	Strongarm, Alachlor, Round-up, skoffel	26°44'.12.8"S	027°03'36.6"E
Potchefstroom/D	15/12/15	Hutton	5.79	21	350	0	7.56	0	90	Strongarm, Alachlor, Round-up, skoffel	26°44'12.5"S	027°03'38.9"E

- Inligting nie beskikbaar/information not available

Tabel 3 Reënval en besproeiing vir die verskillende lokaliteite (mm), 2015/16

Table 3 Rainfall and irrigation at the different localities (mm), 2015/16

Lokaliteit Locality	Maandelikse reënval (mm)/Monthly rainfall (mm)												Totaal Total *	Besproeiing Irrigation	Totaal Total **
	Okt	Nov	Des	Jan	Feb	Mrt	Apr								
Atlanta	0	20	19	148	48	190	10	435	365	800					
Bethlehem	32.77	52.58	39.37	166.12	89.92	52.83	61.21	494.8	140	634.8					
Brits	2	24	25	152	52	185	14	454	700	1154					
Cedara	24.9	54.1	84.6	158.3	115.8	95.5	20.1	553.3	50	603.3					
Delmas	37.8	78.2	97.4	170.2	92.2	182.2	2.8	660.8	0	660.8					
Glen	0	26	0	0	85	14	82	207	571	778					
Greytown	24	234.8	236	122.4	60.2	104.6	21	803	0	803					
Greytown Kranskop	28	68	135	85	65	142	28	551	40	591					
Groblersdal	28.19	45.21	37.59	56.9	72.4	50.8	41.15	332.24	400	732.24					
Kokstad	17.5	65.2	67	47	109	133.3	36	475	0	475					
Potchefstroom B	30.48	36.58	64.7	94.74	76.96	60.2	76.96	440.62	470	910.62					
Potchefstroom Drg	30.48	36.58	64.7	94.74	76.96	60.2	76.96	440.62	0	440.62					

* 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, 2015/16
 Table 4 The number of days from planting to 50% flowering stage of the different trial localities, 2015/16

Kultivar	Koel/Cool						Matig/Moderate						Warm		
	Bethlehem	Clarens	Delmas	Kinross	Kokstad	Gem/Mean	Bergville	Cedara	Glen	Greytown	Kranskop	Kroonstad	Gem/Mean	Brits	Groblersdal
LS 6240 R	70	57	41	68	65	60	63	46	57	35	36	47	53	44	49
PAN 1454 R	78	57	42	78	65	64	57	46	57	35	36	46	43	41	42
SSS 4945 (tuc)	78	57	44	68	68	63	43	46	57	35	36	43	43	41	42
LS 6146 R	78	76	45	70	68	67	43	45	57	35	36	43	45	41	43
PHB 94 Y 80 R	81	57	46	70	68	64	60	49	57	42	36	49	50	41	46
LS 6248 R	72	57	57	82	76	69	61	63	72	49	64	62	50	41	46
SSS 5449 (tuc)	84	76	56	86	75	75	79	60	72	51	49	62	61	44	53
NS 5009 R	78	76	47	72	65	68	43	46	57	40	36	44	43	41	42
DM 5.1i RR	84	81	46	68	68	69	43	45	57	35	36	43	43	41	42
PHB 95 Y 20 R	81	57	60	86	76	72	60	67	72	59	64	64	58	44	51
DM 5953 RSF	84	84	47	72	64	70	43	48	57	37	49	47	52	41	47
SSS 5052 (tuc)	78	76	60	86	72	74	58	64	72	57	64	63	53	44	49
PAN 1521 R	78	57	60	93	75	73	59	64	67	57	64	62	55	41	48
PAN 1500 R	67	79	60	93	75	75	43	67	72	57	66	61	53	44	49
NS 5909 R	86	84	60	94	72	79	59	67	72	57	64	64	58	44	51
LS 6261 R	72	76	58	86	75	73	52	64	72	51	62	60	61	44	53
PHB 96 T 06 R	78	84	62	86	71	76	63	69	74	60	64	66	61	44	53
PAN 1623 R	78	76	60	86	75	75	62	67	72	55	49	61	53	41	47
LS 6161 R	84	57	62	78	72	71	63	65	72	49	64	63	58	41	50
DM 6.2i RR	78	57	62	93	76	73	43	66	72	57	64	60	55	44	50
SSS 6560 (tuc)	78	76	56	82	75	73	63	64	72	57	62	64	53	41	47
LS 6164 R	72	76	58	79	75	72	58	63	72	52	62	61	58	41	50
PAN 1614 R	76	84	60	82	75	75	62	66	72	57	64	64	55	55	55
NS 6448 R	78	84	58	93	76	78	63	67	72	57	64	65	58	47	53
DM 6.8i RR	72	84	63	68	76	73	43	69	72	55	64	61	55	47	51
NS 7211 R	78	76	60	82	72	74	64	68	72	55	64	65	45	41	43
Standaard 1	78	76	39	72	65	66	43	45	62	37	36	45	43	41	42
Standaard 2	78	76	58	78	72	72	59	67	72	57	64	64	61	41	51
Gem/Mean	78	72	55	80	72	71	55	59	67	49	54	57	53	43	48

Tabel 5 Die aantal dae vanaf plant tot fisiologiespystadium van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2015/16
 Table 5 The number of days from planting to physiological maturity of the different soybean cultivars at the different trial localities, 2015/16

Kultivar	Koel/Cool				Matig/Moderate				Warm				
	Bethlehem	Clarens	Delmas	Kinross	Kokstad	Gem/Mean	Bergville	Cedara	Kroonstad	Gem/Mean	Brits	Groblersdal	Gem/Mean
LS 6240 R	134	104	119	139	125	124	105	117	107	110	127	106	117
PAN 1454 R	134	111	124	133	121	125	110	119	106	112	120	110	115
SSS 4945 (tuc)	137	105	120	126	121	122	113	117	106	112	127	106	117
LS 6146 R	134	107	121	133	125	124	110	117	107	111	127	106	117
PHB 94 Y 80 R	134	115	119	133	125	125	113	120	106	113	127	106	117
LS 6248 R	155	116	131	154	128	137	115	130	107	117	135	124	130
SSS 5449 (tuc)	144	117	144	146	132	137	108	128	112	116	120	114	117
NS 5009 R	134	115	120	133	125	125	112	123	106	114	120	110	115
DM 5.1i RR	134	116	119	133	125	125	112	115	106	111	127	106	117
PHB 95 Y 20 R	160	116	135	161	138	142	110	133	115	119	127	124	126
DM 5953 RSF	134	118	126	133	135	129	109	120	106	112	127	106	117
SSS 5052 (tuc)	160	118	140	161	140	144	112	137	118	122	135	117	126
PAN 1521 R	155	122	135	154	138	141	116	131	109	119	127	117	122
PAN 1500 R	155	123	140	154	140	142	116	135	118	123	135	110	123
NS 5909 R	155	124	139	154	138	142	118	139	118	125	135	106	121
LS 6261 R	160	125	141	154	140	144	118	134	118	123	135	117	126
PHB 96 T 06 R	160	128	135	161	142	145	121	138	118	126	129	110	120
PAN 1623 R	160	127	131	154	142	143	121	135	118	125	135	117	126
LS 6161 R	160	132	134	161	140	145	122	138	118	126	135	124	130
DM 6.2i RR	155	127	144	161	142	146	122	135	118	125	127	110	119
SSS 6560 (tuc)	160	124	137	154	142	143	122	137	118	126	135	124	130
LS 6164 R	155	128	142	161	140	145	125	139	118	127	135	117	126
PAN 1614 R	155	128	137	161	140	144	123	136	115	125	135	110	123
NS 6448 R	155	127	137	161	142	144	123	141	118	127	135	117	126
DM 6.8i RR	157	131	144	161	145	148	124	145	118	129	135	117	126
NS 7211 R	157	130	138	154	142	144	124	143	118	128	142	117	130
Standaard 1	134	114	120	133	125	125	110	117	106	111	120	106	113
Standaard 2	155	121	132	154	142	141	114	135	118	122	135	110	123
Gem/Mean	149	120	132	149	135	137	116	130	113	120	130	113	122

Tabel 6 Die aantal dae vanaf plant tot oesstadium van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2015/16
 Table 6 The number of days from planting to maturity of the different soybean cultivars at the different trial localities, 2015/16

Kultivar	Koel/Cool						Matig/Moderate						Warm		
	Bethlehem	Clarens	Delmas	Kinross	Kokstad	Gem/Mean	Bergville	Cedara	Greytown	Kranskop	Kroonstad	Gem/Mean	Brits	Groblersdal	Gem/Mean
LS 6240 R	158	142	137	149	142	146	138	134	120	118	128	137	118	128	
PAN 1454 R	158	142	137	147	142	145	142	134	120	118	129	137	142	140	
SSS 4945 (tuc)	156	142	137	147	131	143	138	134	120	116	127	150	120	135	
LS 6146 R	158	142	137	149	142	146	138	134	120	118	128	144	122	133	
PHB 94 Y 80 R	155	142	137	149	155	148	142	134	121	118	129	145	122	134	
LS 6248 R	175	149	144	152	145	153	142	143	123	125	133	147	126	137	
SSS 5449 (tuc)	175	149	148	151	142	153	138	138	121	118	129	139	118	129	
NS 5009 R	153	149	137	149	153	148	138	134	120	118	128	147	122	135	
DM 5.1i RR	150	142	137	147	142	144	142	134	120	118	129	153	122	137	
PHB 95 Y 20 R	186	157	148	185	155	166	138	147	136	134	139	147	136	142	
DM 5953 RSF	150	149	137	154	155	149	138	134	120	118	128	142	122	132	
SSS 5052 (tuc)	183	157	148	180	155	165	147	153	134	136	143	150	129	139	
PAN 1521 R	175	157	148	175	145	160	138	147	121	140	137	144	124	134	
PAN 1500 R	188	168	148	180	155	168	142	151	123	136	138	153	136	145	
NS 5909 R	192	168	148	189	155	170	147	153	136	136	143	150	136	143	
LS 6261 R	182	149	144	185	155	163	142	153	134	132	140	155	122	139	
PHB 96 T 06 R	187	157	148	185	155	166	142	153	136	140	143	150	134	142	
PAN 1623 R	186	157	151	176	155	165	142	149	134	140	141	150	139	145	
LS 6161 R	190	157	148	180	155	166	138	153	134	140	141	150	139	145	
DM 6.2i RR	195	157	156	189	155	170	147	149	136	140	143	147	129	138	
SSS 6560 (tuc)	179	157	148	170	155	162	142	153	134	136	141	150	141	146	
LS 6164 R	192	168	148	175	155	168	152	153	136	140	145	150	127	138	
PAN 1614 R	192	168	148	189	155	170	142	149	134	136	140	142	129	136	
NS 6448 R	190	168	148	189	155	170	138	153	136	140	142	147	141	144	
DM 6.8i RR	195	168	157	189	155	173	147	160	136	140	146	152	141	147	
NS 7211 R	187	157	148	185	155	166	147	160	136	140	146	158	146	152	
Standaard 1	155	142	137	147	145	145	138	144	120	118	130	139	118	129	
Standaard 2	175	157	148	170	145	159	138	147	123	140	137	144	126	135	
Gem/Mean	176	154	145	169	150	159	142	146	128	130	136	147	130	138	

Tabel 7 Die planthoogte van die verskillende sojaboonekultivars by die verskillende proef lokaliteite, 2015/16

Table 7 The plant height of the different soybean cultivars at the different trial localities, 2015/16

Kultivar	Koel/Cool						Matig/Moderate						Warm			
	Bethlehem	Clarens	Delmas	Kinross	Kokstad	Gem/Mean	Bergville	Cedara	Glen	Greytown	Greytown	Kranskop	Kroonstad	Gem/Mean	Brits	Groblersdal
LS 6240 R	62	60	81	62	48	62	80	51	55	54	63	44	58	51	54	52
PAN 1454 R	78	75	110	63	58	77	100	51	65	66	87	42	68	58	78	68
SSS 4945 (tuc)	58	50	81	57	39	57	80	45	58	54	65	43	58	47	70	59
LS 6146 R	77	65	96	73	45	71	105	48	58	64	93	43	69	62	76	69
PHB 94 Y 80 R	61	65	81	70	38	63	90	52	50	55	75	33	59	50	68	59
LS 6248 R	80	75	106	58	54	75	105	58	67	77	88	43	73	62	96	79
SSS 5449 (tuc)	55	75	107	60	52	70	75	53	67	69	80	47	65	65	62	63
NS 5009 R	72	60	89	60	43	65	75	52	50	62	70	35	57	57	68	62
DM 5.1i RR	52	65	92	45	41	59	95	46	60	56	80	40	63	57	67	62
PHB 95 Y 20 R	63	60	81	65	62	66	105	56	70	69	88	30	70	40	40	40
DM 5953 RSF	66	75	95	73	44	70	95	50	77	59	82	38	67	70	77	74
SSS 5052 (tuc)	75	85	102	62	55	76	100	68	62	64	75	50	70	65	72	68
PAN 1521 R	93	80	106	60	66	81	100	63	80	68	78	53	74	83	91	87
PAN 1500 R	76	85	104	52	60	75	115	63	60	61	78	51	71	62	67	64
NS 5909 R	80	60	113	73	63	78	110	71	80	71	83	45	77	67	79	73
LS 6261 R	73	75	100	65	48	72	80	57	52	56	70	37	59	53	64	59
PHB 96 T 06 R	90	100	118	85	74	93	110	81	78	72	107	57	84	72	89	81
PAN 1623 R	92	90	109	52	59	80	115	67	75	70	97	55	80	68	75	72
LS 6161 R	95	85	111	68	67	85	100	81	68	64	78	53	74	80	91	85
DM 6.2i RR	87	80	113	68	66	83	105	73	78	64	73	58	75	77	94	85
SSS 6560 (tuc)	90	80	115	65	56	81	100	59	73	68	85	53	73	80	71	76
LS 6164 R	97	90	124	75	62	89	110	71	80	75	103	52	82	78	80	79
PAN 1614 R	83	95	123	83	69	91	110	76	75	76	98	53	82	63	82	73
NS 6448 R	78	75	115	90	65	85	105	66	78	71	80	38	73	62	63	62
DM 6.8i RR	95	100	128	83	64	94	115	77	87	72	102	53	84	78	89	84
NS 7211 R	55	65	83	70	55	65	90	59	63	70	87	38	68	55	37	46
Standaard 1	62	55	88	62	44	62	90	50	53	56	68	41	60	58	58	58
Standaard 2	85	90	105	63	61	81	105	67	87	63	85	63	78	92	94	93
Gem/Mean	76	76	103	67	56	75	99	61	68	65	83	46	70	65	73	69

Table 8 Die peulhoogte van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2015/16

Table 8 The pod height of the different soybean cultivars at the different trial localities, 2015/16

Kultivar	Koel/Cool						Matig/Moderate						Warm			
	Bethlehem	Clarens	Delmas	Kinross	Kokstad	Gem/Mean	Bergville	Cedara	Glen	Greytown	Greytown Kranskop	Kroonstad	Gem/Mean	Prits	Groblersdal	Gem/Mean
LS 6240 R	5	7	11	5	5	7	10	8	5	10	8	1	7	2	4	3
PAN 1454 R	10	7	11	5	5	8	10	8	7	9	11	1	8	4	5	4
SSS 4945 (tuc)	5	5	6	4	3	5	6	6	7	6	10	1	6	4	4	4
LS 6146 R	8	6	8	9	3	7	16	7	6	11	8	1	8	6	6	6
PHB 94 Y 80 R	5	4	6	8	2	5	5	7	11	7	16	1	8	5	4	4
LS 6248 R	7	7	11	7	3	7	10	9	13	12	23	2	11	9	7	8
SSS 5449 (tuc)	5	5	14	6	6	7	16	8	8	10	17	1	10	5	4	5
NS 5009 R	8	6	6	4	2	5	6	7	7	9	11	1	7	5	5	5
DM 5.1i RR	2	4	7	1	3	3	10	7	8	8	7	1	7	6	3	5
PHB 95 Y 20 R	6	7	10	9	5	7	6	10	13	11	23	1	11	5	9	7
DM 5953 RSF	5	6	8	8	8	7	10	9	10	4	12	1	8	6	4	5
SSS 5052 (tuc)	8	7	12	6	5	8	12	13	12	13	15	3	11	7	5	6
PAN 1521 R	9	7	11	6	6	8	15	11	15	13	21	1	13	9	8	9
PAN 1500 R	6	10	12	5	6	8	18	13	14	12	22	2	13	8	5	7
NS 5909 R	7	4	9	10	5	7	19	13	17	14	20	2	14	10	12	11
LS 6261 R	9	13	11	8	3	9	10	11	10	11	16	1	10	5	8	7
PHB 96 T 06 R	7	14	8	11	4	9	15	15	17	13	16	2	13	7	6	6
PAN 1623 R	8	7	13	7	4	8	15	10	13	11	20	1	12	9	9	9
LS 6161 R	8	10	10	8	13	10	17	18	14	15	18	3	14	10	15	13
DM 6.2i RR	7	11	11	9	3	8	11	13	14	8	15	2	10	13	4	9
SSS 6560 (tuc)	9	11	12	7	4	9	7	13	9	13	20	2	11	8	8	8
LS 6164 R	9	10	16	11	5	10	16	12	16	15	20	3	14	9	5	7
PAN 1614 R	7	8	13	11	6	9	17	15	11	16	25	3	14	8	6	7
NS 6448 R	8	11	8	13	5	9	13	13	16	15	20	2	13	9	9	9
DM 6.8i RR	8	10	13	13	4	9	19	14	15	9	20	2	13	9	6	8
NS 7211 R	6	7	8	9	5	7	11	13	12	14	20	1	12	6	4	5
Standaard 1	6	5	7	6	6	6	9	9	11	9	11	1	8	4	5	5
Standaard 2	9	7	13	7	6	8	8	10	17	12	23	1	12	13	6	10
Gem/Mean	7	8	10	8	5	7	12	11	12	11	17	2	11	7	6	7

Table 9 Omvalwaarnemings (1-5) van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2015/16
 Table 9 Lodging dat (1-5) of the different soybean cultivars at the different trial localities, 2015/16

Kultivar	Koel/Cool						Matig/Moderate						Warm		
	Bethlehem	Clarens	Delmas	Kinross	Kokstad	Gem/Mean	Bergville	Cedara	Glen	Greytown	Kroonstad	Gem/Mean	Brits	Groblersdal	Gem/Mean
LS 6240 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
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
SSS 4945 (tuc)	1,00	1,00	1,00	1,00	1,00	1,00	2,00	1,00	1,00	1,00	1,00	1,20	1,00	1,00	1,00
LS 6146 R	1,00	1,00	1,00	1,00	1,00	1,00	2,00	1,00	1,00	1,00	1,00	1,20	1,00	1,00	1,00
PHB 94 Y 80 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
LS 6248 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
SSS 5449 (tuc)	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
NS 5009 R	1,00	1,00	1,00	1,00	1,00	1,00	2,00	1,00	1,00	1,00	1,00	1,20	1,00	1,00	1,00
DM 5.1i RR	1,00	1,00	1,00	1,00	1,00	1,00	2,00	1,00	1,00	1,00	1,00	1,20	1,00	1,00	1,00
PHB 95 Y 20 R	1,00	1,00	1,67	1,00	1,00	1,13	2,00	1,00	1,00	2,00	1,00	1,40	1,00	1,00	1,00
DM 5953 RSF	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
SSS 5052 (tuc)	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
PAN 1521 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	1,33	1,17
PAN 1500 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
NS 5909 R	1,00	1,00	1,33	1,00	1,00	1,07	1,00	1,00	1,00	1,00	2,00	1,20	1,00	1,00	1,00
LS 6261 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
PHB 96 T 06 R	1,00	1,00	2,00	1,00	1,00	1,20	1,00	1,00	1,00	1,33	1,00	1,07	1,00	1,00	1,00
PAN 1623 R	1,00	1,00	1,00	1,00	1,00	1,00	2,00	1,00	1,00	1,00	1,00	1,20	1,00	1,00	1,00
LS 6161 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
DM 6.2i RR	1,00	1,00	2,00	1,00	1,00	1,20	2,67	1,00	1,00	1,33	1,00	1,40	1,00	1,00	1,00
SSS 6560 (tuc)	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 6164 R	1,00	1,00	1,00	1,00	1,00	1,00	3,67	1,00	1,00	1,00	1,00	1,53	1,00	1,00	1,00
PAN 1614 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
NS 6448 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
DM 6.8i 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
NS 7211 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
Standaard 1	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
Standaard 2	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	1,33	1,17
Gem/Mean	1,00	1,00	1,21	1,00	1,00	1,04	1,37	1,00	1,00	1,06	1,04	1,09	1,00	1,02	1,01

Table 10 Groenstam (1-5) van die verskillende soja boonkultivars by die verskillende proef lokaliteite, 2015/16
 Table 10 Greenstem (1-5) of the different soybean cultivars at the different trial localities, 2015/16

Kultivar	Koel/Cool					Matig/Moderate					Warm				
	Bethlehem	Clarens	Delmas	Kinross	Kokstad	Gem/Mean	Bergville	Cedara	Glen	Greytown	Kroonstad	Gem/Mean	Brits	Groblersdal	Gem/Mean
LS 6240 R	2,00	1,00	1,00	2,00	1,00	1,40	2,00	1,00	1,67	1,00	1,00	1,33	3,67	1,00	2,33
PAN 1454 R	1,33	1,00	1,00	3,67	1,00	1,60	2,00	3,33	2,33	1,00	1,00	1,93	3,67	1,67	2,67
SSS 4945 (tuc)	1,00	1,00	1,00	2,00	1,00	1,20	2,67	1,67	3,33	1,00	1,00	1,93	3,67	1,00	2,33
LS 6146 R	1,00	1,00	1,00	1,33	1,00	1,07	2,00	2,00	1,00	1,00	1,00	1,40	4,00	3,00	3,50
PHB 94 Y 80 R	1,00	1,00	1,00	2,67	1,00	1,33	1,00	4,67	3,67	1,00	1,33	2,33	4,33	1,67	3,00
LS 6248 R	4,33	1,00	1,00	2,67	1,00	2,00	1,00	1,00	1,33	2,33	2,33	1,60	3,33	1,33	2,33
SSS 5449 (tuc)	2,00	1,00	2,00	1,33	1,00	1,47	2,00	1,33	1,00	1,33	1,00	1,33	3,00	1,33	2,17
NS 5009 R	1,67	1,00	1,00	1,67	1,00	1,27	4,00	3,33	3,67	1,00	1,00	2,60	4,00	2,00	3,00
DM 5.11 RR	1,00	1,00	1,00	2,00	1,00	1,20	3,00	3,67	2,67	1,00	1,00	2,27	4,33	1,67	3,00
PHB 95 Y 20 R	2,33	1,00	1,33	3,33	1,00	1,80	3,00	1,33	1,67	3,00	1,33	2,07	3,33	1,00	2,17
DM 5953 RSF	1,00	1,00	1,00	1,67	1,00	1,13	2,00	4,67	1,33	1,33	1,00	2,07	3,00	1,00	2,00
SSS 5052 (tuc)	1,33	1,00	1,00	2,00	1,00	1,27	1,00	1,33	1,33	2,33	1,00	1,40	4,00	1,00	2,50
PAN 1521 R	2,67	1,00	1,00	2,00	1,33	1,60	1,00	1,00	2,00	1,33	2,33	1,53	2,33	1,67	2,00
PAN 1500 R	4,67	1,00	1,00	2,67	1,33	2,13	2,00	1,67	2,33	1,67	3,33	2,20	3,33	1,33	2,33
NS 5909 R	2,33	1,00	1,67	4,33	1,67	2,20	1,00	1,00	2,00	3,00	4,00	2,20	4,00	1,00	2,50
LS 6261 R	4,67	1,00	1,00	4,33	1,00	2,40	4,00	2,00	2,33	4,00	1,00	2,67	4,00	1,67	2,83
PHB 96 T 06 R	1,00	1,67	1,00	2,33	1,00	1,40	2,00	1,00	1,33	1,00	1,33	1,33	4,00	1,00	2,50
PAN 1623 R	3,67	1,00	1,00	1,67	1,00	1,67	1,00	1,00	1,00	1,67	3,33	1,60	3,67	1,00	2,33
LS 6161 R	1,33	1,67	1,00	4,67	1,00	1,93	2,00	2,00	3,00	2,33	2,00	2,27	3,67	1,00	2,33
DM 6.21 RR	1,67	1,33	2,00	4,33	2,00	2,27	1,00	1,33	3,33	1,00	1,00	1,53	3,33	1,00	2,17
SSS 6560 (tuc)	3,33	1,00	2,00	3,67	1,00	2,20	1,00	1,67	1,33	2,00	2,33	1,67	3,33	1,00	2,17
LS 6164 R	2,67	2,00	1,00	2,67	1,00	1,87	1,00	1,00	1,67	1,33	2,00	1,40	3,00	1,00	2,00
PAN 1614 R	1,33	1,00	1,00	2,67	1,00	1,40	2,33	1,00	1,67	2,67	2,00	1,93	3,33	1,00	2,17
NS 6448 R	1,00	1,00	1,33	3,33	1,33	1,60	1,00	1,00	1,67	1,33	3,33	1,67	3,67	1,00	2,33
DM 6.81 RR	2,00	1,00	3,00	5,00	1,00	2,40	1,00	1,33	3,33	1,00	3,50	2,03	4,00	1,00	2,50
NS 7211 R	2,67	1,00	2,33	2,67	1,33	2,00	1,00	2,67	2,00	2,00	3,33	2,20	3,33	1,00	2,17
Standaard 1	1,33	1,00	1,00	3,67	1,00	1,60	1,00	2,33	2,33	1,33	1,00	1,60	3,00	1,00	2,00
Standaard 2	3,33	1,00	1,00	2,67	1,00	1,80	1,00	1,67	2,00	1,33	1,00	1,40	2,33	1,67	2,00
Gem/Mean	2,13	1,10	1,27	2,82	1,11	1,69	1,75	1,89	2,08	1,65	1,82	1,84	3,52	1,29	2,40

Table 11 Oopsporing (1-5) van die verskillende soja-boonkultivars by die verskillende proef lokaliteite, 2015/16
 Table 11 Shattering (1-5) of the different soybean cultivars at the different trial localities, 2015/16

Kultivar	Koel/Cool			Matig/Moderate			Warm	
	Bethlehem	Kinross	Gem/Mean	Gen	Kroonstad	Gem/Mean	Brits	Gem/Mean
LS 6240 R	1,00	1,00	1,00	1,00	1,00	1,00	2,00	2,00
PAN 1454 R	1,00	1,00	1,00	1,00	3,00	2,00	3,00	3,00
SSS 4945 (tuc)	5,00	2,00	3,50	1,00	5,00	3,00	5,00	5,00
LS 6146 R	1,00	1,00	1,00	1,00	1,00	1,00	2,00	2,00
PHB 94 Y 80 R	1,00	1,00	1,00	1,00	4,00	2,50	5,00	5,00
LS 6248 R	2,00	1,00	1,50	1,00	3,00	2,00	5,00	5,00
SSS 5449 (tuc)	1,00	1,00	1,00	1,67	2,00	1,83	5,00	5,00
NS 5009 R	2,00	1,00	1,50	1,00	2,00	1,50	3,00	3,00
DM 5.1i RR	1,00	1,00	1,00	1,00	4,00	2,50	5,00	5,00
PHB 95 Y 20 R	1,00	1,00	1,00	1,00	4,00	2,50	3,00	3,00
DM 5953 RSF	1,00	1,00	1,00	1,00	5,00	3,00	3,00	3,00
SSS 5052 (tuc)	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
PAN 1521 R	1,00	1,00	1,00	1,00	1,00	1,00	4,00	4,00
PAN 1500 R	1,00	2,00	1,50	1,00	1,00	1,00	2,00	2,00
NS 5909 R	1,00	2,00	1,50	1,00	3,00	2,00	3,00	3,00
LS 6261 R	1,00	1,00	1,00	1,00	3,00	2,00	3,00	3,00
PHB 96 T 06 R	1,00	1,00	1,00	1,00	1,00	1,00	3,00	3,00
PAN 1623 R	1,00	1,00	1,00	1,00	1,00	1,00	3,00	3,00
LS 6161 R	2,00	1,00	1,50	1,00	1,00	1,00	3,00	3,00
DM 6.2i RR	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
SSS 6560 (tuc)	1,00	1,00	1,00	1,00	1,00	1,00	2,00	2,00
LS 6164 R	1,00	2,00	1,50	1,00	1,00	1,00	2,00	2,00
PAN 1614 R	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
NS 6448 R	3,00	1,00	2,00	1,00	2,00	1,50	5,00	5,00
DM 6.8i RR	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
NS 7211 R	2,00	2,00	2,00	1,00	1,00	1,00	2,00	2,00
Standaard 1	1,00	1,00	1,00	1,00	1,00	1,00	5,00	5,00
Standaard 2	1,00	1,00	1,00	1,00	1,00	1,00	2,00	2,00
Gem/Mean	1,36	1,18	1,27	1,02	2,00	1,51	3,00	3,00

Tabel 12 Die planttelling geoes (x 1000) van die verskillende sojaboonkultivars by die verskillende proeflokaleite, 2015/16
 Table 12 The number of plant harvested (x 1000) of the different soybean cultivars at the different trial localities, 2015/16

Kultivar	Koel/Cool				Matig/Moderate				Warm			
	Bethlehem	Delmas	Kinross	Kokstad	Gem/Mean	Cedara	Glen	Kroonstad	Gem/Mean	Brits	Groblersdal	Gem/Mean
LS 6240 R	222	125	237	103	172	276	227	166	223	256	198	227
PAN 1454 R	239	150	229	111	182	275	224	167	222	270	229	249
SSS 4945 (tuc)	260	209	259	157	221	255	292	183	243	219	228	223
LS 6146 R	250	129	267	142	197	286	243	197	242	249	264	257
PHB 94 Y 80 R	247	202	302	133	221	309	361	168	279	255	313	284
LS 6248 R	256	190	253	134	208	284	323	192	266	238	219	229
SSS 5449 (tuc)	223	192	248	133	199	304	252	161	239	272	215	244
NS 5009 R	249	195	277	128	212	279	277	180	245	235	244	240
DM 5.1iRR	218	156	218	87	170	267	214	197	226	238	256	247
PHB 95 Y 20 R	194	175	253	106	182	214	227	146	195	203	172	188
DM 5953 RSF	235	201	293	206	234	325	344	145	272	266	210	238
SSS 5052 (tuc)	215	119	242	87	166	208	213	159	193	233	280	257
PAN 1521 R	241	246	271	190	237	316	305	194	272	277	304	291
PAN 1500 R	209	176	252	159	199	283	251	189	241	237	230	234
NS 5909 R	191	228	283	151	213	281	273	210	255	264	247	256
LS 6261 R	234	180	268	106	197	278	301	180	253	231	320	276
PHB 96 T 06 R	237	237	266	125	216	303	307	171	260	253	302	277
PAN 1623 R	225	189	215	84	178	296	273	189	253	211	216	213
LS 6161 R	213	179	234	236	215	282	247	199	243	244	243	244
DM 6.2iRR	114	136	258	66	144	201	158	176	179	219	237	228
SSS 6560 (tuc)	207	188	271	83	187	255	192	184	210	223	190	207
LS 6164 R	178	212	263	181	209	273	272	204	250	236	296	266
PAN 1614 R	225	175	271	98	192	299	267	197	254	221	199	210
NS 6448 R	197	219	274	135	206	301	248	187	245	259	263	261
DM 6.8iRR	118	153	219	76	142	164	134	105	134	222	201	212
NS 7211 R	213	148	263	79	176	251	268	144	221	246	289	268
Standaard 1	233	156	254	88	183	284	322	152	253	269	203	236
Standaard 2	215	131	272	133	188	257	232	188	226	263	177	220
Gem/Mean	216	178	258	126	194	272	259	176	236	243	241	242

Tabel 13 Persentasie ongewenste sade van die verskillende soja-boonkultivars by die verskillende proef lokaliteite, 2015/16
 Table 13 Percentage undesirable seed of the different soybean cultivars at the different trial localities, 2015/16

Kultivar	Koel/Cool				Matig/Moderate				Warm						
	Bethlehem	Clarens	Delmas	Kinross	Kokstad	Gem/Mean	Cedara	Glen	Greytown	Kranskop	Kroonstad	Gem/Mean	Brits	Groblersdal	Gem/Mean
LS 6240 R	0,34	0,35	0,16	0,32	0,43	0,32	0,78	0,62	1,08	1,72	0,11	0,86	0,47	0,29	0,38
PAN 1454 R	0,14	0,18	0,02	0,32	0,00	0,13	0,67	0,60	1,17	2,00	0,37	0,96	2,29	0,38	1,34
SSS 4945 (tuc)	0,32	0,29	0,00	0,52	0,00	0,23	0,46	1,09	1,52	1,05	0,27	0,88	0,30	0,19	0,25
LS 6146 R	0,32	0,05	0,00	0,43	0,20	0,20	0,55	1,06	1,90	1,39	0,71	1,12	0,80	0,25	0,53
PHB 94 Y 80 R	0,00	0,12	0,11	0,16	0,76	0,23	0,70	0,57	0,71	0,00	0,95	0,59	0,13	0,00	0,07
LS 6248 R	0,31	1,16	0,10	0,73	0,00	0,46	0,56	0,43	1,34	1,58	0,74	0,93	0,30	0,32	0,31
SSS 5449 (tuc)	0,05	0,26	0,10	0,82	0,27	0,30	0,77	0,81	1,06	0,58	0,23	0,69	0,87	0,08	0,48
NS 5009 R	0,19	0,04	0,00	0,21	0,17	0,12	0,52	0,65	1,03	0,95	0,72	0,77	0,88	0,43	0,66
DM 5.1i RR	0,25	0,09	0,06	0,13	0,00	0,11	0,86	1,26	1,04	1,00	0,23	0,88	0,22	0,24	0,23
PHB 95 Y 20 R	0,16	0,46	0,86	0,22	0,00	0,34	0,72	0,69	0,67	1,05	1,59	0,94	0,11	0,17	0,14
DM 5953 RSF	0,48	0,37	0,20	0,62	0,03	0,34	1,57	0,44	0,98	0,60	0,28	0,77	0,42	0,03	0,23
SSS 5052 (tuc)	0,24	0,84	0,37	0,67	0,38	0,50	0,89	0,24	0,39	1,04	1,09	0,73	0,62	0,23	0,43
PAN 1521 R	0,10	0,61	0,20	0,34	0,04	0,26	0,80	0,35	1,49	0,81	1,68	1,03	0,39	0,49	0,44
PAN 1500 R	0,43	1,11	0,00	0,37	0,00	0,38	0,78	1,52	0,83	0,65	1,32	1,02	0,69	0,24	0,47
NS 5909 R	0,48	0,55	0,25	0,33	0,00	0,32	1,21	0,43	0,42	0,82	1,36	0,85	0,64	0,71	0,68
LS 6261 R	0,69	0,41	0,56	0,71	0,29	0,53	0,71	0,26	0,51	1,75	2,84	1,21	0,71	0,15	0,43
PHB 96 T 06 R	0,27	0,71	0,25	0,67	0,18	0,42	0,94	1,77	0,58	0,29	1,57	1,03	0,96	0,65	0,81
PAN 1623 R	0,45	0,55	0,00	0,24	0,00	0,25	1,01	1,24	0,42	0,49	0,74	0,78	0,53	0,28	0,41
LS 6161 R	0,42	0,75	0,29	0,70	0,04	0,44	0,99	1,58	0,48	0,83	0,53	0,88	0,80	0,34	0,57
DM 6.2i RR	0,16	0,39	0,08	0,04	0,39	0,21	1,64	0,24	0,09	0,91	2,74	1,12	0,48	0,29	0,39
SSS 6560 (tuc)	0,34	0,56	0,10	0,40	0,00	0,28	1,49	0,75	0,72	1,02	0,97	0,99	0,79	0,40	0,60
LS 6164 R	0,16	0,88	0,34	0,35	0,07	0,36	1,03	0,68	0,70	1,38	1,97	1,15	0,55	0,75	0,65
PAN 1614 R	0,15	0,34	0,06	0,55	0,08	0,24	0,83	1,20	0,86	0,60	0,73	0,84	0,68	0,31	0,50
NS 6448 R	0,03	0,60	0,57	0,93	0,00	0,43	0,99	0,67	0,72	1,45	2,36	1,24	0,96	0,31	0,64
DM 6.8i RR	0,31	0,87	0,34	0,42	0,22	0,43	0,56	0,98	0,76	2,11	2,65	1,41	1,23	0,30	0,77
NS 7211 R	0,03	0,72	0,27	0,39	0,00	0,28	1,04	0,92	0,79	2,09	2,16	1,40	1,28	0,39	0,84
Standaard 1	0,32	0,87	0,20	0,26	0,00	0,33	0,89	0,12	0,70	2,19	0,91	0,96	0,44	0,06	0,25
Standaard 2	0,20	0,51	0,05	0,19	0,00	0,19	1,21	0,17	0,77	0,53	0,57	0,65	0,17	0,12	0,15
Gem/Mean	0,26	0,52	0,20	0,43	0,13	0,31	0,90	0,76	0,85	1,10	1,16	0,95	0,67	0,30	0,48

Tabel 14 Massa van 100 sade (g) van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2015/16
 Table 14 Mass 100 seeds (g) of the different soybean cultivars at the different trial localities, 2015/16

Kultivar	Koel/Cool						Matig/Moderate						Warm			
	Bethlehem	Clarens	Delmas	Kinross	Kokstad	Gem/Mean	Cedara	Gen	Greytown	Greytown	Kranskop	Kroonstad	Gem/Mean	Atlanta	Brits	Groblersdal
LS 6240 R	19,69	15,30	18,60	16,57	21,62	18,35	19,72	20,47	18,90	20,75	15,14	19,00	16,93	16,96	19,52	17,81
PAN 1454 R	16,59	14,45	16,75	14,94	18,17	16,18	19,11	16,88	17,78	18,86	13,39	17,20	14,85	13,77	17,04	15,22
SSS 4945 (tuc)	15,19	13,89	15,60	14,17	16,33	15,03	18,20	17,76	15,88	17,61	14,65	16,82	14,72	13,89	17,76	15,46
LS 6146 R	15,27	13,76	14,30	13,34	16,10	14,55	16,63	15,57	15,86	18,25	12,22	15,71	13,15	12,91	15,41	13,83
PHB 94 Y 80 R	16,45	14,30	16,16	15,06	17,38	15,87	18,46	17,44	15,74	18,88	14,17	16,94	15,49	13,78	18,77	16,01
LS 6248 R	15,63	11,12	15,11	13,16	15,58	14,12	14,72	15,12	15,90	14,77	13,46	14,79	14,79	12,53	17,09	14,80
SSS 5449 (tuc)	14,64	11,03	14,29	12,85	14,96	13,55	13,89	13,79	14,79	14,57	12,18	13,84	12,72	11,11	15,09	12,98
NS 5009 R	17,31	14,30	16,15	13,53	18,04	15,86	18,51	17,45	16,46	18,80	14,97	17,24	15,94	13,04	17,98	15,65
DM 5.1 RR	15,64	14,72	16,48	15,09	16,92	15,77	18,53	16,37	16,27	18,79	13,05	16,60	14,42	12,88	16,60	14,63
PHB 95 Y 20 R	16,09	11,48	15,27	15,70	16,10	14,93	14,54	14,30	17,11	17,98	15,02	15,79	14,67	13,62	16,63	14,97
DM 5953 RSF	14,49	12,65	15,56	13,94	16,78	14,68	17,35	15,56	16,38	16,85	12,06	15,64	14,86	11,75	15,65	14,08
SSS 5052 (tuc)	14,89	10,98	14,08	14,82	15,29	14,01	14,82	13,15	16,53	16,00	14,03	14,91	16,00	13,12	17,39	15,50
PAN 1521 R	18,08	11,38	16,57	15,66	17,32	15,80	16,37	16,08	19,77	15,15	16,61	16,79	15,90	13,06	17,55	15,51
PAN 1500 R	18,58	11,53	15,13	15,75	16,84	15,57	15,60	15,56	18,70	17,13	14,81	16,36	15,42	12,64	18,24	15,43
NS 5909 R	15,51	12,15	15,51	16,61	16,56	15,27	17,45	13,93	19,63	17,58	15,22	16,76	16,63	13,04	17,25	15,64
LS 6261 R	16,41	12,21	15,64	14,93	17,78	15,39	17,89	15,11	16,92	17,35	13,48	16,15	15,86	13,70	17,60	15,72
PHB 96 T 06 R	14,43	12,54	15,62	15,57	16,29	14,89	16,41	13,41	18,35	18,37	13,66	16,04	16,96	11,99	16,50	15,15
PAN 1623 R	15,57	11,38	14,43	15,10	16,25	14,55	15,66	14,62	17,00	16,40	13,91	15,52	16,42	12,17	16,72	15,10
LS 6161 R	14,05	11,06	14,49	15,21	15,38	14,04	16,00	12,41	18,25	17,42	13,73	15,56	15,53	11,19	15,44	14,05
DM 6.2i RR	17,82	12,22	17,97	18,89	17,78	16,94	19,69	16,37	20,17	21,49	17,13	18,97	17,68	13,62	18,84	16,71
SSS 6560 (tuc)	15,00	11,34	15,72	14,49	15,75	14,46	16,58	12,61	18,62	17,02	14,24	15,81	15,64	12,39	15,89	14,64
LS 6164 R	15,57	11,64	14,33	14,68	15,20	14,29	15,67	13,36	18,78	16,62	14,60	15,81	15,55	11,76	16,49	14,60
PAN 1614 R	16,19	11,38	15,19	16,30	15,49	14,91	16,26	14,24	18,95	17,99	13,60	16,21	16,30	14,20	17,13	15,88
NS 6448 R	15,50	11,47	14,65	16,95	16,60	15,03	17,38	15,17	17,88	20,39	15,20	17,20	17,23	12,85	16,48	15,52
DM 6.8i RR	16,63	12,25	18,15	17,82	17,82	16,53	17,40	14,39	18,70	20,72	16,68	17,58	18,96	13,97	17,89	16,94
NS 7211 R	17,92	11,21	15,38	16,06	17,06	15,53	17,38	13,16	19,01	19,18	18,10	17,37	18,85	15,67	17,94	17,49
Standaard 1	17,49	14,25	19,43	17,83	21,25	18,05	20,77	20,14	20,10	18,92	14,80	18,95	16,08	13,76	20,93	16,92
Standaard 2	17,64	11,20	16,23	16,14	18,15	15,87	16,43	15,53	19,96	15,58	15,88	16,68	16,88	12,89	17,90	15,89
Gem/Mean	16,22	12,40	15,81	15,40	16,96	15,36	17,05	15,36	17,80	17,84	14,50	16,51	15,87	13,15	17,28	15,43

Tabel 15 Oliepersentasie op vogvrye basis van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2015/16
 Table 15 Oil percentage on moisture free basis of the different soybean cultivars at the different trial localities, 2015/16

Kultivar	Koel/Cool					Matig/Moderate					Warm			
	Bethlehem	Delmas	Kinross	Kokstad	Gem/Mean	Cedara	Glen	Greytown	Greytown	Kranskop	Kroonstad	Gem/Mean	Atlanta	Groblersdal
LS 6240 R	13.27	13.43	14.21	13.49	13.60	12.90	15.47	15.69	15.02	12.99	14.41	16.31	13.87	15.09
PAN 1454 R	14.42	13.24	13.64	12.37	13.42	13.41	15.86	17.19	13.55	13.63	14.73	16.42	13.16	14.79
SSS 4945 (tuc)	14.68	13.33	13.01	11.04	13.02	13.44	15.23	17.05	14.17	11.94	14.37	15.67	11.34	13.51
LS 6146 R	9.73	11.13	11.29	11.90	11.01	12.07	13.43	16.20	13.79	12.30	13.56	14.60	9.08	11.84
PHB 94 Y 80 R	13.86	14.38	13.65	13.19	13.77	13.95	16.25	18.24	14.70	10.57	14.74	15.26	13.64	14.45
LS 6248 R	13.38	14.02	10.33	11.56	12.32	11.50	14.80	16.92	13.72	12.13	13.81	14.89	12.78	13.84
SSS 5449 (tuc)	12.51	14.54	9.71	10.98	11.94	11.52	13.31	16.64	14.19	11.23	13.38	15.19	10.91	13.05
NS 5009 R	13.19	12.73	13.50	12.87	13.07	12.47	13.81	16.16	14.13	11.11	13.54	13.53	13.80	13.67
DM 5.1i RR	12.69	12.85	13.71	10.29	12.39	12.88	12.99	15.58	13.76	10.06	13.05	14.63	11.55	13.09
PHB 95 Y 20 R	14.54	15.44	16.03	11.88	14.47	11.45	15.59	18.71	13.93	15.32	15.00	15.84	14.73	15.29
DM 5953 RSF	11.38	12.69	13.46	11.58	12.28	11.74	13.17	16.35	12.91	11.99	13.23	14.50	13.31	13.91
SSS 5052 (tuc)	11.82	14.01	10.43	12.06	12.08	10.91	12.62	15.30	11.85	14.13	12.96	13.22	12.77	13.00
PAN 1521 R	13.25	13.70	9.69	10.31	11.74	11.83	15.24	16.98	12.77	13.02	13.97	14.83	11.98	13.41
PAN 1500 R	15.38	14.83	11.04	14.27	13.88	14.43	15.56	16.99	14.51	15.07	15.31	15.04	15.70	15.37
NS 5909 R	10.13	13.36	12.54	11.72	11.94	11.30	13.31	17.30	11.73	13.85	13.50	13.77	13.31	13.54
LS 6261 R	12.38	13.56	14.54	12.16	13.16	13.36	16.20	18.19	13.71	14.89	15.27	14.75	14.31	14.53
PHB 96 T 06 R	11.67	13.77	12.66	9.86	11.99	10.77	16.42	17.06	11.27	14.40	13.98	13.80	13.35	13.58
PAN 1623 R	14.33	15.45	12.69	10.57	13.26	13.45	14.50	18.03	12.59	14.69	14.65	15.19	13.98	14.59
LS 6161 R	11.63	13.65	15.24	9.87	12.60	14.40	16.72	17.68	12.62	13.50	14.98	15.88	14.85	15.37
DM 6.2i RR	11.76	13.83	14.81	12.51	13.23	11.29	14.26	17.32	12.42	13.95	13.85	14.27	12.42	13.35
SSS 6560 (tuc)	13.80	13.88	10.73	12.39	12.70	11.95	14.75	18.58	12.11	15.08	14.49	13.75	14.12	13.94
LS 6164 R	11.12	14.21	9.70	9.03	11.02	11.34	14.23	16.95	10.91	15.08	13.70	14.23	12.58	13.41
PAN 1614 R	12.05	13.39	14.36	12.10	12.98	11.55	14.81	17.12	11.20	12.64	13.46	13.62	9.76	11.69
NS 6448 R	11.73	14.90	14.83	9.46	12.73	11.71	15.24	17.35	11.23	14.65	14.04	13.72	12.54	13.13
DM 6.8i RR	11.18	13.63	14.94	10.84	12.65	11.86	13.98	16.39	12.04	11.74	13.20	15.14	13.08	14.11
NS 7211 R	13.39	14.17	13.51	12.91	13.50	12.01	14.90	18.04	12.28	14.01	14.25	15.25	14.16	14.71
Standaard 1	12.58	14.00	16.41	12.78	13.94	13.27	15.05	16.94	15.11	13.34	14.74	14.63	12.79	13.71
Standaard 2	12.42	13.89	13.55	9.59	12.36	12.13	13.56	16.23	12.36	13.94	13.64	12.73	11.64	12.19
Gem/Mean	12.65	13.79	13.01	11.56	12.75	12.32	14.69	17.04	13.02	13.26	14.07	14.67	12.91	13.79

Table 16 Ru-proteïenpersentasie op vogvrye basis van die verskillende sojaboontkultivars by die verskillende proef lokaliteite, 2015/16
 Table 16 Percentage crude protein on moisture free basis of the different soybean cultivars at the different trial localities, 2015/16

Kultivar	Koel/Cool						Matig/Moderate						Warm			
	Bethlehem	Delmas	Kinross	Kokstad	Gem/Mean		Cedara	Glen	Greytown	Greytown	Kranskop	Kroonstad	Gem/Mean	Atlanta	Groblersdal	Gem/Mean
LS 6240 R	35.57	34.44	35.10	34.83	34.99		35.76	35.60	34.78	35.65	35.27	35.41	34.98	37.06	37.06	37.06
PAN 1454 R	35.11	33.87	36.34	35.02	35.09		36.07	34.78	33.86	36.54	35.32	35.31	35.07	36.62	36.62	36.62
SSS 4945 (tuc)	35.62	35.28	36.54	36.50	35.99		36.47	34.85	34.25	36.64	36.03	35.65	35.64	38.44	38.44	38.44
LS 6146 R	37.12	35.62	36.25	35.53	36.13		36.42	35.82	34.47	36.55	35.58	35.77	35.70	38.84	38.84	38.84
PHB 94 Y 80 R	35.09	34.37	35.78	34.66	34.98		35.14	33.59	32.65	35.66	36.45	34.70	35.51	36.71	36.71	36.71
LS 6248 R	34.67	33.12	35.86	34.41	34.52		36.25	34.71	34.32	36.09	36.26	35.53	35.89	37.77	37.77	37.77
SSS 5449 (tuc)	35.78	33.85	36.93	35.91	35.62		36.80	35.52	35.49	36.25	36.67	36.15	36.02	38.53	38.53	38.53
NS 5009 R	35.24	34.43	35.30	34.49	34.87		34.74	34.58	33.38	35.84	35.85	34.88	35.70	36.47	36.47	36.47
DM 5.1i RR	35.95	35.70	36.02	36.18	35.96		35.88	35.51	34.81	36.08	36.53	35.76	35.83	38.44	38.44	38.44
PHB 95 Y 20 R	34.25	31.93	33.14	33.06	33.10		36.06	33.87	33.91	35.61	34.89	34.87	34.48	37.59	37.59	37.59
DM 5953 RSF	36.05	34.48	34.91	35.01	35.11		35.85	34.78	33.93	36.20	35.67	35.29	35.44	35.86	35.86	35.86
SSS 5052 (tuc)	35.38	34.02	36.48	34.58	35.12		36.19	35.54	35.81	36.29	35.38	35.84	36.33	37.87	37.87	37.87
PAN 1521 R	34.33	33.16	35.74	34.57	34.45		35.43	33.28	34.18	35.43	35.63	34.79	35.46	37.33	37.33	37.33
PAN 1500 R	33.76	33.15	35.97	33.50	34.10		34.67	33.57	34.83	35.13	35.03	34.65	34.92	35.97	35.97	35.97
NS 5909 R	35.46	33.86	34.86	34.79	34.74		36.34	35.39	34.80	36.83	35.85	35.84	37.76	37.92	37.92	37.92
LS 6261 R	34.54	33.24	34.84	34.19	34.20		35.06	33.57	33.27	35.47	35.07	34.49	35.54	36.02	36.02	36.02
PHB 96 T 06 R	35.04	33.97	35.56	35.08	34.91		36.39	33.27	35.66	36.64	34.96	35.38	36.60	37.48	37.48	37.48
PAN 1623 R	34.72	33.42	35.98	35.04	34.79		35.96	34.97	35.05	36.69	35.14	35.56	36.31	37.80	37.80	37.80
LS 6161 R	34.69	33.40	34.35	34.76	34.30		34.90	33.31	34.92	36.07	35.76	34.99	35.57	36.09	36.09	36.09
DM 6.2i RR	35.15	32.27	33.18	32.01	33.15		35.42	34.71	33.88	35.49	34.45	34.79	35.51	38.08	38.08	38.08
SSS 6560 (tuc)	33.90	33.13	36.04	34.21	34.32		35.56	34.27	33.71	35.86	34.84	34.85	35.95	35.85	35.85	35.85
LS 6164 R	35.13	33.20	35.38	34.71	34.61		35.87	34.23	34.96	36.36	34.95	35.27	35.77	37.45	37.45	37.45
PAN 1614 R	35.12	34.54	34.94	34.29	34.72		36.00	34.21	35.00	36.70	35.95	35.57	35.66	39.07	39.07	39.07
NS 6448 R	35.36	34.25	34.91	35.80	35.08		36.80	34.47	35.07	37.27	35.69	35.86	36.93	37.43	37.43	37.43
DM 6.8i RR	33.90	31.54	33.82	33.87	33.28		35.22	33.70	34.46	35.78	35.04	34.84	34.89	36.61	36.61	36.61
NS 7211 R	33.71	32.49	34.18	33.08	33.37		35.62	33.74	34.20	35.68	35.20	34.89	35.58	36.50	36.50	36.50
Standaard 1	36.01	34.83	34.92	35.12	35.22		35.83	34.70	34.03	36.11	35.56	35.25	35.73	36.81	36.81	36.81
Standaard 2	34.50	33.11	34.40	35.13	34.29		35.43	34.40	34.78	35.39	34.85	34.97	36.63	37.46	37.46	37.46
Gem/Mean	35.04	33.74	35.28	34.65	34.68		35.79	34.46	34.45	36.08	35.50	35.26	35.76	37.29	37.29	37.29

Tabel 17 Gemiddelde van die olie-en proteien persentasie saamgevoeg (Protolie), 2015/16
 Table 17 Average of the oil and protein percentage joined (Profat), 2015/16

Kultivar	Koel/Cool					Matig/Moderate						Warm		
	Bethlehem	Delmas	Kinross	Kokstad	Gem/Mean	Cedara	Gen	Greytown	Kranskop	Kroonstad	Gem/Mean	Atlanta	Groblersdal	Gem/Mean
LS 6240 R	48.84	47.87	49.31	48.32	48.59	48.66	51.07	50.47	50.67	48.26	49.83	51.29	50.93	51.11
PAN 1454 R	49.53	47.11	49.98	47.39	48.50	49.48	50.64	51.05	50.09	48.95	50.04	51.49	49.78	50.64
SSS 4945 (tuc)	50.30	48.61	49.55	47.54	49.00	49.91	50.08	51.30	50.81	47.97	50.01	51.31	49.78	50.55
LS 6146 R	46.85	46.75	47.54	47.43	47.14	48.49	49.25	50.67	50.34	47.88	49.33	50.30	47.92	49.11
PHB 94 Y 80 R	48.95	48.75	49.43	47.85	48.75	49.09	49.84	50.89	50.36	47.02	49.44	50.77	50.35	50.56
LS 6248 R	48.05	47.14	46.19	45.97	46.84	47.75	49.51	51.24	49.81	48.39	49.34	50.78	50.55	50.67
SSS 5449 (tuc)	48.29	48.39	46.64	46.89	47.55	48.32	48.83	52.13	50.44	47.90	49.52	51.21	49.44	50.33
NS 5009 R	48.43	47.16	48.80	47.36	47.94	47.21	48.39	49.54	49.97	46.96	48.41	49.23	50.27	49.75
DM 5.1i RR	48.64	48.55	49.73	46.47	48.35	48.76	48.50	50.39	49.84	46.59	48.82	50.46	49.99	50.23
PHB 95 Y 20 R	48.79	47.37	49.17	44.94	47.57	47.51	49.46	52.62	49.54	50.21	49.87	50.32	52.32	51.32
DM 5953 RSF	47.43	47.17	48.37	46.59	47.39	47.59	47.95	50.28	49.11	47.66	48.52	49.94	49.17	49.56
SSS 5052 (tuc)	47.20	48.03	46.91	46.64	47.20	47.10	48.16	51.11	48.14	49.51	48.80	49.55	50.64	50.10
PAN 1521 R	47.58	46.86	45.43	44.88	46.19	47.26	48.52	51.16	48.20	48.65	48.76	50.29	49.31	49.80
PAN 1500 R	49.14	47.98	47.01	47.77	47.98	49.10	49.13	51.82	49.64	50.10	49.96	49.96	51.67	50.82
NS 5909 R	45.59	47.22	47.40	46.51	46.68	47.64	48.70	52.10	48.56	49.70	49.34	51.53	51.23	51.38
LS 6261 R	46.92	46.80	49.38	46.35	47.36	48.42	49.77	51.46	49.18	49.96	49.76	50.29	50.33	50.31
PHB 96 T 06 R	46.71	47.74	48.22	44.94	46.90	47.16	49.69	52.72	47.91	49.36	49.37	50.40	50.83	50.62
PAN 1623 R	49.05	48.87	48.67	45.61	48.05	49.41	49.47	53.08	49.28	49.83	50.21	51.50	51.78	51.64
LS 6161 R	46.32	47.05	49.59	44.63	46.90	49.30	50.03	52.60	48.69	49.26	49.98	51.45	50.94	51.20
DM 6.2i RR	46.91	46.10	47.99	44.52	46.38	46.71	48.97	51.20	47.91	48.40	48.64	49.78	50.50	50.14
SSS 6560 (tuc)	47.70	47.01	46.77	46.60	47.02	47.51	49.02	52.29	47.97	49.92	49.34	49.70	49.97	49.84
LS 6164 R	46.25	47.41	45.08	43.74	45.62	47.21	48.46	51.91	47.27	50.03	48.98	50.00	50.03	50.02
PAN 1614 R	47.17	47.93	49.30	46.39	47.70	47.55	49.02	52.12	47.90	48.59	49.04	49.28	48.83	49.06
NS 6448 R	47.09	49.15	49.74	45.26	47.81	48.51	49.71	52.42	48.50	50.34	49.90	50.65	49.97	50.31
DM 6.8i RR	45.08	45.17	48.76	44.71	45.93	47.08	47.68	50.85	47.82	46.78	48.04	50.03	49.69	49.86
NS 7211 R	47.10	46.66	47.69	45.99	46.86	47.63	48.64	52.24	47.96	49.21	49.14	50.83	50.66	50.75
Standaard 1	48.59	48.83	51.33	47.90	49.16	49.10	49.75	50.97	51.22	48.90	49.99	50.36	49.60	49.98
Standaard 2	46.92	47.00	47.95	44.72	46.65	47.56	47.96	51.01	47.75	48.79	48.61	49.36	49.10	49.23
Gem/Mean	47.69	47.52	48.28	46.21	47.43	48.11	49.15	51.49	49.10	48.75	49.32	50.43	50.20	50.32

Tabel 18 Die saadopbrengs van elke kultivar by die verskillende lokaliteite, 2015/16
 Table 18 The seed yield of the cultivars at the different localities, 2015/16

Kultivar	Koel/Cool						Matig/Moderate						Warm				
	Bethlehem	Clarens	Delmas	Kinross	Kokstad	Gem/Mean	Bergville	Cedara	Glen	Greytown	Greytown	Kranskop	Kroonstad	Gem/Mean	Atlanta	Brits	Groblersdal
LS 6240 R	2257	1677	3937	2020	2270	2432	3595	2437	2297	2037	2962	1344	2445	1634	1419	2405	1819
PAN 1454 R	2394	1503	3979	2064	2146	2417	2956	2541	1808	2224	2700	1031	2210	1652	1935	2484	2023
SSS 4945 (tuc)	2506	1653	3836	2208	1805	2402	2340	2168	2604	1916	2579	953	2093	1170	1450	3858	2159
LS 6146 R	2214	1787	3613	1895	1564	2215	3330	2111	2014	1889	3135	1314	2299	1763	1829	4110	2567
PHB 94 Y 80 R	2822	2408	4598	2396	1658	2776	3799	2653	1930	1915	2801	1107	2367	1598	1460	3461	2173
LS 6248 R	3639	1963	4790	1724	2430	2909	3293	2598	2515	2315	3565	1183	2578	1515	1727	4360	2534
SSS 5449 (tuc)	3470	1409	4165	1993	2375	2682	2681	2255	2523	2320	3087	1067	2322	1305	1715	2653	1891
NS 5009 R	3211	2184	4298	1721	1739	2631	3779	2550	2487	2004	2835	1465	2520	2072	1802	3284	2386
DM 5.1 RR	2251	1821	3805	1361	1759	2199	3190	2184	2368	2104	2950	1012	2301	1357	1820	3684	2287
PHB 95 Y 20 R	2137	1411	3830	1668	2222	2254	2778	2596	2265	2411	2799	1030	2313	1576	1319	3852	2249
DM 5953 RSF	2877	1827	4590	1888	2210	2678	3520	2758	4016	2143	3341	890	2778	1705	2555	4285	2848
SSS 5052 (tuc)	2802	1230	3810	2120	2230	2438	3677	3022	2048	2586	3115	1334	2630	2008	1733	3524	2422
PAN 1521 R	3927	1488	4250	2080	3090	2967	3970	2854	2758	2548	3386	1148	2777	2163	1941	4890	2998
PAN 1500 R	3301	1629	3955	1990	2876	2750	3222	2721	1748	2486	2629	1041	2308	2064	1693	3836	2531
NS 5909 R	3013	1569	4771	2281	2460	2819	2875	3103	2808	3123	2953	1119	2663	2237	1866	4764	2956
LS 6261 R	3433	1760	4198	2170	2471	2806	2561	2678	2443	2257	3859	1228	2504	1234	1818	4146	2399
PHB 96 T 06 R	3105	2065	3869	2475	2679	2839	2909	2832	1844	2918	3560	1075	2523	1921	1475	2934	2110
PAN 1623 R	3605	1446	3645	2037	2722	2691	3590	3359	2885	3118	3829	1221	3000	2265	1658	3413	2445
LS 6161 R	2956	1729	3701	2110	2982	2696	2293	2939	1712	3113	3583	1130	2462	2321	1705	4071	2699
DM 6.21 RR	2543	1469	4369	1926	1956	2453	2350	3050	3955	3246	3087	1389	2846	2183	1886	4581	2883
SSS 6560 (tuc)	3597	1536	3956	2119	2068	2655	2702	2725	2619	2705	3560	1298	2602	2225	2102	3463	2597
LS 6164 R	2672	2023	3883	2101	2700	2676	3091	3029	2307	2651	4108	1273	2743	2060	1628	3422	2370
PAN 1614 R	2931	1722	3217	1883	2107	2372	3425	2773	1987	2710	3470	1092	2576	2194	1727	4042	2655
NS 6448 R	3021	1790	4579	2555	2503	2890	3643	2887	2616	2971	4039	1167	2887	2336	1607	4126	2689
DM 6.81 RR	2529	1407	3420	2230	2446	2407	2771	2977	2694	3186	3545	1053	2704	2114	1752	3696	2521
NS 7211 R	2785	1503	3826	2246	2080	2488	3736	2911	2186	2993	3062	1159	2674	2557	1595	3540	2564
Standaard 1	2442	1927	4210	1811	2272	2532	3586	2301	2483	1897	2777	1011	2342	1675	1685	3399	2253
Standaard 2	3903	1621	3942	2389	2555	2882	3393	3460	3031	2566	3242	1724	2903	2321	1910	4757	2996
Gem/Mean	2941	1698	4037	2052	2299	2606	3181	2731	2463	2513	3234	1173	2549	1901	1743	3751	2465
KV/CV	14.2	20.2	12.4	24.9	14.4		17.1	14.2	19.8	7.7	15.8	20.1		17.4	20.1	18.6	

Tabel 19 Opbrengstwaarskynlikheid (%) van kultivars geëvalueer in 2013/14, 2014/15 en 2015/16 vir die koeler droëland produksiegebiede by verskillende opbrengspotensiaal

Table 19 Yield probability (%) of cultivars evaluated in 2013/14, 2014/15 and 2015/16 for the cooler dryland production areas at different yield potentials

Kultivar Cultivar	Opbrengspotensiaal/Yield potential (t/ha)									
	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5		
DM 6.2I RR	42	44	46	50	52	56	58	61		
LS 6146 R	44	41	39	37	35	33	32	31		
LS 6161 R	53	51	48	46	43	41	38	37		
LS 6164 R	54	53	50	48	45	44	41	40		
LS 6240 R	44	46	47	48	49	51	52	54		
LS 6248 R	59	59	60	60	60	60	59	59		
LS 6261 R	59	56	52	48	43	40	36	34		
PAN 1454 R	59	55	50	45	40	36	32	29		
PAN 1500 R	67	66	63	62	59	56	53	51		
PAN 1521 R	49	57	64	72	78	83	86	89		
PAN 1614 R	32	35	39	43	48	52	57	60		
PAN 1623 R	73	73	71	70	67	65	62	59		
PHB 94 Y 80 R	43	48	54	60	66	71	75	78		
PHB 95 Y 20 R	32	28	24	20	17	15	13	12		

Tabel 20 Saadopbrengs (kg/ha⁻¹) van kultivars gedurende die 2014/15 en 2015/16 groeiseisoen ten opsigte van die verskillende lokaliteite wat in die koeler produksiegebiede geleë is
 Table 20 Seed yield (kg/ha⁻¹) of cultivars during the 2014/15 and 2015/16 growing season for the various localities situated in the cooler production areas

Cultivar	2014/15						2015/16						
	Bethlehem	Clacolan	Delmas	Kinross	Kokstad	Middelburg	Gem/Mean	Bethlehem	Clarens	Delmas	Kinross	Kokstad	Gem/Mean
LS 6240 R	2221	1230	4793	2050	2963	3063	2720	2257	1677	3937	2020	2270	2432
LS 6444 R	2427	884	3917	1570	2613	3346	2459	-	-	-	-	-	-
PAN 1454 R	2610	1171	4494	1806	2906	3629	2769	2394	1503	3979	2064	2146	2417
LS 6146 R	1943	1090	3808	2056	2819	3166	2480	2214	1787	3613	1895	1564	2215
PHB 94 Y 80 R	2471	1465	5642	1727	2876	3575	2959	2822	2408	4598	2396	1658	2776
LS 6248 R	2631	1286	3687	1499	2387	3067	2426	3639	1963	4790	1724	2430	2909
NS 5009 R	2482	1311	4361	1597	2984	3234	2662	3211	2184	4298	1721	1739	2631
DM 5.11RR	2554	1306	3907	878	2755	3225	2437	2251	1821	3805	1361	1759	2199
PHB 95 Y 20 R	2622	1080	3909	1188	2378	2625	2300	2137	1411	3830	1668	2222	2254
PAN 1583 R	2556	1372	4778	1370	2391	2732	2533	-	-	-	-	-	-
PAN 1664 R	2814	1158	4052	1475	1892	2855	2374	-	-	-	-	-	-
DM 5953 RSF	3892	1199	5090	1977	3483	3618	3210	2877	1827	4590	1888	2210	2678
LS 6453 R	2604	1524	2554	1578	1994	2871	2188	-	-	-	-	-	-
PAN 1521 R	3033	1112	4039	1768	2115	2806	2479	3927	1488	4250	2080	3090	2967
PAN 1500 R	2694	1008	4214	1442	2457	2654	2411	3301	1629	3955	1990	2876	2750
NS 5909 R	3230	1263	4019	748	2367	2497	2354	3013	1569	4771	2281	2460	2819
PHB 96 T 06 R	2583	1284	3695	887	2603	2922	2329	3105	2065	3869	2475	2679	2839
LS 6466 R	2397	1188	3731	645	2503	2586	2175	-	-	-	-	-	-
PAN 1666 R	2432	1226	4335	1275	2382	2249	2316	-	-	-	-	-	-
PAN 1623 R	2556	1394	3636	1583	2918	2726	2469	3605	1446	3645	2037	2722	2691
LS 6261 R	2301	1240	3704	715	1853	2633	2074	3433	1760	4198	2170	2471	2806
DM 6.21RR	2628	1751	3857	1275	2685	2728	2487	2543	1469	4369	1926	1956	2453
LS 6164 R	2612	1206	3482	1042	1777	2566	2114	2672	2023	3883	2101	2700	2676
LS 6161 R	2296	1327	3433	988	1652	2897	2099	2956	1729	3701	2110	2982	2696
PAN 1614 R	2787	1124	4160	1069	2639	2184	2327	2931	1722	3217	1883	2107	2372
NS 6448 R	3029	1596	4399	819	2657	2505	2501	3021	1790	4579	2555	2503	2890
DM 6.81RR	3105	1525	4013	970	2873	2170	2443	2529	1407	3420	2230	2446	2407
NS 7211 R	2860	1559	3911	946	2590	2703	2428	2785	1503	3826	2246	2080	2488
PAN 1729 R	2406	1147	3543	959	1843	2650	2091	-	-	-	-	-	-
SSS 4945 (tuc)	-	-	-	-	-	-	-	2506	1653	3836	2208	1805	2402
SSS 5449 (tuc)	-	-	-	-	-	-	-	3470	1409	4165	1993	2375	2682
SSS 5052 (tuc)	-	-	-	-	-	-	-	2802	1230	3810	2120	2230	2438
SSS 6560 (tuc)	-	-	-	-	-	-	-	3597	1536	3956	2119	2068	2655
Gem/Mean	2647	1277	4040	1307	2495	2844	2435	2923	1693	4034	2048	2290	2598

Tabel 21 Opbrengswaarskynlikheid (%) van kultivars geëvalueer in 2013/14, 2014/15 en 2015/16 vir die matige produksiegebiede by verskillende opbrengspotensiaal
 Table 21 Yield probability (%) of cultivars evaluated in 2013/14, 2014/15 and 2015/16 for the moderate production areas at different yield potentials

Kultivar Cultivar	Opbrengspotensiaal/Yield potential (t/ha)									
	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5		
DM 6.2i RR	74	71	66	62	57	52	47	43		
LS 6146 R	35	31	26	23	20	18	16	15		
LS 6161 R	75	73	70	66	62	58	54	50		
LS 6164 R	67	65	62	58	55	51	47	44		
LS 6240 R	29	29	29	30	31	32	33	35		
LS 6248 R	50	57	64	70	76	80	84	87		
LS 6261 R	39	48	56	65	73	79	84	88		
PAN 1454 R	18	18	18	19	20	21	23	24		
PAN 1500 R	47	44	42	40	37	36	34	33		
PAN 1521 R	63	69	73	78	81	84	86	88		
PAN 1614 R	65	61	57	53	49	44	40	37		
PAN 1623 R	89	91	93	94	95	95	95	95		
PHB 94 Y 80 R	9	14	20	29	39	50	60	69		
PHB 95 Y 20 R	60	52	43	34	26	20	15	11		

Tabel 22 Saadopbrengs (kg/ha⁻¹) van kultivars gedurende die 2014/15 en 2015/16 groeiseisoen ten opsigte van die verskillende lokaliteite wat in die matige produksiegebiede geleë is

Table 22 Seed yield (kg/ha⁻¹) of cultivars during the 2014/15 and 2015/16 growing season for the various localities situated in the moderate production areas

Kultivar	2014/15										2015/16								
	Cedara	Dundee	Glen	Greytown	Kranskop	Kroonstad	Migdal	Potchetstroom Bespr.	Potchetstroom P D1 Drg	Potchetstroom P D2 Drg	Gem/Mean	Bergville	Cedara	Glen	Greytown	Greytown	Kranskop	Kroonstad	Gem/Mean
LS 6240 R	2896	1755	3792	2121	1760	1010	1625	1037	1382	1931	3595	1344	2297	2037	2962	1344	2087	-	-
LS 6444 R	2615	1318	3140	2116	1644	1394	1776	860	912	1753	-	-	-	-	-	-	-	-	-
PAN 1454 R	3546	1647	3545	1328	1981	1302	2250	1364	1993	1993	2956	1550	1808	2224	2700	1031	1918	-	-
LS 6146 R	3405	1661	3239	2228	1740	1125	1819	792	1901	1990	3330	1204	2014	1889	3135	1314	1891	-	-
PHB 94 Y 80 R	3740	1320	3296	1211	1725	1358	2141	961	1079	1870	3799	1643	1930	1915	2801	1107	2052	-	-
LS 6248 R	3922	1896	3421	2770	2254	1267	2637	1262	2029	2384	3293	2357	2515	2315	3565	1183	2285	-	-
NS 5009 R	3666	2046	4012	1322	2027	1313	1979	991	1640	2111	3779	1516	2487	2004	2835	1465	2093	-	-
DM 5.1i RR	2332	1352	3237	1148	1852	1311	2336	924	1291	1754	3190	1220	2368	2104	2950	1012	1993	-	-
PHB 95 Y 20 R	2875	1380	2590	2104	1703	1551	1802	1387	2090	1942	2778	2596	2265	2411	2799	1030	1953	-	-
PAN 1583 R	3033	1605	3622	2435	2190	1169	2633	1437	2607	2303	-	-	-	-	-	-	-	-	-
PAN 1664 R	3086	1590	3624	2549	2118	1138	3735	1223	2401	2385	-	-	-	-	-	-	-	-	-
DM 5953 RSF	3961	1677	4944	1613	2099	1703	2895	1197	1628	2413	3520	1994	4016	2143	3341	890	2283	-	-
LS 6453 R	3685	1434	2845	2239	2303	1421	2030	1019	1567	2060	-	-	-	-	-	-	-	-	-
PAN 1521 R	4421	1726	3528	2621	2222	1380	2202	1418	2370	2432	3970	2854	2758	2548	3386	1148	2446	-	-
PAN 1500 R	3502	1432	3319	2096	1906	1457	2771	1454	2340	2253	3222	2721	1748	2486	2629	1041	2002	-	-
NS 5909 R	3007	1359	3492	1840	1948	1344	3622	1876	2575	2340	2875	3103	2808	3123	2953	1119	2349	-	-
PHB 96 T 06 R	2815	1293	2903	2160	1964	1347	2321	1671	2686	2129	2909	2832	1844	2918	3560	1075	2216	-	-
LS 6466 R	4145	1229	3197	2440	2486	1411	2081	1422	2280	2299	-	-	-	-	-	-	-	-	-
PAN 1666 R	3192	1101	3001	2112	2123	1059	2347	1121	1883	1993	-	-	-	-	-	-	-	-	-
PAN 1623 R	3698	1730	3591	2732	2487	1840	2727	1553	2430	2532	3590	3359	2885	3118	3829	1221	2633	-	-
LS 6261 R	3588	1747	3287	2661	2926	1440	2399	1184	1716	2328	2561	2658	2443	2257	3859	1228	2189	-	-
DM 6.2i RR	3629	1922	3386	2280	2475	1638	2513	1304	2089	2360	2350	3050	3955	3246	3087	1389	2576	-	-
LS 6164 R	3831	1659	2497	2385	1901	1246	2787	1572	2448	2259	3091	3029	2307	2651	4108	1273	2309	-	-
LS 6161 R	4195	1370	3273	2632	2391	1567	2464	1902	2383	2464	2293	2939	1712	3113	3583	1130	2199	-	-
PAN 1614 R	3299	1512	2789	2110	2368	1276	2118	1606	2188	2141	3425	2773	1987	2710	3470	1092	2156	-	-
NS 6448 R	2994	1473	2871	2379	2023	1532	2842	1383	2910	2268	3643	2483	2616	2971	4039	1167	2382	-	-
DM 6.8i RR	4141	984	3411	2501	2838	1457	3146	1229	1912	2502	2771	2977	2694	3186	3545	1053	2315	-	-
NS 7211 R	3433	1247	3274	2216	2426	1184	2718	1943	2115	2284	3736	2911	2186	2993	3062	1159	2268	-	-
PAN 1729 R	3708	1609	2506	2120	1724	1606	3142	1976	2230	2291	-	-	-	-	-	-	-	-	-
SSS 4945 (tuc)	-	-	-	-	-	-	-	-	-	-	2340	1188	2604	1916	2579	953	1899	-	-
SSS 5449 (tuc)	-	-	-	-	-	-	-	-	-	-	2681	1681	2523	2320	3087	1067	2081	-	-
SSS 5052 (tuc)	-	-	-	-	-	-	-	-	-	-	3677	3022	2048	2586	3115	1334	2349	-	-
SSS 6560 (tuc)	-	-	-	-	-	-	-	-	-	-	2702	2689	2619	2705	3560	1298	2323	-	-
Gem/Mean	3461	1520	3298	2154	2124	1374	2478	1365	2015	2199	3157	2373	2440	2534	3251	1159	2202	-	-

Tabel 23 Opbrengstwaarskynlikheid (%) van kultivars geëvalueer in 2013/14, 2014/15 en 2015/16 vir die warm produksiegebiede by verskillende opbrengspotensiaal
 Table 23 Yield probability (%) of cultivars evaluated in 2012/13, 2013/14 and 2014/15 for the warm production areas at different yield potentials

Kultivar Cultivar	Yield potential (t/ha)							
	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5
DM 6.2i RR	63	66	69	73	75	77	77	77
LS 6146 R	35	39	45	51	58	64	69	73
LS 6161 R	87	84	79	72	63	53	43	35
LS 6164 R	79	73	64	53	41	31	22	17
LS 6240 R	45	40	34	30	25	22	19	18
LS 6248 R	28	32	37	42	49	56	62	66
LS 6261 R	13	18	26	37	50	63	73	81
PAN 1454 R	55	51	46	40	35	31	28	25
PAN 1500 R	46	41	34	29	23	20	17	16
PAN 1521 R	66	74	80	86	90	92	93	94
PAN 1614 R	65	64	61	59	56	53	49	47
PAN 1623 R	77	76	75	73	70	66	62	58
PHB 94 Y 80 R	38	39	40	41	43	45	47	49
PHB 95 Y 20 R	5	6	7	9	13	19	26	34

Tabel 24 Saadopbrengs (kg/ha⁻¹) van kultivars gedurende die 2014/15 en 2015/16 groeiseisoen ten opsigte van die verskillende lokaliteite wat in die warm produksiegebiede geleë is
 Table 24 Seed yield (kg/ha⁻¹) of cultivars during the 2014/15 and 2015/16 growing season for the various localities situated in the warm production areas

Kultivar	2014/15				2015/16			
	Atlanta	Brits	Groblersdal	Gem/Mean	Atlanta	Brits	Groblersdal	Gem/Mean
LS 6240 R	4331	3200	1983	3171	1634	1419	2405	1819
LS 6444 R	4165	2651	2074	2963	-	-	-	-
PAN 1454 R	4399	3732	2202	3445	1652	1935	2484	2023
LS 6146 R	4928	2650	2157	3245	1763	1829	4110	2567
PHB 94 Y 80 R	4401	3940	2245	3528	1598	1460	3461	2173
LS 6248 R	4640	2228	2218	3029	1515	1727	4360	2534
NS 5009 R	4622	2738	1794	3052	2072	1802	3284	2386
DM 5.1i RR	4802	3199	2940	3647	1357	1820	3684	2287
PHB 95 Y 20 R	4237	2600	1852	2897	1576	1319	3852	2249
PAN 1583 R	4299	2979	1854	3044	-	-	-	-
PAN 1664 R	3988	3048	1866	2967	-	-	-	-
DM 5953 RSF	4361	3151	2607	3373	1705	2555	4285	2848
LS 6453 R	4318	2788	1913	3006	-	-	-	-
PAN 1521 R	4632	4303	2437	3791	2163	1941	4890	2998
PAN 1500 R	4195	2699	1881	2925	2064	1693	3836	2531
NS 5909 R	4738	2698	2274	3236	2237	1866	4764	2956
PHB 96 T 06 R	4220	2300	1660	2727	1921	1475	2934	2110
LS 6466 R	3871	3112	2211	3064	-	-	-	-
PAN 1666 R	4426	2899	1627	2984	-	-	-	-
PAN 1623 R	4701	3215	2309	3409	2265	1658	3413	2445
LS 6261 R	4635	2806	1694	3045	1234	1818	4146	2399
DM 6.2i RR	4548	3012	2501	3354	2183	1886	4581	2883
LS 6164 R	4091	2618	2230	2980	2060	1628	3422	2370
LS 6161 R	3960	3397	2208	3188	2321	1705	4071	2699
PAN 1614 R	4170	2798	1716	2895	2194	1727	4042	2655
NS 6448 R	-	3110	2662	2886	2336	1607	4126	2689
DM 6.8i RR	4302	3315	2317	3311	2114	1752	3696	2521
NS 7211 R	4226	3534	2517	3425	2557	1595	3540	2564
PAN 1729 R	3509	3129	2039	2892	-	-	-	-
SSS 4945 (tuc)	-	-	-	-	1170	1450	3858	2159
SSS 5449 (tuc)	-	-	-	-	1305	1715	2653	1891
SSS 5052 (tuc)	-	-	-	-	2008	1733	3524	2422
SSS 6560 (tuc)	-	-	-	-	2225	2102	3463	2597
Gem/Mean	4347	3029	2138	3154	1893	1739	3726	2453

Tabel 25 Saamgevatte inligting van al die lokaliteite in die koel produksiegebiede, 2015/16
 Table 25 Summarised information for all the localities in the cool production areas, 2015/16

Kultivar/Cultivar	Dae tot blom/ Days to flowering	Fisiologies ryp/ Physiological mature	Oes datum/ Harvest date	Planthoogte/ Plant height	Peulhoogte/ Pod height	Omval/ Lodging	Groen stam/ Green stem	Opspring/ Shattering	Planttelling/ Number of plants	Persentasie ongewenste sade/Percent tage undesirable seed	Massa 100 sade/ Mass 100 seeds	Olie persentasie/Oil per cent tage	Ru- proteïen- persenta sie/ Crude protein per cent tage	Opbrengs/ Yield
LS 6240 R	60	124	146	62	7	1,00	1,40	1,00	172	0,32	18,35	13,60	34,99	2432
PAN 1454 R	64	125	145	77	8	1,00	1,60	1,00	182	0,13	16,18	13,42	35,09	2417
SSS 4945 (tuc)	63	122	143	57	5	1,00	1,20	3,50	221	0,23	15,03	13,02	35,99	2402
LS 6146 R	67	124	146	71	7	1,00	1,07	1,00	197	0,20	14,55	11,01	36,13	2215
PHB 94 Y 80 R	64	125	148	63	5	1,00	1,33	1,00	221	0,23	15,87	13,77	34,98	2776
LS 6248 R	69	137	153	75	7	1,00	2,00	1,50	208	0,46	14,12	12,32	34,52	2909
SSS 5449 (tuc)	75	137	153	70	7	1,00	1,47	1,00	199	0,30	13,55	11,94	35,62	2682
NS 5009 R	68	125	148	65	5	1,00	1,27	1,50	212	0,12	15,86	13,07	34,87	2631
DM 5.11RR	69	125	144	59	3	1,00	1,20	1,00	170	0,11	15,77	12,39	35,96	2199
PHB 95 Y 20 R	72	142	166	66	7	1,13	1,80	1,00	182	0,34	14,93	14,47	33,10	2254
DM 5953 RSF	70	129	149	70	7	1,00	1,13	1,00	234	0,34	14,68	12,28	35,11	2678
SSS 5052 (tuc)	74	144	165	76	8	1,13	1,27	1,00	166	0,50	14,01	12,08	35,12	2438
PAN 1521 R	73	141	160	81	8	1,00	1,60	1,00	237	0,26	15,80	11,74	34,45	2967
PAN 1500 R	75	142	168	75	8	1,00	2,13	1,50	199	0,38	15,57	13,88	34,10	2750
NS 5909 R	79	142	170	78	7	1,07	2,20	1,50	213	0,32	15,27	11,94	34,74	2819
LS 6261 R	73	144	163	72	9	1,00	2,40	1,00	197	0,53	15,39	13,16	34,20	2806
PHB 96 T 06 R	76	145	166	93	9	1,20	1,40	1,00	216	0,42	14,89	11,99	34,91	2839
PAN 1623 R	75	143	165	80	8	1,00	1,67	1,00	178	0,25	14,55	13,26	34,79	2691
LS 6161 R	71	145	166	85	10	1,00	1,93	1,50	215	0,44	14,04	12,60	34,30	2696
DM 6.21RR	73	146	170	83	8	1,20	2,27	1,00	144	0,21	16,94	13,23	33,15	2453
SSS 6560 (tuc)	73	143	162	81	9	1,00	2,20	1,00	187	0,28	14,46	12,70	34,32	2655
LS 6164 R	72	145	168	89	10	1,00	1,87	1,50	209	0,36	14,29	11,02	34,61	2676
PAN 1614 R	75	144	170	91	9	1,00	1,40	1,00	192	0,24	14,91	12,98	34,72	2372
NS 6448 R	78	144	170	85	9	1,00	1,60	2,00	206	0,43	15,03	12,73	35,08	2890
DM 6.81RR	73	148	173	94	9	1,33	2,40	1,00	142	0,43	16,53	12,65	33,28	2407
NS 7211 R	74	144	166	65	7	1,00	2,00	2,00	176	0,28	15,53	13,50	33,37	2488
Standaard 1	66	125	145	62	6	1,00	1,60	1,00	183	0,33	18,05	13,94	35,22	2532
Standaard 2	72	141	159	81	8	1,13	1,80	1,00	188	0,19	15,87	12,36	34,29	2882
Gem/Mean	71	137	159	75	7	1	2	1	194	0,31	15	12,75	34,68	2606

Tabel 26 Saamgevatte inligting van al die lokaliteite in die matige produksiegebiede, 2015/16
 Table 26 Summarised information for all the localities in the moderate production areas, 2015/16

Kultivar/Cultivar	Dae tot blom/ Days to flowering	Fisiologies ryp/ Physiological mature	Oes datum/ Harvest date	Planthoogte/ Plant height	Peulhoogte/ Pod height	Omval/ Lodging	Groen stam/ Green stem	Opspring/ Shattering	Plantteiling/ Number of plants	Perentasie/ongewenste sade/Per centage undesirable seed	Massa 100 sade/ Mass 100 seeds	Olie persentasie/Oil percentage	Ru- proteïen- persentasie/ Crude protein percentage	Opbrenings/ Yield
LS 6240 R	47	110	128	58	7	1,00	1,33	1,00	223	0,86	19,00	14,41	35,41	2263
PAN 1454 R	46	112	129	68	8	1,00	1,93	2,00	222	0,96	17,20	14,73	35,31	2045
SSS 4945 (tuc)	43	112	127	58	6	1,20	1,93	3,00	243	0,88	16,82	14,37	35,65	1930
LS 6146 R	43	111	128	69	8	1,20	1,40	1,00	242	1,12	15,71	13,56	35,77	2147
PHB 94 Y 80 R	49	113	129	59	8	1,00	2,33	2,50	279	0,59	16,94	14,74	34,70	2199
LS 6248 R	62	117	133	73	11	1,00	1,60	2,00	266	0,93	14,79	13,81	35,53	2538
SSS 5449 (tuc)	62	116	129	65	10	1,00	1,33	1,83	239	0,69	13,84	13,38	36,15	2226
NS 5009 R	44	114	128	57	7	1,20	2,60	1,50	245	0,77	17,24	13,54	34,88	2348
DM 5.11 RR	43	111	129	63	7	1,20	2,27	2,50	226	0,88	16,60	13,05	35,76	2140
PHB 95 Y 20 R	64	119	139	70	11	1,40	2,07	2,50	195	0,94	15,79	15,00	34,87	2313
DM 5953 RSF	47	112	128	67	8	1,00	2,07	3,00	272	0,77	15,64	13,23	35,29	2651
SSS 5052 (tuc)	63	122	143	70	11	1,00	1,40	1,00	193	0,73	14,91	12,96	35,84	2630
PAN 1521 R	62	119	137	74	13	1,00	1,53	1,00	272	1,03	16,79	13,97	34,79	2777
PAN 1500 R	61	123	138	71	13	1,00	2,20	1,00	241	1,02	16,36	15,31	34,65	2308
NS 5909 R	64	125	143	77	14	1,20	2,20	2,00	255	0,85	16,76	13,50	35,84	2663
LS 6261 R	60	123	140	59	10	1,00	2,67	2,00	253	1,21	16,15	15,27	34,49	2501
PHB 96 T 06 R	66	126	143	84	13	1,07	1,33	1,00	260	1,03	16,04	13,98	35,38	2523
PAN 1623 R	61	125	141	80	12	1,20	1,60	1,00	253	0,78	15,52	14,65	35,56	3000
LS 6161 R	63	126	141	74	14	1,00	2,27	1,00	243	0,88	15,56	14,98	34,99	2462
DM 6.21 RR	60	125	143	75	10	1,40	1,53	1,00	179	1,12	18,97	13,85	34,79	2846
SSS 6560 (tuc)	64	126	141	73	11	1,00	1,67	1,00	210	0,99	15,81	14,49	34,85	2596
LS 6164 R	61	127	145	82	14	1,53	1,40	1,00	250	1,15	15,81	13,70	35,27	2743
PAN 1614 R	64	125	140	82	14	1,00	1,93	1,00	254	0,84	16,21	13,46	35,57	2576
NS 6448 R	65	127	142	73	13	1,00	1,67	1,50	245	1,24	17,20	14,04	35,86	2820
DM 6.81 RR	61	129	146	84	13	1,00	2,03	1,00	134	1,41	17,58	13,20	34,84	2704
NS 7211 R	65	128	146	68	12	1,00	2,20	1,00	221	1,40	17,37	14,25	34,89	2674
Standaard 1	45	111	130	60	8	1,00	1,60	1,00	253	0,96	18,95	14,74	35,25	2175
Standaard 2	64	122	137	78	12	1,00	1,40	1,00	226	0,65	16,68	13,64	34,97	2903
Gem	57	120	136	70	11	1,09	1,84	1,51	236	0,95	16,51	14,07	35,26	2489

Tabel 27 Saamgevatte inligting van al die lokaliteite in die warmer produksiegebiede, 2015/16
 Table 27 Summarised information for all the localities in the warmer production areas, 2015/16

Kultivar/Cultivar	Dae tot blom/ Days to flowering	Fisiologies ryp/ Physiological mature	Oes datum/ Harvest date	Planthoogte/ Plant height	Peulhoogte/ Pod height	Omval/ Lodging	Groen stam/ Green stem	Opspring/ Shattering	Planttelling/ Number of plants	Perentasie ongewenste sade/ Percent undeirable seed	Massa 100 sader/ Mass 100 seeds	Olie persentasie/ Oil percent	Ru- proteïen- persentasie/ Crude protein percent	Opbrenge/ Yield
LS 6240 R	49	117	128	52	3	1,00	2,33	2,00	227	0,38	17,81	15,09	37,06	1819
PAN 1454 R	42	115	140	68	4	1,00	2,67	3,00	249	1,34	15,22	14,79	36,62	2023
SSS 4945 (tuc)	42	117	135	59	4	1,00	2,33	5,00	223	0,25	15,46	13,51	38,44	2159
LS 6146 R	43	117	133	69	6	1,00	3,50	2,00	257	0,53	13,83	11,84	38,84	2567
PHB 94 Y 80 R	46	117	134	59	4	1,00	3,00	5,00	284	0,07	16,01	14,45	36,71	2173
LS 6248 R	46	130	137	79	8	1,00	2,33	5,00	229	0,31	14,80	13,84	37,77	2534
SSS 5449 (tuc)	53	117	129	63	5	1,00	2,17	5,00	244	0,48	12,98	13,05	38,53	1891
NS 5009 R	42	115	135	62	5	1,00	3,00	3,00	240	0,66	15,65	13,67	36,47	2386
DM 5.1iRR	42	117	137	62	5	1,00	3,00	5,00	247	0,23	14,63	13,09	38,44	2287
PHB 95 Y 20 R	51	126	142	40	7	1,00	2,17	3,00	188	0,14	14,97	15,29	37,59	2249
DM 5953 RSF	47	117	132	74	5	1,00	2,00	3,00	238	0,23	14,08	13,91	35,86	2848
SSS 5052 (tuc)	49	126	139	68	6	1,00	2,50	1,00	257	0,43	15,50	13,00	37,87	2422
PAN 1521 R	48	122	134	87	9	1,17	2,00	4,00	291	0,44	15,51	13,41	37,33	2998
PAN 1500 R	49	123	145	64	7	1,00	2,33	2,00	234	0,47	15,43	15,37	35,97	2531
NS 5909 R	51	121	143	73	11	1,00	2,50	3,00	256	0,68	15,64	13,54	37,92	2956
LS 6261 R	53	126	139	59	7	1,00	2,83	3,00	276	0,43	15,72	14,53	36,02	2399
PHB 96 T 06 R	53	120	142	81	6	1,00	2,50	3,00	277	0,81	15,15	13,58	37,48	2110
PAN 1623 R	47	126	145	72	9	1,00	2,33	3,00	213	0,41	15,10	14,59	37,80	2445
LS 6161 R	50	130	145	85	13	1,00	2,33	3,00	244	0,57	14,05	15,37	36,09	2699
DM 6.2iRR	50	119	138	85	9	1,00	2,17	1,00	228	0,39	16,71	13,35	38,08	2883
SSS 6560 (tuc)	47	130	146	76	8	1,00	2,17	2,00	207	0,60	14,64	13,94	35,85	2597
LS 6164 R	50	126	138	79	7	1,00	2,00	2,00	266	0,65	14,60	13,41	37,45	2370
PAN 1614 R	55	123	136	73	7	1,00	2,17	1,00	210	0,50	15,88	11,69	39,07	2655
NS 6448 R	53	126	144	62	9	1,00	2,33	5,00	261	0,64	15,52	13,13	37,43	2689
DM 6.8iRR	51	126	147	84	8	1,00	2,50	1,00	212	0,77	16,94	14,11	36,61	2521
NS 7211 R	43	130	152	46	5	1,00	2,17	2,00	268	0,84	17,49	14,71	36,50	2564
Standaard 1	42	113	129	58	5	1,00	2,00	5,00	236	0,25	16,92	13,71	36,81	2253
Standaard 2	51	123	135	93	10	1,17	2,00	2,00	220	0,15	15,89	12,19	37,46	2996
Gem	48	122	138	69	7	1	2	3	242	0,48	15	13,79	37,29	2465

No. R. 478

20 June 2014

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 moisture content.

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%
(j) Deviation in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items	6%



**agriculture,
forestry & fisheries**

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NO. PAGES:	1	DATE: 19th January 2016

Subject

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

Please refer to the e-mail dated 18th January 2016 from **AGBIZ GRAIN**

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

	Nature of deviation	Maximum percentage permissible deviation
(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)	5%
(j)	Deviation in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items	7%

This permission is subject to the following conditions:

- (a) All other conditions of the Standard and Requirements regarding the control of export for Feed Products shall be complied with.
- (b) It may be withdrawn at any time should a valid complaint be received
- (c) **AGBIZ GRAIN** indemnifies this Directorate and the Department from any detrimental effect, financially or otherwise, which may emanate as a result of this permission.
- (d) Termination date is until the regulations are reviewed.



EXECUTIVE OFFICER:
AGRICULTURAL PRODUCT STANDARDS
Copies: Regional Manager: Directorate: Inspection Services

