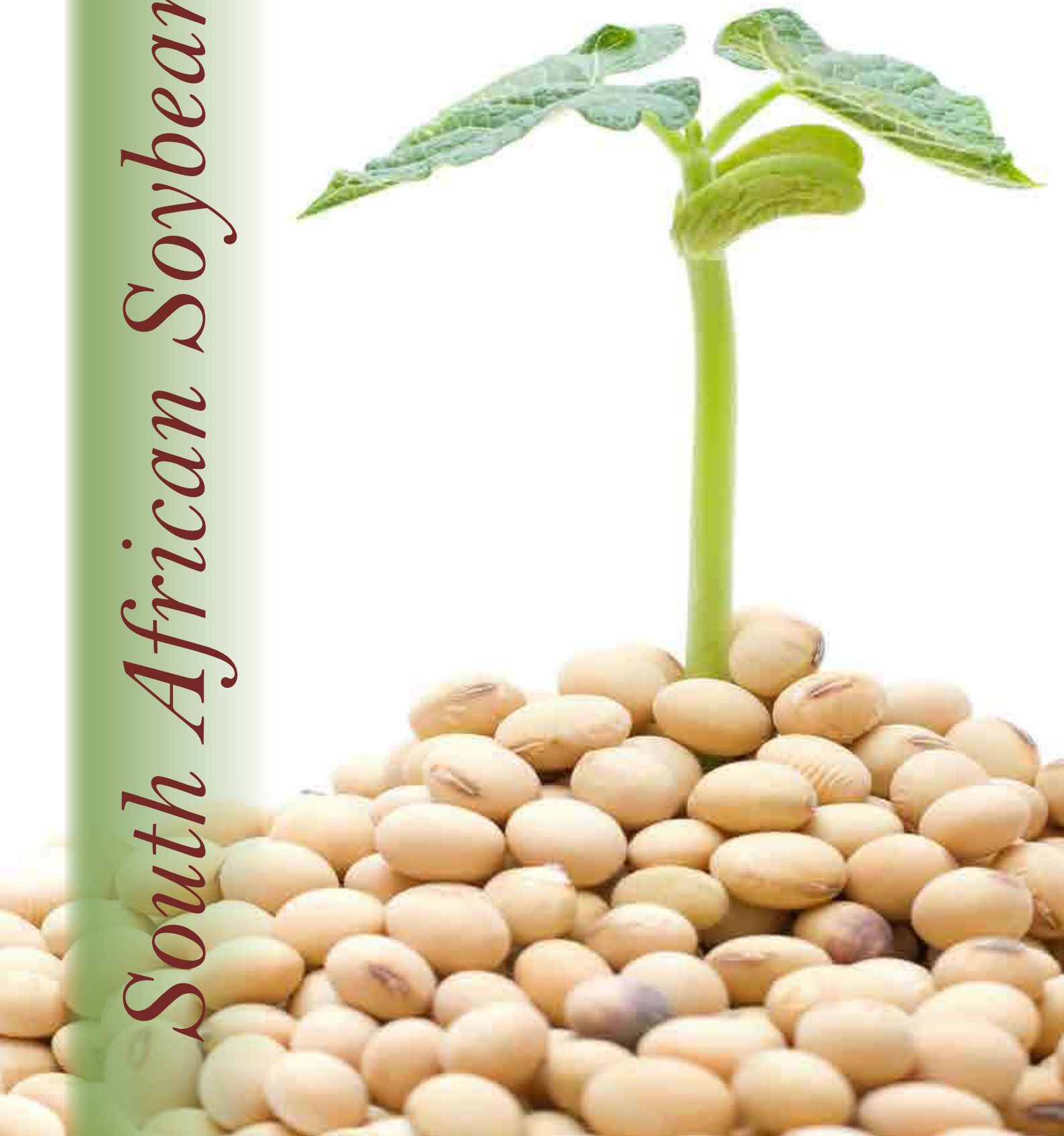
South African Soybean Crop

Quality Report
2016/2017 Season



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South African
COMMERCIAL SOYBEAN QUALITY FOR THE 2016/2017 SEASON

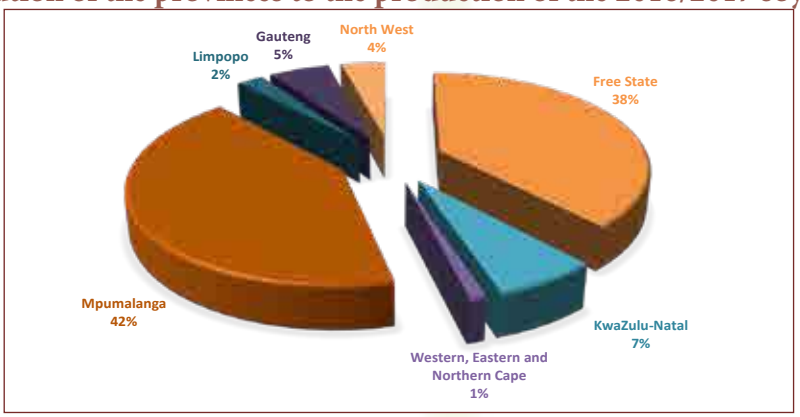
Acknowledgements
With gratitude to:

- ***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.*
- *The Bureau for Food and Agricultural Policy (BFAP) for providing research based market analysis.*

Introduction

The final figure for the commercial soybean crop of the 2016/2017 season is 1 316 000 tons, as overseen by the National Crop Estimates Liaison Committee (CELC). The final calculated crop figure was adjusted downward slightly by 370 tons (0.03%). This all-time high record crop represents an increase of 77.4% (574 000 tons) compared to the severely drought affected 2015/2016 season. The major soybean-producing provinces, contributing 80.0% of the total crop, were Mpumalanga and the Free State.

Graph 1: Contribution of the provinces to the production of the 2016/2017 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 28. One hundred and fifty composite soybean samples, representing the different production regions, were analysed for quality. The samples were graded, milled and analysed for moisture, crude protein, crude fat, crude fibre and ash content. Fifteen randomly selected samples were analysed to quantitatively determine the presence of genetically modified soybeans.

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

This is the sixth 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 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 is provided in table and graph format. Import and export figures over several seasons as well as information on the manufacture, import and export of oil seeds products, are also included.

The 2016/17 Report of the National Soybean Cultivar Trials conducted by the ARC-Grain Crops in Potchefstroom, is included in totality and as received, in this report. The national grading regulations as published in the Government Gazette No. R.370 of 21 April 2017 are also provided.

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 requirements compared to other commodities for example wheat and maize.

Sufficient and well-timed rainfall through most of the summer grain producing area resulted in a record soybean crop this season. The national yield increased from an average of 1.48 t/ha last season to 2.29 t/ha this season.

Table1: Soybean production overview over two seasons

Province	Type of production	2016/2017			2015/2016		
		Hectares planted, ha	Production, tons	Yield, t/ha	Hectares planted, ha	Production, tons	Yield, t/ha
Western Cape	Dryland	-	-	-	-	-	-
	Irrigation	700	1 050	1.50	800	1 200	1.50
	Total	700	1 050	1.50	800	1 200	1.50
Northern Cape	Dryland	-	-	-	-	-	-
	Irrigation	3 000	10 500	3.50	4 000	13 600	3.40
	Total	3 000	10 500	3.50	4 000	13 600	3.40
Free State	Dryland	232 600	477 700	2.05	167 900	137 500	0.82
	Irrigation	7 400	26 300	3.55	6 100	10 500	1.72
	Total	240 000	504 000	2.10	174 000	148 000	0.85
Eastern Cape	Dryland	1 850	2 775	1.50	1 500	2 100	1.40
	Irrigation	-	-	-	-	-	-
	Total	1 850	2 775	1.50	1 500	2 100	1.40
KwaZulu-Natal	Dryland	22 000	58 155	2.64	19 000	39 000	2.05
	Irrigation	8 500	31 450	3.70	9 000	27 000	3.00
	Total	30 500	89 605	2.94	28 000	66 000	2.36
Mpumalanga	Dryland	234 700	533 500	2.27	232 300	390 000	1.68
	Irrigation	6 300	20 800	3.30	7 700	18 000	2.34
	Total	241 000	554 300	2.30	240 000	408 000	1.70
Limpopo	Dryland	1 500	3 750	2.50	3 500	2 400	0.69
	Irrigation	7 000	26 000	3.71	12 500	36 000	2.88
	Total	8 500	29 750	3.50	16 000	38 400	2.40
Gauteng	Dryland	22 900	61 620	2.69	20 800	41 600	2.00
	Irrigation	2 500	9 500	3.80	2 200	9 000	4.09
	Total	25 400	71 420	2.80	23 000	50 600	2.20
North West	Dryland	15 600	25 500	1.63	12 500	6 600	0.53
	Irrigation	7 400	27 400	3.70	3 000	7 500	2.50
	Total	23 000	52 900	2.30	15 500	14 100	0.91
RSA	Dryland	531 150	1 163 000	2.19	457 500	619 200	1.35
	Irrigation	42 800	153 000	3.57	45 300	122 800	2.71
	Total	573 950	1 316 000	2.29	502 800	742 000	1.48

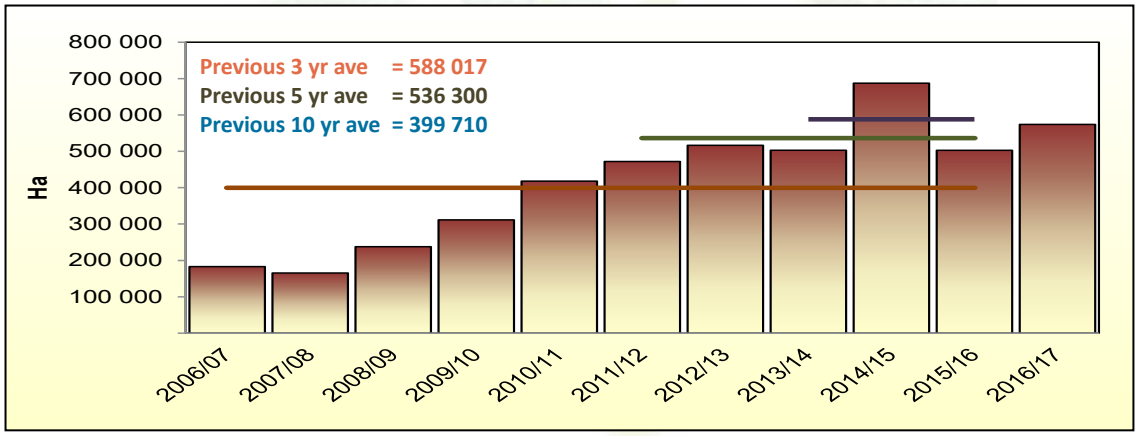
Figures provided by the CEC.

According to the *BFAP Baseline, Agricultural Outlook 2017 – 2026*, the average yield is projected to increase at an annual rate of 4.4% over the outlook period, amounting to a total soybean crop of 2.1 million tons by 2026. The projected yield and resulting crop increases, will follow the introduction of endpoint royalties that will support the availability of new technology to South African producers in coming years.

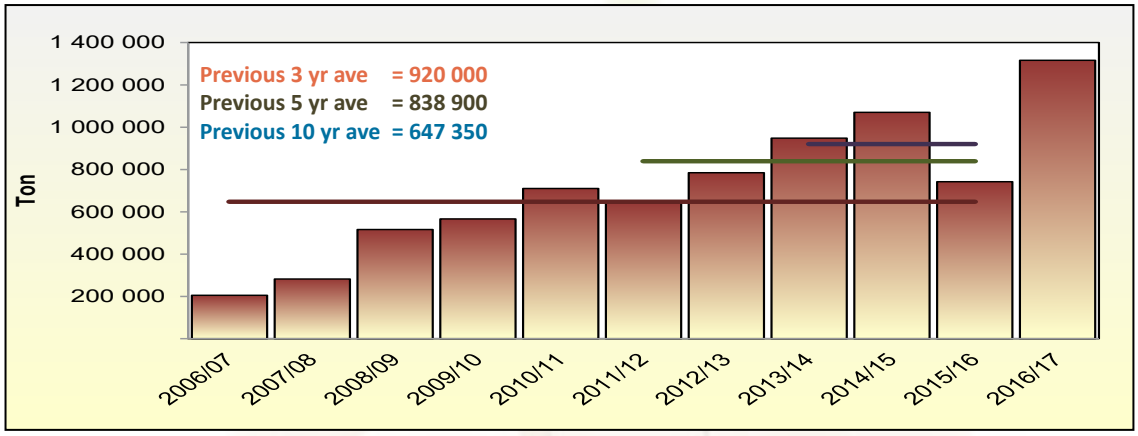
The area planted for soybean production increased by 14% to 573 950 hectares this season, as farmers most probably opted for lower risk alternatives following the impact of the previous season's drought. The expectation is that the soybean area will increase at an average of 4% per year to just under 900 000 hectares by 2026.

Soybeans account for more than half of the world oilseed production. According to the *World Agricultural Supply and Demand Estimates Report (WASDE - 575)* an estimated 351.32 million metric tons of soybeans were produced during the 2016/2017 season. The United States, Brazil and Argentina are the biggest contributors to this total. The world soybean production during the 2017/2018 season is projected to be 340.86 million metric tons.

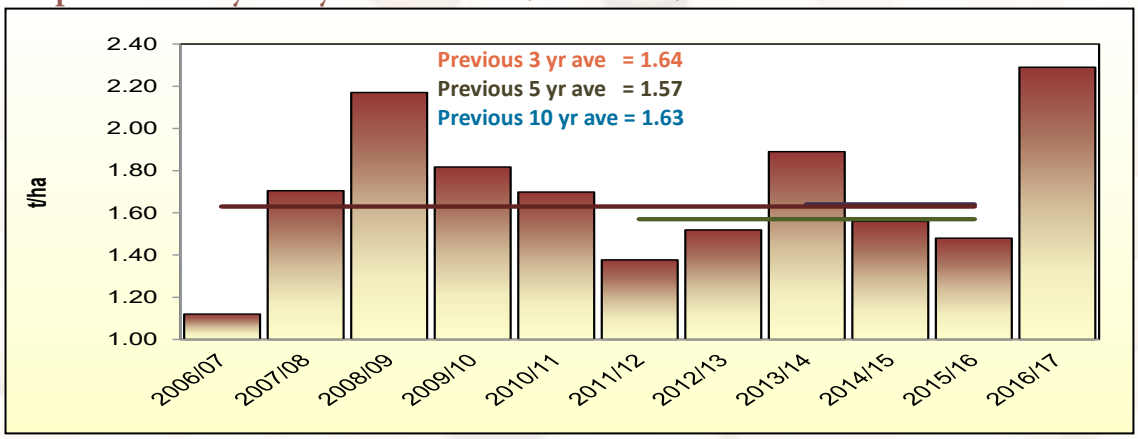
Graph 2: Total RSA area utilised for soybean production from 2006/07 to 2016/17



Graph 3: Soybean production in RSA from 2006/07 to 2016/17

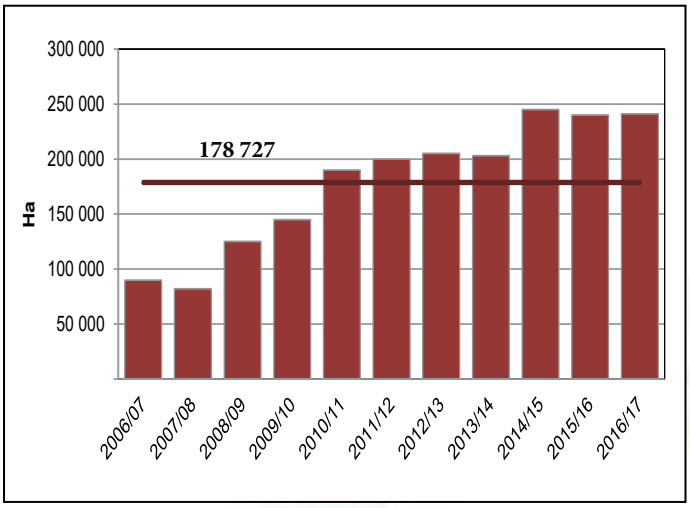


Graph 4: RSA soybean yield from 2006/07 to 2016/17

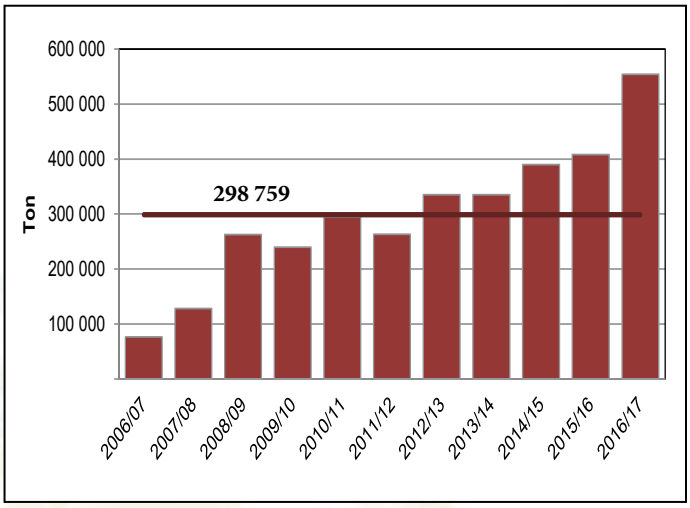


Figures provided by the CEC.

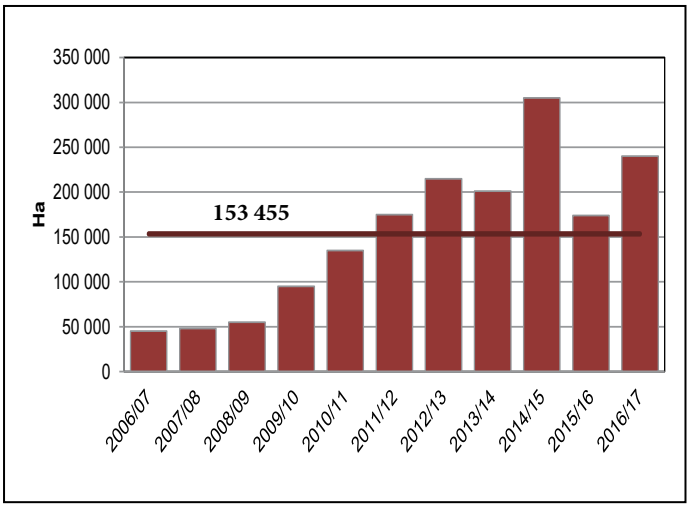
Graph 5: Area utilised for soybean production in Mpumalanga since 2006/07



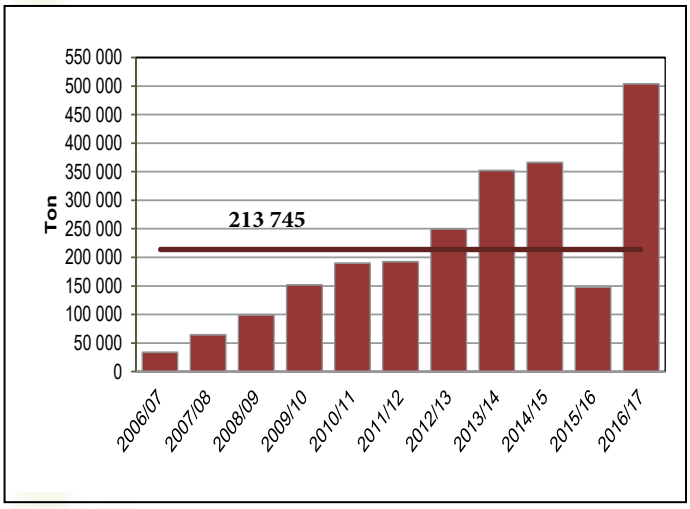
Graph 6: Soybean production in Mpumalanga since 2006/07



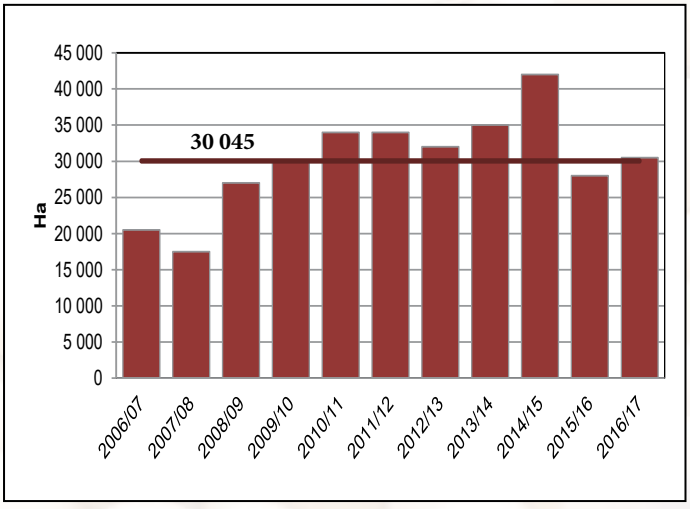
Graph 7: Area utilised for soybean production in the Free State since 2006/07



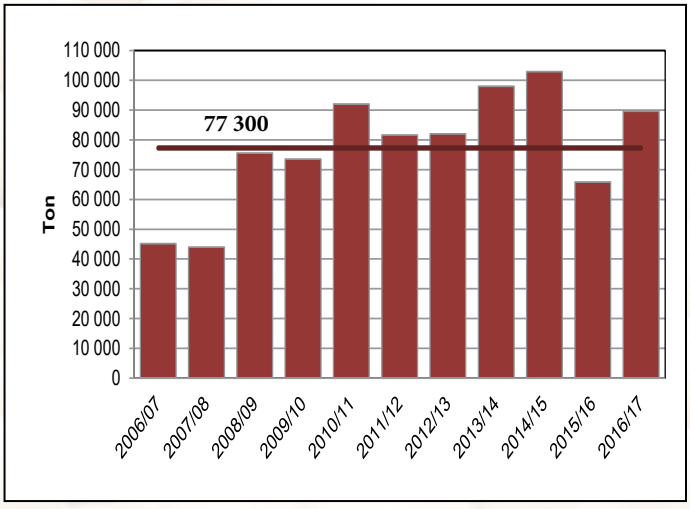
Graph 8: Soybean production in the Free State since 2006/07



Graph 9: Area utilised for soybean production in KwaZulu-Natal since 2006/07



Graph 10: Soybean production in KwaZulu-Natal since 2006/07



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 2017 to January 2018), only 26 858 tons of soybeans have been imported compared to the 271 098 tons of the 2016/2017 season. This stands to reason given the record crop produced locally. Of the 969 052 tons of soybeans processed to date, 2.4% was used for human consumption, 13.6% 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 only 4.5% or 38 597 tons less than the total quantity crushed during the previous season.

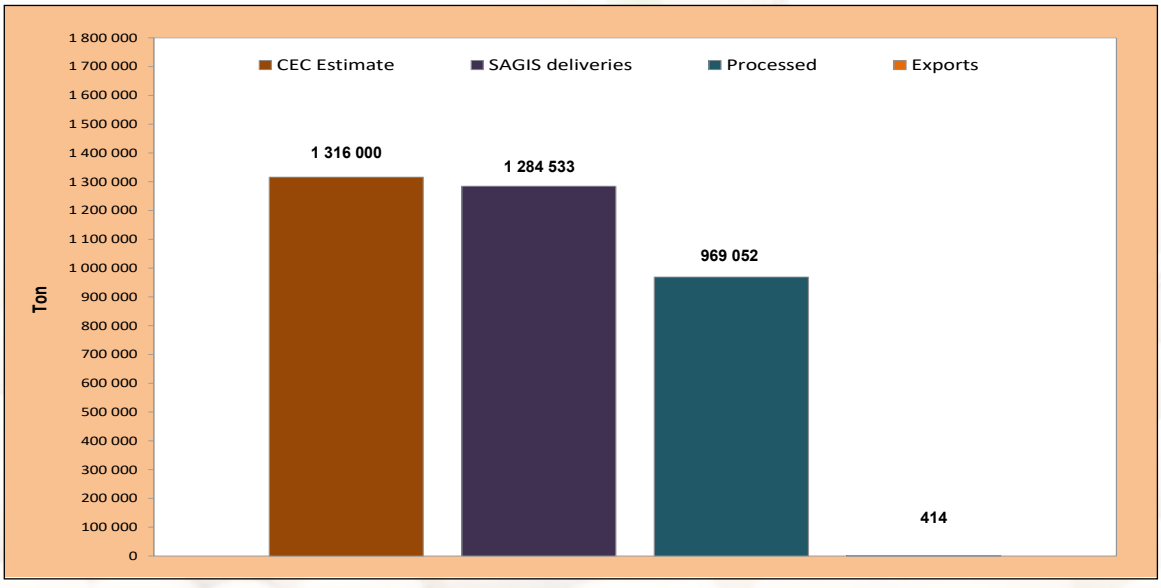
According to *BFAP Baseline*, the maximum theoretical capacity derived from dedicated soybean crushers locally, is estimated at 1.75 million tons, when dual capacity plants (plants that can crush both soybeans and sunflower) are included, this figure increases to 2.5 million tons. Imports are expected to increase slightly over the second half of the outlook period to supply sufficient raw product for crushing purposes. It is projected that by 2026, South Africa will be crushing almost 2.3 million tons of soybeans, of which 7% will be imported.

Due to the increase in the quantity of locally produced soybeans this season, domestic soybean oilcake production is expected to increase by 23% to 840 000 tons. Excluding the previous season, domestic oilcake production has exceeded imported oilcake since 2014, and production is projected to increase to over 1.8 million tons by 2026. This represents an average increase of 9% per annum, continually replacing imports so that only 250 000 tons (equating to 13% of the domestic soybean oilcake use) is projected to be imported by 2026. Product quality and consistency is expected to improve to be in line with imported products on a consistent basis, as the local crushing industry's utilization rates and soybean availability improve.

South Africa remains a net importer of vegetable oils. Domestic consumption of palm, sunflower, soybean and canola oil during 2016 was estimated at more than one million tons, with palm oil comprising approximately 41%. The share of soybean oil in domestically produced vegetable oils, is expected to increase at the expense of sunflower oil, as soybean production and crushing expands over the outlook period. Soya oil imports are projected to decrease by more than two thirds from 160 000 tons in 2017 to 50 000 tons by 2026.

414 tons of soybeans/products have been exported so far this season compared to the 6 745 tons in the previous season. Globally, soybean exports during the 2016/2017 season amounted to an estimated 147.46 million metric tons, with Brazil exporting 43% and the United States 40% of this figure. Argentina was the third largest exporter of soybeans (5% of the total). The projected world soybean exports for the 2017/2018 season currently stands at 150.60 million metric tons. China remains the largest importer of soybeans followed by the European Union and Mexico. 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 2017 - Jan 2018)



Information provided by SAGIS.

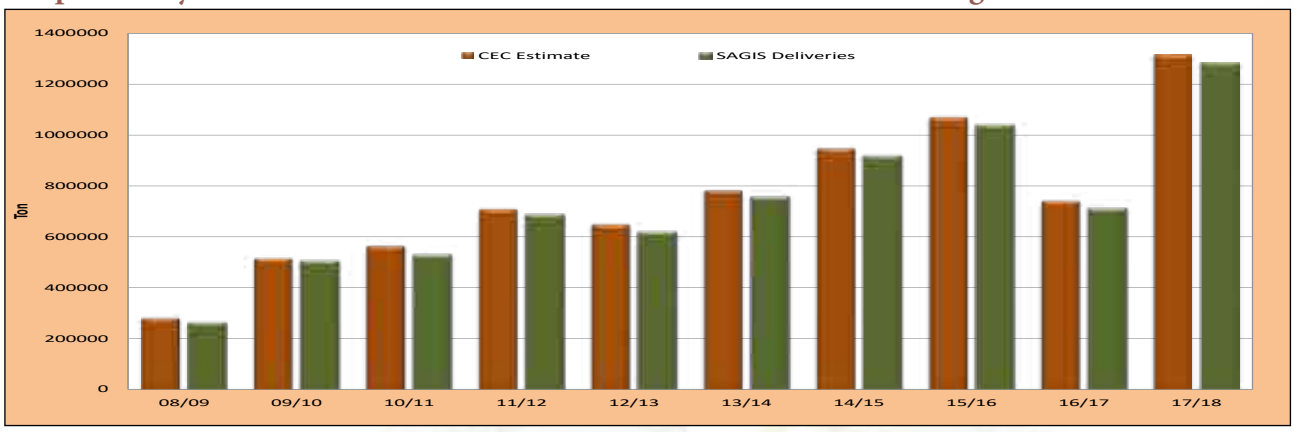
SOYBEANS: SUPPLY AND DEMAND TABLE BASED ON SAGIS' INFO (TON)																	Publication date: 2018-02-26	
	Season (Mar - Feb)																Current Season Mar - Jan	10 Year average
	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	2007/08-2016/17
																	***	
																	11	
CEC (Crop Estimate)	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	1 316 000	647 350
SUPPLY																		
Opening stock (1 Mar)	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	84 792	80 438
Prod deliveries	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	713 660	1 284 533	623 595
Imports	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	271 098	26 858	64 291
Surplus	0	0	400	0	0	3 900	3 300	900	700	1 500	1 800	1 698	2 572	0	10 526	1 122	3 005	2 412
Total Supply	**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**	**1 075 008**	**1 399 188**	**710 985**
DEMAND																		
Processed*	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	974 901	969 052	567 493
-human	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	23 875	23 201	26 539
-animal feed (full fat soya)	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	98 718	132 140	144 514
-crush (oil/oilcake)	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	852 308	813 711	455 911
Withdrawn by producers	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	1 301	3 358
Released to end-consumers	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	1 098	597	2 232
Seed for planting purposes	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	5 678	8 795	4 926
Net receipts(-)/disp(+)	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	1 427	411	1 607
Deficit	0	600	0	2 000	600	0	0	0	0	0	0	0	0	2 782	0	0	0	278
Exports	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	6 745	414	51 090
Total Demand	**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**	**990 216**	**980 570**	**690 455**
Ending Stock (28 Feb)	**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**	**84 792**	**418 618**	**80 281**
- processed p/month	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	81 242	88 096	52 249
- months' stock	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	1.0	4.8	2

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

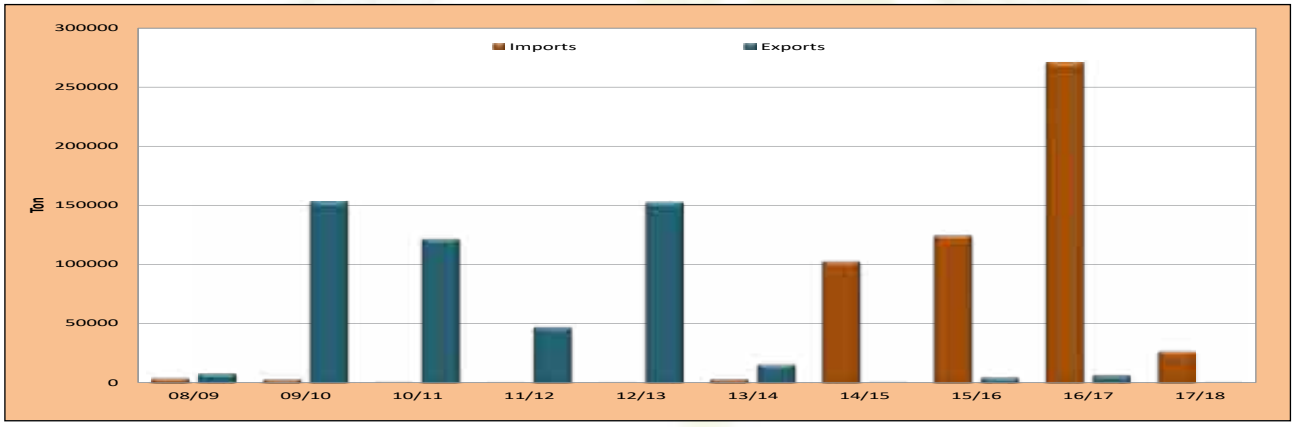
Note: Figures in red: opening stock and ending stock difference

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

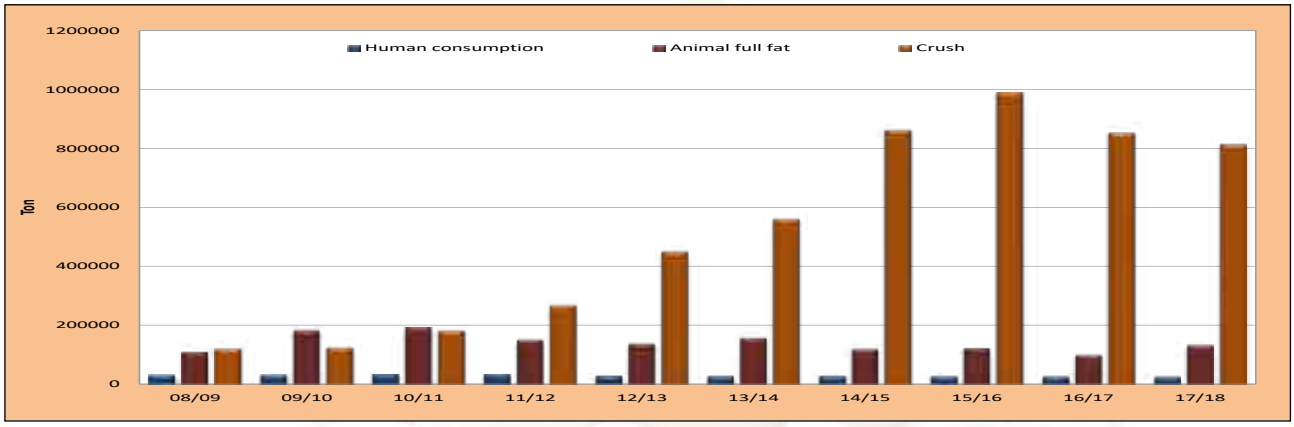
Graph 12: Soybeans: CEC Estimate vs SAGIS deliveries over 10 marketing seasons



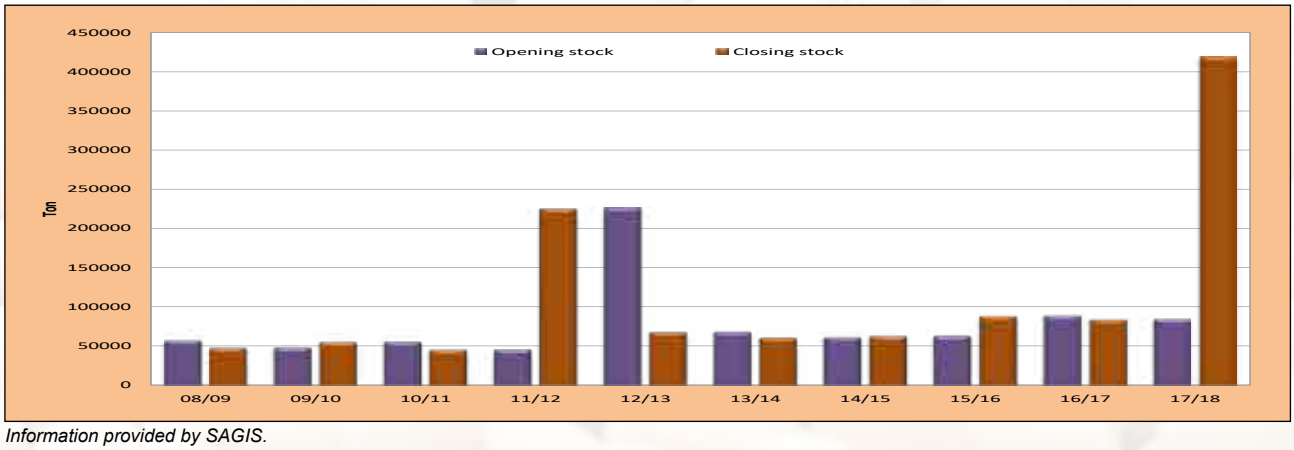
Graph 13: Soybeans: Imports and Exports over 10 marketing seasons



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	61 705	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	3 314	0	0	204	263 576	4 004	0	271 098
2017/2018	0	248	3 153	0	0	0	22 385	1 072	26 858

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	267 094	0	0	267 094
2017/2018*	0	248	0	0	248

* Progressive / Progressief Mar / Mrt 2017 - Jan 2018
Note: Includes Imports 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	2 614	4 131	6 745
2017/2018	4	410	0	414

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
2017/2018*	0	0	0	0	0

* Progressive / Progressief Mar / Mrt 2017 - Jan 2018

All figures are reported in Tons

	OIL SEEDS PRODUCTS PER MONTH MANUFACTURED															
	Nov 2016 Tons	Dec 2016 Tons	Jan 2017 Tons	Feb 2017 Tons	Mar 2017 Tons	Apr 2017 Tons	May 2017 Tons	Jun 2017 Tons	Jul 2017 Tons	Aug 2017 Tons	Sep 2017 Tons	Oct 2017 Tons	Nov 2017 Tons	Dec 2017 Tons	Jan 2018 Tons	Progressive: Nov 2016 - Jan 2018 Tons
Palm Oil and Derivatives	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Soybean Oil	10 722	11 202	10 027	6 715	6 108	10 800	15 551	12 536	14 669	13 853	14 471	10 445	15 405	11 045	14 045	**177 594**
Sunflower Oil	21 617	16 712	21 987	25 916	23 378	13 323	16 031	24 349	30 315	32 939	29 794	35 381	33 694	22 268	28 678	**376 382**
Cottonseed Oil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Coconut Oil/ Groundnut Oil/ Canola Oil/ Corn (Maize) Oil/ Blends or mixes of Oils which includes one of the above Oils/ Biodiesel	110	3 542	4 042	4 338	4 469	4 001	4 921	4 536	5 203	5 388	4 728	5 193	5 279	2 602	4 768	**63 120**
Cottonseed Oilcake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Sunflower Oilcake	23 467	19 323	26 889	30 123	26 252	16 291	19 612	28 293	33 149	35 372	35 006	40 002	38 937	26 420	33 208	**432 344**
Coconut Oilcake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Palmnut Oilcake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Soybean Oilcake/ Canola Oilcake	45 709	50 111	46 132	33 095	31 060	50 354	74 646	58 193	69 535	66 311	66 509	51 117	74 761	51 238	66 183	**834 954**
Soybean Flours and Meals/ Textured Vegetable Protein	1 737	925	1 646	1 640	1 337	2 142	3 067	3 189	3 094	3 298	3 314	3 839	3 614	2 137	2 947	**37 926**
Soybean Fullfat	7 876	6 402	6 056	6 296	8 123	10 595	11 821	14 533	13 464	13 834	12 683	12 420	14 675	13 972	14 483	**167 233**
Peanut Butter and Paste	3 027	2 134	2 534	2 553	2 643	1 596	1 887	3 355	2 524	3 275	3 113	2 855	2 897	2 471	1 471	**38 335**
Total	**114 265**	**110 351**	**119 313**	**110 676**	**103 370**	**109 102**	**147 536**	**148 984**	**171 953**	**174 270**	**169 618**	**161 252**	**189 262**	**132 153**	**165 783**	**2 127 888**

Oilseed Information: Figures were only verified from February 2017.

SAGIS South African Grain Information Service NPC
Suid Afrikaanse Graaninligtingsdiens NWM
Reg no. 1997/019186/08

	OIL SEEDS PRODUCTS PER MONTH IMPORTED															
	Nov 2016 Tons	Dec 2016 Tons	Jan 2017 Tons	Feb 2017 Tons	Mar 2017 Tons	Apr 2017 Tons	May 2017 Tons	Jun 2017 Tons	Jul 2017 Tons	Aug 2017 Tons	Sep 2017 Tons	Oct 2017 Tons	Nov 2017 Tons	Dec 2017 Tons	Jan 2018 Tons	Progressive: Nov 2016 - Jan 2018 Tons
Palm Oil and Derivatives	33 591	27 204	37 457	25 525	17 892	32 028	24 414	25 746	24 327	32 451	19 787	49 011	22 794	32 947	18 389	**423 563**
Soybean Oil	17 427	14 406	12 179	7 000	505	5 000	6 590	5 050	11 867	5 000	3 591	12 030	2 000	0	4 000	**106 645**
Sunflower Oil	4 000	18 769	18 446	15 459	5 268	13 110	3 521	6 425	44	9 019	2 029	2 066	12 027	1 966	17 527	**129 676**
Cottonseed Oil	3 929	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**3 929**
Coconut Oil/ Groundnut Oil/ Canola Oil/ Corn (Maize) Oil/ Blends or mixes of Oils which includes one of the above Oils/ Biodiesel	697	326	608	122	200	551	280	400	427	300	1 680	100	20	401	30	**6 142**
Cottonseed Oilcake (Including Pellets)	0	0	0	0	0	0	84	83	0	0	0	0	0	0	0	**167**
Sunflower Oilcake (Including Pellets)	0	0	0	6 505	1 570	9 145	0	7 633	0	0	5 818	0	0	0	0	**30 671**
Coconut Oilcake (Including Pellets)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Palmnut Oilcake (Including Pellets)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Soybean Oilcake/ Canola Oilcake (Including Pellets)	30 504	62 096	89 756	15 574	26 478	66 549	38 838	30 914	41 202	0	71 599	58 919	13 646	39 057	12 799	**597 931**
Soybean Flours and Meals/ Textured Vegetable Protein	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Soybean Fullfat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Peanut Butter and Paste	30	164	91	45	16	175	32	164	139	156	99	132	93	47	181	**1 564**
Total	**90 178**	**122 965**	**158 537**	**70 230**	**51 929**	**126 558**	**73 759**	**76 415**	**78 006**	**46 926**	**104 603**	**122 258**	**50 580**	**74 418**	**52 926**	**1 300 288**

Oilseed Information: Figures were only verified from February 2017.

	OIL SEEDS PRODUCTS PER MONTH EXPORTED															
	Nov 2016 Tons	Dec 2016 Tons	Jan 2017 Tons	Feb 2017 Tons	Mar 2017 Tons	Apr 2017 Tons	May 2017 Tons	Jun 2017 Tons	Jul 2017 Tons	Aug 2017 Tons	Sep 2017 Tons	Oct 2017 Tons	Nov 2017 Tons	Dec 2017 Tons	Jan 2018 Tons	Progressive: Nov 2016 - Jan 2018 Tons
Palm Oil and Derivatives	1 919	1 157	1 007	1 003	1 955	1 203	1 327	1 009	1 681	2 920	3 408	2 192	2 407	1 908	1 887	**26 983**
Soybean Oil	5 967	9 539	4 278	2 976	4 404	3 188	3 890	2 475	3 209	4 569	1 423	1 452	2 033	2 289	2 538	**54 230**
Sunflower Oil	22	1 380	0	604	536	38	96	74	36	117	94	188	134	450	297	**4 066**
Cottonseed Oil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Coconut Oil/ Groundnut Oil/ Canola Oil/ Corn (Maize) Oil/ Blends or mixes of Oils which includes one of the above Oils/ Biodiesel	1 228	306	414	76	48	22	37	91	791	625	310	22	47	115	36	**4 168**
Cottonseed Oilcake (Including Pellets)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Sunflower Oilcake (Including Pellets)	721	386	333	196	274	137	136	392	377	209	151	128	240	133	98	**3 911**
Coconut Oilcake (Including Pellets)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Palmnut Oilcake (Including Pellets)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Soybean Oilcake/ Canola Oilcake (Including Pellets)	2 050	1 418	2 049	604	692	855	293	1 397	2 213	1 730	1 985	1 174	845	371	638	**18 314**
Soybean Flours and Meals/ Textured Vegetable Protein	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**27**
Soybean Fullfat	1 504	542	503	341	166	308	342	271	510	344	339	578	866	837	244	**7 695**
Peanut Butter and Paste	0	292	0	0	29	27	36	26	21	35	35	27	23	44	23	**618**
Total	**13 438**	**15 020**	**8 584**	**5 800**	**8 104**	**5 778**	**6 157**	**5 735**	**8 838**	**10 549**	**7 745**	**5 761**	**6 595**	**6 147**	**5 761**	**120 012**

Oilseed Information: Figures were only verified from February 2017.

RSA Production Regions

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

Figure 1: RSA Provinces

Provincial map with gratitude to SIQ.

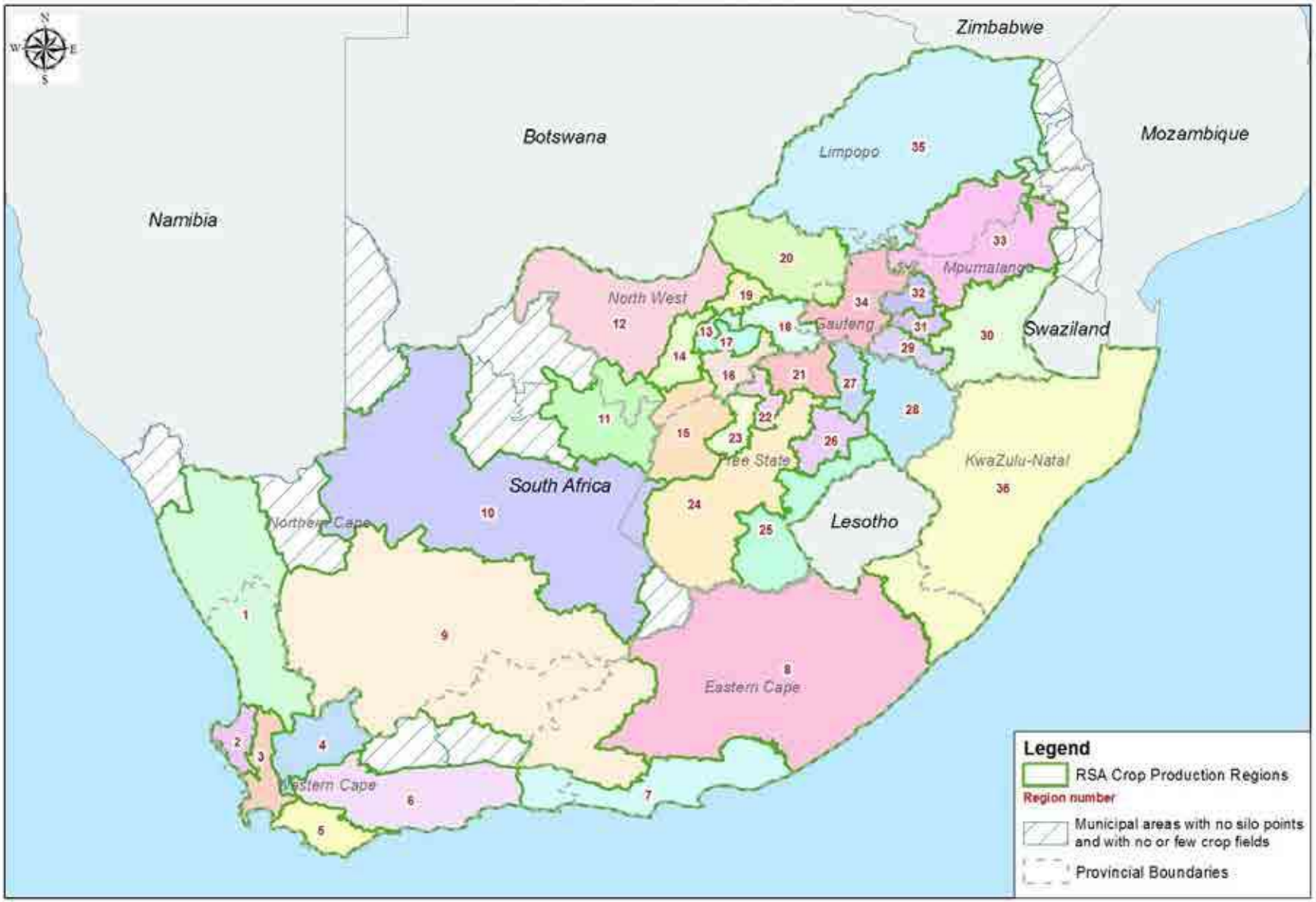
The 9 provinces are divided into 36 grain production regions.

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

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

The production regions from which soybeans have been received for the crop quality survey of the 2016/2017 production season, are named and described on pages 21 to 27 (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 2016/2017 – Summary of results

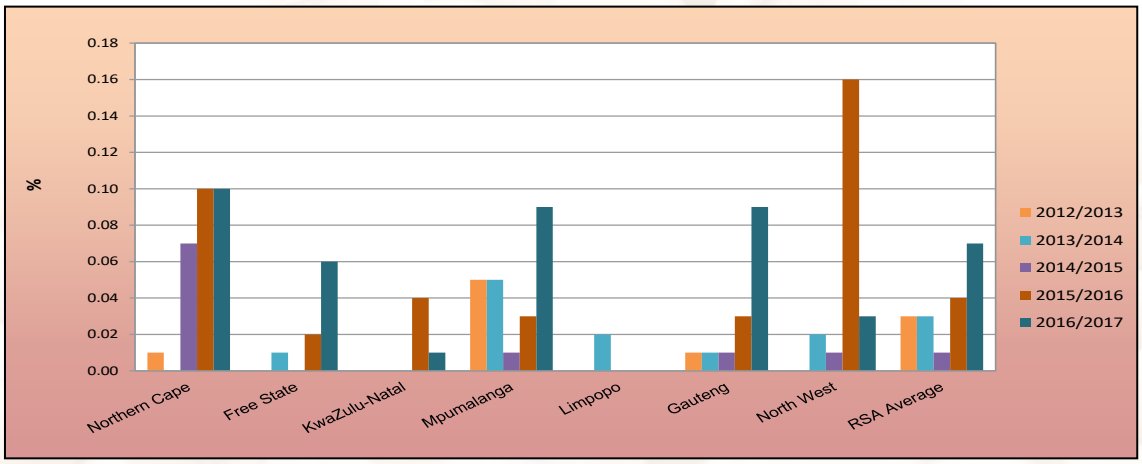
Eighty-eight percent (132) of the 150 samples analysed for the purpose of this survey were graded as Grade SB1 and 18 of the samples were downgraded to COSB (Class Other Soya Beans). During the previous two seasons, 11% (2015/2016) and 13% (2014/2015) of the samples were downgraded to COSB.

- Two of the 18 samples were 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%.
- Eleven samples were downgraded as a result of the percentage soiled soybeans present in the sample exceeding the maximum permissible deviation of 10%.
- One sample was downgraded as a result of the presence of poisonous seeds (*Convolvulus sp.*) exceeding the maximum permissible number, namely 7 per 1000 g.
- The remaining three 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 and collective deviations.

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 five of the 150 samples graded, all of these pods were green, but not wet according to the definition, upon receival at the SAGL. The percentage of these pods in the samples ranged from 0.04% to 0.60% 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%.

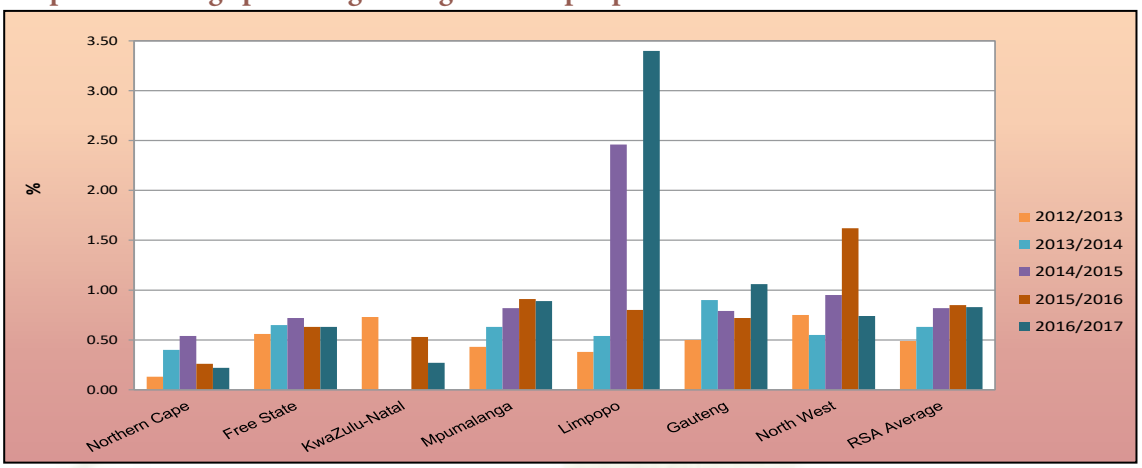
The number of samples containing sclerotia from the fungus *Sclerotinia sclerotiorum*, almost tripled from the previous season (from 36 to 105 samples). The three highest percentages of sclerotia observed (0.38%, 0.36% and 0.30%) were on samples from Mpumalanga. These percentages are however still well below the maximum permissible level of 4%. The national weighted average percentage this season was 0.07% compared to the 0.04% of the previous season. See Graph 16.

Graph 16: Average percentage sclerotia per province over five seasons



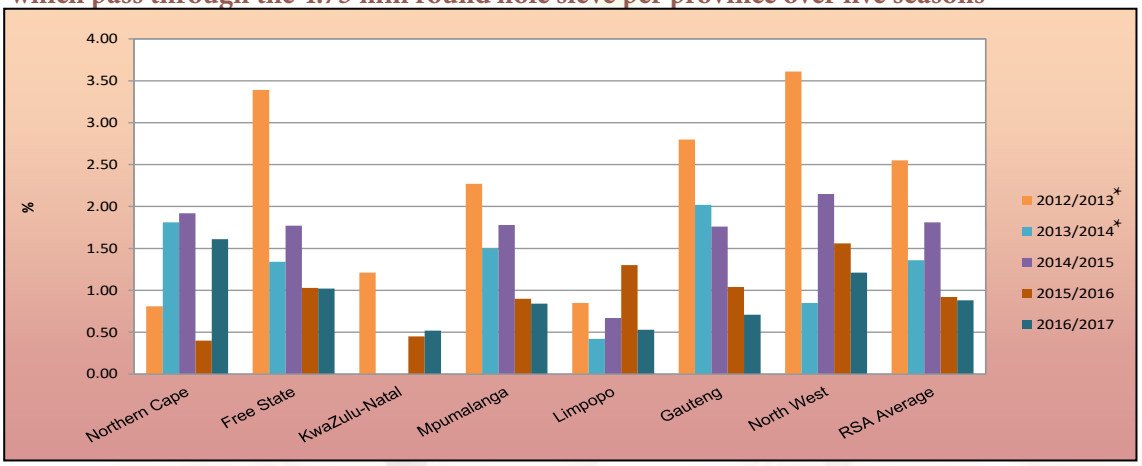
Limpopo province (two samples) had the highest weighted average percentage foreign matter (3.40%). The percentage foreign matter in the rest of the samples ranged from 0.22 in the Northern Cape (two samples) to 1.06 in Gauteng (11 samples). Please refer to Graph 17.

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



Northern Cape province 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 1.61% and the samples from KwaZulu-Natal and Limpopo the lowest with 0.52% and 0.53% respectively. Mpumalanga province (86 samples) averaged 0.84% and the Free State province (33 samples) 1.02%. The national weighted average percentage decreased from 0.92% the previous season to 0.88% this season. This is the lowest percentage of the six seasons for which crop quality data is available. Please see Graph 18.

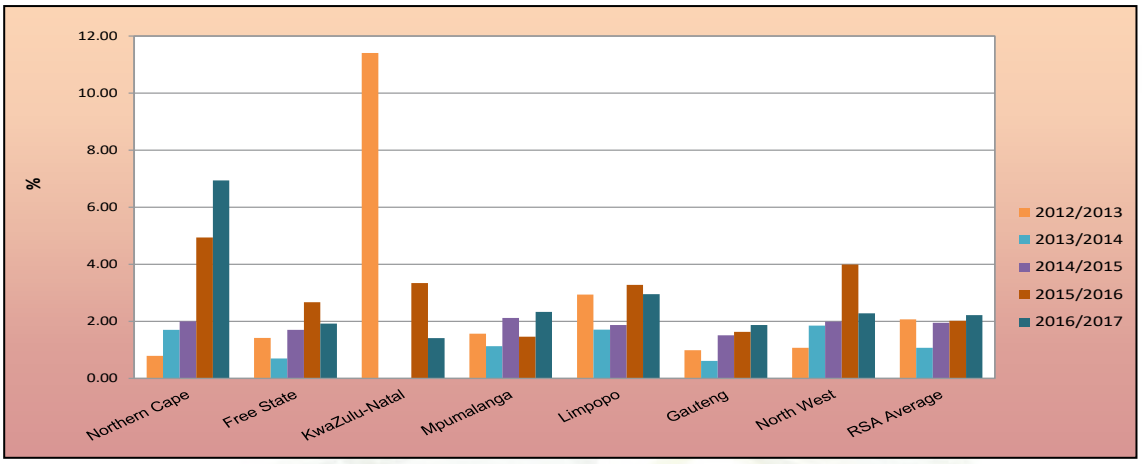
Graph 18: Average percentage soybeans and parts of soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve per province over five seasons



** Represent soybeans and parts of soybeans which pass through the 4.75 mm round hole sieve.*

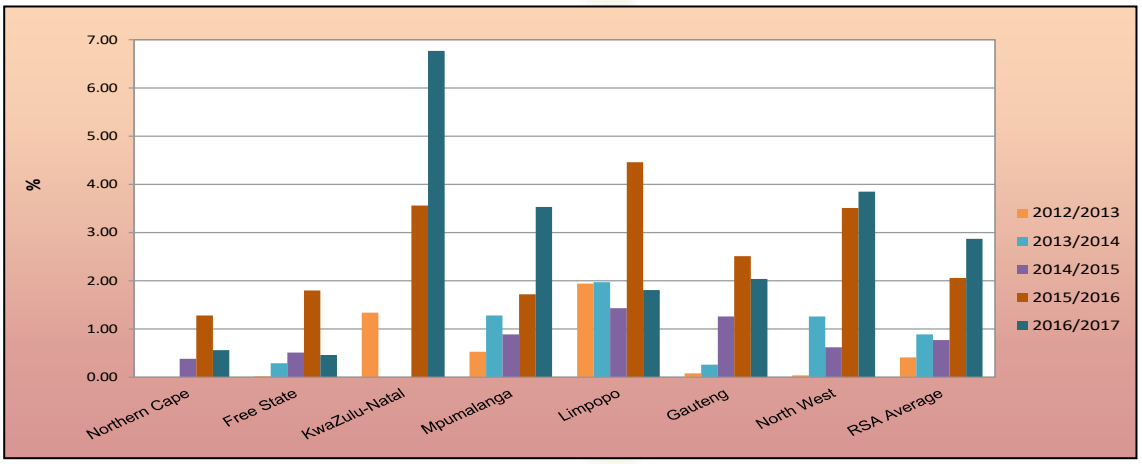
The lowest weighted average percentage defective soybeans on the 4.75 mm sieve was observed on the eight samples from KwaZulu-Natal, namely 1.41%. The Northern Cape province reported the highest percentage namely 6.94, followed by Limpopo and Mpumalanga provinces with 2.95 and 2.33 respectively. The national weighted average increased slightly from 2.02% last season to 2.22% 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 South African weighted average percentage soiled soybeans of 2.87% is the highest since this survey was started in the 2011/2012 season when the average was 1.60%. The average last season was 2.06%. Average weighted percentages per province ranged from 0.46 in the Free State to 6.77 in KwaZulu-Natal. Please see Graph 20. Eleven samples exceeded the maximum permissible deviation of 10% according to the grading regulations. More than half of these samples originated from Mpumalanga. Last season, no samples exceeded this grading limit.

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

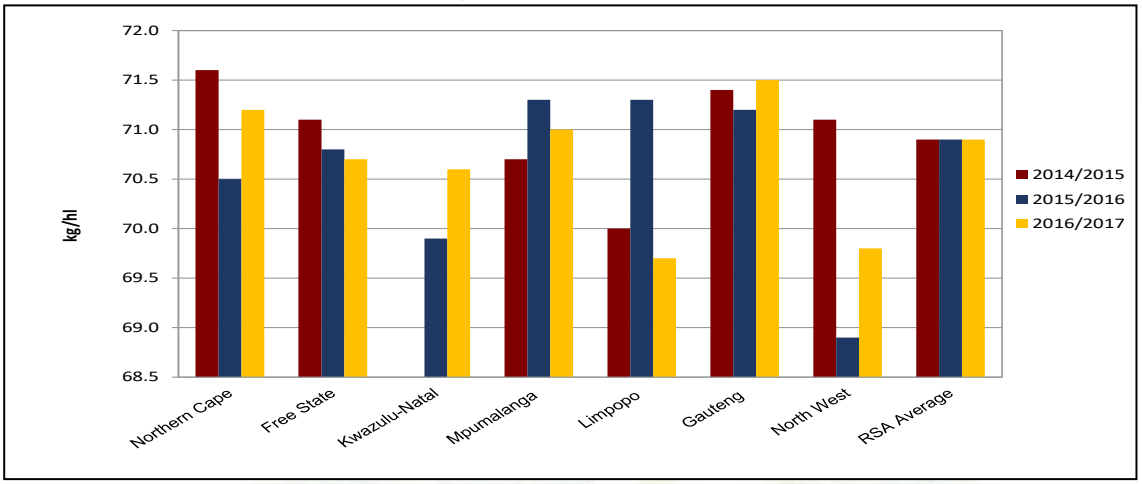


Test weight does not form part of the grading regulations for soybeans in South Africa. An approximation of the test weight of South African soybeans is provided in Table 2 for information purposes. The g/1L filling weight of the 150 soybeans samples was determined by means of the Kern 222 apparatus.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

Table 2: Approximation of test weight per province over three seasons

Province	Test weight, kg/hl								
	2016/2017 Season			2015/2016 Season			2014/2015 Season		
	Weighted average	Range	No. of samples	Weighted average	Range	No. of samples	Weighted average	Range	No. of samples
Northern Cape (Regions 10 - 11)	71.2	71.1 - 71.2	2	70.5	-	1	71.6	71.2 - 71.9	3
Free State (Regions 21 - 28)	70.7	65.8 - 72.1	33	70.8	68.5 - 73.0	23	71.1	67.0 - 72.7	42
KwaZulu-Natal (Regions 36)	70.6	69.2 - 71.5	8	69.9	67.7 - 71.6	14	-	-	-
Mpumalanga (Regions 29 - 33)	71.0	67.6 - 72.6	86	71.3	68.9 - 72.7	91	70.7	63.3 - 78.2	77
Limpopo (Region 35)	69.7	69.1 - 70.2	2	71.3	-	1	70.0	69.3 - 70.8	2
Gauteng (Region 34)	71.5	70.8 - 73.6	11	71.2	70.6 - 72.2	5	71.4	69.5 - 72.4	8
North West (Region 12 - 20)	69.8	67.7 - 70.9	8	68.9	64.9 - 70.5	8	71.1	68.8 - 72.2	18
RSA	***70.9***	***65.8 - 73.6***	***150***	***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	2016/2017		2015/2016		2014/2015		2013/2014	
Moisture, % (17hr, 103°C)	7.4		7.4		7.0		7.1	
Moisture basis	**Dry basis**	**As is**	**Dry basis**	**As is**	**Dry basis**	**As is**	**Dry basis**	**As is**
Crude protein, %	40.15	37.18	40.22	37.24	39.89	37.10	39.84	37.01
Crude fat, %	19.8	18.3	19.4	18.0	19.3	17.9	19.7	18.3
Crude fibre, %	5.9	5.9	7.3	7.3	6.4	6.4	6.1	6.1
Ash, %	4.58	4.24	4.61	4.27	4.64	4.32	4.66	4.33
No. of samples	***150***		***143***		***150***		***150***	

The weighted average crude protein content this season was 40.15%, slightly lower than the 40.22 of the previous season. The samples from Limpopo had the highest weighted average crude protein content of 40.65%, while the Free State reported the lowest average, namely 39.45%. The weighted average crude fat percentage of 19.8% was almost half a percentage point higher than the 19.4% in 2015/2016. This is also the highest average percentage over the six seasons that this survey has been done. The samples from North West had the highest weighted average crude fat content of 21.9%. The lowest average fat content was observed in Mpumalanga with 19.4%.

The weighted average percentage crude fibre varied from 5.3% in the Northern Cape to 6.0% in Gauteng. The RSA weighted average was the lowest of the past four seasons. A small variation of only 0.08% is observed with regards to the national weighted average ash content over the six seasons that this survey has been conducted. This season, the average ash content was 4.58%, the lowest of the six seasons. Samples from the Northern Cape tend to show higher ash contents over seasons compared to the other provinces. With the exception of this season, this is also true for Limpopo province.

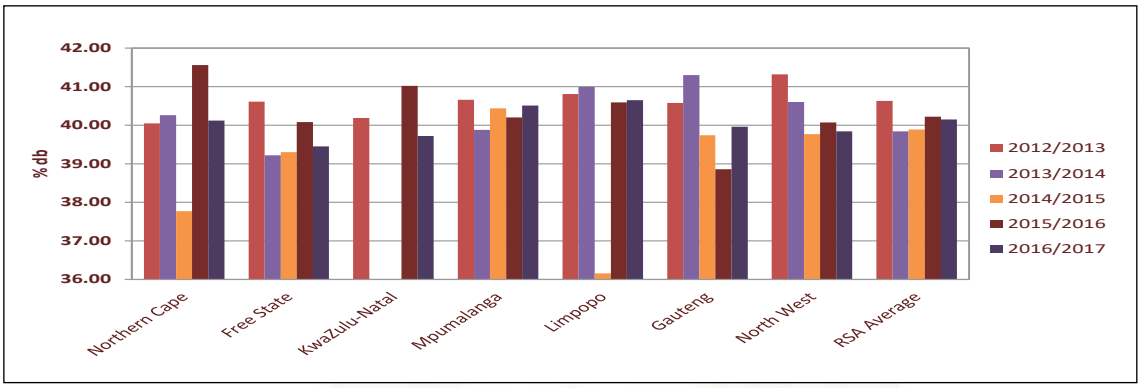
Graphs 22 to 25 on page 18 provide comparisons between provinces over seasons for the nutritional components mentioned above.

A summary of the RSA Soybean Crop Quality averages of the 2016/2017 season compared to those of the 2015/2016 season, is provided in Table 4 on page 19.

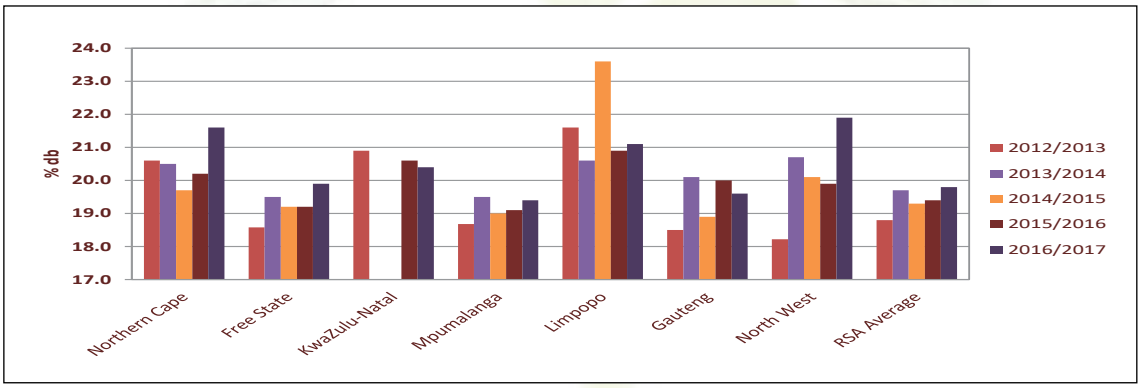
All fifteen samples tested for genetic modification (GM), tested positive for the presence of the CP4 EPSPS trait (Roundup Ready®). Please refer to the results in Table 5 on page 20 of this report.

Please see pages 21 to 26 for the average soybean quality per region.

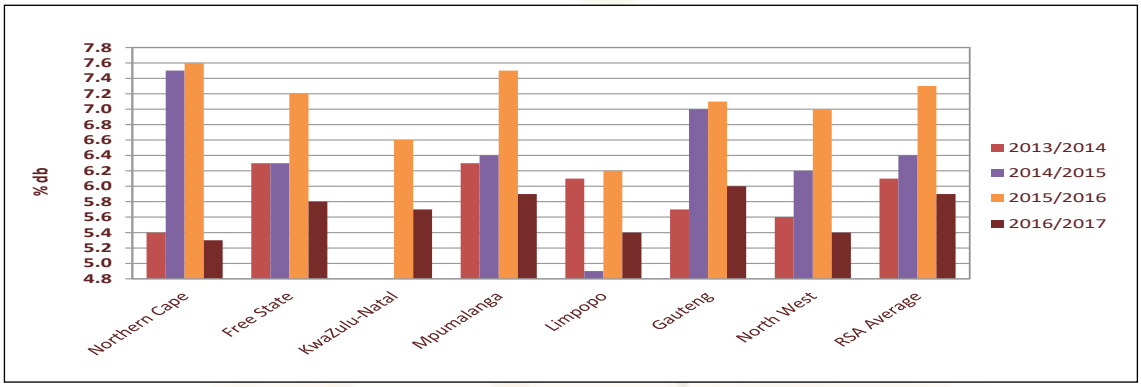
Graph 22: Average crude protein content per province over five seasons



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



Graph 24: Average crude fibre content per province over four seasons



Graph 25: Average ash content per province over five seasons

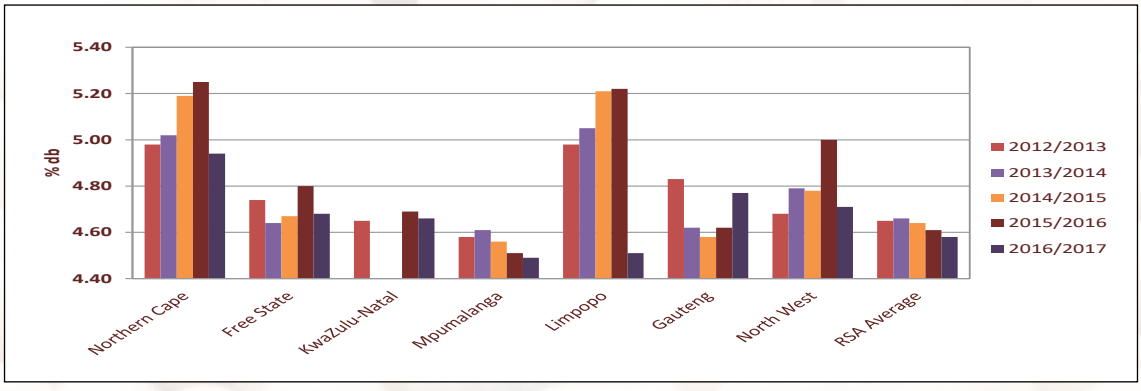


Table 4: South African Soybean Crop Quality Averages 2016/2017 vs 2015/2016						
Class and Grade Soya	**2016/2017**			**2015/2016**		
	SB1	**COSB**	**Average**	**SB1**	**COSB**	**Average**
Grading:						
(A) Wet pods, %	0.00	0.00	0.00	0.00	0.00	0.00
(B) Foreign matter, including stones, other grains and sunflower seeds: Provided that such deviations are individually within the limits specified in items (c), (d), and (e), %	0.69	1.83	0.83	0.66	2.35	0.85
(C) Other grain, %	0.05	0.39	0.09	0.07	1.02	0.17
(D) Sunflower seed, %	0.01	0.01	0.01	0.00	0.08	0.01
(E) Stones, %	0.01	0.00	0.01	0.01	0.13	0.02
(F) Sclerotia, %	0.07	0.08	0.07	0.03	0.09	0.04
(G) Soybeans and parts of soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	0.89	0.82	0.88	0.82	1.67	0.92
(H) Defective soybeans on the 4.75 mm round hole sieve, %	2.18	2.51	2.22	1.95	2.55	2.02
(I) Soiled soybeans, %	2.04	8.99	2.87	1.87	3.56	2.06
(J) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	0.77	1.90	0.90	0.70	2.44	0.89
Poisonous seeds *(Crotalaria sp., Datura sp., Ricinis communis)*	0	0	0	0	2	0
Poisonous seeds *(Argemone mexicana L., Convolvulus sp., Ipomoea purpurea Roth., Lolium temulentum, Xanthium sp.)*	0	2	0	0	6	1
Undesirable odour	No	No	No	No	No	No
Live insects	No	No	No	No	No	No
Number of samples	***132***	***18***	***150***	***127***	***16***	***143***
Nutritional analysis:						
Moisture, % (17 hr, 103 °C)	7.4	7.1	7.4	7.4	7.7	7.4
Crude Protein, % (db)	40.11	40.45	40.15	40.24	40.08	40.22
Crude Fat, % (db)	19.8	19.6	19.8	19.4	19.6	19.4
Crude Fibre, % (db)	5.8	5.9	5.9	7.3	7.3	7.3
Ash, % (db)	4.58	4.56	4.58	4.60	4.74	4.61
Number of samples	***132***	***18***	***150***	***127***	***16***	***143***

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%. Values lower than 0.125% (limit of detection) is reported as <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 2016/2017 season

Region	Class and grade	CP4 EPSPS, %
10	SB1	>3.0
14	SB1	>3.0
20	SB1	>3.0
22	SB1	>3.0
25	SB1	>3.0
26	SB1	>3.0
28	SB1	>3.0
29	SB1	>3.0
30	SB1	>3.0
31	SB1	>3.0
32	COSB	>3.0
33	SB1	>3.0
34	SB1	>3.0
35	COSB	>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	(14) North-West Southern Region	(17) North-West Central Northern Region (Ottosdal)
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)	Amalia (Bins) Barberspan (Bins) Delareyville (Bins) Excelsior (Bins) Geysdorp (Bins) Hallatshope (Bins) Migdol (Bins) Nooitgedacht (Bins) Schweizer-Reneke (Bins) Taaibospan (Bins)	Boschpoort (Bags/Bins/Bulk) Hartbeesfontein (Bins) Kleinharts (Bins) Melliodora (Bins) Ottosdal (Bins) Rostrataville (Bins) Vermaas (Bins) Werda (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), %	0.22	0.20	0.24	0.03	0.32	0.30	0.34	0.03	1.60	1.56	1.64	0.06
(c) Other grain, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.20	0.20	0.00
(d) Sunflower seed, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.10	0.10	0.00
(e) Stones, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(f) Sclerotia, %	0.10	0.10	0.10	0.00	0.08	0.06	0.10	0.03	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, %	1.61	1.42	1.80	0.27	1.16	0.62	1.70	0.76	2.00	1.82	2.18	0.25
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	6.94	6.60	7.28	0.48	0.29	0.26	0.32	0.04	4.00	3.82	4.18	0.25
(i) Soiled Soybeans, %	0.56	0.40	0.72	0.23	0.00	0.00	0.00	0.00	6.05	5.92	6.18	0.18
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	0.32	0.30	0.34	0.03	0.40	0.40	0.40	0.00	1.60	1.56	1.64	0.06
Poisonous seeds *(Crotalaria sp., Datura sp., Ricinis communis)*	0	0	0	0	0	0	0	0	0	0	0	0
Poisonous seeds *(Argemone mexicana L., Convolvulus sp., Ipomoea purpurea Roth., Lolium temulentum, Xanthium sp.)*	0	0	0	0	0	0	0	0	0	0	0	0
Number of samples	***2***				***2***				***2***			
Nutritional analysis:	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Moisture, % (17 hr, 103 °C)	6.9	6.8	6.9	0.07	7.5	7.4	7.5	0.07	7.2	7.2	7.2	0.00
Crude protein, % (db)	40.12	40.04	40.19	0.11	40.88	40.67	41.09	0.30	38.16	37.78	38.54	0.54
Crude fat, % (db)	21.6	21.5	21.7	0.14	20.0	19.2	20.8	1.13	23.1	22.8	23.4	0.42
Crude Fibre, % (db)	5.3	5.2	5.3	0.07	5.9	5.4	6.4	0.71	5.4	5.0	5.7	0.49
Ash, % (db)	4.94	4.93	4.95	0.01	4.20	4.15	4.24	0.06	4.59	4.53	4.65	0.08
Number of samples	***2***				***2***				***2***			

SOUTH AFRICAN
REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(18) North-West Central Region (Ventersdorp)				(20) North-West Eastern Region				(21) Free State North-Western Region (Viljoenskroon)			
Silo/Intake stands (Type of storage)	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)				Attie (Bins) Groenebloem (Bins) Heuningspruit (Bins) Koppies (Bins) Rooiwal (Bins) Vierfontein (Bins) Viljoenskroon (Bins) Vredefort (Bins) Weiveld (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
(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), %	0.36	-	-	-	0.57	0.40	0.72	0.16	0.33	0.20	0.40	0.08
(c) Other grain, %	0.00	-	-	-	0.12	0.00	0.20	0.11	0.07	0.00	0.16	0.07
(d) Sunflower seed, %	0.10	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(e) Stones, %	0.00	-	-	-	0.05	0.00	0.16	0.09	0.00	0.00	0.00	0.00
(f) Sclerotia, %	0.00	-	-	-	0.03	0.00	0.10	0.06	0.06	0.00	0.10	0.05
(g) Soybeans and parts of Soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	0.56	-	-	-	0.93	0.62	1.50	0.50	0.72	0.23	1.38	0.46
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	0.24	-	-	-	3.13	1.84	4.76	1.49	1.89	0.96	3.34	0.74
(i) Soiled Soybeans, %	0.00	-	-	-	6.22	0.64	10.86	5.17	0.65	0.00	2.00	0.73
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	0.36	-	-	-	0.60	0.40	0.72	0.17	0.39	0.24	0.50	0.09
Poisonous seeds *(Crotalaria sp., Datura sp., Ricinis communis)*	0	-	-	-	0	0	0	0	0	0	0	0
Poisonous seeds *(Argemone mexicana L., Convolvulus sp., Ipomoea purpurea Roth., Lolium temulentum, Xanthium sp.)*	0	-	-	-	0	0	0	0	0	0	0	0
Number of samples	***1***				***3***				***7***			
Nutritional analysis:	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Moisture, % (17 hr, 103 °C)	7.3	-	-	-	6.9	6.6	7.3	0.38	7.4	6.1	8.7	1.11
Crude protein, % (db)	39.52	-	-	-	40.36	38.83	41.60	1.41	38.98	35.97	42.08	2.13
Crude fat, % (db)	22.1	-	-	-	22.4	21.5	23.5	1.01	20.8	19.5	21.7	0.76
Crude Fibre, % (db)	5.2	-	-	-	5.1	4.8	5.3	0.25	5.8	4.9	7.1	0.83
Ash, % (db)	4.71	-	-	-	5.13	4.97	5.44	0.27	4.70	4.58	4.88	0.10
Number of samples	***1***				***3***				***7***			

SOUTH AFRICAN
REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(22) Free State North-Western Region (Bothaville)	(23) Free State North-Western Region (Bultfontein)	(24) Free State Central Region
Silo/Intake stands (Type of storage)	Allanridge (Bins) Bothaville (Bins) Mirage (Bins) Misgunst (Bunkers) Odendaalsrus (Bins) Schoonspruit (Bins) Schuttesdraai (Bins)	Bultfontein (Bins) Losdoorns (Bins) Protespan (Bins) Tierfontein (Bins) Wesselsbron (Bins) Willemsrust (Bins)	Bloemfontein (Bins) Brandfort (Bins) De Brug (Bins) Geneva (Bins) Hennenman (Bins) Kroonstad (Bins) Petrusburg (Bins) Theunissen (Bins) Van Tonder (Bins) Welgeleë (Bins) Winburg (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	-	-	-
(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), %	1.71	0.12	4.70	2.59	0.46	-	-	-	0.26	-	-	-
(c) Other grain, %	0.03	0.00	0.10	0.06	0.08	-	-	-	0.00	-	-	-
(d) Sunflower seed, %	0.00	0.00	0.00	0.00	0.00	-	-	-	0.04	-	-	-
(e) Stones, %	0.00	0.00	0.00	0.00	0.00	-	-	-	0.00	-	-	-
(f) Sclerotia, %	0.00	0.00	0.00	0.00	0.00	-	-	-	0.00	-	-	-
(g) Soybeans and parts of Soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	0.98	0.22	2.46	1.28	1.78	-	-	-	0.75	-	-	-
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	3.33	0.28	8.12	4.20	3.80	-	-	-	6.90	-	-	-
(i) Soiled Soybeans, %	0.45	0.24	0.88	0.37	0.94	-	-	-	0.40	-	-	-
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	1.71	0.12	4.70	2.59	0.46	-	-	-	0.26	-	-	-
Poisonous seeds *(Crotalaria sp., Datura sp., Ricinis communis)*	0	0	0	0	0	-	-	-	0	-	-	-
Poisonous seeds *(Argemone mexicana L., Convolvulus sp., Ipomoea purpurea Roth., Lolium temulentum, Xanthium sp.)*	0	0	0	0	0	-	-	-	0	-	-	-
Number of samples	***3***				***1***				***1***			

Nutritional analysis:	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Moisture, % (17 hr, 103 °C)	6.5	6.4	6.6	0.12	7.7	-	-	-	6.0	-	-	-
Crude protein, % (db)	39.63	37.36	41.45	2.08	38.23	-	-	-	40.77	-	-	-
Crude fat, % (db)	21.3	20.6	22.0	0.70	22.5	-	-	-	20.5	-	-	-
Crude Fibre, % (db)	4.9	4.8	5.0	0.12	5.0	-	-	-	4.5	-	-	-
Ash, % (db)	4.62	4.42	4.91	0.26	4.64	-	-	-	4.81	-	-	-
Number of samples	***3***				***1***				***1***			

SOUTH AFRICAN
REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(25) Free State South-Western Region	(26) Free State South-Eastern Region	(28) Free State Eastern Region
Silo/Intake stands (Type of storage)	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)	Afrikaskop (Bins/Bunkers) Ascent (Bins) Cornelia (Bins) Daniëlsrus (Bins) Eeram (Bins) Frankfort (Bins) Harrismith (Bins) Jim Fouché (Bins) Kransfontein (Bins/Bunkers) Memel (Bins) Reitz (Bins) Tweeling (Bins) Villiers (Bins/Bulk) Vrede (Bins) Warden (Bins) Windfield (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	1.73	0.50	0.42	0.16	0.78	0.26	0.63	0.16	1.20	0.36
(c) Other grain, %	0.17	0.00	1.26	0.44	0.02	0.00	0.08	0.04	0.07	0.00	0.16	0.08
(d) Sunflower seed, %	0.01	0.00	0.08	0.03	0.03	0.00	0.08	0.04	0.00	0.00	0.00	0.00
(e) Stones, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(f) Sclerotia, %	0.08	0.00	0.10	0.03	0.03	0.00	0.08	0.04	0.10	0.00	0.20	0.09
(g) Soybeans and parts of Soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	0.76	0.16	1.70	0.55	1.19	0.16	2.14	0.93	1.41	0.16	6.18	2.04
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	1.28	0.64	1.94	0.40	1.20	0.84	1.42	0.26	1.63	0.94	2.60	0.70
(i) Soiled Soybeans, %	0.29	0.00	0.78	0.30	0.30	0.00	0.70	0.36	0.50	0.00	1.28	0.54
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	0.76	0.28	1.81	0.51	0.44	0.16	0.78	0.27	0.73	0.16	1.40	0.41
Poisonous seeds *(Crotalaria sp., Datura sp., Ricinis communis)*	0	0	0	0	0	0	0	0	0	0	0	0
Poisonous seeds *(Argemone mexicana L., Convolvulus sp., Ipomoea purpurea Roth., Lolium temulentum, Xanthium sp.)*	1	0	6	2.12	0	0	0	0	0	0	0	0
Number of samples	***8***				***5***				***8***			

Nutritional analysis:	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
Moisture, % (17 hr, 103 °C)	8.4	7.8	9.5	0.62	7.2	6.5	7.6	0.43	7.7	7.1	8.1	0.37
Crude protein, % (db)	40.06	38.85	41.54	1.05	38.58	36.93	39.47	1.12	39.73	38.27	41.24	1.04
Crude fat, % (db)	20.3	17.7	23.4	2.04	19.3	15.9	20.6	1.97	18.1	10.7	21.5	3.79
Crude Fibre, % (db)	6.2	5.5	7.3	0.70	6.2	5.6	6.6	0.41	5.6	4.6	6.8	0.78
Ash, % (db)	4.61	4.43	4.71	0.09	4.81	4.64	5.09	0.19	4.67	4.54	4.74	0.06
Number of samples	***8***				***5***				***8***			

SOUTH AFRICAN
REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(29) Mpumalanga Southern Region	(30) Mpumalanga Eastern Region	(31) Mpumalanga Central Region
Silo/Intake stands (Type of storage)	Balfour (Bins) Greylingstad (Bins) Grootvlei (Bins) Harvard (Bins) Holmdene (Bins) Leeuspruit (Bins) Platrand (Bins) Standerton (Bins) Val (Bins)	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) Bethal (Bins) Brakfontein (Bunkers) Devon (Bins) Kinross (Bins/Bunkers) Klipfontein (Bunkers) Leslie (Bins) Palmietfontein (Bunkers) Trichardt (Bins) Vaalkrantz (Bunkers)

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), %	0.73	0.08	1.72	0.47	1.99	0.20	9.76	2.73	0.59	0.16	1.00	0.29
(c) Other grain, %	0.06	0.00	0.48	0.12	0.06	0.00	0.50	0.15	0.04	0.00	0.16	0.06
(d) Sunflower seed, %	0.01	0.00	0.08	0.03	0.00	0.00	0.00	0.00	0.01	0.00	0.10	0.03
(e) Stones, %	0.01	0.00	0.20	0.04	0.06	0.00	0.70	0.20	0.00	0.00	0.00	0.00
(f) Sclerotia, %	0.05	0.00	0.16	0.04	0.08	0.00	0.12	0.04	0.07	0.00	0.12	0.04
(g) Soybeans and parts of Soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	1.02	0.24	2.86	0.59	0.98	0.16	2.40	0.76	0.74	0.00	1.50	0.45
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	2.12	0.60	5.56	1.19	2.88	1.44	4.28	0.90	1.76	0.16	2.98	0.75
(i) Soiled Soybeans, %	1.58	0.00	6.50	1.48	1.97	0.00	9.38	2.55	2.72	0.00	10.34	2.87
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	0.79	0.08	1.78	0.48	2.07	0.26	9.88	2.74	0.66	0.22	1.12	0.30
Poisonous seeds *(Crotalaria sp., Datura sp., Ricinis communis)*	0	0	0	0	0	0	0	0	0	0	0	0
Poisonous seeds *(Argemone mexicana L., Convolvulus sp., Ipomoea purpurea Roth., Lolium temulentum, Xanthium sp.)*	1	0	20	4.00	1	0	6	2.15	0	0	0	0
Number of samples	***27***				***12***				***14***			

Nutritional analysis:	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Moisture, % (17 hr, 103 °C)	7.8	6.7	8.6	0.42	7.8	6.7	10.1	1.24	6.9	6.6	7.5	0.24
Crude protein, % (db)	40.17	38.29	41.67	0.85	40.81	38.74	42.33	1.22	40.59	39.21	41.97	0.91
Crude fat, % (db)	19.8	17.9	23.1	1.14	19.8	18.7	21.3	1.03	18.2	9.5	20.2	2.64
Crude Fibre, % (db)	5.9	4.9	7.3	0.60	5.9	5.0	7.1	0.65	6.2	5.6	6.9	0.46
Ash, % (db)	4.45	4.04	4.71	0.14	4.37	4.10	4.66	0.14	4.54	4.41	4.77	0.11
Number of samples	***27***				***12***				***14***			

SOUTH AFRICAN
REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(32) Mpumalanga Western Region	(33) Mpumalanga Northern Region	(34) Gauteng
Silo/Intake stands (Type of storage)	Argent (Bins/Bunkers) Dryden (Bins) Eloff (Bins) Endicott (Bins) Hawerklip (Bins) Kendal (Bins) Ogies (Bins) Vlakfontein (Bunkers)	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)

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), %	0.99	0.30	2.00	0.47	0.56	0.10	3.68	0.80	1.06	0.22	5.74	1.60
(c) Other grain, %	0.01	0.00	0.10	0.03	0.10	0.00	0.60	0.16	0.04	0.00	0.40	0.12
(d) Sunflower seed, %	0.01	0.00	0.20	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(e) Stones, %	0.00	0.00	0.00	0.00	0.01	0.00	0.14	0.04	0.00	0.00	0.00	0.00
(f) Sclerotia, %	0.19	0.08	0.38	0.10	0.07	0.00	0.16	0.05	0.09	0.00	0.24	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, %	0.89	0.56	1.46	0.28	0.52	0.16	2.12	0.44	0.71	0.22	1.67	0.42
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	2.31	0.84	6.64	1.35	2.72	0.66	7.28	1.42	1.87	0.52	3.12	0.72
(i) Soiled Soybeans, %	6.15	0.80	12.26	4.10	5.96	0.20	21.34	5.73	2.04	0.00	11.92	3.35
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	1.18	0.42	2.10	0.51	0.63	0.10	3.80	0.83	1.15	0.22	5.84	1.60
Poisonous seeds *(Crotalaria sp., Datura sp., Ricinis communis)*	0	0	0	0	0	0	1	0.24	0	0	0	0
Poisonous seeds *(Argemone mexicana L., Convolvulus sp., Ipomoea purpurea Roth., Lolium temulentum, Xanthium sp.)*	0	0	0	0	0	0	0	0	0	0	4	1.21
Number of samples	***15***				***18***				***11***			

Nutritional analysis:	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Moisture, % (17 hr, 103 °C)	7.2	6.5	8.4	0.55	6.9	6.3	7.5	0.34	7.2	6.5	7.6	0.35
Crude protein, % (db)	40.36	37.93	41.89	0.92	40.88	39.02	43.79	1.01	39.96	38.42	41.05	0.89
Crude fat, % (db)	19.4	18.0	20.6	0.73	19.7	18.2	22.4	1.15	19.6	18.5	20.7	0.75
Crude Fibre, % (db)	5.9	5.1	6.8	0.53	5.8	4.5	6.5	0.50	6.0	5.1	6.8	0.47
Ash, % (db)	4.57	4.44	4.70	0.07	4.51	4.23	4.91	0.23	4.77	4.31	5.56	0.36
Number of samples	***15***				***18***				***11***			

SOUTH AFRICAN
REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(35) Limpopo				(36) KwaZulu-Natal			
Silo/Intake stands (Type of storage)	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)				Bergville (Bins/Bunkers) Bloedrivier (Bins) Dannhauser (Bins) Dundee (Bins) Mizpah (Bins) Paulpietersburg (Bins) Pietermaritzburg (Bins) Vryheid (Bins) Winterton (Bins/Bunkers)			
Grading:	**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
(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), %	3.40	0.20	6.60	4.53	0.27	0.10	0.44	0.12
(c) Other grain, %	2.50	0.00	5.00	3.54	0.03	0.00	0.20	0.07
(d) Sunflower seed, %	0.05	0.00	0.10	0.07	0.00	0.00	0.00	0.00
(e) Stones, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(f) Sclerotia, %	0.00	0.00	0.00	0.00	0.01	0.00	0.10	0.04
(g) Soybeans and parts of Soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	0.53	0.20	0.85	0.46	0.52	0.16	1.02	0.34
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	2.95	1.08	4.82	2.64	1.41	0.68	2.62	0.67
(i) Soiled Soybeans, %	1.81	1.80	1.82	0.01	6.77	2.06	13.54	4.81
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	3.40	0.20	6.60	4.53	0.28	0.10	0.46	0.13
Poisonous seeds *(Crotalaria sp., Datura sp., Ricinis communis)*	0	0	0	0	0	0	0	0
Poisonous seeds *(Argemone mexicana L., Convolvulus sp., Ipomoea purpurea Roth., Lolium temulentum, Xanthium sp.)*	0	0	0	0	0	0	0	0
Number of samples	***2***				***8***			
Nutritional analysis:	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Moisture, % (17 hr, 103 °C)	7.0	6.7	7.2	0.35	7.1	6.7	7.4	0.26
Crude protein, % (db)	40.65	39.10	42.19	2.18	39.72	38.86	40.30	0.59
Crude fat, % (db)	21.1	20.4	21.8	0.99	20.4	17.8	21.4	1.13
Crude Fibre, % (db)	5.4	5.2	5.5	0.21	5.7	4.9	6.5	0.55
Ash, % (db)	4.51	4.08	4.93	0.60	4.66	4.53	4.79	0.10
Number of samples	***2***				***8***			

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, per silo bin at each silo.

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.

If there were more than one container per class and grade per silo bin, 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 370 of 21 April 2017).

Please see pages 77 to 86 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 certify that -

SOUTHERN AFRICAN GRAIN LABORATORY NPC

Co. Reg. No.: 1997/018518/08

Facility Accreditation Number: **T0116**

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

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

CHEMICAL AND PHYSICAL ANALYSIS

The facility is accredited in accordance with the recognised International Standard

ISO/IEC 17025:2005

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

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

Mr R Josias
Chief Executive Officer
Effective Date: 01 November 2014
Certificate Expires: 31 October 2019

ANNEXURE A

SCHEDULE OF ACCREDITATION

Facility Number: **T0116**

Permanent Address of Laboratory:

Southern African Grain Laboratory (NPC)
Agri-Hub Office Park - Grain Building
477 Witherite Road
The Willows
Pretoria
0040

Technical Signatories:

Ms J Nortje (All Methods)
Ms M Bothma (All Chemical Methods)
Ms M Hammes (All Chemical Methods)
Ms A de Jager (Nutrients & Contaminants)
Ms W Louw (In-house Methods 001, 002, 003, 010 & 026)
Ms D Moleke (Rheological Methods)
Ms I Terblanche (Rheological Methods)
Ms H Meyer (All Chemical, Nutrients and Contaminants & Grading Methods)
Ms J Kruger (All Chemical Methods)
Ms P Modiba (All Chemical Methods)
Ms M Motlanthe (In-house Methods 001, 003 & 026)
Mr B van Der Linde (Grading)
Ms M Ramare (All Chemical Methods Excl. In-House Method 012 and SOP MC23)
Ms Z Skhosana (In-house Method 026)
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Nominated Representative:

Ms PM Modiba

Issue No.: 27
Date of Issue: 22 February 2018
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^{0}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)

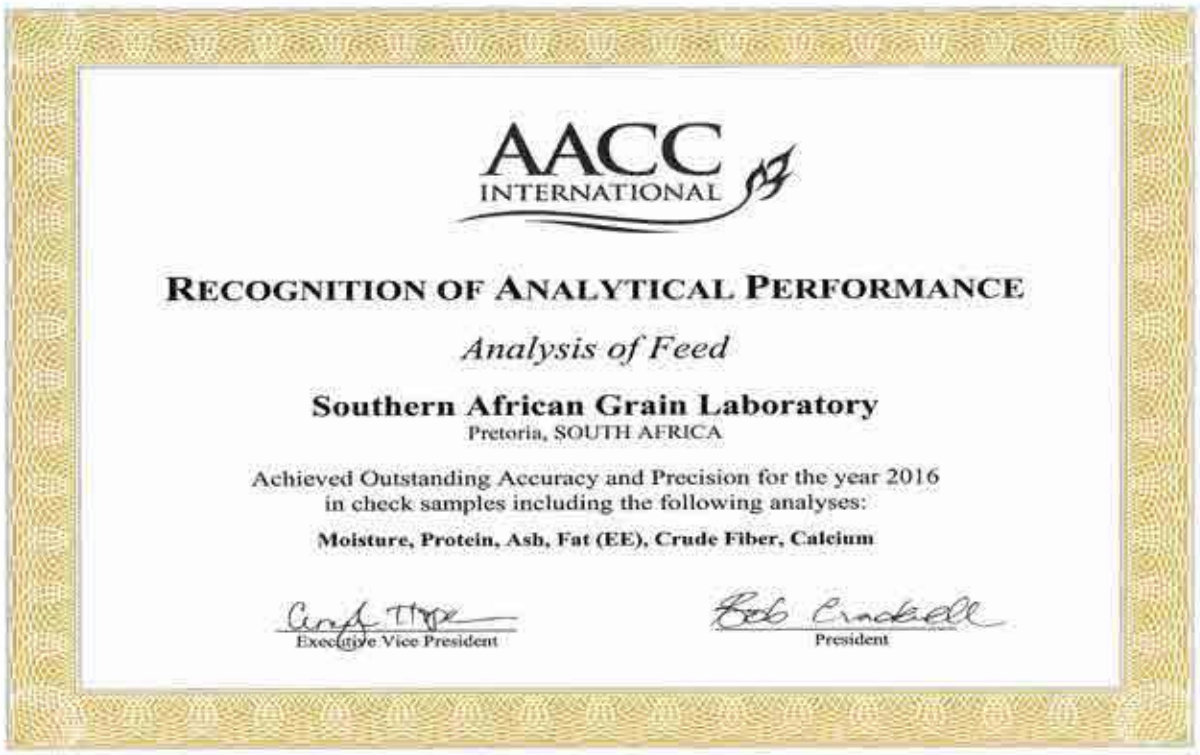
Maize Grits	Moisture (Oven Method)	Analytical EBC Method 6.2.2, latest edition (4 hours, 130^{0}C)
Animal feed, Plant tissue and Sunflower (Milled)	Moisture (Oven Method)	AgriLASA 2.1, Latest Edition (5 hours, 105^{0}C)
All flours, cereal grains, oilseeds and animal feeds	Nitrogen and protein (Combustion 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



AACC INTERNATIONAL

RECOGNITION OF ANALYTICAL PERFORMANCE

Analysis of Feed

Southern African Grain Laboratory
Pretoria, SOUTH AFRICA

Achieved Outstanding Accuracy and Precision for the year 2016
in check samples including the following analyses:

Moisture, Protein, Ash, Fat (EE), Crude Fiber, Calcium

Executive Vice President

President

CERTIFICATE
SERTIFIKAAT

IT IS HEREBY CERTIFIED THAT
HIERMEE WORD GESERTIFISEER DAT

Southern African Grain Lab

FEEDS / VOERE

FOR THE PERIOD OF / VIR DIE TYDPERK VAN **01/07/2017** TO / TOT **31/01/2018**

PARTICIPATED IN THE QUALITY ASSURANCE SCHEME AND CONFORMED TO THE REQUIREMENTS
IN RESPECT OF THE FOLLOWING DETERMINATIONS
AAN DIE KWALITEITS MONITERINGS SKEMA EN AAN DIE VEREIESTES MET BETREKKING TOT DIE
VOLGENDE BEPALINGS VOLDOEN HET

Ash	**Crude Fibre**	**Fat**
Moisture	**Nx6.25-Protein**	**Starch**

EVALUASION CRITERIA
Z – VALUE BETWEEN -2 AND 2 PARTICIPATION ≥ 83%

EVALUASIE KRITERIA
Z-WAARDE TUSSEN -2 EN 2 DEELNAME ≥ 83%

PRESIDENT

THISTLE QA

AfLASA
AGRI LABORATORY ASSOCIATION OF SOUTHERN AFRICA
AGRI LABORATORIUM ASSOSIASIE VAN SUIDELIKE AFRIKA

Landbounavorsingsraad
Graangewasse
Potchefstroom

Agricultural Research Council
Grain Crops
Potchefstroom

Republiek van Suid Afrika
Republic of South Africa

VERSLAG VAN DIE NASIONALE SOJABOON KULTIVARPROEWE/ 2016/17

REPORT OF THE NATIONAL SOYBEAN CULTIVAR TRIALS

Verantwoordelike beampte:
Responsible officer:
AS de Beer

BEDANKINGS

Dank is verskuldig aan die volgende persone vir hul onderskeie bydraes in die verwesenliking van hierdie verslag:

1 Alle medewerkers en koöperateurs soos gelys op bladsy 11.

2 Mev. H. Vermeulen vir rekenarisering van data en saamstel van die verslag.

3 Me Nicolene Thiebaut vir haar hulp met die verwerking en interpertering van die data.

4 Die Navorsings Bestuurder, IGG; en sojabooncultivarevaluasiekomitee, onder wie se wakende oog die proewe uitgevoer is.

5 Kollegas (me L. Bronkhorst, mnre N. Mogapi, C. Ramatlotlo en S. Seutwladi) en personeel van IGG wie op direkte of indirekte wyse bystand verleen het.

6 Die saadmaatskappye (Tabel 1). Olie- en Proteïensade Ontwikkelingstrust (OPOT) en Landbounavorsingsraad (LNR) wie die projek finansieer.

ACKNOWLEDGEMENTS

Credit is due to the following persons for their respective contributions to this report:

1 All the collaborators and co-operators as listed on page 11.

2 Mrs. H. Vermeulen for processing of data and for compiling the report.

3 Me Nicolene Thiebaut for the processing and interpretation of the data.

4 The Research Manager (GCI), and the soybean cultivar evaluation committee under whose watchful eye the trials were executed.

5 Collegues (me L. Bronkhorst, mr's N. Mogapi, C Ramatlotlo and S. Seutwladi) and personnel of GCI who rendered assistance in a direct or indirect way.

6 The Seed Companies (Table 1), Oil- and Protein Seeds Development Trust (OPDT) and Agricultural Research Council (ARC) for financing the project.

INHOUD/INDEX

ONDERWERP **BLADSY**
SUBJECT **PAGE**

TABEL **BLADSY**
TABLE **PAGE**

1 INTRODUCTION

The National Soybean Cultivar Trials (project M101/62) were planted for the 39th successive year this past growing season. A total of 21 trials were planted at 20 localities, illustrated in the locality list.

1.1 AIM

The aim of the project was primarily the following:

(I) To compare cultivars for agronomic and economic performance;

(ii) to test the adaptability of cultivars and new releases for specific areas and cultivation practices.

2 MATERIALS AND METHODS

2.1 GENERAL

The trials were planted as randomized block designs as well as a Latinized row-column design using three replications with 32 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 analysis.

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.

Four (4) of the 21 trials could not be included (19%) in the report compared to the five (5) out of 19 trials (26%) in the 2015/16 season.

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

1 Bergville – Hail damage. Trial terminated.
2 Groblersdal – High CV%. Damage by pigeons and water logging.
3 Hoopstad – High CV%. Replanted due to wind damage. Late second planting and severe drought just after planting.
4 Kokstad – Poor emergence. Trial terminated

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 (46 days Brits) and the longest in the cooler areas (78 days at Clocolan).

The number of days to physiological maturity is shown in Table 5. The longest average days to maturity was experienced at Clarens (150 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) had a mean plant height of 112 cm (highest) in the moderate area compared to 44 cm (lowest) of the indeterminate cultivar PAN 1532 R (MG 5.3) 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 54 cm at Brits to 107 cm at Potchefstroom (Irrigation).

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) and LS 6164 R (MG 6.0; determinate), as last season showed a mean pod height of 18cm in the moderate area, while DM 6.8i RR (MG 6.8; indeterminate) also had an above average pod height in all the areas.

PHB 94 Y 80 R (MG 4.8) (indeterminate) had the lowest reading of 4, 8 and 5 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. The highest lodging figures was reported for PAN 1521 R and LDC 5.9 at Delmas and Kinross (cool area) and PHB 95 Y 20 R at Clarens.

3.2.5 Green stem (Table 10)

A high percentage of green stem, like the previous season, was recorded at Brits, while the cultivar PHB 95 Y 20 R showed a high tendency for green stem, across all three climatic regions. Plants also retained their leaves that could hamper the harvesting process.

3.2.6 Shattering 3 weeks after harvesting (Table 11)

The highest shattering occurred at Brits and Brits (K2) in the warm production area as well as at Delmas and Kinross in the cool area.

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 Delmas were due to pigeon damage after planting. The lower number of plant ha^{-1} in the case of Stoffberg is due to a seeding rate of 234 000 seed ha^{-1}.

3.2.8 Percentage undesirable seed (Table 13)

The lowest mean of 0.65% undesirable seeds was recorded for the cool and moderate region. The range varied from 1.41% at Verkeerdevlei to 0.21% at Delmas.

3.2.9 Mass (g) 100^{-1} seeds (Table 14)

The variation in seed mass among localities ranged between 14.77 g 100^{-1} seeds at Clarens to 18.62 g 100^{-1} seeds at Greytown Kranskop and 18.63 g 100^{-1} at Potchefstroom (Irrigation). The highest seed mass was recorded for LS 6240 R across all climatic regions, while SSS 5052 (tuc), had the smallest seed across all areas.

3.2.10 Oil percentage (Table 15)

The cultivar 5302 RSF had, the highest average oil percentage for all the regions (15.72% cool, 14.25% moderate, 15.16% warm).

3.2.11 Crude Protein percentage (Table 16)

The cultivar SSS 4945 (tuc), as the previous season 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. The cultivar 5302 RSF had the highest average profat value for all the regions.

3.2.13 Yield (Table 18)

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

4 INTERPRETATION OF YIELD RESULTS

4.1 INTRODUCTION

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

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

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

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

Yield probability of a cultivar is the chance to get an above average yield at a particular yield potential. For instance, if the yield probability of a cultivar, at a particular yield potential equals 60%, the chance to get a yield above the mean of all cultivars is 60% with a 40% chance of obtaining a yield below the mean. 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 1623 R showed an above average yield probability (Table 19) for the low to medium yield potential, (cool area), while PAN 1521 R, DM 5953 RSF and PHB 94 Y 80 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, PHB 94 Y 80 R and DM 5953 RSF, as for the cool area, showed above average figures over the whole production potential range. DM 5953 RSF, PAN 1623 R, NS 7211 R and PAN 1521 R also performed above average for the warm areas.

Lokaliteite, medewerkers en adresse van kultivarproewe soos beplan vir, 2016/17
Localities, co-operators and addresses of the cultivar trials, 2016/17

Nr No	Lokaliteit Locality	Adres van proeflokaliteit Adress of trial locality	Tel. no. Tel. nr.	Verantwoordelike beampte Responsible officer
1	Bethlehem	Kleingraan Instituut Bethlehem 9700	082 375 8999	L Bronkhorst & E Maree
2	Bergville	J Jackson Shamrock H4 Bergville 3350	082 388 0311	R Wessels
3	Brits	Hartebeespoort Nav. Stasie Posbus 1261 Brits 0250	082 375 8999	L Bronkhorst & T Kruger
4	Brits K2	K2 Navorsingstasie Brits 0250	072 606 5094	R Boshoff
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	Clocolan	G Hugo van Niekerk Kroon Clocolan 9735	082 375 8999	L Bronkhorst & E Maree
8	Delmas-Pannar	Pannar Saad Navorsingsplaas Posbus 439 Delmas 2210	013-665 8524/082 969 1981	A Mathebula
9	Dundee	Dundee Navorsingstasie Posbus 626 Dundee 3000	034 212 479/076 953 3587	M Buthelezi
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	Groblersdal-Loskop	Loskopproefplaas Posbus 1367 Groblersdal 0470	013-262 3042/083 274 1951	C Fourie
13	Hoopstad	R Taljaard Posbus 120 Hoopstad 9479	082 375 8999	L Bronkhorst
14	Kinross	Vosstoffel Boerdery Posbus 80 Kinross 2270	082 375 8999	L Bronkhorst
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, M van Heerden & 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
20	Verkeerdevlei	Bloemfontein	082 375 8999	L Bronkhorst, J Richter & E Maree

Tabel 1 Sojaboonsaad eienskappe en inligting oor verskaffers, 2016/17
Table 1 Soybean seed characteristics and information about agents, 2016/17

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	JA/YES	Linkseed	JA/YES
PAN 1454 R	4.4	I	BL	P	T	JA/YES	Pannar	JA/YES
SSS 4945 (tuc)	4.5	I	-	W	-	JA/YES	Sensako	JA/YES
LS 6146 R	4.4	I	BL	P	G	JA/YES	Link Seed	JA/YES
PHB 94 Y 80 R	4.8	I	BL	P	T	JA/YES	Pioneer	JA/YES
LS 6248 R	4.8	SD	BL	W	W	JA/YES	Link Seed	JA/YES
SSS 5449 (tuc)	4.9	I	-	P	-	JA/YES	Sensako	JA/YES
PHB 95 Y 20	5.2	D	BL	P	T	JA/YES	Pioneer	JA/YES
DM 5953 RSF	5.3	I	IB	P	W	JA/YES	GDM Seeds	JA/YES
PAN 1532 R	5.3	I	LB	P	G	JA/YES	Pannar	JA/YES
SSS 5052 (tuc)	5.5	I	-	W	-	JA/YES	Sensako	JA/YES
5609 RSF	5.6	I	-	P	G	JA/YES	GDM Seeds	JA/YES
PAN 1521 R	5.7	I	IB	P	G	JA/YES	Pannar	JA/YES
5302 RSF	5.7	I	-	P	G	JA/YES	GDM Seeds	JA/YES
LS 6261 R	6.0	SD	BL	W	B	JA/YES	Link Seed	JA/YES
SSS 5755 (tuc)	5.8	I	-	-	-	JA/YES	Sensako	JA/YES
NS 5909 R	5.9	I	IB	P	G	JA/YES	K2	NEE/NO
LDC 5.9	5.9	-	-	-	-	JA/YES	Louise Dreyfus	NEE/NO
PHB 96 T 06 R	6.1	I	KL	W	G	JA/YES	Pioneer	NEE/NO
LDC 6.0	6.0	-	-	-	-	JA/YES	Louise Dreyfus	NEE/NO
PAN 1623 R	6.1	I	L	W	G	JA/YES	Pannar	JA/YES
LS 6161 R	6.3	D	IB	P	B	JA/YES	Link Seed	JA/YES
P61T38 R	6.3	D	LB	W	G	JA/YES	Pioneer	JA/YES
SSS 6560 (tuc)	6.2	I	-	W	-	JA/YES	Sensako	JA/YES
6663 RSF	6.3	I	-	P	G	JA/YES	GDM Seeds	JA/YES
LS 6164 R	6.0	D	LB	W	G	JA/YES	Link Seed	JA/YES
PAN 1614 R	6.4	I	LB	W	G	JA/YES	Pannar	NEE/NO
NS 6448 R	6.4	SD	LB	P	G	JA/YES	K2	NEE/NO
P64T39 R	6.4	I	KL	W	G	JA/YES	Pioneer	JA/YES
DM 6.8i RR	6.8	I	B	P	G	JA/YES	GDM Seeds	JA/YES
6968 RSF	6.9	I	-	P	G	JA/YES	GDM Seeds	JA/YES
NS 7211 R	7.2	D	LB	W	G	JA/YES	K2	NEE/NO

*1 D - Bepaald/determinate; I - Onbepaald/indeterminate; SD - Semi-Bepaald/semi deteminate
*2 BL - Swart/black; IB - Onvollodig 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 verbouiingpraktyke by die onderskeie proeflokaliteite van die kultivarproewe, 2016/17
Table 2 General information in connection with soil and cultivation practices at the different trial localities, 2016/17

Lokaliteit Locality	Plantdatum Date of planting	Grondvorm Soil type	Grond ontleding Soil analysis			Bemesting Fertilization			Spasiëring Spacing (cm)	Onkruid beheer Weed control	Koördinate van lokaliteite Co-ordinate of localities	
			pH (H_2O)	P	K	N	P	K				
Bergville/B	13/11/2016	-	3.7	43.1	146.6	-	-	-	90	-	S28°43.234"	E29°18.433"
Bethlehem/D	27/10/2016	Avalon	7.88	72	295	4.2	2.52	0	90	Strongarm, Agill, Round-up, skoffel	S28°09'36,1"	E028°18'14,9"
Brits/B	30/11/2016 19/12/2016	Arcadia	8.01	16	40	1.12	14.81	0	75	Strongarm, Agill, Round-up, skoffel	S26°21'31,7"	E029°08'04,5"
Brits K2/B	01/12/2016	Katspruit	8.23	4	350	0	21.84	0	75	Geen. Slegs geskoffel	S25,591916	E27,719345
Cedara/D	06/12/2016	Hutton	4.51	-	-	0	30.45	0	45	Dual S Gold, Hammer, Basagran	S29°32'10"	E30°16'00"
Clarens/D	22/11/2016		4.0	19.8	207.0	-	-	-	90	-	S28°23.387	E28°25.254
Clocolan/D	31/10/2016	-	5.03	56	73	6.44	2.52	10.5	75	-	S28,90864°	E027,60007°
Delmas/D	24/11/2016	Sandy loam (Davidson)	0	0	0	0	0	0	90	Flumetsulam, Metolachlor 960, Roundup	S26°8'36,08"	E28°42'28,73"
Dundee/D	09/12/2016	Hutton	-	-	-	-	-	-	45	-	S28° 08'19.74	E30° 18'53.52
Greytown/D	24/11/2016	Hutton	5.29	20	198	-	-	-	75	Metagan Gold, Roundup	S29°05'08,85"	E30°36'17,8"
Greytown Kranskop/D	22/11/2016	Hutton	4.75	36	330	-	-	-	90	Felgan Gold, Classic	S29°03'48,37"	E30°41'02,84"
Groblersdal/B	03/11/2016	Avalon	5.35	31	148	2.24	2.31	0	75	Strongarm, Agill, Round-up	S25°10'43,4"	E029°23'16,2"
Hoopstad	15/11/2016 09/12/2016	-	6.25	61	143	7.28	2.52	0	75	-	S27°53'38,8"	E025°48'22,7"
Kinross/D	02/11/2016	-	6.67	107	300	1.96	2.31	0	75	Strongarm, Agill, Round-up, skoffel	S26°22'26,2"	E029°08'47,7"
Kokstad/D	29/11/2016	-	-	-	-	-	-	-	45	Dual Gold	S30°31'54"	E29°24'44"
Kroonstad/D	16/11/2016	-	6.31	35	178	5.04	2.31	0	90	Strongarm, Agill, Round-up, skoffel	S27°36'29,9"	E027°14'00,6"
Middelburg/D	22/11/2016	-	Boer werk op globale monster			-	-	-	75	Strongarm, Agill, Round-up, skoffel	S25°39'51,7"	E029°43'19,9"
Potchefstroom/B	09/11/2016	Hutton	7.56	75	298	0	2.31	0	75	Strongarm, Alachlor, Round-up, skoffel	S26°44'00,0"	E027°04'01,2"
Potchefstroom/D	12/11/2016	Hutton	7.40	59	293	0	2.52	0	90	Strongarm, Alachlor, Round-up, skoffel	S26°44'11,2"	E027°03'35,5"
Stoffberg	17/11/2016		5.48	16	158	0	0	0	75	-	S-25,4371430	E29,853207
Verkeerdevlei	28/11/2016	Hutton	-	-	-	4.2	13.02	0	75	Strongarm, Agill, Round-up	S28°09'36,1"	E028°18'14,9"

- Inligting nie beskikbaar/information not available

Tabel 3 Reënval en besproeiing vir die verskillende lokaliteite (mm), 2016/17
Table 3 Rainfall and irrigation at the different localities (mm), 2016/17

Lokaliteit Locality	Maandelikse reënval (mm)/ Monthly rainfall (mm)							Totaal Total *	Besproeiing Irrigation	Totaal Total **
	Okt	Nov	Des	Jan	Feb	Mrt	Apr			
Bethlehem	-	36.07	96.27	141.22	244.09	26.92	24.89	569.46	100	669.46
Cedara	75.2	87.38	34.04	83.7	217.5	64	76.45	638.27	0	638.27
Delmas	106.45	257.75	156.95	187.36	120.67	42.53	64.65	936.36	0	936.36
Greytown	66	112.6	59	110.6	118.6	49	12.8	528.6	0	528.6
Greytown Kranskop	68	103	31	138	140	63	15	558	50	608
Groblersdal	36.5	143.5	110.5	177.5	79.5	19.5	15.5	582.5	225	807.5
Potchefstroom B	55.12	94.74	93.98	29.21	225.55	33.78	46.23	578.61	0	578.61
Potchefstroom Drg	55.12	94.74	93.98	29.21	225.55	33.78	46.23	578.61	0	578.61
Stoffberg	41	185	269	116	167	86	109	973	0	973

* 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, 2016/17
Table 4 The number of days from planting to 50% flowering stage of the different soybean cultivars at the different trial localities, 2016/17

	Koel/Cool							Matig/Moderate									Warm		
Kultivar Cultivar	Bethlehem	Clarens	Clocolan	Delmas	Kinross	Middelburg	Gem/Mean	Cedara	Dundee	Greytown Kranskop	Kroonstad	Potchefstroom Besproei	Potchefstroom Droog	Stoffberg	Verkeerdevlei	Gem/Mean	Brits	Brits K2	Gem/Mean
LS 6240 R	65	55	60	52	62	49	57	43	49	45	49	47	44	45	35	45	43	35	39
PAN 1454 R	46	52	51	47	52	49	50	43	42	47	49	47	44	46	35	44	37	44	41
SSS 4945 (tuc)	46	54	61	50	56	49	53	45	49	47	49	47	44	46	35	45	37	35	36
LS 6146 R	46	52	51	45	56	49	50	44	48	47	49	47	44	48	35	45	37	35	36
PHB 94 Y 80 R	46	54	51	54	52	57	52	47	48	47	49	47	44	48	42	47	40	45	43
LS 6248 R	75	54	70	55	77	64	66	60	59	61	49	56	52	52	64	57	48	45	47
SSS 5449 (tuc)	65	76	78	64	73	56	69	60	58	61	56	56	51	54	64	58	46	49	48
PHB 95 Y 20 R	83	79	86	68	86	64	78	63	61	64	58	47	58	55	42	56	50	44	47
DM 5953 RSF	65	52	61	47	52	49	54	46	48	47	56	47	51	48	42	48	37	45	41
PAN 1532 R	75	70	81	94	77	64	77	60	59	66	58	56	52	52	64	58	37	49	43
SSS 5052 (tuc)	75	79	81	69	77	72	76	66	62	61	63	58	58	56	64	61	50	45	48
5609 RSF	71	76	85	64	69	64	71	63	59	65	58	56	52	61	64	60	46	45	46
PAN 1521 R	75	77	84	67	77	72	75	61	58	66	63	58	52	62	64	61	48	44	46
5302 RSF	75	76	81	58	69	64	71	59	57	66	56	56	51	60	60	58	44	49	47
LS 6261 R	65	70	84	63	77	64	71	61	57	63	55	54	52	60	64	58	46	49	48
SSS 5755 (tuc)	83	74	79	64	77	72	75	63	60	66	63	56	58	63	68	62	50	49	50
NS 5909 R	81	79	86	61	77	72	76	67	63	66	63	58	66	67	70	65	50	49	50
LDC 5,9	83	81	85	59	82	72	77	65	60	64	58	58	55	52	64	60	50	49	50
PHB 96 T 06 R	83	86	91	102	83	72	86	68	62	67	68	61	58	66	35	61	50	49	50
LDC 6.0	83	79	86	71	77	72	78	65	63	66	63	61	58	65	64	63	48	49	49
PAN 1623 R	83	79	81	64	77	72	76	67	61	63	58	58	52	66	64	61	46	49	48
LS 6161 R	83	79	71	64	77	72	74	66	60	63	63	56	51	63	64	61	46	49	48
P61T38 R	75	76	84	59	77	64	73	65	62	65	63	58	65	60	64	63	48	44	46
SSS 6560 (tuc)	83	79	85	59	82	64	75	75	62	65	63	58	58	65	64	64	50	49	50
6663 RSF	75	86	92	72	77	72	79	67	65	69	68	69	58	66	74	67	50	55	53
LS 6164 R	82	76	85	55	77	72	74	64	61	66	63	69	66	63	64	64	50	47	49
PAN 1614 R	83	80	85	65	82	72	78	67	63	66	65	61	58	68	74	65	50	49	50
NS 6448 R	75	81	86	67	77	64	75	66	64	69	63	61	66	63	74	66	53	55	54
P64T39 R	82	79	85	68	77	72	77	67	62	67	58	58	58	64	64	62	50	49	50
DM 6.8i RR	83	86	86	66	77	72	78	67	65	69	63	61	66	68	74	67	53	49	51
6968 RSF	88	79	91	73	77	72	80	66	65	65	63	58	58	67	74	64	48	55	52
NS 7211 R	78	81	86	60	82	72	77	66	61	65	67	56	58	65	74	64	48	49	49
Gem/Mean	74	73	78	63	73	65	71	61	59	62	59	56	55	59	59	59	46	47	47

Tabel 5 Die aantal dae vanaf plant tot fisiologiesrypstadium van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2016/17
Table 5 The number of days from planting to physiological maturity of the different soybean cultivars at the different trial localities, 2016/17

	Koel/Cool						Matig/Moderate									Warm		
Kultivar Cultivar	Bethlehem	Clarens	Clocolan	Kinross	Middelburg	Gem/Mean	Cedara	Dundee	Greytown Kranskop	Kroonstad	Potchefstroom Besproei	Potchefstroom Droog	Stoffberg	Verkeerdevlei	Gem/Mean	Brits	Brits K2	Gem/Mean
LS 6240 R	128	124	100	134	120	121	117	112	115	112	114	111	112	122	114	101	98	100
PAN 1454 R	128	135	100	134	127	125	117	115	114	112	114	111	121	122	116	101	119	110
SSS 4945 (tuc)	125	129	100	134	117	121	116	112	114	112	114	111	113	122	114	115	105	110
LS 6146 R	125	133	100	130	117	121	115	112	114	112	114	111	117	122	115	112	100	106
PHB 94 Y 80 R	125	137	100	134	117	123	114	111	114	112	114	111	112	122	114	101	98	100
LS 6248 R	146	144	136	143	133	140	127	120	119	126	121	118	122	122	122	115	105	110
SSS 5449 (tuc)	128	144	143	141	127	137	121	117	117	134	121	118	122	122	122	112	98	105
PHB 95 Y 20 R	154	151	155	147	141	150	125	117	132	134	114	122	121	122	123	115	113	114
DM 5953 RSF	128	135	100	134	127	125	124	114	114	112	121	118	118	122	118	112	105	109
PAN 1532 R	146	144	143	147	130	142	128	121	119	138	127	122	121	122	125	112	109	111
SSS 5052 (tuc)	146	151	143	147	133	144	130	125	127	134	121	117	127	114	124	112	113	113
5609 RSF	139	151	143	147	133	143	128	117	119	134	127	118	128	114	123	115	119	117
PAN 1521 R	146	144	155	141	133	144	126	116	114	126	127	122	128	136	124	115	113	114
5302 RSF	139	144	150	147	141	144	123	120	114	138	114	118	129	114	121	112	105	109
LS 6261 R	146	144	155	154	141	148	127	116	124	134	114	122	125	122	123	115	105	110
SSS 5755 (tuc)	154	151	155	154	133	149	127	120	129	130	121	122	136	122	126	123	113	118
NS 5909 R	154	161	155	147	141	152	132	132	119	138	121	125	134	126	128	115	113	114
LDC 5,9	146	151	155	147	133	146	129	124	127	138	121	122	136	114	126	115	119	117
PHB 96 T 06 R	154	161	155	154	141	153	134	125	127	134	127	128	138	122	129	115	119	117
LDC 6.0	146	161	155	147	141	150	129	127	127	126	120	122	135	122	126	115	113	114
PAN 1623 R	154	161	143	147	133	148	128	123	121	134	127	122	135	126	127	115	113	114
LS 6161 R	146	144	155	154	133	146	131	125	121	130	115	117	136	114	124	112	113	113
P61T38 R	154	151	143	147	141	147	136	123	140	138	127	128	136	122	131	115	119	117
SSS 6560 (tuc)	154	151	137	147	133	144	130	129	140	126	127	132	136	122	130	115	113	114
6663 RSF	154	161	155	150	156	155	131	127	129	134	127	128	138	126	130	137	119	128
LS 6164 R	154	161	143	147	141	149	128	118	142	138	141	138	138	114	132	115	113	114
PAN 1614 R	154	161	143	147	141	149	130	121	119	130	131	122	133	126	127	115	113	114
NS 6448 R	154	161	143	154	141	151	133	126	127	126	141	132	137	114	130	137	113	125
P64T39 R	158	161	155	154	156	157	134	124	127	138	127	122	136	126	129	115	113	114
DM 6.8i RR	154	161	155	154	149	155	135	130	148	138	127	128	139	114	132	137	119	128
6968 RSF	158	161	155	154	151	156	135	131	129	126	121	122	141	122	128	115	119	117
NS 7211 R	154	161	155	154	156	156	130	123	148	134	127	132	138	114	131	123	119	121
Gem/Mean	145	150	140	146	136	143	127	121	125	129	123	122	129	121	125	116	112	114

Tabel 6 Die aantal dae vanaf plant tot oesstadium van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2016/17
Table 6 The number of days from planting to maturity of the different soybean cultivars at the different trial localities, 2016/17

	Koel/Cool							Matig/Moderate									Warm		
Kultivar Cultivar	Bethlehem	Clarens	Clocolan	Delmas	Kinross	Middelburg	Gem/Mean	Cedara	Dundee	Greytown Kranskop	Kroonstad	Potchefstroom Besproei	Potchefstroom Droog	Stoffberg	Verkeerdevlei	Gem/Mean	Brits	Brits K2	Gem/Mean
LS 6240 R	146	144	147	135	141	133	141	121	123	134	138	151	135	152	129	135	124	113	119
PAN 1454 R	146	161	155	133	141	143	147	122	152	134	138	144	135	136	129	136	122	124	123
SSS 4945 (tuc)	146	154	155	133	145	133	144	121	124	134	138	148	135	138	129	133	122	113	118
LS 6146 R	146	154	155	134	141	133	144	119	125	134	138	138	135	136	133	132	124	113	119
PHB 94 Y 80 R	146	161	151	133	141	133	144	121	132	134	138	138	135	134	129	133	124	126	125
LS 6248 R	163	161	175	141	163	146	158	132	128	134	148	142	150	152	142	141	126	123	125
SSS 5449 (tuc)	158	161	170	147	155	148	157	125	138	161	138	137	135	138	138	139	122	115	119
PHB 95 Y 20 R	165	168	184	147	170	167	167	130	123	134	148	161	150	167	161	147	127	130	129
DM 5953 RSF	146	154	155	133	141	133	144	124	125	134	138	138	135	134	129	132	126	115	121
PAN 1532 R	160	161	179	149	167	146	161	133	135	134	148	152	141	140	152	142	126	119	123
SSS 5052 (tuc)	165	168	198	151	168	163	169	135	144	134	167	158	150	167	157	151	139	123	131
5609 RSF	160	168	169	145	163	167	162	133	128	134	153	150	146	167	161	147	129	123	126
PAN 1521 R	168	161	179	149	158	146	160	131	126	134	157	151	139	167	142	143	131	125	128
5302 RSF	160	161	170	140	160	151	157	127	138	134	148	148	135	134	142	138	124	119	122
LS 6261 R	163	161	184	141	182	154	164	134	123	134	153	148	141	167	142	143	126	121	124
SSS 5755 (tuc)	173	168	193	150	177	169	172	133	143	134	167	146	143	167	161	149	131	128	130
NS 5909 R	175	168	193	151	182	169	173	137	153	168	162	164	146	167	161	157	134	130	132
LDC 5,9	182	168	193	156	173	165	173	134	148	148	167	167	146	157	143	151	137	141	139
PHB 96 T 06 R	173	168	189	146	177	163	169	138	145	147	167	161	143	152	161	152	134	130	132
LDC 6.0	175	168	198	150	173	167	172	134	144	148	162	156	146	152	161	151	137	125	131
PAN 1623 R	168	168	184	150	177	169	169	133	134	134	158	151	139	167	147	145	129	123	126
LS 6161 R	168	161	179	149	177	149	164	135	139	134	153	152	143	167	142	146	129	130	130
P61T38 R	165	168	189	139	175	160	166	141	136	155	158	155	146	167	171	154	139	125	132
SSS 6560 (tuc)	182	168	193	151	177	154	171	135	143	155	162	164	146	167	166	155	139	141	140
6663 RSF	178	168	198	156	182	169	175	136	159	168	167	167	159	167	171	162	141	125	133
LS 6164 R	172	168	170	139	182	167	166	134	132	155	167	158	146	167	147	151	126	136	131
PAN 1614 R	182	168	189	151	173	163	171	136	147	147	167	152	146	167	171	154	126	123	125
NS 6448 R	170	168	189	149	165	163	167	137	143	147	153	152	146	162	161	150	134	123	129
P64T39 R	187	168	189	151	182	165	174	136	142	148	162	158	150	167	151	152	136	136	136
DM 6.8i RR	187	168	198	153	182	163	175	139	157	161	167	167	159	167	171	161	143	141	142
6968 RSF	187	168	198	157	182	169	177	139	153	168	167	167	159	167	171	161	141	136	138
NS 7211 R	170	168	198	148	168	169	170	135	150	161	162	157	151	167	162	156	139	125	132
Gem/Mean	167	164	180	145	167	156	163	132	139	144	155	153	144	157	151	147	131	126	128

Tabel 7 Die planthoogte van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2016/17
Table 7 The plant height of the different soybean cultivars at the different trial localities, 2016/17

Kultivar Cultivar	Koel/Cool							Matig/Moderate										Warm		
	Bethlehem	Clarens	Clocolan	Delmas	Kinross	Middelburg	Gem/Mean	Cedara	Dundee	Greytown	Greytown Kranskop	Kroonstad	Potchefstroom Besproei	Potchefstroom Droog	Stoffberg	Verkeerdevlei	Gem/Mean	Brits	Brits K2	Gem/Mean
LS 6240 R	62	75	75	101	57	48	70	79	68	76	78	57	98	85	54	73	74	40	58	49
PAN 1454 R	93	90	88	116	64	58	85	102	98	106	93	78	102	97	70	87	92	45	63	54
SSS 4945 (tuc)	62	90	68	83	57	52	69	75	70	72	78	77	90	78	57	67	74	50	60	55
LS 6146 R	82	90	77	111	59	54	79	90	83	99	100	73	102	91	71	75	87	48	65	57
PHB 94 Y 80 R	55	70	60	79	63	45	62	74	67	78	74	55	103	80	56	63	72	42	50	46
LS 6248 R	93	105	85	104	85	77	91	103	86	97	103	95	103	85	74	73	91	55	68	62
SSS 5449 (tuc)	87	100	80	99	83	73	87	90	72	92	97	85	117	95	71	78	89	50	56	53
PHB 95 Y 20 R	77	90	73	106	68	60	79	95	79	78	93	73	98	71	81	77	83	52	58	55
DM 5953 RSF	90	80	67	93	78	50	76	79	78	81	87	68	107	88	65	85	82	67	81	74
PAN 1532 R	82	80	67	111	73	62	79	74	65	76	80	72	102	70	68	70	75	42	46	44
SSS 5052 (tuc)	90	90	82	108	92	78	90	100	80	100	97	102	110	80	68	85	91	52	63	58
5609 RSF	65	85	62	92	57	57	70	84	65	70	72	65	74	72	48	67	68	42	50	46
PAN 1521 R	102	85	92	110	100	82	95	93	88	91	98	103	108	92	77	93	94	77	92	84
5302 RSF	83	90	78	102	75	65	82	84	72	88	82	78	105	82	69	82	82	50	61	56
LS 6261 R	78	85	65	105	70	63	78	72	67	76	82	78	100	70	67	74	76	52	51	51
SSS 5755 (tuc)	87	100	65	109	85	71	86	89	79	96	102	90	90	95	73	77	88	47	61	54
NS 5909 R	98	100	72	105	90	79	91	105	83	99	110	99	125	85	87	75	97	53	68	61
LDC 5,9	93	80	87	118	112	81	95	100	80	102	107	103	128	92	85	95	99	78	73	76
PHB 96 T 06 R	95	105	85	118	93	85	97	104	88	105	117	107	133	97	102	83	104	62	73	68
LDC 6.0	75	60	60	100	72	60	71	77	60	75	85	95	82	73	67	65	75	40	57	48
PAN 1623 R	92	95	88	108	90	84	93	97	89	99	102	93	120	90	67	82	93	57	72	64
LS 6161 R	93	90	93	105	87	83	92	92	90	89	98	103	92	93	92	94	94	58	78	68
P61T38 R	62	85	63	97	60	54	70	92	73	74	95	72	72	70	66	73	76	50	57	54
SSS 6560 (tuc)	92	105	75	94	95	64	88	87	75	86	105	90	103	87	74	77	87	57	70	64
6663 RSF	103	110	72	95	100	88	95	120	93	98	115	107	137	110	93	78	106	58	73	66
LS 6164 R	105	105	82	95	95	92	96	110	92	118	110	113	103	103	88	92	103	60	87	73
PAN 1614 R	103	95	82	118	105	85	98	111	100	109	118	103	124	100	82	83	104	55	63	59
NS 6448 R	75	100	67	107	75	63	81	102	100	97	107	87	97	78	79	77	92	53	57	55
P64T39 R	110	100	98	106	103	86	101	102	89	107	110	103	115	93	78	90	99	77	93	85
DM 6.8i RR	111	100	90	133	110	97	107	115	102	116	118	120	143	103	97	93	112	65	93	79
6968 RSF	113	110	92	115	107	86	104	106	96	100	105	113	148	87	93	92	104	59	87	73
NS 7211 R	68	95	67	107	77	67	80	101	73	74	103	73	105	72	83	83	85	46	67	56
Gem/Mean	87	92	77	105	82	70	85	94	81	91	98	89	107	86	75	80	89	54	67	61

Tabel 8 Die peulhoogte van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2016/17
Table 8 The pod height of the different soybean cultivars at the different trial localities, 2016/17

Kultivar Cultivar	Koel/Cool							Matig/Moderate										Warm		
	Bethlehem	Clarens	Clocolan	Delmas	Kinross	Middelburg	Gem/Mean	Cedara	Dundee	Greytown	Greytown Kranskop	Kroonstad	Potchefstroom Besproei	Potchefstroom Droog	Stoffberg	Verkeerdevlei	Gem/Mean	Brits	Brits K2	Gem/Mean
LS 6240 R	3	8	7	12	6	2	6	12	10	10	9	6	14	8	7	8	9	3	9	6
PAN 1454 R	8	7	8	10	6	4	7	14	14	9	7	5	13	12	12	10	11	4	9	7
SSS 4945 (tuc)	4	7	6	8	7	2	6	11	9	10	9	4	13	8	3	6	8	3	7	5
LS 6146 R	9	7	7	12	7	2	7	12	14	16	11	3	11	10	8	7	10	3	8	6
PHB 94 Y 80 R	2	6	4	6	6	1	4	12	12	9	3	4	15	9	5	3	8	5	6	5
LS 6248 R	9	15	8	9	10	5	10	22	17	18	22	10	11	8	18	5	15	6	10	8
SSS 5449 (tuc)	6	7	9	14	7	5	8	20	14	12	18	8	12	10	12	9	13	3	7	5
PHB 95 Y 20 R	10	10	8	12	9	6	9	20	17	20	22	11	12	8	22	6	15	7	10	9
DM 5953 RSF	10	5	4	8	8	1	6	11	13	12	9	5	17	11	5	7	10	5	10	8
PAN 1532 R	6	18	5	15	8	4	9	13	12	14	13	6	13	8	8	6	10	2	8	5
SSS 5052 (tuc)	9	16	9	14	10	7	11	20	15	16	17	9	14	8	14	9	14	6	10	8
5609 RSF	5	10	7	9	6	4	7	15	15	17	12	7	12	8	4	4	10	3	7	5
PAN 1521 R	10	10	13	17	11	5	11	19	17	17	18	10	15	9	9	11	14	7	11	9
5302 RSF	7	3	9	14	6	2	7	14	13	12	8	5	15	9	13	8	11	2	8	5
LS 6261 R	7	10	4	22	8	7	10	18	16	19	17	7	11	8	14	8	13	5	10	8
SSS 5755 (tuc)	11	10	4	14	9	8	9	18	14	17	18	8	10	11	16	8	13	4	9	6
NS 5909 R	7	16	9	12	11	8	11	28	21	20	20	10	19	9	24	8	18	5	9	7
LDC 5,9	3	10	8	15	12	7	9	17	13	18	24	7	14	10	13	9	14	8	9	8
PHB 96 T 06 R	8	15	9	12	7	7	10	18	12	14	25	8	12	9	24	7	14	5	7	6
LDC 6.0	5	3	2	16	6	4	6	13	10	13	19	6	9	8	11	7	11	5	7	6
PAN 1623 R	7	9	12	12	8	4	9	17	17	17	17	9	14	9	15	8	14	3	9	6
LS 6161 R	11	8	10	13	10	9	10	18	20	18	18	12	11	10	20	11	15	6	12	9
P61T38 R	9	15	5	10	10	8	9	25	21	22	20	9	8	7	25	7	16	7	11	9
SSS 6560 (tuc)	8	15	8	10	11	7	10	18	14	17	20	7	10	10	16	8	13	6	9	7
6663 RSF	9	13	7	9	8	7	9	21	15	16	20	8	14	15	22	6	15	5	8	7
LS 6164 R	9	10	7	11	9	8	9	22	18	24	25	11	12	12	27	11	18	7	12	9
PAN 1614 R	12	11	10	14	11	9	11	25	18	18	27	8	16	11	26	8	17	7	12	9
NS 6448 R	9	17	4	13	7	6	10	20	16	15	23	9	14	10	19	8	15	6	11	9
P64T39 R	8	16	12	11	8	6	10	19	16	16	24	7	11	9	12	12	14	6	12	9
DM 6.8i RR	8	15	8	10	11	8	10	23	21	22	19	11	14	13	27	12	18	8	13	10
6968 RSF	11	20	11	17	13	8	13	24	24	18	20	11	14	10	23	10	17	6	11	9
NS 7211 R	8	18	4	13	8	5	9	21	17	16	23	7	13	8	15	10	14	4	8	6
Gem/Mean	8	11	7	12	9	6	9	18	15	16	17	8	13	10	15	8	13	5	9	7

Tabel 9 Omvalwaarnemings (1-5) van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2016/17
Table 9 Lodging data (1-5) of the different soybean cultivars at the different trial localities, 2016/17

	Koel/Cool							Matig/Moderate									Warm		
Kultivar Cultivar	Bethlehem	Clarens	Clocolan	Delmas	Kinross	Middelburg	Gem/Mean	Cedara	Dundee	Greytown	Kroonstad	Potchefstroom Besproei	Potchefstroom Droog	Stoffberg	Verkeerdevlei	Gem/Mean	Brits	Brits K2	Gem/Mean
LS 6240 R	1.00	1.00	1.00	2.33	1.00	1.00	1.22	1.00	1.00	1.00	1.00	1.67	1.00	1.00	1.00	1.08	1.67	1.00	1.33
PAN 1454 R	1.00	1.00	1.00	3.33	1.00	1.00	1.39	1.00	1.00	1.00	1.00	1.33	1.00	1.00	1.00	1.04	1.00	1.00	1.00
SSS 4945 (tuc)	1.00	1.00	1.00	2.00	1.00	1.00	1.17	1.00	1.00	1.00	1.00	3.00	1.00	1.00	1.00	1.25	1.00	1.00	1.00
LS 6146 R	1.00	1.00	1.00	3.00	1.00	1.00	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHB 94 Y 80 R	1.00	1.00	1.00	3.67	1.00	1.00	1.44	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	2.67	1.00	1.00	1.28	1.00	1.00	1.00	1.00	1.33	1.00	1.00	1.00	1.04	1.33	1.00	1.17
SSS 5449 (tuc)	1.00	1.00	1.00	2.67	1.00	1.00	1.28	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHB 95 Y 20 R	1.00	4.00	1.00	3.67	1.00	1.00	1.94	1.00	1.00	1.00	1.00	1.67	1.00	1.00	1.00	1.08	1.00	1.00	1.00
DM 5953 RSF	1.00	1.00	1.00	2.67	1.00	1.00	1.28	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 1532 R	1.00	1.00	1.00	2.00	1.00	1.00	1.17	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	1.00	4.67	1.33	1.00	1.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
5609 RSF	1.00	1.00	1.00	2.00	1.00	1.00	1.17	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PAN 1521 R	2.67	1.00	1.00	4.33	4.33	1.00	2.39	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
5302 RSF	1.00	1.00	1.00	3.33	1.00	1.00	1.39	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
LS 6261 R	1.00	1.00	1.00	2.33	1.00	1.00	1.22	1.00	1.00	1.00	1.00	1.33	1.00	1.00	1.00	1.04	1.00	1.00	1.00
SSS 5755 (tuc)	1.00	1.00	1.00	2.33	1.00	1.00	1.22	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	1.33	1.00	1.00	5.00	1.00	1.00	1.72	1.00	1.00	1.00	1.00	1.67	1.00	1.00	1.00	1.08	1.00	1.00	1.00
LDC 5,9	1.00	1.00	1.00	5.00	4.67	1.00	2.28	1.00	1.00	1.00	1.00	3.33	1.00	1.00	1.00	1.29	1.00	1.00	1.00
PHB 96 T 06 R	1.00	1.00	1.00	4.67	1.33	1.00	1.67	1.00	1.00	1.00	1.00	1.67	1.00	1.00	1.00	1.08	1.00	1.00	1.00
LDC 6.0	1.00	1.00	1.00	3.67	2.00	1.00	1.61	1.00	1.00	1.00	1.00	1.67	1.00	1.00	1.00	1.08	1.00	1.00	1.00
PAN 1623 R	1.00	1.00	1.00	5.00	1.33	1.00	1.72	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
LS 6161 R	1.33	1.00	1.00	3.00	1.00	1.00	1.39	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
P61T38 R	1.00	1.00	1.00	2.00	1.00	1.00	1.17	1.00	1.00	1.00	1.00	2.00	1.00	1.00	1.00	1.13	1.00	1.00	1.00
SSS 6560 (tuc)	1.00	1.00	1.00	4.33	1.00	1.00	1.56	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
6663 RSF	1.00	3.00	1.00	5.00	1.33	1.00	2.06	1.00	1.00	1.00	1.33	1.33	1.00	1.00	1.00	1.08	1.00	1.00	1.00
LS 6164 R	1.00	1.00	1.00	4.00	2.00	1.00	1.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PAN 1614 R	1.33	1.00	1.00	5.00	1.00	1.00	1.72	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	5.00	1.00	1.00	1.67	1.00	1.00	2.33	1.00	1.00	1.00	1.00	1.00	1.17	1.00	1.00	1.00
P64T39 R	1.33	1.00	1.00	4.00	3.00	1.00	1.89	1.00	1.00	1.00	1.00	3.33	1.00	1.00	1.00	1.29	1.00	1.00	1.00
DM 6.8i RR	1.00	3.00	1.00	5.00	1.33	1.00	2.06	1.00	1.00	1.00	1.00	2.33	1.00	1.00	1.00	1.17	1.00	1.00	1.00
6968 RSF	1.00	1.00	1.00	2.00	1.00	1.00	1.17	1.00	1.00	1.00	1.33	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00
NS 7211 R	1.00	1.00	1.00	2.00	1.00	1.00	1.17	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Gem/Mean	1.09	1.22	1.00	3.49	1.40	1.00	1.53	1.00	1.00	1.04	1.02	1.43	1.00	1.00	1.00	1.06	1.03	1.00	1.02

Tabel 10 Groenstam (1-5) van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2016/17
Table 10 Greenstem (1-5) of the different soybean cultivars at the different trial localities, 2016/17

	Koel/Cool						Matig/Moderate									Warm		
Kultivar Cultivar	Bethlehem	Clarens	Clocolan	Kinross	Middelburg	Gem/Mean	Cedara	Dundee	Greytown	Kroonstad	Potchefstroom Besproei	Potchefstroom Droog	Stoffberg	Verkeerdevlei	Gem/Mean	Brits	Brits K2	Gem/Mean
LS 6240 R	1.00	1.00	2.00	2.67	1.33	1.60	1.33	1.00	1.00	2.67	4.00	2.67	1.00	1.67	1.92	3.33	1.67	2.50
PAN 1454 R	1.67	1.00	2.00	3.33	4.00	2.40	2.67	3.00	1.00	2.33	4.00	2.33	2.00	3.00	2.54	4.67	3.67	4.17
SSS 4945 (tuc)	1.33	1.00	2.00	2.00	2.33	1.73	1.67	1.00	1.00	3.00	4.67	2.67	1.00	3.33	2.29	5.00	2.00	3.50
LS 6146 R	1.00	1.00	2.00	2.33	1.33	1.53	1.00	1.00	1.00	3.00	2.67	2.33	5.00	1.00	2.13	5.00	1.67	3.33
PHB 94 Y 80 R	2.33	1.00	2.67	3.00	3.33	2.47	4.67	1.00	1.00	3.00	4.33	3.00	1.00	4.00	2.75	4.67	2.67	3.67
LS 6248 R	2.33	1.00	2.67	4.33	4.00	2.87	1.00	1.00	1.00	4.00	4.00	3.00	2.00	1.33	2.17	3.67	3.00	3.33
SSS 5449 (tuc)	1.67	1.00	2.67	3.33	4.67	2.67	1.00	1.00	1.00	4.00	2.67	3.67	1.00	1.33	1.96	3.33	3.33	3.33
PHB 95 Y 20 R	4.33	1.00	3.67	5.00	4.67	3.73	1.67	1.33	1.00	4.00	4.67	3.00	5.00	4.00	3.08	4.33	2.33	3.33
DM 5953 RSF	1.33	1.00	1.67	2.00	1.67	1.53	1.33	1.00	1.00	3.67	3.00	2.33	1.00	1.00	1.79	4.00	2.67	3.33
PAN 1532 R	2.33	1.00	2.33	3.67	2.33	2.33	1.00	1.00	1.00	2.00	4.67	2.67	1.00	1.33	1.83	3.00	1.67	2.33
SSS 5052 (tuc)	2.33	1.00	1.33	3.00	2.67	2.07	1.00	1.00	1.00	3.67	4.67	3.33	3.00	2.00	2.46	4.00	2.00	3.00
5609 RSF	2.00	1.00	2.67	4.67	4.67	3.00	1.00	1.00	1.00	4.67	4.33	3.00	3.00	2.33	2.54	4.67	3.00	3.83
PAN 1521 R	3.67	1.00	3.00	3.67	2.33	2.73	1.00	1.00	1.00	2.67	4.33	2.33	2.00	1.00	1.92	4.67	1.00	2.83
5302 RSF	1.67	1.00	2.67	4.00	3.33	2.53	1.00	1.00	1.00	2.33	4.00	2.00	1.00	1.67	1.75	3.67	2.67	3.17
LS 6261 R	3.67	1.00	3.33	5.00	5.00	3.60	2.33	1.00	1.33	4.67	4.00	4.00	2.00	1.33	2.58	5.00	3.00	4.00
SSS 5755 (tuc)	2.67	1.00	2.33	4.00	1.67	2.33	1.33	1.00	1.00	3.67	4.00	4.67	4.00	1.33	2.63	3.67	2.00	2.83
NS 5909 R	4.67	1.00	1.67	4.00	2.67	2.80	2.33	1.00	1.00	4.67	4.67	3.33	3.00	2.00	2.75	4.67	2.67	3.67
LDC 5,9	4.00	1.00	2.33	4.00	1.67	2.60	1.00	1.33	1.00	3.00	4.67	3.33	1.00	2.00	2.17	4.00	2.33	3.17
PHB 96 T 06 R	2.33	1.00	1.33	1.33	1.00	1.40	1.33	1.00	1.00	2.00	5.00	3.67	1.00	2.00	2.13	4.67	1.33	3.00
LDC 6.0	5.00	1.00	2.33	3.67	3.67	3.13	1.00	1.00	1.00	4.00	4.67	3.33	1.00	2.00	2.25	5.00	2.33	3.67
PAN 1623 R	1.67	1.00	2.33	2.67	1.67	1.87	1.00	1.00	1.00	3.33	4.00	5.00	1.00	1.67	2.25	3.00	1.67	2.33
LS 6161 R	4.33	1.00	1.67	4.00	1.33	2.47	1.00	1.00	1.00	4.33	4.33	4.00	1.00	2.67	2.42	4.67	2.00	3.33
P61T38 R	3.00	1.00	2.67	4.67	4.33	3.13	1.67	1.00	1.00	4.33	4.00	3.67	5.00	1.33	2.75	5.00	1.33	3.17
SSS 6560 (tuc)	3.00	1.00	2.00	2.00	3.33	2.27	1.33	1.00	1.00	4.67	4.67	3.33	1.00	1.00	2.25	4.33	2.00	3.17
6663 RSF	4.00	1.00	2.00	3.67	4.67	3.07	1.67	1.00	1.67	4.33	5.00	3.33	5.00	2.00	3.00	5.00	1.00	3.00
LS 6164 R	4.00	1.00	2.00	4.33	4.00	3.07	1.33	1.00	1.00	3.33	4.33	4.00	5.00	2.00	2.75	3.67	2.67	3.17
PAN 1614 R	3.33	1.00	2.00	3.33	2.33	2.40	1.33	1.00	1.00	4.67	4.67	4.00	2.00	2.00	2.58	3.67	2.00	2.83
NS 6448 R	1.00	1.00	2.00	2.67	1.33	1.60	1.00	1.00	1.00	1.67	4.33	3.33	3.00	2.33	2.21	3.67	1.00	2.33
P64T39 R	4.33	1.00	1.67	3.33	1.67	2.40	1.00	1.00	1.00	2.00	5.00	3.00	1.00	1.67	1.96	4.67	2.67	3.67
DM 6.8i RR	2.67	1.00	2.67	2.67	1.67	2.13	1.00	1.00	1.00	3.67	5.00	4.00	1.00	2.00	2.33	5.00	3.00	4.00
6968 RSF	5.00	1.00	2.00	3.67	2.67	2.87	1.33	1.00	1.00	3.67	5.00	3.33	2.00	2.33	2.46	5.00	2.00	3.50
NS 7211 R	4.00	1.00	2.00	4.33	5.00	3.27	1.33	1.00	1.00	4.67	4.67	3.67	5.00	2.33	2.96	4.00	1.67	2.83
Gem/Mean	2.86	1.00	2.24	3.45	2.89	2.49	1.43	1.08	1.03	3.49	4.31	3.29	2.28	1.97	2.36	4.27	2.19	3.23

Tabel 11 Oopspring (1-5) van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2016/17
Table 11 Shattering (1-5) of the different soybean cultivars at the different trial localities, 2016/17

	Koel/Cool							Matige/Moderate								Warm		
Kultivar Cultivar	Bethlehem	Clarens	Clocolan	Delmas	Kinross	Middelburg	Gem/Mean	Dundee	Greytown	Kroonstad	Potchefstroom Besproei	Potchefstroom Droog	Stoffberg	Verkeerdevlei	Gem/Mean	Brits	Brits K2	Gem/Mean
LS 6240 R	2.00	1.00	3.00	2.33	5.00	1.00	2.39	1.00	1.00	2.00	1.00	1.00	1.00	2.00	1.29	3.00	3.00	3.00
PAN 1454 R	1.00	1.00	1.00	4.00	4.00	2.00	2.17	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.14	5.00	3.00	4.00
SSS 4945 (tuc)	3.00	2.00	3.00	5.00	5.00	4.00	3.67	1.00	1.67	1.00	1.00	1.00	1.00	3.00	1.38	5.00	3.00	4.00
LS 6146 R	2.00	2.00	3.00	2.67	5.00	1.00	2.61	1.00	1.00	2.00	2.00	2.00	1.00	2.00	1.57	4.00	3.00	3.50
PHB 94 Y 80 R	2.00	2.00	3.00	5.00	4.00	3.00	3.17	1.00	1.00	1.00	2.00	2.00	1.00	3.00	1.57	5.00	3.00	4.00
LS 6248 R	2.00	1.00	1.00	3.67	5.00	1.00	2.28	1.00	1.00	2.00	2.00	2.00	1.00	3.00	1.71	5.00	3.00	4.00
SSS 5449 (tuc)	2.00	1.00	1.00	3.67	5.00	1.00	2.28	1.00	1.00	1.00	2.00	2.00	1.00	3.00	1.57	5.00	4.00	4.50
PHB 95 Y 20 R	1.00	1.00	2.00	2.00	5.00	1.00	2.00	1.00	1.00	1.00	2.00	2.00	1.00	2.00	1.43	5.00	2.00	3.50
DM 5953 RSF	2.00	1.00	2.00	3.00	4.00	2.00	2.33	1.00	1.00	1.00	1.00	1.00	1.00	3.00	1.29	2.00	4.00	3.00
PAN 1532 R	1.00	1.00	1.00	2.00	1.00	1.00	1.17	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.29	1.00	3.00	2.00
SSS 5052 (tuc)	2.00	1.00	1.00	1.33	3.00	1.00	1.56	1.00	1.00	1.00	2.00	2.00	1.00	3.00	1.57	1.00	2.00	1.50
5609 RSF	1.00	1.00	2.00	3.67	4.00	1.00	2.11	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.43	4.00	3.00	3.50
PAN 1521 R	1.00	1.00	2.00	2.33	3.00	1.00	1.72	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.43	1.00	2.00	1.50
5302 RSF	2.00	1.00	2.00	4.67	4.00	1.00	2.44	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.43	5.00	2.00	3.50
LS 6261 R	1.00	1.00	3.00	3.33	3.00	1.00	2.06	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	5.00	4.00	4.50
SSS 5755 (tuc)	3.00	1.00	3.00	1.00	1.00	1.00	1.67	1.00	1.00	1.00	2.00	2.00	1.00	2.00	1.43	3.00	1.00	2.00
NS 5909 R	3.00	1.00	1.00	2.33	4.00	2.33	2.28	1.00	1.00	1.00	2.00	2.00	1.00	2.00	1.43	2.00	2.00	2.00
LDC 5,9	1.00	1.00	1.00	3.00	2.00	1.00	1.50	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.14	1.00	1.00	1.00
PHB 96 T 06 R	2.00	1.00	1.00	1.33	1.00	1.00	1.22	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.29	1.00	3.00	2.00
LDC 6.0	1.00	1.00	1.00	2.67	4.00	1.00	1.78	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.43	2.00	2.00	2.00
PAN 1623 R	1.00	1.00	1.00	1.33	4.00	1.00	1.56	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	1.50
LS 6161 R	2.00	1.00	1.00	3.67	5.00	1.00	2.28	1.00	1.33	2.00	4.00	4.00	1.00	3.00	2.33	5.00	3.00	4.00
P61T38 R	1.00	1.00	1.00	2.67	1.00	1.00	1.28	1.00	1.00	2.00	1.00	1.00	1.00	1.00	1.14	2.00	1.00	1.50
SSS 6560 (tuc)	2.00	1.00	1.00	2.33	2.50	1.00	1.64	1.00	1.00	2.00	2.00	2.00	1.00	2.00	1.57	2.00	2.00	2.00
6663 RSF	2.00	1.00	1.00	1.67	1.00	1.00	1.28	1.00	1.00	1.00	1.00	1.00	1.00	3.00	1.29	1.00	4.00	2.50
LS 6164 R	1.00	1.00	3.00	2.67	5.00	1.00	2.28	1.00	1.67	1.00	1.00	1.00	1.00	3.00	1.38	5.00	2.00	3.50
PAN 1614 R	3.00	1.00	1.00	1.00	1.00	1.00	1.33	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.29	2.00	2.00	2.00
NS 6448 R	2.00	1.00	3.00	4.00	4.00	3.00	2.83	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.29	4.00	5.00	4.50
P64T39 R	2.00	1.00	1.00	2.33	1.00	1.00	1.39	1.00	1.00	2.00	1.00	1.00	1.00	1.00	1.14	1.00	1.00	1.00
DM 6.8i RR	2.00	1.00	1.00	2.67	1.00	1.00	1.44	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.29	1.00	2.00	1.50
6968 RSF	1.00	1.00	2.00	1.00	3.00	1.00	1.50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.50
NS 7211 R	2.00	1.00	2.00	4.00	5.00	1.00	2.50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	4.00	4.00	4.00
Gem/Mean	1.75	1.09	1.72	2.76	3.30	1.32	1.99	1.00	1.05	1.34	1.66	1.66	1.00	1.81	1.36	2.97	2.56	2.77

Tabel 13 Persentasie ongewenste sade van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2016/17
Table 13 Percentage undesirable seed of the different soybean cultivars at the different trial localities, 2016/17

Kultivar Cultivar	Koel/Cool							Matig/Moderate										Warm		
	Bethlehem	Clarens	Clocolan	Delmas	Kinross	Middelburg	Gem/Mean	Cedara	Dundee	Greytown	Greytown Kranskop	Kroonstad	Potchefstroom Besproei	Potchefstroom Droog	Stoffberg	Verkeerdevlei	Gem/Mean	Brits	Brits K2	Gem/Mean
LS 6240 R	0.00	0.20	0.43	0.40	1.14	0.30	0.41	0.00	2.50	0.60	0.80	0.60	0.37	0.65	0.60	0.60	0.75	0.60	0.30	0.45
PAN 1454 R	0.39	0.90	1.00	0.30	0.99	0.80	0.73	0.00	2.00	0.80	0.90	0.60	0.50	0.57	0.60	0.50	0.72	0.70	0.40	0.55
SSS 4945 (tuc)	0.14	0.20	0.87	0.40	0.80	0.10	0.42	0.30	1.10	0.30	0.40	0.50	0.81	0.35	0.60	0.60	0.55	1.20	0.20	0.70
LS 6146 R	0.27	0.40	0.35	0.50	1.78	0.40	0.62	0.40	0.50	0.30	0.50	2.00	1.45	1.05	0.80	1.40	0.93	0.60	1.20	0.90
PHB 94 Y 80 R	0.22	0.00	0.64	0.60	2.00	1.50	0.83	0.70	0.90	0.40	0.40	0.90	0.65	0.71	0.90	0.70	0.70	0.90	0.90	0.90
LS 6248 R	0.68	2.20	1.57	0.00	0.44	1.00	0.98	0.40	0.60	0.60	0.20	0.31	0.79	1.36	1.10	0.80	0.68	0.60	0.50	0.55
SSS 5449 (tuc)	0.24	0.90	1.07	0.00	0.11	0.10	0.40	0.00	0.80	0.10	0.20	0.60	0.00	1.38	0.80	0.30	0.46	0.90	0.20	0.55
PHB 95 Y 20 R	1.52	0.00	0.39	0.10	0.52	1.00	0.59	0.30	0.80	0.20	0.40	0.80	0.69	3.12	0.90	1.10	0.92	1.80	0.10	0.95
DM 5953 RSF	0.32	0.00	0.81	0.00	0.34	0.70	0.36	0.10	1.60	0.80	0.40	0.00	0.86	0.79	0.80	0.20	0.62	1.70	0.70	1.20
PAN 1532 R	1.22	0.10	0.27	0.00	1.19	0.50	0.55	0.00	0.20	0.00	0.50	0.00	0.22	0.33	0.40	1.30	0.33	0.50	0.30	0.40
SSS 5052 (tuc)	0.45	1.00	1.06	0.40	0.34	0.20	0.58	0.20	0.40	0.00	0.40	0.40	0.25	2.43	0.40	2.00	0.72	1.60	0.60	1.10
5609 RSF	0.84	0.40	0.07	0.00	0.40	1.00	0.45	0.30	0.50	0.40	0.10	0.31	0.11	0.61	0.40	0.20	0.33	0.80	0.20	0.50
PAN 1521 R	0.96	3.40	0.58	0.00	1.37	0.00	1.05	0.30	0.50	0.80	0.00	0.40	0.90	0.73	0.50	1.00	0.57	0.80	0.50	0.65
5302 RSF	0.74	1.60	0.60	0.00	0.62	0.70	0.71	0.20	0.00	0.00	0.30	0.40	0.10	0.27	0.60	0.90	0.31	0.80	0.60	0.70
LS 6261 R	0.58	0.60	1.20	0.00	0.80	0.70	0.65	0.50	0.00	0.40	0.30	0.40	0.35	1.32	1.00	0.90	0.57	1.80	0.90	1.35
SSS 5755 (tuc)	0.44	1.10	0.86	0.10	0.83	0.30	0.61	0.10	0.30	0.50	0.20	1.10	0.30	0.97	1.00	1.00	0.61	1.20	0.50	0.85
NS 5909 R	0.62	0.40	0.66	0.10	0.27	0.80	0.48	0.80	0.70	0.30	0.40	0.20	0.50	0.64	0.80	1.70	0.67	1.10	0.60	0.85
LDC 5,9	0.30	2.00	0.21	0.60	0.61	0.80	0.75	0.20	0.30	0.10	0.00	0.00	0.40	0.60	1.10	1.40	0.46	0.90	0.20	0.55
PHB 96 T 06 R	0.60	0.90	0.76	0.40	0.78	0.30	0.62	0.00	0.90	0.10	0.30	0.70	0.76	0.50	1.00	2.10	0.71	0.80	0.70	0.75
LDC 6.0	0.20	0.50	0.24	0.40	0.51	1.40	0.54	0.10	0.60	0.40	0.20	0.50	0.67	0.87	0.30	0.40	0.45	0.50	0.40	0.45
PAN 1623 R	0.79	1.90	0.50	0.30	0.30	1.10	0.82	0.60	0.40	0.30	0.20	0.10	0.31	1.36	0.60	2.30	0.69	0.80	0.60	0.70
LS 6161 R	0.29	1.30	0.52	0.00	0.12	0.20	0.41	0.60	0.30	0.40	0.10	0.10	0.09	1.37	0.40	0.90	0.47	0.90	0.70	0.80
P61T38 R	0.96	1.50	0.14	0.00	0.40	0.70	0.62	0.00	0.10	0.50	0.00	0.00	0.56	0.63	0.40	0.80	0.33	1.40	0.10	0.75
SSS 6560 (tuc)	0.32	1.30	0.81	0.20	0.20	0.50	0.56	0.00	0.10	0.50	0.00	0.00	0.46	0.66	0.40	2.10	0.47	1.50	1.00	1.25
6663 RSF	0.78	0.80	1.32	0.10	0.14	1.90	0.84	0.50	2.30	0.80	0.10	0.60	0.77	0.76	0.70	2.50	1.00	4.10	1.10	2.60
LS 6164 R	0.41	1.00	1.13	0.30	0.70	0.90	0.74	0.30	0.10	1.00	0.20	0.30	0.42	1.29	0.40	0.40	0.49	0.90	1.00	0.95
PAN 1614 R	0.30	1.50	0.60	0.50	0.37	0.20	0.58	0.40	0.40	0.20	0.20	0.20	0.45	0.20	0.50	3.40	0.66	1.50	0.80	1.15
NS 6448 R	0.18	1.20	0.41	0.20	0.56	0.70	0.54	0.60	0.80	0.90	0.10	0.20	0.26	0.37	0.60	1.80	0.63	4.40	1.10	2.75
P64T39 R	0.93	0.50	0.58	0.20	0.47	1.30	0.66	0.40	0.90	1.60	0.00	1.00	0.29	0.35	0.40	2.40	0.82	1.10	0.40	0.75
DM 6.8i RR	0.66	3.80	0.72	0.10	1.47	0.30	1.18	0.80	1.10	1.00	0.50	0.60	0.22	1.43	0.90	6.70	1.47	3.90	0.40	2.15
6968 RSF	0.99	0.50	0.99	0.20	1.80	1.00	0.91	0.50	1.30	0.60	0.00	0.60	0.82	1.93	1.00	1.60	0.93	2.30	0.60	1.45
NS 7211 R	0.58	1.10	0.62	0.40	0.60	0.70	0.67	0.50	0.50	0.80	0.50	0.90	0.47	0.86	0.70	1.20	0.71	2.10	1.50	1.80
Gem/Mean	0.56	1.04	0.69	0.21	0.72	0.69	0.65	0.32	0.73	0.49	0.28	0.48	0.49	0.95	0.68	1.41	0.65	1.40	0.60	1.00

Tabel 14 Massa van 100 sade (g) van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2016/17
Table 14 Mass 100 seeds (g) of the different soybean cultivars at the different trial localities, 2016/17

	Koel/Cool							Matig/Moderate										Warm		
Kultivar Cultivar	Bethlehem	Clarens	Clocolan	Delmas	Kinross	Middelburg	Gem/Mean	Cedara	Dundee	Greytown	Greytown Kranskop	Kroonstad	Potchefstroom Besproei	Potchefstroom Droog	Stoffberg	Verkeerdevlei	Gem/Mean	Brits	Brits K2	Gem/Mean
LS 6240 R	21.38	19.37	17.56	23.33	19.67	21.33	20.44	21.00	20.63	18.20	24.00	23.63	21.34	21.61	22.40	21.13	21.55	20.40	19.53	19.97
PAN 1454 R	19.29	17.07	14.19	16.53	17.93	20.40	17.57	20.20	19.00	17.35	19.00	19.17	17.98	18.76	17.90	17.23	18.51	17.27	18.73	18.00
SSS 4945 (tuc)	18.64	17.17	15.91	20.17	18.10	18.90	18.15	20.03	18.70	17.20	19.90	21.40	19.85	19.22	16.90	17.97	19.02	16.37	16.47	16.42
LS 6146 R	16.77	16.20	14.98	16.57	15.47	17.17	16.19	17.67	16.40	16.05	19.80	16.27	15.96	16.19	14.60	15.57	16.50	16.73	14.60	15.67
PHB 94 Y 80 R	18.46	16.73	15.01	18.17	17.23	18.33	17.32	18.70	17.70	16.80	19.80	18.70	19.19	17.23	19.40	18.23	18.42	18.13	16.80	17.47
LS 6248 R	15.44	13.67	14.67	14.03	16.01	16.56	15.06	15.13	13.37	13.45	18.50	16.43	18.23	17.82	18.60	13.33	16.10	16.20	15.77	15.98
SSS 5449 (tuc)	14.75	14.10	13.39	15.77	14.83	16.00	14.81	14.00	13.80	13.80	16.90	16.03	15.18	16.08	17.20	13.67	15.18	15.30	15.27	15.28
PHB 95 Y 20 R	15.51	14.80	14.59	16.17	16.90	17.73	15.95	16.10	15.73	13.35	17.80	16.97	17.97	19.28	17.40	14.73	16.59	16.73	14.73	15.73
DM 5953 RSF	18.89	16.37	16.62	19.50	16.94	18.27	17.76	16.97	14.93	15.75	20.00	17.83	17.01	14.91	16.30	15.53	16.58	16.17	16.73	16.45
PAN 1532 R	15.38	13.67	14.57	16.17	16.05	16.20	15.34	16.13	14.63	14.15	17.90	16.80	18.20	17.14	16.70	14.60	16.25	16.17	13.63	14.90
SSS 5052 (tuc)	14.99	13.93	13.10	15.03	14.40	15.23	14.45	14.47	13.70	13.55	15.60	14.80	16.58	18.37	19.60	14.03	15.63	16.37	14.17	15.27
5609 RSF	15.52	14.63	15.14	18.33	17.80	18.63	16.68	15.00	14.37	14.35	17.50	17.33	18.97	16.87	18.10	15.80	16.48	17.37	16.80	17.08
PAN 1521 R	18.52	14.07	16.57	16.77	17.92	17.83	16.95	16.47	14.23	14.20	16.20	19.23	21.96	18.40	18.50	15.20	17.15	20.17	18.60	19.38
5302 RSF	17.79	14.93	17.08	16.77	18.89	19.33	17.47	15.73	15.40	14.20	19.00	19.33	19.79	17.96	18.00	16.93	17.37	18.37	17.60	17.98
LS 6261 R	16.49	13.90	15.62	17.00	18.23	18.63	16.65	17.40	14.20	17.90	18.60	17.07	17.46	18.63	18.80	14.50	17.17	17.20	15.50	16.35
SSS 5755 (tuc)	14.90	13.80	14.51	14.60	17.01	17.50	15.39	15.17	14.43	14.50	18.40	17.97	17.75	18.30	16.80	14.57	16.43	17.27	14.90	16.08
NS 5909 R	16.48	14.03	14.88	15.70	17.02	16.87	15.83	15.73	15.03	15.25	17.70	16.73	18.54	19.41	19.20	14.73	16.93	15.88	15.87	15.87
LDC 5,9	19.56	15.33	16.84	17.60	19.13	19.20	17.94	16.37	16.73	16.30	21.80	20.30	23.23	19.96	21.50	15.93	19.12	18.70	19.67	19.18
PHB 96 T 06 R	14.95	13.63	14.17	16.27	15.31	17.27	15.27	16.77	15.33	15.10	17.90	15.97	18.90	16.96	17.30	14.63	16.54	17.13	14.83	15.98
LDC 6.0	16.12	14.40	14.58	15.53	16.93	17.83	15.90	14.13	14.95	14.70	16.60	16.07	18.26	18.27	17.00	14.67	16.07	17.50	15.03	16.27
PAN 1623 R	15.10	13.50	14.78	15.27	15.23	15.60	14.91	15.03	13.50	14.25	16.60	17.07	17.99	17.83	18.10	13.87	16.03	15.17	15.03	15.10
LS 6161 R	14.24	14.27	13.89	15.47	15.73	14.97	14.76	16.33	14.20	13.00	17.80	15.40	15.89	16.92	19.70	14.37	15.96	15.67	13.93	14.80
P61T38 R	15.42	14.37	15.74	16.60	16.97	17.13	16.04	16.03	15.13	14.70	18.10	17.03	18.64	18.51	18.20	13.77	16.68	16.40	14.43	15.42
SSS 6560 (tuc)	15.38	14.20	13.80	15.13	15.30	16.63	15.08	15.47	14.13	13.20	16.10	16.87	17.99	16.89	17.50	13.73	15.76	17.93	16.17	17.05
6663 RSF	16.56	14.40	15.51	17.17	17.22	18.36	16.54	17.60	15.53	15.65	18.60	18.30	17.48	18.91	19.90	14.83	17.42	18.73	13.90	16.32
LS 6164 R	16.44	15.17	14.60	16.03	17.57	18.00	16.30	17.00	14.87	15.15	20.90	17.33	18.75	18.19	20.70	15.00	17.54	16.30	17.00	16.65
PAN 1614 R	15.52	14.17	15.55	15.70	16.85	15.60	15.56	14.80	13.90	14.85	17.30	16.67	18.62	16.89	18.00	13.60	16.07	16.53	15.63	16.08
NS 6448 R	15.35	13.57	15.21	15.33	16.30	17.90	15.61	15.50	13.57	13.95	18.30	18.70	18.28	18.22	18.80	15.97	16.81	16.63	13.33	14.98
P64T39 R	17.32	14.73	14.89	15.57	17.38	16.83	16.12	16.03	14.43	14.25	18.90	16.67	20.83	17.60	17.90	14.60	16.80	17.40	16.33	16.87
DM 6.8i RR	16.36	14.30	16.75	15.53	17.55	17.97	16.41	16.16	15.60	13.70	20.00	17.27	20.66	19.67	19.60	13.60	17.36	19.23	16.50	17.87
6968 RSF	17.39	14.67	16.34	17.10	17.23	18.83	16.93	17.97	16.60	15.90	20.10	18.77	20.05	20.51	21.70	15.37	18.55	21.17	15.93	18.55
NS 7211 R	16.79	13.53	16.24	16.07	16.33	20.20	16.53	15.77	14.97	15.35	20.10	17.60	18.68	19.26	20.10	15.13	17.44	18.73	14.67	16.70
Gem/Mean	16.62	14.77	15.23	16.59	16.92	17.73	16.31	16.46	15.30	15.00	18.62	17.68	18.63	18.15	18.51	15.21	17.06	17.35	15.88	16.62

Tabel 15 Oliepersentasie op vogvrye basis van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2016/17
Table 15 Oil percentage on moisture free basis of the different soybean cultivars at the different trial localities, 2016/17

Kultivar Cultivar	Koel/Cool						Matig/Moderate									Warm		
	Bethlehem	Clarens	Delmas	Kinross	Middelburg	Gem/Mean	Cedara	Dundee	Greytown	Greytown Kranskop	Kroonstad	Potchefstroom Droog	Stoffberg	Verkeerdevlei	Gem/Mean	Brits	Brits K2	Gem/Mean
LS 6240 R	14.22	12.28	12.46	14.49	13.91	13.47	12.89	12.90	15.32	13.91	13.74	12.43	13.73	11.88	13.35	11.36	14.43	12.90
PAN 1454 R	13.03	12.20	12.26	14.40	14.96	13.37	11.12	15.07	15.12	11.90	11.19	11.38	13.59	12.74	12.76	11.20	15.69	13.45
SSS 4945 (tuc)	14.21	11.15	9.81	12.89	13.65	12.34	14.22	12.86	13.51	13.86	13.32	9.91	11.62	14.00	12.91	12.13	12.56	12.35
LS 6146 R	10.98	12.32	8.62	13.94	11.52	11.48	11.11	13.18	12.48	12.03	8.70	10.56	11.78	8.43	11.03	10.92	10.88	10.90
PHB 94 Y 80 R	15.82	12.76	13.29	14.43	15.57	14.37	13.67	14.46	15.84	14.38	9.39	11.87	13.89	13.50	13.38	8.23	15.33	11.78
LS 6248 R	13.54	13.28	10.14	11.51	14.13	12.52	14.69	13.69	14.08	14.81	12.70	12.06	13.94	12.82	13.60	12.54	15.00	13.77
SSS 5449 (tuc)	14.14	14.62	10.16	13.26	14.55	13.35	11.34	13.45	14.25	12.52	12.31	11.46	11.44	12.08	12.36	11.16	14.74	12.95
PHB 95 Y 20 R	15.42	14.94	15.36	13.93	16.48	15.23	15.94	15.62	15.66	14.12	13.65	13.00	14.39	14.99	14.67	11.90	14.99	13.45
DM 5953 RSF	12.53	11.70	12.51	11.62	12.61	12.19	9.95	11.27	13.30	12.84	12.67	10.71	9.67	12.58	11.62	9.09	14.23	11.66
PAN 1532 R	12.87	13.59	8.77	14.51	13.18	12.58	12.78	12.35	12.96	12.87	10.82	11.40	10.71	16.81	12.59	12.51	16.29	14.40
SSS 5052 (tuc)	13.15	14.69	14.91	12.71	13.92	13.88	13.95	13.65	13.64	10.76	7.99	11.97	11.49	12.19	11.96	11.72	14.57	13.15
5609 RSF	11.11	14.35	11.31	12.11	15.01	12.78	13.74	12.74	14.08	9.78	12.94	7.42	11.50	11.41	11.70	11.65	13.41	12.53
PAN 1521 R	13.34	13.85	12.78	12.90	13.96	13.37	14.21	12.59	15.00	12.94	13.58	10.43	11.87	12.47	12.89	11.89	14.76	13.33
5302 RSF	14.95	16.05	15.53	14.45	17.64	15.72	15.60	14.78	16.00	14.54	15.18	10.89	13.37	13.64	14.25	14.47	15.84	15.16
LS 6261 R	12.64	14.33	12.86	14.33	13.18	13.47	15.07	13.18	12.92	13.11	13.07	15.52	13.37	10.50	13.34	11.45	15.30	13.38
SSS 5755 (tuc)	12.52	13.39	7.10	13.84	14.36	12.24	12.83	13.08	13.95	11.54	12.17	8.53	11.76	12.03	11.99	12.54	15.46	14.00
NS 5909 R	13.57	13.26	12.52	13.56	15.52	13.69	13.70	11.33	14.76	13.64	7.09	11.39	14.79	14.78	12.69	11.33	16.46	13.90
LDC 5,9	14.18	13.57	12.70	15.27	14.95	14.13	15.19	14.12	13.57	13.30	12.17	10.40	12.51	14.37	13.20	11.11	14.55	12.83
PHB 96 T 06 R	13.45	11.60	12.05	12.37	12.63	12.42	14.44	9.49	13.58	13.16	7.23	8.69	11.63	14.62	11.61	13.63	17.65	15.64
LDC 6.0	15.62	15.18	14.08	14.15	17.96	15.40	15.32	15.16	13.39	12.72	12.79	10.36	12.33	12.71	13.10	14.83	15.18	15.01
PAN 1623 R	14.64	14.11	14.30	14.21	15.25	14.50	15.94	13.46	16.04	13.69	11.98	12.41	14.50	16.91	14.37	13.30	14.91	14.11
LS 6161 R	14.40	12.89	12.54	12.34	12.60	12.95	12.79	11.99	14.36	12.20	10.01	11.29	12.72	12.88	12.28	14.01	17.04	15.53
P61T38 R	14.06	14.01	13.64	13.33	15.45	14.10	16.24	13.07	16.12	14.18	11.31	11.67	13.57	14.14	13.79	14.93	15.22	15.08
SSS 6560 (tuc)	14.05	13.57	9.41	13.37	14.72	13.02	15.43	11.64	15.76	13.11	11.14	9.88	11.30	14.55	12.85	13.32	16.53	14.93
6663 RSF	13.42	14.57	13.42	13.59	16.99	14.40	14.41	14.40	12.80	12.84	11.35	11.57	13.53	15.12	13.25	15.34	16.66	16.00
LS 6164 R	13.58	13.93	14.57	12.94	15.14	14.03	13.58	13.25	15.07	13.62	9.52	11.97	13.71	13.14	12.98	13.74	16.68	15.21
PAN 1614 R	15.55	14.90	15.59	13.65	15.54	15.05	14.63	15.50	13.78	12.78	9.15	12.68	13.23	16.53	13.54	12.83	15.58	14.21
NS 6448 R	12.78	14.05	13.62	14.01	14.65	13.82	12.85	13.54	16.80	12.79	12.75	9.49	11.75	13.63	12.95	14.98	17.51	16.25
P64T39 R	14.88	14.34	10.23	14.13	15.28	13.77	13.74	14.97	16.40	11.93	13.58	9.73	11.91	14.39	13.33	12.56	15.82	14.19
DM 6.8i RR	13.18	13.45	8.34	13.42	11.82	12.04	10.03	13.11	14.86	12.55	10.43	11.07	12.09	14.65	12.35	13.14	12.93	13.04
6968 RSF	16.17	13.21	9.24	15.44	16.49	14.11	12.49	14.88	16.36	13.32	13.51	13.75	14.62	14.81	14.22	12.59	16.93	14.76
NS 7211 R	13.66	14.35	14.43	13.00	16.85	14.46	15.20	15.73	15.75	12.84	11.54	10.41	14.03	13.25	13.59	14.41	17.03	15.72
Gem/Mean	13.80	13.64	12.14	13.57	14.70	13.57	13.72	13.45	14.61	12.96	11.53	11.13	12.70	13.52	12.95	12.53	15.32	13.92

Tabel 16 Ru-proteïenpersentasie op vogvrye basis van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2016/17
Table 16 Percentage crude protein on moisture free basis of the different soybean cultivars at the different trial localities, 2016/17

	Koel/Cool						Matig/Moderate									Warm		
Kultivar Cultivar	Bethlehem	Clarens	Delmas	Kinross	Middelburg	Gem/Mean	Cedara	Dundee	Greytown	Greytown Kranskop	Kroonstad	Potchefstroom Droog	Stoffberg	Verkeerdevlei	Gem/Mean	Brits	Brits K2	Gem/Mean
LS 6240 R	34.31	33.28	33.64	34.20	34.17	33.92	34.66	34.42	34.05	34.50	34.83	35.32	35.34	34.91	34.75	36.14	35.19	35.67
PAN 1454 R	34.43	32.64	33.21	33.27	33.35	33.38	34.81	32.65	34.21	35.03	35.63	35.81	35.75	34.25	34.77	36.61	34.31	35.46
SSS 4945 (tuc)	35.42	33.95	36.05	34.82	35.10	35.07	34.78	35.58	34.69	34.90	35.19	36.30	35.90	35.15	35.31	36.92	35.70	36.31
LS 6146 R	36.58	32.85	35.91	34.03	34.36	34.75	35.51	34.93	35.05	35.59	36.64	35.98	35.20	37.08	35.75	37.08	36.39	36.74
PHB 94 Y 80 R	34.19	32.70	33.01	33.63	33.40	33.39	34.27	33.50	33.65	34.37	35.90	35.56	34.95	33.40	34.45	38.27	34.47	36.37
LS 6248 R	34.12	30.72	33.52	33.29	32.76	32.88	33.79	34.18	34.37	33.81	34.24	34.99	33.58	33.09	34.01	36.46	34.67	35.57
SSS 5449 (tuc)	35.06	31.67	34.43	34.10	33.91	33.83	35.31	34.75	34.71	35.60	34.97	35.62	36.15	34.63	35.22	37.35	35.43	36.39
PHB 95 Y 20 R	32.93	30.63	32.02	32.86	32.71	32.23	33.30	33.45	33.09	33.97	34.19	34.82	33.55	32.22	33.57	36.10	34.65	35.38
DM 5953 RSF	34.67	32.87	33.75	34.72	33.76	33.95	36.52	34.54	34.34	34.75	35.20	34.99	37.10	34.17	35.20	36.82	34.73	35.78
PAN 1532 R	34.49	32.17	35.51	32.47	34.65	33.86	34.70	35.50	35.15	35.13	36.09	36.76	36.47	31.78	35.20	36.34	33.14	34.74
SSS 5052 (tuc)	34.46	31.85	32.68	34.41	34.17	33.51	33.92	34.87	34.58	35.96	36.16	35.86	35.54	33.55	35.06	36.78	34.36	35.57
5609 RSF	34.83	30.97	32.75	33.30	32.84	32.94	33.92	34.65	34.87	36.64	34.22	36.39	34.49	33.69	34.86	36.84	35.37	36.11
PAN 1521 R	32.92	30.75	32.69	32.98	32.89	32.45	33.82	33.99	33.55	34.43	33.76	35.41	33.90	32.62	33.94	35.42	34.59	35.01
5302 RSF	33.42	31.42	32.41	33.00	32.39	32.53	33.33	33.65	33.12	33.85	35.59	35.58	35.26	33.38	34.22	35.80	34.49	35.15
LS 6261 R	34.10	31.68	33.21	32.20	34.10	33.06	34.85	34.77	34.97	35.07	35.05	34.09	34.20	34.09	34.64	36.53	34.20	35.37
SSS 5755 (tuc)	33.11	31.60	34.73	31.98	32.74	32.83	34.81	33.34	34.17	34.53	33.93	35.42	34.20	33.50	34.24	35.63	33.47	34.55
NS 5909 R	34.05	31.92	34.27	33.58	33.25	33.41	35.57	35.98	34.84	34.87	36.56	36.52	34.89	32.72	35.24	37.45	34.42	35.94
LDC 5,9	33.28	31.54	33.11	31.88	33.40	32.64	33.95	33.81	34.52	35.42	34.85	35.26	34.65	33.08	34.44	36.20	34.32	35.26
PHB 96 T 06 R	34.76	32.27	34.03	34.76	34.72	34.11	34.96	36.61	35.06	34.92	36.83	36.49	35.56	32.46	35.36	36.25	32.07	34.16
LDC 6.0	32.52	30.00	32.65	32.41	31.13	31.74	33.89	33.10	34.23	34.18	33.69	35.39	34.83	34.01	34.17	35.22	34.35	34.79
PAN 1623 R	34.28	32.04	32.98	33.41	33.56	33.25	34.91	34.77	34.33	35.28	35.33	35.42	33.86	32.21	34.51	36.42	34.48	35.45
LS 6161 R	33.23	32.25	33.29	33.81	34.40	33.40	35.22	34.49	34.02	35.42	35.67	35.21	34.54	33.40	34.75	35.68	32.58	34.13
P61T38 R	34.18	31.70	33.88	33.53	33.11	33.28	34.43	34.80	34.05	34.20	35.73	35.23	34.50	32.58	34.44	34.87	34.62	34.75
SSS 6560 (tuc)	33.32	31.63	35.32	33.26	32.91	33.29	33.79	34.62	33.50	34.38	34.65	35.35	34.92	32.44	34.21	35.09	33.88	34.49
6663 RSF	33.56	31.57	32.21	32.65	31.76	32.35	32.48	32.48	34.77	33.89	34.43	34.26	34.53	32.00	33.61	32.64	32.18	32.41
LS 6164 R	34.50	31.56	31.67	33.01	32.89	32.73	35.24	34.81	33.86	34.21	36.09	35.90	34.08	33.90	34.76	35.26	33.13	34.20
PAN 1614 R	33.26	31.59	33.06	33.32	33.06	32.86	34.52	33.41	34.08	34.68	35.71	35.47	34.60	29.72	34.02	32.83	33.81	33.32
NS 6448 R	34.68	32.13	33.86	33.73	34.34	33.75	35.32	34.59	33.35	35.43	35.02	36.73	35.35	33.02	34.85	34.20	33.40	33.80
P64T39 R	32.99	31.23	34.89	32.75	32.26	32.82	34.55	33.03	33.33	35.09	34.12	35.80	35.15	33.15	34.28	34.86	34.05	34.45
DM 6.8i RR	32.94	31.52	34.19	31.38	33.17	32.64	34.90	32.90	33.12	33.78	33.99	33.74	33.57	30.76	33.35	34.03	34.60	34.32
6968 RSF	32.33	31.91	34.65	32.08	31.78	32.55	34.79	33.67	33.03	34.13	33.87	33.11	33.90	31.90	33.55	35.47	33.98	34.73
NS 7211 R	33.12	30.49	31.69	32.43	31.19	31.78	33.61	33.25	33.05	33.76	34.04	35.21	33.87	31.98	33.60	34.67	32.49	33.58
Gem/Mean	33.94	31.78	33.60	33.23	33.26	33.16	34.51	34.22	34.12	34.74	35.07	35.44	34.82	33.15	34.51	35.82	34.17	35.00

Tabel 17 Gemiddelde van die olie-en proteïen persentasie saamgevoeg (Protolie), 2016/17
Table 17 Average of the oil and protein percentage joined (Profat), 2016/17

Kultivar Cultivar	Koel/Cool						Matig/Moderate									Warm		
	Bethlehem	Clarens	Delmas	Kinross	Middelburg	Gem/Mean	Cedara	Dundee	Greytown	Greytown Kranskop	Kroonstad	Potchefstroom Droog	Stoffberg	Verkeerdevlei	Gem/Mean	Brits	Brits K2	Gem/Mean
LS 6240 R	48.53	45.56	46.10	48.69	48.08	47.39	47.55	47.32	49.37	48.41	48.57	47.75	49.07	46.79	48.10	47.50	49.62	48.56
PAN 1454 R	47.46	44.84	45.47	47.67	48.31	46.75	45.93	47.72	49.33	46.93	46.82	47.19	49.34	46.99	47.53	47.81	50.00	48.91
SSS 4945 (tuc)	49.63	45.10	45.86	47.71	48.75	47.41	49.00	48.44	48.20	48.76	48.51	46.21	47.52	49.15	48.22	49.05	48.26	48.66
LS 6146 R	47.56	45.17	44.53	47.97	45.88	46.22	46.62	48.11	47.53	47.62	45.34	46.54	46.98	45.51	46.78	48.00	47.27	47.64
PHB 94 Y 80 R	50.01	45.46	46.30	48.06	48.97	47.76	47.94	47.96	49.49	48.75	45.29	47.43	48.84	46.90	47.83	46.50	49.80	48.15
LS 6248 R	47.66	44.00	43.66	44.80	46.89	45.40	48.48	47.87	48.45	48.62	46.94	47.05	47.52	45.91	47.61	49.00	49.67	49.34
SSS 5449 (tuc)	49.20	46.29	44.59	47.36	48.46	47.18	46.65	48.20	48.96	48.12	47.28	47.08	47.59	46.71	47.57	48.51	50.17	49.34
PHB 95 Y 20 R	48.35	45.57	47.38	46.79	49.19	47.46	49.24	49.07	48.75	48.09	47.84	47.82	47.94	47.21	48.25	48.00	49.64	48.82
DM 5953 RSF	47.20	44.57	46.26	46.34	46.37	46.15	46.47	45.81	47.64	47.59	47.87	45.70	46.77	46.75	46.83	45.91	48.96	47.44
PAN 1532 R	47.36	45.76	44.28	46.98	47.83	46.44	47.48	47.85	48.11	48.00	46.91	48.16	47.18	48.59	47.79	48.85	49.43	49.14
SSS 5052 (tuc)	47.61	46.54	47.59	47.12	48.09	47.39	47.87	48.52	48.22	46.72	44.15	47.83	47.03	45.74	47.01	48.50	48.93	48.72
5609 RSF	45.94	45.32	44.06	45.41	47.85	45.72	47.66	47.39	48.95	46.42	47.16	43.81	45.99	45.10	46.56	48.49	48.78	48.64
PAN 1521 R	46.26	44.60	45.47	45.88	46.85	45.81	48.03	46.58	48.55	47.37	47.34	45.84	45.77	45.09	46.82	47.31	49.35	48.33
5302 RSF	48.37	47.47	47.94	47.45	50.03	48.25	48.93	48.43	49.12	48.39	50.77	46.47	48.63	47.02	48.47	50.27	50.33	50.30
LS 6261 R	46.74	46.01	46.07	46.53	47.28	46.53	49.92	47.95	47.89	48.18	48.12	49.61	47.57	44.59	47.98	47.98	49.50	48.74
SSS 5755 (tuc)	45.63	44.99	41.83	45.82	47.10	45.07	47.64	46.42	48.12	46.07	46.10	43.95	45.96	45.53	46.22	48.17	48.93	48.55
NS 5909 R	47.62	45.18	46.79	47.14	48.77	47.10	49.27	47.31	49.60	48.51	43.65	47.91	49.68	47.50	47.93	48.78	50.88	49.83
LDC 5,9	47.46	45.11	45.81	47.15	48.35	46.78	49.14	47.93	48.09	48.72	47.02	45.66	47.16	47.45	47.65	47.31	48.87	48.09
PHB 96 T 06 R	48.21	43.87	46.08	47.13	47.35	46.53	49.40	46.10	48.64	48.08	44.06	45.18	47.19	47.08	46.97	49.88	49.72	49.80
LDC 6.0	48.14	45.18	46.73	46.56	49.09	47.14	49.21	48.26	47.62	46.90	46.48	45.75	47.16	46.72	47.26	50.05	49.53	49.79
PAN 1623 R	48.92	46.15	47.28	47.62	48.81	47.76	50.85	48.23	50.37	48.97	47.31	47.83	48.36	49.12	48.88	49.72	49.39	49.56
LS 6161 R	47.63	45.14	45.83	46.15	47.00	46.35	48.01	46.48	48.38	47.62	45.68	46.50	47.26	46.28	47.03	49.69	49.62	49.66
P61T38 R	48.24	45.71	47.52	46.86	48.56	47.38	50.67	47.87	50.17	48.38	47.04	46.90	48.07	46.72	48.23	49.80	49.84	49.82
SSS 6560 (tuc)	47.37	45.20	44.73	46.63	47.63	46.31	49.22	46.26	49.26	47.49	45.79	45.23	46.22	46.99	47.06	48.41	50.41	49.41
6663 RSF	46.98	46.14	45.63	46.24	48.75	46.75	46.89	46.88	47.57	46.73	45.78	45.83	48.06	47.12	46.86	47.98	48.84	48.41
LS 6164 R	48.08	45.49	46.24	45.95	48.03	46.76	48.82	48.06	48.93	47.83	45.61	47.87	47.79	47.04	47.74	49.00	49.81	49.41
PAN 1614 R	48.81	46.49	48.65	46.97	48.60	47.90	49.15	48.91	47.86	47.46	44.86	48.15	47.83	46.25	47.56	45.66	49.39	47.53
NS 6448 R	47.46	46.18	47.48	47.74	48.99	47.57	48.17	48.13	50.15	48.22	47.77	46.22	47.10	46.65	47.80	49.18	50.91	50.05
P64T39 R	47.87	45.57	45.12	46.88	47.54	46.60	48.29	48.00	49.73	47.02	47.70	45.53	47.06	47.54	47.61	47.42	49.87	48.64
DM 6.8i RR	46.12	44.97	42.53	44.80	44.99	44.68	44.93	46.01	47.98	46.33	44.42	44.81	45.66	45.41	45.69	47.17	47.53	47.35
6968 RSF	48.50	45.12	43.89	47.52	48.27	46.66	47.28	48.55	49.39	47.45	47.38	46.86	48.52	46.71	47.77	48.06	50.91	49.49
NS 7211 R	46.78	44.84	46.12	45.43	48.04	46.24	48.81	48.98	48.80	46.60	45.58	45.62	47.90	45.23	47.19	49.08	49.52	49.30
Gem/Mean	47.74	45.42	45.74	46.79	47.96	46.73	48.24	47.68	48.73	47.70	46.60	46.57	47.52	46.67	47.46	48.34	49.49	48.92

Tabel 18 Die saadopbrengs van elke kultivar by die verskillende lokaliteite, 2016/17
Table 18 The The seed yield of the cultivars at the different localities, 2016/17

Kultivar Cultivar	Koel/Cool							Matig/Moderate										Warm		
	Bethlehem	Clarens	Clocolan	Delmas	Kinross	Middelburg	Gem/Mean	Cedara	Dundee	Greytown	Greytown Kranskop	Kroonstad	Potchefstroom Besproei	Potchefstroom Droog	Stoffberg	Verkeerdevlei	Gem/Mean	Brits	Brits K2	Gem/Mean
LS 6240 R	2617	2371	2792	3978	3435	2928	3020	4536	3368	3044	3573	3577	3601	2776	1403	2624	3167	1551	2416	1984
PAN 1454 R	2830	2877	2161	2703	3363	2838	2795	4255	2886	2956	3148	3021	2954	2618	1912	2566	2924	1673	2578	2125
SSS 4945 (tuc)	3261	3100	2966	3323	4694	3337	3447	4441	3474	2677	3140	3965	3706	3297	1695	2981	3264	2064	2687	2375
LS 6146 R	2675	3115	3343	3506	2143	2834	2936	3999	2949	3367	3424	3645	2752	2976	1507	2650	3030	1722	2483	2103
PHB 94 Y 80 R	3184	3787	2795	3283	2885	3218	3192	4274	3091	3521	2980	2984	3384	3037	1738	2575	3065	1766	2717	2241
LS 6248 R	3900	2713	2508	3152	3640	2360	3046	4268	2944	3031	3365	3074	3791	2881	3212	2414	3220	1524	2861	2193
SSS 5449 (tuc)	4081	2856	2500	3611	3598	2465	3185	4083	2627	3676	3214	3756	3623	2949	2239	2287	3162	1938	2220	2079
PHB 95 Y 20 R	2855	2347	2110	3368	3445	2929	2842	4050	3206	2652	3409	3356	3392	2633	3003	2160	3096	2431	2551	2491
DM 5953 RSF	4684	3602	3413	4522	5430	3090	4123	4672	3432	3519	4102	4182	3636	3172	2195	2852	3529	2921	3668	3294
PAN 1532 R	3782	2589	2701	3897	3283	2699	3159	3990	3331	3144	3180	3687	4221	3289	2935	2068	3316	1910	1895	1902
SSS 5052 (tuc)	3305	2372	2635	3342	3666	2376	2949	3859	3029	2853	2647	4198	3274	3294	3262	2307	3191	1871	2601	2236
5609 RSF	3984	2748	3028	3756	3773	2825	3352	4594	2942	2745	3764	4056	4043	2666	3871	1406	3343	2174	2846	2510
PAN 1521 R	4387	2506	3294	3765	4159	3083	3533	4323	3274	3291	3739	4530	4537	3927	3653	2860	3793	3654	4176	3915
5302 RSF	4037	2555	3480	3766	4251	2570	3443	4509	2700	3421	3518	3857	3743	3018	2963	2520	3361	2649	3095	2872
LS 6261 R	3466	2121	3344	3481	3449	2944	3134	3793	3020	4676	3322	4024	3308	2814	3081	2737	3419	1738	2637	2187
SSS 5755 (tuc)	3173	2564	2242	3546	3435	2655	2936	3928	2847	2958	3017	4093	2844	3188	2845	1844	3063	1652	2008	1830
NS 5909 R	3731	2465	2593	3517	4136	3480	3320	3866	2834	3222	4015	3966	3714	3311	3702	1799	3381	2052	2419	2236
LDC 5,9	4079	2035	2633	3792	3781	2988	3218	4473	2947	3138	4216	3983	3503	3628	3447	2747	3565	2936	3413	3174
PHB 96 T 06 R	2688	2319	1907	3764	3221	2807	2784	4298	2833	3535	3628	3471	3510	3854	3256	1753	3349	2352	2159	2256
LDC 6.0	3107	584	1930	3752	3580	2414	2561	4197	2640	2204	3380	4233	3586	3057	1989	2199	3054	1431	1906	1669
PAN 1623 R	3727	2480	3056	3617	3636	3112	3271	3975	3122	3565	2838	3726	3242	3530	3970	2252	3358	2364	2896	2630
LS 6161 R	2928	2072	2792	4147	3195	2889	3004	4230	3180	3161	3043	3672	3541	3783	3020	2367	3333	2203	2448	2326
P61T38 R	3341	2402	2876	4171	3917	2616	3220	4130	3172	2888	4269	3809	3151	3248	3915	1916	3389	2419	2732	2576
SSS 6560 (tuc)	3073	2494	2251	3460	3538	2968	2964	3803	3028	2799	4051	3678	3096	2864	3343	1684	3150	2328	2188	2258
6663 RSF	3875	1633	2254	2834	3646	2561	2800	3997	2909	2726	2928	3970	2313	2294	4069	1449	2962	1842	1947	1895
LS 6164 R	3416	2662	1806	2793	3976	2933	2931	4003	2302	3110	3654	3394	3050	3589	2964	2253	3147	1885	2400	2142
PAN 1614 R	3282	2302	3205	3207	3674	2621	3048	3734	2680	2845	3648	3806	3243	3353	2989	1651	3106	1891	2260	2075
NS 6448 R	3460	2988	3028	3894	3084	2910	3227	3846	2976	3341	3644	4281	3430	3860	2767	1543	3299	1926	2019	1973
P64T39 R	3581	2447	2867	3858	5095	3283	3522	3883	2949	3234	4049	4230	4238	3955	3830	2195	3618	4226	2825	3526
DM 6.8i RR	3391	2994	2327	3357	3774	2744	3098	4443	2973	3190	4146	3317	3305	2956	4735	1339	3378	2565	2688	2626
6968 RSF	3186	1537	2818	2836	2921	3205	2751	3956	2926	2546	3855	3702	3111	2595	3919	1604	3135	2645	2080	2362
NS 7211 R	2982	2776	2855	3710	4136	2716	3196	4161	2504	2708	3838	3860	2939	3618	3777	1651	3228	2297	2591	2444
Gem/Mean	3440	2513	2703	3553	3686	2856	3125	4143	2972	3117	3523	3784	3431	3188	3038	2164	3262	2206	2575	2391
CV	9.7	10.3	17.1	15.6	13.7	14.8		9.3	14.4	9.5	12.1	12.5	17.6	12.2	4.6	21.0		16.2	16.5	

Tabel 19 Opbrengswaarskynlikheid (%) van kultivars geëvalueer in 2014/15, 2015/16 en 2016/17 vir die koeler droëland produksiegebiede by verskillende opbrengspotensiaal
Table 19 Yield probability (%) of cultivars evaluated in 2014/15, 2015/16 and 2016/17 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
PAN1454R	56	53	49	46	42	39	35	33
LS6146R	71	65	57	48	38	30	24	19
LS6248R	47	49	52	55	57	60	62	64
PHB95Y20R	13	11	10	10	10	10	11	12
LS6164R	48	43	38	34	29	26	23	21
LS6161R	50	46	41	36	31	28	25	23
LS6261R	48	47	45	44	42	41	39	39
PAN1614R	26	27	29	32	34	38	41	45
LS6240R	54	54	53	52	52	51	50	49
PHB94Y80R	58	60	61	63	64	65	65	65
PAN1521R	54	58	63	68	72	75	78	80
PHB96T06R	55	49	43	37	31	26	22	19
PAN1623R	79	76	71	65	57	50	42	37
DM5953RSF	51	64	76	86	92	96	98	99
NS5909R	18	26	35	47	59	71	79	86
NS6448R	43	46	50	54	59	63	66	68
DM6.8iRR	53	49	45	41	37	33	30	28
NS7211R	40	40	40	41	41	42	43	44

Tabel 20 Saadopbrengs (kg/ha^{-1}) van kultivars gedurende die 2015/16 en 2016/17 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 2015/16 and 2016/17 growing season for the various localities situated in the cooler production areas

Kultivar Cultivar	2015/16						2016/17						
	Bethlehem	Clarens	Delmas	Kinross	kokstad	Gem/Mean	Bethlehem	Clarens	Clocolan	Delmas	Kinross	Middelburg	Gem/Mean
LS 6240 R	2257	1677	3937	2020	2270	2432	2617	2371	2792	3978	3435	2928	3020
PAN 1454 R	2394	1503	3979	2064	2146	2417	2830	2877	2161	2703	3363	2838	2795
SSS 4945 (tuc)	2506	1653	3836	2208	1805	2402	3261	3100	2966	3323	4694	3337	3447
LS 6146 R	2214	1787	3613	1895	1564	2215	2675	3115	3343	3506	2143	2834	2936
PHB 94 Y 80 R	2822	2408	4598	2396	1658	2776	3184	3787	2795	3283	2885	3218	3192
LS 6248 R	3639	1963	4790	1724	2430	2909	3900	2713	2508	3152	3640	2360	3046
SSS 5449 (tuc)	3470	1409	4165	1993	2375	2682	4081	2856	2500	3611	3598	2465	3185
NS 5009 R	3211	2184	4298	1721	1739	2631	-	-	-	-	-	-	-
DM 5.1i RR	2251	1821	3805	1361	1759	2199	-	-	-	-	-	-	-
PHB 95 Y 20 R	2137	1411	3830	1668	2222	2254	2855	2347	2110	3368	3445	2929	2842
DM 5953 RSF	2877	1827	4590	1888	2210	2678	4684	3602	3413	4522	5430	3090	4123
SSS 5052 (tuc)	2802	1230	3810	2120	2230	2438	3305	2372	2635	3342	3666	2376	2949
PAN 1521 R	3927	1488	4250	2080	3090	2967	4387	2506	3294	3765	4159	3083	3533
PAN 1500 R	3301	1629	3955	1990	2876	2750	-	-	-	-		-	-
NS 5909 R	3013	1569	4771	2281	2460	2819	3731	2465	2593	3517	4136	3480	3320
LS 6261 R	3433	1760	4198	2170	2471	2806	3466	2121	3344	3481	3449	2944	3134
PHB 96 T 06 R	3105	2065	3869	2475	2679	2839	2688	2319	1907	3764	3221	2807	2784
PAN 1623 R	3605	1446	3645	2037	2722	2691	3727	2480	3056	3617	3636	3112	3271
LS 6161 R	2956	1729	3701	2110	2982	2696	2928	2072	2792	4147	3195	2889	3004
DM 6.2i RR	2543	1469	4369	1926	1956	2453	-	-	-	-	-	-	-
SSS 6560 (tuc)	3597	1536	3956	2119	2068	2655	3073	2494	2251	3460	3538	2968	2964
LS 6164 R	2672	2023	3883	2101	2700	2676	3416	2662	1806	2793	3976	2933	2931
PAN 1614 R	2931	1722	3217	1883	2107	2372	3282	2302	3205	3207	3674	2621	3048
NS 6448 R	3021	1790	4579	2555	2503	2890	3460	2988	3028	3894	3084	2910	3227
DM 6.8i RR	2529	1407	3420	2230	2446	2407	3391	2994	2327	3357	3774	2744	3098
NS 7211 R	2785	1503	3826	2246	2080	2488	2982	2776	2855	3710	4136	2716	3196
PAN 1532 R	-	-	-	-	-	-	3782	2589	2701	3897	3283	2699	3159
5609 RSF	-	-	-	-	-	-	3984	2748	3028	3756	3773	2825	3352
5302 RSF	-	-	-	-	-	-	4037	2555	3480	3766	4251	2570	3443
SSS 5755 (tuc)	-	-	-	-	-	-	3173	2564	2242	3546	3435	2655	2936
LDC 5,9	-	-	-	-	-	-	4079	2035	2633	3792	3781	2988	3218
LDC 6.0	-	-	-	-	-	-	3107	584	1930	3752	3580	2414	2561
P61T38 R	-	-	-	-	-	-	3341	2402	2876	4171	3917	2616	3220
6663 RSF	-	-	-	-	-	-	3875	1633	2254	2834	3646	2561	2800
P64T39 R	-	-	-	-	-	-	3581	2447	2867	3858	5095	3283	3522
6968 RSF	-	-	-	-	-	-	3186	1537	2818	2836	2921	3205	2751
Gem/Mean	2923	1693	4034	2048	2290	2598	3440	2513	2703	3553	3686	2856	3125

Tabel 21 Opbrengswaarskynlikheid (%) van kultivars geëvalueer 2014/15, 2015/16 en 2016/17 vir die matige produksiegebiede by verskillende opbrengspotensiaal

Table 21 Yield probability (%) of cultivars evaluated in 2014/15, 2015/16 and 2016/17 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
PAN1454R	25	23	22	21	20	19	19	20
LS6146R	36	34	30	28	25	23	22	21
LS6248R	61	60	57	56	53	51	49	47
PHB95Y20R	51	41	31	22	15	10	7	4
LS6164R	61	57	53	49	45	40	37	33
LS6161R	65	63	61	58	55	52	49	46
LS6261R	61	60	58	57	54	52	50	48
PAN1614R	51	49	44	41	37	34	31	29
LS6240R	30	33	36	40	43	48	51	55
PHB94Y80R	21	24	27	31	35	39	44	49
PAN1521R	53	64	74	82	88	93	95	97
PHB96T06R	48	48	48	48	48	48	48	48
PAN1623R	87	85	82	79	75	69	64	58
DM5953RSF	39	46	53	62	69	75	80	84
NS5909R	66	65	63	62	60	57	55	53
NS6448R	57	57	58	58	58	58	57	57
DM6.8iRR	60	60	61	61	61	61	60	60
NS7211R	51	52	52	53	53	54	54	55

Tabel 22 Saadopbrengs (kg/ha^{-1}) van kultivars gedurende die 2015/16 en 2016/17 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 2015/16 and 2016/17 growing season for the various localities situated in the moderate production areas

Kultivar Cultivar	2015/16							2016/17									
	Bergville	Cedara	Glen	Greytown	Greytown Kranskop	Kroonstad	Gem/Mean	Cedara	Dundee	Greytown	Greytown Kranskop	Kroonstad	Potchefstroom Besproei	Potchefstroom Droog	Stoffberg	Verkeerdevlei	Gem/Mean
LS 6240 R	3595	2437	2297	2037	2962	1344	2445	4536	3368	3044	3573	3577	3601	2776	1403	2624	3167
PAN 1454 R	2956	2541	1808	2224	2700	1031	2210	4255	2886	2956	3148	3021	2954	2618	1912	2566	2924
SSS 4945 (tuc)	2340	2168	2604	1916	2579	953	2093	4441	3474	2677	3140	3965	3706	3297	1695	2981	3264
LS 6146 R	3330	2111	2014	1889	3135	1314	2299	3999	2949	3367	3424	3645	2752	2976	1507	2650	3030
PHB 94 Y 80 R	3799	2653	1930	1915	2801	1107	2367	4274	3091	3521	2980	2984	3384	3037	1738	2575	3065
LS 6248 R	3293	2598	2515	2315	3565	1183	2578	4268	2944	3031	3365	3074	3791	2881	3212	2414	3220
SSS 5449 (tuc)	2681	2255	2523	2320	3087	1067	2322	4083	2627	3676	3214	3756	3623	2949	2239	2287	3162
NS 5009 R	3779	2550	2487	2004	2835	1465	2520	-	-	-	-	-	-	-	-	-	-
DM 5.1i RR	3190	2184	2368	2104	2950	1012	2301	-	-	-	-	-	-	-	-	-	-
PHB 95 Y 20 R	2778	2596	2265	2411	2799	1030	2313	4050	3206	2652	3409	3356	3392	2633	3003	2160	3096
DM 5953 RSF	3520	2758	4016	2143	3341	890	2778	4672	3432	3519	4102	4182	3636	3172	2195	2852	3529
SSS 5052 (tuc)	3677	3022	2048	2586	3115	1334	2630	3859	3029	2853	2647	4198	3274	3294	3262	2307	3191
PAN 1521 R	3970	2854	2758	2548	3386	1148	2777	4323	3274	3291	3739	4530	4537	3927	3653	2860	3793
PAN 1500 R	3222	2721	1748	2486	2629	1041	2308	-	-	-	-	-	-	-	-	-	-
NS 5909 R	2875	3103	2808	3123	2953	1119	2663	3866	2834	3222	4015	3966	3714	3311	3702	1799	3381
LS 6261 R	2561	2678	2443	2257	3859	1228	2504	3793	3020	4676	3322	4024	3308	2814	3081	2737	3419
PHB 96 T 06 R	2909	2832	1844	2918	3560	1075	2523	4298	2833	3535	3628	3471	3510	3854	3256	1753	3349
PAN 1623 R	3590	3359	2885	3118	3829	1221	3000	3975	3122	3565	2838	3726	3242	3530	3970	2252	3358
LS 6161 R	2350	3050	3955	3246	3087	1389	2846	4230	3180	3161	3043	3672	3541	3783	3020	2367	3333
DM 6.2i RR	2293	2939	1712	3113	3583	1130	2462	-	-	-	-	-	-	-	-	-	-
SSS 6560 (tuc)	2702	2725	2619	2705	3560	1298	2602	3803	3028	2799	4051	3678	3096	2864	3343	1684	3150
LS 6164 R	3091	3029	2307	2651	4108	1273	2743	4003	2302	3110	3654	3394	3050	3589	2964	2253	3147
PAN 1614 R	3425	2773	1987	2710	3470	1092	2576	3734	2680	2845	3648	3806	3243	3353	2989	1651	3106
NS 6448 R	3643	2887	2616	2971	4039	1167	2887	3846	2976	3341	3644	4281	3430	3860	2767	1543	3299
DM 6.8i RR	2771	2977	2694	3186	3545	1053	2704	4443	2973	3190	4146	3317	3305	2956	4735	1339	3378
NS 7211 R	3736	2911	2186	2993	3062	1159	2674	4161	2504	2708	3838	3860	2939	3618	3777	1651	3228
PAN 1532 R	-	-	-	-	-	-	-	3990	3331	3144	3180	3687	4221	3289	2935	2068	3316
5609 RSF	-	-	-	-	-	-	-	4594	2942	2745	3764	4056	4043	2666	3871	1406	3343
5302 RSF	-	-	-	-	-	-	-	4509	2700	3421	3518	3857	3743	3018	2963	2520	3361
SSS 5755 (tuc)	-	-	-	-	-	-	-	3928	2847	2958	3017	4093	2844	3188	2845	1844	3063
LDC 5,9	-	-	-	-	-	-	-	4473	2947	3138	4216	3983	3503	3628	3447	2747	3565
LDC 6.0	-	-	-	-	-	-	-	4197	2640	2204	3380	4233	3586	3057	1989	2199	3054
P61T38 R	-	-	-	-	-	-	-	4130	3172	2888	4269	3809	3151	3248	3915	1916	3389
6663 RSF	-	-	-	-	-	-	-	3997	2909	2726	2928	3970	2313	2294	4069	1449	2962
P64T39 R	-	-	-	-	-	-	-	3883	2949	3234	4049	4230	4238	3955	3830	2195	3618
6968 RSF	-	-	-	-	-	-	-	3956	2926	2546	3855	3702	3111	2595	3919	1604	3135
Gem/Mean	3157	2720	2440	2534	3251	1159	2543	4143	2972	3117	3523	3784	3431	3188	3038	2164	3262

Tabel 23 Opbrengswaarskynlikheid (%) van kultivars geëvalueer 2014/15, 2015/16 en 2016/17 vir die warm produksiegebiede by verskillende opbrengspotensiaal
Table 23 Yield probability (%) of cultivars evaluated in 2014/15, 2015/16 and 2016/17 for the warm production areas at different yield potentials

Kultivar Cultivar	Opbrengspotensiaal/Yield potential (t/ha)						
	1.5	2	2.5	3	3.5	4	4.5
PAN1454R	50	46	41	37	33	31	29
LS6146R	18	26	38	51	65	75	82
LS6248R	25	30	36	44	52	59	64
PHB95Y20R	22	22	24	26	29	32	35
LS6164R	48	29	15	6	3	1	1
LS6161R	70	64	58	50	43	36	31
LS6261R	11	17	27	40	54	66	76
PAN1614R	36	34	34	32	33	33	34
LS6240R	30	26	23	21	19	19	19
PHB94Y80R	29	37	46	56	65	73	78
PAN1521R	88	89	90	89	88	87	85
PHB96T06R	48	38	29	21	16	12	10
PAN1623R	74	71	69	64	61	56	53
DM5953RSF	87	85	82	76	71	64	57
NS5909R	44	51	58	65	70	75	78
NS6448R	49	51	53	55	56	58	59
DM6.8iRR	90	84	76	64	50	37	28
NS7211R	71	72	71	70	69	67	65

Tabel 24 Saadopbrengs (kg/ha^{-1}) van kultivars gedurende die 2015/16 en 2016/17 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 2015/16 and 2016/17 growing season for the various localities situated in the warm production areas

Kultivar Cultivar	2015/16				2016/17		
	Atlanta	Brits	Groblersdal	Gem/Mean	Brits	Brits K2	Gem/Mean
LS 6240 R	1634	1419	2405	1819	1551	2416	1984
PAN 1454 R	1652	1935	2484	2023	1673	2578	2125
SSS 4945 (tuc)	1170	1450	3858	2159	2064	2687	2375
LS 6146 R	1763	1829	4110	2567	1722	2483	2103
PHB 94 Y 80 R	1598	1460	3461	2173	1766	2717	2241
LS 6248 R	1515	1727	4360	2534	1524	2861	2193
SSS 5449 (tuc)	1305	1715	2653	1891	1938	2220	2079
NS 5009 R	2072	1802	3284	2386	-	-	-
DM 5.1i RR	1357	1820	3684	2287	-	-	-
PHB 95 Y 20 R	1576	1319	3852	2249	2431	2551	2491
DM 5953 RSF	1705	2555	4285	2848	2921	3668	3294
SSS 5052 (tuc)	2008	1733	3524	2422	1871	2601	2236
PAN 1521 R	2163	1941	4890	2998	3654	4176	3915
PAN 1500 R	2064	1693	3836	2531	-	-	-
NS 5909 R	2237	1866	4764	2956	2052	2419	2236
LS 6261 R	1234	1818	4146	2399	1738	2637	2187
PHB 96 T 06 R	1921	1475	2934	2110	2352	2159	2256
PAN 1623 R	2265	1658	3413	2445	2364	2896	2630
LS 6161 R	2321	1705	4071	2699	2203	2448	2326
DM 6.2i RR	2183	1886	4581	2883	-	-	-
SSS 6560 (tuc)	2225	2102	3463	2597	2328	2188	2258
LS 6164 R	2060	1628	3422	2370	1885	2400	2142
PAN 1614 R	2194	1727	4042	2655	1891	2260	2075
NS 6448 R	2336	1607	4126	2689	1926	2019	1973
DM 6.8i RR	2114	1752	3696	2521	2565	2688	2626
NS 7211 R	2557	1595	3540	2564	2297	2591	2444
PAN 1532 R	-	-	-	-	1910	1895	1902
5609 RSF	-	-	-	-	2174	2846	2510
5302 RSF	-	-	-	-	2649	3095	2872
SSS 5755 (tuc)	-	-	-	-	1652	2008	1830
LDC 5,9	-	-	-	-	2936	3413	3174
LDC 6.0	-	-	-	-	1431	1906	1669
P61T38 R	-	-	-	-	2419	2732	2576
6663 RSF	-	-	-	-	1842	1947	1895
P64T39 R	-	-	-	-	4226	2825	3526
6968 RSF	-	-	-	-	2645	2080	2362
Gem/Mean	1893	1739	3726	2453	2206	2575	2391

Tabel 25 Saamgevatte inligting van al die lokaliteite in die koel produksiegebiede, 2016/17
Table 25 Summerised information for all the localities in the cool production areas, 2016/17

Kultivar/Cultivar	Dae tot blom/ Days to flowe-ring	Fisiolo gies ryp/ Physolo gical mature	Oes datum/ Harvest date	Plant hoogte/ Plant height	Peulhoog te/ Pod height	Omval/ Lod-ging	Groen stam/ Green stem	Oopspring/ Shattering	Planttel ling/ Number of plants	Persentasie ongewenste sade/Percen tage undesirable seed	Massa 100 sade/ Mass 100 seeds	Olie persen-tasie/Oil percentage	Ru-proteïen-persentasie/ Crude protein percentage	Opbrengs/ Yield
LS 6240 R	57	121	141	70	6	1.22	1.60	2.39	216	0.41	20.44	13.47	33.92	3020
PAN 1454 R	50	125	147	85	7	1.39	2.40	2.17	251	0.73	17.57	13.37	33.38	2795
SSS 4945 (tuc)	53	121	144	69	6	1.17	1.73	3.67	243	0.42	18.15	12.34	35.07	3447
LS 6146 R	50	121	144	79	7	1.33	1.53	2.61	252	0.62	16.19	11.48	34.75	2936
PHB 94 Y 80 R	52	123	144	62	4	1.44	2.47	3.17	230	0.83	17.32	14.37	33.39	3192
LS 6248 R	66	140	158	91	10	1.28	2.87	2.28	260	0.98	15.06	12.52	32.88	3046
SSS 5449 (tuc)	69	137	157	87	8	1.28	2.67	2.28	256	0.40	14.81	13.35	33.83	3185
PHB 95 Y 20 R	78	150	167	79	9	1.94	3.73	2.00	260	0.59	15.95	15.23	32.23	2842
DM 5953 RSF	54	125	144	76	6	1.28	1.53	2.33	251	0.36	17.76	12.19	33.95	4123
PAN 1532 R	77	142	161	79	9	1.17	2.33	1.17	259	0.55	15.34	12.58	33.86	3159
SSS 5052 (tuc)	76	144	169	90	11	1.67	2.07	1.56	248	0.58	14.45	13.88	33.51	2949
5609 RSF	71	143	162	70	7	1.17	3.00	2.11	246	0.45	16.68	12.78	32.94	3352
PAN 1521 R	75	144	160	95	11	2.39	2.73	1.72	273	1.05	16.95	13.37	32.45	3533
5302 RSF	71	144	157	82	7	1.39	2.53	2.44	258	0.71	17.47	15.72	32.53	3443
LS 6261 R	71	148	164	78	10	1.22	3.60	2.06	254	0.65	16.65	13.47	33.06	3134
SSS 5755 (tuc)	75	149	172	86	9	1.22	2.33	1.67	253	0.61	15.39	12.24	32.83	2936
NS 5909 R	76	152	173	91	11	1.72	2.80	2.28	268	0.48	15.83	13.69	33.41	3320
LDC 5,9	77	146	173	95	9	2.28	2.60	1.50	240	0.75	17.94	14.13	32.64	3218
PHB 96 T 06 R	86	153	169	97	10	1.67	1.40	1.22	255	0.62	15.27	12.42	34.11	2784
LDC 6.0	78	150	172	71	6	1.61	3.13	1.78	190	0.54	15.90	15.40	31.74	2561
PAN 1623 R	76	148	169	93	9	1.72	1.87	1.56	264	0.82	14.91	14.50	33.25	3271
LS 6161 R	74	146	164	92	10	1.39	2.47	2.28	270	0.41	14.76	12.95	33.40	3004
P61T38 R	73	147	166	70	9	1.17	3.13	1.28	255	0.62	16.04	14.10	33.28	3220
SSS 6560 (tuc)	75	144	171	88	10	1.56	2.27	1.64	245	0.56	15.08	13.02	33.29	2964
6663 RSF	79	155	175	95	9	2.06	3.07	1.28	241	0.84	16.54	14.40	32.35	2800
LS 6164 R	74	149	166	96	9	1.67	3.07	2.28	255	0.74	16.30	14.03	32.73	2931
PAN 1614 R	78	149	171	98	11	1.72	2.40	1.33	255	0.58	15.56	15.05	32.86	3048
NS 6448 R	75	151	167	81	10	1.67	1.60	2.83	246	0.54	15.61	13.82	33.75	3227
P64T39 R	77	157	174	101	10	1.89	2.40	1.39	260	0.66	16.12	13.77	32.82	3522
DM 6.8i RR	78	155	175	107	10	2.06	2.13	1.44	255	1.18	16.41	12.04	32.64	3098
6968 RSF	80	156	177	104	13	1.17	2.87	1.50	251	0.91	16.93	14.11	32.55	2751
NS 7211 R	77	156	170	80	9	1.17	3.27	2.50	244	0.67	16.53	14.46	31.78	3196
Gem/Mean	71	143	163	85	9	1.53	2.49	1.99	250	0.65	16.31	13.57	33.16	3125

Tabel 26 Saamgevatte inligting van al die lokaliteite in die matige produksiegebiede, 2016/17
Table 26 Summerised information for all the localities in the moderate production areas, 2016/17

Kultivar/Cultivar	Dae tot blom/ Days to flowe-ring	Fisiologies ryp/ Physological mature	Oes datum/ Harvest date	Planthoogte/ Plant height	Peul hoogte/ Pod height	Omval/ Lod-ging	Groen stam/ Green stem	Oopspring/ Shattering	Planttelling/ Number of plants	Persentasie ongewenste sade/Percentage undesirable seed	Massa 100 sade/ Mass 100 seeds	Olie persen-tasie/Oil percentage	Ru-proteïen-persentasie/ Crude protein percentage	Opbrengs/ Yield
LS 6240 R	45	114	135	74	9	1.08	1.92	1.29	225	0.75	21.55	13.35	34.75	3167
PAN 1454 R	44	116	136	92	11	1.04	2.54	1.14	260	0.72	18.51	12.76	34.77	2924
SSS 4945 (tuc)	45	114	133	74	8	1.25	2.29	1.38	250	0.55	19.02	12.91	35.31	3264
LS 6146 R	45	115	132	87	10	1.00	2.13	1.57	256	0.93	16.50	11.03	35.75	3030
PHB 94 Y 80 R	47	114	133	72	8	1.00	2.75	1.57	231	0.70	18.42	13.38	34.45	3065
LS 6248 R	57	122	141	91	15	1.04	2.17	1.71	251	0.68	16.10	13.60	34.01	3220
SSS 5449 (tuc)	58	122	139	89	13	1.00	1.96	1.57	268	0.46	15.18	12.36	35.22	3162
PHB 95 Y 20 R	56	123	147	83	15	1.08	3.08	1.43	256	0.92	16.59	14.67	33.57	3096
DM 5953 RSF	48	118	132	82	10	1.00	1.79	1.29	266	0.62	16.58	11.62	35.20	3529
PAN 1532 R	58	125	142	75	10	1.00	1.83	1.29	262	0.33	16.25	12.59	35.20	3316
SSS 5052 (tuc)	61	124	151	91	14	1.00	2.46	1.57	256	0.72	15.63	11.96	35.06	3191
5609 RSF	60	123	147	68	10	1.00	2.54	1.43	251	0.33	16.48	11.70	34.86	3343
PAN 1521 R	61	124	143	94	14	1.00	1.92	1.43	263	0.57	17.15	12.89	33.94	3793
5302 RSF	58	121	138	82	11	1.00	1.75	1.43	250	0.31	17.37	14.25	34.22	3361
LS 6261 R	58	123	143	76	13	1.04	2.58	1.00	250	0.57	17.17	13.34	34.64	3419
SSS 5755 (tuc)	62	126	149	88	13	1.00	2.63	1.43	255	0.61	16.43	11.99	34.24	3063
NS 5909 R	65	128	157	97	18	1.08	2.75	1.43	253	0.67	16.93	12.69	35.24	3381
LDC 5,9	60	126	151	99	14	1.29	2.17	1.14	235	0.46	19.12	13.20	34.44	3565
PHB 96 T 06 R	61	129	152	104	14	1.08	2.13	1.29	264	0.71	16.54	11.61	35.36	3349
LDC 6.0	63	126	151	75	11	1.08	2.25	1.43	188	0.45	16.07	13.10	34.17	3054
PAN 1623 R	61	127	145	93	14	1.00	2.25	1.00	271	0.69	16.03	14.37	34.51	3358
LS 6161 R	61	124	146	94	15	1.00	2.42	2.33	266	0.47	15.96	12.28	34.75	3333
P61T38 R	63	131	154	76	16	1.13	2.75	1.14	261	0.33	16.68	13.79	34.44	3389
SSS 6560 (tuc)	64	130	155	87	13	1.00	2.25	1.57	240	0.47	15.76	12.85	34.21	3150
6663 RSF	67	130	162	106	15	1.08	3.00	1.29	225	1.00	17.42	13.25	33.61	2962
LS 6164 R	64	132	151	103	18	1.00	2.75	1.38	251	0.49	17.54	12.98	34.76	3147
PAN 1614 R	65	127	154	104	17	1.00	2.58	1.29	256	0.66	16.07	13.54	34.02	3106
NS 6448 R	66	130	150	92	15	1.17	2.21	1.29	238	0.63	16.81	12.95	34.85	3299
P64T39 R	62	129	152	99	14	1.29	1.96	1.14	263	0.82	16.80	13.33	34.28	3618
DM 6.8i RR	67	132	161	112	18	1.17	2.33	1.29	253	1.47	17.36	12.35	33.35	3378
6968 RSF	64	128	161	104	17	1.04	2.46	1.00	250	0.93	18.55	14.22	33.55	3135
NS 7211 R	64	131	156	85	14	1.00	2.96	1.00	257	0.71	17.44	13.59	33.60	3228
Gem	59	125	147	89	13	1.06	2.36	1.36	251	0.65	17.06	12.95	34.51	3262

Tabel 27 Saamgevatte inligting van al die lokaliteite in die warmer produksiegebiede, 2016/17
Table 27 Summerised information for all the localities in the warmer production areas, 2016/17

Kultivar/Cultivar	Dae tot blom/ Days to flowe-ring	Fisiologies ryp/ Physological mature	Oes datum/ Harvest date	Plant hoogte/ Plant height	Peulhoogte/ Pod height	Omval/ Lod-ging	Groen stam/ Green stem	Oopspring/ Shattering	Planttelling/ Number of plants	Persentasie ongewenste sade/Percentage undesirable seed	Massa 100 sade/ Mass 100 seeds	Olie persen-tasie/Oil percentage	Ru-proteïen-persentasie/ Crude protein percentage	Opbrengs/ Yield
LS 6240 R	39	100	119	49	6	1.33	2.50	3.00	259	0.45	19.97	12.90	35.67	1984
PAN 1454 R	41	110	123	54	7	1.00	4.17	4.00	291	0.55	18.00	13.45	35.46	2125
SSS 4945 (tuc)	36	110	118	55	5	1.00	3.50	4.00	291	0.70	16.42	12.35	36.31	2375
LS 6146 R	36	106	119	57	6	1.00	3.33	3.50	263	0.90	15.67	10.90	36.74	2103
PHB 94 Y 80 R	43	100	125	46	5	1.00	3.67	4.00	291	0.90	17.47	11.78	36.37	2241
LS 6248 R	47	110	125	62	8	1.17	3.33	4.00	267	0.55	15.98	13.77	35.57	2193
SSS 5449 (tuc)	48	105	119	53	5	1.00	3.33	4.50	278	0.55	15.28	12.95	36.39	2079
PHB 95 Y 20 R	47	114	129	55	9	1.00	3.33	3.50	291	0.95	15.73	13.45	35.38	2491
DM 5953 RSF	41	109	121	74	8	1.00	3.33	3.00	293	1.20	16.45	11.66	35.78	3294
PAN 1532 R	43	111	123	44	5	1.00	2.33	2.00	280	0.40	14.90	14.40	34.74	1902
SSS 5052 (tuc)	48	113	131	58	8	1.00	3.00	1.50	301	1.10	15.27	13.15	35.57	2236
5609 RSF	46	117	126	46	5	1.00	3.83	3.50	291	0.50	17.08	12.53	36.11	2510
PAN 1521 R	46	114	128	84	9	1.00	2.83	1.50	323	0.65	19.38	13.33	35.01	3915
5302 RSF	47	109	122	56	5	1.00	3.17	3.50	288	0.70	17.98	15.16	35.15	2872
LS 6261 R	48	110	124	51	8	1.00	4.00	4.50	285	1.35	16.35	13.38	35.37	2187
SSS 5755 (tuc)	50	118	130	54	6	1.00	2.83	2.00	293	0.85	16.08	14.00	34.55	1830
NS 5909 R	50	114	132	61	7	1.00	3.67	2.00	303	0.85	15.87	13.90	35.94	2236
LDC 5,9	50	117	139	76	8	1.00	3.17	1.00	296	0.55	19.18	12.83	35.26	3174
PHB 96 T 06 R	50	117	132	68	6	1.00	3.00	2.00	294	0.75	15.98	15.64	34.16	2256
LDC 6.0	49	114	131	48	6	1.00	3.67	2.00	223	0.45	16.27	15.01	34.79	1669
PAN 1623 R	48	114	126	64	6	1.00	2.33	1.50	293	0.70	15.10	14.11	35.45	2630
LS 6161 R	48	113	130	68	9	1.00	3.33	4.00	314	0.80	14.80	15.53	34.13	2326
P61T38 R	46	117	132	54	9	1.00	3.17	1.50	300	0.75	15.42	15.08	34.75	2576
SSS 6560 (tuc)	50	114	140	64	7	1.00	3.17	2.00	258	1.25	17.05	14.93	34.49	2258
6663 RSF	53	128	133	66	7	1.00	3.00	2.50	297	2.60	16.32	16.00	32.41	1895
LS 6164 R	49	114	131	73	9	1.00	3.17	3.50	305	0.95	16.65	15.21	34.20	2142
PAN 1614 R	50	114	125	59	9	1.00	2.83	2.00	294	1.15	16.08	14.21	33.32	2075
NS 6448 R	54	125	129	55	9	1.00	2.33	4.50	280	2.75	14.98	16.25	33.80	1973
P64T39 R	50	114	136	85	9	1.00	3.67	1.00	314	0.75	16.87	14.19	34.45	3526
DM 6.8i RR	51	128	142	79	10	1.00	4.00	1.50	303	2.15	17.87	13.04	34.32	2626
6968 RSF	52	117	138	73	9	1.00	3.50	1.50	290	1.45	18.55	14.76	34.73	2362
NS 7211 R	49	121	132	56	6	1.00	2.83	4.00	291	1.80	16.70	15.72	33.58	2444
Gem	47	114	128	61	7	1.02	3.23	2.77	289	1.00	16.62	13.92	35.00	2391

DEPARTMENT OF AGRICULTURE, FORESTRY AND FISHERIES

NO. R. 370 **21 APRIL 2017**

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, Forestry and Fisheries 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. R478 of 20 June 2014.

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 --

"animal filth" means dead rodents, dead birds and dung;

"bag" means bag manufactured from --

(a) jute or phormium or a mixture of jute and phormium; or

(b) polypropylene that complies with SABS specification CKS632 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 bin of a grain elevator 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 damaged is not larger half of the surface of the soya beans, shall not be deemed as defective soya beans;

"foreign matter" means all matter that --

(a) pass through the 1,8 mm slotted screen during the sieving process (including soya beans and pieces of soya beans);

(b) that do not pass through the 1,8 mm slotted screen other than soya beans, glass, coal, dung, sclerotia or metal (including loose seed coats of soya bean as well as pods and parts of pods);

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

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

"other grains" grains or pieces of grains of wheat, barley, oats, triticate, 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 No. 54 of 1972, may present 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 fungi tissue, known as sclerotia. The sclerotia vary in size and form and consist of dark exterior, a white interior and rough surface texture;

"soiled soya beans" means whole soya beans which do not pass through the 4,75 mm screen and which are discoloured by soil or any other substances: Provided that if the discolouration is caused by plant material such as soya beans shall not be regarded as soiled soya beans;

"soya beans" means the threshed seed or 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 No. 119 of 1990;

"the 1,8 mm slotted screen" means a sieve --

(a) with a flat bottom of metal sheet of 1,0 mm thickness with apertures 12,7 mm long and 1,8 mm wide with rounded ends. The spacing between the slots in the same row must be 2,43 mm wide and the spacing between the rows of slots must be 2,0 mm wide. The slots must be alternately oriented with a slot always opposite the solid inter segment of the next row of slots;

(b) of which the upper surface of the sieve is smooth;

(c) with a round frame of suitable material with an inner diameter of between 300 mm and 310 mm maximum and at least 50 mm high; and

(d) that fits onto a tray with a solid bottom and must be at least 20 mm above the bottom of the tray.

"the 4,75 mm round-hole screen" 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 into a tray with a solid bottom; and not less than 20 mm above the bottom of the tray.

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

Restriction 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 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 undesirable smell or 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 No. 54 of 1972;

(d) be free from glass, metal, coal or dung;

(e) with the exception of Class Other soya beans, be free from insects;

(f) be free from animal filth;

(g) with the exception of Class Other soya beans, have a moisture content of not more than 13 percent; and

(h) 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 seeds 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.

(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 per cent 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 per cent 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 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 patter, 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 similar contents 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 grade other than that determined by means of that 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 that are 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 grain that is 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 Chemistry) 101/1 method.

PART IV

INSPECTION METHODS

Determination of undesirable odours, harmful substances, poisonous seeds, glass, metal, coal, dung, insects and animal filth

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 undesirable odour;

(b) whether it contains soya beans in which or on which a substance is found, 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;

(e) whether it contains any insects; and

(f) whether it contains animal filth.

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 permitted for a class 1 moisture meter as detailed in ISO 7700/2 based on result of the 72 hour, 103°C oven dried method [the latest revision of the AACCI ("American Association of Cereal Chemists International) Method 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 working samples of at least 200 g from a representative sample of the consignment.

(b) Place the 1,8 mm slotted screen in the pan and the 4,75 mm round-hole screen on top of the 1,8 mm slotted screen. Place the sample on the 4,75 mm round-hole screen and sieve the sample by moving the sieve 30 strokes to and fro, alternately away from and towards the operator of the sieve, in the same direction as the long axes of the slots of the 1,8 mm screen, which rests on a table or other suitable smooth surface, 250 mm to 460 mm away and towards the operator with each stroke. The prescribed 30 strokes must be completed within 30 to 35 seconds: Provided that the screening process may also be performed in some or other container or an automatic sieving apparatus.

(c) Remove the foreign matter from both sieves by hand and add it to the foreign matter below the 1,8 mm screen in the pan and determine the mass of the foreign matter. Remove all other grain, sunflower seed, stones and sclerotia by hand from the working samples and determine the mass of the other grain, sunflower seed, stones and sclerotia separately.

(d) Express the respective masses thus determined as a percentage of the total mass of the working sample concerned.

(e) Such percentages represent the percentages of other grain, sunflower seed, stones, sclerotia and that of foreign matter in the consignment concerned.

Determination of the percentage defective soya beans

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

(a) Obtain a working sample of at least 100 g soya beans that remain on top of the 4,75 mm round-hole screen after sieving action, which is free of other grain, sunflower, stones, sclerotia and foreign matter, from the representative sample of the consignment.

(b) Sieve the working sample with the 4,75 mm round-hole screen by moving the screen 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 screen by hand.

(d) Determine the mass of the defective soya beans on the 4,75 mm round-hole screen and express it as a percentage of the mass of the working samples 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 screen

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

(a) Determine the mass of the soya beans and pieces of soya beans that pass through the 4,75 mm round-hole screen and remain on top of the 1,8 mm slotted screen from which the other grain, sunflower seed, stones, sclerotia and foreign matter have been removed and express as percentage of the mass of the working sample.

(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 screen and not through a 1,8 mm slotted screen.

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 17(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 17(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, screenings and foreign material 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 Legal Metrology Act No. 09 of 2014 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 deviation	*Maximum percentage permissible deviation (m/m)*
	Grade/Graad SB1
1	2
(a) Wet pods	0,2%
(b) Foreign matter, including stones, other grain and sunflower seeds: Provided that such deviations are individually within the limits specified in itmes (c), (d) and (e)	5%
(c) Other grain	0,5%
(d) Sunflower seed	0,1%
(e) Stones	1%
(f) Sclerotia	4%
(g) Soya beans and parts of soya beans above the 1,8 mm slotted screen which pass through the 4,75 mm round-hole screen	10%
(h) Defective soya beans on the 4,75 mm round-hole screen	10%
(i) Soiled soya beans	10%
(j) Deviation in (b) and (f) collectively: Providedthat such deviations are individually within the limits of said items	7%