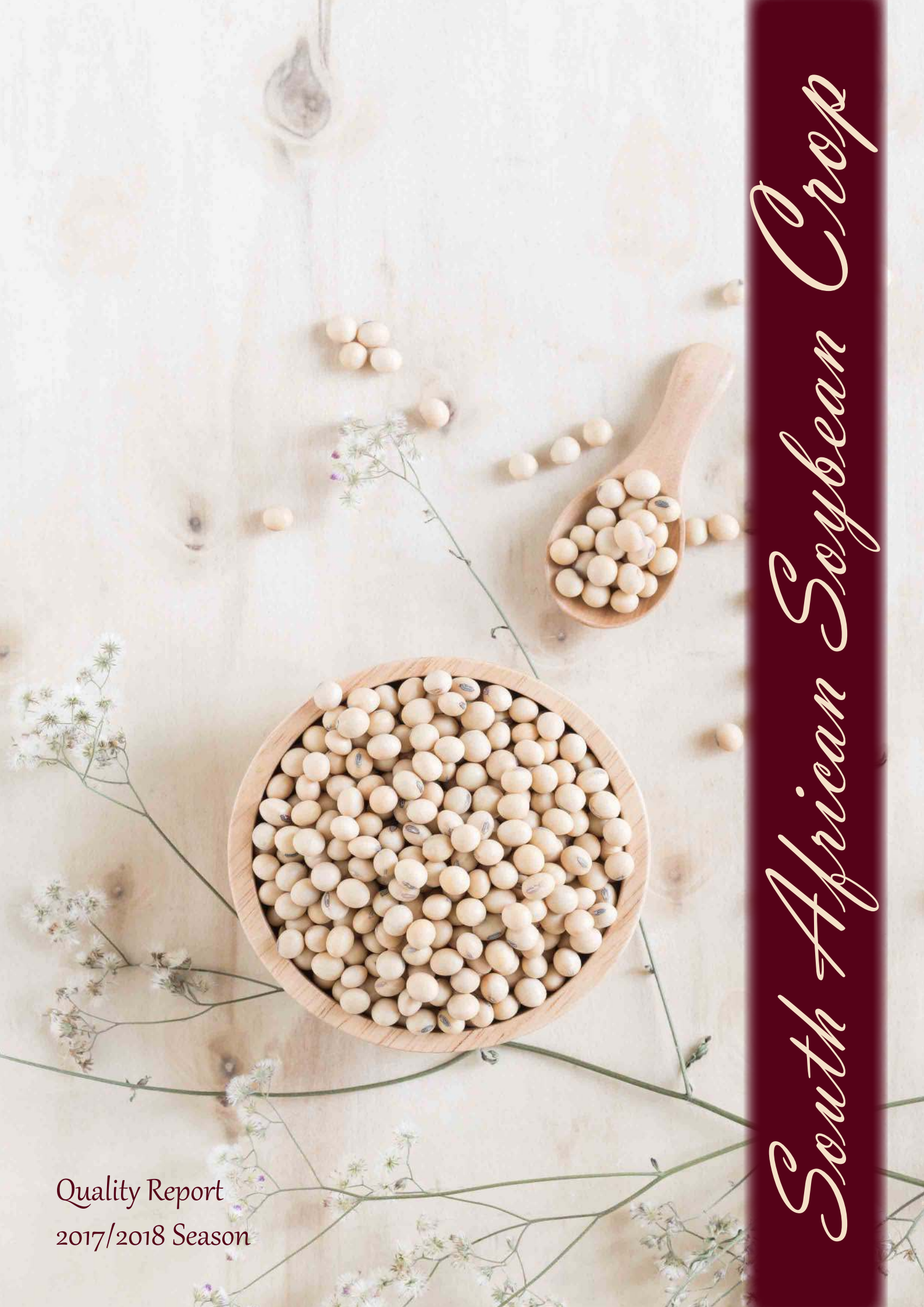


Quality Report
2017/2018 Season

South African Soybean Crop



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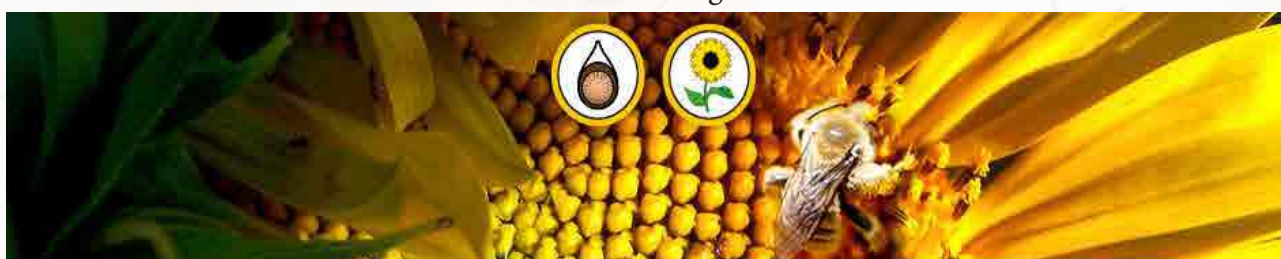
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South African COMMERCIAL SOYBEAN QUALITY FOR THE 2017/2018 SEASON



Acknowledgements

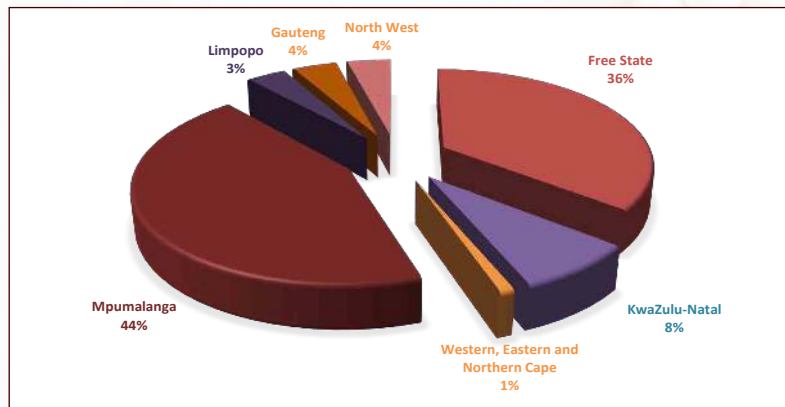
With gratitude to:

- 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 2017/2018 season, as overseen by the National Crop Estimates Liaison Committee (CELC), is 1 540 000 tons. The final calculated crop figure was adjusted downward slightly by 0.70% or 10 800 tons. This is the second consecutive year that an all-time high record crop has been harvested.

Graph 1: Contribution of the provinces to the production of the 2017/2018 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 seventh 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 2017/18 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 Government Notice NO. R.370 of 21 April 2017 are also provided.

Production

Soybeans is 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.

The commercial soybean crop production and area planted figures increased by 17% and 37% respectively to reach 1 540 000 tons and 787 200 hectares, the highest on record. The average national yield decreased by 14% to 1.96 t/ha, closer to the 10-year average of 1.75 t/ha. The major soybean-producing provinces, contributing 79.5% of the total crop, were Mpumalanga and the Free State as in previous seasons.

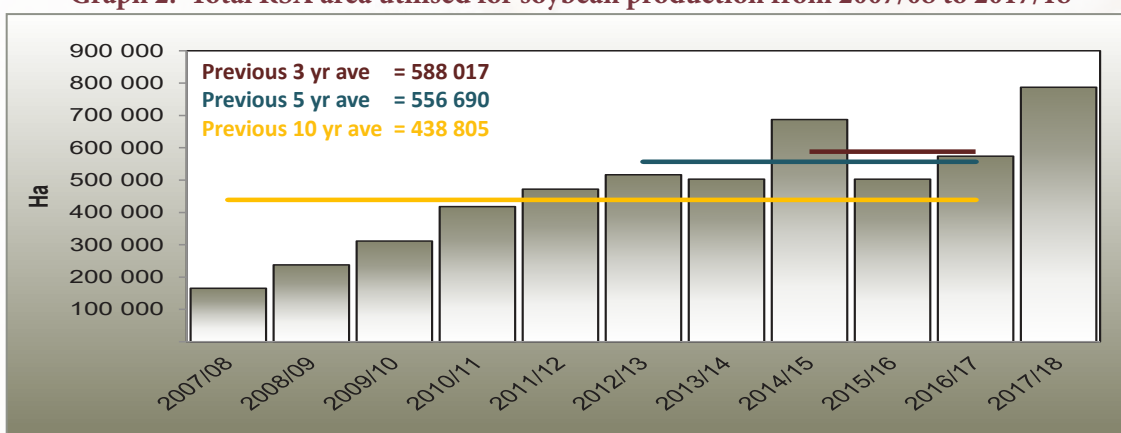
Province	Type of production	2017/2018			2016/2017		
		Hectares planted, ha	Production, tons	Yield, t/ha	Hectares planted, ha	Production, tons	Yield, t/ha
Western Cape	Dryland	-	-	-	-	-	-
	Irrigation	800	1 200	1.50	700	1 050	1.50
	Total	800	1 200	1.50	700	1 050	1.50
Northern Cape	Dryland	-	-	-	-	-	-
	Irrigation	3 000	10 500	3.50	3 000	10 500	3.50
	Total	3 000	10 500	3.50	3 000	10 500	3.50
Free State	Dryland	330 500	508 500	1.54	232 600	477 700	2.05
	Irrigation	14 500	43 500	3.00	7 400	26 300	3.55
	Total	345 000	552 000	1.60	240 000	504 000	2.10
Eastern Cape	Dryland	2 400	2 900	1.21	1 850	2 775	1.50
	Irrigation	-	-	-	-	-	-
	Total	2 400	2 900	1.21	1 850	2 775	1.50
KwaZulu-Natal	Dryland	26 300	75 000	2.85	22 000	58 155	2.64
	Irrigation	13 700	49 000	3.58	8 500	31 450	3.70
	Total	40 000	124 000	3.10	30 500	89 605	2.94
Mpumalanga	Dryland	298 000	632 000	2.12	234 700	533 500	2.27
	Irrigation	12 000	40 700	3.39	6 300	20 800	3.30
	Total	310 000	672 700	2.17	241 000	554 300	2.30
Limpopo	Dryland	6 000	10 000	1.67	1 500	3 750	2.50
	Irrigation	14 000	44 000	3.14	7 000	26 000	3.71
	Total	20 000	54 000	2.70	8 500	29 750	3.50
Gauteng	Dryland	27 000	51 000	1.89	22 900	61 620	2.69
	Irrigation	3 000	10 500	3.50	2 500	9 500	3.80
	Total	30 000	61 500	2.05	25 400	71 420	2.80
North West	Dryland	28 000	38 000	1.36	15 600	25 500	1.63
	Irrigation	8 000	23 200	2.90	7 400	27 400	3.70
	Total	36 000	61 200	1.70	23 000	52 900	2.30
RSA	Dryland	718 200	1 317 400	1.83	531 150	1 163 000	2.19
	Irrigation	69 000	222 600	3.23	42 800	153 000	3.57
	Total	787 200	1 540 000	1.96	573 950	1 316 000	2.29

Figures provided by the CEC.

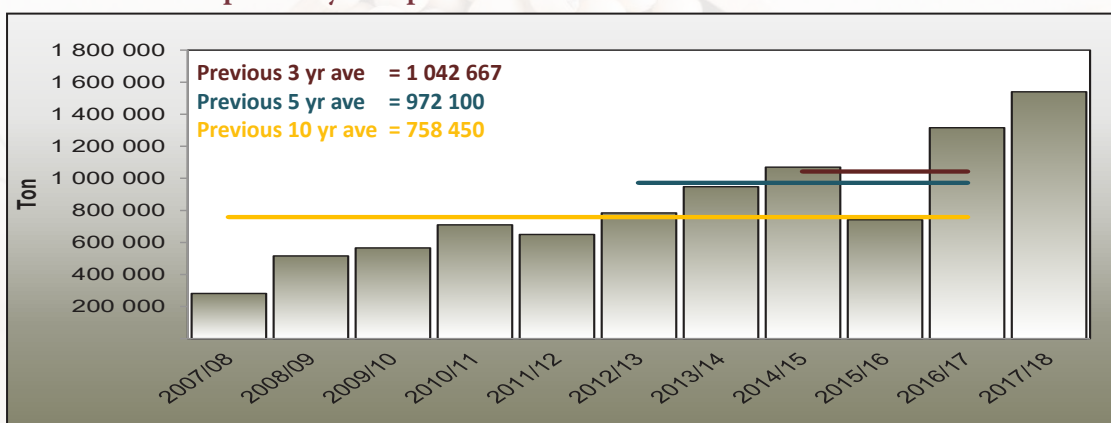
According to the *BFAP Baseline, Agricultural Outlook 2018 – 2027*, the area cultivated to soybeans is projected to continue expanding by an annual average of 2.9%, reaching 962 000 hectares by 2027. In addition to expanding area, projected production growth is underpinned by an average annual yield gain of 2% over the outlook period. This yield gain is faster than the yield improvements observed over the past decade. A number of trends needs to be considered with regards to projecting future soybean yields. Firstly, there is a rapid increase in the number of soybean varieties available for planting. Secondly, the area under soybean production has increased rapidly and western production regions that have traditionally been regarded as marginal areas for soybean production are gradually coming into production. Thirdly, producers have continued adapting production techniques, resulting in more stable and improved yields. Successful introduction of the End Point Royalty system remains a crucial factor to the introduction of the latest seed technology in South Africa, determining to a large extent the competitiveness of South African soybean farmers.

Soybeans account for more than half of the world oilseed production. According to the *World Agricultural Supply and Demand Estimates Report (WASDE - 586)* an estimated 340.47 million metric tons of soybeans were produced during the 2017/2018 season. The United States, Brazil and Argentina are the biggest contributors to this total. The world soybean production during the 2018/2019 season is projected to be 360.08 million metric tons.

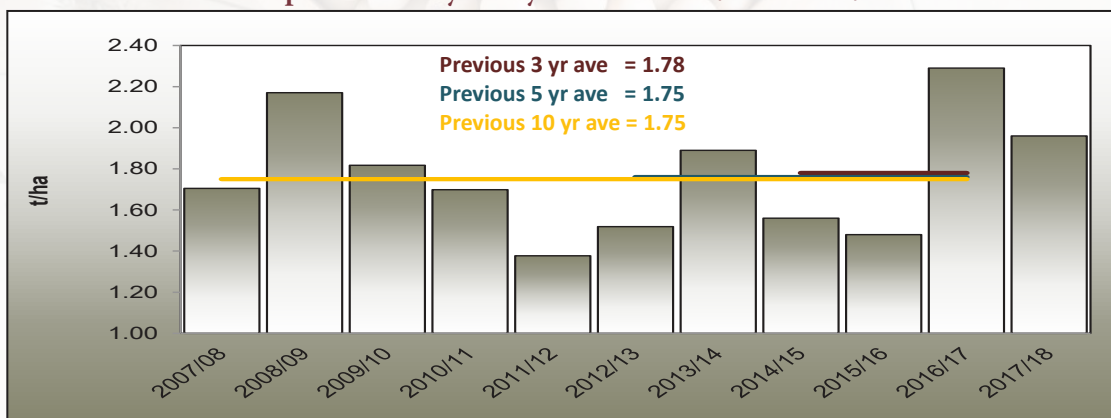
Graph 2: Total RSA area utilised for soybean production from 2007/08 to 2017/18



Graph 3: Soybean production in RSA from 2007/08 to 2017/18

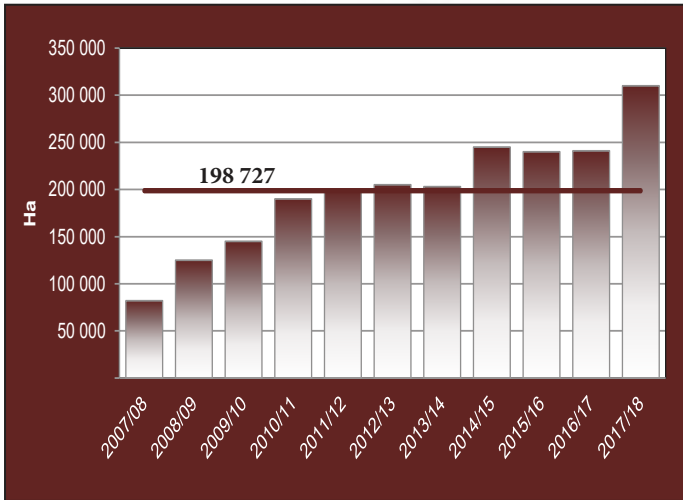


Graph 4: RSA soybean yield from 2007/08 to 2017/18

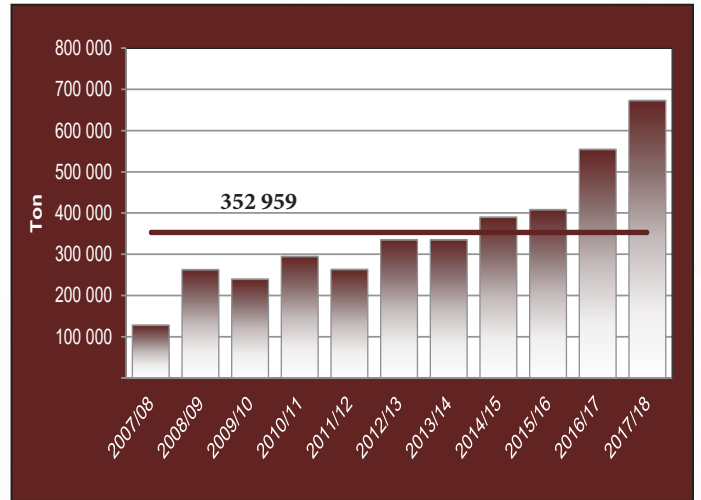


Figures provided by the CEC.

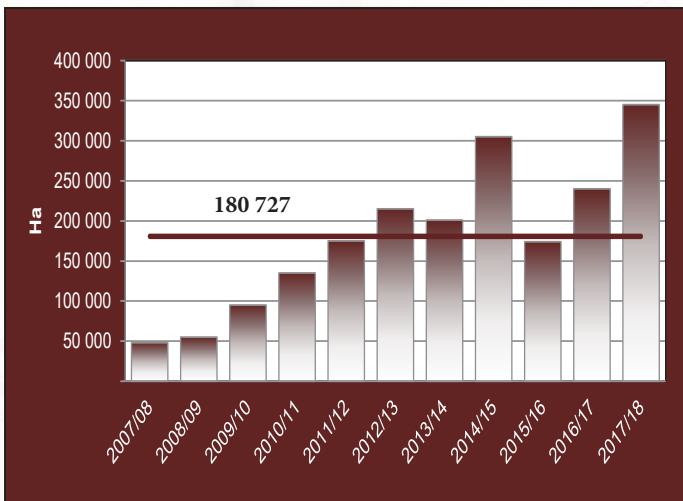
Graph 5: Area utilised for soybean production in Mpumalanga since 2007/08



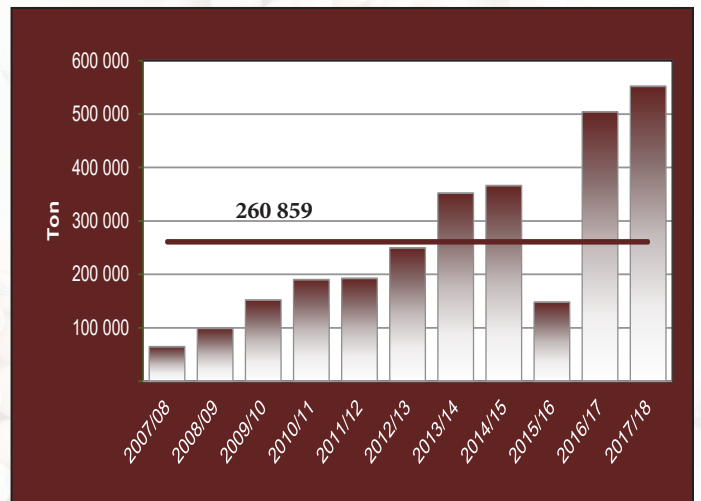
Graph 6: Soybean production in Mpumalanga since 2007/08



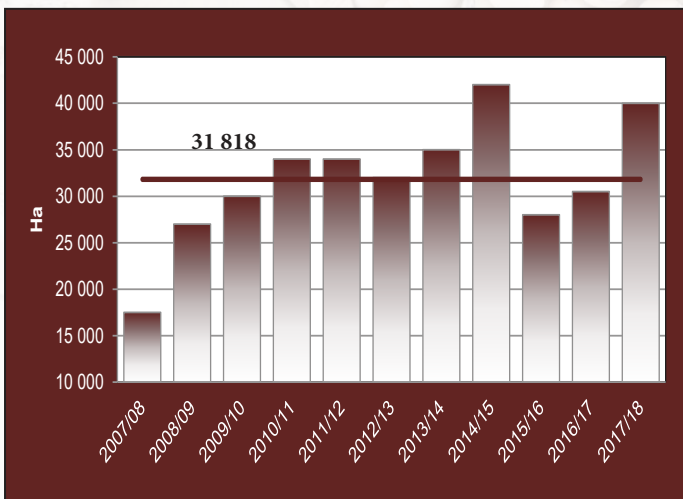
Graph 7: Area utilised for soybean production in the Free State since 2007/08



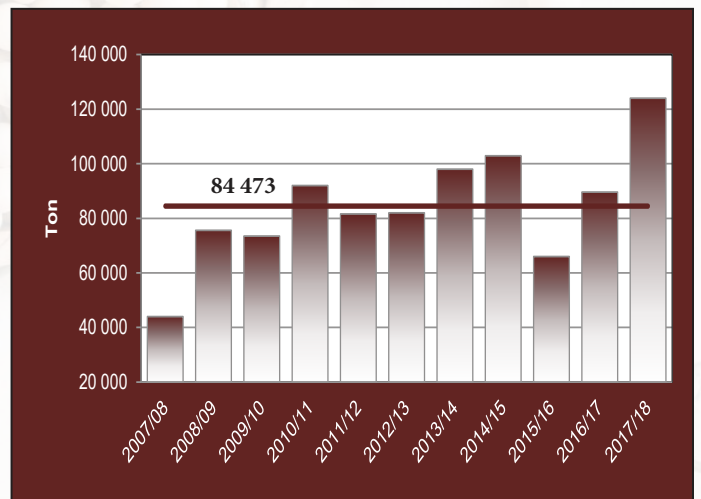
Graph 8: Soybean production in the Free State since 2007/08



Graph 9: Area utilised for soybean production in KwaZulu-Natal since 2007/08



Graph 10: Soybean production in KwaZulu-Natal since 2007/08



Figures provided by the CEC.

— Eleven season average

Supply and Demand

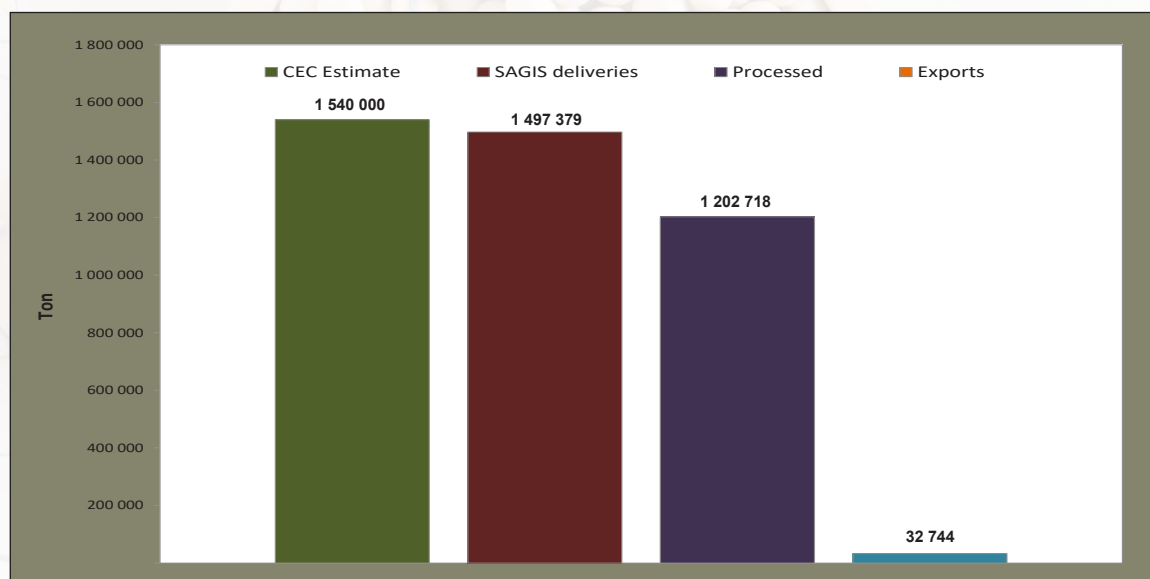
The soybean marketing season dates from March to end of February. According to SAGIS' supply and demand figures for the current marketing season to date (March 2018 to January 2019), only 6 496 tons of soybeans have been imported compared to the 27 508 and 271 098 tons of the previous two seasons. The lower import figures of the current and 2017/2018 seasons, stands to reason given the record crops produced locally. Of the 1.2 million tons of soybeans processed to date, 1.9% was used for human consumption, 16.6% 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 almost 10% more than the total quantity crushed during the previous season and 85% more than the 10-year average.

According to BFAP Baseline, the local demand for soybean cake currently exceeds the local levels of production and despite the fact that the development of new crushing plants has resulted in progressive replacement of imports by local production, a significant amount of soybean cake is still being imported. Approximately 450 000 tons of soybean cake will probably be imported during the current season. Soybean oilcake consumption is projected to rise to 1.56 million tons by 2027.

Total vegetable oil demand (including palm oil) increased by an average of 3% per annum over the last 10 years. 41% of this consumption figure was produced locally in 2017. During 2007 to 2017, soybean oil consumption increased by an average of 2% per year. Over the 2018 – 2027 period, soybean oil consumption is projected to expand by 1.7%, while soybean oil production is expected to grow at an annual average of 5.6% over the next decade.

32 744 tons of soybeans/products have been exported so far this season compared to the 414 tons in the previous season. Globally, soybean exports during the 2017/2018 season amounted to an estimated 152.96 million metric tons, with Brazil exporting 50% and the United States 38% of this figure. The projected world soybean exports for the 2018/2019 season currently stands at 154.20 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 2018 - Jan 2019)**



Information provided by SAGIS.

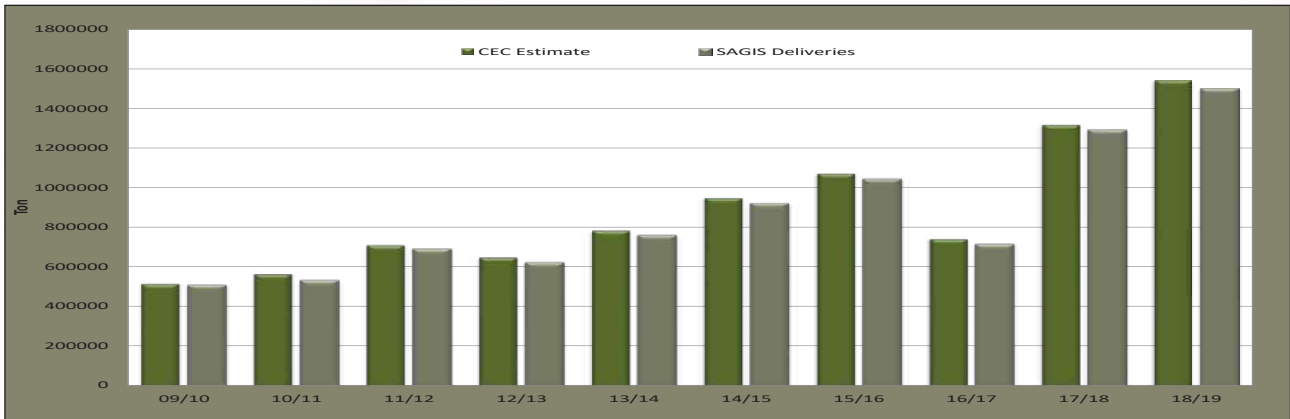
SOYBEANS: SUPPLY AND DEMAND TABLE BASED ON SAGIS' INFO (TON)													Publication date: 2019-02-26					
Season (Mar - Feb)													Current Season	10 Year average				
	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	Mar - Jan	2008/09-2017/18
CEC (Crop Estimate)	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	1 540 000	758 450
SUPPLY																		
Opening stock (1 Mar)	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	330 535	80 257
Prod deliveries	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	1 290 218	1 497 379	734 077
Imports	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	27 508	6 496	53 832
Surplus	0	400	0	0	3 900	3 300	900	700	1 500	1 800	1 698	2 572	0	10 526	1 122	2 519	11 956	2 334
Total Supply	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	1 405 037	1 846 366	870 499
DEMAND																		
Processed*	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	1 063 783	1 202 718	699 162
-human	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	25 056	22 867	26 855
-animal feed (full fat soya)	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	147 302	199 451	141 254
-crush (oil/oilcake)	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	891 425	980 400	531 053
Withdrawn by producers	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	1 331	495	3 191
Released to end-consumers	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	608	404	2 202
Seed for planting purposes	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	10 597	5 666
Net receipts(-)/displ(+)	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	-429	97	1 404
Deficit	600	0	2 000	600	0	0	0	0	0	0	0	0	2 782	0	0	0	0	278
Exports	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	32 744	51 042
Total Demand	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	1 074 502	1 247 055	762 945
Ending Stock (28 Feb)	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	330 535	599 311	107 555
- processed p/month	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	88 649	109 338	58 264
- months' stock	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	3.7	5.5	2

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

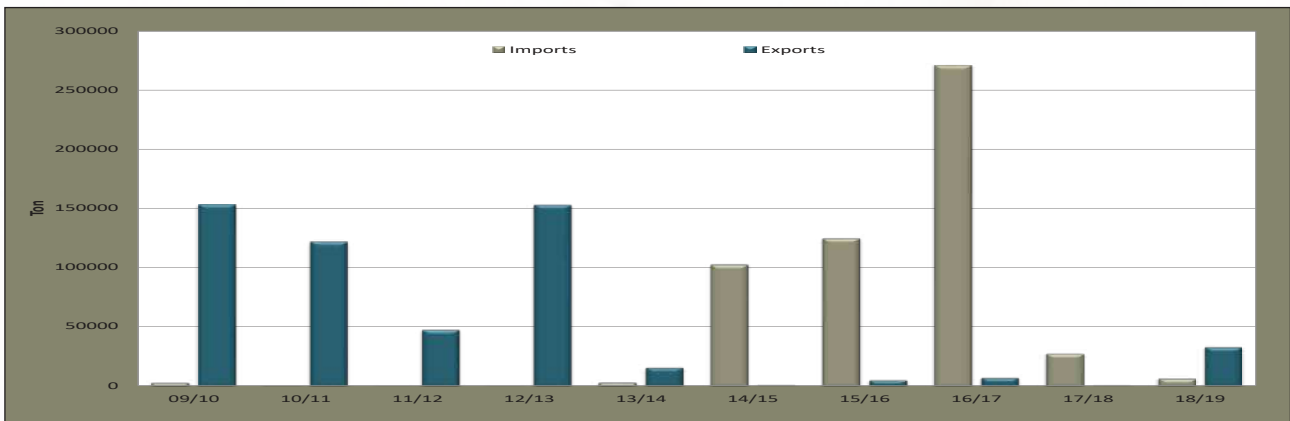
Note: Figures in red: opening stock and ending stock difference

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

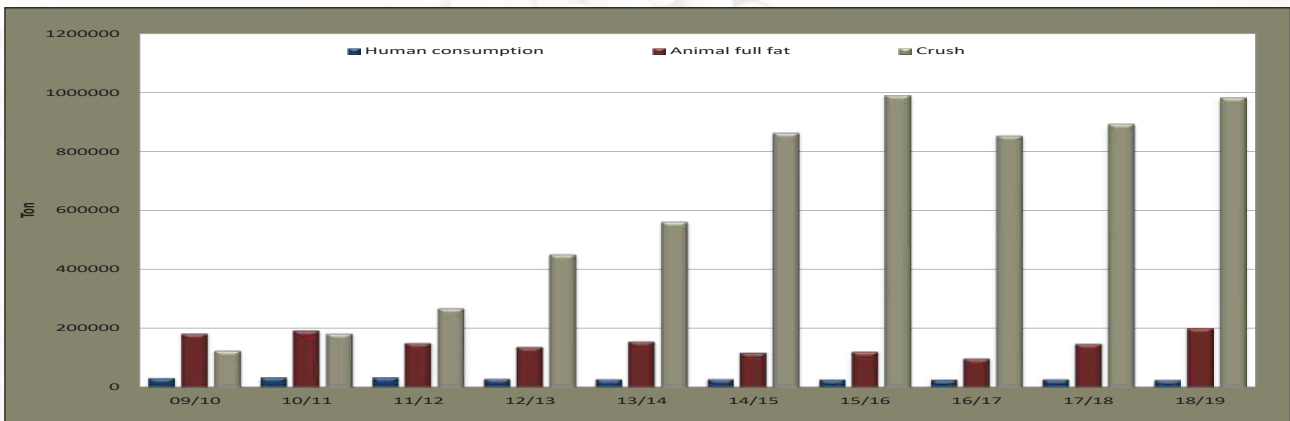
Graph 12: Soybeans: CEC Estimate vs SAGIS deliveries over 10 marketing seasons



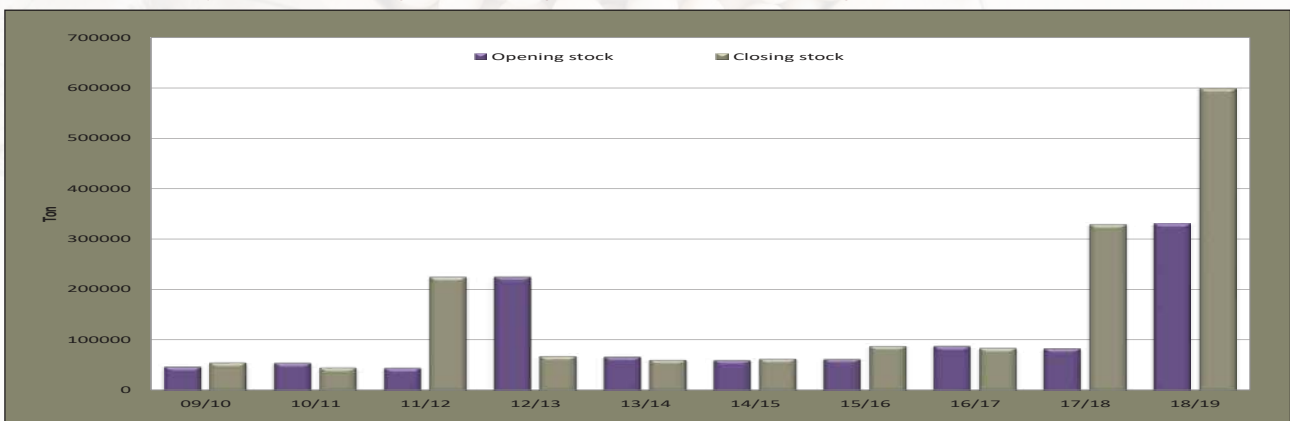
Graph 13: Soybeans: Imports and Exports over 10 marketing seasons



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



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



Information provided by SAGIS.

Season	SOYBEANS: IMPORTS FOR RSA PER COUNTRY (Tons)									Total
	Brazil	Ethiopia	Malawi	Mozambique	Nigeria	Paraguay	Ukraine	Zambia	Zimbabwe	
2014/2015	61 705	0	7 520	202	0	0	0	25 264	8 286	102 977
2015/2016	59 998	1 648	862	0	0	59 697	0	2 776	0	124 981
2016/2017	0	3 314	0	0	204	263 576	0	4 004	0	271 098
2017/2018	0	371	3 153	0	0	0	0	22 912	1 072	27 508
2018/2019	0	160	1 854	343	0	0	645	3 494	0	6 496

Season	SOYBEANS IMPORTS PER HARBOUR (Tons)				
	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	371	0	0	371
2018/2019*	0	805	0	0	805

* Progressive March 2018 - January 2019
 Note: Includes Imports for RSA and Other Countries

Season	SOYBEANS: RSA EXPORTS PER COUNTRY (Tons)				Total
	Botswana	Mozambique	Turkey	Zimbabwe	
2014/2015	1	575	0	0	576
2015/2016	220	4 457	0	0	4 677
2016/2017	0	2 614	0	4 131	6 745
2017/2018	4	410	0	0	414
2018/2019	17	160	27 660	4 907	32 744

Season	SOYBEANS EXPORTS PER HARBOUR (Tons)				
	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
2018/2019*	0	27 660	0	0	27 660

* Progressive March 2018 - January 2019

OIL SEEDS PRODUCTS PER MONTH MANUFACTURED													
	Marketing Year Mar 2017 - Feb 2018 Progressive: 12 Months	Mar 2018 Manufactured Tons	Apr 2018 Manufactured Tons	May 2018 Manufactured Tons	Jun 2018 Manufactured Tons	Jul 2018 Manufactured Tons	Aug 2018 Manufactured Tons	Sep 2018 Manufactured Tons	Oct 2018 Manufactured Tons	Nov 2018 Manufactured Tons	Dec 2018 Manufactured Tons	Jan 2019 Manufactured Tons	Market- ing year Mar 2018 - Jan 2019 Progressive: 11 Months
Palm Oil and Derivatives	0	0	0	0	0	0	0	0	0	0	0	0	0
Soybean Oil	152 434	12 850	11 864	13 246	14 062	13 739	13 329	16 219	17 253	19 301	17 766	17 932	167 561
Sunflower Oil	319 052	30 784	19 667	22 546	33 366	33 293	27 545	29 388	30 893	25 846	20 187	21 228	294 743
Cottonseed Oil	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	55 278	4 691	4 091	4 881	4 556	5 044	4 059	4 732	4 904	4 887	2 676	4 396	48 917
Cottonseed Oilcake	0	0	0	0	0	0	0	0	0	0	0	0	0
Sunflower Oilcake	369 122	34 248	21 769	27 349	38 949	38 679	32 844	35 862	38 795	32 589	24 986	26 679	352 749
Coconut Oilcake	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
Soybean Oilcake/ Canola Oilcake	722 794	60 566	53 336	65 277	65 899	64 898	61 512	76 837	81 418	89 620	80 734	84 769	784 866
Soybean Flours and Meals/ Textured Vegetable Protein	35 121	2 675	3 106	2 898	3 628	3 298	3 461	3 649	3 408	3 454	2 344	3 600	35 521
Soybean Fullfat	155 345	15 003	14 607	17 206	16 605	18 103	19 396	20 229	22 631	22 582	17 245	20 571	204 178
Peanut Butter and Paste	30 422	2 461	2 366	2 814	2 492	2 433	2 403	2 809	2 704	2 642	2 969	1 299	27 412
Total	1 839 568	163 278	130 826	156 217	179 557	179 487	164 549	189 725	202 006	200 921	168 907	180 474	1 915 947

	OIL SEEDS PRODUCTS PER MONTH IMPORTED												
	Marketing Year Mar 2017 - Feb 2018 Progressive: 12 Months	Mar 2018 Manufactured Tons	Apr 2018 Manufactured Tons	May 2018 Manufactured Tons	Jun 2018 Manufactured Tons	Jul 2018 Manufactured Tons	Aug 2018 Manufactured Tons	Sep 2018 Manufactured Tons	Oct 2018 Manufactured Tons	Nov 2018 Manufactured Tons	Dec 2018 Manufactured Tons	Jan 2019 Manufactured Tons	Market- ing year Mar 2018 - Jan 2019 Progressive: 11 Months
Palm Oil and Derivatives	323 198	24 727	22 454	20 288	38 237	21 346	20 880	36 716	18 261	28 811	18 383	37 757	287 860
Soybean Oil	50 123	1 500	3 500	4 250	0	3 100	1 000	7 085	4,000	0	0	2 358	26 793
Sunflower Oil	81 034	44	9 063	3 000	0	9 006	0	9 998	3 018	2 482	5 934	4 976	47 521
Cottonseed Oil	1 995	0	0	0	0	0	0	750	0	0	2 500	0	3 250
Coconut Oil/ Groundnut Oil/ Canola Oil/ Corn (Maize) Oil/ Blends or mixes of Oils which includes one of the above Oils/ Biodiesel	4 789	560	500	70	410	670	30	240	850	400	320	1 050	5 100
Cottonseed Oilcake	167	0	0	0	0	0	0	0	0	0	0	0	0
Sunflower Oilcake	24 166	0	0	9 604	9 956	0	7 392	0	0	6 565	0	0	33 517
Coconut Oilcake	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
Soybean Oilcake/ Canola Oilcake	438 555	20 262	41 864	32 737	44 445	14 178	28 806	51 009	16 385	39 671	42 996	0	332 373
Soybean Flours and Meals/ Textured Vegetable Protein	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
Peanut Butter and Paste	1 320	304	177	0	81	49	55	0	47	39	37	55	844
Total	925 347	47 397	77 578	69 949	93 129	48 349	58 163	105 798	42 561	77 968	70 170	46 196	737 258

OIL SEEDS PRODUCTS PER MONTH EXPORTED													
	Marketing Year Mar 2017 - Feb 2018 Progressive: 12 Months	Mar 2018 Manufactured Tons	Apr 2018 Manufactured Tons	May 2018 Manufactured Tons	Jun 2018 Manufactured Tons	Jul 2018 Manufactured Tons	Aug 2018 Manufactured Tons	Sep 2018 Manufactured Tons	Oct 2018 Manufactured Tons	Nov 2018 Manufactured Tons	Dec 2018 Manufactured Tons	Jan 2019 Manufactured Tons	Market- ing year Mar 2018 - Jan 2019 Progressive: 11 Months
Palm Oil and Derivatives	23 661	908	822	983	1 092	1 176	1 400	1 231	1 088	896	258	1 023	10 877
Soybean Oil	33 775	4 513	5 771	3 989	1 831	1 942	1 888	817	1 727	1 562	2 009	1 465	27 514
Sunflower Oil	2 151	120	64	719	132	227	166	193	97	109	206	83	2 116
Cottonseed Oil	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	2 308	64	197	83	65	139	16	101	67	4	51	91	878
Cottonseed Oilcake	0	0	0	0	0	0	0	0	0	0	0	0	0
Sunflower Oilcake	2 343	208	33	193	56	306	363	196	676	674	167	103	2 975
Coconut Oilcake	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
Soybean Oilcake/ Canola Oilcake	13 141	1 323	996	1 228	1 291	893	1 056	615	989	1 173	863	415	10 842
Soybean Flours and Meals/ Textured Vegetable Protein	0	0	0	0	0	0	0	197	273	541	355	382	1 748
Soybean Fullfat	4 904	283	335	315	862	375	460	508	662	579	594	1 200	6 173
Peanut Butter and Paste	345	22	109	103	131	128	5	40	47	129	32	35	781
Total	82 628	7 441	8 327	7 613	5 460	5 186	5 354	3 898	5 626	5 667	4 535	4 797	63 904

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.

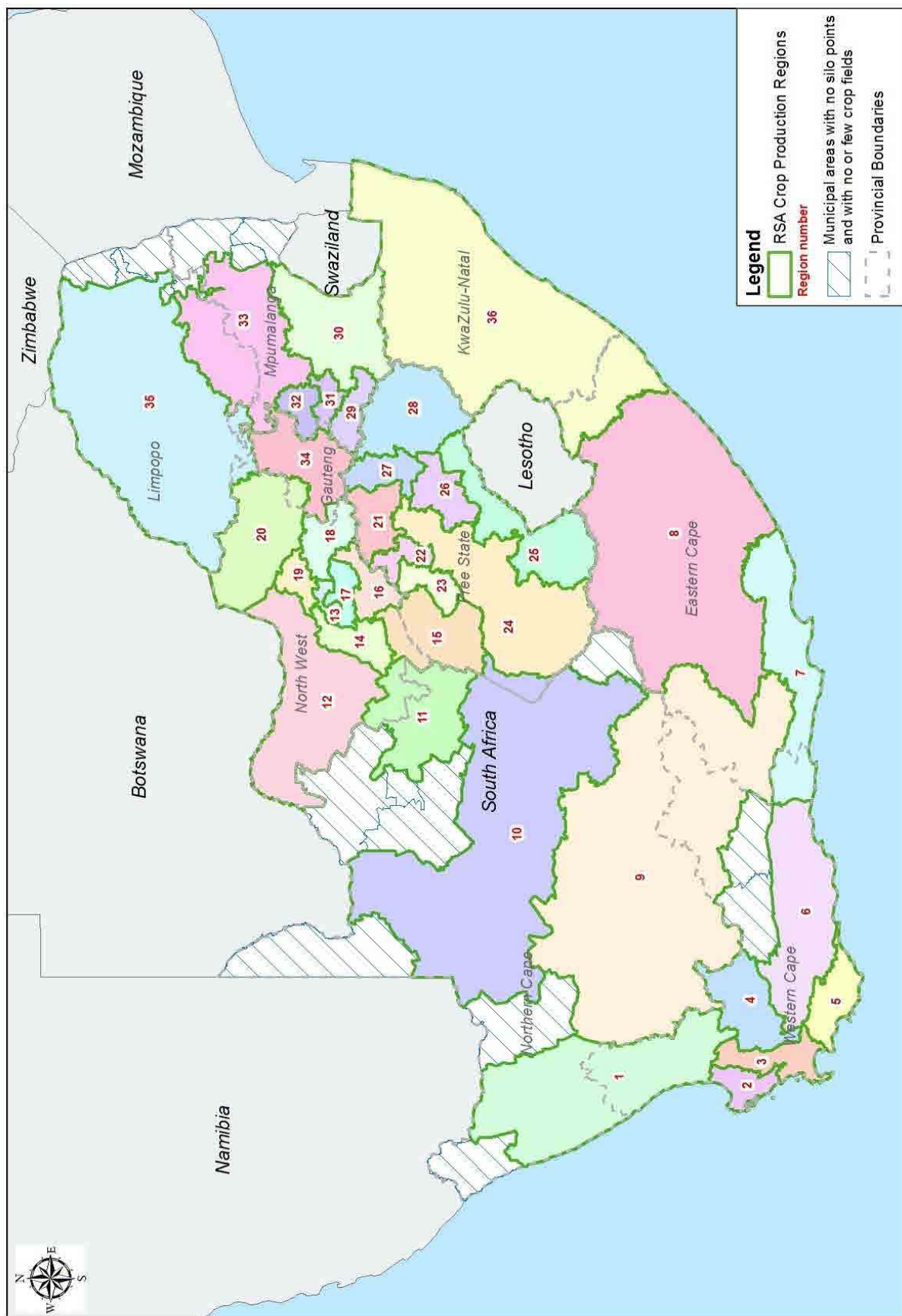
The regions are distributed as follows:

- Region 1: Namakwaland
- Regions 2 to 4: Swartland
- Regions 5 and 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 2017/2018 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 SIO.

Soybean Crop Quality 2017/2018 – Summary of results

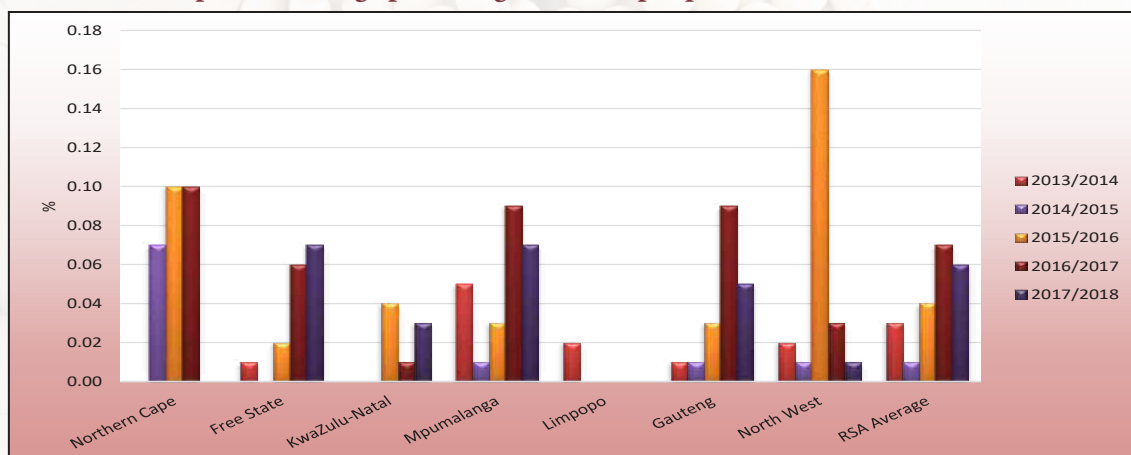
Eighty-seven percent (130) of the 150 samples analysed for the purpose of this survey were graded as Grade SB1, while 20 of the samples were downgraded to COSB (Class Other Soya Beans). During the previous two seasons, 12% (2016/2017) and 11% (2015/2016) of the samples were downgraded to COSB.

- Two of the 20 samples were downgraded as a result of the percentage foreign matter present in the sample exceeding the maximum permissible deviation of 5%.
- Six of the samples were downgraded as a result of the percentage other grain present in the sample exceeding the maximum permissible deviation of 0.5%.
- Two samples were downgraded as a result of the percentage soiled soybeans present in the sample exceeding the maximum permissible deviation of 10%.
- Six samples in total were downgraded as a result of the presence of poisonous seeds. Three samples were downgraded due to the number of *Datura sp.* seeds exceeding the maximum permissible number (1 per 1000 g) and the other three as a result of the number of *Convolvulus sp.* seeds exceeding 7 per 1000 g.
- The remaining four samples were downgraded as a result of a combination of one or more of the following deviations exceeding the maximum permissible deviation: foreign matter, other grain, soiled soybeans, collective deviations as well as the presence of an undesirable odour.

Wet pods were not present in any of the 150 samples received and graded.

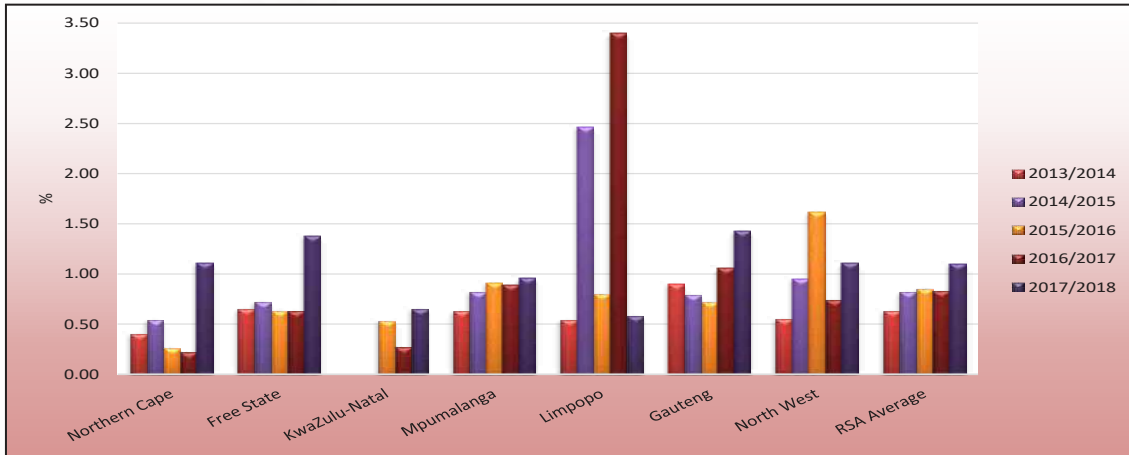
The number of samples containing sclerotia from the fungus *Sclerotinia sclerotiorum*, decreased by 16% compared to the previous season (88 vs 105 samples). The three highest percentages sclerotia observed (0.36%, 0.32% and 0.30%) were on samples from the Free State. These percentages are however still well below the maximum permissible level of 4%. The national weighted average percentage this season was 0.06% compared to the 0.07% of the previous season. See Graph 16.

Graph 16: Average percentage sclerotia per province over five seasons



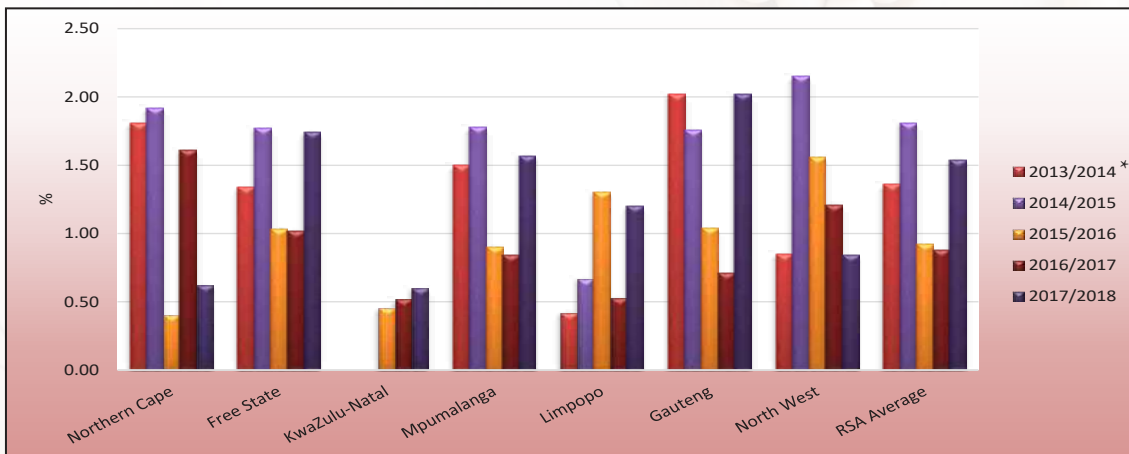
Gauteng province (11 samples) had the highest weighted average percentage foreign matter (1.43%). The percentage foreign matter in the rest of the samples ranged from 0.58 in Limpopo (four samples) to 1.38 in the Free State (45 samples). Please refer to Graph 17.

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



Gauteng reported the highest weighted average percentage soybeans and parts of soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, namely 2.02% and the samples from KwaZulu-Natal (N=9) and the Northern Cape (N=2) the lowest with 0.60% and 0.62% respectively. Mpumalanga province (71 samples) averaged 1.57% and the Free State province 1.74%.

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



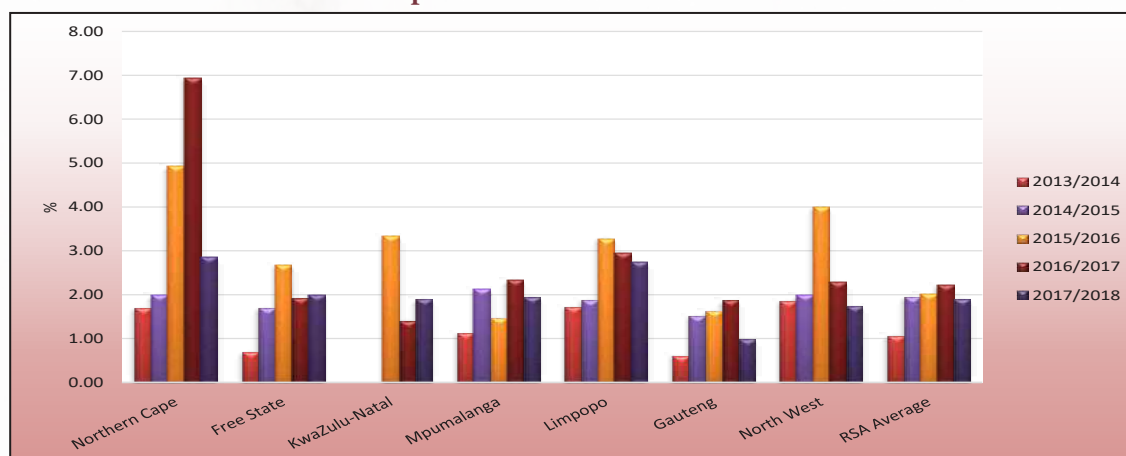
* Represent soybeans and parts of soybeans which pass through the 4.75 mm round hole sieve.

The national weighted average percentage increased from 0.88% the previous season to 1.54% this season. Please see Graph 18.

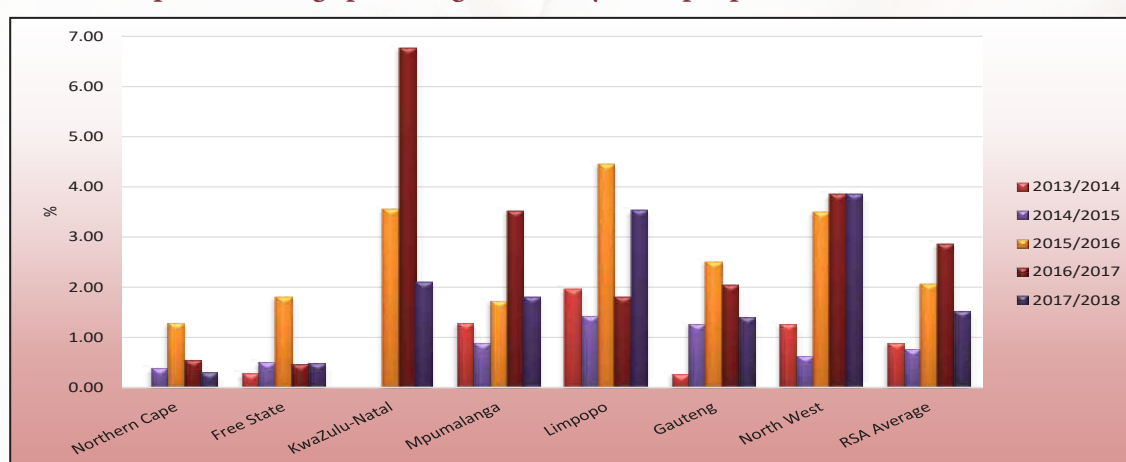
The lowest weighted average percentage defective soybeans on the 4.75 mm sieve was observed on the samples from Gauteng, namely 0.98%. The Northern Cape province reported the highest percentage namely 2.85%, followed by Limpopo with 2.74%. The national weighted average decreased from 2.22% last season to 1.91% this season. Please see Graph 19.

The national weighted average percentage soiled soybeans was 1.53%, compared to the 2.87% of the previous season. Average weighted percentages per province ranged from 0.30 in the Northern Cape to 3.86 in North West (8 samples). Please see Graph 20. Three samples exceeded the maximum permissible deviation of 10% according to the grading regulations. All three samples originated from Mpumalanga. Last season, 11 samples exceeded this grading limit.

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



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



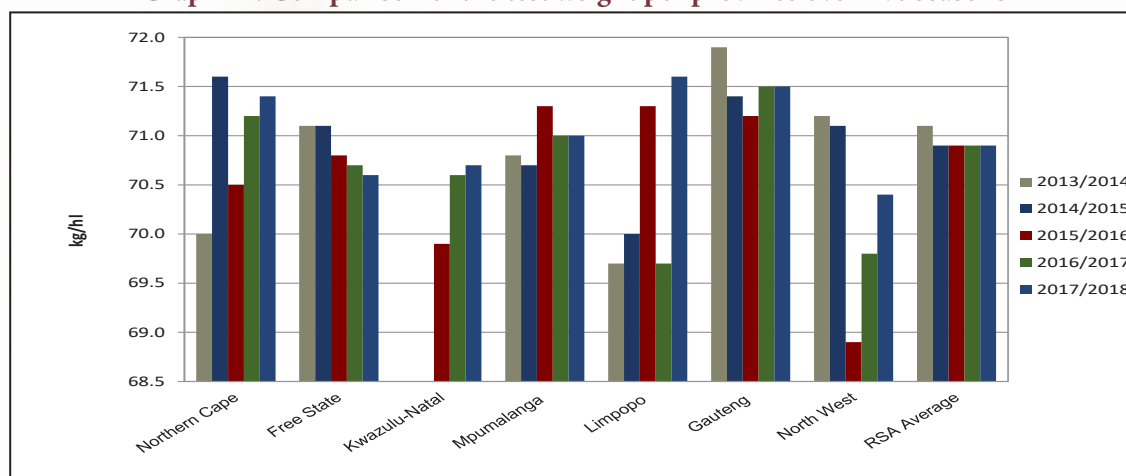
Test weight does not form part of the grading regulations for soybeans in South Africa. An approximation of the test weight of South African soybeans is provided in Table 2 for information purposes. The standard working procedure of the Kern 222 instrument, as described in ISO 7971-3:2009, was followed. The g/1 L filling mass of the soybean samples was determined and divided by two. The test weight was then 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 five seasons.

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

Province	Test weight, kg/hl								
	2017/2018 Season			2016/2017 Season			2015/2016 Season		
	Weighted average	Range	No. of samples	Weighted average	Range	No. of samples	Weighted average	Range	No. of samples
Northern Cape (Regions 10 - 11)	71.4	70.2 - 72.5	2	71.2	71.1 - 71.2	2	70.5	-	1
Free State (Regions 21 - 28)	70.6	67.2 - 73.6	*44	70.7	65.8 - 72.1	33	70.8	68.5 - 73.0	23
KwaZulu-Natal (Regions 36)	70.7	70.0 - 71.6	9	70.6	69.2 - 71.5	8	69.9	67.7 - 71.6	14
Mpumalanga (Regions 29 - 33)	71.0	68.2 - 72.5	71	71.0	67.6 - 72.6	86	71.3	68.9 - 72.7	91
Limpopo (Region 35)	71.6	71.4 - 72.1	4	69.7	69.1 - 70.2	2	71.3	-	1
Gauteng (Region 34)	71.5	70.3 - 74.0	11	71.5	70.8 - 73.6	11	71.2	70.6 - 72.2	5
North West (Region 12 - 20)	70.4	69.0 - 72.5	8	69.8	67.7 - 70.9	8	68.9	64.9 - 70.5	8
RSA	70.9	67.2 - 74.0	149	70.9	65.8 - 73.6	150	70.9	64.9 - 73.0	143

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

Graph 21: Comparison of the test weight per province over five 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 average 'as is' basis results are provided in Table 3. These 'as is' averages values were calculated by converting each individual value from dry basis to 'as is'.

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

Season	2017/2018		2016/2017		2015/2016		2014/2015	
Moisture, % (17hr, 103°C)	7.4		7.4		7.4		7.0	
Moisture basis	Dry basis	As is	Dry basis	As is	Dry basis	As is	Dry basis	As is
Crude protein, %	40.18	37.40	40.15	37.20	40.22	37.22	39.89	37.10
Crude fat, %	19.3	18.0	19.8	18.5	19.4	17.9	19.3	17.9
Crude fibre, %	5.9	5.5	5.9	5.4	7.3	6.8	6.4	5.9
Ash, %	4.59	4.27	4.58	4.24	4.61	4.27	4.64	4.31
No. of samples	150		150		143		150	

The weighted average crude protein content this season was 40.18%, slightly higher than the 40.15% of the previous season. As in the 2016/2017 season, Limpopo had the highest weighted average crude protein content (41.51%). Gauteng (39.82%) and the Free State (39.92%) reported the lowest averages. The weighted average crude fat percentage of 19.3% was half a percentage point lower than the 19.8% in the previous season, but similar to the average values reported in 2014/2015 and 2015/2016. The samples from Limpopo had the highest weighted average crude fat content, namely 21.4%. The lowest average fat content was observed in the Free State with 18.9%.

The weighted average percentage crude fibre varied from 5.3% in Limpopo to 6.1% in both Gauteng and North West. The RSA weighted average, 5.9%, was the same as the previous season and also the lowest value of the duration of the project. A small variation of only 0.08% is observed with regards to the national weighted average ash content over the seven seasons that this survey has been conducted. This season, the average ash content was 4.59%, the second lowest of the seven seasons and similar to the previous season. Samples from the Northern Cape and Limpopo tend to show higher ash contents over seasons compared to the other provinces.

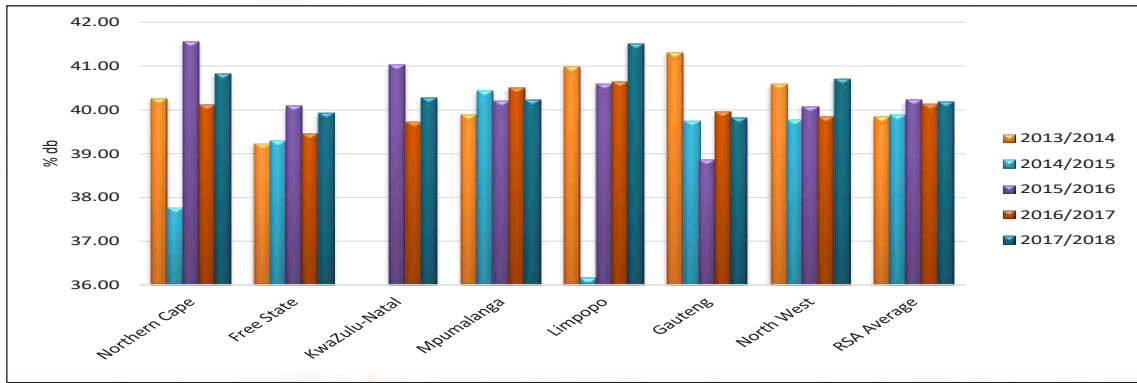
Graphs 22 to 25 on page 18 provide comparisons between provinces over seasons for the nutritional components mentioned above.

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 4 on page 19 of this report.

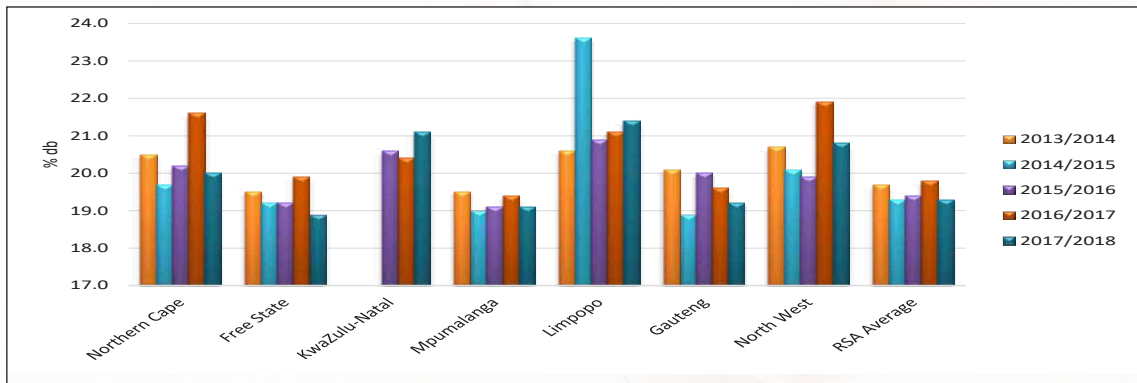
A summary of the RSA Soybean Crop Quality averages of the 2017/2018 season compared to those of the 2016/2017 season, is provided in Table 5 on page 20.

Please see pages 21 to 27 for the average soybean quality per region.

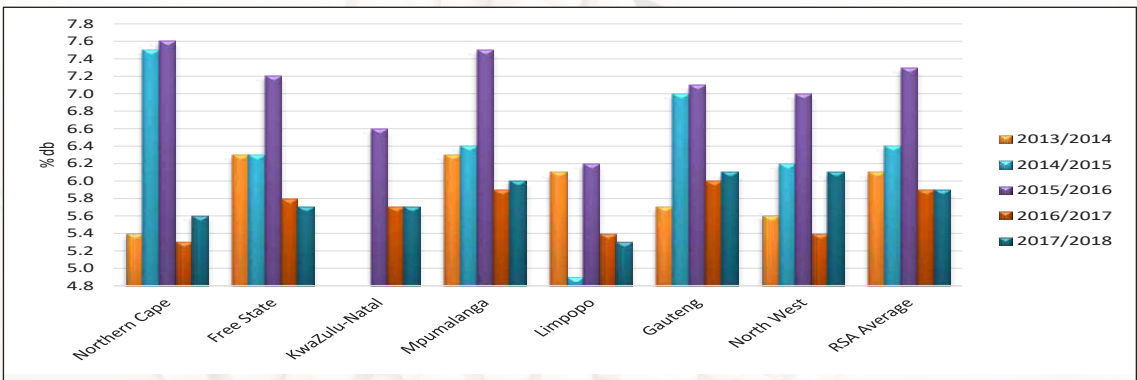
Graph 22: Average crude protein content per province over five seasons



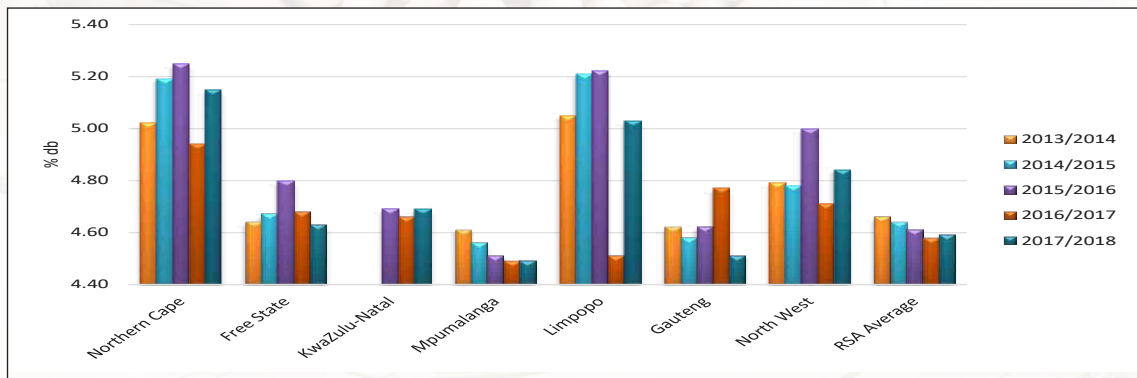
Graph 23: Average crude fat content per province over five seasons



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



Graph 25: Average ash content per province over five seasons



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). Globally, GM soybeans occupy approximately 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 the CP4 EPSPS (RR1/RR2) protein.

The sensitivity of the measurements using the above-mentioned kit is 0.25%, i.e. one Roundup Ready soybean in 400 conventional soybeans. The limit of detection (LOD) for measurements of the CP4 EPSPS protein is 0.125%. The highest measurement that can be quantified is 3%. Values higher than 3% is reported as >3.0%.

Table 4: GM results for the 2017/2018 season		
Region	Class and grade	CP4 EPSPS, %
11	SB1	>3.0
20	SB1	>3.0
21	SB1	>3.0
25	COSB	>3.0
26	SB1	>3.0
27	SB1	>3.0
28	SB1	>3.0
29	SB1	>3.0
30	SB1	>3.0
31	COSB	>3.0
32	SB1	>3.0
33	SB1	>3.0
34	SB1	>3.0
35	SB1	>3.0
36	SB1	>3.0
<i>Average of samples</i>		>3.0
<i>Number of samples</i>		15

Table 5: South African Soybean Crop Quality Averages 2017/2018 vs 2016/2017

Class and Grade Soya	2017/2018			2016/2017		
	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), %	0.80	3.08	1.10	0.69	1.83	0.83
(C) Other grain, %	0.06	1.48	0.25	0.05	0.39	0.09
(D) Sunflower seed, %	0.01	0.00	0.01	0.01	0.01	0.01
(E) Stones, %	0.02	0.00	0.01	0.01	0.00	0.01
(F) Sclerotia, %	0.06	0.05	0.06	0.07	0.08	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, %	1.47	1.95	1.54	0.89	0.82	0.88
(H) Defective soybeans on the 4.75 mm round hole sieve, %	1.89	2.07	1.91	2.18	2.51	2.22
(I) Soiled soybeans, %	1.32	2.89	1.53	2.04	8.99	2.87
(J) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	0.86	3.12	1.16	0.77	1.90	0.90
Poisonous seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	0	1	0	0	0	0
Poisonous seeds (<i>Argemone mexicana L.</i> , <i>Convolvulus sp.</i> , <i>Ipomoea purpurea Roth.</i> , <i>Lolium temulentum</i> , <i>Xanthium sp.</i>)	0	1	0	0	2	0
Undesirable odour	No	No	No	No	No	No
Live insects	No	No	No	No	No	No
Number of samples	130	20	150	132	18	150
Nutritional analysis:						
Moisture, % (17 hr, 103 °C)	6.9	6.9	6.9	7.4	7.1	7.4
Crude Protein, % (db)	40.08	40.81	40.18	40.11	40.45	40.15
Crude Fat, % (db)	19.3	19.4	19.3	19.8	19.6	19.8
Crude Fibre, % (db)	5.9	5.7	5.9	5.8	5.9	5.9
Ash, % (db)	4.59	4.54	4.59	4.58	4.56	4.58
Number of samples	130	20	150	132	18	150

SOUTH AFRICAN REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(11) Vaalharts Region				(14) North-West Southern Region				(17) North-West Central Northern Region (Ottosdal)			
Silo/Intake stands (Type of storage)	Barkly West (Bins/Bulk) Jan Kempdorp (Bags/Bunkers) Hartswater (Bins) Jan Kempdorp 287 (Bins) Magogong (Bins) Tadcaster (Bins)				Amalia (Bins) Barberspan (Bins) Delareyville (Bins) Excelsior (Bins) Geysdorp (Bins) Hallatshope (Bins) Madibogo (Bins) Migdol (Bins) Nooitgedacht (Bins) Schweizer-Reneke (Bins) Taaiboschpan (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	-	-	-
(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), %	1.11	0.18	2.04	1.32	1.40	-	-	-	0.83	-	-	-
(c) Other grain, %	0.00	0.00	0.00	0.00	0.10	-	-	-	0.00	-	-	-
(d) Sunflower seed, %	0.00	0.00	0.00	0.00	0.08	-	-	-	0.08	-	-	-
(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	-	-	-	0.10	-	-	-
(g) Soybeans and parts of Soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	0.62	0.16	1.08	0.65	1.16	-	-	-	1.41	-	-	-
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	2.85	2.50	3.20	0.49	2.22	-	-	-	1.30	-	-	-
(i) Soiled Soybeans, %	0.30	0.28	0.32	0.03	0.42	-	-	-	0.00	-	-	-
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	1.11	0.18	2.04	1.32	1.40	-	-	-	0.93	-	-	-
Poisonous seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	0	0	0	0	0	-	-	-	0	-	-	-
Poisonous seeds (<i>Argemone mexicana L.</i> , <i>Convolvulus sp.</i> , <i>Ipomoea purpurea Roth.</i> , <i>Lolium temulentum</i> , <i>Xanthium sp.</i>)	0	0	0	0	0	-	-	-	0	-	-	-
Number of samples	2				1				1			
Nutritional analysis:	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
Moisture, % (17 hr, 103 °C)	6.8	6.7	6.9	0.14	7.7	-	-	-	6.9	-	-	-
Crude protein, % (db)	40.82	40.35	41.28	0.66	40.22	-	-	-	41.60	-	-	-
Crude fat, % (db)	20.0	19.5	20.5	0.71	21.4	-	-	-	19.4	-	-	-
Crude Fibre, % (db)	5.6	5.5	5.7	0.14	5.4	-	-	-	6.1	-	-	-
Ash, % (db)	5.15	5.13	5.17	0.03	4.69	-	-	-	4.57	-	-	-
Number of samples	2				1				1			

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) Kommandonek (Bunker) Koppies (Bins) Rooiwal (Bins) Vierfontein (Bins) Viljoenskroon (Bins) Vredefort (Bins) Weiveld (Bins)								
<u>Grading:</u>	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
(a) Wet pods, %	0.00	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(b) Foreign matter, including stones, other grains and sunflower seeds: Provided that such deviations are individually within the limits specified in items (c), (d), and (e), %	0.68	-	-	-	1.20	0.80	1.86	0.42	0.70	0.46	0.85	0.17
(c) Other grain, %	0.26	-	-	-	0.00	0.00	0.00	0.00	0.10	0.00	0.22	0.11
(d) Sunflower seed, %	0.00	-	-	-	0.00	0.00	0.00	0.00	0.04	0.00	0.07	0.03
(e) Stones, %	0.00	-	-	-	0.27	0.00	0.62	0.30	0.00	0.00	0.00	0.00
(f) Sclerotia, %	0.00	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(g) Soybeans and parts of Soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	0.62	-	-	-	0.70	0.56	0.86	0.11	1.89	1.33	2.82	0.65
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	0.80	-	-	-	1.92	1.82	2.02	0.07	2.02	1.30	2.60	0.65
(i) Soiled Soybeans, %	1.34	-	-	-	5.82	2.12	9.62	3.50	0.48	0.00	1.56	0.74
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	0.68	-	-	-	1.20	0.80	1.86	0.42	0.70	0.46	0.85	0.17
Poisonous seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	0	-	-	-	0	0	0	0	0	0	0	0
Poisonous seeds (<i>Argemone mexicana L.</i> , <i>Convolvulus sp.</i> , <i>Ipomoea purpurea Roth.</i> , <i>Lolium temulentum</i> , <i>Xanthium sp.</i>)	0	-	-	-	0	0	0	0	0	0	0	0
Number of samples	1				5				4			
<u>Nutritional analysis:</u>	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
Moisture, % (17 hr, 103 °C)	6.7	-	-	-	6.6	6.4	6.7	0.11	7.0	6.6	7.6	0.43
Crude protein, % (db)	40.67	-	-	-	40.63	39.55	42.33	1.13	40.42	38.04	43.65	2.64
Crude fat, % (db)	17.5	-	-	-	21.6	20.8	22.3	0.56	19.8	18.6	21.6	1.30
Crude Fibre, % (db)	6.4	-	-	-	6.2	5.6	6.7	0.44	5.5	4.8	6.3	0.62
Ash, % (db)	4.84	-	-	-	4.93	4.78	5.05	0.10	4.71	4.57	4.78	0.09
Number of samples	1				5				4			

SOUTH AFRICAN REGIONAL SOYBEAN QUALITY

PRODUCTION REGION Silo/Intake stands (Type of storage)	(22) Free State North-Western Region (Bothaville)				(23) Free State North-Western Region (Bultfontein)				(24) Free State Central Region			
	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
	Allanridge (Bins) Bothaville (Bins) Mirage (Bins) Misgunst (Bunkers) Odendaalsrus (Bins) Schoonspruit (Bins) Schuttendraai (Bins)				Bultfontein (Bins) Kaalplaas (Bins) Losdoorns (Bins) Protespan (Bins) Tierfontein (Bins) Wesselsbron (Bins) Willemsrust (Bins)				Bainsvlei (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)			
<u>Grading:</u>												
(a) Wet pods, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-
(b) Foreign matter, including stones, other grains and sunflower seeds: Provided that such deviations are individually within the limits specified in items (c), (d), and (e), %	0.65	0.20	1.09	0.63	0.28	0.24	0.32	0.06	1.66	-	-	-
(c) Other grain, %	0.10	0.00	0.20	0.14	0.08	0.00	0.16	0.11	0.00	-	-	-
(d) Sunflower seed, %	0.02	0.00	0.04	0.03	0.04	0.00	0.08	0.06	0.00	-	-	-
(e) Stones, %	0.06	0.00	0.12	0.08	0.00	0.00	0.00	0.00	0.00	-	-	-
(f) Sclerotia, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-
(g) Soybeans and parts of Soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	1.56	0.86	2.26	0.99	0.60	0.54	0.66	0.08	1.35	-	-	-
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	1.84	1.46	2.22	0.54	2.72	1.82	3.62	1.27	0.90	-	-	-
(i) Soiled Soybeans, %	0.00	0.00	0.00	0.00	0.24	0.16	0.32	0.11	6.36	-	-	-
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	0.65	0.20	1.09	0.63	0.28	0.24	0.32	0.06	1.66	-	-	-
Poisonous seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	3	0	5	3.54	0	0	0	0	1	-	-	-
Poisonous seeds (<i>Argemone mexicana L.</i> , <i>Convolvulus sp.</i> , <i>Ipomoea purpurea Roth.</i> , <i>Lolium temulentum</i> , <i>Xanthium sp.</i>)	0	0	0	0	0	0	0	0	0	-	-	-
Number of samples	2				2				1			
<u>Nutritional analysis:</u>												
Moisture, % (17 hr, 103 °C)	6.9	6.6	7.1	0.35	6.8	6.5	7.0	0.35	6.8	-	-	-
Crude protein, % (db)	37.57	36.05	39.08	2.14	38.29	37.96	38.62	0.47	38.74	-	-	-
Crude fat, % (db)	20.3	20.0	20.5	0.35	20.6	20.2	20.9	0.49	19.1	-	-	-
Crude Fibre, % (db)	5.6	5.5	5.7	0.14	5.6	5.3	5.9	0.42	6.1	-	-	-
Ash, % (db)	4.87	4.68	5.05	0.26	4.87	4.57	5.17	0.42	4.77	-	-	-
Number of samples	2				2				1			

SOUTH AFRICAN REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(25) Free State South-Western Region				(26) Free State South-Eastern Region				(27) Free State Northern Region			
	Silo/Intake stands (Type of storage)	Bethlehem (Bins) Clocolan (Bins) Dewetsdorp (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)	Gottenburg (Bins) Heilbron (Bins) Hoogte Grainlink (Bins) Mooigeleë (Bins) Petrus Steyn (Bins) Wolwehoek (Bins)								
<u>Grading:</u>	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
(a) Wet pods, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(b) Foreign matter, including stones, other grains and sunflower seeds: Provided that such deviations are individually within the limits specified in items (c), (d), and (e), %	4.31	0.70	14.70	4.52	0.71	0.12	2.12	0.60	0.83	0.64	0.94	0.14
(c) Other grain, %	2.65	0.00	13.50	4.47	0.09	0.00	0.42	0.13	0.04	0.00	0.16	0.08
(d) Sunflower seed, %	0.00	0.00	0.00	0.00	0.01	0.00	0.08	0.03	0.03	0.00	0.08	0.04
(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	0.00	0.30	0.11	0.09	0.00	0.36	0.13	0.11	0.00	0.17	0.08
(g) Soybeans and parts of Soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	3.56	1.42	5.65	1.11	0.94	0.16	2.08	0.65	1.57	0.98	2.10	0.50
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	3.23	1.82	6.50	1.34	1.17	0.70	1.78	0.34	1.76	0.74	4.56	1.87
(i) Soiled Soybeans, %	0.26	0.00	0.62	0.21	0.47	0.00	1.26	0.47	0.33	0.00	0.80	0.34
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	4.41	1.00	14.70	4.44	0.81	0.12	2.18	0.68	0.94	0.64	1.11	0.21
Poisonous seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	0	0	0	0	1	0	10	2.89	0	0	0	0
Poisonous seeds (<i>Argemone mexicana L.</i> , <i>Convolvulus sp.</i> , <i>Ipomoea purpurea Roth.</i> , <i>Lolium temulentum</i> , <i>Xanthium sp.</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Number of samples	9				12				4			
<u>Nutritional analysis:</u>	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
Moisture, % (17 hr, 103 °C)	6.8	6.6	7.0	0.16	6.7	6.2	6.9	0.19	7.2	6.9	7.7	0.36
Crude protein, % (db)	40.77	34.91	45.43	3.09	39.97	36.21	43.92	2.36	40.43	39.84	41.35	0.67
Crude fat, % (db)	18.2	15.8	20.0	1.24	18.8	17.3	21.5	1.37	19.7	18.8	20.1	0.62
Crude Fibre, % (db)	5.6	4.7	6.2	0.45	5.7	5.3	6.3	0.40	5.3	4.4	6.5	0.94
Ash, % (db)	4.54	4.31	4.93	0.18	4.64	4.27	5.16	0.23	4.46	4.38	4.56	0.09
Number of samples	9				12				4			

SOUTH AFRICAN REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(28) Free State Eastern Region				(29) Mpumalanga Southern Region				(30) Mpumalanga Eastern Region						
	Silo/Intake stands (Type of storage)				Afrikaskop (Bins/Bunkers) Ascent (Bins) Vrede (Bins) Cornelia (Bins) Warden (Bins) Daniëlsrus (Bins) Windfield (Bins) Eeram (Bins) Frankfort (Bins) Harrismith (Bins) Jim Fouché (Bins) Kransfontein (Bins/Bunkers) Memel (Bins) Reitz (Bins) Tweeling (Bins) Villiers (Bins/Bulk)				Balfour (Bins) Greylingstad (Bins) Grootvlei (Bins) Harvard (Bins) Holmdene (Bins) Leeuspruit (Bins) Platrand (Bins) Standerton (Bins) Val (Bins)				Amersfoort (Bins) Carolina (Bins) Davel (Bins) Eerstelingsfontein (Bunkers) Ermelo (Bins) Estancia (Bins) Hendriksvallei (Bunkers) Lothair (Bins) Maizeveld (Bins) Mkondo (Bins) Morgenzon (Bins) Overvaal (Bins) Panbult (Bins) Sandspruit (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), %	0.47	0.04	1.76	0.51	1.07	0.22	3.35	0.91	0.88	0.06	1.68	0.43			
(c) Other grain, %	0.01	0.00	0.08	0.03	0.09	0.00	0.75	0.18	0.09	0.00	0.88	0.18			
(d) Sunflower seed, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
(e) Stones, %	0.05	0.00	0.60	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
(f) Sclerotia, %	0.07	0.00	0.18	0.06	0.10	0.00	0.26	0.08	0.06	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, %	1.42	0.10	3.77	1.14	2.06	1.13	4.18	0.77	1.58	0.22	3.10	0.67			
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	1.97	0.30	4.80	1.45	1.99	0.26	3.84	1.14	1.91	0.86	2.70	0.44			
(i) Soiled Soybeans, %	0.37	0.00	1.50	0.60	0.99	0.00	3.40	1.22	1.82	0.00	16.22	3.50			
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	0.54	0.04	1.90	0.54	1.17	0.28	3.41	0.90	0.94	0.14	1.78	0.43			
Poisonous seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinus communis</i>)	0	0	0	0	0	0	0	0	0	0	0	0			
Poisonous seeds (<i>Argemone mexicana L.</i> , <i>Convolvulus sp.</i> , <i>Ipomoea purpurea Roth.</i> , <i>Lolium temulentum</i> , <i>Xanthium sp.</i>)	0	0	2	0.81	0	0	0	0	1	0	10	2.57			
Number of samples	11				18				28						
Nutritional analysis:	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev			
Moisture, % (17 hr, 103 °C)	6.9	6.6	7.5	0.34	6.8	6.6	7.2	0.18	6.9	6.6	7.6	0.27			
Crude protein, % (db)	39.64	32.71	44.17	2.74	40.08	36.96	43.19	1.55	40.10	38.44	43.45	1.31			
Crude fat, % (db)	18.5	16.8	20.3	1.12	18.9	17.5	20.5	0.87	19.0	17.8	21.3	0.76			
Crude Fibre, % (db)	6.2	5.2	7.4	0.65	6.2	5.7	6.8	0.40	6.1	4.9	7.6	0.55			
Ash, % (db)	4.63	4.41	5.06	0.18	4.46	4.35	4.78	0.10	4.46	4.25	4.65	0.09			
Number of samples	11				18				28						

SOUTH AFRICAN REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(31) Mpumalanga Central Region				(32) Mpumalanga Western Region				(33) Mpumalanga Northern Region			
	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
Silo/Intake stands (Type of storage)	Bakenlaagte (Bunkers) Bethal (Bins) Brakfontein (Bunkers) Devon (Bins) Kinross (Bins/Bunkers) Klipfontein (Bunkers) Leslie (Bins) Palmietfontein (Bunkers) Trichardt (Bins) Vaalkrantz (Bunkers)				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)			
Grading:												
(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), %	1.44	0.20	4.16	1.75	0.76	0.32	1.34	0.32	0.82	0.00	1.40	0.54
(c) Other grain, %	0.25	0.00	0.92	0.41	0.13	0.00	0.46	0.18	0.24	0.00	0.80	0.30
(d) Sunflower seed, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.04	0.01
(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, %	0.04	0.00	0.08	0.03	0.07	0.00	0.16	0.04	0.07	0.00	0.12	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, %	1.61	0.06	2.69	0.97	0.98	0.50	2.24	0.50	1.16	0.16	3.02	0.91
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	1.95	0.24	3.76	1.38	1.66	1.00	2.08	0.38	2.38	0.60	5.38	1.51
(i) Soiled Soybeans, %	1.73	0.00	7.94	2.85	2.16	0.00	9.34	2.63	3.12	0.18	12.34	4.29
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	1.48	0.20	4.20	1.76	0.83	0.42	1.40	0.32	0.89	0.00	1.50	0.57
Poisonous seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Poisonous seeds (<i>Argemone mexicana L.</i> , <i>Convolvulus sp.</i> , <i>Ipomoea purpurea Roth.</i> , <i>Lolium temulentum</i> , <i>Xanthium sp.</i>)	1	0	5	2.44	0	0	0	0	1	0	5	1.77
Number of samples	7				10				8			
Nutritional analysis:												
Moisture, % (17 hr, 103 °C)	7.1	6.7	7.5	0.28	6.9	6.5	7.3	0.27	7.1	6.8	7.5	0.27
Crude protein, % (db)	40.13	37.92	41.67	1.27	40.23	38.95	42.39	1.02	41.12	40.06	42.24	0.99
Crude fat, % (db)	19.2	17.7	20.1	0.80	19.4	18.7	20.0	0.42	19.5	18.8	20.4	0.69
Crude Fibre, % (db)	5.7	4.4	6.3	0.65	5.9	5.3	6.9	0.55	6.0	5.4	7.1	0.52
Ash, % (db)	4.53	4.42	4.64	0.08	4.59	4.53	4.68	0.06	4.50	4.37	4.69	0.09
Number of samples	7				10				8			

SOUTH AFRICAN REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(34) Gauteng				(35) Limpopo				(36) KwaZulu-Natal			
Silo/Intake stands (Type of storage)	Bloekomspruit (Bins) Bronkhorstspruit (Bins) Glenroy (Bins) Goeie Hoek (Bins) Kaalfontein (Bins) Kliprivier (Bunkers) Meyerton (Bunkers) Middelvlei (Bins) Nigel (Bins) Oberholzer (Bins) Pretoria Wes (Bins) Raathsvlei (Bins) Vogelvallei (Bunkers)				Alma (Bins) Lehau (Bins) Naboomspruit (Mookgophong)(Bins) Northam (Bins) Nutfield (Bins) Nylstroom (Modimolle) (Bins) Potgietersrus (Mokopane) (Bins) Roedtan (Bins) Settlers (Bins) Warmbad (Bela-Bela) (Bins)				Bergville (Bins/Bunkers) Bloedrivier (Bins) Dannhauser (Bins) Dundee (Bins) Mizpah (Bins) Paulpietersburg (Bins) Pietermaritzburg (Bins) Vryheid (Bins) Winterton (Bins/Bunkers)			
<u>Grading:</u>	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
(a) Wet pods, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(b) Foreign matter, including stones, other grains and sunflower seeds: Provided that such deviations are individually within the limits specified in items (c), (d), and (e), %	1.43	0.06	5.50	1.68	0.58	0.36	0.80	0.19	0.65	0.02	2.96	0.92
(c) Other grain, %	0.05	0.00	0.36	0.11	0.11	0.00	0.16	0.08	0.17	0.00	1.20	0.39
(d) Sunflower seed, %	0.00	0.00	0.00	0.00	0.05	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, %	0.05	0.00	0.12	0.04	0.00	0.00	0.00	0.00	0.03	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, %	2.02	0.20	7.83	2.05	1.20	0.30	1.95	0.68	0.60	0.08	1.32	0.50
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	0.98	0.23	1.80	0.49	2.74	1.64	4.18	1.06	1.90	0.70	4.38	1.17
(i) Soiled Soybeans, %	1.41	0.00	4.60	1.61	3.54	1.00	6.00	2.42	2.11	0.38	5.10	1.67
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	1.48	0.06	5.55	1.69	0.58	0.36	0.80	0.19	0.67	0.02	2.96	0.92
Poisonous seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	0	0	5	1.51	0	0	0	0	0	0	0	0
Poisonous seeds (<i>Argemone mexicana L.</i> , <i>Convolvulus sp.</i> , <i>Ipomoea purpurea Roth.</i> , <i>Lolium temulentum</i> , <i>Xanthium sp.</i>)	0	0	5	1.51	3	0	10	5.00	0	0	0	0
Number of samples	11				4				9			
<u>Nutritional analysis:</u>	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
Moisture, % (17 hr, 103 °C)	6.9	6.7	7.1	0.11	7.6	6.6	9.3	1.20	7.1	6.4	7.4	0.30
Crude protein, % (db)	39.82	37.59	41.37	1.12	41.51	40.76	42.33	0.65	40.27	38.89	42.70	1.08
Crude fat, % (db)	19.2	17.9	20.3	0.80	21.4	21.3	21.5	0.08	21.1	20.5	23.0	0.76
Crude Fibre, % (db)	6.1	4.9	7.4	0.74	5.3	4.7	5.6	0.41	5.7	5.1	6.2	0.37
Ash, % (db)	4.51	4.34	4.68	0.12	5.03	4.96	5.07	0.05	4.69	4.55	4.95	0.12
Number of samples	11				4				9			

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 (Government Notice NO. R 370 of 21 April 2017).

Please see pages 74 to 83 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 standard working procedure of the Kern 222 instrument, as described in ISO 7971-3:2009, was followed. The g/1 L filling mass of the soybean samples was determined and divided by two. The test weight was then 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.

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 (H₂SO₄) and 1.25% Sodium hydroxide (NaOH) solutions under specific conditions.

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.

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**

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Ms A de Jager (Nutrients & Contaminants Methods)
Ms W Louw (In-house Methods 001, 002, 003, 010 & 026)
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Ms H Meyer (All Chemical, Nutrients and Contaminants & Grading Methods)
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Ms PM Modiba

Issue No.: 28

Date of Issue: 20 December 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 ⁰ C) (2 hour; 130 ⁰ C)
Flour, semolina, bread, all kind of grains and cereal products and food products (except those that	Moisture (Oven Method)	AACCI 44-15.02, Latest Edition (1 hour; 130 ⁰ C)

Facility Number: T0116

are sugar coated)		(72 hour; 103°C)
Maize Grits	Moisture (Oven Method)	Analytical EBC Method 6.2.2, latest edition (4 hours, 130°C)
Animal feed, Plant tissue and Sunflower (Milled)	Moisture (Oven Method)	AgriLASA 2.1, Latest Edition (5 hours, 105°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
	Total Sodium (Na) Total Iron (Fe) Total Zinc (Zn)	In-house method 010
Grain based food and feed products (fortified and unfortified) and fortification mixes		
Yeast and Bread	Vitamin D ₂ (HPLC)	In-House method 029

Facility Number: T0116

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



RECOGNITION OF ANALYTICAL PERFORMANCE

Analysis of Feed

Southern African Grain Laboratory
Pretoria, SOUTH AFRICA

Achieved Outstanding Accuracy and Precision for the year 2017
in check samples including the following analyses:

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


Executive Vice President


President



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

CERTIFICATE OF PARTICIPATION

This serves to confirm that

**SOUTH AFRICAN GRAIN
LABORATORY**

is actively participating in the

FEEDS

discipline of the AgriLASA PT Scheme for
Cycle One of 2018/2019.



Landbounavorsingsraad
Graangewasse
Potchefstroom

Agricultural Research Council
Grain Crops
Potchefstroom

Republiek van Suid Afrika
Republic of South Africa

**VERSLAG VAN DIE NASIONALE
SOJABOON KULTIVARPROEWE/
2017/18**

**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:

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1 INTRODUCTION

The National Soybean Cultivar Trials (project M101/62 (P05000002) were planted for the 40th successive year this past growing season. A total of 21 trials were planted at 21 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 35 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 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.

Three (3) of the 21 trials could not be included (14%) in the report compared to the four (4) out of 21 trials (19%) in the 2016/17 season.

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

- 1 Hopetown – High CV%. Deviate from set trial plan.
- 2 Kestell – First planting damage by pigeons. Second planting poor emergence. Trial terminated.
- 3 Verkeerdevlei – Poor emergence due severe drought just after planting. Poor yield results.

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 (45 days Marble Hall) and the longest in

the cooler areas (90 days at Clarens).

The number of days to physiological maturity is shown in Table 5. The longest average days to maturity was experienced at Stoffberg (168 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 6663 RSF (MG 6.3) had a mean plant height of 112 cm (highest) in the warm area compared to 56 cm (lowest) of the indeterminate cultivar LS 6851 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 58 cm at Dundee to 101 cm at Bergville.

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 cultivars DM 6.8i RR (MG 6.8; indeterminate) and DM 6663 RSF (MG 6.3; indeterminate), showed a mean pod height of 17cm in the warm area, while NS 5909 R (MG 5.9; indeterminate) and LS 6860 R (MG 6.0; semi determinate) also had an above average pod height in all the areas.

SSS 5449 (tuc) (MG 4.9) (indeterminate) had the lowest reading of 4 in the warm region. 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 at Bapsfontein. The highest lodging figures was reported for LS 6248 R and Y 657 at Bapsfontein as well as LS 6248 R, LS 6860 R, DM 6663 RSF, DM 6402 RSF and DM 6.8i RR at Bergville, both in the moderate area.

3.2.5 Green stem (Table 10)

A high percentage of green stem, was recorded at Potchefstroom, while the cultivars P48T48 R and DM 6663 RSF 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 Greytown in the moderate production area as well as at Delmas 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.

3.2.8 Percentage undesirable seed (Table 13)

The lowest mean of 0.09% undesirable seeds was recorded for the moderate region. The range varied from 1.57% at Bethlehem (due to hail damage) to 0.13% at Cedara.

3.2.9 Mass (g) 100⁻¹ seeds (Table 14)

The variation in seed mass among localities ranged between 14.25 g 100⁻¹ seeds at Bethlehem to 19.28 g 100⁻¹ seeds at Delmas. The highest seed mass was recorded

for PHB 96 T 06 R in the cool region, while LS 6248 R, had the smallest seed in the cool region.

3.2.10 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 1521 R and DM 5953 RSF showed an above average yield probability (Table 19) for all the yield potentials. For the moderate area PAN 1521 R and PAN 1623 R, as for the cool area, showed above average figures over the whole production potential range. PAN 1521 R, PAN 1623 R and DM 6.8i RR also performed above average for the warm areas.

Lokaliite, medewerkers en adresse van kultivarproewe soos beplan vir, 2017/18
Localities, co-operators and addresses of the cultivar trials, 2017/18

Nr No	Lokaliite Locality	Adres van proeflokaliiteit Address of trial locality	Tel. no. Tel. nr.	Verantwoordelike beampte Responsible officer
1	Bapsfontein	Bapsfontein	013 665 2251/082 969 1981	A Mathebula
2	Bergville	J Jackson Shamrock H4 Bergville 3350	082 388 0311	R Wessels
3	Bethlehem	Kleingraan Instituut Bethlehem 9700	082 375 8999	L Bronkhorst & E Maree
4	Brits 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	Groblersdal (Agricol)	Koos Louw trust suite 38 postnet Groblersdal	083 625 4906/081 016 7848	R van Niekerk & C Schoeman
12	Hopetown	Hopetown	084 475 0924/072 253 9433	D Scheepers & PJ Fourie
13	Kestell	Kestell	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	Marble Hall	Marble Hall	079 043 0597	R Boshoff
18	Middelburg	G Anderson Postnet Suite 15 P/Bag 1866 Middelburg 1050	082 375 8999	L Bronkhorst
19	Potchefstroom	IGG Proefplaas Privaatsak X1251 Potchefstroom 2520	018-299 6366/082 375 8999	L Bronkhorst
20	Stoffberg	CMJ Boerdery Posbus 6 Stoffberg 1056	083 625 4906/081 016 7848	R van Niekerk & C Schoeman
21	Verkeerdevlei	Bloemfontein	082 375 8999	L Bronkhorst, J Richter & E Maree

Tabel 1 Sojaboonsaad eienskappe en inligting oor verskaffers, 2017/18
 Table 1 Soybean seed characteristics and information about agents, 2017/18

Kultivar Cultivar	Volwassenheids- groeperings Maturity Group	Groeiwyse Growth habit	Hilum kleur Hilum colour	Blomkleur Flower colour	Haarkleur Pubescence	Op varieteits lys On variety list	Verskaffer Agent	Telersregte Breeding rights
PAN 1454 R	4.3	I	BL	P	B	JAYES	Pannar	JAYES
PHB 94 Y 80 R	4.8	I	BL	P	W	JAYES	Pioneer	JAYES
LS 6248 R	4.8	SD	BL	W	W	JAYES	Link Seed	JAYES
P48T48 R	4.8	I	B	W	T	JAYES	Pioneer	JAYES
DM 5953 RSF	4.8	I	IB	P	W	JAYES	GDM Seeds	JAYES
SSS 5449 (tuc)	4.9	I	B	P	G	JAYES	Sensako	JAYES
NS 5009 R	5.0	I	B	W	T	JAYES	K2	NEE/NO
LS 6851 R	5.1	SD	B	P	W	JAYES	Link Seed	JAYES
NS 5258 R	5.2	I	BL	W	B	JAYES	K2	NEE/NO
PAN 1532 R	5.3	I	LB	P	G	JAYES	Pannar	JAYES
DM 5351 RSF	5.3	I	IB	W	B	JAYES	GDM Seeds	JAYES
Y 540	5.4	I	B	W	-	JAYES	Southern Hemisphere Seeds	NEE/NO
SSS 5052 (tuc)	5.5	I	B	W	G	JAYES	Sensako	JAYES
NS 5509	5.5	I	BL	P	B	JAYES	K2	NEE/NO
Y 550	5.5	I	BL	P	-	JAYES	Southern Hemisphere Seeds	NEE/NO
DM 5609 RSF	5.6	D	LB	P	G	JAYES	GDM Seeds	JAYES
PAN 1521 R	5.7	I	IB	P	G	JAYES	Pannar	JAYES
DM 5302 RSF	5.7	I	LB	P	G	JAYES	GDM Seeds	JAYES
NS 5909 R	5.9	I	IB	P	G	JAYES	K2	NEE/NO
LS 6860 R	6.0	SD	B	P	W	JAYES	Link Seed	JAYES
PHB 96 T 06 R	6.0	I	KL	W	G	JAYES	Pioneer	NEE/NO
PAN 1623 R	6.1	I	KL	W	G	JAYES	Pannar	JAYES
LS 6161 R	6.1	D	IB	P	B	JAYES	Link Seed	JAYES
LS 6862 R	6.2	SD	B	W	W	JAYES	Link Seed	JAYES
SSS 6560 (tuc)	6.2	I	B	W	G	JAYES	Sensako	JAYES
NS 6267 R	6.2	D	IB	P	W	JAYES	K2	NEE/NO
Y 627	6.2	I	B	W	-	JAYES	Southern Hemisphere Seeds	NEE/NO
P61T38 R	6.3	D	LB	W	G	JAYES	Pannar	JAYES
DM 6663 RSF	6.3	I	LB	P	G	JAYES	GDM Seeds	JAYES
NS 6448 R	6.4	SD	LB	P	G	JAYES	K2	NEE/NO
P64T39 R	6.4	I	KL	W	G	JAYES	Pannar seed	JAYES
DM 6402 RSF	6.4	I	LB	W	G	JAYES	GDM Seeds	JAYES
Y 657	6.5	-	B	P	-	JAYES	Southern Hemisphere Seeds	NEE/NO
LS 6868 R	6.8	SD	B	W	W	JAYES	Link Seed	JAYES
DM 6.8i RR	6.8	I	B	P	G	JAYES	GDM Seeds	JAYES

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

*2 BL - Swart/black; IB - Onvolledig 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 verbouingspraktjke by die onderskeie proeflokaltite van die kultivarproewe, 2017/18
Table 2 General information in connection with soil and cultivation practices at the different trial localities, 2017/18

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 ₂ O)	P	K	N	P	K			S	E
Bapsfontein/B	09/11/2017	-	-	-	-	-	-	-	90	-	S26,0878	E28,5816
Bergville/B	21/11/2017	-	-	-	-	-	-	-	90	-	S28°43.234"	E29°18.433"
Bethlehem/D	30/10/2017	Avalon	5.94	60	255	4.76	2.52	0	75	Strongarm, Alachlor, skoffel	S28°09'36,1"	E028°18'14,9"
Brits K2/B	01/12/2017	Katspruit	-	-	-	-	-	-	75	Geen. Slegs geskoffel	S25.591916	E27.719345
Cedara/D	21/11/2017	Hutton	4.29	7	218	0	6.3	0	45	Dual S Gold, Hammer, Round-up powermax	S29°32'10"	E30°16'00"
Clarens/D	14/11/2017	-	-	-	-	-	-	-	90	-	S28°23.387	E28°25.254
Clocolan/D	21/11/2017	-	4.61	56	150	6.44	2.52	0	75	Strongarm en Alachlor	S28°90864°	E027.60007°
Delmas/D	08/12/2017	Sandy loam (Davidson)	-	-	-	-	-	-	90	Flumetsulam, Metolachlor 960, Roundup	S26°8'36,08"	E28°42'28,73"
Dundee/D	15/12/2017	Hutton	-	-	-	-	-	-	45	-	S28°08'19.74	E30°18'53.52
Greytown/D	13/11/2017	Hutton	5.29	20	198	17.78	26.67	35.56	75	Metagan Gold, Roundup	S29°05'08,85"	E30°36'17,8"
(Groblersdal/B) Marble Hall	29/11/2017	Avalon	-	-	-	-	-	-	75	Strongarm, Agill, Round-up	S 25.066033	E29,144778
Hopetown/B	13/12/2017	-	-	-	-	-	-	-	75	-	S29°35'35"	E23°59'50"
Kestell/D	24/11/2017 05/12/2017	-	-	-	-	-	-	-	75	Strongarm, Alachlor en skoffel	S25°39'47.4	"E029°46'19,8"
Kinross/D	20/11/2017	-	4.58	71	173	3.08	2.31	0	75	Strongarm, Alachlor, Round-up, skoffel	S26°22'26,2"	E29°08'47,7"
Kokstad/D	27/11/2017	-	-	-	-	-	-	-	45	Dual Gold	S30°31'54"	E29°24'44"
Kroonstad/D	08/12/2017	-	5.87	41	95	5.88	2.31	11.5	75	Strongarm, Alachlor, Round-up, skoffel	S27°36'29,9"	E027°14'00,6"
Middelburg/D	02/11/2017	-	Boer werk op globale monster			-	-	-	75	Strongarm, Agill, Round-up, skoffel	S25°39'46,4"	E029°46'30,3"
Potchefstroom/B	09/11/2017	Hutton	6.14	61	268	0	2.31	0	75	Strongarm, Alachlor, Round-up, skoffel	S26°44'00,0"	E027°04'01,2"
Stoffberg/D	27/10/2017	Hutton	4.77	15	150	0	0	0	76	Round-up powermax	S25.437151	E29.853939
(Thabazimbi/B) Groblersdal	15/11/2017	Hutton	6.41	21	333	0	0	0	76	Round-up powermax	S25.377004	E29.365510
Verkeerdevelei/D	08/12/2017	Hutton	-	-	-	-	-	-	75	Strongarm, Alachlor, Round-up	S28°48'15,6"	E026°46'39,9"

- Inligting nie beskikbaar/information not available

Haal skade/Hail damage Clarens – 24/12/2018

Tabel 3 Reënval en besproeiing vir die verskillende lokaliteite (mm), 2017/18
 Table 3 Rainfall and irrigation at the different localities (mm), 2017/18

Lokaliiteit Locality	Maandelikse reënval (mm)/Monthly rainfall (mm)												Totaal Total *	Besproeiing Irrigation	Totaal Total **
	Okt	Nov	Des	Jan	Feb	Mrt	Apr								
Bethlehem	43.18	94.23	114.3	98.55	163.07	213.11	43.43	769.87	0	769.87					
Cedara	145.29	135.64	98.3	20.83	227.6	155.7	64.77	848.13	0	848.13					
Greytown	-	123.2	102.8	72.4	83.6	122.8	41.6	546.4	0	546.4					
Groblersdal	79	83	132	37	38	91	60	520	325	845					
Potchefstroom B	56.13	69.34	62.48	47.24	68.33	58.93	35.56	398.01	0	398.01					
Stoffberg	77	65	140	46	44	89	49	510	0	510					

* 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, 2017/18
 Table 4. The number of days from planting to 50% flowering stage of the different soybean cultivars at the different trial localities, 2017/18

Kultivar	Koel/Cool								Matig/Moderate								Warm			
	Bethlehem	Clarens	Coccolan	Delmas	Kinross	Kokstad	Middelburg	Gem/Mean	Dapfontein	Bergville	Cedara	Dundee	Kroonstad	Potchefstroom	Stoffberg	Gem/Mean	Brits K2	Groblersdal	Marble Hill	Gem/Mean
PAN 1454 R	56	62	55	49	60	71	63	59	56	59	81	53	39	43	61	56	45	40	40	42
PHB 94 Y 80 R	43	62	55	48	60	76	63	58	56	62	60	53	39	43	62	54	43	38	41	40
LS 6248 R	72	94	84	67	84	85	97	83	76	77	77	67	64	62	62	69	49	47	48	48
P48T48 R	64	69	55	49	60	69	77	63	56	59	60	54	39	43	58	53	42	42	41	42
DM 5953 RSF	67	69	64	49	60	71	63	63	56	59	60	52	39	43	63	53	42	45	43	43
SSS 5449 (tuc)	67	87	70	67	79	84	83	77	68	74	73	66	59	62	75	68	46	54	44	48
NS 5009 R	67	69	55	49	66	72	77	65	56	59	71	56	39	43	60	55	42	49	41	44
LS 6851 R	86	90	84	66	79	87	90	83	69	74	75	65	54	62	74	68	46	56	44	49
NS 5258 R	67	69	57	49	60	73	63	63	56	59	61	54	39	43	68	54	43	48	40	44
PAN 1532 R	77	97	95	67	79	84	92	84	75	70	73	66	64	57	78	69	49	54	45	49
DM 5351 RSF	64	69	57	49	60	75	70	63	55	59	60	52	39	49	61	54	42	48	40	43
Y 540	77	84	57	67	79	82	83	76	70	77	62	66	59	49	71	65	47	52	46	48
SSS 5052 (tuc)	79	97	96	69	85	85	90	86	77	74	78	68	63	62	79	72	51	50	46	49
NA 5509 R	77	94	96	67	87	88	90	85	77	74	79	68	54	71	83	72	51	57	45	51
Y 550	86	97	70	67	87	80	83	81	72	74	76	66	64	54	82	70	47	55	46	49
DM 5609 RSF	77	97	84	63	79	78	108	84	74	74	76	65	70	71	80	73	46	56	45	49
PAN 1521 R	86	97	96	68	87	87	83	86	78	74	75	67	65	71	84	73	51	56	47	51
DM 5302 RSF	77	92	84	66	77	87	77	80	70	77	73	66	64	57	74	69	48	54	45	49
NS 5909 R	86	96	91	71	92	83	97	88	81	80	80	73	59	69	81	75	51	61	47	53
LS 6860 R	91	101	91	75	92	91	108	93	81	77	80	71	70	71	81	76	50	60	47	53
PHB 96 T 06 R	91	97	96	74	89	91	104	92	82	77	81	73	64	71	87	76	51	57	46	52
PAN 1623 R	77	97	91	70	82	88	104	87	79	74	80	70	65	62	83	73	51	59	46	52
LS 6161 R	86	94	91	69	79	85	97	86	77	74	80	67	70	69	82	74	49	62	45	52
LS 6862 R	86	94	96	72	79	89	90	87	80	77	77	66	70	62	83	74	49	56	45	50
SSS 6560 (tuc)	77	97	70	67	87	87	90	82	76	74	77	66	64	69	85	73	50	60	44	51
NS 6267 R	86	90	84	67	79	83	90	83	75	74	76	67	54	71	85	72	48	55	46	50
Y 627	86	97	84	67	79	84	90	84	77	74	77	67	54	71	84	72	51	59	47	52
P61T38 R	77	94	84	68	79	85	90	82	74	86	76	66	59	67	86	74	50	60	47	52
DM 6663 RSF	91	103	91	74	87	92	90	90	82	77	81	73	70	71	90	78	51	59	47	52
NS 6448 R	91	94	84	61	82	90	97	86	81	77	79	71	63	71	89	76	49	53	47	50
P64T39 R	86	97	91	75	92	91	90	89	83	77	81	71	70	62	88	76	51	56	46	51
DM 6402 RSF	91	97	96	75	92	89	108	93	84	89	80	73	64	67	90	78	53	56	48	52
Y 657	86	100	91	68	92	90	104	90	82	77	80	71	64	71	92	77	53	58	48	53
LS 6868 R	86	106	96	77	92	85	108	93	82	89	82	72	64	71	93	79	51	61	48	53
DM 6.8i RR	91	100	91	76	87	89	90	89	82	77	81	69	70	67	90	77	52	64	48	54
Gem/Mean	79	90	81	65	80	84	89	81	73	73	75	65	58	61	78	69	48	54	45	49

Tabel 5 Die aantal dae vanaf plant tot fisiologiesryp stadium van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2017/18

Table 5 The number of days from planting to physiological maturity of the different soybean cultivars at the different trial localities, 2017/18

Kultivar	Koel/Cool						Matig/Moderate						Warm				
	Bethlehem	Clarens	Clocolan	Kinross	Kokstad	Widdeburg	Gem/Mean	Bergville	Cedara	Kroonstad	Potchefstroom	Stoffberg	Gem/Mean	Brits K2	Groblersdal	Marble Hall	Gem/Mean
PAN 1454 R	130	146	146	137	133	140	139	126	131	123	128	147	131	114	103	111	109
PHB 94 Y 80 R	130	139	141	132	141	138	137	123	130	120	128	146	129	112	101	113	109
LS 6248 R	148	156	141	148	158	154	151	137	141	132	145	152	141	113	121	119	118
P48T48 R	130	143	141	137	135	141	138	137	131	116	134	152	134	108	105	119	111
DM 5953 RSF	130	143	141	132	163	138	141	116	131	123	128	155	131	112	112	114	113
SSS 5449 (tuc)	148	153	146	146	158	154	151	123	135	116	128	163	133	112	113	111	112
NS 5009 R	130	143	141	137	133	138	137	116	132	116	128	155	129	122	119	116	119
LS 6851 R	148	167	160	137	158	167	156	126	141	132	145	161	141	108	127	120	119
NS 5258 R	130	139	141	132	137	140	137	116	130	120	134	153	131	108	105	112	108
PAN 1532 R	148	153	160	148	156	154	153	126	137	132	145	167	141	111	125	121	119
DM 5351 RSF	130	139	141	132	135	140	136	123	130	123	134	154	133	108	111	113	111
Y 540	148	153	160	143	150	150	151	126	134	123	145	159	137	110	119	114	114
SSS 5052 (tuc)	148	162	163	148	141	154	153	134	138	132	145	168	143	113	120	115	116
NA 5509 R	163	167	163	148	154	161	159	129	140	132	145	172	144	113	123	120	119
Y 550	163	167	163	148	150	158	158	129	138	123	134	171	139	110	120	120	117
DM 5609 RSF	148	160	160	148	154	158	155	123	137	123	136	169	138	114	124	118	119
PAN 1521 R	155	160	160	137	156	154	154	129	135	132	136	160	138	119	121	111	117
DM 5302 RSF	148	156	163	146	150	154	153	123	136	123	128	162	134	108	114	114	112
NS 5909 R	163	170	163	155	156	167	162	137	144	132	145	169	145	118	128	118	121
LS 6860 R	163	170	163	163	141	167	161	149	143	110	145	168	143	119	125	116	120
PHB 96 T 06 R	163	167	163	155	158	167	162	137	142	132	145	173	146	125	126	122	124
PAN 1623 R	177	167	163	148	150	154	160	134	139	132	145	176	145	117	126	115	119
LS 6161 R	177	162	163	155	150	161	161	137	143	140	145	170	147	120	127	122	123
LS 6862 R	157	167	163	148	158	158	159	134	143	132	134	177	144	108	129	118	118
SSS 6560 (tuc)	163	156	160	148	156	154	156	134	139	132	145	176	145	117	119	113	116
NS 6267 R	148	167	163	155	135	167	156	144	143	123	145	178	147	115	129	119	121
Y 627	163	167	160	148	156	158	159	134	139	132	145	182	146	112	122	120	118
P61T38 R	148	162	163	148	141	159	154	137	147	132	145	182	149	124	135	119	126
DM 6663 RSF	148	170	163	155	162	167	161	133	143	140	128	182	145	120	128	123	124
NS 6448 R	163	170	160	148	163	158	160	137	144	132	145	181	148	132	127	121	127
P64T39 R	144	170	163	163	156	165	160	137	148	140	145	183	151	120	130	122	124
DM 6402 RSF	163	170	163	151	158	167	162	149	143	132	128	181	147	124	134	122	127
Y 657	148	167	163	155	161	161	159	137	144	132	145	181	148	116	132	121	123
LS 6868 R	144	170	163	155	168	169	162	149	148	140	145	183	153	118	132	115	122
DM 6.81 RR	144	170	163	155	168	167	161	149	148	123	145	183	150	125	131	121	126
Gem/Mean	150	160	157	147	151	156	153	132	139	128	139	168	141	116	122	117	118

Tabel 6 Die aantal dae vanaf plant tot oesstadium van die verskillende sojaaboonkultivars by die verskillende proef lokaliteite, 2017/18

Table 6 The number of days from planting to maturity of the different soybean cultivars at the different trial localities, 2017/18

Kultivar	Koel/Cool						Matig/Moderate						Warm				
	Bethlehem	Clarens	Ciocolan	Kinross	Kokstad	Widdeburg	Gem/Mean	Bergville	Cedara	Kroonstad	Potchefstroom Bespr	Stoffberg	Gem/Mean	Brits K2	Groblersdal	Marble Hall	Gem/Mean
PAN 1454 R	153	171	168	148	157	154	159	142	148	132	145	153	144	127	112	133	124
PHB 94 Y 80 R	148	168	168	148	157	154	157	142	150	132	145	153	144	127	112	121	120
LS 6248 R	191	185	197	180	192	196	190	155	155	155	186	164	163	127	134	133	131
P48T48 R	153	171	168	155	157	167	162	155	148	132	145	161	148	127	112	133	124
DM 5953 RSF	148	171	168	148	157	154	158	142	148	132	145	164	146	127	120	121	123
SSS 5449 (tuc)	167	171	171	164	168	171	169	142	148	154	145	164	151	127	120	121	123
NS 5009 R	152	171	168	148	157	154	158	142	148	139	145	164	148	127	131	121	126
LS 6851 R	169	185	184	178	191	196	184	155	153	154	162	176	160	133	139	125	132
NS 5258 R	158	168	174	148	157	154	160	142	148	154	145	161	150	121	112	121	118
PAN 1532 R	169	171	181	178	191	174	177	155	148	155	162	176	159	127	134	121	129
DM 5351 RSF	148	168	168	148	157	154	157	142	148	132	145	164	146	127	140	121	129
Y 540	158	171	174	164	157	167	165	142	148	155	151	169	153	127	131	121	126
SSS 5052 (tuc)	184	185	197	180	193	196	189	155	148	155	176	176	162	127	131	133	130
NA 5509 R	191	185	197	178	191	189	188	142	150	154	173	184	161	127	134	129	130
Y 550	191	185	190	178	192	196	189	142	150	154	165	176	158	127	131	121	126
DM 5609 RSF	184	185	184	171	191	179	182	142	148	155	154	176	155	125	134	133	131
PAN 1521 R	176	185	190	155	193	169	178	155	148	154	176	169	160	128	134	125	129
DM 5302 RSF	169	185	177	155	191	174	175	142	148	154	154	169	153	127	120	121	123
NS 5909 R	191	185	197	169	191	196	188	155	155	155	176	176	163	133	139	121	131
LS 6860 R	191	185	197	182	193	196	191	155	155	155	184	176	165	128	134	125	129
PHB 96 T 06 R	191	185	197	180	192	196	190	155	158	147	173	184	163	130	139	130	133
PAN 1623 R	191	185	184	178	192	189	186	155	153	155	173	184	164	130	139	133	134
LS 6161 R	191	185	197	178	191	181	187	155	155	155	173	169	161	127	139	133	133
LS 6862 R	184	185	197	178	191	196	188	155	158	155	168	184	164	127	145	121	131
SSS 6560 (tuc)	191	185	190	178	192	196	189	155	155	155	175	184	165	127	131	129	129
NS 6267 R	184	185	190	178	193	196	188	155	158	147	173	184	163	128	139	133	133
Y 627	191	185	184	178	193	189	187	155	153	155	184	187	167	128	134	133	132
P61T38 R	176	185	190	178	191	196	186	155	163	155	179	184	167	130	145	133	136
DM 6663 RSF	191	185	190	178	191	196	189	155	158	155	181	187	167	134	139	124	132
NS 6448 R	191	185	197	180	191	189	189	155	155	155	162	187	163	134	139	129	134
P64T39 R	191	185	197	178	191	196	190	155	163	155	186	187	169	128	139	133	133
DM 6402 RSF	191	185	197	176	191	196	189	155	155	155	186	184	167	128	145	133	135
Y 657	191	185	197	178	191	196	187	155	153	154	168	184	163	128	145	133	135
LS 6868 R	191	185	197	178	192	196	190	155	163	155	173	187	167	128	145	133	135
DM 6.8i RR	191	185	197	178	193	196	190	155	163	155	184	187	169	134	145	133	137
Gem/Mean	178	181	186	170	183	182	180	151	153	151	166	175	159	128	133	128	130

Tabel 7 Die planthoogte van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2017/18
 Table 7 The plant height of the different soybean cultivars at the different trial localities, 2017/18

Kultivar	Koel/Cool								Matig/Moderate								Warm		
	Bethlehem	Clarens	Clocolan	Delmas	Kinross	Widdeburg	Gem/Mean	Bapfontein	Bergville	Cedara	Dundee	Greytown	Kroonstad	Potchefstroom	Stoffberg	Gem/Mean	Groblersdal	Marble Hall	Gem/Mean
PAN 1454 R	73	60	85	66	88	92	77	73	105	77	60	69	77	75	70	76	67	90	79
PHB 94 Y 80 R	65	50	65	58	78	80	66	64	100	65	51	59	50	80	66	67	64	80	72
LS 6248 R	108	80	88	80	110	112	96	93	115	103	69	91	95	105	75	93	73	110	92
P48T48 R	72	70	68	64	87	78	73	69	90	66	47	65	60	48	61	63	55	80	68
DM 5953 RSF	83	65	77	62	87	98	79	72	95	74	55	65	72	93	70	75	68	90	78
SSS 5449 (tuc)	80	90	87	72	95	102	88	79	90	82	52	71	72	77	67	74	65	90	78
NS 5009 R	52	45	70	63	65	78	62	66	60	62	43	63	73	73	65	63	63	90	77
LS 6851 R	57	60	70	61	90	80	70	68	90	79	52	75	55	58	54	66	51	60	56
NS 5258 R	75	65	57	76	72	83	71	81	85	70	47	63	50	75	63	67	61	90	76
PAN 1532 R	92	60	70	66	75	78	73	68	85	72	42	70	68	82	68	69	65	80	73
DM 5351 RSF	87	60	77	66	87	87	77	74	90	71	50	62	68	92	72	72	68	90	79
Y 540	92	65	62	62	87	92	76	69	70	77	51	66	67	85	70	69	63	95	79
SSS 5052 (tuc)	97	65	73	63	102	93	82	81	110	87	63	79	80	93	68	83	65	100	83
NA 5509 R	93	80	78	66	92	107	86	72	110	93	59	76	73	95	65	80	64	110	87
Y 550	105	80	97	66	88	100	89	67	105	93	57	79	75	90	62	78	58	110	84
DM 5609 RSF	75	65	57	68	90	92	74	74	90	77	55	74	58	60	60	69	57	70	64
PAN 1521 R	117	80	77	69	100	101	90	70	105	85	67	76	75	108	65	81	64	110	87
DM 5302 RSF	92	75	62	68	90	93	80	76	100	75	50	71	60	72	70	72	66	90	78
NS 5909 R	110	55	77	68	100	105	86	72	110	92	51	76	75	110	75	83	71	90	81
LS 6860 R	110	90	90	87	113	110	100	87	105	94	62	79	83	123	75	89	72	110	91
PHB 96 T 06 R	110	80	110	73	107	101	97	73	115	106	63	91	75	98	75	87	72	120	96
PAN 1623 R	98	65	82	83	97	104	88	83	105	95	61	79	83	110	75	86	73	110	92
LS 6161 R	97	75	78	76	97	96	87	81	110	93	62	82	85	110	70	87	67	120	94
LS 6862 R	85	75	87	70	92	95	84	80	100	84	57	73	72	100	70	79	66	90	78
SSS 6560 (tuc)	103	75	78	82	107	95	90	90	115	95	60	75	73	108	70	86	67	110	89
NS 6267 R	82	80	63	73	92	90	80	79	100	92	58	71	63	67	75	76	72	80	76
Y 627	97	80	82	66	98	107	88	70	110	93	59	80	72	98	70	82	66	100	83
P61T38 R	82	65	68	64	95	92	78	70	95	88	56	76	67	55	58	71	54	70	62
DM 6663 RSF	127	80	98	80	102	113	100	79	110	103	72	96	95	110	101	96	94	130	112
NS 6448 R	112	80	70	69	93	97	87	73	110	96	59	85	65	90	72	81	68	90	79
P64T39 R	115	65	88	73	110	108	93	78	115	96	69	83	75	117	78	89	76	100	88
DM 6402 RSF	112	80	95	74	95	105	94	79	105	94	62	91	85	100	95	89	92	120	106
Y 657	112	75	92	75	102	111	94	77	110	96	59	78	73	100	80	84	75	100	88
LS 6868 R	90	60	75	80	110	120	89	81	110	101	67	95	75	85	90	88	88	120	104
DM 6.8i RR	132	105	92	81	108	123	107	92	115	111	76	97	93	130	70	98	65	130	98
Gem/Mean	94	71	78	71	94	98	84	76	101	87	58	77	73	91	71	79	68	98	83

Tabel 8 Die peulhoogte van die verskillende soja boonkultivars by die verskillende proef lokaliteite, 2017/18

Table 8 The pod height of the different soybean cultivars at the different trial localities, 2017/18

Kultivar	Koel/Cool					Matig/Moderate								Warm					
	Bethlehem	Clarens	Clocolan	Delmas	Kinross	Middelburg	Gem/Mean	Bapsfontein	Bergville	Cedara	Dundee	Greytown	Kroonstad	Potchetstroom	Stoffberg	Gem/Mean	Groblersdal	Marble Hall	Gem/Mean
PAN 1454 R	5	5	10	13	7	9	8	14	7	11	9	11	8	7	10	10	7	10	9
PHB 94 Y 80 R	5	3	3	7	8	8	6	6	10	10	7	10	1	8	5	7	4	10	7
LS 6248 R	13	7	2	19	11	10	11	18	20	20	12	17	10	10	10	15	8	10	9
P48T48 R	6	7	3	9	10	7	7	9	9	12	8	12	4	5	5	8	3	10	7
DM 5953 RSF	7	5	6	8	7	10	7	7	16	13	9	11	8	11	10	11	7	10	9
SSS 5449 (tuc)	6	10	8	9	8	10	9	12	7	17	6	12	3	6	5	8	3	5	4
NS 5009 R	5	5	5	8	5	9	6	7	5	9	6	10	6	7	5	7	4	10	7
LS 6851 R	2	5	4	10	11	7	6	11	13	19	9	19	2	5	5	10	3	10	7
NS 5258 R	7	5	1	15	6	8	7	15	6	9	7	8	1	6	8	8	6	5	6
PAN 1532 R	8	6	4	8	9	7	7	8	13	14	6	16	4	7	8	10	7	10	9
DM 5351 RSF	9	4	8	8	8	9	8	8	12	13	6	10	4	10	9	9	7	8	8
Y 540	7	5	2	14	10	8	8	14	10	13	7	12	3	11	7	10	5	15	10
SSS 5052 (tuc)	9	5	7	10	10	10	8	8	17	18	10	21	7	9	7	12	6	10	8
NA 5509 R	9	6	6	13	10	10	9	12	9	21	12	19	4	13	10	13	8	15	12
Y 550	14	10	6	12	10	10	10	16	16	18	9	19	5	5	5	12	4	10	7
DM 5609 RSF	5	5	3	11	9	10	7	11	10	15	9	18	1	5	5	9	3	10	7
PAN 1521 R	13	7	7	16	10	11	11	16	14	17	14	19	4	12	8	13	7	10	9
DM 5302 RSF	8	7	2	11	7	8	7	10	9	12	7	12	2	7	12	9	11	10	11
NS 5909 R	12	10	10	19	11	10	12	18	17	22	10	18	5	12	15	15	13	15	14
LS 6860 R	14	10	5	14	14	9	11	13	17	17	12	23	6	11	18	15	16	10	13
PHB 96 T 06 R	12	5	10	9	12	8	9	9	14	18	12	20	5	13	20	14	17	10	14
PAN 1623 R	9	7	4	16	9	12	9	16	13	18	11	16	4	13	12	13	10	8	9
LS 6161 R	10	7	7	15	10	10	10	13	20	20	10	25	7	12	8	14	6	15	11
LS 6862 R	7	7	6	11	9	11	9	10	13	16	11	20	4	11	15	12	12	10	11
SSS 6560 (tuc)	9	10	6	17	9	10	10	15	21	21	10	17	4	11	12	14	11	10	11
NS 6267 R	8	10	4	14	12	11	10	12	12	23	14	20	3	7	15	13	13	10	12
Y 627	9	10	3	13	8	11	9	13	15	19	10	17	5	10	15	13	12	15	14
P61T38 R	6	10	2	15	11	10	9	15	7	25	15	27	4	10	10	14	8	15	12
DM 6663 RSF	10	10	11	15	10	11	11	12	13	23	13	20	9	9	21	15	18	15	17
NS 6448 R	15	10	6	15	9	11	11	16	17	22	12	20	3	11	12	14	11	15	13
P64T39 R	12	5	8	10	13	9	9	11	18	18	11	21	4	10	10	13	8	8	8
DM 6402 RSF	13	9	9	15	8	10	11	17	19	18	12	20	6	9	10	13	9	10	10
Y 657	13	9	9	16	11	9	11	13	19	19	10	18	4	12	8	13	7	8	8
LS 6868 R	8	5	7	13	11	11	9	14	17	22	12	26	6	8	13	15	12	10	11
DM 6.8i RR	22	11	5	16	10	10	12	18	19	21	13	20	9	10	20	16	19	15	17
Gem/Mean	9	7	6	13	9	10	9	12	13	17	10	17	5	9	11	12	9	11	10

Tabel 9 Omvalwaarnemings (1-5) van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2017/18
 Table 9 Lodging dat (1-5) of the different soybean cultivars at the different trial localities, 2017/18

Kultivar	Koel/Cool				Matig/Moderate								Warm							
	Bethlehem	Cicolan	Delmas	Kinross	Widdelburg	Gem/Mean	Bapfontein	Bergville	Cedara	Dundee	Greytown	Kronstad	Potchefstroom	Stoffberg	Verkeerdevel	Gem/Mean	Brits K2	Groblersdal	Marble Hall	Gem/Mean
	1.00	1.00	2.33	1.67	1.00	1.40	3.00	1.00	1.00	1.00	1.33	1.00	1.00	1.00	1.00	1.00	1.26	1.00	1.00	1.00
PAN 1454 R	1.00	1.00	3.00	1.00	1.00	1.40	3.00	1.00	1.00	1.00	1.33	1.00	1.00	1.00	1.00	1.00	1.26	1.00	1.00	1.00
PHB 94 Y 80 R	1.00	1.00	3.00	1.00	1.00	1.40	3.00	1.00	1.00	1.00	2.33	1.00	1.00	1.00	1.00	1.00	1.37	1.00	1.00	1.00
LS 6248 R	1.00	1.00	3.00	1.67	1.00	1.53	5.00	5.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.89	1.00	1.00	1.00
P48T48 R	1.00	1.00	2.33	1.00	1.00	1.27	3.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.22	1.00	1.00	1.00
DM 5953 RSF	1.00	1.00	2.33	1.00	1.00	1.27	3.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.26	1.00	1.00	1.00
SSS 5449 (tuc)	1.00	1.00	2.67	1.00	1.00	1.33	3.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.22	1.00	1.00	1.00
NS 5009 R	1.00	1.00	1.33	1.00	1.00	1.07	3.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.22	1.00	1.00	1.00
LS 6851 R	1.00	1.00	1.00	1.00	1.00	1.00	2.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.15	1.00	1.00	1.00
NS 5258 R	1.00	1.00	2.33	1.00	1.00	1.27	3.00	1.00	1.00	1.00	1.33	1.00	1.00	1.00	1.00	1.00	1.26	1.00	1.00	1.00
PAN 1532 R	1.00	1.00	1.33	1.00	1.00	1.07	2.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.15	1.00	1.00	1.00
DM 5351 RSF	1.00	1.00	2.00	1.00	1.00	1.20	2.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.19	1.00	1.00	1.00
Y 540	1.00	1.00	1.67	1.00	1.00	1.13	3.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.26	1.00	1.00	1.00
SSS 5052 (tuc)	1.00	1.00	2.00	1.00	1.00	1.20	3.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.26	1.00	1.00	1.00
NA 5509 R	1.00	1.00	1.67	1.00	1.67	1.27	4.00	1.00	1.00	1.00	1.33	1.00	1.00	1.00	1.00	1.00	1.37	1.00	1.00	1.00
Y 550	1.00	1.00	2.33	1.00	1.33	1.33	4.33	3.00	1.00	1.00	1.67	1.00	1.00	1.00	1.00	1.00	1.67	1.00	1.00	1.00
DM 5609 RSF	1.00	1.00	2.00	1.00	1.00	1.20	3.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.22	1.00	1.00	1.00
PAN 1521 R	1.00	1.00	2.00	1.67	1.00	1.33	4.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.00	1.00	1.00
DM 5302 RSF	1.00	1.00	2.67	1.00	1.00	1.33	3.67	3.00	1.00	1.00	1.33	1.00	1.00	1.00	1.00	1.00	1.56	1.00	1.00	1.00
NS 5909 R	1.00	1.00	2.33	1.00	1.00	1.27	3.67	3.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.52	1.00	1.00	1.00
LS 6860 R	1.00	1.00	2.33	1.33	1.33	1.40	3.33	5.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.70	1.00	1.00	1.00
PHB 96 T 06 R	1.00	1.00	2.67	1.00	1.00	1.33	4.67	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.52	1.00	1.00	1.00
PAN 1623 R	1.00	1.00	3.00	1.00	1.67	1.53	4.50	1.00	1.00	1.00	1.33	1.00	1.00	1.00	1.00	1.00	1.43	1.00	1.00	1.00
LS 6161 R	1.00	1.00	2.33	1.00	1.00	1.27	3.50	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.39	1.00	1.00	1.00
LS 6862 R	1.00	1.00	2.00	1.00	1.00	1.20	3.50	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.39	1.00	1.00	1.00
SSS 6560 (tuc)	1.00	1.00	2.00	1.00	1.00	1.20	4.33	2.00	1.00	1.00	2.00	1.00	1.00	1.00	1.00	1.00	1.59	1.00	1.00	1.00
NS 6267 R	1.00	1.00	1.33	1.00	1.00	1.07	4.00	4.00	1.00	1.00	1.67	1.00	1.00	1.00	1.00	1.00	1.74	1.00	1.00	1.00
Y 627	1.00	1.00	2.67	1.00	1.00	1.33	4.33	2.00	1.00	1.00	1.67	1.00	1.00	1.00	1.00	1.00	1.56	1.00	1.00	1.00
P61T38 R	1.00	1.00	1.00	1.00	1.00	1.00	2.33	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.26	1.00	1.00	1.00
DM 6663 RSF	1.00	1.00	3.00	1.33	1.33	1.53	4.00	5.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.78	1.00	1.00	1.00
NS 6448 R	1.00	1.00	1.33	1.00	1.00	1.07	3.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.00	1.00	1.00
P64T39 R	1.00	1.00	2.67	1.33	1.00	1.40	3.33	2.00	1.00	1.00	1.33	1.00	1.67	1.00	1.00	1.00	1.48	1.00	1.00	1.00
DM 6402 RSF	1.00	1.00	2.67	1.00	1.33	1.40	3.33	5.00	1.00	1.00	1.33	1.00	1.00	1.00	1.00	1.00	1.74	1.00	1.00	1.00
Y 657	1.00	1.00	2.67	1.00	1.00	1.33	5.00	3.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.67	1.00	1.00	1.00
LS 6868 R	1.00	1.00	2.00	1.00	1.00	1.20	3.50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.28	1.00	1.00	1.00
DM 6.8i RR	1.00	1.00	3.33	1.33	1.00	1.53	4.00	5.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.78	1.00	1.00	1.00
Gem/Mean	1.00	1.00	2.21	1.10	1.08	1.28	3.53	2.11	1.00	1.00	1.19	1.00	1.02	1.00	1.00	1.43	1.00	1.00	1.00	1.00

Tabel 10 Groenstam (1-5) van die verskillende sojaboonekultivars by die verskillende proef lokaliteite, 2017/18
 Table 10 Greenstem (1-5) of the different soybean cultivars at the different trial localities, 2017/18

Kultivar	Koel/Cool					Matig/Moderate					Warm							
	Bethehem	Cicolan	Kinross	Kokstad	Middelburg	Gem/Mean	Bapsfontein	Cedara	Dundee	Greytown	Kroonstad	Potchefstroom	Stoffberg	Gem/Mean	Brits K2	Groblersdal	Marble Hill	Gem/Mean
PAN 1454 R	2.67	1.67	2.33	1.00	1.33	1.80	1.00	1.33	1.00	2.00	4.00	5.00	1.00	2.19	1.00	2.00	1.00	1.33
PHB 94 Y 80 R	2.00	1.33	1.00	1.00	2.00	1.47	1.00	2.67	1.00	2.00	4.33	4.33	1.00	2.33	1.00	1.00	1.00	1.00
LS 6248 R	1.33	3.67	1.00	1.00	1.00	1.60	2.67	1.00	1.00	2.33	5.00	4.33	1.00	2.48	1.00	1.00	1.00	1.00
P48T48 R	3.33	1.67	1.67	1.00	2.67	2.07	1.33	2.33	1.00	2.33	4.67	5.00	2.00	2.67	1.00	3.00	1.00	1.67
DM 5953 RSF	4.00	1.00	1.00	1.00	1.00	1.60	1.00	1.00	1.00	1.00	3.67	4.67	2.00	2.05	1.00	2.00	1.00	1.33
SSS 5449 (tuc)	2.00	1.33	1.00	1.00	1.00	1.27	1.00	1.00	1.00	1.67	4.67	4.67	1.00	1.62	1.00	1.00	1.00	1.00
NS 5009 R	3.00	1.00	2.00	1.00	1.67	1.73	1.00	2.33	1.00	1.00	3.00	5.00	2.00	2.19	1.00	3.00	1.00	1.67
LS 6851 R	2.67	2.00	1.00	1.00	1.00	1.53	1.33	1.00	1.00	1.00	3.33	4.00	1.00	1.81	1.00	1.00	1.00	1.00
NS 5258 R	2.33	1.33	1.33	1.00	1.00	1.40	1.00	1.00	1.00	1.33	2.00	3.33	1.00	1.52	1.00	1.00	1.00	1.00
PAN 1532 R	2.00	2.33	1.00	1.00	1.00	1.47	1.00	1.00	1.00	1.33	2.33	4.33	1.00	1.71	1.00	2.00	1.00	1.33
DM 5351 RSF	3.67	1.00	1.00	1.00	1.00	1.53	1.00	1.00	1.00	1.33	3.33	5.00	2.00	2.10	1.00	2.00	1.00	1.33
Y 540	2.00	3.33	1.00	1.00	2.33	1.93	1.00	1.00	1.00	1.00	3.33	5.00	1.00	1.90	1.00	1.00	1.00	1.00
SSS 5052 (tuc)	2.67	2.67	1.00	1.00	1.00	1.67	1.67	1.00	1.00	1.33	3.33	4.00	1.00	1.90	1.00	1.00	1.00	1.00
NA 5509 R	2.00	1.67	1.00	1.00	1.00	1.33	2.67	1.00	1.00	4.00	3.00	4.67	1.00	2.48	1.00	1.00	1.00	1.00
Y 550	2.33	2.67	1.00	1.00	1.00	1.67	4.00	1.00	1.00	3.00	3.67	5.00	1.00	2.67	1.00	2.00	1.00	1.33
DM 5609 RSF	2.00	2.67	1.00	1.00	1.67	1.67	2.33	1.00	1.00	1.33	4.33	5.00	2.00	2.43	1.00	3.00	1.00	1.67
PAN 1521 R	2.67	2.67	2.00	1.00	1.67	2.00	1.33	1.00	1.00	1.00	2.33	3.67	1.00	1.62	1.00	1.00	1.00	1.00
DM 5302 RSF	2.00	3.00	1.67	1.00	1.00	1.73	1.00	1.00	1.00	1.00	2.33	4.33	1.00	1.67	1.00	1.00	1.00	1.00
NS 5909 R	3.00	3.67	1.00	1.00	1.33	2.00	2.67	1.00	1.00	2.67	5.00	5.00	1.00	2.62	1.00	1.00	1.00	1.00
LS 6860 R	2.67	3.00	1.00	1.00	1.67	1.87	3.67	1.00	1.00	3.67	4.33	3.67	1.00	2.62	1.00	1.00	1.00	1.00
PHB 96 T 06 R	2.00	3.00	1.00	1.00	1.00	1.60	1.33	1.00	1.00	1.67	3.67	4.33	1.00	2.00	1.00	1.00	1.00	1.00
PAN 1623 R	2.33	2.67	1.00	1.00	1.00	1.60	1.33	1.00	1.00	1.67	3.33	4.33	1.00	1.95	1.00	1.00	1.00	1.00
LS 6161 R	1.33	2.33	1.00	1.00	1.33	1.40	2.00	1.00	1.33	2.67	4.33	5.00	1.00	2.48	1.00	1.00	1.00	1.00
LS 6862 R	1.67	1.67	1.00	1.00	1.00	1.27	2.00	1.00	1.00	2.33	4.00	4.00	1.00	2.19	1.00	1.00	1.00	1.00
SSS 6560 (tuc)	1.67	4.00	1.00	1.00	1.00	1.73	1.33	1.00	1.00	2.67	4.00	5.00	1.00	2.29	1.00	1.00	1.00	1.00
NS 6267 R	3.67	2.33	1.00	1.00	1.00	1.80	3.33	1.00	1.00	2.00	5.00	4.67	1.00	2.57	1.00	2.00	1.00	1.33
Y 627	2.00	3.00	1.00	1.00	1.67	1.73	2.67	1.00	1.00	2.00	4.67	4.67	1.00	2.43	1.00	2.00	1.00	1.33
P61T38 R	3.00	3.00	1.00	1.00	1.00	1.80	2.67	1.67	1.00	3.00	4.67	3.33	1.00	2.48	1.00	1.00	1.00	1.00
DM 6663 RSF	3.67	2.67	1.00	1.00	1.00	1.87	4.33	1.00	1.00	5.00	5.00	5.00	1.00	3.19	1.00	3.00	1.00	1.67
NS 6448 R	1.67	2.67	1.00	1.00	1.00	1.47	1.67	1.00	1.00	3.00	2.33	4.67	1.00	2.10	1.00	1.00	1.00	1.00
P64T39 R	3.33	1.33	1.00	1.00	1.00	1.53	3.00	1.00	1.00	3.00	4.67	5.00	1.00	2.67	1.00	1.00	1.00	1.00
DM 6402 RSF	3.33	3.67	1.00	1.00	1.00	2.00	4.00	1.00	1.00	4.33	5.00	4.67	1.00	3.00	1.00	2.00	1.00	1.33
Y 657	2.00	1.67	1.00	1.00	1.00	1.33	2.33	1.00	1.00	1.67	2.33	3.67	1.00	1.86	1.00	1.00	1.00	1.00
LS 6868 R	2.67	3.00	1.00	1.00	1.33	1.80	2.33	1.00	1.00	5.00	3.67	4.00	2.00	2.71	1.00	2.00	1.00	1.33
DM 6.8i RR	3.67	3.67	1.00	1.00	1.00	2.07	4.33	1.00	1.00	5.00	4.67	4.33	1.00	3.05	1.00	1.00	1.00	1.00
Gem/Mean	2.52	2.41	1.14	1.00	1.26	1.67	2.07	1.15	1.01	2.30	3.72	4.48	1.17	2.27	1.00	1.49	1.00	1.16

Tabel 11 Oorsprong (1-5) van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2017/18
 Table 11 Shattering (1-5) of the different soybean cultivars at the different trial localities, 2017/18

Kultivar	Koel/Cool						Matig/Moderate						Warm					
	Bethlehem	Ciocolan	Delmas	Kinross	Middeburg	Gem/Mean	Bapsfontein	Cedara	Dundee	Greytown	Kroonstad	Potchestroom	Stoffberg	Gem/Mean	Brits K2	Groblersdal	Marble Hall	Gem/Mean
PAN 1454 R	1.33	1.00	4.67	1.00	1.00	1.80	1.00	1.00	1.00	5.00	1.00	1.00	1.00	1.57	1.00	1.00	1.00	1.00
PHB 94 Y 80 R	3.33	1.00	5.00	1.00	1.00	2.27	1.33	1.00	1.00	5.00	1.00	1.00	1.00	1.62	1.00	1.00	1.00	1.00
LS 6248 R	1.00	1.00	3.33	1.00	1.00	1.47	1.00	1.00	1.00	4.00	1.00	1.00	1.00	1.43	1.00	1.00	1.00	1.00
P48T48 R	1.33	1.00	3.33	1.00	1.00	1.53	2.67	1.00	1.00	4.67	1.00	1.00	1.00	1.76	1.00	1.00	1.00	1.00
DM 5953 RSF	1.00	1.00	5.00	1.00	1.00	1.80	1.33	1.00	1.00	5.00	1.00	1.00	1.00	1.62	1.00	1.00	1.00	1.00
SSS 5449 (tuc)	1.00	1.00	3.33	1.00	1.00	1.47	1.67	1.00	1.00	3.67	1.00	1.00	1.00	1.48	1.00	1.00	1.00	1.00
NS 5009 R	1.00	1.00	4.67	1.00	1.00	1.73	2.67	1.00	1.00	3.00	1.00	1.00	1.00	1.52	1.00	1.00	1.00	1.00
LS 6851 R	1.00	1.00	2.33	1.00	1.00	1.27	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 5258 R	1.00	1.00	3.67	1.00	1.00	1.53	1.00	1.00	1.00	4.67	1.00	1.00	1.00	1.52	1.00	1.00	1.00	1.00
PAN 1532 R	1.00	1.00	1.67	1.00	1.00	1.13	1.00	1.00	1.00	1.67	1.00	1.00	1.00	1.10	1.00	1.00	1.00	1.00
DM 5351 RSF	1.00	1.00	5.00	1.00	1.00	1.80	2.00	1.00	1.00	5.00	1.00	1.00	1.00	1.71	1.00	1.00	1.00	1.00
Y 540	1.00	1.00	3.00	1.00	1.00	1.40	2.00	1.00	1.00	4.33	1.00	1.00	1.00	1.62	1.00	1.00	1.00	1.00
SSS 5052 (tuc)	1.00	1.00	3.67	1.00	1.00	1.53	1.33	1.00	1.00	1.67	1.00	1.00	1.00	1.14	1.00	1.00	1.00	1.00
NA 5509 R	1.00	1.00	1.67	1.00	1.00	1.13	1.00	1.00	1.00	3.00	1.00	1.00	1.00	1.29	1.00	1.00	1.00	1.00
Y 550	1.00	1.00	2.33	1.00	1.00	1.27	1.00	1.00	1.00	1.67	1.00	1.00	1.00	1.10	1.00	1.00	1.00	1.00
DM 5609 RSF	1.00	1.00	2.33	1.00	1.00	1.27	1.00	1.00	1.00	2.00	1.00	1.00	1.00	1.14	1.00	1.00	1.00	1.00
PAN 1521 R	1.00	1.00	3.00	1.00	1.00	1.40	1.00	1.00	1.00	1.67	1.00	1.00	1.00	1.10	1.00	1.00	1.00	1.00
DM 5302 RSF	1.00	1.00	3.33	1.00	1.00	1.47	1.33	1.00	1.00	2.00	1.00	1.00	1.00	1.19	1.00	1.00	1.00	1.00
NS 5909 R	1.00	1.00	3.00	1.00	1.00	1.40	1.00	1.00	1.00	3.00	1.00	1.00	1.00	1.29	1.00	1.00	1.00	1.00
LS 6860 R	1.00	1.00	3.33	1.00	1.00	1.47	1.00	1.00	1.00	2.67	1.00	1.00	1.00	1.24	1.00	1.00	1.00	1.00
PHB 96 T 06 R	1.00	1.00	3.00	1.00	1.00	1.40	1.00	1.00	1.00	1.33	1.00	1.00	1.00	1.05	1.00	1.00	1.00	1.00
PAN 1623 R	1.00	1.00	2.67	1.00	1.00	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
LS 6161 R	1.00	1.00	4.00	1.00	1.00	1.60	1.00	1.00	1.00	2.67	1.00	1.00	1.00	1.24	1.00	1.00	1.00	1.00
LS 6862 R	1.00	1.00	2.33	1.00	1.00	1.27	1.00	1.00	1.00	1.33	1.00	1.00	1.00	1.05	1.00	1.00	1.00	1.00
SSS 6560 (tuc)	1.00	1.00	4.00	1.00	1.00	1.60	1.33	1.00	1.00	1.33	1.00	1.00	1.00	1.10	1.00	1.00	1.00	1.00
NS 6267 R	1.00	1.00	4.33	1.00	1.00	1.67	1.33	1.00	1.00	1.33	1.00	1.00	1.00	1.10	1.00	1.00	1.00	1.00
Y 627	1.00	1.00	4.00	1.00	1.00	1.60	1.00	1.00	1.00	3.33	1.00	1.00	1.00	1.33	1.00	1.00	1.00	1.00
P61T38 R	1.00	1.00	2.00	1.00	1.00	1.20	1.00	1.00	1.00	1.67	1.00	1.00	1.00	1.10	1.00	1.00	1.00	1.00
DM 6663 RSF	1.00	1.00	5.00	1.00	1.00	1.80	1.00	1.00	1.00	1.67	1.00	1.00	1.00	1.10	1.00	1.00	1.00	1.00
NS 6448 R	1.00	1.00	4.00	1.00	1.00	1.60	1.00	1.00	1.00	2.67	1.00	1.00	1.00	1.24	1.00	1.00	1.00	1.00
P64T39 R	1.00	1.00	3.00	1.00	1.00	1.40	1.00	1.00	1.00	1.33	1.00	1.00	1.00	1.05	1.00	1.00	1.00	1.00
DM 6402 RSF	1.00	1.00	2.67	1.00	1.00	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Y 657	1.00	1.00	5.00	1.00	1.00	1.80	1.00	1.00	1.00	2.00	1.00	1.00	1.00	1.14	1.00	1.00	1.00	1.00
LS 6868 R	1.00	1.00	3.67	1.00	1.00	1.53	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
DM 6.8i RR	1.00	1.00	2.67	1.00	1.00	1.33	1.00	1.00	1.00	1.33	1.00	1.00	1.00	1.05	1.00	1.00	1.00	1.00
Gem/Mean	1.09	1.00	3.43	1.00	1.00	1.50	1.23	1.00	1.00	2.56	1.00	1.00	1.00	1.26	1.00	1.00	1.00	1.00

Tabel 12 Die plantelling drie weke na opkoms (x 1000) van die verskillende soja boonkultivars by die verskillende proeflokaleite, 2017/18
 Table 12 The number of plant three weeks after germination (x 1000) of the different soybean cultivars at the different trial localities, 2017/18

Kultivar	Koel/Cool						Matig/Moderate						Warm					
	Bethlehem	Ciocolan	Delmas	Kinross	Kokstad	Middelburg	Gem/Mean	Bapsfontein	Cedara	Dundee	Kronstad	Potchefstroom	Stoffberg	Gem/Mean	Brits K2	Groblersdal	Marble Hall	Gem/Mean
PAN 1454 R	257	219	135	177	140	223	192	326	320	208	218	324	167	261	282	189	119	197
PHB 94 Y 80 R	239	166	102	222	129	149	168	377	301	219	193	295	178	261	325	208	137	223
LS 6248 R	277	206	159	154	155	214	194	373	327	209	187	302	174	262	309	189	125	208
P48T48 R	258	236	96	166	83	226	178	332	286	203	187	288	185	247	393	186	118	233
DM 5953 RSF	321	202	224	244	160	194	224	395	358	309	181	287	185	286	265	205	133	201
SSS 5449 (tuc)	240	189	109	203	155	229	188	425	374	223	150	287	186	274	307	205	112	208
NS 5009 R	195	160	131	103	98	196	147	186	240	132	163	277	179	196	333	168	105	202
LS 6851 R	64	207	87	70	80	191	116	164	107	122	124	283	133	155	279	157	81	172
NS 5258 R	241	127	195	188	126	217	182	384	345	255	216	289	185	279	318	199	121	213
PAN 1532 R	261	192	157	208	141	202	193	359	358	199	202	303	177	266	291	206	124	207
DM 5351 RSF	326	226	203	241	109	246	225	471	389	277	209	283	173	300	306	209	147	221
Y 540	228	81	85	166	106	238	151	144	232	143	126	267	179	182	349	185	106	213
SSS 5052 (tuc)	274	164	163	199	122	206	188	379	339	219	157	315	188	266	333	212	134	226
NA 5509 R	263	195	169	212	162	192	199	305	322	209	216	296	185	255	266	218	112	198
Y 550	271	196	154	211	134	216	197	397	353	255	202	300	192	283	344	190	138	224
DM 5609 RSF	214	90	181	234	152	201	179	367	323	257	169	307	186	268	278	198	117	197
PAN 1521 R	258	134	175	189	166	172	182	276	303	206	198	294	174	242	303	203	93	200
DM 5302 RSF	243	203	80	190	122	204	174	294	258	164	156	269	161	217	235	206	91	177
NS 5909 R	172	159	156	145	129	204	161	219	214	161	119	276	173	194	337	203	117	219
LS 6860 R	185	109	115	116	81	223	138	157	197	147	104	312	180	183	343	207	112	221
PHB 96 T 06 R	252	258	147	192	131	182	194	366	367	296	174	306	182	282	287	219	136	214
PAN 1623 R	264	209	160	166	132	152	181	312	270	217	194	303	193	248	282	198	82	187
LS 6161 R	256	106	217	198	181	176	189	369	349	301	199	285	192	283	275	206	124	202
LS 6862 R	64	113	79	69	134	184	107	181	152	185	175	292	153	190	315	197	111	208
SSS 6560 (tuc)	241	151	92	144	76	214	153	303	294	120	144	292	177	222	322	211	106	213
NS 6267 R	263	212	100	202	94	208	180	392	331	226	170	285	181	264	325	214	122	220
Y 627	217	150	173	215	129	231	186	346	327	284	193	290	190	268	266	218	147	210
P61T38 R	236	134	125	172	144	192	167	363	281	256	204	293	164	260	353	194	113	220
DM 6663 RSF	285	173	171	199	156	186	195	262	228	207	190	306	182	229	309	214	91	205
NS 6448 R	283	179	205	235	172	230	217	417	356	261	228	277	192	289	297	224	112	211
P64T39 R	249	202	99	157	119	237	177	269	202	204	153	302	184	219	307	210	133	217
DM 6402 RSF	258	200	126	120	151	201	176	282	263	215	198	301	193	242	321	217	118	219
Y 657	276	190	139	230	180	237	209	384	306	239	164	287	161	257	301	208	124	211
LS 6868 R	231	177	138	160	142	211	176	268	251	210	202	304	184	236	272	217	141	210
DM 6.8i RR	286	147	100	136	172	185	171	243	278	204	159	312	181	229	316	219	101	212
Gem/Mean	241	173	141	178	133	205	179	317	292	215	178	294	178	246	307	203	117	209

Tabel 13 Persentasie ongewenste sade van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2017/18
 Table 13 Percentage undesirable seed of the different soybean cultivars at the different trial localities, 2017/18

Kultivar	Koel/Cool						Matig/Moderate			
	Phethlehem	Clocolan	Kinross	Kokstad	Middelburg	Gem/Mean	Cedara	Kroonstad	Potchefstroom	Gem/Mean
PAN 1454 R	0.10	0.00	0.00	0.40	0.10	0.12	0.00	0.30	0.10	0.13
PHB 94 Y 80 R	0.00	0.10	0.00	0.20	0.20	0.10	0.30	0.00	0.30	0.20
LS 6248 R	1.00	1.00	0.20	1.20	0.10	0.70	0.10	0.10	0.40	0.20
P48T48 R	0.10	0.10	0.00	0.70	0.50	0.28	0.00	0.10	0.10	0.07
DM 5953 RSF	0.10	0.30	0.60	0.30	0.10	0.28	0.00	0.30	0.10	0.13
SSS 5449 (tuc)	0.60	0.10	0.30	1.20	0.10	0.46	0.10	0.10	0.00	0.07
NS 5009 R	0.00	0.00	0.50	0.30	0.50	0.26	0.00	0.00	0.00	0.00
LS 6851 R	2.90	0.50	0.40	0.70	0.00	0.90	0.10	0.10	0.10	0.10
NS 5258 R	0.10	0.20	0.00	0.00	0.90	0.24	0.00	0.40	0.10	0.17
PAN 1532 R	0.60	0.10	0.20	1.40	0.70	0.60	0.10	0.10	0.10	0.10
DM 5351 RSF	0.20	0.00	0.10	0.40	0.40	0.22	0.10	0.10	0.20	0.13
Y 540	0.70	0.30	0.10	1.20	0.50	0.56	0.20	0.00	0.10	0.10
SSS 5052 (tuc)	5.40	0.60	0.30	2.20	0.40	1.78	2.00	0.10	0.20	0.77
NS 5509 R	1.50	0.30	0.20	0.50	0.60	0.62	0.20	0.20	0.00	0.13
Y 550	4.80	0.20	0.30	1.20	0.20	1.34	0.00	0.10	0.30	0.13
DM 5609 RSF	2.00	0.20	0.10	0.40	0.00	0.54	0.10	0.00	0.20	0.10
PAN 1521 R	1.10	0.10	0.70	0.40	0.30	0.52	0.10	0.00	0.10	0.07
DM 5302 RSF	1.00	0.20	0.50	0.80	0.70	0.64	0.10	0.00	0.50	0.20
NS 5909 R	1.10	0.40	0.10	0.70	0.30	0.52	0.10	0.10	0.20	0.13
LS 6860 R	1.00	0.70	0.20	1.00	0.80	0.74	0.10	0.00	0.10	0.07
PHB 96 T 06 R	2.20	1.60	0.40	1.10	0.30	1.12	0.00	0.20	0.50	0.23
PAN 1623 R	2.10	0.20	0.30	0.80	0.20	0.72	0.30	0.10	0.00	0.13
LS 6161 R	2.50	0.80	0.00	0.50	0.50	0.86	0.00	0.10	0.30	0.13
LS 6862 R	0.60	0.10	0.20	0.50	0.30	0.34	0.00	0.00	0.30	0.10
SSS 6560 (tuc)	2.20	1.10	0.20	0.90	0.00	0.88	0.10	0.10	0.20	0.13
NS 6267 R	2.10	0.50	0.10	0.90	0.10	0.74	0.30	0.40	0.20	0.30
Y 627	2.30	0.00	0.20	0.50	0.20	0.64	0.00	0.00	0.20	0.07
P61T38 R	1.50	0.30	0.10	1.00	0.00	0.58	0.00	0.50	0.10	0.20
DM 6663 RSF	1.10	0.60	0.30	0.80	0.30	0.62	0.00	0.10	0.00	0.03
NS 6448 R	2.50	0.50	0.10	0.80	0.10	0.80	0.00	0.10	0.30	0.13
P64T39 R	2.20	3.20	0.30	0.80	0.20	1.34	0.00	0.20	0.10	0.10
DM 6402 RSF	1.50	1.20	0.30	0.90	0.00	0.78	0.00	0.10	0.00	0.03
Y 657	3.20	1.20	0.20	3.00	2.20	1.96	0.20	0.20	0.20	0.20
LS 6868 R	3.00	1.50	0.30	0.50	0.70	1.20	0.00	1.50	0.10	0.53
DM 6.81RR	1.50	1.00	0.00	0.70	0.30	0.70	0.10	0.10	0.10	0.10
Gem/Mean	1.57	0.55	0.22	0.83	0.37	0.71	0.13	0.17	0.17	0.16

Tabel 14 Massa van 100 sade (g) van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2017/18

Table 14 Mass 100 seeds (g) of the different soybean cultivars at the different trial localities, 2017/18

Kultivar	Koel/Cool						Matig/Moderate						Warm								
	Bethlehem	Clarens	Clocolan	Delmas	Kinross	Kokstad	Middelburg	Gem/Mean	Bapsfontein	Bergville	Cedara	Dundee	Greytown	Kroonstad	Potchetstroom	Stoffberg	Gem/Mean	Brits K2	Groblerdsdal	Marble Hill	Gem/Mean
PAN 1454 R	16.30	15.70	16.77	18.97	17.27	17.53	18.83	17.34	18.90	19.20	19.77	18.67	18.57	17.90	18.73	18.30	18.75	16.95	17.30	20.47	18.24
PHB 94 Y 80 R	16.77	15.40	17.57	17.67	16.20	17.53	18.00	17.02	18.70	17.80	19.40	18.20	18.77	16.37	20.03	17.90	18.40	17.70	16.50	20.00	18.07
LS 6248 R	12.77	12.80	12.97	14.97	13.03	14.00	14.43	13.57	16.60	14.20	13.10	14.37	13.50	15.40	16.10	16.70	15.00	15.83	17.50	18.23	17.19
P48T48 R	17.67	18.10	18.50	20.03	17.87	19.27	20.37	18.83	19.40	19.90	20.70	19.93	19.10	19.03	19.60	15.40	19.13	17.27	15.50	19.93	17.57
DM 5953 RSF	16.73	15.70	16.07	16.43	15.50	18.63	17.47	16.65	16.80	16.90	16.53	16.83	15.67	16.73	18.57	13.70	16.47	18.23	13.50	17.47	16.40
SSS 5449 (tuc)	12.33	13.50	13.50	16.40	13.03	13.93	14.67	13.91	14.10	13.10	13.53	13.97	12.63	15.87	15.30	16.20	14.34	14.80	15.60	17.60	16.00
NS 5009 R	16.77	16.60	17.07	18.10	17.53	18.10	19.30	17.64	17.50	17.60	19.70	19.40	17.57	18.13	19.60	18.10	18.45	15.73	20.00	19.47	18.40
LS 6851 R	11.73	12.90	14.53	17.23	15.40	14.83	18.27	14.99	15.20	14.20	13.07	14.77	12.87	16.10	16.00	17.40	14.95	14.50	16.90	16.83	16.08
NS 5258 R	14.43	13.40	15.07	16.43	13.83	15.87	15.17	14.89	15.30	15.30	15.20	15.90	15.10	15.23	16.80	15.30	15.52	14.67	15.90	17.87	16.14
PAN 1532 R	13.65	12.70	13.87	17.63	14.50	15.37	15.63	14.76	15.50	15.30	15.07	14.57	13.50	16.07	15.90	17.50	15.43	15.43	18.10	16.27	16.60
DM 5351 RSF	16.37	14.10	15.53	17.13	15.07	17.53	17.23	16.14	17.20	16.50	16.53	17.63	14.70	15.97	19.33	13.80	16.46	16.67	14.30	17.60	16.19
Y 540	12.50	14.30	14.87	17.00	14.37	14.70	15.57	14.76	14.10	14.60	14.23	15.27	13.40	16.23	16.10	17.80	15.22	14.07	18.00	15.80	15.96
SSS 5052 (tuc)	12.27	12.40	14.73	16.73	13.23	13.90	15.57	14.12	15.50	16.20	13.30	15.00	13.53	16.27	17.00	18.20	15.33	14.10	17.80	17.97	16.62
NA 5509 R	14.33	14.90	14.80	18.60	14.70	15.80	18.47	15.94	17.00	16.40	15.50	16.10	14.67	17.97	18.73	17.90	16.78	15.47	16.80	18.70	16.99
Y 550	14.03	13.50	13.90	17.53	14.80	14.73	17.40	15.13	18.30	15.10	16.37	16.00	14.17	17.37	17.37	16.80	16.43	13.57	16.70	18.07	16.11
DM 5609 RSF	14.87	14.00	15.23	18.60	14.07	15.10	15.87	15.39	16.20	16.20	14.63	15.50	14.13	17.73	18.77	13.00	15.77	-	11.30	19.40	15.35
PAN 1521 R	14.70	13.80	15.20	17.87	15.27	15.53	16.17	15.50	16.80	15.70	15.23	16.87	14.23	18.43	20.70	16.60	16.82	17.60	15.60	19.37	17.52
DM 5302 RSF	14.20	14.50	16.50	18.70	15.93	14.97	16.30	15.87	16.20	14.80	15.40	15.57	14.03	17.97	18.50	15.40	15.98	17.20	15.30	19.07	17.19
NS 5909 R	14.57	12.90	14.10	18.10	16.00	15.13	17.43	15.46	17.00	16.80	15.43	16.47	15.03	18.10	20.40	18.00	17.15	15.97	17.70	17.87	17.18
LS 6860 R	15.70	15.60	14.20	19.27	16.67	16.37	20.90	16.96	18.40	18.60	16.10	18.07	17.50	20.00	20.30	18.20	18.40	19.80	19.50	19.40	19.57
PHB 96 T 06 R	12.80	14.60	13.63	75.37	14.90	15.10	15.50	23.13	16.20	17.40	15.10	16.20	14.53	17.90	17.23	16.80	16.42	16.87	16.60	17.67	17.04
PAN 1623 R	12.57	12.90	14.37	16.47	13.83	14.50	15.23	14.27	16.30	15.40	14.27	15.00	14.60	16.23	16.37	17.70	15.73	16.33	16.80	17.73	16.96
LS 6161 R	12.30	13.80	13.27	16.90	14.33	14.10	15.67	14.34	16.00	17.20	14.23	16.03	14.90	16.47	17.43	16.20	16.06	15.40	17.00	17.73	16.71
LS 6862 R	13.17	15.20	14.47	19.07	15.57	15.83	17.43	15.82	16.80	16.90	15.87	16.83	13.47	18.73	18.23	14.90	16.47	14.07	14.00	18.73	15.60
SSS 6560 (tuc)	12.47	12.50	13.50	16.47	14.27	14.07	16.03	14.19	17.60	16.80	14.93	15.40	13.83	16.10	17.63	16.00	16.04	14.60	15.50	17.77	15.96
NS 6267 R	14.03	12.70	15.80	19.00	15.33	15.73	18.07	15.81	16.30	17.30	15.40	16.67	15.80	18.20	18.87	18.30	17.10	17.20	18.40	19.97	18.52
Y 627	13.73	13.30	16.20	16.70	14.70	15.67	17.27	15.37	16.80	16.70	15.10	16.07	14.20	17.77	16.60	17.10	16.29	-	16.90	17.17	17.03
P61T38 R	13.73	13.90	15.67	18.10	16.13	15.30	18.47	15.90	17.10	18.00	16.93	17.37	14.37	17.83	17.00	16.40	16.88	17.43	17.00	19.53	17.99
DM 6663 RSF	15.17	13.80	15.30	17.80	15.67	15.30	18.40	15.92	17.00	16.90	15.17	16.97	17.87	18.50	18.43	14.50	17.17	16.73	13.80	18.07	16.20
NS 6448 R	13.80	15.10	13.83	19.27	15.40	15.30	15.47	15.45	16.70	16.50	14.50	16.77	15.93	17.83	17.07	17.10	16.55	16.20	17.50	17.07	17.07
P64T39 R	15.50	14.40	12.67	17.47	15.30	14.07	16.93	15.19	17.50	17.20	14.97	15.50	16.10	17.47	19.93	17.60	17.03	16.23	16.00	18.43	16.89
DM 6402 RSF	14.70	15.80	13.20	16.33	14.77	14.83	16.70	15.19	16.70	15.10	13.80	15.63	16.23	16.70	17.27	16.30	15.97	13.70	17.20	16.53	15.81
Y 657	12.07	12.10	12.33	16.63	13.40	14.73	13.60	13.55	16.00	15.30	13.40	13.97	14.07	16.20	16.50	15.70	15.14	16.43	14.90	15.80	15.71
LS 6868 R	13.33	13.20	12.37	16.37	14.73	13.93	16.20	14.30	14.30	14.50	13.13	15.60	15.67	15.93	15.57	15.50	15.03	14.97	15.70	17.00	15.89
DM 6.8i RR	16.87	15.50	14.07	19.60	16.87	15.20	17.03	16.45	16.90	18.80	15.27	17.93	18.23	18.93	19.87	17.80	17.97	16.90	17.80	19.05	17.92
Gem/Mean	14.25	14.16	14.73	19.28	15.13	15.50	16.89	15.71	16.65	16.40	15.45	16.31	15.21	17.25	17.94	16.57	16.47	16.02	16.43	18.17	16.88

Table 18 Die saadopbrengs van elke kultivar by die verskillende lokaliteite, 2017/18
 Table 18 The seed yield of the cultivars at the different localities, 2017/18

Kultivar	Koel/Cool						Matig/Moderate						Warm								
	Bethlehem	Clarens	Clocolan	Delmas	Kinross	Kokstad	Middelburg	Gem/Mean	Bapsfontein	Bergville	Cedara	Dundee	Greytown	Kroonstad	Potchefstroom	Stoffberg	Gem/Mean	Brits K2	Groblersdal	Marble Hall	Gem/Mean
PAN 1454 R	1840	2854	2643	1969	3263	2218	4142	2704	5554	3468	4174	1219	1757	2590	3158	996	2864	2964	2139	4497	3200
PHB 94 Y 80 R	1763	3865	2711	1331	4205	4326	4433	3234	5375	4301	4536	1601	1771	1806	2911	2229	3066	2750	1951	4372	3024
LS 6248 R	1561	2654	2115	3102	3434	2017	2294	2454	4380	3911	3873	2357	1829	3685	3209	1866	3139	2629	3397	4812	3613
P48T48 R	2060	3023	3091	1857	4014	2797	4014	2979	5610	4357	4343	2499	2272	2679	2402	1346	3189	2606	1880	4502	2996
DM 5953 RSF	3544	3687	3369	2661	3681	3932	3846	3531	5853	4165	4727	2561	1752	2200	5139	1701	3512	2957	3015	3750	3240
SSS 5449 (tuc)	1961	2459	2660	2897	3870	2156	3543	2792	5085	3702	4006	1700	1932	3048	3271	1912	3082	2729	3133	4591	3484
NS 5009 R	1389	2553	2433	2131	2951	2793	3897	2593	4865	4111	4331	1324	2130	2791	2818	1375	2968	2507	3235	5073	3605
LS 6851 R	896	1818	2896	2694	2931	1943	2876	2294	5260	4351	5269	1981	2075	3653	3475	1173	3405	2939	2330	4504	3258
NS 5258 R	2972	3752	1722	3450	3153	2672	3851	3082	5462	4258	4196	1537	1888	2984	4232	1398	3244	2294	2356	5353	3334
PAN 1532 R	2286	2863	2447	3637	3341	2912	3973	3065	5222	4203	4096	1842	2137	4119	3932	2340	3486	2443	2737	4404	3195
DM 5351 RSF	2693	3222	3624	2343	3608	4165	4835	3499	5579	4103	4514	2284	1773	2488	5018	1328	3383	2776	3258	4840	3624
Y 540	2758	2173	2639	2486	4261	3305	4107	3104	4967	4607	4802	1882	2172	3925	4408	2270	3629	2481	2161	5169	3270
SSS 5052 (tuc)	1649	1837	1737	3071	3555	1976	2855	2383	5082	3245	3417	2217	2159	4323	3673	2000	3264	2609	3174	4796	3526
NA 5509 R	1343	2646	2930	3430	3391	2625	4532	2985	4466	3893	3890	2335	1987	4346	3931	1915	3345	3080	4627	4261	3989
Y 550	1490	2713	2474	3392	3658	2429	3475	2790	4516	3749	3962	1732	1918	3139	2778	2173	2996	2194	3245	4256	3232
DM 5609 RSF	2028	3031	2027	3427	3473	2779	3266	2861	5697	3985	4259	2555	2196	3802	3341	1793	3454	2078	3115	4849	3347
PAN 1521 R	2180	2821	2513	3305	3756	3432	3334	3049	4927	3545	4155	2734	2140	3967	4277	2806	3569	3458	3580	5109	4049
DM 5302 RSF	2399	3311	3016	2917	3658	2630	3270	3029	5125	4176	4213	2253	2031	3306	3865	2236	3401	2748	2780	5164	3564
NS 5909 R	1354	1837	1916	3078	3510	2233	3328	2465	4891	4183	4352	2294	2060	3295	4534	1835	3431	2977	3325	4608	3637
LS 6860 R	1304	1374	1079	3310	3247	1450	2800	2081	4368	3570	3863	2332	1785	3832	3532	2278	3195	3026	3608	4484	3706
PHB 96 T 06 R	1223	2481	2566	3939	3843	2268	2932	2750	4843	4047	3860	1691	1882	3640	3866	2146	3247	2987	3627	4039	3551
PAN 1623 R	1404	3056	3590	3876	4230	1839	3941	3134	3515	3534	3888	2743	2304	3858	3835	2140	3227	3091	4463	4715	4090
LS 6161 R	926	2253	1959	3131	3817	2844	3213	2592	2938	3960	3741	2304	2116	3252	4705	2049	3133	2572	3215	5082	3623
LS 6862 R	1310	2175	2080	3458	3847	1938	3138	2564	3147	4760	5331	2185	1889	3868	4724	2910	3602	2386	4618	4718	3907
SSS 6560 (tuc)	1416	2378	2725	3032	2948	3183	2459	2592	4777	3832	4238	2290	1934	3297	3794	2723	3360	2700	4060	5126	3962
NS 6267 R	1664	2596	2825	3143	4199	2939	3728	3013	5107	4599	4279	2015	2197	4078	3298	2660	3529	2582	3427	4532	3514
Y 627	1677	2628	3125	3379	4228	1954	3198	2884	5108	4224	4466	2314	2081	4373	4282	2291	3642	2333	3716	4130	3393
P61T38 R	1871	2659	3123	3437	3373	2197	2921	2797	5551	4269	5066	2448	2334	4051	3725	1526	3621	3971	4187	5001	4386
DM 6663 RSF	1483	1981	2330	3343	4094	1458	3616	2615	4661	3326	4905	2391	2187	4290	3815	1638	3401	3517	4032	4239	3930
NS 6448 R	1703	2699	2208	3698	3825	1876	3627	2805	5543	4402	4183	2010	2044	4346	3156	1675	3420	3580	3624	4624	3943
P64T39 R	1412	2745	2760	3333	4292	1941	3687	2881	5208	3165	4698	2356	2304	4136	5275	1326	3558	3767	3875	5439	4360
DM 6402 RSF	1402	1646	1199	2651	2990	1403	3084	2053	4774	4098	3663	2258	2209	4153	3522	1423	3263	2398	3782	4706	3629
Y 657	1754	2680	2726	3721	4125	1751	4383	3020	5182	4644	4295	2590	2153	4153	3714	2478	3651	2692	5035	5105	4277
LS 6868 R	1087	1833	1696	3040	2267	2271	2810	2143	3132	3588	3924	1654	2020	3652	3007	1457	2804	2888	2766	4711	3455
DM 6.8i RR	1359	2381	1924	3517	3042	1536	3301	2437	4936	4158	4452	2360	2242	4280	4575	1565	3571	3439	3766	4361	3855
Gem/Mean	1748	2591	2482	3062	3599	2462	3506	2779	4877	4014	4285	2138	2047	3583	3806	1914	3333	2833	3350	4683	3622
CV	2.1.7	18.5	21.2	19.0	18.7	24.8	21.5	21.5	9.6	12.8	10.6	15.2	7.6	16.7	14.1	6.9	7.0	17.8	7.0	10.1	

Tabel 19 Oprengs waarskynlikheid (%) van kultivars geëvalueer in 2015/16, 2016/17 en 2017/18 vir die koeler droëland produksiegebiede by verskillende opbrengspotensiaal

Kultivar	Oprengspotensiaal/Yield potential (t/ha)									
	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5		
Cultivar										
PAN 1454 R	53	48	42	35	29	24	21	18		
PHB 94 Y 80 R	64	62	60	57	54	50	47	44		
LS 6248 R	51	51	51	51	50	50	49	49		
DM 5953 RSF	78	79	79	79	77	76	73	71		
SSS 5449 (tuc)	8	13	23	37	55	72	84	91		
SSS 5052 (tuc)	27	27	26	27	28	30	32	35		
PAN 1521 R	71	73	76	77	79	79	79	78		
NS 5909 R	8	13	20	33	49	66	78	87		
PHB 96 T 06 R	52	49	45	42	38	35	32	31		
PAN 1623 R	52	56	59	63	66	69	71	73		
LS 6161 R	38	37	36	35	35	35	36	37		
SSS 6560 (tuc)	38	35	32	29	27	26	25	25		
NS 6448 R	62	63	64	65	65	65	64	63		
DM 6.8i RR	46	42	37	32	28	25	22	21		

Tabel 20 Saadopbrengs (kg/ha⁻¹) van kultivars gedurende die 2016/17 en 2017/18 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 2016/17 and 2017/18 growing season for the various localities situated in the cooler production areas

Kultivar Cultivar	2016/17								2017/18							
	Bethlehem	Clarens	Ocolocian	Delmas	Kinross	Middelburg	Gem/Mean	Bethlehem	Clarens	Ocolocian	Delmas	Kinross	Kokstad	Middelburg	Gem/Mean	
PAN 1454 R	2830	2877	2161	2703	3363	2838	2795	1840	2854	2643	1969	3263	2218	4142	2704	
PHB 94 Y 80 R	3184	3787	2795	3283	2885	3218	3192	1763	3865	2711	1331	4205	4326	4433	3234	
LS 6248 R	3900	2713	2508	3152	3640	2360	3046	1561	2654	2115	3434	3434	2017	2294	2454	
P48T48 R	-	-	-	-	-	-	-	2060	3023	3091	1857	4014	2797	4014	2979	
DM 5953 RSF	4684	3602	3413	4522	5430	3090	4123	3544	3687	3369	2661	3681	3932	3846	3531	
SSS 5449 (tuc)	4081	2856	2500	3611	3598	2465	3185	1961	2459	2660	2897	3870	2156	3543	2792	
NS 5009 R	-	-	-	-	-	-	-	1389	2553	2433	2131	2951	2793	3897	2593	
LS 6851 R	-	-	-	-	-	-	-	896	1818	2896	2694	2931	1943	2876	2294	
NS 5258 R	-	-	-	-	-	-	-	2972	3752	1722	3450	3153	2672	3851	3082	
PAN 1532 R	3782	2589	2701	3897	3283	2699	3159	2286	2863	2447	3637	3341	2912	3973	3065	
DM 5351 RSF	-	-	-	-	-	-	-	2693	3222	3624	2343	3608	4165	4835	3499	
Y 540	-	-	-	-	-	-	-	2758	2173	2639	2486	4261	3305	4107	3104	
SSS 5052 (tuc)	3305	2372	2635	3342	3666	2376	2949	1649	1837	1737	3071	3555	1976	2855	2383	
NA 5509 R	-	-	-	-	-	-	-	1343	2646	2930	3430	3391	2625	4532	2985	
Y 550	-	-	-	-	-	-	-	1490	2713	2474	3392	3558	2429	3475	2790	
DM 5609 RSF	3984	2748	3028	3756	3773	2825	3352	2028	3031	2027	3427	3473	2779	3266	2861	
PAN 1521 R	4387	2506	3294	3765	4159	3083	3533	2180	2821	2513	3305	3756	3432	3334	3049	
DM 5302 RSF	4037	2555	3480	3766	4251	2570	3443	2399	3311	3016	2917	3658	2630	3270	3029	
NS 5909 R	3731	2485	2593	3517	4136	3480	3320	1354	1837	1916	3078	3510	2233	3328	2465	
LS 6860 R	-	-	-	-	-	-	-	1304	1374	1079	3310	3247	1450	2800	2081	
PHB 96 T 06 R	2688	2319	1907	3764	3221	2807	2784	1223	2481	2566	3939	3843	2268	2932	2750	
PAN 1623 R	3727	2480	3056	3617	3636	3112	3271	1404	3056	3590	3876	4230	1839	3941	2750	
LS 6161 R	2928	2072	2792	4147	3195	2889	3004	926	2253	1959	3131	3817	2844	3213	2592	
LS 6862 R	-	-	-	-	-	-	-	1310	2175	2080	3458	3847	1938	3138	2564	
SSS 6560 (tuc)	3073	2494	2251	3460	3538	2968	2964	1416	2378	2725	3032	2948	3183	2459	2592	
NS 6267 R	-	-	-	-	-	-	-	1664	2596	2825	3143	4199	2939	3728	3013	
Y 627	-	-	-	-	-	-	-	1677	2628	3125	3379	4228	1954	3198	2884	
P61T38 R	3341	2402	2876	4171	3917	2616	3220	1871	2659	3123	3437	3373	2197	2921	2797	
DM 6663 RSF	3875	1633	2254	2834	3646	2561	2800	1483	1981	2330	3343	4094	1458	3616	2615	
NS 6448 R	3460	2988	3028	3894	3084	2910	3227	1703	2699	2208	3698	3825	1876	3627	2805	
P64T39 R	3581	2447	2867	3858	5095	3283	3522	1412	2745	2760	3333	4292	1941	3687	2881	
DM 6402 RSF	-	-	-	-	-	-	-	1402	1646	1199	2651	2990	1403	3084	2053	
Y 657	-	-	-	-	-	-	-	1754	2680	2726	3721	4125	1751	4383	3020	
LS 6868 R	-	-	-	-	-	-	-	1087	1833	1696	3040	2267	2271	2810	2143	
DM 6.8i RR	3391	2994	2327	3357	3774	2744	3098	1359	2381	1924	3517	3042	1536	3301	2437	
LS 6240 R	2617	2371	2792	3978	3435	2928	3020	-	-	-	-	-	-	-	-	
SSS 4945 (tuc)	3261	3100	2966	3323	4694	3337	3447	-	-	-	-	-	-	-	-	
LS 6146 R	2675	3115	3343	3506	2143	2834	2936	-	-	-	-	-	-	-	-	
PHB 95 Y 20 R	2855	2347	2110	3368	3445	2929	2842	-	-	-	-	-	-	-	-	
LS 6261 R	3466	2121	3344	3481	3449	2944	3134	-	-	-	-	-	-	-	-	
LS 6164 R	3416	2662	1806	2793	3976	2933	2931	-	-	-	-	-	-	-	-	
PAN 1614 R	3202	2302	3205	3207	3674	2621	3048	-	-	-	-	-	-	-	-	
NS 7211 R	2982	2776	2855	3710	4136	2716	3196	-	-	-	-	-	-	-	-	
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	-	-	-	-	-	-	-	-	
6968 RSF	3186	1537	2818	2836	2921	3205	2751	-	-	-	-	-	-	-	-	
Gem/Mean	3440	2513	2703	3553	3686	2856	3125	1748	2591	2482	3062	3599	2462	3506	2779	

Tabel 21 Opbrengswaarskynlikheid (%) van kultivars geëvalueer in 2015/16, 2016/17 en 2017/18 vir die matige produksiegebiede by verskillende opbrengspotensiaal

Table 21 Yield probability (%) of cultivars in the 2015/16, 2016/17 and 2017/18 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		
PAN 1454 R	8	9	11	13	16	20	25	30		
PHB 94 Y 80 R	32	32	33	33	35	36	37	39		
LS 6248 R	72	66	57	49	38	30	23	17		
DM 5953 RSF	37	43	49	56	62	68	73	78		
SSS 5449 (tuc)	27	27	28	28	29	30	32	33		
SSS 5052 (tuc)	68	65	60	55	49	44	38	34		
PAN 1521 R	87	87	86	84	82	80	76	73		
NS 5909 R	63	64	64	64	65	65	64	64		
PHB 96 T 06 R	34	37	40	43	47	51	55	59		
PAN 1623 R	88	85	82	78	73	67	60	53		
LS 616 1R	60	58	56	54	51	49	46	44		
SSS 6560 (tuc)	72	66	59	51	42	35	28	22		
NS 6448 R	36	41	46	53	58	65	70	74		
DM 6:8i RR	51	53	56	59	61	63	65	67		

Tabel 22 Saadopbrengs (kg/ha⁻¹) van kultivars gedurende die 2016/17 en 2017/18 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 2016/17 and 2017/18 growing season for the various localities situated in the moderate production areas

Kultivar	2016/17								2017/18												
	Cedara	Dundee	Greytown	Greytown	Kranskop	Kroonstad	Potcheirstroom	Bespr	Potcheirstroom	Stoffberg	Verkeerdeval	Gem/Mean	Bapsfontein	Bergville	Cedara	Dundee	Greytown	Kroonstad	Potcheirstroom	Bespr	Stoffberg
PAN 1454 R	4255	2886	2956	3148	3021	2954	1912	2566	2924	5554	3468	4174	1219	1757	2590	996	2864				
PHB 94 Y 80 R	4274	3091	3521	2980	2984	3384	3037	1738	3065	5375	4301	4536	1601	1771	1806	2229	3066				
LS 6248 R	4268	2944	3031	3365	3074	3791	2881	3212	3220	4380	3911	3873	1829	1829	3685	1866	3139				
P48T48 R	-	-	-	-	-	-	-	-	-	5610	4357	4343	2499	2272	2679	2402	1346				
DM 5953 RSF	4672	3432	3519	4102	4182	3636	3172	2195	3529	5853	4165	4727	2561	1752	2200	5139	3512				
SSS 5449 (tuc)	4083	2627	3676	3214	3756	3623	2949	2239	3162	5085	3702	4006	1700	1932	3048	3271	1912	3082			
NS 5009 R	-	-	-	-	-	-	-	-	-	4865	4111	4331	1324	2130	2791	2818	1375	2968			
LS 6851 R	-	-	-	-	-	-	-	-	-	5260	4351	5269	1981	2075	3653	3475	1173	3405			
NS 5258 R	-	-	-	-	-	-	-	-	-	5462	4258	4196	1537	1888	2984	4232	1398	3244			
PAN 1532 R	3990	3331	3144	3180	3687	4221	3289	2935	3316	5222	4203	4096	1842	2137	4119	3932	2340	3486			
DM 5351 RSF	-	-	-	-	-	-	-	-	-	5579	4103	4514	2264	1773	2488	5018	1328	3383			
Y 540	-	-	-	-	-	-	-	-	-	4967	4607	4802	1882	2172	3925	4408	2270	3629			
SSS 5052 (tuc)	3859	3029	2853	2647	4198	3274	3294	3262	3191	5082	3245	3417	2217	2159	4323	3673	2000	3264			
NA 5509 R	-	-	-	-	-	-	-	-	-	4466	3893	3890	2335	1987	4346	3931	1915	3345			
Y 550	-	-	-	-	-	-	-	-	-	4516	3749	3962	1732	1918	3139	2778	2173	2996			
DM 5609 RSF	4594	2942	2745	3764	4056	4043	2666	3871	3343	5697	3985	4259	2555	2196	3802	3341	1793	3454			
PAN 1521 R	4323	3274	3291	3739	4530	4537	3927	3653	3793	4927	3545	4155	2734	2140	3967	4277	2806	3569			
DM 5302 RSF	4509	2700	3421	3518	3857	3743	3018	2963	3361	5125	4176	4213	2253	2031	3306	3865	2236	3401			
NS 5909 R	3866	2834	3222	4015	3966	3714	3311	3702	3381	4891	4183	4352	2294	2060	3295	4534	1835	3431			
LS 6860 R	-	-	-	-	-	-	-	-	-	4368	3570	3863	2332	1785	3832	3532	2278	3195			
PHB 96 T 06 R	4298	2833	3535	3628	3471	3510	3854	3256	3349	4843	4047	3860	1691	1882	3640	3866	2146	3247			
PAN 1623 R	3975	3122	3565	2838	3726	3242	3530	3970	3358	3515	3534	3888	2743	2304	3858	3835	2140	3227			
LS 6161 R	4230	3180	3161	3043	3672	3541	3783	3020	3333	2938	3960	3741	2304	2116	3252	4705	2049	3133			
LS 6862 R	-	-	-	-	-	-	-	-	-	3147	4760	5331	2185	1889	3868	4724	2910	3602			
SSS 6560 (tuc)	3803	3028	2799	4051	3678	3096	2864	3343	3150	4777	3832	4238	2290	1934	3297	3794	2723	3360			
NS 6267 R	-	-	-	-	-	-	-	-	-	5107	4599	4279	2015	2197	4078	3298	2660	3529			
Y 627	-	-	-	-	-	-	-	-	-	5108	4224	4466	2314	2081	4373	4282	2291	3642			
P61T38 R	4130	3172	2888	4269	3809	3151	3248	3915	3389	5551	4269	5066	2448	2334	4051	3725	1526	3621			
DM 6663 RSF	3997	2909	2726	2928	3970	2313	2294	4069	2962	4661	3326	4905	2391	2187	4290	3815	1638	3401			
NS 6448 R	3846	2976	3341	3644	4281	3430	3860	2767	3299	5543	4402	4183	2010	2044	4346	3156	1675	3420			
P64T39 R	3883	2949	3234	4049	4230	4238	3955	3830	3618	5208	3165	4698	2356	2304	4136	5275	1326	3558			
DM 6402 RSF	-	-	-	-	-	-	-	-	-	4774	4098	3663	2258	2209	4153	3522	1423	3263			
Y 657	-	-	-	-	-	-	-	-	-	5182	4644	4295	2590	2153	4153	3714	2478	3651			
LS 6868 R	-	-	-	-	-	-	-	-	-	3132	3588	3924	1654	2020	3652	3007	1457	2804			
DM 6.81 RR	4443	2973	3190	4146	3317	3305	2956	4735	3378	4936	4158	4452	2360	2242	4280	4575	1565	3571			
LS 6240 R	4536	3368	3044	3573	3577	3601	2776	1403	3167	-	-	-	-	-	-	-	-	-			
SSS 4945 (tuc)	4441	3474	2677	3140	3965	3706	3297	1695	3264	-	-	-	-	-	-	-	-	-			
LS 6146 R	3999	2949	3367	3424	3645	2752	2976	1507	3030	-	-	-	-	-	-	-	-	-			
PHB 95 Y 20 R	4050	3206	2652	3409	3356	3392	2633	3003	3096	-	-	-	-	-	-	-	-	-			
LS 6261 R	3793	3020	4676	3322	4024	3308	2814	3081	3419	-	-	-	-	-	-	-	-	-			
LS 6164 R	4003	2302	3110	3654	3394	3050	3589	2964	3147	-	-	-	-	-	-	-	-	-			
PAN 1614 R	3734	2680	2845	3648	3806	3243	3353	2989	3106	-	-	-	-	-	-	-	-	-			
NS 7211 R	4161	2504	2708	3838	3860	2939	3618	3777	3228	-	-	-	-	-	-	-	-	-			
SSS 5755 (tuc)	3928	2847	2958	3017	4093	3188	2845	1844	3063	-	-	-	-	-	-	-	-	-			
LDC 5.9	4473	2947	3138	4216	3983	3503	3628	3447	3565	-	-	-	-	-	-	-	-	-			
LDC 6.0	4197	2640	2204	3380	4233	3586	3057	1989	3054	-	-	-	-	-	-	-	-	-			
6968 RSF	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Gem/Mean	4143	2972	3117	3523	3784	3431	3188	3038	3262	4877	4014	4285	2138	2047	3583	3806	1914	3333			

Tabel 23 Opbrengstwaarskynlikheid (%) van kultivars geëvalueer in 2015/16, 2016/17 en 2017/18 vir die warm produksiegebiede by verskillende opbrengspotensiaal
 Table 23 Yield probability (%) of cultivars in the 2015/16, 2016/17 and 2017/18 for the warm production areas at different yield potentials

Kultivar Cultivar	Opbrengspotensiaal/Yield potential (t/ha)									
	1.5	2.0	2.5	3.0	3.5	4.0	4.5			
PAN 1454 R	45	38	32	25	21	18	16			
PHB 94 Y 80 R	29	26	24	23	23	23	24			
LS 6248 R	22	30	42	55	68	77	84			
DM 5953 RSF	80	74	67	57	47	37	30			
SSS 5449 (tuc)	20	19	19	19	20	22	24			
SSS 5052 (tuc)	27	29	31	34	38	43	47			
PAN 1521 R	72	77	82	85	88	89	89			
NS 5909 R	52	55	59	62	65	67	69			
PHB 96 T 06 R	53	46	38	31	24	20	17			
PAN 1623 R	62	63	65	66	66	66	65			
LS 6161 R	34	40	47	54	62	68	73			
SSS 6560 (tuc)	51	53	57	60	62	64	66			
NS 6448 R	51	54	57	60	63	65	67			
DM 6.8 IRR	72	71	68	65	61	57	53			

Tabel 24 Saadopbrengs (kg/ha⁻¹) van kultivars gedurende die 2016/17 en 2017/18 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 2016/17 and 2017/18 growing season for the various localities situated in the warm production areas

Kultivar Cultivar	2016/17			2017/18			
	Brits	Brits K2	Gem/Mean	Brits K2	Groblersdal Agricol	Marble Hall	Gem/Mean
PAN 1454 R	1673	2578	2125	2964	2139	4497	3200
PHB 94 Y 80 R	1766	2717	2241	2750	1951	4372	3024
LS 6248 R	1524	2861	2193	2629	3397	4812	3613
P48T48 R	-	-	-	2606	1880	4502	2996
DM 5953 RSF	2921	3668	3294	2957	3015	3750	3240
SSS 5449 (tuc)	1938	2220	2079	2729	3133	4591	3484
NS 5009 R	-	-	-	2507	3235	5073	3605
LS 6851 R	-	-	-	2939	2330	4504	3258
NS 5258 R	-	-	-	2294	2356	5353	3334
PAN 1532 R	1910	1895	1902	2443	2737	4404	3195
DM 5351 RSF	-	-	-	2776	3258	4840	3624
Y 540	-	-	-	2481	2161	5169	3270
SSS 5052 (tuc)	1871	2601	2236	2609	3174	4796	3526
NA 5509 R	-	-	-	3080	4627	4261	3989
Y 550	-	-	-	2194	3245	4256	3232
DM 5609 RSF	2174	2846	2510	2078	3115	4849	3347
PAN 1521 R	3654	4176	3915	3458	3580	5109	4049
DM 5302 RSF	2649	3095	2872	2748	2780	5164	3564
NS 5909 R	2052	2419	2236	2977	3325	4608	3637
LS 6860 R	-	-	-	3026	3608	4484	3706
PHB 96 T 06 R	2352	2159	2256	2987	3627	4039	3551
PAN 1623 R	2364	2896	2630	3091	4463	4715	4090
LS 6161 R	2203	2448	2326	2572	3215	5082	3623
LS 6862 R	-	-	-	2386	4618	4718	3907
SSS 6560 (tuc)	2328	2188	2258	2700	4060	5126	3962
NS 6267 R	-	-	-	2582	3427	4532	3514
Y 627	-	-	-	2333	3716	4130	3393
P61T38 R	2419	2732	2576	3971	4187	5001	4386
DM 6663 RSF	1842	1947	1895	3517	4032	4239	3930
NS 6448 R	1926	2019	1973	3580	3624	4624	3943
P64T39 R	4226	2825	3526	3767	3875	5439	4360
DM 6402 RSF	-	-	-	2398	3782	4706	3629
Y 657	-	-	-	2692	5035	5105	4277
LS 6868 R	-	-	-	2888	2766	4711	3455
DM 6.8i RR	2565	2688	2626	3439	3766	4361	3855
LS 6240 R	1551	2416	1984	-	-	-	-
SSS 4945 (tuc)	2064	2687	2375	-	-	-	-
LS 6146 R	1722	2483	2103	-	-	-	-
PHB 95 Y 20 R	2431	2551	2491	-	-	-	-
LS 6261 R	1738	2637	2187	-	-	-	-
LS 6164 R	1885	2400	2142	-	-	-	-
PAN 1614 R	1891	2260	2075	-	-	-	-
NS 7211 R	2297	2591	2444	-	-	-	-
SSS 5755 (tuc)	1652	2008	1830	-	-	-	-
LDC 5.9	2936	3413	3174	-	-	-	-
LDC 6.0	1431	1906	1669	-	-	-	-
6968 RSF	2645	2080	2362	-	-	-	-
Gem/Mean	2206	2575	2391	2833	3350	4683	3622

Tabel 26 Saamgevatte inligting van al die lokaliteite in die koel produksiegebiede, 2017/18
 Table 26 Summarised information for all the localities in the cool production areas, 2017/18

Kultivar/Cultivar	Dae tot blom/ Days to flowering	Fisiologies tip/ Physiological mature	Oes datum/ Harvest date	Planthoogte/ Plant height	Peulhoogte/ Pod height	Omval/ Lodging	Groenstam/ Green stem	Opspring/ Shattering	Plantteling/ Number of plants	Per sentasie ongewenste sate/ Percentage undesirable seed	Massa 100 sade/ Mass 100 seeds	Olie persentasie/Oil percentage	Ru- proteïen- persentasie/ Crude protein percentage	Opbrengs/ Yield
PAN 1454 R	59	139	159	77	8	1.40	1.80	1.80	192	0.12	17.34	12.35	33.85	2704
PHB 94 Y 80 R	58	137	157	66	6	1.40	1.47	2.27	168	0.10	17.02	14.28	33.45	3234
LS 6248 R	83	151	190	96	11	1.53	1.60	1.47	194	0.70	13.57	12.27	32.54	2454
P48T48 R	63	138	162	73	7	1.27	2.07	1.53	178	0.28	18.83	13.64	32.71	2979
DM 5953 RSF	63	141	158	79	7	1.27	1.60	1.80	224	0.28	16.65	12.22	33.80	3531
SSS 5449 (tuc)	77	151	169	88	9	1.33	1.27	1.47	188	0.46	13.91	14.07	33.54	2792
NS 5009 R	65	137	158	62	6	1.07	1.73	1.73	147	0.26	17.64	14.09	32.97	2593
LS 6851 R	83	156	184	70	6	1.00	1.53	1.27	116	0.90	14.99	13.22	32.79	2294
NS 5258 R	63	137	160	71	7	1.27	1.40	1.53	182	0.24	14.89	12.48	34.34	3082
PAN 1532 R	84	153	177	73	7	1.07	1.47	1.13	193	0.60	14.76	12.68	33.73	3065
DM 5351 RSF	63	136	157	77	8	1.20	1.53	1.80	225	0.22	16.14	12.25	33.93	3499
Y 540	76	151	165	76	8	1.13	1.93	1.40	151	0.56	14.76	11.44	33.53	3104
SSS 5052 (tuc)	86	153	189	82	8	1.20	1.67	1.53	188	1.78	14.12	12.78	33.42	2383
NA 5509 R	85	159	188	86	9	1.27	1.33	1.13	199	0.62	15.94	13.21	32.50	2985
Y 550	81	158	189	89	10	1.33	1.67	1.27	197	1.34	15.13	14.05	32.30	2790
DM 5609 RSF	84	155	182	74	7	1.20	1.67	1.27	179	0.54	15.39	12.98	32.74	2861
PAN 1521 R	86	154	178	90	11	1.33	2.00	1.40	182	0.52	15.50	12.86	32.89	3049
DM 5302 RSF	80	153	175	80	7	1.33	1.73	1.47	174	0.64	15.87	15.66	32.31	3029
NS 5909 R	88	162	188	86	12	1.27	2.00	1.40	161	0.52	15.46	12.75	33.49	2465
LS 6860 R	93	161	191	100	11	1.40	1.87	1.47	138	0.74	16.96	13.47	31.48	2081
PHB 96 T 06 R	92	162	190	97	9	1.33	1.60	1.40	194	1.12	23.13	12.98	32.87	2750
PAN 1623 R	87	160	186	88	9	1.53	1.60	1.33	181	0.72	14.27	14.65	33.12	3134
LS 6161 R	86	161	187	87	10	1.27	1.40	1.60	189	0.86	14.34	12.67	32.95	2592
LS 6862 R	87	159	188	84	9	1.20	1.27	1.27	107	0.34	15.82	11.40	33.10	2564
SSS 6560 (tuc)	82	156	189	90	10	1.20	1.73	1.60	153	0.88	14.19	13.49	32.79	2592
NS 6267 R	83	156	188	80	10	1.07	1.80	1.67	180	0.74	15.81	11.59	31.21	3013
Y 627	84	159	187	88	9	1.33	1.73	1.60	186	0.64	15.37	13.07	31.88	2884
P61T38 R	82	154	186	78	9	1.00	1.80	1.20	167	0.58	15.90	13.84	32.86	2797
DM 6663 RSF	90	161	189	100	11	1.53	1.87	1.80	195	0.62	15.92	14.59	31.87	2615
NS 6448 R	86	160	189	87	11	1.07	1.47	1.60	177	0.80	15.45	13.36	33.31	2805
P64T39 R	89	160	190	93	9	1.40	1.53	1.40	177	1.34	15.19	14.02	32.12	2881
DM 6402 RSF	93	162	189	94	11	1.40	2.00	1.33	176	0.78	15.19	15.41	31.89	2053
Y 657	90	159	187	94	11	1.33	1.33	1.80	209	1.96	13.55	14.53	32.60	3020
LS 6868 R	93	162	190	89	9	1.20	1.80	1.53	176	1.20	14.30	13.43	33.05	2143
DM 6.8iRR	89	161	190	107	12	1.53	2.07	1.33	171	0.70	16.45	12.26	31.79	2437
Gem/Mean	81	153	180	84	9	1.28	1.67	1.50	179	0.71	15.71	13.26	32.85	2779

Tabel 27 Saamgevatte inligting van al die lokaliteite in die matige produksiegebiede, 2017/18
 Table 27 Summarised information for all the localities in the moderate production areas, 2017/18

Kultivar/Cultivar	Dae tot blom/ Days to flowering	Fisiologies ryp/ Physiological mature	Oes datum/ Harvest date	Planthoogte/ Plant height	Peulhoogte/ Pod height	Omval/ Lodging	Groenstam/ Green stem	Opspring/ Shattering	Plantteling/ Number of plants	Persentasie ongewenste sade/ Percentage undesirable seed	Massa 100 sade/ Mass 100 seeds	Olie persentasie/ Oil percentage	Ru- proteïen- tasie/ Crude protein percentage	Opbrensk/ Yield
PAN 1454 R	56	131	144	76	10	1.26	2.19	1.57	261	0.08	18.75	13.80	35.18	2864
PHB 94 Y 80 R	54	129	144	67	7	1.37	2.33	1.62	261	0.12	18.40	14.50	35.20	3066
LS 6248 R	69	141	163	93	15	1.89	2.48	1.43	262	0.12	15.00	13.65	34.45	3139
P48T48 R	53	134	148	63	8	1.22	2.67	1.76	247	0.04	19.13	13.52	34.50	3189
DM 5953 RSF	53	131	146	75	11	1.26	2.05	1.62	286	0.08	16.47	12.51	35.22	3512
SSS 5449 (tuc)	68	133	151	74	8	1.22	1.62	1.48	274	0.04	14.34	13.72	35.58	3082
NS 5009 R	55	129	148	63	7	1.22	2.19	1.52	196	0.00	18.45	13.67	34.75	2968
LS 6851 R	68	141	160	66	10	1.15	1.81	1.00	155	0.06	14.95	12.90	35.34	3405
NS 5258 R	54	131	150	67	8	1.26	1.52	1.52	279	0.10	15.52	14.02	35.46	3244
PAN 1532 R	69	141	159	69	10	1.15	1.71	1.10	266	0.06	15.43	13.68	35.24	3486
DM 5351 RSF	54	133	146	72	9	1.19	2.10	1.71	300	0.08	16.46	13.05	35.23	3383
Y 540	65	137	153	69	10	1.26	1.90	1.62	182	0.06	15.22	12.06	35.43	3629
SSS 5052 (tuc)	72	143	162	83	12	1.26	1.90	1.14	266	0.46	15.33	13.87	35.03	3264
NA 5509 R	72	144	161	80	13	1.37	2.48	1.29	255	0.08	16.78	13.72	35.04	3345
Y 550	70	139	158	78	12	1.67	2.67	1.10	283	0.08	16.43	14.64	34.09	2996
DM 5609 RSF	73	138	155	69	9	1.22	2.43	1.14	268	0.06	15.77	12.75	35.31	3454
PAN 1521 R	73	138	160	81	13	1.33	1.62	1.10	242	0.04	16.82	13.82	34.51	3569
DM 5302 RSF	69	134	153	72	9	1.56	1.67	1.19	217	0.12	15.98	15.42	34.09	3401
NS 5909 R	75	145	163	83	15	1.52	2.62	1.29	194	0.08	17.15	13.87	35.27	3431
LS 6860 R	76	143	165	89	15	1.70	2.62	1.24	183	0.04	18.40	13.30	34.43	3195
PHB 96 T 06 R	76	146	163	87	14	1.52	2.00	1.05	282	0.14	16.42	13.63	35.19	3247
PAN 1623 R	73	145	164	86	13	1.43	1.95	1.00	283	0.08	15.73	15.12	34.98	3227
LS 6161 R	74	147	161	87	14	1.39	2.48	1.24	248	0.08	16.06	13.93	34.85	3133
LS 6862 R	74	144	164	79	12	1.39	2.19	1.05	190	0.06	16.47	10.98	35.62	3602
SSS 6560 (tuc)	73	145	165	86	14	1.59	2.29	1.10	222	0.08	16.04	13.94	34.54	3360
NS 6267 R	72	147	163	76	13	1.74	2.57	1.10	264	0.18	17.10	12.47	34.74	3529
Y 627	72	146	167	82	13	1.56	2.43	1.33	268	0.04	16.29	13.71	34.35	3642
P61T38 R	74	149	167	71	14	1.26	2.48	1.10	260	0.12	16.88	14.65	34.63	3621
DM 6663 RSF	78	145	167	96	15	1.78	3.19	1.10	229	0.02	17.17	13.79	34.21	3401
NS 6448 R	76	148	163	81	14	1.33	2.10	1.24	289	0.08	16.55	13.52	35.34	3420
P64T39 R	76	151	169	89	13	1.48	2.67	1.05	219	0.06	17.03	14.68	34.07	3558
DM 6402 RSF	78	147	167	89	13	1.74	3.00	1.00	242	0.02	15.97	14.79	34.59	3263
Y 657	77	148	163	84	13	1.67	1.86	1.14	257	0.12	15.14	14.71	34.37	3651
LS 6868 R	79	153	167	88	15	1.28	2.71	1.00	236	0.32	15.03	13.10	35.71	2804
DM 6.8i RR	77	150	169	98	16	1.78	3.05	1.05	229	0.06	17.97	13.04	34.25	3571
Gem/Mean	69	141	159	79	12	1.43	2.27	1.26	246	0.09	16.47	13.67	34.88	3333

Table 28 Saamgevatte inligting van al die lokaliteite in die warmer produksiegebiede, 2017/18
Table 28 Summarised information for all the localities in the warmer production areas, 2017/18

Kultivar/Cultivar	Dae tot blom/ Days to flower	Fisiologies ryp/ Physiological mature	Oes datum/ Harvest date	Plant hoogte Plant height	Peulhoogte/ Pod height	Omval/ Lodging	Groenstam/ Green stem	Opspring/ Shattering	Planttel- ling/ Number of plants	Persen- tasie ongewen- ste sade/ Per- centage undesir- able seed	Massa 100 sade/ Mass 100 seeds	Olie persen- tasie/Oil percen- tage	Ru- proteïen- persen- tasie/ Crude protein percen- tage	Opbrengs/ Yield
PAN 1454 R	42	109	124	79	9	1.00	1.33	1.00	197	-	18.24	13.99	36.61	3200
PHB 94 Y 80 R	40	109	120	72	7	1.00	1.00	1.00	223	-	18.07	14.07	36.57	3024
LS 6248 R	48	118	131	92	9	1.00	1.00	1.00	208	-	17.19	13.99	35.92	3613
P48T48 R	42	111	124	68	7	1.00	1.67	1.00	233	-	17.57	11.79	36.26	2996
DM 5953 RSF	43	113	123	79	9	1.00	1.33	1.00	201	-	16.40	12.02	36.84	3240
SSS 5449 (tuc)	48	112	123	78	4	1.00	1.00	1.00	208	-	16.00	12.89	37.12	3484
NS 5009 R	44	119	126	77	7	1.00	1.67	1.00	202	-	18.40	13.17	36.27	3605
LS 6851 R	49	119	132	56	7	1.00	1.00	1.00	172	-	16.08	12.61	37.07	3258
NS 5258 R	44	108	118	76	6	1.00	1.00	1.00	213	-	16.14	15.11	35.78	3334
PAN 1532 R	49	119	127	73	9	1.00	1.33	1.00	207	-	16.60	13.94	36.46	3195
DM 5351 RSF	43	111	129	79	8	1.00	1.33	1.00	221	-	16.19	11.91	37.01	3624
Y 540	48	114	126	79	10	1.00	1.00	1.00	213	-	15.96	12.57	36.95	3270
SSS 5052 (tuc)	49	116	130	83	8	1.00	1.00	1.00	226	-	16.62	12.97	36.59	3526
NA 5509 R	51	119	130	87	12	1.00	1.00	1.00	198	-	16.99	14.05	36.41	3989
Y 550	49	117	126	84	7	1.00	1.33	1.00	224	-	16.11	14.18	35.53	3232
DM 5609 RSF	49	119	131	64	7	1.00	1.67	1.00	197	-	15.35	11.55	36.35	3347
PAN 1521 R	51	117	129	87	9	1.00	1.00	1.00	200	-	17.52	13.17	36.18	4049
DM 5302 RSF	49	112	123	78	11	1.00	1.00	1.00	177	-	17.19	13.59	36.28	3564
NS 5909 R	53	121	131	81	14	1.00	1.00	1.00	219	-	17.18	13.43	37.04	3637
LS 6860 R	53	120	129	91	13	1.00	1.00	1.00	221	-	19.57	13.15	36.29	3706
PHB 96 T 06 R	52	124	133	96	14	1.00	1.00	1.00	214	-	17.04	13.37	36.62	3551
PAN 1623 R	52	119	134	92	9	1.00	1.00	1.00	187	-	16.96	13.41	37.17	4090
LS 6161 R	52	123	133	94	11	1.00	1.00	1.00	202	-	16.71	14.52	35.59	3623
LS 6862 R	50	118	131	78	11	1.00	1.00	1.00	208	-	15.60	10.55	37.35	3907
SSS 6560 (tuc)	51	116	129	89	11	1.00	1.00	1.00	213	-	15.96	13.88	36.05	3962
NS 6267 R	50	121	133	76	12	1.00	1.33	1.00	220	-	18.52	12.60	36.53	3514
Y 627	52	118	132	83	14	1.00	1.33	1.00	210	-	17.03	13.91	35.73	3393
P61T38 R	52	126	136	62	12	1.00	1.00	1.00	220	-	17.99	15.12	35.89	4386
DM 6663 RSF	52	124	132	112	17	1.00	1.67	1.00	205	-	16.20	11.37	36.44	3930
NS 6448 R	50	127	134	79	13	1.00	1.00	1.00	211	-	17.07	13.42	36.52	3943
P64T39 R	51	124	133	88	8	1.00	1.00	1.00	217	-	16.89	13.61	36.32	4360
DM 6402 RSF	52	127	135	106	10	1.00	1.33	1.00	219	-	15.81	14.00	36.35	3629
Y 657	53	123	135	88	8	1.00	1.00	1.00	211	-	15.71	14.23	36.06	4277
LS 6868 R	53	122	135	104	11	1.00	1.33	1.00	210	-	15.89	11.96	37.58	3455
DM 6.8i RR	54	126	137	98	17	1.00	1.00	1.00	212	-	17.92	13.46	36.11	3855
Gem/Mean	49	118	130	83	10	1.00	1.16	1.00	209	-	16.88	13.24	36.45	3622

GOVERNMENT NOTICES • GOEWERMENTSKENNISGEWINGS

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.

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"**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.

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- (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

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- (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 pater, 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 --

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- (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

- (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.

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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

<i>Nature of deviation</i>	<i>Maximum percentage permissible deviation (m/m)</i>
	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%

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