South African Soybean Crop

Quality Report 2020/2021 Season

Compiled and issued by:
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South African

COMMERCIAL SOYBEAN QUALITY FOR THE 2020/2021 SEASON

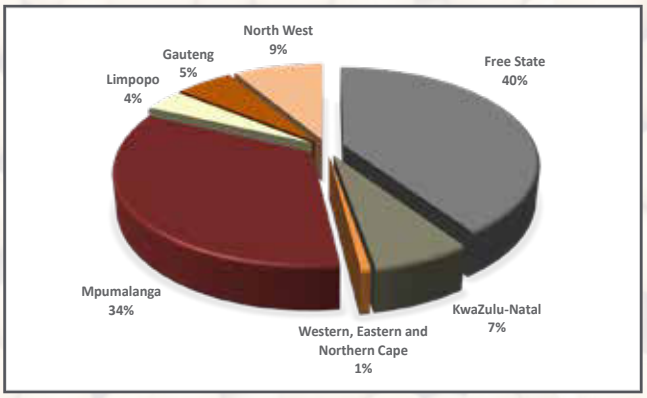
Acknowledgements
With gratitude to:

- *The Oilseeds Advisory Committee (OAC) as well as the Oil & Protein Seed Development Trust (OPDT) 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, Land Reform and Rural Development (DALRRD) 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.*
- *Precision Oil Laboratories for providing Fatty Acid Profile analyses.*

Introduction

The final commercial soybean crop figure of the 2020/21 season, as overseen by the National Crop Estimates Liaison Committee (CELC), is 1 897 000 tons. This all-time high record crop represents a 52% increase (651 500 tons) year on year. The major soybean producing provinces, namely the Free State and Mpumalanga, contributed 74% of the total crop.

Graph 1: Provincial contribution to the production of the 2020/21 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 37. 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. Twenty samples, randomly selected to represent the different production regions, were submitted to Precision Oil Laboratories for fatty acid profile analyses.

This is the tenth 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 various proficiency testing schemes, both nationally and internationally, as part of our ongoing quality assurance procedures to demonstrate technical competency and international comparability.

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.

The results of this survey are available on the SAGL website (www.sagl.co.za). Hard copy reports are distributed to all Directly Affected Groups and interested parties. The report is also available to read or 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 2020/21 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 are the most important oilseed crop produced in South Africa, driven mainly by the demand for protein feed in the animal feed industry. Soybeans have benefits to producers in crop rotation programs, especially as part of conservation agriculture, but also due to lower input requirements compared to other commodities for example wheat and maize.

Table 1: Soybean production overview over two seasons

Province	Type of production	2020/21			2019/20		
		Hectares planted, ha	Production, tons	Yield, t/ha	Hectares planted, ha	Production, tons	Yield, t/ha
Western Cape	Dryland	-	-	-	-	-	-
	Irrigation	-	-	-	-	-	-
	Total	-	-	-	-	-	-
Northern Cape	Dryland	-	-	-	-	-	-
	Irrigation	1 000	3 500	3.50	2 000	7 000	3.50
	Total	1 000	3 500	3.50	2 000	7 000	3.50
Free State	Dryland	353 000	734 700	2.08	304 000	486 750	1.60
	Irrigation	12 000	31 800	2.65	11 000	33 000	3.00
	Total	365 000	766 500	2.10	315 000	519 750	1.65
Eastern Cape	Dryland	2 700	7 850	2.91	1 300	2 300	1.77
	Irrigation	400	1 450	3.63	200	700	3.50
	Total	3 100	9 300	3.00	1 500	3 000	2.00
KwaZulu-Natal	Dryland	20 500	71 500	3.49	22 000	56 000	2.55
	Irrigation	15 500	58 100	3.75	13 000	45 500	3.50
	Total	36 000	129 600	3.60	35 000	101 500	2.90
Mpumalanga	Dryland	282 000	614 550	2.18	252 000	390 000	1.55
	Irrigation	8 000	30 000	3.75	8 000	26 000	3.25
	Total	290 000	644 550	2.22	260 000	416 000	1.60
Limpopo	Dryland	4 000	10 700	2.68	2 700	4 350	1.61
	Irrigation	16 500	61 050	3.70	12 800	43 700	3.41
	Total	20 500	71 750	3.50	15 500	48 050	3.10
Gauteng	Dryland	38 500	92 400	2.40	34 000	63 200	1.86
	Irrigation	3 500	12 600	3.60	2 000	7 000	3.50
	Total	42 000	105 000	2.50	36 000	10 200	1.95
North West	Dryland	57 400	130 500	2.27	30 000	51 000	1.70
	Irrigation	12 100	36 300	3.00	10 000	29 000	2.90
	Total	69 500	166 800	2.40	40 000	80 000	2.00
RSA	Dryland	758 100	1 662 200	2.19	646 000	1 053 600	1.63
	Irrigation	69 000	234 800	3.40	59 000	191 900	3.25
	Total	827 100	1 897 000	2.29	705 000	1 245 000	1.77

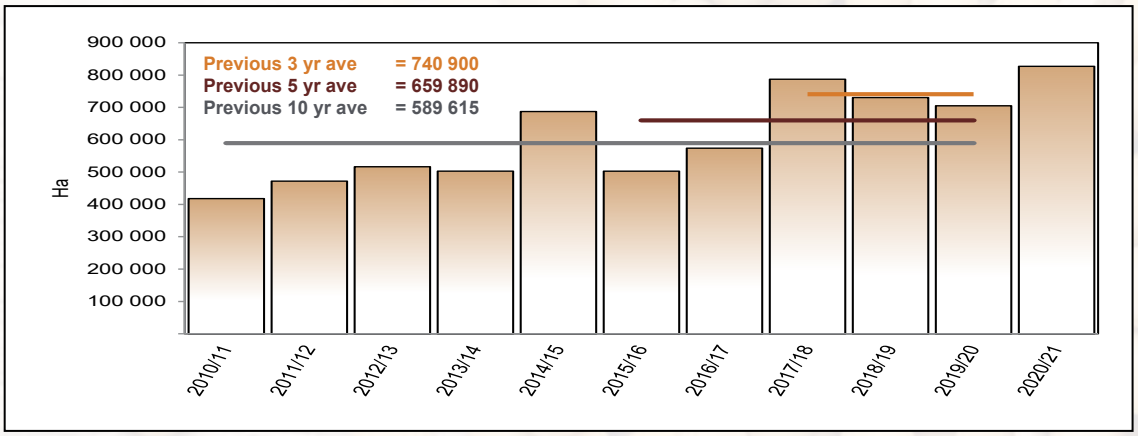
Figures provided by the CEC.

Compared to the 2019/20 production season, the area utilised for commercial soybean crop production increased by just more than 17% (122 100 hectares). Both the area planted as well as the production figures, are the highest figures on record. The average national yield increased by 29% to 2.29 t/ha, also a national record.

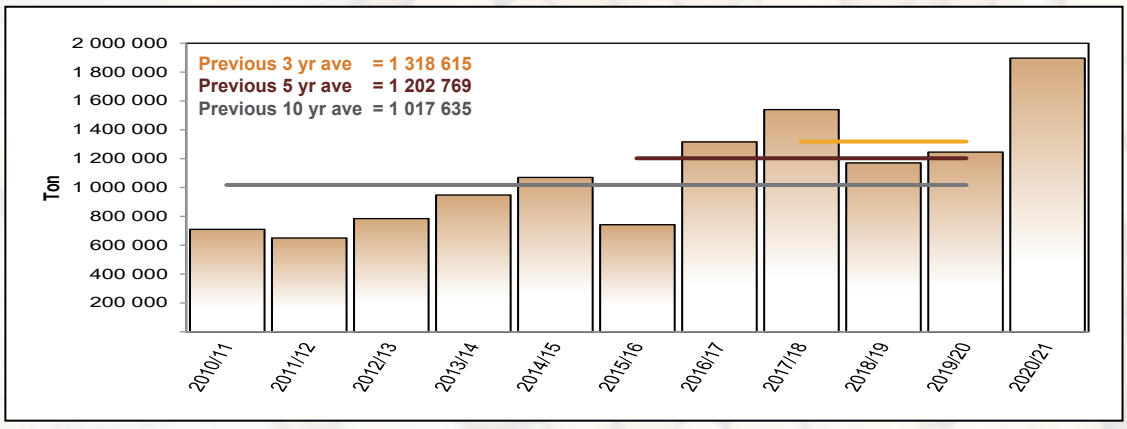
According to *The BFAP Baseline, Agricultural Outlook 2021 – 2030*, the area cultivated to soybeans is projected to continue increasing, expanding by 34% over the ten-year period to 2030. Despite the additional growth in area, yields are also expected to increase by 24% relative to the base period, assuming normal weather patterns as well as the impact of the breeding technology levy, which could incentivise seed companies to make the latest technology available to South African producers. Over the course of the next ten years, soybean production is expected to increase by 260 000 tons from the current year's record crop, an increase of 2.4% per year.

Soybeans account for more than half of the world oilseed production. According to the *World Agricultural Supply and Demand Estimates Report (WASDE – 622)* an estimated 366.23 million metric tons of soybeans were produced during the 2020/21 season. Brazil and the United States are by far the biggest contributors to this total. The world soybean production during the 2021/22 season is projected to be 353.80 million metric tons.

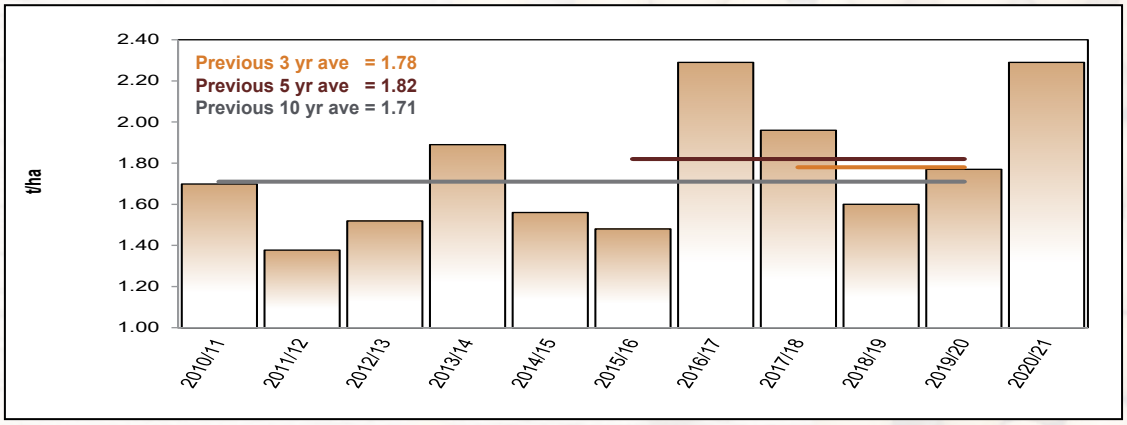
Graph 2: Total RSA area utilised for soybean production from 2010/11 to 2020/21



Graph 3: Soybean production in RSA from 2010/11 to 2020/21

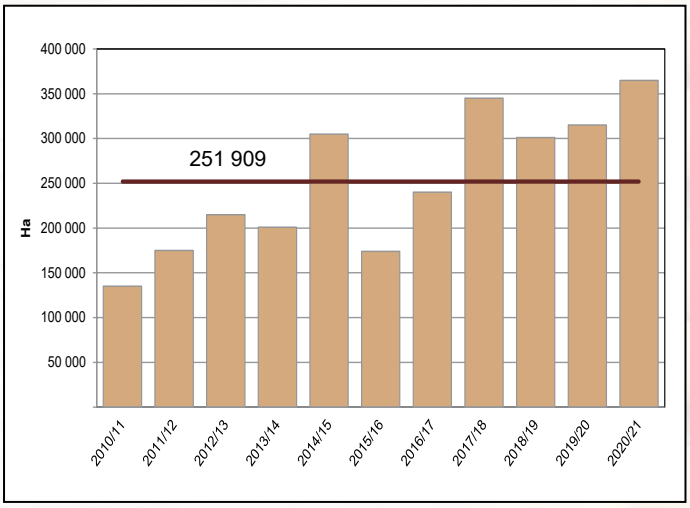


Graph 4: RSA soybean yield from 2010/11 to 2020/21

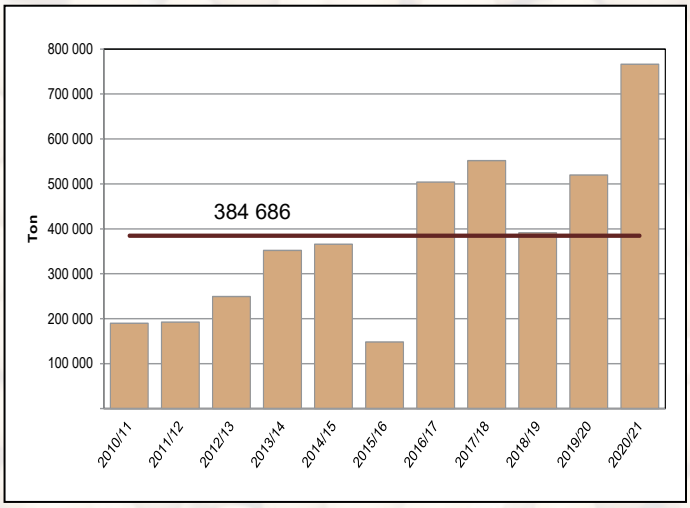


Figures provided by the CEC.

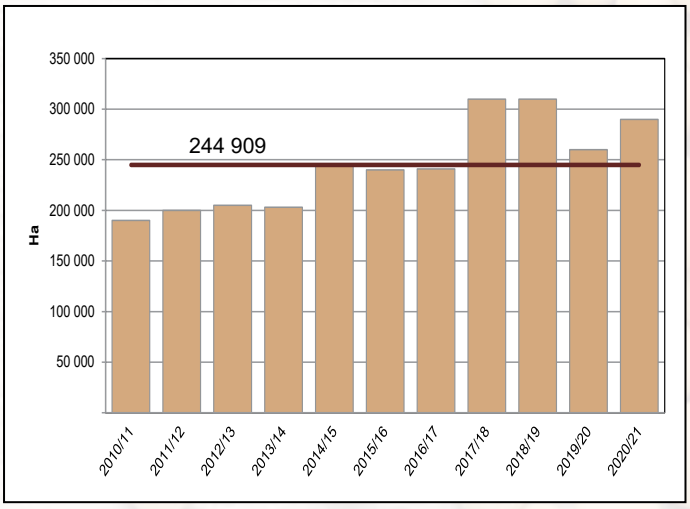
Graph 5: Area utilised for soybean production in the Free State since 2010/11



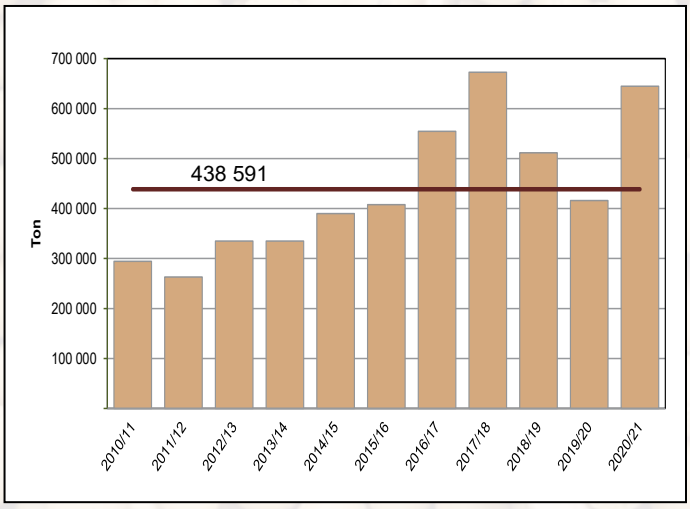
Graph 6: Soybean production in the Free State since 2010/11



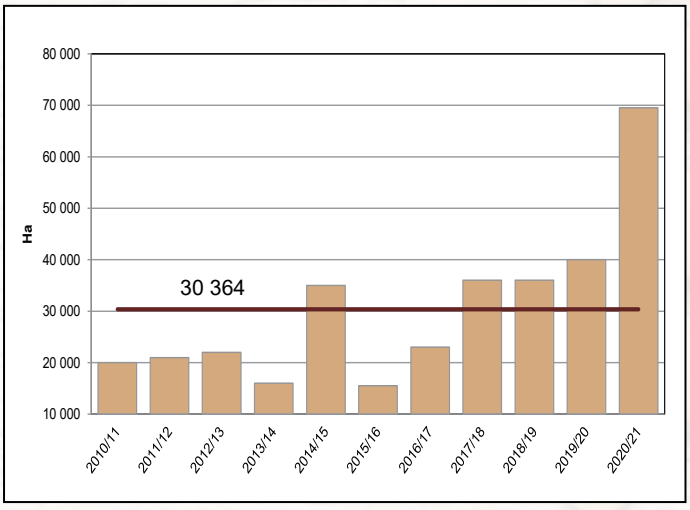
Graph 7: Area utilised for soybean production in Mpumalanga since 2010/11



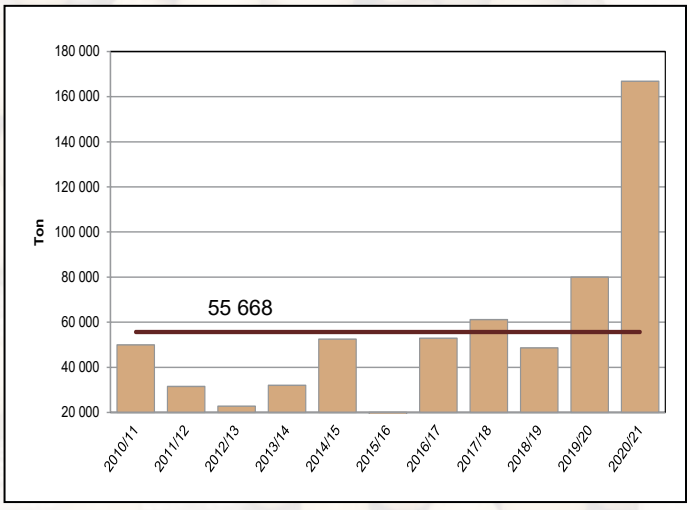
Graph 8: Soybean production in Mpumalanga since 2010/11



Graph 9: Area utilised for soybean production in North West since 2010/11



Graph 10: Soybean production in North West since 2010/11



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 2021 to January 2022), the amount of soybeans imported (13 278 tons) decreased significantly compared to the 116 103 tons of the previous season, the ten year average is 66 257 tons. China remains the largest importer of soybeans worldwide, with 99.76 million metric tons during the 2020/21 season, followed by the European Union.

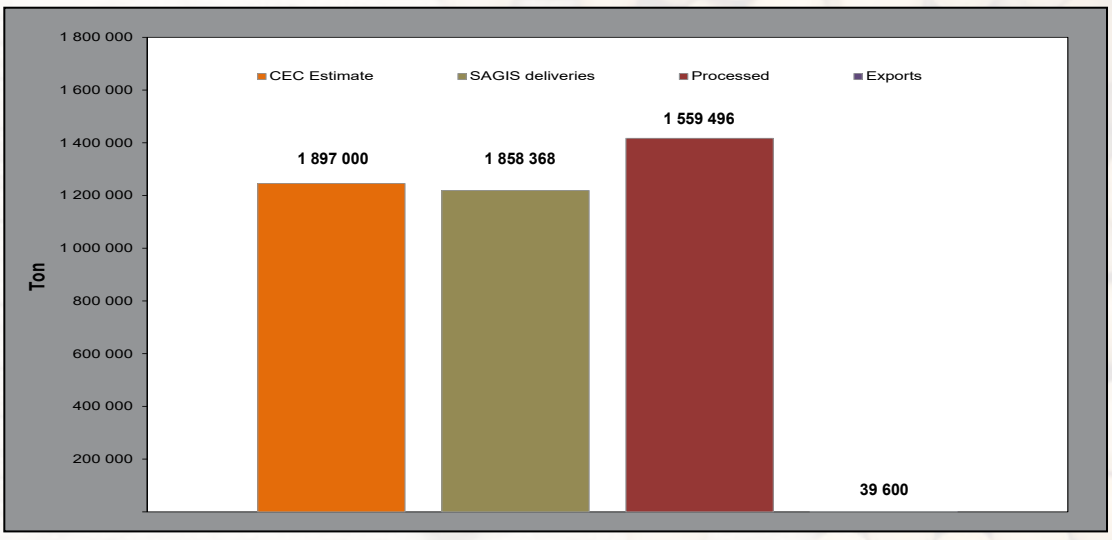
Of the 1.56 million tons of soybeans processed locally to date, 1.3% was used for human consumption, 9.8% for animal feed as full fat soya and the bulk crushed to produce oil and oilcake. Soybean oilcake demand is primarily driven by the feed industry. The quantity of soybeans crushed so far, is 11% more than the total quantity crushed during the previous season and 64% more than the 10-year average. According to *BFAP Baseline*, soybean processing volumes are projected to increase by 43% over the next 10 years.

Over the past decade, the soybean industry has been one of the most dynamic sectors in local agriculture, now becoming more mature, expansion is occurring at a much slower rate. Total soybean processing capacity (crush and full fat) in South Africa is derived from a combination of dedicated soybean processing facilities, as well as plants with the ability to switch between soybeans and sunflower. The projected production growth is expected to support increased processing over time, resulting in current capacity being utilised completely towards 2030. It is projected that net imports share of total oilcake consumption will be a mere 14% in 2030, declining from 66% in 2010.

Over the 2021 – 2030 period, soybean oilcake consumption is expected to increase by 2% per year. Despite sufficient soybean production to yield an exportable surplus by 2030, the high cost of transportation from the summer rainfall regions to particularly the Western Cape, implies that South Africa will continue to import some soybean oilcake into coastal regions. Investment in rail infrastructure to reduce this cost will enable South Africa to become self-sufficient in oilcake production. Vegetable oil consumption declined in 2020 due to pressure on consumer spending and lockdown restrictions. Growth is expected to resume in the medium term and by 2030 consumption is projected to be 16% higher than in the 2018-20 base period. Over the next ten years, soybean oil consumption is expected to increase by 15%.

39 600 tons of soybeans/products have been exported so far this season compared to the 1 060 and 5 336 tons of the previous two seasons respectively. The 10-year average is 26 682 tons. Globally, soybean exports during the 2020/21 season amounted to an estimated 164.48 million metric tons, with Brazil exporting 50% and the United States 37% of this figure. The projected world soybean exports for the 2021/22 season currently stands at 158.63 million metric tons. Argentina, followed by Brazil and the USA are the largest exporters of soybean meal and Argentina and Brazil the largest exporters of soybean oil *(WASDE - 622)*.

Graph 11: Soybean supply and demand overview for the current marketing season (Mar 2021 - Jan 2022)



Information provided by SAGIS.

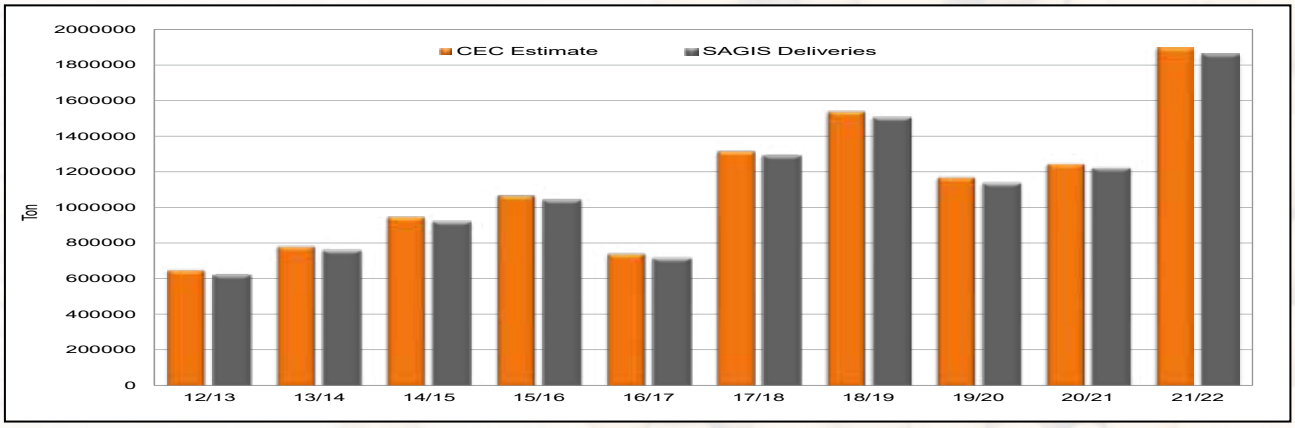
SAGIS South African Grain Information Service
Suid-Afrikaanse Graan Inligtingsdiens

SOYBEANS: SUPPLY AND DEMAND TABLE BASED ON SAGIS' INFO (TON) — **Publication date: 2022-02-25**

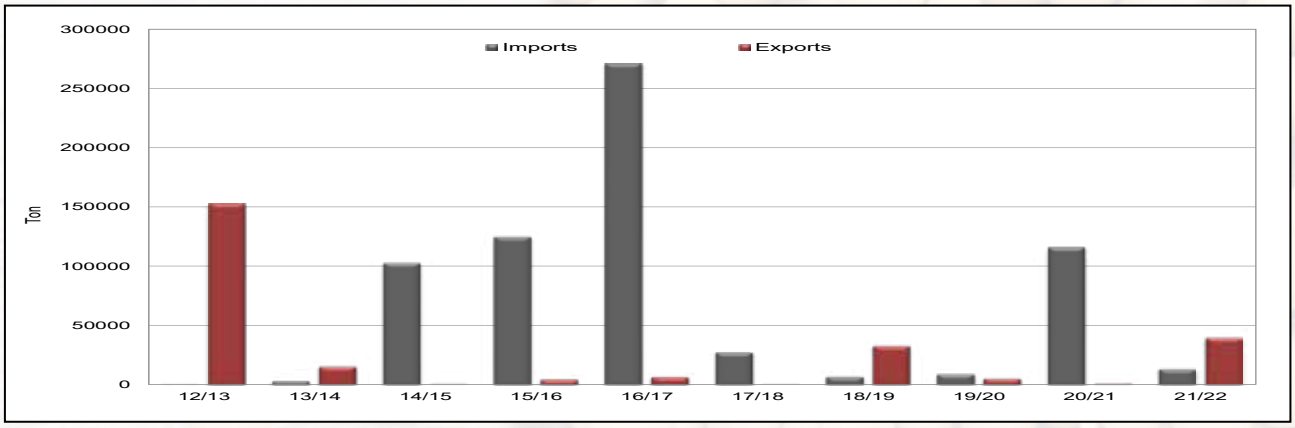
	Season (Mar - Feb)																Current Season Mar - Jan	10 Year average
	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	2011/12-2020/21
																	11	
CEC (Crop Estimate)	272 500	424 000	205 000	282 000	516 000	566 000	710 000	650 000	784 500	948 000	1 070 000	742 000	1 316 000	1 540 000	1 170 345	1 245 500	1 897 000	1 017 635
SUPPLY																		
Opening stock (1 Mar)	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	502 241	138 455	46 053	161 130
Prod deliveries	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	1 502 976	1 135 145	1 219 044	1 858 368	989 423
Imports	9 700	5 000	132 100	4 200	3 100	600	300	300	3 256	102 977	124 981	271 098	27 508	6 945	9 098	116 103	13 278	66 257
Surplus	0	3 900	3 300	900	700	1 500	1 800	1 698	2 572	0	10 526	1 122	2 519	4 497	0	1 968	2 786	2 670
Total Supply	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	1 844 953	1 646 484	1 475 570	1 920 485	1 219 480
DEMAND																		
Processed	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	1 298 544	1 484 692	1 417 165	1 559 496	1 018 742
-human	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	25 005	23 759	23 234	20 362	25 234
-animal feed (full fat soya)	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	218 973	191 323	144 985	153 302	148 492
-crush (oil/oilcake)	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	1 054 566	1 269 610	1 248 946	1 385 832	845 015
Withdrawn by producers	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	567	676	496	182	2 025
Released to end-consumers	3 400	1 900	900	1 200	900	3 700	3 400	2 757	2 825	2 886	2 650	1 098	608	431	367	673	115	1 770
Seed for planting purposes	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	10 599	7 640	9 961	10 585	7 156
Net receipts(-)/disp(+)	1 500	300	1 600	1 300	3 200	1 900	1 600	0	2 316	1 924	805	1 427	-429	-239	1 107	162	269	867
Deficit	600	0	0	0	0	0	0	0	0	2 782	0	0	0	0	8 097	0	0	1 088
Exports	7 000	1 000	900	8 000	153 100	121 700	47 200	152 616	15 390	576	4 677	6 745	414	32 810	5 336	1 060	39 600	26 682
Total Demand	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	1 342 712	1 507 915	1 429 517	1 610 247	1 058 329
Ending Stock (28 Feb)	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	502 241	138 569	46 053	310 238	161 151
- processed p/month	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	108 212	123 724	118 097	141 772	84 897
- months' stock	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	4.6	1.1	0.4	2.2	2

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

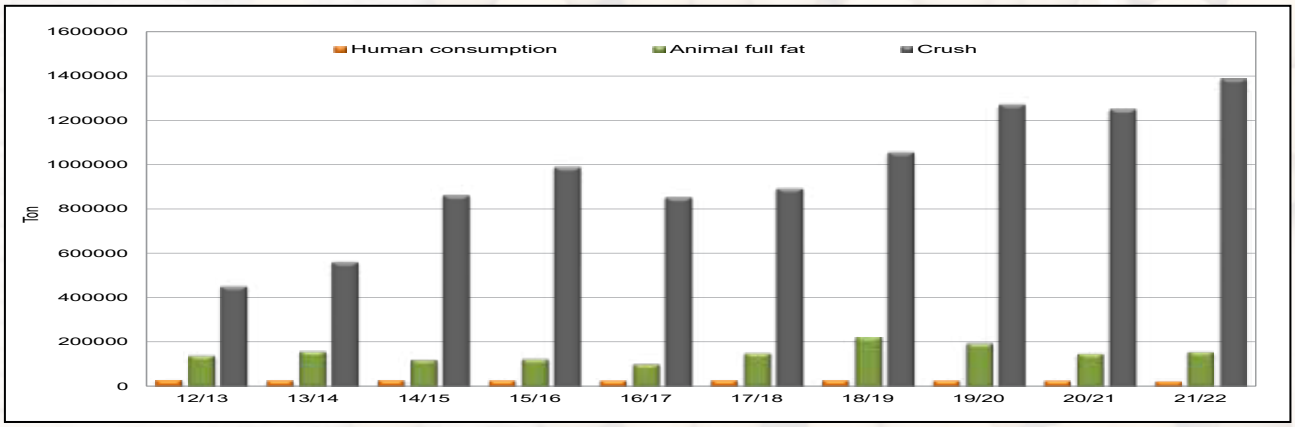
Graph 12: Soybeans: CEC Estimate vs SAGIS deliveries over 10 marketing seasons



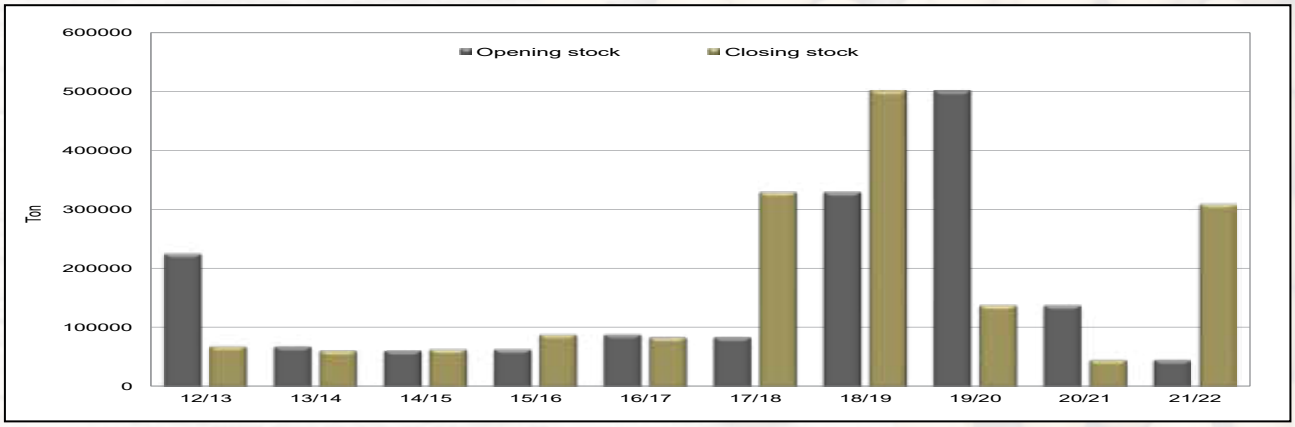
Graph 13: Soybeans: Imports and Exports over 10 marketing seasons



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.

SAGIS South African Grain Information Service NPC
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Reg no. 1997/019186/08

Season	SOYBEANS: IMPORTS FOR RSA PER COUNTRY (Tons)											
	Australia	Brazil	Ethiopia	Malawi	Mozambique	Nigeria	Paraguay	Ukraine	USA	Zambia	Zimbabwe	Total
2016/17	0	0	3 314	0	0	204	263 576	0	0	4 004	0	**271 098**
2017/18	0	0	371	3 153	0	0	0	0	0	22 912	1 072	**27 508**
2018/19	0	0	160	1 953	343	0	0	645	0	3 844	0	**6 945**
2019/20	343	0	0	2 492	2 151	0	0	0	0	4 112	0	**9 098**
2020/21	0	55 000	0	1 280	1 623	0	0	0	52 534	4 728	0	**115 165**
2021/22	0	0	0	3 197	30	0	0	0	0	8 204	1 847	**13 278**

Season	SOYBEANS IMPORTS PER HARBOUR (Tons)				
	Harbours				
	East London	Durban	Cape Town	Port Elizabeth	Total
2007/08	0	71 885	31 433	0	**103 318**
2008/09	0	12 004	0	0	**12 004**
2009/10	0	0	0	0	**0**
2010/11	0	0	0	0	**0**
2011/12	0	163	0	0	**163**
2012/13	0	344	0	0	**344**
2013/14	0	2 661	0	98	**2 759**
2014/15	0	61 705	0	0	**61 705**
2015/16	0	121 343	0	0	**121 343**
2016/17	0	267 094	0	0	**267 094**
2017/18	0	371	0	0	**371**
2018/19	0	805	0	0	**805**
2019/20	0	343	0	0	**343**
2020/21	0	107 534	0	0	**107 534**
2021/22*	0	674	0	0	**674**

*Progressive March 2021 - January 2022
Note: Includes Imports for RSA and Other Countries

Season	SOYBEANS: RSA EXPORTS PER COUNTRY (Tons)								
	Botswana	Lesotho	Malawi	Malaysia	Mozambique	Turkey	Eswatini	Zimbabwe	Total
2016/17	0	0	0	0	2 614	0	0	4 131	**6 745**
2017/18	4	0	0	0	410	0	0	0	**414**
2018/19	17	0	0	0	160	27 660	0	4 973	**32 810**
2019/20	189	0	0	0	291	0	0	4 856	**5 336**
2020/21	744	9	0	0	298	0	7	2	**1 060**
2021/22	918	0	764	986	7 745	0	0	29 187	**39 600**

Season	SOYBEANS EXPORTS PER HARBOUR (Tons)				
	Harbours				
	East London	Durban	Cape Town	Port Elizabeth	Total
2007/08	0	0	0	0	0
2008/09	0	0	0	0	0
2009/10	0	151 212	0	0	151 212
2010/11	0	121 243	0	0	121 243
2011/12	0	40 633	0	0	40 633
2012/13	0	152 318	0	0	152 318
2013/14	0	15 044	0	0	15 044
2014/15	0	0	0	0	0
2015/16	0	0	0	0	0
2016/17	0	0	0	0	0
2017/18	0	0	0	0	0
2018/19	0	27 660	0	0	27 660
2019/20	0	0	0	0	0
2020/21	0	0	0	0	0
2021/22*	0	986	0	0	986

*Progressive March 2021 - January 2022

SAGIS South African Grain Information Service NPC
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Reg no. 1997/019186/08

	OIL SEEDS PRODUCTS PER MONTH MANUFACTURED													
	Marketing year Mar 2019 - Feb 2020 Progressive: 12 Months	Marketing year Mar 2020 - Feb 2021 Progressive: 12 Months	Mar 2021 Tons	Apr 2021 Tons	May 2021 Tons	June 2021 Tons	July 2021 Tons	Aug 2021 Tons	Sep 2021 Tons	Oct 2021 Tons	Nov 2021 Tons	Dec 2021 Tons	Jan 2022 Tons	Marketing year Mar 2021 - Feb 2022 Progressive: 11 Months
Palm Oil and Derivatives	**0**	**0**	0	0	0	0	0	0	0	0	0	0	0	**0**
Soybean Oil	**220 307**	**214 912**	11 363	21 942	23 481	20 516	21 515	20 867	25 161	24 611	22 815	23 009	23 593	**238 873**
Sunflower Oil	**234 557**	**305 099**	23 099	26 180	32 005	36 678	27 480	27 680	24 309	26 868	20 881	10 875	3 498	**259 553**
Coconut Oil/ Groundnut Oil / Canola Oil / Corn (Maize) Oil / Blends or mixes of Oils which includes one of the above Oils / Biodiesel / Cottonseed Oil	**47 910**	**48 762**	5 271	5 557	3 899	6 019	5 501	6 050	6 211	6 270	5 985	4 393	6 936	**62 092**
Sunflower Oilcake	**276 766**	**351 190**	26 499	28 731	36 503	41 428	31 911	30 399	28 918	29 019	24 043	11 072	6 503	**295 026**
Coconut Oilcake	**0**	**0**	0	0	0	0	0	0	0	0	0	0	0	**0**
Palmnut Oilcake	**0**	**0**	0	0	0	0	0	0	0	0	0	0	0	**0**
Soybean Oilcake / Canola Oilcake / Cottonseed Oilcake	**1 022 415**	**1 005 161**	52 584	101 341	105 142	97 314	100 452	102 898	123 999	116 626	109 391	104 001	113 151	**1 126 899**
Soybean Flours and Meals / Textured Vegetable Protein	**39 785**	**38 724**	2 808	3 081	4 015	2 958	3 997	2 896	3 981	3 537	3 944	3 304	3 607	**38 128**
Soybean Fullfat	**194 228**	**148 918**	10 012	12 602	12 402	15 830	17 128	15 641	14 339	12 480	15 091	13 136	16 004	**154 665**
Peanut Butter and Paste	**28 026**	**37 131**	3 197	2 881	2 858	3 050	2 628	2 593	3 562	2 515	3 476	2 144	1 972	**30 876**
Total	**2 063 994**	**2 149 897**	**134 833**	**202 315**	**220 305**	**223 793**	**210 612**	**209 024**	**230 480**	**221 926**	**205 626**	**171 934**	**175 264**	**2 206 112**

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

	OIL SEEDS PRODUCTS PER MONTH IMPORTED													
	Marketing year Mar 2019 - Feb 2020 Progressive: 12 Months	Marketing year Mar 2020 - Feb 2021 Progressive: 12 Months	Mar 2021 Tons	Apr 2021 Tons	May 2021 Tons	June 2021 Tons	July 2021 Tons	Aug 2021 Tons	Sep 2021 Tons	Oct 2021 Tons	Nov 2021 Tons	Dec 2021 Tons	Jan 2022 Tons	Marketing year Mar 2021 - Feb 2022 Progressive: 11 Months
Palm Oil and Derivatives	**534 456**	**528 067**	39 501	54 159	56 770	36 203	47 836	44 699	41 587	51 782	28 992	35 466	52 494	**489 489**
Soybean Oil	**90 934**	**119 019**	3 300	9 477	5 000	9 668	4 634	1 860	7 413	5 659	14 494	1 110	4 720	**67 335**
Sunflower Oil	**244 099**	**136 571**	295	355	232	0	96	96	9 352	11 873	23 069	20 830	34 036	**100 234**
Coconut Oil/ Groundnut Oil / Canola Oil / Corn (Maize) Oil / Blends or mixes of Oils which includes one of the above Oils / Biodiesel / Cottonseed Oil	**14 386**	**12 702**	1 832	452	512	423	1 108	706	218	1 122	667	860	1 697	**9 597**
Sunflower Oilcake	**118 791**	**7 049**	119	0	0	0	0	0	232	9 125	8 747	36 034	705	**54 962**
Coconut Oilcake	**0**	**0**	0	0	0	0	0	0	0	0	0	0	0	**0**
Palmnut Oilcake	**0**	**0**	0	0	0	0	0	0	0	0	0	0	0	**0**
Soybean Oilcake / Canola Oilcake / Cottonseed Oilcake	**463 478**	**401 851**	32 407	64 371	37 770	41 064	0	52 967	16 590	38 938	44 273	44 523	4 929	**377 832**
Soybean Flours and Meals / Textured Vegetable Protein	**0**	**0**	0	0	0	0	0	0	0	0	0	0	0	**0**
Soybean Fullfat	**0**	**0**	0	0	0	0	0	0	0	0	0	0	0	**0**
Peanut Butter and Paste	**1 391**	**1 503**	96	204	62	46	0	142	163	154	151	204	177	**1 399**
Total	**1 467 535**	**1 206 762**	**77 550**	**129 018**	**100 346**	**87 404**	**53 674**	**100 470**	**75 555**	**118 653**	**120 393**	**139 027**	**98 758**	**1 100 848**

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

	OIL SEEDS PRODUCTS PER MONTH EXPORTED													
	Marketing year Mar 2019 - Feb 2020 Progressive: 12 Months	Marketing year Mar 2020 - Feb 2021 Progressive: 12 Months	Mar 2021 Tons	Apr 2021 Tons	May 2021 Tons	June 2021 Tons	July 2021 Tons	Aug 2021 Tons	Sep 2021 Tons	Oct 2021 Tons	Nov 2021 Tons	Dec 2021 Tons	Jan 2022 Tons	Marketing year Mar 2021 - Feb 2022 Progressive: 11 Months
Palm Oil and Derivatives	**16 078**	**12 476**	744	565	968	1 321	1 380	2 422	2 365	1 252	962	917	799	**13 695**
Soybean Oil	**17 619**	**44 035**	2 648	3 405	3 866	2 992	8 274	2 688	5 009	6 734	3 530	4 289	4 756	**48 191**
Sunflower Oil	**3 067**	**3 200**	819	228	179	191	189	152	364	211	148	177	124	**2 782**
Coconut Oil/ Groundnut Oil / Canola Oil / Corn (Maize) Oil / Blends or mixes of Oils which includes one of the above Oils / Biodiesel / Cottonseed Oil	**933**	**6 679**	1 591	1 162	754	859	157	323	86	282	928	1 315	1 413	**8 870**
Sunflower Oilcake	**3 006**	**1 510**	324	374	60	102	132	122	136	32	105	105	133	**1 625**
Coconut Oilcake	**0**	**0**	0	0	0	0	0	0	0	0	0	0	0	**0**
Palmnut Oilcake	**0**	**0**	0	0	0	0	0	0	0	0	0	0	0	**0**
Soybean Oilcake / Canola Oilcake / Cottonseed Oilcake	**10 520**	**11 547**	1 018	759	1 143	1 050	906	1 266	2 673	1 969	2 222	1 010	1 123	**15 139**
Soybean Flours and Meals / Textured Vegetable Protein	**4 108**	**5 267**	199	272	800	680	2 468	2 227	2 074	2 963	3 000	1 086	3 000	**18 769**
Soybean Fullfat	**2 723**	**2 742**	229	102	300	238	340	204	204	176	170	547	200	**2 710**
Peanut Butter and Paste	**274**	**228**	9	24	14	30	26	12	21	26	16	25	17	**220**
Total	**58 328**	**87 684**	**7 581**	**6 891**	**8 084**	**7 463**	**13 872**	**9 416**	**12 932**	**13 645**	**11 081**	**9 471**	**11 565**	**112 001**

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.

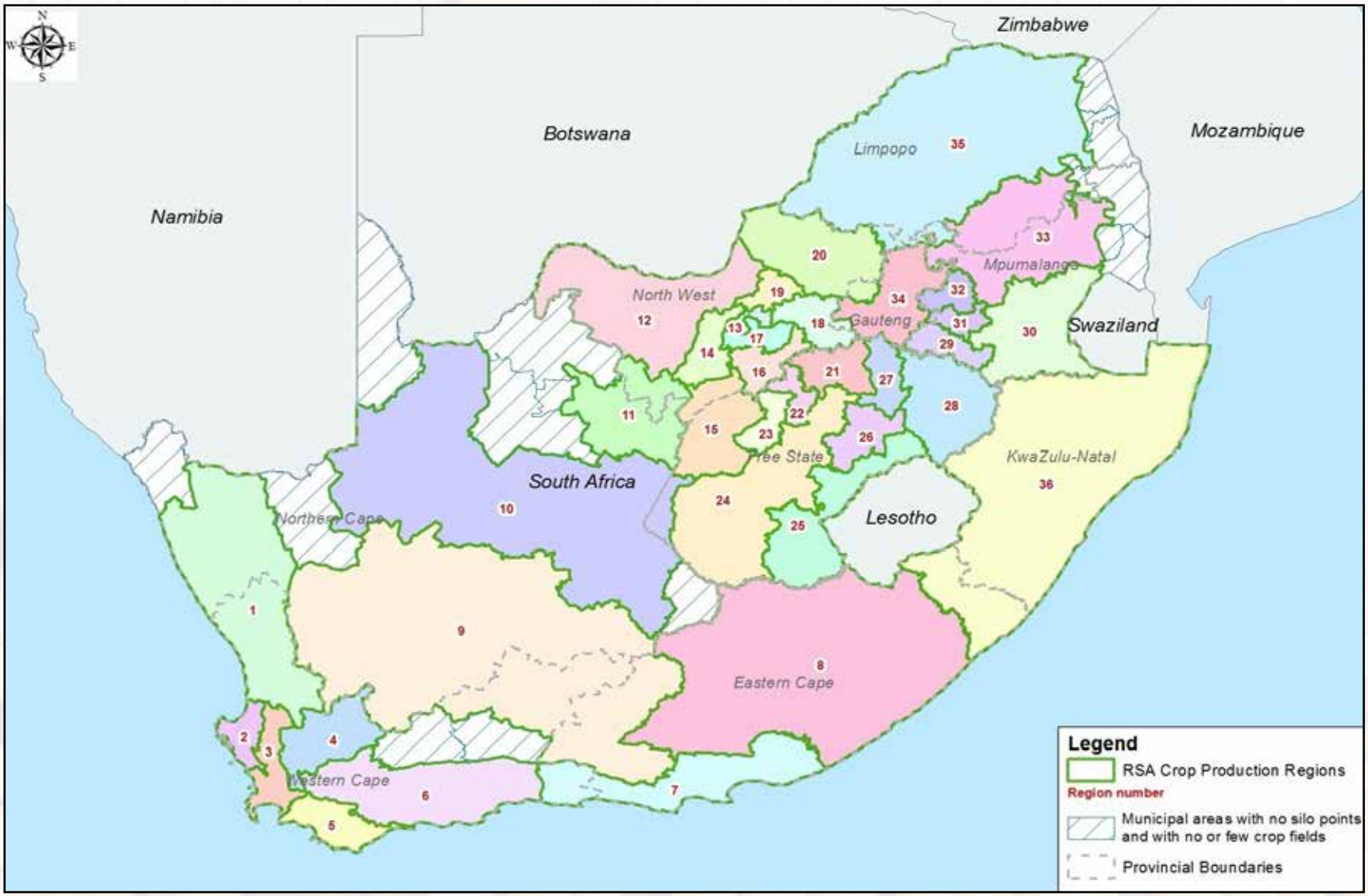
The 9 provinces are divided into 36 grain production regions.

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 2020/21 production season, are named and described on pages 22 to 24. All the silo/intake stands as well as the type of storage structure, situated in a particular region, are provided.

Figure 2: RSA Crop Production Regions



Regional map with gratitude to Agbiz Grain and SiQ.

Soybean Crop Quality 2020/21 – Summary of results

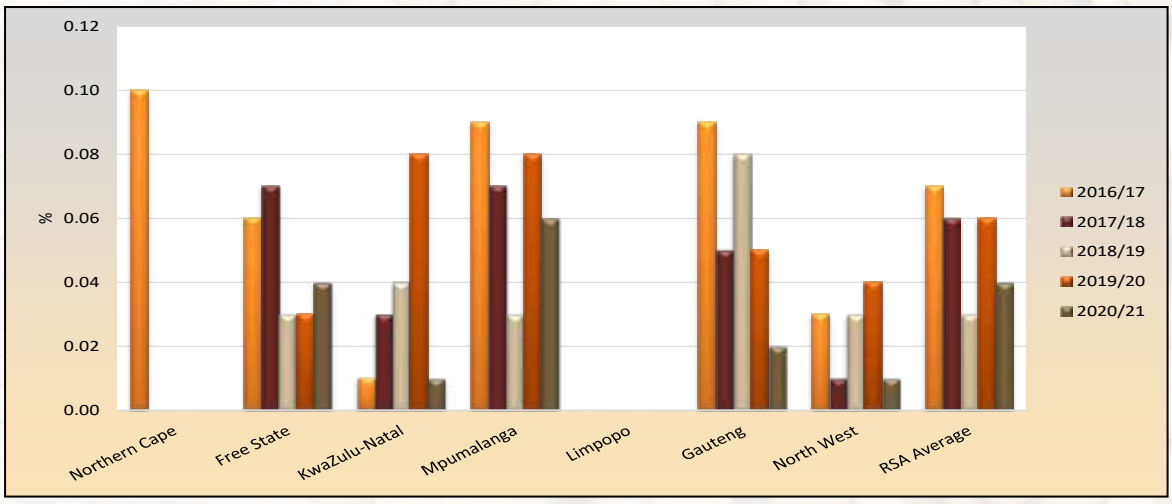
Eighty percent (120) of the 150 samples analysed for the purpose of this survey were graded as Grade SB1, while 30 (20%) of the samples were downgraded to COSB (Class Other Soya Beans). During the previous two seasons, 27% (2019/20) and 11% (2018/19) of the samples were downgraded to COSB.

- Four of the 30 samples were downgraded as a result of the percentage other grain exceeding the maximum permissible deviation of 0.5%.
- Four of the samples were downgraded as a result of the percentage defective soybeans on the 4.75 mm round-hole sieve exceeding the maximum permissible deviation of 10%.
- Five samples were downgraded as a result of the percentage soiled soybeans present in the samples exceeding the maximum permissible deviation of 10%.
- Seven samples were downgraded as a result of the number of *Crotolaria sp.* and one sample as a result of *Datura sp.* poisonous seeds present exceeding the maximum permissible number of 1 per 1000 g.
- Three samples were downgraded as a result of the number of *Ipomoea purpurea* Roth. poisonous seeds present exceeding the maximum permissible number of 7 per 1000 g.
- The remaining six 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, sunflower seed, defective soybeans above the 4.75 mm sieve, soiled soybeans and the presence of poisonous seeds *(Ipomoea purpurea* Roth.*)*

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

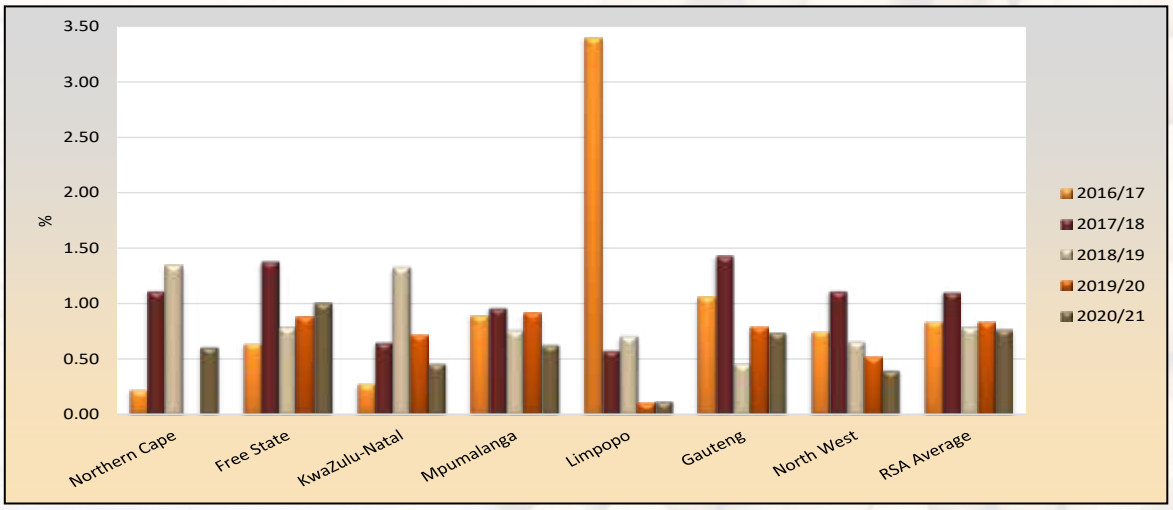
The percentage samples containing sclerotia from the fungus *Sclerotinia sclerotiorum*, showed a small increase from 41% (62 samples) in the previous season to 43% (65 samples) this season. In the 2018/19 season, 41 samples (27%) contained sclerotia. 55% of the samples that contained sclerotia this season originated in Mpumalanga and 40% originated in the Free State province. All these percentages sclerotia found to be present in the samples are however still well below the maximum permissible level of 4%. The national weighted average percentage this season was 0.04% compared to the 0.06% of the previous season. See Graph 16.

Graph 16: Average percentage sclerotia per province over five seasons



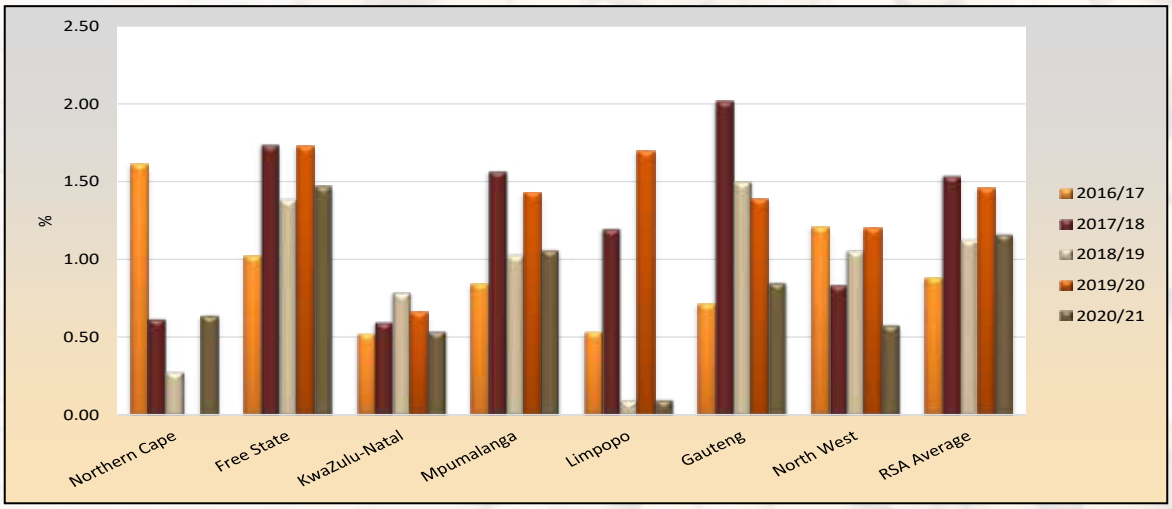
The samples received from the Free State province (61 samples) had the highest percentage foreign matter (1.01%), followed by Gauteng (5 samples) with 0.74% and Mpumalanga (66 samples) and the Northern Cape (2 samples) with 0.63% and 0.61% respectively. The lowest percentage foreign matter was observed on the single sample from Limpopo, namely 0.12%. The national weighted average of 0.77% was in line with previous seasons. Please refer to Graph 17.

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



The Free State reported the highest weighted average percentage soybeans and parts of soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, namely 1.47%, followed by the 1.06% from Mpumalanga. The lowest weighted average value reported was 0.10% on the sample from Limpopo. The national weighted average percentage decreased from 1.46 % the previous season to 1.16% this season. The 2018/19 season's average was 1.13%. Please see Graph 18.

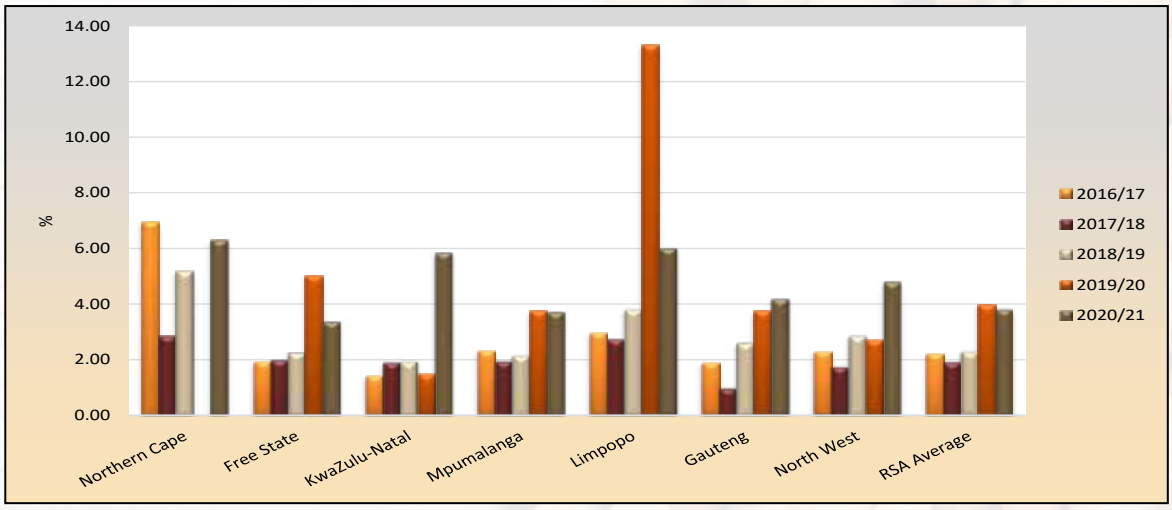
Graph 18: Average percentage soybeans and parts of soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve per province over five seasons



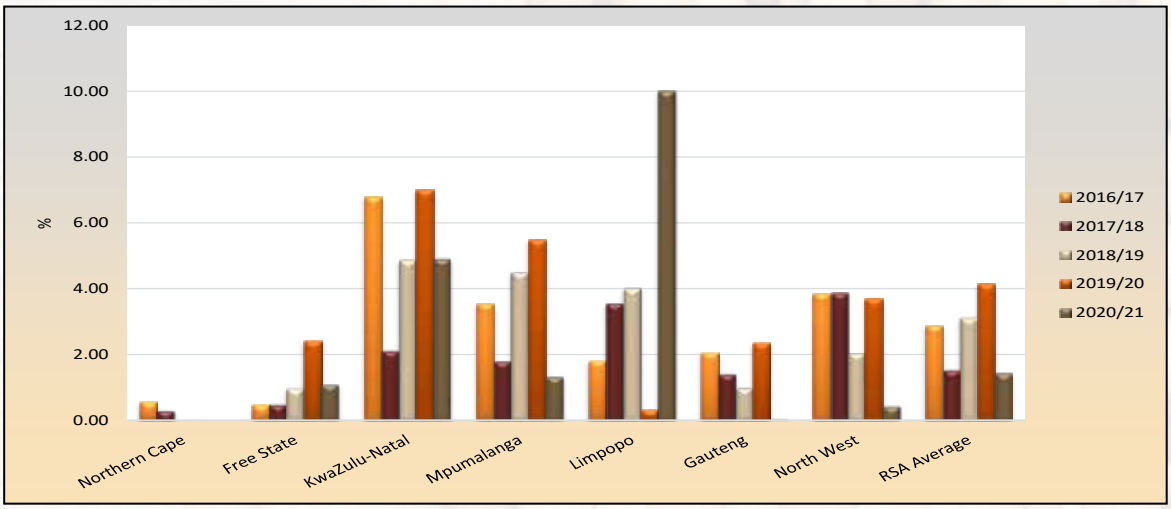
The lowest weighted average percentage defective soybeans on the 4.75 mm sieve, namely 3.37%, was observed on the samples from the Free State. The highest percentage, namely 6.30% was observed on the Northern Cape samples. The averages in the other provinces ranged from 3.72% in Mpumalanga to 6.00% in Limpopo. The national weighted average decreased from 3.98% last season to 3.82% this season. Please see Graph 19.

The national weighted average percentage soiled soybeans was 1.44%, the lowest average since the 2014/15 season. The previous two seasons averaged 4.13% and 3.10% respectively. Weighted average percentages per province ranged from 0% in the Northern Cape to 10.00% in Limpopo. Please see Graph 20. Six samples exceeded the maximum permissible deviation of 10% according to the grading regulations. The highest percentage reported was 14.54% on a sample from the Free State. The rest of these samples originated in Mpumalanga, KwaZulu-Natal and the Free State. Last season, 17 samples, originating from these same provinces, exceeded the 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



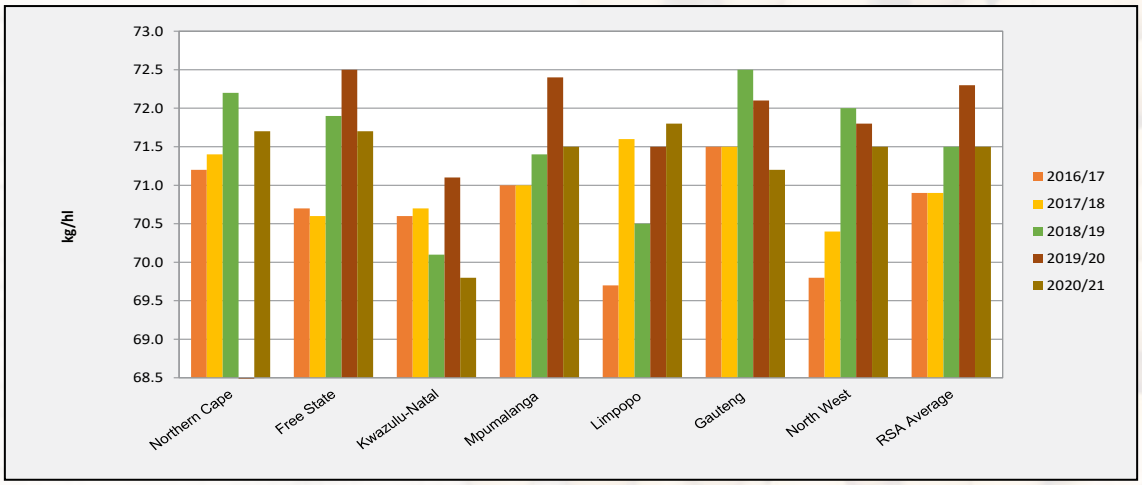
Test weight does not form part of the grading regulations for soybeans in South Africa. An approximation of the test weight of South African soybeans is provided in Table 2 for information purposes. The standard working procedure of the Kern 222 instrument, as described in ISO 7971-3:2019, was followed. 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								
	2020/21 Season			2019/20 Season			2018/19 Season		
	Weighted average	Range	No. of samples	Weighted average	Range	No. of samples	Weighted average	Range	No. of samples
Northern Cape (Regions 10 - 11)	71.7	71.6 - 71.7	2	-	-	-	72.2	-	1
Free State (Regions 21 - 28)	71.7	68.9 - 75.0	**59	72.5	70.3 - 74.4	51	71.9	69.4 - 74.2	42
KwaZulu-Natal (Region 36)	69.8	67.7 - 71.2	10	71.1	70.0 - 72.3	9	70.1	68.2 - 72.4	12
Mpumalanga (Regions 29 - 33)	71.5	66.5 - 73.2	*65	72.4	70.2 - 74.0	*64	71.4	67.8 - 74.6	73
Limpopo (Region 35)	71.8	-	1	71.5	-	1	70.5	68.9 - 73.2	3
Gauteng (Region 34)	71.2	70.3 - 71.8	5	72.1	71.0 - 73.2	8	72.5	71.7 - 73.8	12
North West (Region 12 - 20)	71.5	70.8 - 71.9	5	71.8	68.7 - 73.3	16	72.0	72.1 - 73.5	**5
RSA	***71.5***	***66.5 - 75.0***	***147***	***72.3***	***68.7 - 74.4***	***149***	***71.5***	***67.8 - 74.6***	***148***

** One sample with an outlier value was not taken into account for calculation purposes.*
***Two samples with outlier values were 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' or wet basis results for the last five seasons are provided in Table 3. These 'as is' average 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 five seasons

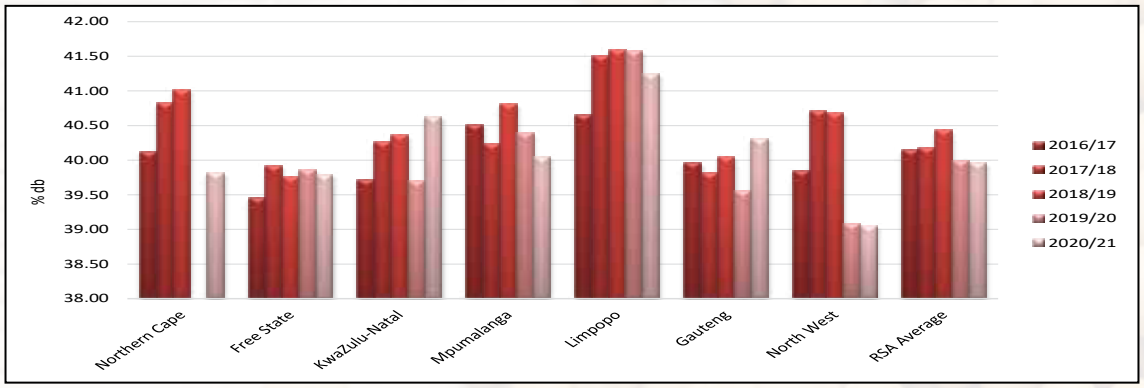
Season	2020/21		2019/20		2018/19		2017/18		2016/17	
Moisture, % (17hr, 103°C)	7.5		7.2		7.0		7.4		7.4	
Moisture basis	**Dry basis**	**As is**	**Dry basis**	**As is**	**Dry basis**	**As is**	**Dry basis**	**As is**	**Dry basis**	**As is**
Crude protein, %	39.96	36.95	39.99	37.12	40.43	37.60	40.18	37.40	40.15	37.20
Crude fat, %	19.5	18.0	18.0	16.7	19.1	17.8	19.3	18.0	19.8	18.5
Crude fibre, %	6.8	6.3	7.0	6.5	6.8	6.3	5.9	5.5	5.9	5.4
Ash, %	4.55	4.21	4.63	4.19	4.67	4.34	4.59	4.27	4.58	4.24
No. of samples	***150***		***150***		***150***		***150***		***150***	

The weighted average crude protein content this season was 39.96% compared to the 39.99% of the previous season. As in the previous four seasons, Limpopo had the highest weighted average crude protein content (41.25%). North West (5 samples) reported the lowest average namely 39.05%. The weighted average crude fat percentage of 19.5% was the highest since the 2016/17 season. The samples from KwaZulu-Natal (N = 10) had the highest weighted average crude fat content (as in the previous two seasons), namely 21.5%. The lowest fat averages were observed in the Free State and Gauteng provinces, with 19.1% and 19.2% respectively.

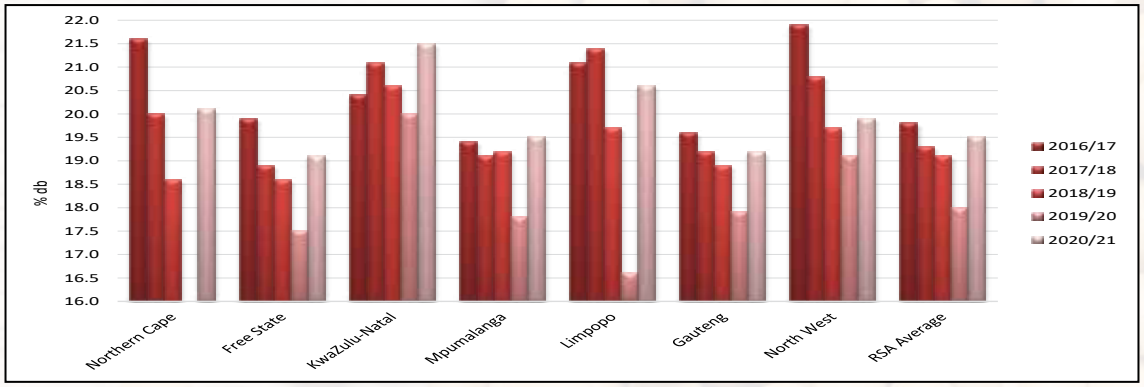
The weighted average percentage crude fibre varied from 5.8% in the Northern Cape to 7.2% in North West. The RSA weighted average was 6.8% compared to the 7.0% of the previous season. A small variation of only 0.12% is observed with regards to the national weighted average ash content over the ten seasons that this survey has been conducted. This season, the average ash content was 4.55%, the lowest average of the 10 seasons. Last season this value was 4.63%.

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

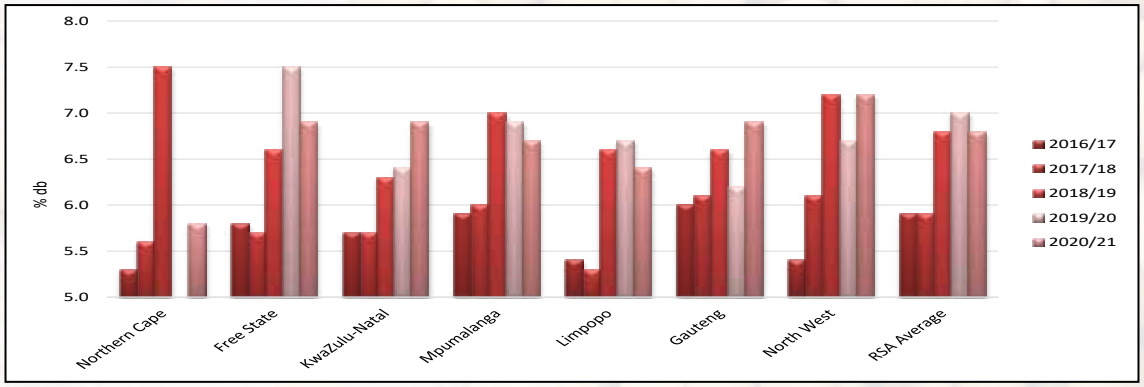
Graph 22: Average crude protein content per province over five seasons



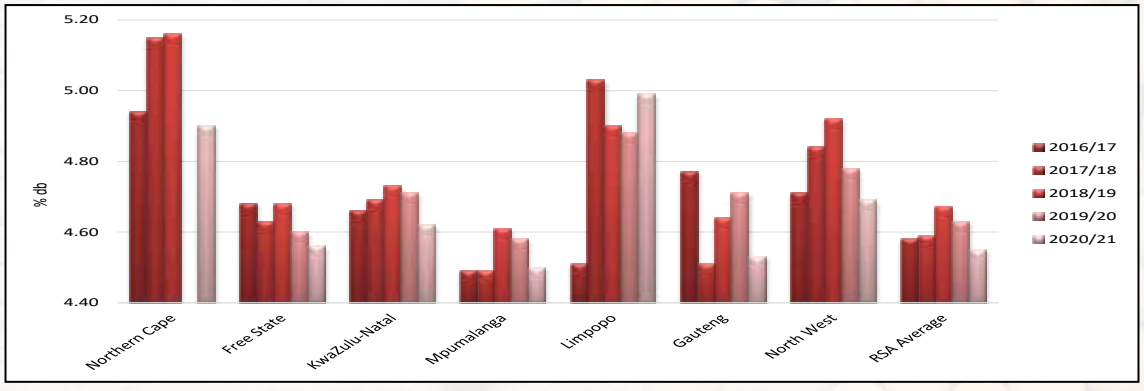
Graph 23: Average crude fat content per province over five seasons



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



Graph 25: Average ash content per province over five seasons



The 2020/21 season is the third season that the SAGL conducted the moisture, crude protein and crude fat analyses on the ARC Grain Crops soybean cultivar trials' samples. Please see a comparison of the results between the crop survey and cultivar samples in Table 4.

Table 4: Comparison between the moisture, crude protein and crude fat results of the soybean crop quality and ARC cultivar trial samples of the 2020/21 season

Analysis	Moisture, % (17hr, 103°C)	Crude Protein, % (db)	Crude Protein, % (as is)	Crude Fat, % (db)	Crude Fat, % (as is)
Soybean Crop Quality Survey results					
Average	**7.5**	**39.96**	**36.95**	**19.5**	**18.0**
Minimum	6.2	33.81	31.11	16.7	15.4
Maximum	9.4	42.77	39.48	23.2	21.5
Standard Deviation	0.60	1.77	1.58	1.16	1.10
No. of samples	*150*	*150*	*150*	*150*	*150*
ARC Grain Crops Cultivar trial sample results					
Average	**7.2**	**41.39**	**38.41**	**19.6**	**18.2**
Minimum	6.5	36.89	34.49	16.6	15.5
Maximum	8.5	44.61	40.82	23.6	21.6
Standard Deviation	0.48	1.47	1.46	1.53	1.5
No. of samples	*90*	*90*	*90*	*90*	*90*
% Difference between crop and cultivar samples	***0.3***	***-1.4***	***-1.5***	***-0.1***	***-0.2***

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

A summary of the RSA Soybean Crop Quality averages of the 2020/21 season compared to those of the 2019/20 season, is provided in Table 6 on page 21.

Please see pages 25 to 31 for the average soybean quality per region.

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 total soybean area planted.

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 the screened 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 5: GM results for the 2020/21 season

REGION	Class and grade	CP4 EPSPS, %
11	COSB	>3.0
18	SB1	>3.0
20	SB1	>3.0
21	COSB	>3.0
22	COSB	>3.0
25	SB1	>3.0
26	COSB	>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
36	COSB	>3.0
Average of samples		***>3.0***
Number of samples		***15***

Table 6: South African Soybean Crop Quality Averages 2020/21 vs 2019/20						
Class and Grade Soya	**2020/21**			**2019/20**		
	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), %	0.57	1.53	0.77	0.79	0.94	0.83
(C) Other grain, %	0.04	0.71	0.17	0.08	0.22	0.12
(D) Sunflower seed, %	0.00	0.05	0.01	0.01	0.02	0.01
(E) Stones, %	0.02	0.05	0.03	0.02	0.05	0.03
(F) Sclerotia, %	0.04	0.04	0.04	0.06	0.05	0.06
(G) Soybeans and parts of soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	1.06	1.55	1.16	1.58	1.15	1.46
(H) Defective soybeans on the 4.75 mm round hole sieve, %	3.49	5.13	3.82	3.47	5.35	3.98
(I) Soiled soybeans, %	0.98	3.29	1.44	3.02	7.09	4.13
(J) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	0.62	1.58	0.81	0.85	0.99	0.89
Poisonous seeds *(Crotalaria sp., Datura sp., Ricinis communis)*	0	2	0	0	1	0
Poisonous seeds *(Argemone mexicana L., Convolvulus sp., Ipomoea purpurea Roth., Lolium temulentum, Xanthium sp.)*	0	3	1	0	1	0
Undesirable odour	No	No	No	No	No	No
Live insects	No	No	No	No	No	No
Number of samples	***120***	***30***	***150***	***109***	***41***	***150***
Nutritional analysis:						
Moisture, % (17 hr, 103 °C)	7.5	7.5	7.5	7.2	7.2	7.2
Crude Protein, % (db)	40.18	39.12	39.96	39.91	40.23	39.99
Crude Fat, % (db)	19.4	20.0	19.5	17.9	18.1	18.0
Crude Fibre, % (db)	6.9	6.7	6.8	7.0	7.2	7.0
Ash, % (db)	4.53	4.60	4.55	4.62	4.65	4.63
Number of samples	***120***	***30***	***150***	***109***	***41***	***150***

Grain Production Regions

Silo/Intake stands per region indicating type of storage structure

Region 11: Vaalharts Region

GWK	Barkly West (Bins/Bulk)	Senwes	Jan Kempdorp 287 (Bins)
GWK	Jan Kempdorp (Bags/Bunkers)	Senwes	Magogong 288 (Bins)
Senwes	Hartswater (Bins)	Senwes	Tadcaster (Bins)

Region 14: North West Southern Region

NWK	Barberspan (Bins)	NWK	Taaibospan (Bins)
NWK	Delareyville (Bins)	Senwes	Amalia (Bins)
NWK	Excelsior (Bins)	Senwes	Hallatshope (Bins)
NWK	Geysdorp (Bins)	Senwes	Migdol (Bins)
NWK	Migdol (Bins)	Senwes	Schweizer-Reneke (Bins)
NWK	Nooitgedacht (Bins)		

Region 18: North-West Central Region (Ventersdorp)

NWK	Bodenstein (Bins)	Senwes	Makokskraal (Bins)
NWK	Coligny (Bins)	Senwes	Potchefstroom (Bins)
Senwes	Buckingham (Bins)	Senwes	Ventersdorp Silo A (Bins)
Senwes	Enselspruit (Bins)	Senwes	Ventersdorp Silo B (Bins)

Region 20: North-West Eastern Region

Afgri	Battery (Bins)	NWK	Derby (Bins)
Afgri	Brits (Bins)	NWK	Koster (Bins)
Afgri	Beestekraal (Bunkers)	NWK	Swartruggens (Bins)
NWK	Boons (Bins)	NWK	Syferbult (Bins)

Region 21: Free State North-Western Region (Viljoenskroon)

Afgri	Kommandonek (Bunkers)	Senwes	Rooiwal (Bins)
Senwes	Attie (Bins)	Senwes	Vierfontein (Bins)
Senwes	Groenebloem (Bins)	Senwes	Viljoenskroon (Bins) G232
Senwes	Heuningspruit (Bins)	Senwes	Viljoenskroon (Bins) G266
Senwes	Koppies (Bins)	Senwes	Vredefort (Bins)
Senwes	Rooiwal (Bins)	Senwes	Weiveld (Bins)

Region 22: Free State North-Western Region (Bothaville)

Senwes	Allanridge (Bins)	Senwes	Misgunst (Bunkers)
Senwes	Bothaville Silo A (Bins)	Senwes	Odendaalsrus (Bins)
Senwes	Bothaville Silo B (Bins)	Senwes	Schoonspruit (Bins)
Senwes	Mirage (Bins)	Senwes	Schuttesdraai (Bins)

Region 23: Free State North-Western Region (Bultfontein)

Senwes	Bultfontein (Bins)	Senwes	Tierfontein (Bins)
Senwes	Kaalplaas (Bins)	Senwes	Wesselsbron (Bins/Bunkers)
Senwes	Losdoorns (Bins)	Senwes	Willemsrus (Bins)
Senwes	Protespan (Bins)		

Region 25: Free State South-Western Region

Afgri	Bethlehem (Bins)	OVK	Marseilles (Bins)
Afgri	Slabberts (Bins)	OVK	Modderpoort (Bins)
OVK	Clocolan (Bins)	OVK	Tweespruit (Bins)
OVK	Ficksburg (Bins)	OVK	Westminster (Bins)
OVK	Fouriesburg (Bins)	Senwes	Dewetsdorp (Bins)

Grain Production Regions

Silo/Intake stands per region indicating type of storage structure

Region 26: Free State South-Eastern Region

Afgri	Kaallaagte (Bins)	Afgri	Monte Video (Bins)
Afgri	Libertas (Bins)	Afgri	Senekal (Bins)
Afgri	Marquard (Bins)	Senwes	Arlington (Bins)
Afgri	Meets (Bins)	Senwes	Steynsrus (Bins)

Region 27: Free State Northern Region

Senwes	Gottenburg (Bins)	Senwes	Mooigeleë (Bins)
Senwes	Heilbron (Bins)	Senwes	Wolwehoek (Bins)
Senwes	Hoogte Grainlink (Bins)	VKB	Petrus Steyn (Bins)

Region 28: Free State Eastern Region

Afgri	Afrikaskop (Bins/Bunkers)	VKB	Jim Fouché (Bins)
Afgri	Eeram (Bins)	VKB	Memel (Bins)
Afgri	Harrismith (Bins)	VKB	Reitz (Bins)
Afgri	Kransfontein (Bins/Bunkers)	VKB	Tweeling (Bins)
VKB	Ascent (Bins)	VKB	Villiers (Bins/Bulk)
VKB	Cornelia (Bins)	VKB	Vrede (Bins)
VKB	Daniëlsrus (Bins)	VKB	Warden (Bins)
VKB	Frankfort (Bins)	VKB	Windfield (Bins)

Region 29: Mpumalanga Southern Region

Afgri	Balfour (Bins)	Afgri	Leeuspruit (Bins)
Afgri	Greylingstad (Bins)	Afgri	Platrand (Bins)
Afgri	Grootvlei (Bins)	Afgri	Standerton (Bins)
Afgri	Harvard (Bins)	Afgri	Vaaldrift (Bunkers)
Afgri	Holmdene (Bins)	Afgri	Val (Bins)

Region 30: Mpumalanga Eastern Region

Afgri	Amersfoort (Bins)	Afgri	Maizefield (Bins)
Afgri	Carolina (Bins)	Afgri	Morgenzon (Bins)
Afgri	Davel (Bins)	Afgri	Overvaal (Bins)
Afgri	Eerstelingsfontein (Bunkers)	Afgri	Sandspruit (Bunkers)
Afgri	Ermelo (Bins)	BKB	Waterval (Bunkers)
Afgri	Estancia (Bins)	TWK	Mkondo (Bins)
Afgri	Hendriksvallei (Bunkers)	TWK	Panbult (Bins)
Afgri	Lothair (Bins)		

Region 31: Mpumalanga Central Region

Afgri	Bakenlaagte (Bunkers)	Afgri	Kortlaagte (Bunkers)
Afgri	Bethal (Bins)	Afgri	Leslie (Bins)
Afgri	Brakfontein (Bunkers)	Afgri	Palmietfontein (Bunkers)
Afgri	Devon (Bins)	Afgri	Trichardt (Bins)
Afgri	Kinross (Bins/Bunkers)	Afgri	Vaalkrantz (Bunkers)

Region 32: Mpumalanga Western Region

Afgri	Argent (Bins/Bunkers)	Afgri	Hawerklip (Bins)
Afgri	Delmas (Bunkers)	Afgri	Kendal (Bins)
Afgri	Dryden (Bins)	Afgri	Ogies (Bins)
Afgri	Eloff (Bins)	Afgri	Vlakfontein (Bunkers)
Afgri	Endicott (Bins)		

Grain Production Regions

Silo/Intake stands per region indicating type of storage structure

Region 33: Mpumalanga Northern Region

Afgri	Arnot (Bins)	Afgri	Middelburg (Bins)
Afgri	Driefontein (Bins)	Afgri	Pan (Bins)
Afgri	Lydenburg (Bins)	Afgri	Stoffberg (Bins)
Afgri	Marble Hall (Bins)	BKB	Wonderfontein (Bins)

Region 34: Gauteng Region

Afgri	Bloekomspruit (Bins)	Afgri	Nigel (Bins)
Afgri	Bronkhorstspruit (Bins)	Afgri	Pretoria Wes (Bins)
Afgri	Glenroy (Bins)	Afgri	Vogelvallei (Bunkers)
Afgri	Goeie Hoek (Bins)	Senwes	Middelvlei (Bins)
Afgri	Kaalfontein (Bins)	Senwes	Oberholzer (Bins)
Afgri	Kliprivier (Bunkers)	Senwes	Raathsvlei (Bins)
Afgri	Meyerton (Bunkers)		

Region 35: Limpopo Region

Afgri	Northam (Bins)	VKB	Nylstroom (Modimolle) (Bins)
VKB	Alma (Bins)	VKB	Potgietersrus (Mokopane) (Bins)
VKB	Lehau (Bins)	VKB	Roedtan (Bins)
VKB	Naboomspruit (Mookgophong) (Bins)	VKB	Settlers (Bins)
VKB	Nutfield (Bins)	VKB	Warmbad (Bela-Bela) (Bins)

Region 36: KwaZulu-Natal Region

Afgri	Bergville (Bins/Bunkers)	Afgri	Mizpah (Bins)
Afgri	Bloedrivier (Bins)	Afgri	Paulpietersburg (Bins)
Afgri	Chelmsford Dam (Bunkers)	Afgri	Pietermaritzburg (Bins)
Afgri	Dannhauser (Bins)	Afgri	Vryheid (Bins)
Afgri	Dundee (Bins)	Afgri	Winterton (Bins/Bunkers)

South African
REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(11) Vaalharts Region				(14) North-West Southern Region				(18) North-West Central Region (Ventersdorp)			
Grading:	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
(a) Wet pods, %	0.00	0.00	0.00	0.00	0.00	-	-	-	0.00	0.00	0.00	0.00
(b) Foreign matter, including stones, other grains and sunflower seeds: Provided that such deviations are individually within the limits specified in items (c), (d), and (e), %	0.61	0.32	0.90	0.41	0.18	-	-	-	0.66	0.56	0.76	0.14
(c) Other grain, %	0.04	0.00	0.08	0.06	0.13	-	-	-	0.14	0.00	0.28	0.20
(d) Sunflower seed, %	0.00	0.00	0.00	0.00	0.00	-	-	-	0.03	0.00	0.06	0.04
(e) Stones, %	0.00	0.00	0.00	0.00	0.00	-	-	-	0.00	0.00	0.00	0.00
(f) Sclerotia, %	0.00	0.00	0.00	0.00	0.00	-	-	-	0.03	0.00	0.06	0.04
(g) Soybeans and parts of Soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	0.64	0.50	0.78	0.20	0.16	-	-	-	0.66	0.54	0.77	0.16
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	6.30	2.44	10.16	5.46	6.00	-	-	-	3.29	2.02	4.56	1.80
(i) Soiled Soybeans, %	0.00	0.00	0.00	0.00	0.00	-	-	-	0.00	0.00	0.00	0.00
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	0.61	0.32	0.90	0.41	0.18	-	-	-	0.69	0.62	0.76	0.10
Poisonous seeds *(Crotalaria sp., Datura sp., Ricinis communis)*	0	0	0	0.0	0	-	-	-	0	0	0	0.0
Poisonous seeds *(Argemone mexicana L., Convolvulus sp., Ipomoea purpurea Roth., Lolium temulentum, Xanthium sp.)*	0	0	0	0.0	0	-	-	-	0	0	0	0.0
Number of samples	***2***				***1***				***2***			
Nutritional analysis:	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Moisture, % (17 hr, 103 °C)	7.1	6.9	7.2	0.21	7.5	-	-	-	6.7	6.5	6.8	0.21
Crude protein, % (db)	39.82	39.12	40.52	0.99	41.60	-	-	-	36.01	34.36	37.65	2.33
Crude fat, % (db)	20.1	20.0	20.2	0.14	17.4	-	-	-	20.8	19.6	21.9	1.63
Crude Fibre, % (db)	5.8	5.6	5.9	0.21	7.4	-	-	-	7.1	6.2	7.9	1.20
Ash, % (db)	4.90	4.83	4.96	0.09	4.11	-	-	-	4.72	4.42	5.01	0.42
Number of samples	***2***				***1***				***2***			

South African
REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(20) North-West Eastern Region				(21) Free State North-Western Region (Viljoenskroon)				(22) Free State North-Western Region (Bothaville)			
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), %	0.26	0.26	0.26	0.00	2.41	0.45	4.35	1.73	0.53	0.21	0.85	0.29
(c) Other grain, %	0.04	0.00	0.08	0.06	0.06	0.00	0.14	0.08	0.24	0.00	0.40	0.20
(d) Sunflower seed, %	0.05	0.00	0.10	0.07	0.00	0.00	0.00	0.00	0.03	0.00	0.10	0.05
(e) Stones, %	0.04	0.00	0.08	0.06	0.08	0.00	0.30	0.13	0.00	0.00	0.00	0.00
(f) Sclerotia, %	0.00	0.00	0.00	0.00	0.10	0.00	0.40	0.17	0.02	0.00	0.06	0.03
(g) Soybeans and parts of Soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	0.70	0.40	1.00	0.42	3.35	0.77	5.00	1.67	0.85	0.54	1.12	0.26
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	5.70	5.00	6.40	0.99	5.01	1.80	10.24	3.78	6.04	4.00	8.76	2.10
(i) Soiled Soybeans, %	1.10	0.00	2.20	1.56	0.00	0.00	0.00	0.00	0.30	0.00	1.20	0.60
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	0.26	0.26	0.26	0.00	2.51	0.45	4.45	1.83	0.55	0.21	0.85	0.28
Poisonous seeds *(Crotalaria sp., Datura sp., Ricinis communis)*	0	0	0	0.00	2	0	10	4.00	2	0	5	2.45
Poisonous seeds *(Argemone mexicana L., Convolvulus sp., Ipomoea purpurea Roth., Lolium temulentum, Xanthium sp.)*	0	0	0	0.00	0	0	0	0.00	0	0	0	0.00
Number of samples	***2***				***5***				***4***			
Nutritional analysis:	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Moisture, % (17 hr, 103 °C)	7.8	7.7	7.8	0.07	6.9	6.2	8.5	0.90	7.0	6.9	7.1	0.10
Crude protein, % (db)	40.82	39.77	41.87	1.48	38.01	33.81	41.46	3.14	39.44	38.56	39.83	0.60
Crude fat, % (db)	20.2	19.6	20.7	0.78	20.2	18.8	21.8	1.32	19.3	18.9	19.6	0.36
Crude Fibre, % (db)	7.1	6.7	7.4	0.49	7.4	6.5	8.1	0.65	6.3	6.0	6.5	0.22
Ash, % (db)	4.94	4.79	5.08	0.21	4.74	4.27	5.58	0.52	4.49	4.40	4.57	0.07
Number of samples	***2***				***5***				***4***			

South African
REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(23) Free State North-Western Region (Bultfontein)				(25) Free State South-Western Region				(26) Free State South-Eastern Region			
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), %	2.38	0.16	9.00	3.72	0.48	0.30	0.72	0.22	1.53	0.10	4.15	1.49
(c) Other grain, %	1.69	0.00	8.00	3.53	0.10	0.10	0.10	0.00	0.72	0.00	3.42	1.16
(d) Sunflower seed, %	0.02	0.00	0.06	0.03	0.00	0.00	0.00	0.00	0.12	0.00	1.28	0.38
(e) Stones, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.16	0.05
(f) Sclerotia, %	0.06	0.00	0.10	0.05	0.04	0.00	0.06	0.03	0.06	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, %	2.18	0.70	5.00	1.68	0.70	0.50	0.88	0.19	1.30	0.40	2.65	0.80
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	3.82	3.10	5.40	0.91	1.38	1.10	1.68	0.29	3.72	1.80	6.80	1.80
(i) Soiled Soybeans, %	0.36	0.00	1.40	0.61	0.00	0.00	0.00	0.00	1.27	0.00	10.44	3.09
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	2.44	0.26	9.00	3.69	0.52	0.36	0.78	0.23	1.60	0.10	4.15	1.48
Poisonous seeds *(Crotalaria sp., Datura sp., Ricinis communis)*	5	0	10	3.70	0	0	0	0.00	2	0	15	4.62
Poisonous seeds *(Argemone mexicana L., Convolvulus sp., Ipomoea purpurea Roth., Lolium temulentum, Xanthium sp.)*	0	0	0	0.00	0	0	0	0.00	0	0	0	0.00
Number of samples	***5***				***3***				***11***			
Nutritional analysis:	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Moisture, % (17 hr, 103 °C)	6.7	6.4	7.0	0.24	7.4	7.3	7.5	0.12	7.6	6.8	8.9	0.81
Crude protein, % (db)	39.11	34.93	41.41	2.47	41.31	41.08	41.48	0.21	38.45	33.93	42.40	2.44
Crude fat, % (db)	19.9	19.0	20.9	0.73	17.7	17.5	17.8	0.15	19.4	18.6	20.6	0.55
Crude Fibre, % (db)	6.9	6.2	8.8	1.07	6.5	6.5	6.5	0.00	6.8	6.2	7.4	0.33
Ash, % (db)	4.59	4.27	4.78	0.19	4.18	4.14	4.25	0.06	4.67	4.52	4.81	0.09
Number of samples	***5***				***3***				***11***			

South African
REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(27) Free State Northern Region				(28) Free State Eastern Region				(29) Mpumalanga Southern Region			
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), %	0.26	0.16	0.40	0.11	0.56	0.00	4.78	0.97	0.60	0.15	1.58	0.43
(c) Other grain, %	0.00	0.00	0.00	0.00	0.06	0.00	0.86	0.16	0.07	0.00	0.34	0.11
(d) Sunflower seed, %	0.03	0.00	0.06	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(e) Stones, %	0.00	0.00	0.00	0.00	0.01	0.00	0.40	0.07	0.03	0.00	0.20	0.06
(f) Sclerotia, %	0.00	0.00	0.00	0.00	0.03	0.00	0.12	0.05	0.05	0.00	0.16	0.06
(g) Soybeans and parts of Soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	3.16	1.32	4.00	1.24	1.03	0.00	2.82	0.84	1.52	0.47	3.50	0.87
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	2.82	1.60	4.00	1.09	2.78	0.80	7.10	1.19	3.73	1.37	5.58	1.36
(i) Soiled Soybeans, %	0.10	0.00	0.24	0.12	1.72	0.00	14.54	3.35	0.49	0.00	1.40	0.54
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	0.26	0.16	0.40	0.11	0.59	0.00	4.78	0.97	0.64	0.15	1.68	0.44
Poisonous seeds *(Crotalaria sp., Datura sp., Ricinis communis)*	0	0	0	0.00	0	0	0	0.00	0	0	0	0.00
Poisonous seeds *(Argemone mexicana L., Convolvulus sp., Ipomoea purpurea Roth., Lolium temulentum, Xanthium sp.)*	0	0	0	0.00	1	0	26	4.83	0	0	0	0.00
Number of samples	***4***				***29***				***11***			
Nutritional analysis:	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Moisture, % (17 hr, 103 °C)	7.8	7.7	7.9	0.08	7.8	6.8	9.1	0.52	7.6	7.0	8.6	0.52
Crude protein, % (db)	41.89	40.39	42.43	1.00	40.33	37.84	42.45	1.32	40.89	39.44	42.77	1.01
Crude fat, % (db)	18.7	17.8	19.3	0.65	18.9	16.7	21.5	1.23	19.0	17.5	20.1	0.68
Crude Fibre, % (db)	7.2	6.2	9.1	1.32	7.0	5.9	8.7	0.79	6.9	6.2	7.7	0.41
Ash, % (db)	4.70	4.50	4.82	0.15	4.52	4.28	4.93	0.16	4.45	4.31	4.53	0.07
Number of samples	***4***				***29***				***11***			

South African
REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(30) Mpumalanga Eastern Region				(31) Mpumalanga Central Region				(32) Mpumalanga Western Region			
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), %	0.71	0.13	1.80	0.48	0.49	0.12	1.08	0.36	0.47	0.10	0.95	0.31
(c) Other grain, %	0.03	0.00	0.43	0.08	0.11	0.00	0.60	0.21	0.06	0.00	0.14	0.08
(d) Sunflower seed, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(e) Stones, %	0.04	0.00	0.40	0.09	0.02	0.00	0.10	0.04	0.00	0.00	0.00	0.00
(f) Sclerotia, %	0.06	0.00	0.30	0.07	0.05	0.00	0.20	0.08	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, %	1.19	0.23	2.60	0.61	0.83	0.10	2.50	0.88	0.51	0.20	0.97	0.29
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	3.38	1.00	6.26	1.40	5.47	0.90	11.30	3.60	2.97	1.40	4.80	1.65
(i) Soiled Soybeans, %	1.50	0.00	12.74	2.33	0.57	0.00	3.00	0.89	0.44	0.00	1.20	0.46
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	0.77	0.13	1.90	0.50	0.54	0.12	1.08	0.34	0.50	0.10	1.00	0.32
Poisonous seeds *(Crotalaria sp., Datura sp., Ricinis communis)*	0	0	0	0.00	0	0	0	0.00	0	0	0	0.00
Poisonous seeds *(Argemone mexicana L., Convolvulus sp., Ipomoea purpurea Roth., Lolium temulentum, Xanthium sp.)*	0	0	10	1.83	1	0	10	3.02	0	0	0	0.00
Number of samples	***30***				***11***				***5***			
Nutritional analysis:	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Moisture, % (17 hr, 103 °C)	7.5	6.7	9.4	0.63	7.3	6.6	8.2	0.56	7.6	6.9	8.7	0.69
Crude protein, % (db)	40.09	37.54	42.07	1.39	39.06	35.96	41.99	1.74	40.23	38.31	41.69	1.24
Crude fat, % (db)	19.6	18.2	21.0	0.74	19.8	17.7	23.1	1.61	18.9	18.3	19.4	0.43
Crude Fibre, % (db)	6.5	5.6	7.9	0.63	6.9	5.3	7.9	1.00	7.3	6.8	7.6	0.36
Ash, % (db)	4.50	4.21	4.73	0.13	4.44	4.26	4.60	0.11	4.58	4.39	4.81	0.17
Number of samples	***30***				***11***				***5***			

South African
REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(33) Mpumalanga Northern Region				(34) Gauteng Region				(35) Limpopo Region			
Grading:	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
(a) Wet pods, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-
(b) Foreign matter, including stones, other grains and sunflower seeds: Provided that such deviations are individually within the limits specified in items (c), (d), and (e), %	0.69	0.20	1.58	0.52	0.74	0.06	2.50	1.05	0.12	-	-	-
(c) Other grain, %	0.02	0.00	0.16	0.05	0.46	0.00	2.20	0.98	0.00	-	-	-
(d) Sunflower seed, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-
(e) Stones, %	0.12	0.00	0.90	0.29	0.00	0.00	0.00	0.00	0.00	-	-	-
(f) Sclerotia, %	0.09	0.00	0.26	0.08	0.02	0.00	0.08	0.04	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	0.20	1.10	0.33	0.85	0.10	2.10	0.96	0.10	-	-	-
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	3.09	1.80	4.82	0.87	4.19	1.66	9.00	2.86	6.00	-	-	-
(i) Soiled Soybeans, %	3.18	1.16	12.36	3.64	0.04	0.00	0.18	0.08	10.00	-	-	-
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	0.78	0.30	1.68	0.50	0.76	0.06	2.50	1.05	0.12	-	-	-
Poisonous seeds *(Crotalaria sp., Datura sp., Ricinis communis)*	0	0	0	0.00	0	0	0	0.00	0	-	-	-
Poisonous seeds *(Argemone mexicana L., Convolvulus sp., Ipomoea purpurea Roth., Lolium temulentum, Xanthium sp.)*	0	0	0	0.00	0	0	0	0.00	0	-	-	
Number of samples	***9***				***5***				***1***			
Nutritional analysis:	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Moisture, % (17 hr, 103 °C)	7.9	7.3	9.3	0.58	7.6	7.2	8.2	0.46	7.3	-	-	-
Crude protein, % (db)	40.00	35.23	41.18	1.84	40.31	38.31	42.00	1.45	41.25	-	-	-
Crude fat, % (db)	19.7	18.8	21.0	0.63	19.2	18.3	20.0	0.74	20.6	-	-	-
Crude Fibre, % (db)	6.6	6.1	7.0	0.30	6.9	6.5	7.3	0.34	6.4	-	-	-
Ash, % (db)	4.56	4.40	5.15	0.23	4.53	4.42	4.59	0.07	4.99	-	-	-
Number of samples	***9***				***5***				***1***			

South African
REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(36) KwaZulu-Natal Region			
Grading:	**ave**	**min**	**max**	**stdev**
(a) Wet pods, %	0.00	0.00	0.00	0.00
(b) Foreign matter, including stones, other grains and sunflower seeds: Provided that such deviations are individually within the limits specified in items (c), (d), and (e), %	0.46	0.06	2.42	0.70
(c) Other grain, %	0.05	0.00	0.23	0.09
(d) Sunflower seed, %	0.00	0.00	0.00	0.00
(e) Stones, %	0.00	0.00	0.00	0.00
(f) Sclerotia, %	0.01	0.00	0.06	0.03
(g) Soybeans and parts of Soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	0.54	0.14	1.43	0.35
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	5.85	2.08	11.66	3.29
(i) Soiled Soybeans, %	4.91	1.40	12.40	3.22
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	0.47	0.06	2.48	0.72
Poisonous seeds *(Crotalaria sp., Datura sp., Ricinis communis)*	0	0	0	0.00
Poisonous seeds *(Argemone mexicana L., Convolvulus sp., Ipomoea purpurea Roth., Lolium temulentum, Xanthium sp.)*	3	0	20	6.75
Number of samples	***10***			
Nutritional analysis:	**ave**	**min**	**max**	**stdev**
Moisture, % (17 hr, 103 °C)	7.7	7.2	8.2	0.32
Crude protein, % (db)	40.63	39.53	42.16	0.84
Crude fat, % (db)	21.5	20.2	23.2	0.88
Crude Fibre, % (db)	6.9	6.1	7.6	0.49
Ash, % (db)	4.62	4.44	4.84	0.13
Number of samples	***10***			

Fatty acid Profile

Fatty acid profiles are the most important tool for identification of authenticity of vegetable fats and oils. All types of oil have their own specific fatty acid profile which is unique to that product. Fatty acids are typically esterified to a glycerol backbone to form triglycerides (also called fats or oils). Fatty acids are either described as saturated or unsaturated, with saturated fatty acids being solid at room temperature and unsaturated fatty acids being liquid at room temperature. Unsaturated fatty acids are further subdivided into mono-unsaturated (one double bond in the carbon chain) or poly-unsaturated (more than one double bond in the carbon chain). The unique fatty acid profile of each product/crop is a combination of saturated, mono-unsaturated and poly-unsaturated oils and is specific to that type of oil.

Fatty acid profiles of every crop, however, are subject to variation. The variation or typical pattern of fatty acids in a specific oil not only influences the stability and physical properties of the oil but also aids in distinguishing one type of oil from another. Variation of fatty acids within the same product depend on climate, latitude, soil type, cultivar, rainfall as well as seasonal variation. These variations should be included when ranges for identification of authenticity are determined.

It is imperative to include ranges wherein fatty acids vary, in order to successfully validate the authenticity of a specific vegetable oil. Building of a database requires gathering of information over different seasons, areas and cultivars in order to give a true reflection of the ranges wherein fatty acids can differ. Currently, no national updated database for fatty acid composition of soybean oil is available.

It is important that South Africa, as a soybean producing country, develop and maintain a national fatty acid profile database to the benefit of the Oil Seed Industry. Annual analysis of crop and cultivar samples will ensure that the natural variation caused by different cultivars as well as the influence of climate and locality are included in the database values. Seasonal variations will also be addressed. Recording all variation applicable to the crops in the database will enable the annual review of the specified ranges.

Precision Oil Laboratories was subcontracted for the third consecutive season to perform fatty acid profile analyses on 20 composite crop samples representing different production regions as well as 18 cultivar samples from different localities. Please refer to Tables 7, 8 and 9 on pages 33 to 36 for the results.

The following fatty acid were included in the profile analysis:

C14:0	Myristic acid	C18:3n3	n3 Linolenic acid
C16:0	Palmitic acid	C20:0	Arachidic acid
C16:1	Palmitoleic acid	C20:1	Eicosenoic acid
C17:0	Margaric acid	C20:2	Eicosadienoic acid
C17:1	Glinkgolic acid	C21:0	Heneicosanoic acid
C18:0	Stearic acid	C22:0	Behenic acid
C18:1 c	cis Oleic acid	C22:1	Erucic acid
C18:2 c	cis Linoleic acid	C24:0	Lignoceric acid
C18:3n6	n6 Linolenic acid	C24:1	Nervonic acid

References:

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Van Niekerk, P.J., 1990. Determination of the component oils of edible oil blends. University of Pretoria.

The Fatty acid Profile information was supplied by Dr. Mathilda Mostert from Precision Oil Laboratories.

Table 7: Fatty acid profile results of a selection of crop quality samples from the 2020/21 season

Province	Region	g Fatty acids/100 g Fatty Acids																	
		C14:0	C16:0	C16:1	C17:0	C17:1	C18:0	C18:1 c	C18:2 c	C18:3n6	C18:3n3	C20:0	C20:1	C20:2	C21:0	C22:0	C22:1	C24:0	C24:1
Northern Cape	11	ND	9.5	ND	ND	ND	5.19	24.46	51.6	ND	7.74	0.51	LOQ	ND	ND	0.439	ND	LOQ	ND
North West	18	ND	9.3	ND	LOQ	ND	5.34	22.25	52.7	ND	8.86	0.53	LOQ	ND	ND	0.49	ND	LOQ	ND
	20	ND	9.56	ND	LOQ	ND	5.40	21.80	53.2	ND	8.31	0.50	LOQ	LOQ	ND	0.47	ND	LOQ	ND
	Min	-	*9.3*	-	-	-	*5.34*	*21.80*	*52.7*	-	*8.31*	*0.50*	-	-	-	*0.47*	-	-	-
	Max	-	*9.56*	-	-	-	*5.40*	*22.25*	*53.2*	-	*8.86*	*0.53*	-	-	-	*0.49*	-	-	-
	N	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Free State	21	ND	9.16	ND	LOQ	ND	5.72	23.14	52.5	ND	7.69	0.53	LOQ	LOQ	ND	0.53	ND	LOQ	ND
	22	ND	9.5	ND	LOQ	ND	5.49	22.15	52.8	ND	8.29	0.55	LOQ	ND	ND	0.51	ND	LOQ	ND
	23	ND	9.22	ND	LOQ	ND	5.21	22.08	53.4	ND	8.35	0.49	LOQ	ND	ND	0.50	ND	LOQ	ND
	25	ND	9.0	ND	LOQ	ND	5.98	21.12	52.9	ND	9.40	0.56	LOQ	ND	ND	0.473	ND	LOQ	ND
	26	ND	9.3	ND	LOQ	ND	6.71	21.69	52.2	ND	8.56	0.55	LOQ	ND	ND	0.440	ND	LOQ	ND
	27	ND	9.32	ND	LOQ	ND	6.44	22.64	51.5	ND	8.09	0.63	LOQ	LOQ	ND	0.59	ND	0.23	ND
	28	ND	8.6	ND	LOQ	ND	4.70	23.18	52.6	ND	9.38	0.48	LOQ	ND	ND	0.50	ND	LOQ	ND
	28	ND	9.59	ND	LOQ	ND	5.92	22.26	52.2	ND	8.24	0.53	LOQ	LOQ	ND	0.51	ND	LOQ	ND
	Min	-	*8.6*	-	-	-	*4.70*	*21.12*	*51.5*	-	*7.69*	*0.48*	-	-	-	*0.440*	-	-	-
	Max	-	*9.59*	-	-	-	*6.71*	*23.18*	*53.4*	-	*9.40*	*0.63*	-	-	-	*0.59*	-	*0.23*	-
	N	*8*	*8*	*8*	*8*	*8*	*8*	*8*	*8*	*8*	*8*	*8*	*8*	*8*	*8*	*8*	*8*	*8*	*8*
Mpumalanga	29	ND	9.2	ND	LOQ	ND	5.91	22.00	51.3	ND	9.79	0.58	LOQ	ND	LOQ	0.53	ND	LOQ	ND
	30	ND	9.4	ND	LOQ	ND	5.76	22.98	51.6	ND	8.73	0.55	LOQ	ND	ND	0.48	ND	LOQ	ND
	30	ND	8.60	ND	LOQ	ND	5.70	22.42	52.3	ND	9.31	0.57	LOQ	ND	LOQ	0.56	ND	LOQ	ND
	31	ND	9.8	ND	LOQ	ND	5.95	23.33	52.2	ND	7.38	0.48	LOQ	ND	ND	0.383	ND	LOQ	ND
	32	ND	9.43	ND	LOQ	ND	5.79	23.08	52.1	ND	7.71	0.55	LOQ	LOQ	ND	0.59	ND	LOQ	ND
	33	ND	8.9	ND	LOQ	ND	5.56	22.69	52.6	ND	8.67	0.54	LOQ	ND	ND	0.49	ND	LOQ	ND
	Min	-	*8.60*	-	-	-	*5.56*	*22.00*	*51.3*	-	*7.38*	*0.48*	-	-	-	*0.383*	-	-	-
	Max	-	*9.8*	-	-	-	*5.95*	*23.33*	*52.6*	-	*9.79*	*0.58*	-	-	-	*0.59*	-	-	-
	N	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*
Gauteng	34	ND	9.43	ND	LOQ	ND	5.28	22.33	52.4	ND	8.87	0.48	LOQ	ND	ND	0.52	ND	LOQ	ND
Limpopo	35	ND	10.61	LOQ	LOQ	ND	6.94	26.63	47.3	ND	6.69	0.56	LOQ	ND	ND	0.48	ND	LOQ	ND
KwaZulu-Natal	36	ND	10.12	ND	LOQ	ND	5.00	25.11	50.4	ND	7.60	0.47	LOQ	LOQ	ND	0.50	ND	LOQ	ND
RSA	*Min*	-	*8.60*	-	-	-	*4.70*	*21.12*	*47.3*	-	*6.69*	*0.47*	-	-	-	*0.383*	-	-	-
	Max	-	*9.8*	-	-	-	*6.94*	*26.63*	*53.4*	-	*9.79*	*0.63*	-	-	-	*0.59*	-	*0.23*	-
	N	*20*	*20*	*20*	*20*	*20*	*20*	*20*	*20*	*20*	*20*	*20*	*20*	*20*	*20*	*20*	*20*	*20*	*20*

Note:
Limit of detection (LOD) = 0.09 g Fatty acid/100 g Fatty acids.
Values below the limit of detection are reported as ND (not detected).
Limit of quantitation (LOQ) = 0.28 g Fatty acid/100 g Fatty acids.
Values below the limit of quantitation cannot be accurately quantified.

Table 8: Fatty acid profile results of a selection of cultivar samples per region from the 2020/21 season

Province	Locality	Region	Cultivar	g Fatty acids/100 g Fatty Acids																
				C14:0	C16:0	C16:1	C17:0	C17:1	C18:0	C18:1 c	C18:2 c	C18:3n6	C18:3n3	C20:0	C20:1	C20.2	C21:0	C22:0	C22:1	C24:0	C24:1
Free State	Bethlehem	25	DM 5953 RSF	ND	10.4	ND	LOQ	ND	5.89	22.31	51.3	ND	8.55	0.46	LOQ	LOQ	ND	0.41	ND	LOQ	ND
			SSS 5052 (tuc)	ND	9.4	ND	LOQ	ND	5.38	21.42	52.9	ND	9.11	0.50	LOQ	LOQ	ND	0.50	ND	LOQ	ND
			PAN 1521 R	ND	9.4	ND	LOQ	ND	6.22	21.98	51.8	ND	8.90	0.57	LOQ	LOQ	ND	0.49	ND	LOQ	ND
			RA 660 R	ND	8.8	ND	LOQ	ND	5.22	20.34	54.7	ND	9.36	0.47	LOQ	LOQ	ND	0.49	ND	LOQ	ND
			P61T38 R	ND	8.7	ND	LOQ	ND	5.49	20.07	54.5	ND	9.59	0.47	LOQ	LOQ	ND	0.53	ND	LOQ	ND
			NS 6448 R	ND	9.6	ND	LOQ	ND	5.17	20.52	54.4	ND	8.74	0.45	LOQ	LOQ	ND	0.43	ND	LOQ	ND
		Min		*-*	*8.7*	*-*	*-*	*-*	*5.17*	*20.07*	*51.3*	*-*	*8.55*	*0.45*	*-*	*-*	*-*	*0.41*	*-*	*-*	*-*
		Max		*-*	*10.4*	*-*	*-*	*-*	*6.22*	*22.31*	*54.7*	*-*	*9.59*	*0.57*	*-*	*-*	*-*	*0.53*	*-*	*-*	*-*
		N		*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*
Mpumalanga	Marble Hall	33	DM 5953 RSF	ND	10.8	LOQ	LOQ	ND	5.74	26.99	48.7	ND	6.06	0.47	LOQ	LOQ	ND	0.43	ND	LOQ	ND
			SSS 5052 (tuc)	ND	10.8	LOQ	LOQ	ND	4.66	23.79	51.4	ND	7.36	0.51	LOQ	LOQ	ND	0.58	ND	LOQ	ND
			PAN 1521 R	ND	10.3	LOQ	LOQ	ND	5.35	24.14	51.5	ND	6.69	0.56	LOQ	LOQ	ND	0.59	ND	LOQ	ND
			RA 660 R	ND	10.0	ND	LOQ	ND	5.03	23.69	52.5	ND	6.83	0.52	LOQ	LOQ	ND	0.59	ND	LOQ	ND
			P61T38 R	ND	10.0	LOQ	LOQ	ND	5.20	22.33	53.4	ND	7.13	0.50	LOQ	LOQ	ND	0.53	ND	LOQ	ND
			NS 6448 R	LOQ	10.9	ND	LOQ	ND	5.48	23.38	51.7	ND	6.56	0.56	LOQ	LOQ	ND	0.55	ND	LOQ	ND
		Min		*-*	*10.0*	*-*	*-*	*-*	*4.66*	*22.33*	*48.7*	*-*	*6.06*	*0.47*	*-*	*-*	*-*	*0.43*	*-*	*-*	*-*
		Max		*-*	*10.9*	*-*	*-*	*-*	*5.74*	*26.99*	*53.4*	*-*	*7.36*	*0.56*	*-*	*-*	*-*	*0.59*	*-*	*-*	*-*
		N		*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*
KwaZulu-Natal	Greytown	36	DM 5953 RSF	ND	10.4	LOQ	LOQ	ND	6.39	29.98	44.2	ND	7.30	0.54	LOQ	ND	ND	0.48	ND	LOQ	ND
			SSS 5052 (tuc)	ND	10.4	LOQ	LOQ	ND	5.05	23.76	50.5	ND	8.41	0.54	LOQ	LOQ	ND	0.56	ND	LOQ	ND
			PAN 1521 R	ND	10.0	LOQ	LOQ	ND	5.75	25.07	49.1	ND	8.21	0.58	LOQ	LOQ	ND	0.56	ND	LOQ	ND
			RA 660 R	ND	9.7	ND	LOQ	ND	4.98	21.88	52.8	ND	8.84	0.49	LOQ	LOQ	ND	0.53	ND	LOQ	ND
			P61T38 R	ND	9.9	LOQ	LOQ	ND	4.99	21.22	53.0	ND	9.17	0.47	LOQ	LOQ	ND	0.52	ND	LOQ	ND
			NS 6448 R	ND	10.7	ND	LOQ	ND	4.77	19.86	54.6	ND	8.49	0.46	LOQ	LOQ	ND	0.46	ND	LOQ	ND
		Min		*-*	*9.7*	*-*	*-*	*-*	*4.77*	*19.86*	*44.2*	*-*	*7.30*	*0.46*	*-*	*-*	*-*	*0.46*	*-*	*-*	*-*
		Max		*-*	*10.7*	*-*	*-*	*-*	*6.39*	*29.98*	*54.6*	*-*	*9.17*	*0.58*	*-*	*-*	*-*	*0.56*	*-*	*-*	*-*
		N		*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*
RSA	*Min*			*-*	*8.7*	*-*	*-*	*-*	*4.66*	*19.86*	*44.2*	*-*	*6.06*	*0.45*	*-*	*-*	*-*	*0.41*	*-*	*-*	*-*
	Max			*-*	*10.9*	*-*	*-*	*-*	*6.39*	*29.98*	*54.7*	*-*	*9.59*	*0.58*	*-*	*-*	*-*	*0.59*	*-*	*-*	*-*
	N			*18*	*18*	*18*	*18*	*18*	*18*	*18*	*18*	*18*	*18*	*18*	*18*	*18*	*18*	*18*	*18*	*18*	*18*

Note:
Limit of detection (LOD) = 0.09 g Fatty acid/100 g Fatty acids.
Values below the limit of detection are reported as ND (not detected).
Limit of quantitation (LOQ) = 0.28 g Fatty acid/100 g Fatty acids.
Values below the limit of quantitation cannot be accurately quantified.

Table 9: Fatty acid profile results per cultivar from the 2020/21 season

Cultivar	Locality	Region	g Fatty acids/100 g Fatty Acids																
			C14:0	C16:0	C16:1	C17:0	C17:1	C18:0	C18:1 c	C18:2 c	C18:3n6	C18:3n3	C20:0	C20:1	C20:2	C21:0	C22:0	C22:1	C24:0	C24:1
DM 5953 RSF	Bethlehem	25	ND	10.4	LOQ	LOQ	ND	6.39	29.98	44.2	ND	7.30	0.54	LOQ	ND	ND	0.48	ND	LOQ	ND
	Marble Hall	33	ND	10.8	LOQ	LOQ	ND	5.74	26.99	48.7	ND	6.06	0.47	LOQ	LOQ	ND	0.43	ND	LOQ	ND
	Greytown	36	ND	10.4	ND	LOQ	ND	5.89	22.31	51.3	ND	8.55	0.46	LOQ	LOQ	ND	0.41	ND	LOQ	ND
	Min		-	***10.4***	-	-	-	***5.74***	***22.31***	***44.2***	-	***6.06***	***0.46***	-	-	-	***0.41***	-	-	-
	Max		-	***10.8***	-	-	-	***6.39***	***29.98***	***51.3***	-	***8.55***	***0.54***	-	-	-	***0.48***	-	-	-
	N		*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*
NS 6448 R	Bethlehem	25	ND	10.7	ND	LOQ	ND	4.77	19.86	54.6	ND	8.49	0.46	LOQ	LOQ	ND	0.46	ND	LOQ	ND
	Marble Hall	33	LOQ	10.9	ND	LOQ	ND	5.48	23.38	51.7	ND	6.56	0.56	LOQ	LOQ	ND	0.55	ND	LOQ	ND
	Greytown	36	ND	9.6	ND	LOQ	ND	5.17	20.52	54.4	ND	8.74	0.45	LOQ	LOQ	ND	0.43	ND	LOQ	ND
	Min		-	***9.6***	-	-	-	***4.77***	***19.86***	***51.7***	-	***6.56***	***0.45***	-	-	-	***0.43***	-	-	-
	Max		-	***10.9***	-	-	-	***5.48***	***23.38***	***54.6***	-	***8.74***	***0.56***	-	-	-	***0.55***	-	-	-
	N		*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*
P61T38 R	Bethlehem	25	ND	9.9	LOQ	LOQ	ND	4.99	21.22	53.0	ND	9.17	0.47	LOQ	LOQ	ND	0.52	ND	LOQ	ND
	Marble Hall	33	ND	10.0	LOQ	LOQ	ND	5.20	22.33	53.4	ND	7.13	0.50	LOQ	LOQ	ND	0.53	ND	LOQ	ND
	Greytown	36	ND	8.7	ND	LOQ	ND	5.49	20.07	54.5	ND	9.59	0.47	LOQ	LOQ	ND	0.53	ND	LOQ	ND
	Min		-	***8.7***	-	-	-	***4.99***	***20.07***	***53.0***	-	***7.13***	***0.47***	-	-	-	***0.52***	-	-	-
	Max		-	***10.0***	-	-	-	***5.49***	***22.33***	***54.5***	-	***9.59***	***0.50***	-	-	-	***0.53***	-	-	-
	N		*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*
PAN 1521 R	Bethlehem	25	ND	10.0	LOQ	LOQ	ND	5.75	25.07	49.1	ND	8.21	0.58	LOQ	LOQ	ND	0.56	ND	LOQ	ND
	Marble Hall	33	ND	10.3	LOQ	LOQ	ND	5.35	24.14	51.5	ND	6.69	0.56	LOQ	LOQ	ND	0.59	ND	LOQ	ND
	Greytown	36	ND	9.4	ND	LOQ	ND	6.22	21.98	51.8	ND	8.90	0.57	LOQ	LOQ	ND	0.49	ND	LOQ	ND
	Min		-	***9.4***	-	-	-	***5.35***	***21.98***	***49.1***	-	***6.69***	***0.56***	-	-	-	***0.49***	-	-	-
	Max		-	***10.3***	-	-	-	***6.22***	***25.07***	***51.8***	-	***8.90***	***0.58***	-	-	-	***0.59***	-	-	-
	N		*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*
RA 660 R	Bethlehem	25	ND	9.7	ND	LOQ	ND	4.98	21.88	52.8	ND	8.84	0.49	LOQ	LOQ	ND	0.53	ND	LOQ	ND
	Marble Hall	33	ND	10.0	ND	LOQ	ND	5.03	23.69	52.5	ND	6.83	0.52	LOQ	LOQ	ND	0.59	ND	LOQ	ND
	Greytown	36	ND	8.8	ND	LOQ	ND	5.22	20.34	54.7	ND	9.36	0.47	LOQ	LOQ	ND	0.49	ND	LOQ	ND
	Min		-	***8.8***	-	-	-	***4.98***	***20.34***	***52.5***	-	***6.83***	***0.47***	-	-	-	***0.49***	-	-	-
	Max		-	***10.0***	-	-	-	***5.22***	***23.69***	***54.7***	-	***9.36***	***0.52***	-	-	-	***0.59***	-	-	-
	N		*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*

Table 9: Fatty acid profile results per cultivar from the 2020/21 season

Cultivar	Locality	Region	g Fatty acids/100 g Fatty Acids (continue)																
			C14:0	C16:0	C16:1	C17:0	C17:1	C18:0	C18:1 c	C18:2 c	C18:3n6	C18:3n3	C20:0	C20:1	C20:2	C21:0	C22:0	C22:1	C24:0	C24:1
SSS 5052 (tuc)	Bethlehem	25	ND	10.4	LOQ	LOQ	ND	5.05	23.76	50.5	ND	8.41	0.54	LOQ	LOQ	ND	0.56	ND	LOQ	ND
	Marble Hall	33	ND	10.8	LOQ	LOQ	ND	4.66	23.79	51.4	ND	7.36	0.51	LOQ	LOQ	ND	0.58	ND	LOQ	ND
	Greytown	36	ND	9.4	ND	LOQ	ND	5.38	21.42	52.9	ND	9.11	0.50	LOQ	LOQ	ND	0.50	ND	LOQ	ND
	Min		-	*9.4*	-	-	-	*4.66*	*21.42*	*50.5*	-	*7.36*	*0.50*	-	-	-	*0.50*	-	-	-
	Max		-	*10.8*	-	-	-	*5.38*	*23.79*	*52.9*	-	*9.11*	*0.54*	-	-	-	*0.58*	-	-	-
	N		*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*
RSA	*Min*		-	*8.7*	-	-	-	*4.66*	*19.86*	*44.2*	-	*6.06*	*0.45*	-	-	-	*0.41*	-	-	-
	Max		-	*10.9*	-	-	-	*6.39*	*29.98*	*54.7*	-	*9.59*	*0.58*	-	-	-	*0.59*	-	-	-
	N		*18*	*18*	*18*	*18*	*18*	*18*	*18*	*18*	*18*	*18*	*18*	*18*	*18*	*18*	*18*	*18*	*18*	*18*

Note:
Limit of detection (LOD) = 0.09 g Fatty acid/100 g Fatty acids.
Values below the limit of detection are reported as ND (not detected).
Limit of quantitation (LOQ) = 0.28 g Fatty acid/100 g Fatty acids.
Values below the limit of quantitation cannot be accurately quantified.

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 86 to 95 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 7971-3:2019, 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

Crude fibre is the loss on ignition of the dried residue remaining after digestion of a sample with 1.25% Sulphuric acid (H_2SO_4) and 1.25% Sodium hydroxide (NaOH) solutions under specific conditions.

In-House method 031 was used for the determination of the crude fibre in the samples. This method is based on AACCI method 32-10.01 using the Velp FIWE Advance fibre AutoExtractor.

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.

Precision Oil Laboratories' Fatty Acid Profile Methods:

Fat Extraction

In-House method POL 019 was used for the extraction of the crude fat from the samples. After sample preparation the fat is extracted by petroleum ether under reflux, followed by the removal of the solvent by evaporation. The residue obtained from the fat extraction is used for preparation of methyl esters for determination of the fatty acid profile.

Fatty Acid Profile

In-House method POL 015 was used for determination of the fatty acid composition. Extracted fat is converted to methyl esters using an alkali catalyzed method. Methyl esters are injected into a Gas Chromatograph and an external fatty acid methyl ester standard is used to identify peaks based on retention times. The fatty acid composition is expressed as a total fatty acid content of 100% with different fatty acids representing a percentage of the total fatty acids.

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 facility
provided that all 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 17025:2017

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

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

Mr R Josias
Chief Executive Officer

Effective Date: 01 November 2019
Certificate Expires: 31 October 2024

ANNEXURE A

SCHEDULE OF ACCREDITATION

Facility Number: **T0116**

Permanent Address of Laboratory:

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Agri-Hub Office Park - Grain Building
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The Willows
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Technical Signatories:

Ms J Nortje (All Methods excl. In-house method 029)
Ms M Bothma (All Chemical Methods)
Ms A de Jager (Nutrients & Contaminants Methods)
Ms W Louw (In-house Methods 001, 002, 003, 010 & 026)
Ms D Moleke (Rheological Methods)
Mrs H Meyer (All Chemical, Nutrients and Contaminants & Grading Methods)
Ms J Kruger (All Chemical Methods)
Ms M Motlanthe (In-house Methods 001, 003 & 026)
Mr B van Der Linde (Grading)
Ms M Ramare (All Chemical Methods Excl. In-House Method 012 and SOP MC23)
Ms T de Beer (Rheological Methods)

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Nominated Representative:

Mrs H Meyer

Issue No.: 32
Date of Issue: 19 November 2021
Expiry Date: 31 October 2024

Material or Products Tested	Type of Tests / Properties Measured, Range of Measurement	Standard Specifications, Techniques / Equipment Used
CHEMICAL		
Ground Barley	Moisture (Oven Method)	Analytical EBC Method 3.2, latest Edition (2 hour; 130^{0}C)
Cereal and cereal products specifically-wheat, rice, (hulled paddy), barley, millet, rye, and oats as grain, semolina and flour	Moisture (Oven Method)	ICC Std No.110/1, Latest Edition (90 min; 130˚C) (2 hour; 130˚C)
Flour, semolina, bread, all kind of grains and cereal products and food products (except those that are sugar coated)	Moisture (Oven Method)	AACCI 44-15.02, Latest Edition (1 hour; 130˚C) (72 hour; 103˚C)

Maize Grits	Moisture (Oven Method)	Analytical EBC Method 6.2.2, latest edition (4 hours, 130^{0}C)
Animal feed, Plant tissue and Sunflower (Milled)	Moisture (Oven Method)	AgriLASA 2.1, Latest Edition (5 hours, 105^{0}C)
All flours, cereal grains, oilseeds and animal feeds	Nitrogen and protein (Combustion method - Dumas)	AACCI 46-30.01, Latest Edition
Cereal based food stuff	Dietary fibres (Total)	In-house method 012
Food stuff and feeds	Carbohydrates (by difference) (calculation) Energy value (calculation) Total digestible nutritional value (calculation)	SOP MC 23
Food Stuff and feeds	Determination of Ash	In-house method 011
Wheat Kernels	Moisture (Oven Method)	Government Gazette Wheat Regulation, Latest Edition (72 hour, 103˚C)
Flours of grains e.g. barley, oats, triticale, maize, rye, sorghum and wheat; oilseeds like soybeans and sunflower, feeds and mixed feeds and foodstuffs	Crude fat (Ether extraction by Soxhlet)	In-house method 024
Meal and flour of wheat, rye, barley, other grains, starch containing and malted products	Falling number	ICC Std 107/1, Latest Edition
NUTRIENTS AND CONTAMINANTS		
Vitamin fortified food and feed products and fortification mixes grain based	Vitamin A as all trans Retinol (Saponification) (HPLC)	In-house method 001
	Thiamine Mononitrate (HPLC) Riboflavin (HPLC) Nicotinamide (HPLC) Pyridoxine Hydrochloride (HPLC)	In-house method 002
	Folic Acid (HPLC)	In-house method 003
Grain based food and feed products (fortified and unfortified) and fortification mixes	Total Sodium (Na) Total Iron (Fe) Total Zinc (Zn)	In-house method 010

Yeast and Bread	Vitamin D_2 (HPLC)	In-House method 029
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

Landbounavorsingsraad

Graangewasse

Potchefstroom

Agricultural Research Council

Grain Crops

Potchefstroom

Republiek van Suid Afrika

Republic of South Africa

VERSLAG VAN DIE NASIONALE SOJABOON KULTIVARPROEWE/ 2020/21

REPORT OF THE NATIONAL SOYBEAN CULTIVAR TRIALS

Verantwoordelike beampte:

Responsible officer:

AS de Beer

L Bronkhorst

N Cochrane

BEDANKINGS

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

1 Alle medewerkers en koöperateurs soos gelys op bladsy 11.

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

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

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

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

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

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

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

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

INHOUD/INDEX

TABEL TABLE		BLADSY PAGE

1 INTRODUCTION

The National Soybean Cultivar Trials (project M101/62 (P05000002) were planted for the 43th successive year this past growing season. A total of 24 trials (of the planned 26 trials) were planted at 24 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 and 30 cultivars. Cultivar characteristics are shown in Table 1.

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

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

2.2 OBSERVATIONS

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

2.2.1 Date of flowering: The time at which one fully open flower per plant was observed across 50% of the plots.

2.2.2 Physiological maturity: The number of days when 50% of the pods appear yellow or brown.

2.2.3 Date of harvest maturity: When 95% of the pods for a given plot had turned brown. This is an indication of length of growing season, (number of days from date of planting to date of maturity).

2.2.4 Plant height: The average height in centimetre (cm) of plants from the soil surface to the growth point at maturity.

2.2.5 Pod height: The average height in centimetre (cm) of the lowest pods on the plant from soil surface at maturity.

2.2.6 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

2.2.7 Green stem: The percentage green stems at harvest rated on a 1 (normally mature) to 5 (more than 80% green stems) scale.

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

2.2.9 Plant count three (3) weeks after emergence: The number of plants counted on 5 m of the two inner rows. This data will be used to calculate the germination percentage and will be compared with the germination percentage of different soil types.

2.2.10 100 seeds mass: Determined on an air dry basis from a randomly selected sample retained on a 4,75 mm standard grading screen.

2.2.11 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).

2.2.12 Protein and oil percentage: The analysis was done by the SAGL (Southern African Grain Laboratory NPC) by using the “Soxhlet” apparatus (oil percentage) and the “Dumas” method (protein percentage).

2.2.13 Grain yield: Four metres of the two centre rows were harvested by hand at soil level and threshed. The grain moisture was determined and 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.

One (1) of the 24 trials planted could not be included (4.2%) in the report compared to the three (3) out of 18 trials (16.7%) in the 2019/20 season.

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

1. Hoopstad – high CV%.

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 (42 days Marble Hall) and the longest in the cooler areas (78 days at Clarens).

The number of days to physiological maturity is shown in Table 5. The longest average days to maturity was experienced at Clarens (145 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 P71T74 R (MG 7.1) had a mean plant height of 111 cm (highest) in the warm area compared to 60 cm (lowest) of the determinate cultivar LS 6851 R (MG 5.5) in the moderate region.

The average plant height between localities varied from a mean of 63 cm at Barberspan to 101 cm at Schweizer-Reneke PD1.

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 P64T39 R (MG 6.4; indeterminate) and P71T74 R (MG 7.1; indeterminate), had a mean pod height of 22 cm in the warm area, but also had an above average pod height in the cool and moderate areas.
Other cultivars with above average pod heights for all the climate areas are SSS 5052 (tuc) (MG 5.5; indeterminate), NS 5909 R (MG 5.9; indeterminate), LS 6860 R (MG 6.0; indeterminate), PAN 1521 R (MG 5.7; indeterminate), LS 6164 R (MG 6.1; indeterminate), PAN 1555 R (MG 5.7, indeterminate), DM 6.8i RR (MG 6.8; indeterminate), SSS 6560 (tuc) (MG 6.2; indeterminate), P61T38 R (MG 6.1;

determinate), NS 6448 R (MG 6.4; semi-determinate), PAN 1644 R (MG 6.7; indeterminate) and DM 68R09 (MG 6.6; indeterminate).

DM 52R19 (MG 4.7) (indeterminate) had the lowest reading of 4 cm. 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 overall lodging occurred in the trial at Bapsfontein. The highest lodging figures was reported for P61T38 R and P71T74 R at Belfast in the cool area.

3.2.5 Green stem (Table 10)

A high percentage of green stem, was recorded at Kroonstad as well as Schweizer-Reneke PD1 and PD2 while the cultivars DM 5351 RSF, LS 6851 R, DM 59R03, DM 60T05, SSS 6560 (tuc), LS 6164 R, DM 68R09, DM 6.8i RR, P71T74 R and NS 5909 R showed an above average tendency for green stem for all the climatic regions. Plants also retained their leaves that could hamper the harvesting process.

3.2.6 Shattering with harvesting (Table 11)

The highest shattering occurred at Bapsfontein in the cool area and Groblersdal in the warm area.

3.2.7 Number of plants three (3) weeks after emergence (Table 12)

Enough certified seed was provided to establish 400 000 plants ha^{-1} for the irrigation and high rainfall areas and 350 000 for dryland. The lowest plants ha^{-1} count were recorded at Leeudoringstad due to physical damage caused during the spraying of the commercial crop adjacent to the trial.

3.2.8 Percentage undesirable seed (Table 13)

The lowest mean of 0.25% undesirable seeds was recorded for the warm region. The range varied from 1.82% at Belfast to 0.01% at Bergville.

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

The variation in seed mass among localities ranged between 13.54 g 100^{-1} seeds at Villiers to 19.31 g 100^{-1} seeds at Schweizer-Reneke PD2. The highest seed mass was recorded for PAN 1479 R in the moderate region, while SSS 5052 (tuc), had the smallest seed in the cool area.

1.2.10 Oil percentage (Table 15)

The cultivar DM 52R19 had, the highest average oil percentage for all the regions (20.16% cool, 21.60% moderate, 22.68% warm). The average oil percentage are 21.12% for the warm, 20.49% for the moderate and 18.94% for the cool area.

1.2.11 Crude Protein percentage (Table 16)

The cultivars LG60155 R, DM 5302 RSF, PAN 1555 R, RA 568 R, DM 60T05 and PAN 1644 R had an above 40% average for all climate regions. The overall average are 39.70% for the warm, 39.61% for the moderate and 40.16% for the cool area.

3.2.12 Profat (Table 17)

The inclusion of this table in the report was requested by Dr Erhard Bredenham as the total value of oil and protein is a much better indicator for the selection of a cultivar than the single oil or protein factor. The cultivars DM 5953 RSF and NS 5258 R, had the highest average profat value for all the regions.

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.

DM 5351 RSF, DM 5953 RSF and PAN 1521 R showed an above average yield probability (Table 19) for all the yield potentials in the cool area. For the moderate area P64T39 R and DM 6.8i RR showed above average figures over the whole production potential range (Table 21). SSS 5052 (tuc), PAN 1521 R, DM 6.8i RR and P71T74 R also performed above average for the warm areas (Table 23).

Lokaliteite, medewerkers en proeflokaliteit van kultivarproewe soos beplan vir, 2020/21
Localities, co-operators and trial locality of the cultivar trials, 2019/20

Nr No	Lokaliteit Locality	Proeflokaliteit Trial locality	Verantwoordelike beampte Responsible officer
1	Barberspan	J Basson	G de Beer & L Bronkhorst
2	Bapsfontein	Corteva Agriscience Research Centre	A Mathebula
3	Belfast	G Roos	L Bronkhorst
4	Bergville	J Jackson	R Wessels
5-6	Bethlehem	Kleingraan Instituut ARC	L Bronkhorst
7	Brits K2	K2 Navorsingstasie	F Middleton
8	Cedara	Departmaent of Agriculture	J Arathoon
9	Clarens	D Terblanche	R Wessels
10	Delmas-Pannar	Pannar Saad Navorsingsplaas	A Mathebula
11	Greytown	Pannar Proefplaas	A Jarvie
12	Groblersdal (Agricol)	R Louw	R van Niekerk & C Schoeman
13	Groblersdal (Agri Seed)	-	D van Staden
14	Hoopstad	R Taljaard	G de Beer & L Bronkhorst
15	Kinross	Vosstoffel Boerdery	L Bronkhorst
16	Kroonstad	Hoërskool Kroonstad	L Bronkhorst
17	Leeudoringstad	D Bergh	G de Beer & L Bronkhorst
18	Lichtenburg Wes	-	G de Beer & L Bronkhorst
19	Marble Hall	P Louw	D Leeuwner
20	Potchefstroom	Limagrain Research Station	F Middleton
21-22	Schweizer Reneke	J du Plessis	G de Beer & L Bronkhorst
23	Standerton	T Schoonraad	C Schoeman
24	Stoffberg	P Prinsloo	R van Niekerk & C Schoeman
25	Villiers	-	D van Staden
26	Winterton	Terry Muirhead	F Middleton

Tabel 1 Sojaboonsaad eienskappe en inligting oor verskaffers, 2020/21
Table 1 Soybean seed characteristics and information about agents, 2020/21

Kultivar Cultivar	Volwassenheids-groeperings Maturity Group	Groeiwyse Growth habit *1	Hilum kleur Hilum colour *2	Blomkleur Flower colour *3	Haarkleur Pubescence *4	Op varieteits lys On variety list	Verskaffer Agent	Telersregte Breeding rights
PAN 1479	4.7	I	BL	P	T	JA/YES	Pannar	JA/YES
DM 52R19	4.7	I	DB	P	LB	NEE/NO	Agicol	-
DM 5953 RSF	4.8	I	IB	P	T	JA/YES	GDM Seeds	JA/YES
RA 4918 R	4.9	I	BL	P	T	JA/YES	Agri Seed	JA/YES
DM 5351 RSF	5.1	I	IB	W	T	JA/YES	GDM Seeds	JA/YES
NS 5258 R	5.2	I	BL	W	B	JA/.YES	Limagrain (K2)	NEE/NO
SSS 5449 (tuc)	5.2	I	B	P	G	JA/YES	Syngenta (Sensako)	JA/YES
PAN 1532 R	5.3	I	LB	P	G	JA/YES	Pannar	JA/YES
RA 565 R	5.5	I	B	P	G	JA/YES	Agri Seed	JA/YES
LS 6851 R	5.5	D	B	P	W	JA/YES	Limagrain	JA/YES
LG60155R	5.5	I	KL	W	G	NEE/NO	Limagrain	-
SSS 5052 (tuc)	5.5	I	B	W	G	JA/YES	Sensako	JA/YES
DM 5302 RSF	5.7	I	LB	P	G	JA/YES	GDM Seeds	JA/YES
PAN 1555 R	5.7	I	B	P	T	JA/YES	Pannar	JA/YES
PAN 1521 R	5.7	I	IB	P	G	JA/YES	Pannar	JA/YES
RA 568 R	5.8	I	B	P	G	JA/YES	Agri Seed	JA/YES
NS 5909 R	5.9	I	IB	P	G	JA/YES	Limagrain (K2)	NEE/NO
RA 660 R	6.0	I	B	P	G	JA/YES	Agri Seed	JA/YES
DM 59R03	6.0	I	LB	W	G	NEE/NO	GDM Seeds	-
DM 60R05	6.0	I	LB	W	G	NEE/NO	GDM Seeds	-
SSS 6560 (tuc)	6.2	I	B	W	G	JA/YES	Sensako	JA/YES
LS 6164 R	6.1	I	LB	W	G	JA/YES	Limagrain	JA/YES
P61T38 R	6.1	D	LB	W	G	JA/YES	Pioneer	JA/YES
LS 6860 R	6.2	I	B	P	W	JA/YES	Limagrain	JA/YES
NS 6448 R	6.4	SD	LB	P	G	JA/YES	Limagrain (K2)	NEE/NO
P64T39 R	6.4	I	KL	W	G	JA/YES	Pioneer	JA/YES
DM 68R09	6.6	I	B	W	G	NEE/NO	GDM Seeds	-
PAN 1644 R	6.7	I	IB	P	G	JA/YES	Pannar	NEE/NO
DM 6.8i RR	6.8	I	B	P	G	JA/YES	GDM Seeds	JA/YES
P71T74 R	7.1	I	KL	W	G	JA/YES	Pioneer	JA/YES

*1 D - Bepaald/determinate; I - Onbepaald/indeterminate; SD - Semi-Bepaald/semi deteminate
*2 BL - Swart/black; IB - Onvollodig swart/imperfect black; B - Bruin/brown; LB - Ligbruin/buff; G - Grys/grey; KL - Kleurloos/buff
*3 P - Pers/purple; W - Wit/white
*4 B - Bruin/brown; G - Grys/grey; W - Wit/white; T – Taankleurig/Tawny

Tabel 2 Algemene inligting aangaande grond en verbouiingpraktyke by die onderskeie proeflokaliteite van die kultivarproewe, 2020/21
Table 2 General information in connection with soil and cultivation practices at the different trial localities, 2020/21

Lokaliteit Locality	Plantdatum Date of planting	Spasiëring Spacing (cm)	Onkruid beheer Weed control
Barberspan/D	26/11/2020	90	Strongarm, Alachlor, Round-up
Bapsfontein/B/I	26/11/2020	90	Metagan Gold, Karate, Touchdown, Functional
Belfast/D	02/11/2020	75	Farmer sprayed
Bergville/B/I	02/12/2020	75	-
Bethlehem PD1/D	03/11/2020	75	Strongarm, Alachlor
Bethlehem PD2/D	03/12/2020	75	Strongarm, Alachlor
Brits Limagrain/B/I	25/11/2020	45	-
Cedara/D	17/11/2020	45	Metalachlor 915 S, Bateleur Gold,Round-up Power Max
Clarens/D	20/11/2020	90	Strongarm, Alanex
Delmas/D	Nie geplant/Not planted	75	-
Frankfort/D (Villiers)	27/11/2020	76	-
Greytown/D	10/12/2020	75	Glyphosate
Groblersdal Agricol/B/I	28/11/2020	90	Round-up Power max
Groblersdal Agri Seed/B/I	30/11/2021	90	-
Hoopstad/D	24/11/2020	75	Round-up
Kinross/D	16/11/2020	75	Strongarm, Alanex
Kroonstad/D	17/12/2020	75	Strongarm, Alanex
Leeudoringstad/D	18/11/2020	75	Strongarm, Alanex
Lichtenburg Wes/D	Nie geplant/Not planted	75	-
Marble Hall/B/I	30/11/2020	75	Farmer sprayed
Potchefstroom Limagrain/D	10/12/2020	75	-
Schweizer Reneke/ PD1/D	11/11/2020	110	Round-up
Schweizer Reneke/ PD2/D	07/12/2020	110	Round-up
Standerton/D	19/11/2020	90	Round-up Power max
Stoffberg/D	27/11/2020	90	Round-up Power max
Winterton/D	04/12/2020	75	Round-up

Tabel 3 Reënval en besproeiing vir die verskillende lokaliteite (mm), 2020/21
Table 3 Rainfall and irrigation at the different localities (mm), 2020/21

Lokaliteit	Maandelikse reënval (mm)/							Totaal	Besproeiing	Totaal
Locality	Monthly rainfall (mm)							Total	Irrigation	Total
	Okt	Nov	Des	Jan	Feb	Mrt	Apr	*		**
Cedara	62,48	188,21	111,25	123,19	84,83	38,86	63,25	672,07	0	672,07
Groblersdal (Agricoll)	-	0	53	82	56	48	-	239	410	649
Greytown	-	93,97	117,86	116,6	58,72	43,3	57,93	488,38	0	488,38
Hoopstad	0	71	162	136	109	64	18	560	0	560
Schweizer Reneke	12,7	69,6	117,1	176,3	139,2	61,2	25,7	601,8	0	601,8
Standerton	-	45	99	101	86	48	21	400	0	400
Stoffberg	-	16	91	128	89	58	23	405	0	405

* 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, 2020/21
Table 4 The number of days from planting to 50% flowering stage of the different soybean cultivars at the different trial localities, 2020/21

Kultivar Cultivar	Koel/Cool								Matig/Moderate								Warm					
	Belfast	Bethlehem PD1	Bethlehem PD2	Clarens	Kinross	Standerton	Winterton	Gem/Mean	Barberspan	Bergville	Cedara	Kroonstad	Leeudoringstad	Potchefstroom	Stoffberg	Gem/Mean	Brits	Groblersdal (Agricol)	Marble Hall	Schweizer-Reneke PD1	Schweizer-Reneke PD2	Gem/Mean
PAN 1479 R	59	53	59	72	53	50	46	56	35	35	44	42	38	32	43	38	35	36	35	35	34	35
DM 52R19	59	53	59	72	53	52	43	56	34	35	45	42	38	44	44	40	38	38	35	36	34	36
DM 5953 RSF	59	57	59	72	53	56	46	57	36	35	51	42	41	35	46	41	40	37	35	36	34	36
RA 4918 R	59	67	59	72	53	55	46	59	36	41	49	56	45	47	45	46	43	37	35	36	35	37
DM 5351 RSF	59	57	59	72	53	56	45	57	37	38	44	42	40	32	45	40	41	37	35	37	36	37
NS 5258 R	59	53	59	72	70	51	43	58	37	31	49	42	40	44	49	42	45	41	35	35	36	38
SSS 5449 (tuc)	66	67	64	72	70	61	49	64	39	45	63	48	55	51	53	51	35	42	35	54	47	43
PAN 1532 R	74	70	66	82	60	63	50	66	42	50	65	48	54	53	50	52	45	42	39	55	50	46
RA 565 R	82	70	69	48	70	64	51	65	43	52	64	48	55	52	55	53	46	42	39	55	49	46
LS 6851 R	66	57	66	74	70	64	49	64	43	52	64	48	55	49	57	53	41	43	49	51	46	46
LG60155R	74	64	69	82	53	67	52	66	48	59	68	55	47	51	58	55	41	45	39	55	52	46
SSS 5052 (tuc)	66	64	69	82	65	66	50	66	45	56	66	55	60	52	60	56	37	45	39	59	50	46
DM 5302 RSF	66	57	64	72	70	63	50	63	50	52	62	48	59	50	56	54	40	45	35	52	47	44
PAN 1555 R	74	64	69	82	70	66	52	68	49	59	70	62	62	57	58	60	55	46	43	57	53	51
PAN 1521 R	74	64	69	82	70	67	52	68	49	52	64	55	59	52	60	56	43	46	39	57	51	47
RA 568 R	74	57	66	82	70	64	48	66	53	56	64	55	60	52	61	57	37	46	39	58	48	46
NS 5909 R	74	70	66	82	70	68	54	69	49	59	65	60	62	53	61	58	51	47	43	61	53	51
RA 660 R	79	64	69	82	70	69	52	69	52	59	66	55	62	52	63	58	48	47	49	58	51	51
DM 59R03	82	74	66	82	70	70	51	71	50	52	65	55	62	51	62	57	40	46	49	60	49	49
DM 60T05	74	64	75	82	70	69	53	70	50	56	64	62	62	55	63	59	45	53	39	60	52	50
SSS 6560 (tuc)	71	70	66	82	70	70	52	69	50	52	66	48	61	53	63	56	48	48	43	58	50	49
LS 6164 R	82	64	67	82	70	70	52	70	48	56	66	55	62	51	62	57	50	49	43	59	47	50
P61T38 R	74	74	66	82	70	71	55	70	47	59	69	55	57	54	62	58	56	49	43	59	51	52
LS 6860 R	89	70	69	82	70	71	56	72	49	59	71	62	64	55	64	61	55	49	43	61	53	52
NS 6448 R	74	64	69	82	70	72	55	69	43	56	70	64	63	57	62	59	51	51	49	61	54	53
P64T39 R	82	70	75	84	70	72	52	72	45	49	68	60	62	52	63	57	48	50	39	61	54	50
DM 68R09	82	70	41	82	70	72	57	68	56	59	70	60	65	60	64	62	58	51	49	62	55	55
PAN 1644 R	82	70	66	82	53	73	54	69	48	59	69	55	65	56	66	60	58	52	53	60	56	56
DM 6.8i RR	82	70	69	82	70	76	54	72	55	59	69	71	65	64	67	64	53	52	49	60	56	54
P71T74 R	82	74	69	82	70	77	56	73	57	56	68	60	66	57	69	62	59	54	53	62	58	57
Gem/Mean	73	65	65	78	66	66	51	66	46	51	63	54	56	51	58	54	46	46	42	54	48	47

Tabel 5 Die aantal dae vanaf plant tot fisiologiesrypstadium van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2020/21
Table 5 The number of days from planting to physiological maturity of the different soybean cultivars at the different trial localities, 2020/21

Kultivar Cultivar	Koel/Cool								Matig/Moderate								Warm					
	Belfast	Bethlehem PD1	Bethlehem PD2	Clarens	Kinross	Standerton	Winterton	Gem/Mean	Barberspan	Bergville	Cedara	Kroonstad	Leeudoringstad	Potchefstroom	Stoffberg	Gem/Mean	Brits	Groblersdal (Agricol)	Marble Hall	Schweizer-Reneke PD1	Schweizer-Reneke PD2	Gem/Mean
PAN 1479 R	128	122	117	130	120	116	103	119	98	111	118	104	121	105	99	108	101	96	95	111	109	102
DM 52R19	128	122	117	130	120	116	110	120	105	111	123	104	121	108	100	110	100	98	95	110	110	103
DM 5953 RSF	128	122	117	130	124	117	108	121	120	104	122	104	121	111	100	112	105	96	95	110	109	103
RA 4918 R	128	122	117	130	124	118	106	121	106	100	123	104	120	109	103	109	99	96	95	121	109	104
DM 5351 RSF	133	122	117	130	124	119	111	122	124	107	121	104	121	112	101	113	103	96	95	114	115	105
NS 5258 R	128	117	117	130	120	118	107	120	112	104	121	104	121	105	102	110	99	99	95	114	113	104
SSS 5449 (tuc)	133	133	132	144	124	120	108	128	113	104	123	104	126	110	104	112	99	97	95	121	117	106
PAN 1532 R	138	138	132	144	130	121	117	131	122	100	133	117	130	116	108	118	102	100	100	129	119	110
RA 565 R	148	138	132	144	136	121	113	133	131	104	131	117	130	115	106	119	99	101	95	132	117	109
LS 6851 R	133	138	134	144	136	122	118	132	133	115	137	117	127	115	119	123	99	102	95	134	124	111
LG60155R	138	138	132	151	126	123	115	132	121	107	129	117	127	125	113	120	99	100	95	130	121	109
SSS 5052 (tuc)	136	138	134	144	130	123	115	131	121	100	132	117	132	115	116	119	102	101	95	134	124	111
DM 5302 RSF	135	138	126	144	129	124	106	129	121	100	127	112	126	113	117	117	100	98	95	122	117	106
PAN 1555 R	138	138	132	144	143	126	117	134	122	100	133	117	129	119	118	120	103	102	100	134	124	112
PAN 1521 R	135	138	117	144	120	125	114	128	122	111	129	112	128	113	119	119	100	101	95	134	120	110
RA 568 R	136	138	132	144	124	126	111	130	127	104	130	117	129	112	118	120	99	100	95	131	116	108
NS 5909 R	136	138	132	151	136	127	120	134	120	113	135	117	133	117	119	122	105	102	95	134	125	112
RA 660 R	148	138	132	144	124	128	117	133	121	107	134	117	133	118	117	121	100	100	95	136	121	110
DM 59R03	148	138	132	144	136	128	116	135	121	107	132	117	136	117	118	121	102	101	95	137	122	111
DM 60T05	153	138	132	144	136	129	119	136	121	107	132	112	132	117	116	120	103	101	95	137	126	112
SSS 6560 (tuc)	148	138	132	151	120	128	121	134	124	113	134	117	132	123	119	123	105	103	102	137	120	113
LS 6164 R	159	138	132	144	143	130	122	138	121	118	136	117	133	131	120	125	103	103	97	139	124	113
P61T38 R	153	145	132	144	136	129	123	137	121	113	140	117	131	128	121	124	110	104	100	138	125	115
LS 6860 R	148	154	132	161	143	131	121	141	121	115	139	124	141	124	120	126	106	102	97	138	128	114
NS 6448 R	148	145	134	151	143	133	124	140	124	107	141	120	138	128	121	126	102	104	95	138	126	113
P64T39 R	153	154	134	161	143	134	120	143	127	107	136	124	136	125	121	125	105	104	100	137	126	114
DM 68R09	153	138	132	161	143	135	125	141	124	113	137	117	138	132	124	126	113	105	107	138	122	117
PAN 1644 R	153	145	132	144	124	137	121	137	123	111	134	117	139	119	123	124	111	106	100	137	126	116
DM 6.8i RR	153	154	132	151	143	138	125	142	127	115	141	124	144	134	126	130	112	106	97	137	130	116
P71T74 R	153	145	134	161	143	140	125	143	133	104	138	124	144	133	128	129	112	108	100	142	132	119
Gem/Mean	142	137	129	145	131	126	116	132	121	108	131	115	131	118	115	120	103	101	97	130	121	110

Tabel 6 Die aantal dae vanaf plant tot oesstadium van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2020/21
Table 6 The number of days from planting to maturity of the different soybean cultivars at the different trial localities, 2020/21

Kultivar Cultivar	Koel/Cool										Matig/Moderate								Warm						
	Bapsfontein	Belfast	Bethlehem PD1	Bethlehem PD2	Clarens	Kinross	Standerton	Villiers	Winterton	Gem/Mean	Barberspan	Bergville	Cedara	Kroonstad	Leeudoringstad	Potchefstroom	Stoffberg	Gem/Mean	Brits	Groblersdal (Agricol)	Groblersdal (Agri Seed)	Marble Hall	Schweizer-Reneke PD1	Schweizer-Reneke PD2	Gem/Mean
PAN 1479 R	137	156	158	132	144	147	139	136	137	143	124	133	146	117	142	151	117	133	132	116	119	104	126	122	120
DM 52R19	123	156	138	132	144	143	139	136	137	139	124	133	146	117	142	151	117	133	132	116	119	113	126	122	121
DM 5953 RSF	138	136	138	132	144	143	139	136	137	138	133	133	146	117	142	151	117	134	132	116	119	113	126	122	121
RA 4918 R	148	156	138	132	144	143	139	136	137	141	124	133	146	117	142	151	117	133	132	116	119	113	139	122	124
DM 5351 RSF	135	156	143	132	144	143	139	136	137	141	140	133	146	117	142	151	117	135	135	116	119	113	148	128	127
NS 5258 R	134	156	138	132	144	143	139	136	137	140	124	133	146	117	142	151	124	134	132	116	119	113	139	128	125
SSS 5449 (tuc)	133	156	153	142	161	143	139	136	137	144	124	133	146	117	142	151	124	134	132	116	119	113	148	128	126
PAN 1532 R	130	160	153	147	161	152	139	136	137	146	133	133	156	132	148	151	124	140	132	116	119	114	148	142	128
RA 565 R	129	156	153	147	161	147	139	136	137	145	140	133	148	132	148	151	124	139	132	116	119	113	148	128	126
LS 6851 R	123	169	153	147	163	156	139	136	137	147	140	133	156	132	142	151	124	140	132	116	119	113	148	142	128
LG60155R	152	156	153	147	161	152	139	136	137	148	133	133	148	132	142	151	124	138	132	116	119	113	139	142	127
SSS 5052 (tuc)	152	164	153	147	169	156	139	136	137	150	133	133	162	137	142	151	124	140	132	124	119	113	151	142	130
DM 5302 RSF	137	156	153	147	161	143	139	136	137	145	133	133	148	117	142	151	124	135	132	124	119	113	139	133	127
PAN 1555 R	135	156	153	147	161	156	139	136	137	147	133	133	156	137	148	151	124	140	135	124	119	113	148	139	130
PAN 1521 R	139	156	153	137	161	156	147	136	137	147	133	133	148	134	142	151	131	139	132	124	119	113	148	142	130
RA 568 R	120	156	153	147	161	143	147	136	137	144	140	133	148	132	148	151	131	140	132	124	119	113	139	142	128
NS 5909 R	122	164	153	144	169	156	147	136	137	148	133	133	170	139	148	151	131	144	132	124	119	113	154	142	131
RA 660 R	147	156	153	147	161	143	147	136	137	147	133	133	156	132	148	151	124	140	132	124	119	113	148	142	130
DM 59R03	122	156	158	152	171	156	147	136	137	148	133	133	156	139	148	151	131	142	132	124	119	113	154	142	131
DM 60T05	122	165	153	152	169	156	147	136	137	149	133	133	162	139	148	151	131	142	132	124	119	113	154	142	131
SSS 6560 (tuc)	148	168	153	154	180	156	147	136	137	153	140	133	170	137	148	151	131	144	132	124	119	114	154	142	131
LS 6164 R	122	168	153	154	176	156	147	144	137	151	133	143	170	137	148	151	131	145	132	124	119	113	154	142	131
P61T38 R	136	168	153	147	167	156	147	136	137	150	133	143	170	137	148	151	131	145	132	124	119	113	154	142	131
LS 6860 R	154	168	168	158	180	156	147	144	137	157	133	143	162	139	148	151	131	144	132	130	119	113	154	142	132
NS 6448 R	120	168	158	154	171	156	152	136	137	150	133	133	162	139	148	151	131	142	132	130	119	113	154	142	132
P64T39 R	121	169	168	167	180	156	152	136	137	154	140	133	162	143	148	151	131	144	132	130	119	113	154	142	132
DM 68R09	133	164	158	154	176	156	152	136	137	152	140	143	160	148	155	141	131	145	132	130	119	114	154	142	132
PAN 1644 R	138	160	153	154	165	156	152	139	137	150	133	143	156	143	148	151	136	144	132	130	119	113	154	142	132
DM 6.8i RR	122	168	168	167	176	156	152	144	137	154	140	143	170	152	155	151	136	150	132	130	119	113	154	142	132
P71T74 R	147	169	168	167	180	156	152	144	137	158	140	143	170	152	155	151	136	150	132	130	119	114	154	142	132
Gem/Mean	134	160	153	147	164	151	144	137	137	148	134	135	156	133	146	151	127	140	132	122	119	113	147	137	128

Tabel 7 Die planthoogte van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2020/21

Table 7 The plant height of the different soybean cultivars at the different trial localities, 2020/21

Kultivar Cultivar	Koel/Cool									Matig/Moderate									Warm					
	Bapsfontein	Belfast	Bethlehem PD1	Bethlehem PD2	Clarens	Kinross	Standerton	Winterton	Gem/Mean	Barberspan	Bergville	Cedara	Greytown	Kroonstad	Leeudoringstad	Potchefstroom	Stoffberg	Gem/Mean	Brits	Groblersdal (Agricol)	Marble Hall	Schweizer-Reneke PD1	Schweizer-Reneke PD2	Gem/Mean
PAN 1479 R	114	83	77	47	60	57	75	77	74	50	58	89	89	58	60	80	57	68	72	85	57	90	90	79
DM 52R19	80	60	64	57	43	55	60	74	62	60	48	75	68	48	65	82	65	64	70	85	58	80	77	74
DM 5953 RSF	120	77	82	65	67	70	100	90	84	60	56	83	79	55	60	86	65	68	77	80	64	95	86	80
RA 4918 R	74	80	78	52	48	68	70	75	68	80	58	80	74	62	55	81	65	69	82	85	66	85	80	79
DM 5351 RSF	86	90	81	52	52	63	85	90	75	65	57	94	91	68	55	90	70	74	90	85	65	95	87	84
NS 5258 R	100	73	67	45	38	43	75	65	64	60	58	83	81	50	67	80	67	68	73	80	56	105	92	81
SSS 5449 (tuc)	99	100	88	75	58	87	85	82	84	50	55	87	83	73	50	89	70	70	73	85	60	95	90	81
PAN 1532 R	91	90	87	60	65	77	100	81	81	55	66	84	77	65	77	83	72	72	70	85	72	85	75	77
RA 565 R	85	93	88	58	73	72	95	86	81	59	58	92	78	62	60	87	75	71	75	80	70	100	92	83
LS 6851 R	96	83	75	52	58	72	90	74	75	54	47	72	59	55	55	73	69	60	60	65	48	85	76	67
LG60155R	92	93	85	70	52	77	90	70	79	55	54	84	70	53	55	78	64	64	65	70	55	95	72	71
SSS 5052 (tuc)	107	103	100	72	77	80	95	88	90	70	84	103	92	77	70	98	88	85	83	100	67	110	90	90
DM 5302 RSF	89	87	87	50	67	57	90	73	75	60	51	80	72	58	65	81	71	67	75	90	54	95	85	80
PAN 1555 R	90	100	97	70	77	93	105	94	91	60	88	103	92	85	75	88	86	85	100	95	84	110	90	96
PAN 1521 R	101	95	100	95	85	92	105	99	97	65	99	97	86	82	87	97	92	88	87	90	71	112	90	90
RA 568 R	82	78	77	57	55	67	80	63	70	60	49	73	68	63	75	67	73	66	63	75	52	90	77	71
NS 5909 R	102	107	93	70	78	88	95	91	91	55	88	109	94	78	75	93	88	85	87	85	65	105	95	87
RA 660 R	106	82	75	53	62	68	80	84	76	60	61	80	77	62	70	76	75	70	72	70	58	90	85	75
DM 59R03	76	95	113	98	82	103	117	101	98	65	78	99	90	78	75	103	68	82	83	100	72	110	110	95
DM 60T05	111	93	95	60	68	70	90	91	85	55	56	96	90	63	70	76	73	72	77	75	69	90	95	81
SSS 6560 (tuc)	97	103	107	85	88	93	100	100	97	70	106	108	100	87	80	92	80	90	82	100	83	120	107	98
LS 6164 R	95	105	112	87	92	97	120	107	102	65	95	121	99	95	90	109	97	96	93	120	70	117	118	104
P61T38 R	97	85	77	57	62	73	85	74	76	58	44	83	86	57	50	84	57	65	67	80	64	75	80	73
LS 6860 R	118	122	115	92	92	95	90	97	103	60	119	106	98	88	107	110	94	98	98	110	80	117	96	100
NS 6448 R	109	102	87	57	63	78	100	89	86	63	82	96	86	68	80	87	84	81	75	90	73	100	96	87
P64T39 R	102	105	118	95	92	95	100	95	100	70	76	106	93	92	95	105	93	91	98	100	76	117	100	98
DM 68R09	103	98	102	72	77	82	85	98	90	60	89	100	85	67	90	97	72	83	97	95	84	107	106	98
PAN 1644 R	80	98	108	83	77	85	105	97	92	70	85	95	91	73	80	92	84	84	95	115	79	105	107	100
DM 6.8i RR	96	117	120	80	92	90	110	123	103	80	133	128	112	85	100	110	98	106	100	115	93	120	120	110
P71T74 R	119	122	112	85	87	102	110	106	105	90	89	120	109	95	118	91	100	102	107	117	91	117	125	111
Gem/Mean	97	94	92	68	70	78	93	88	85	63	73	94	86	70	74	89	77	78	82	90	68	101	93	87

Tabel 8 Die peulhoogte van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2020/21
Table 8 The pod height of the different soybean cultivars at the different trial localities, 2020/21

Kultivar Cultivar	Koel/Cool									Matig/Moderate									Warm					
	Bapsfontein	Belfast	Bethlehem PD1	Bethlehem PD2	Clarens	Kinross	Standerton	Winterton	Gem/Mean	Barberspan	Bergville	Cedara	Greytown	Kroonstad	Leeudoringstad	Potchefstroom	Stoffberg	Gem/Mean	Brits	Groblersdal (Agricol)	Marble Hall	Schweizer-Reneke PD1	Schweizer-Reneke PD2	Gem/Mean
PAN 1479 R	16	9	7	5	7	5	5	8	8	4	4	11	9	5	6	10	2	6	5	4	7	10	19	9
DM 52R19	11	1	4	5	3	1	3	5	4	9	5	9	8	2	6	12	5	7	6	7	3	9	11	7
DM 5953 RSF	17	4	6	7	7	6	15	6	9	7	10	11	11	6	9	16	8	10	5	7	5	11	15	9
RA 4918 R	11	10	7	7	5	3	3	5	6	9	6	10	10	7	5	11	6	8	8	7	3	14	14	9
DM 5351 RSF	17	8	6	7	7	6	6	7	8	7	4	11	11	7	5	12	10	8	6	8	6	20	13	11
NS 5258 R	14	7	3	3	3	3	3	4	5	4	4	9	11	3	9	8	3	6	5	6	3	22	16	10
SSS 5449 (tuc)	16	9	10	8	8	9	12	10	10	4	9	16	18	7	5	21	6	11	8	5	3	19	20	11
PAN 1532 R	9	10	9	7	7	9	19	8	10	5	15	20	14	7	15	14	8	12	7	6	11	22	24	14
RA 565 R	10	11	10	6	8	9	18	9	10	14	7	19	17	7	9	17	8	12	6	4	7	20	20	11
LS 6851 R	12	9	8	8	6	7	9	10	9	6	7	18	12	7	5	9	9	9	10	2	7	19	15	11
LG60155R	9	10	8	7	5	6	17	5	8	4	8	16	13	2	5	15	5	9	4	3	6	17	15	9
SSS 5052 (tuc)	12	13	13	9	8	10	18	10	12	14	16	24	23	10	8	21	21	17	10	14	7	28	19	16
DM 5302 RSF	13	9	8	5	7	6	12	7	8	9	8	17	13	6	6	18	14	11	7	11	3	17	19	11
PAN 1555 R	16	15	13	8	11	13	15	11	13	9	20	28	23	14	11	25	13	18	14	13	12	30	24	19
PAN 1521 R	12	11	13	12	13	12	26	8	13	7	18	22	16	8	15	21	15	15	9	11	9	25	19	15
RA 568 R	10	9	7	6	7	7	7	6	7	9	8	19	13	7	12	19	13	13	7	4	7	15	22	11
NS 5909 R	8	16	14	10	9	13	7	9	11	9	21	27	22	12	15	26	19	19	9	12	10	28	25	17
RA 660 R	13	13	8	7	7	7	12	9	10	7	12	19	16	7	11	19	14	13	6	3	9	20	19	11
DM 59R03	9	12	12	13	11	10	23	11	13	9	14	23	13	8	13	21	4	13	7	11	5	24	27	15
DM 60T05	25	12	12	9	6	10	8	10	12	9	11	24	16	9	10	16	18	14	8	8	9	17	25	13
SSS 6560 (tuc)	14	15	12	11	9	10	23	7	13	9	17	26	21	12	13	21	9	16	9	20	10	30	28	19
LS 6164 R	17	13	13	11	11	11	26	12	14	6	13	27	23	12	20	28	21	19	12	21	10	30	30	21
P61T38 R	11	14	13	9	10	13	23	7	12	10	14	24	20	12	8	21	10	15	7	9	14	19	23	15
LS 6860 R	15	16	14	14	10	11	18	12	14	6	24	24	20	13	27	21	15	19	11	22	10	27	28	20
NS 6448 R	12	14	10	8	7	8	21	10	11	7	19	23	19	10	11	19	16	16	7	14	9	23	26	16
P64T39 R	13	15	13	9	9	12	23	10	13	10	12	27	20	12	17	26	16	17	36	20	10	25	20	22
DM 68R09	19	11	14	8	8	9	9	11	11	7	19	23	15	8	13	23	12	15	10	8	9	19	29	15
PAN 1644 R	13	12	13	9	9	10	24	9	12	10	17	21	19	9	12	17	19	15	10	20	9	24	26	18
DM 6.8i RR	12	13	14	9	10	10	25	13	13	14	25	22	19	11	28	25	17	20	7	22	10	25	40	21
P71T74 R	19	14	13	11	9	12	28	15	15	14	8	27	25	14	27	22	18	19	10	22	12	30	37	22
Gem/Mean	14	11	10	8	8	9	15	9	10	8	13	20	16	8	12	18	12	13	9	11	8	21	22	14

Tabel 9 Omvalwaarnemings (1-5) van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2020/21
Table 9 Lodging dat (1-5) of the different soybean cultivars at the different trial localities, 2020/21

Kultivar Cultivar	Koel/Cool									Matig/Moderate								Warm						
	Bapsfontein	Belfast	Bethlehem PD1	Bethlehem PD2	Clarens	Kinross	Standerton	Winterton	Gem/Mean	Barberspan	Bergville	Greytown	Kroonstad	Leeudoringstad	Potchefstroom	Stoffberg	Gem/Mean	Brits	Groblersdal (Agricol)	Groblersdal (Agri Seed)	Marble Hall	Schweizer-Reneke PD1	Schweizer-Reneke PD2	Gem/Mean
PAN 1479 R	2,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,13	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
DM 52R19	1,67	1,67	1,00	1,00	1,00	1,00	1,00	1,00	1,17	1,00	1,00	1,33	1,00	1,00	1,00	1,00	1,05	1,00	1,00	1,33	1,00	1,00	1,00	1,06
DM 5953 RSF	2,00	1,33	1,00	1,00	1,00	1,00	1,00	1,00	1,17	1,00	1,00	1,33	1,00	1,00	1,00	1,00	1,05	1,00	1,00	1,00	1,00	1,00	1,00	1,00
RA 4918 R	2,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,13	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,67	1,00	1,00	1,00	1,11
DM 5351 RSF	2,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,13	1,00	1,00	1,33	1,00	1,00	1,00	1,00	1,05	1,00	1,00	1,67	1,00	1,00	1,00	1,11
NS 5258 R	2,33	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,17	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
SSS 5449 (tuc)	1,67	1,00	1,33	1,00	1,00	1,00	1,00	1,00	1,13	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
PAN 1532 R	2,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,13	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,33	1,00	1,00	1,00	1,06
RA 565 R	2,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,13	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
LS 6851 R	1,67	2,00	1,00	1,00	1,00	1,00	1,00	1,00	1,21	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
LG60155R	1,33	1,00	2,00	1,00	1,00	1,00	1,00	1,00	1,17	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,67	1,00	1,00	1,00	1,11
SSS 5052 (tuc)	2,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,13	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,33	1,00	1,00	1,00	1,06
DM 5302 RSF	1,67	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,08	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
PAN 1555 R	2,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,13	1,00	1,00	1,33	1,00	1,00	1,00	1,00	1,05	1,00	1,00	1,00	1,00	1,00	1,00	1,00
PAN 1521 R	2,00	1,67	1,33	1,67	1,67	1,00	1,00	1,00	1,42	1,00	1,00	1,33	1,00	1,00	1,00	1,00	1,05	1,00	1,00	1,33	1,00	1,00	1,00	1,06
RA 568 R	1,33	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,04	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
NS 5909 R	2,00	2,33	1,00	1,00	1,00	1,00	1,00	1,00	1,29	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
RA 660 R	1,67	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,08	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
DM 59R03	2,00	2,67	2,67	1,00	1,00	1,00	1,00	1,00	1,54	1,00	2,00	1,00	1,00	1,00	1,00	1,00	1,14	1,00	1,00	1,00	1,00	1,00	1,00	1,00
DM 60T05	2,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,13	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
SSS 6560 (tuc)	2,33	1,33	1,00	1,00	1,33	1,00	1,00	1,00	1,25	1,00	1,00	1,67	1,00	1,00	1,00	1,00	1,10	1,00	1,00	1,00	1,00	1,00	1,00	1,00
LS 6164 R	3,00	1,67	1,00	1,00	1,33	1,00	2,00	1,00	1,50	1,00	1,00	2,00	1,00	1,00	1,00	1,00	1,14	1,00	1,00	1,00	1,00	1,00	1,00	1,00
P61T38 R	1,67	3,33	1,00	1,00	1,00	1,00	1,00	1,00	1,38	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
LS 6860 R	2,67	2,00	1,00	1,00	1,00	1,00	1,00	1,00	1,33	1,00	1,00	1,67	1,00	1,00	1,00	1,00	1,10	1,00	1,00	1,33	1,00	1,00	1,00	1,06
NS 6448 R	2,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,13	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
P64T39 R	2,00	3,00	1,67	1,00	1,00	1,00	1,00	1,00	1,46	1,00	1,00	1,33	1,00	1,00	1,00	1,00	1,05	1,00	1,00	1,00	1,00	1,00	1,00	1,00
DM 68R09	2,00	1,33	1,00	1,00	1,00	1,00	1,00	1,00	1,17	1,00	2,00	1,33	1,00	1,00	1,00	1,00	1,19	1,00	1,00	3,00	1,00	1,00	1,00	1,33
PAN 1644 R	2,00	1,33	1,00	1,00	1,00	1,00	1,00	1,00	1,17	1,00	2,00	1,00	1,00	1,00	1,00	1,00	1,14	1,00	1,00	1,00	1,00	1,00	1,00	1,00
DM 6.8i RR	2,67	3,00	1,00	1,00	2,33	1,00	1,00	1,00	1,63	1,00	1,00	2,00	1,00	1,00	1,00	1,00	1,14	1,00	1,00	2,33	1,00	1,00	1,00	1,22
P71T74 R	2,67	3,67	1,00	1,00	1,67	1,00	1,00	1,00	1,63	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,67	1,00	2,00	1,00	1,28
Gem/Mean	2,01	1,58	1,13	1,02	1,11	1,00	1,03	1,00	1,24	1,00	1,10	1,19	1,00	1,00	1,00	1,00	1,04	1,00	1,00	1,26	1,00	1,03	1,00	1,05

Tabel 10 Groenstam (1-5) van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2020/21
Table 10 Greenstem (1-5) of the different soybean cultivars at the different trial localities, 2020/21

Kultivar Cultivar	Koel/Cool									Matig/Moderate								Warm					
	Bapsfontein	Belfast	Bethlehem PD1	Bethlehem PD2	Clarens	Kinross	Standerton	Winterton	Gem/Mean	Barberspan	Bergville	Cedara	Kroonstad	Leeudoringstad	Potchefstroom	Stoffberg	Gem/Mean	Brits	Groblersdal (Agricol)	Marble Hall	Schweizer-Reneke PD1	Schweizer-Reneke PD2	Gem/Mean
PAN 1479 R	2,00	4,67	4,67	1,67	1,33	4,67	1,00	1,00	2,63	2,00	1,00	1,33	3,33	5,00	1,00	1,00	2,10	1,00	1,00	1,67	2,00	2,00	1,53
DM 52R19	1,00	1,67	1,33	1,00	1,00	3,00	1,00	1,00	1,38	3,00	1,00	1,00	3,33	2,00	1,00	1,00	1,76	1,00	1,00	1,00	2,00	3,00	1,60
DM 5953 RSF	1,00	1,00	1,33	1,00	1,00	1,00	1,00	1,00	1,04	4,00	1,00	1,00	2,00	1,00	1,00	1,00	1,57	1,00	1,00	1,33	2,00	2,00	1,47
RA 4918 R	1,00	1,00	1,00	1,00	1,00	1,67	1,00	1,00	1,08	4,00	1,00	1,00	3,00	3,00	1,00	1,00	2,00	1,00	1,00	1,00	3,00	2,00	1,60
DM 5351 RSF	1,33	4,67	5,00	2,00	2,33	4,67	1,00	1,00	2,75	4,00	1,00	1,00	4,67	4,00	1,00	1,00	2,38	1,00	1,00	1,00	5,00	5,00	2,60
NS 5258 R	1,33	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,04	1,00	1,00	1,00	3,33	2,00	1,00	1,00	1,48	1,00	1,00	1,00	2,00	4,00	1,80
SSS 5449 (tuc)	1,00	3,33	1,00	2,33	3,00	1,00	1,00	1,00	1,71	2,00	1,00	1,00	4,67	2,00	1,00	1,00	1,81	1,00	1,00	1,00	4,00	4,00	2,20
PAN 1532 R	1,67	1,67	1,67	2,33	3,00	1,33	1,00	1,00	1,71	2,00	1,00	1,00	3,33	2,00	1,00	1,00	1,62	1,00	1,00	2,33	4,00	3,00	2,27
RA 565 R	1,67	1,33	1,00	1,00	2,33	1,33	1,00	1,00	1,33	4,00	1,00	1,33	2,00	1,00	1,00	1,00	1,62	1,00	1,00	1,00	4,00	4,00	2,20
LS 6851 R	1,33	2,33	1,00	2,00	4,00	1,67	1,00	1,00	1,79	5,00	1,00	1,00	1,67	3,00	1,00	1,00	1,95	1,00	1,00	1,67	3,00	5,00	2,33
LG60155R	1,00	1,00	1,00	1,00	2,33	1,00	1,00	1,00	1,17	3,00	1,00	1,00	1,67	2,00	1,00	1,00	1,52	1,00	1,00	1,00	4,00	4,00	2,20
SSS 5052 (tuc)	1,67	3,33	1,00	1,33	4,67	1,33	1,00	1,00	1,92	1,00	1,00	1,00	4,00	1,00	1,00	1,00	1,43	1,00	1,00	1,00	5,00	5,00	2,60
DM 5302 RSF	1,33	1,00	1,00	1,00	1,33	1,00	1,00	1,00	1,08	1,00	1,00	1,00	4,00	2,00	1,00	1,00	1,57	1,00	1,00	1,00	4,00	5,00	2,40
PAN 1555 R	1,00	1,33	1,00	3,33	2,00	1,00	1,00	1,00	1,46	1,00	1,00	1,00	4,67	2,00	1,00	1,00	1,67	1,00	1,00	2,00	2,00	4,00	2,00
PAN 1521 R	1,33	1,67	1,00	1,67	2,00	1,00	1,00	1,00	1,33	2,00	1,00	1,00	2,67	2,00	1,00	1,00	1,52	1,00	1,00	1,00	2,00	4,00	1,80
RA 568 R	1,00	1,00	1,00	1,00	1,67	2,00	1,00	1,00	1,21	5,00	1,00	1,67	1,33	3,00	1,00	1,00	2,00	1,00	1,00	1,00	3,00	5,00	2,20
NS 5909 R	3,00	3,00	2,33	4,00	4,67	1,67	1,00	1,00	2,58	2,00	1,00	2,33	3,67	2,00	1,00	1,00	1,86	1,00	1,00	1,00	5,00	5,00	2,60
RA 660 R	1,00	1,00	1,00	1,00	3,00	1,33	1,00	1,00	1,29	1,00	1,00	1,00	1,67	2,00	1,00	1,00	1,24	1,00	1,00	1,00	2,00	4,00	1,80
DM 59R03	1,33	2,33	3,33	1,67	4,00	1,67	1,00	1,00	2,04	4,00	1,00	1,33	3,00	2,00	1,00	1,00	1,90	1,00	1,00	1,00	5,00	4,00	2,40
DM 60T05	1,67	3,33	1,67	2,67	5,00	2,00	1,00	1,00	2,29	2,00	1,00	2,67	4,00	2,00	1,00	1,00	1,95	1,00	1,00	1,00	5,00	4,00	2,40
SSS 6560 (tuc)	2,00	2,33	2,00	1,33	3,67	1,33	1,00	1,00	1,83	5,00	1,00	2,00	4,33	2,00	1,00	1,00	2,33	1,00	1,00	3,00	4,00	4,00	2,60
LS 6164 R	3,67	3,33	2,00	1,67	3,67	2,33	1,00	1,00	2,33	1,00	1,00	2,33	4,67	3,00	1,00	1,00	2,00	1,00	1,00	1,67	4,00	4,00	2,33
P61T38 R	2,33	2,33	1,67	4,00	3,67	2,33	1,00	1,00	2,29	2,00	1,00	2,33	4,33	1,00	1,00	1,00	1,81	1,00	1,00	1,67	4,00	3,00	2,13
LS 6860 R	3,00	4,33	2,67	2,00	2,67	3,00	1,00	1,00	2,46	1,00	1,00	1,00	4,33	2,00	1,00	1,00	1,62	1,00	1,00	1,33	4,00	3,00	2,07
NS 6448 R	2,00	2,33	1,67	1,00	3,67	1,00	1,00	1,00	1,71	2,67	1,00	1,33	3,00	2,00	1,00	1,00	1,71	1,00	1,00	1,67	3,00	3,00	1,93
P64T39 R	2,33	3,00	3,00	1,00	3,33	1,33	1,00	1,00	2,00	2,00	1,00	1,00	3,33	2,00	1,00	1,00	1,62	1,00	1,00	1,00	3,00	5,00	2,20
DM 68R09	2,33	3,67	3,00	2,67	4,00	1,00	1,00	1,00	2,33	5,00	1,00	1,67	4,00	4,00	1,00	1,00	2,52	1,00	1,00	2,67	3,00	4,00	2,33
PAN 1644 R	2,00	1,00	1,33	1,00	1,33	1,00	1,00	1,00	1,21	2,00	1,00	1,67	3,33	2,00	1,00	1,00	1,71	1,00	1,00	2,33	4,00	4,00	2,47
DM 6.8i RR	2,67	3,67	2,67	1,00	3,33	2,33	1,00	1,00	2,21	3,00	1,00	2,00	4,67	4,00	1,00	1,00	2,38	1,00	1,00	1,00	5,00	5,00	2,60
P71T74 R	3,00	3,67	3,33	1,00	3,00	2,67	1,00	1,00	2,33	5,00	1,00	3,00	4,00	4,00	1,00	1,00	2,71	1,00	1,00	2,33	5,00	5,00	2,87
Gem/Mean	1,77	2,38	1,89	1,69	2,77	1,79	1,00	1,00	1,78	2,72	1,00	1,43	3,40	2,37	1,00	1,00	1,85	1,00	1,00	1,42	3,57	3,93	2,18

Tabel 11 Oopspring (1-5) van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2020/21
Table 11 Shattering (1-5) of the different soybean cultivars at the different trial localities, 2020/21

Kultivar Cultivar	Koel/Cool									Matig/Moderate						Warm					
	Bapsfontein	Belfast	Bethlehem PD1	Bethlehem PD2	Clarens	Kinross	Standerton	Winterton	Gem/Mean	Barberspan	Kroonstad	Leeudoringstad	Potchefstroom	Stoffberg	Gem/Mean	Brits	Groblersdal (Agricol)	Marble Hall	Schweizer-Reneke PD1	Schweizer-Reneke PD2	Gem/Mean
PAN 1479 R	2,33	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,17	1,00	1,00	1,00	1,00	2,00	1,20	1,00	3,00	1,00	1,00	1,00	1,40
DM 52R19	2,33	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,17	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
DM 5953 RSF	2,67	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,21	1,00	1,00	1,00	1,00	2,00	1,20	1,00	2,00	1,00	1,00	1,00	1,20
RA 4918 R	3,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,25	1,00	1,00	1,00	1,00	2,00	1,20	1,00	2,00	1,00	1,00	1,00	1,20
DM 5351 RSF	2,67	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,21	1,00	1,00	1,00	1,00	2,00	1,20	1,00	2,00	1,00	1,00	1,00	1,20
NS 5258 R	1,67	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,08	1,00	1,00	1,00	1,00	2,00	1,20	1,00	2,00	1,00	1,00	1,00	1,20
SSS 5449 (tuc)	2,67	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,21	1,00	1,00	1,00	1,00	2,00	1,20	1,00	3,00	4,00	1,00	1,00	2,00
PAN 1532 R	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
RA 565 R	1,33	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,04	1,00	5,00	1,00	1,00	1,00	1,80	1,00	1,00	1,00	1,00	1,00	1,00
LS 6851 R	1,33	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,04	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
LG60155R	1,67	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,08	1,00	1,00	1,00	1,00	1,00	1,00	1,00	3,00	1,00	1,00	1,00	1,40
SSS 5052 (tuc)	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	2,00	1,00	1,00	1,00	1,20
DM 5302 RSF	2,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,13	1,00	1,00	1,00	1,00	1,00	1,00	1,00	2,00	1,00	1,00	1,00	1,20
PAN 1555 R	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	2,00	1,00	1,00	1,00	1,20
PAN 1521 R	2,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,13	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
RA 568 R	1,67	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,08	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
NS 5909 R	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	2,00	1,00	1,00	1,00	1,20
RA 660 R	1,67	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,08	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 59R03	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	2,00	1,20	1,00	1,00	1,00	1,00	1,00	1,00
DM 60T05	1,33	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,04	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
SSS 6560 (tuc)	1,33	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,04	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
LS 6164 R	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
P61T38 R	1,33	1,00	1,00	1,00	1,67	1,00	1,00	1,00	1,13	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
LS 6860 R	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
NS 6448 R	1,67	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,08	1,00	1,00	1,00	1,00	1,00	1,00	1,00	2,00	1,00	1,00	1,00	1,20
P64T39 R	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
DM 68R09	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
PAN 1644 R	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
DM 6.8i RR	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	2,00	1,00	1,00	1,00	1,20
P71T74 R	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
Gem/Mean	1,56	1,00	1,00	1,00	1,02	1,00	1,00	1,00	1,07	1,00	1,13	1,00	1,00	1,23	1,07	1,00	1,53	1,10	1,00	1,00	1,13

Tabel 12 Die planttelling geoes (x 1000) van die verskillende sojaboonkultivars by die verskillende proeflokaliteite, 2020/21
Table 12 The number of plant harvested (x 1000) of the different soybean cultivars at the different trial localities, 2020/21

Kultivar Cultivar	Koel/Cool									Matig/Moderate							Warm				
	Bapsfontein	Belfast	Bethlehem PD1	Bethlehem PD2	Clarens	Kinross	Standerton	Winterton	Gem/Mean	Barberspan	Cedara	Kroonstad	Leeudoringstad	Potchefstroom	Stoffberg	Gem/Mean	Groblersdal (Agricol)	Marble Hall	Schweizer-Reneke PD1	Schweizer-Reneke PD2	Gem/Mean
PAN 1479 R	242	264	208	264	228	266	248	210	241	235	342	272	178	313	260	267	320	276	201	207	251
DM 52R19	170	276	183	201	218	219	263	170	213	191	249	250	146	227	253	219	322	278	222	123	236
DM 5953 RSF	154	249	220	271	208	246	258	234	230	322	406	228	169	343	259	288	317	280	243	193	258
RA 4918 R	85	256	223	274	202	256	254	269	227	253	363	259	138	292	246	259	314	263	223	249	262
DM 5351 RSF	194	247	213	270	223	271	259	306	248	268	422	274	204	303	246	286	314	257	231	130	233
NS 5258 R	233	277	158	267	203	241	260	189	229	120	319	247	224	303	255	244	316	272	229	223	260
SSS 5449 (tuc)	256	253	175	263	216	237	256	223	235	192	346	244	102	280	252	236	319	270	228	240	264
PAN 1532 R	157	277	203	252	209	264	260	283	238	211	392	258	194	309	250	269	317	265	242	248	268
RA 565 R	200	243	211	259	218	251	261	252	237	242	353	250	168	331	259	267	322	263	250	239	269
LS 6851 R	222	253	156	268	213	235	253	282	235	304	348	261	156	279	256	267	326	267	239	128	240
LG60155R	155	272	168	260	214	217	261	192	217	112	256	223	166	224	253	206	324	252	239	221	259
SSS 5052 (tuc)	202	279	203	258	223	296	256	339	257	339	458	273	209	310	256	308	318	262	216	240	259
DM 5302 RSF	211	254	192	267	197	235	255	244	232	238	318	235	155	344	250	257	316	258	226	231	258
PAN 1555 R	245	254	224	254	227	269	260	268	250	229	348	256	178	271	252	256	320	248	250	251	267
PAN 1521 R	138	256	206	247	231	289	259	288	239	271	388	262	215	304	244	281	318	268	231	258	269
RA 568 R	214	269	188	252	190	253	261	268	237	248	350	246	148	324	250	261	317	272	225	266	270
NS 5909 R	254	245	206	272	216	252	263	238	243	122	326	258	138	304	252	233	315	282	188	240	256
RA 660 R	183	261	222	283	232	228	257	280	243	160	310	260	143	243	249	228	317	279	229	232	265
DM 59R03	187	256	197	260	208	223	255	233	227	122	339	273	197	302	258	249	314	258	231	231	259
DM 60T05	272	268	263	272	212	278	259	329	269	225	506	257	222	259	243	285	312	281	252	206	263
SSS 6560 (tuc)	251	254	173	265	212	246	259	237	237	192	336	261	168	273	246	246	311	268	253	238	267
LS 6164 R	241	277	204	253	220	256	261	265	247	163	388	278	230	288	253	267	317	270	250	249	272
P61T38 R	235	267	137	259	221	224	260	230	229	133	332	258	160	291	248	237	325	272	231	245	268
LS 6860 R	175	226	205	272	220	222	257	226	225	156	324	234	117	276	257	227	330	258	231	240	265
NS 6448 R	182	247	151	273	209	120	260	229	209	127	220	241	146	256	250	207	333	260	237	202	258
P64T39 R	264	264	227	275	200	263	259	308	258	214	465	267	285	321	256	301	324	260	235	223	260
DM 68R09	194	245	201	276	210	232	259	204	228	186	350	252	179	242	247	243	321	248	215	225	252
PAN 1644 R	244	278	192	264	208	248	265	254	244	184	378	255	188	289	248	257	319	259	220	234	258
DM 6.8i RR	220	264	192	269	214	208	264	252	235	176	318	251	113	282	246	231	327	267	217	247	264
P71T74 R	249	252	206	257	224	242	259	263	244	286	376	262	235	314	251	287	321	265	232	200	255
Gem/Mean	208	259	197	263	214	243	259	252	237	207	354	255	176	290	252	256	320	266	231	222	260

Tabel 13 Persentasie ongewenste sade van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2020/21
Table 13 Percentage undesirable seed of the different soybean cultivars at the different trial localities, 2020/21

Kultivar Cultivar	Koel/Cool									Matig/Moderate									Warm					
	Belfast	Bethlehem PD1	Bethlehem PD2	Clarens	Kinross	Standerton	Villiers	Winterton	Gem/Mean	Barberspan	Bergville	Cedara	Greytown	Kroonstad	Leeudoringstad	Potchefstroom	Stoffberg	Gem/Mean	Groblersdal (Agricol)	Groblersdal (Agri Seed)	Marble Hall	Schweizer-Reneke PD1	Schweizer-Reneke PD2	Gem/Mean
PAN 1479 R	0,00	0,43	0,17	0,00	0,62	0,00	0,25	0,02	0,19	0,40	0,00	0,00	1,22	0,00	0,00	0,00	0,48	0,26	0,28	0,00	0,00	0,00	0,03	0,06
DM 52R19	0,27	0,57	1,00	0,00	0,24	0,15	0,44	0,19	0,36	0,44	0,00	0,03	0,27	0,41	0,00	0,00	0,00	0,14	0,00	0,50	0,06	0,30	0,30	0,23
DM 5953 RSF	0,48	0,00	0,17	0,27	0,69	0,04	0,19	0,00	0,23	1,10	0,00	0,26	0,65	0,13	0,04	0,24	0,00	0,30	0,14	0,20	0,25	0,14	0,28	0,20
RA 4918 R	0,48	0,09	0,00	0,00	0,25	0,16	0,00	0,08	0,13	0,78	0,00	0,08	0,46	0,30	0,18	0,00	0,14	0,24	0,00	0,16	0,00	0,35	0,67	0,24
DM 5351 RSF	0,00	0,11	0,00	0,07	0,35	0,18	0,08	0,00	0,10	0,46	0,00	0,12	0,61	0,00	0,23	0,07	0,15	0,21	0,00	0,50	0,59	0,27	0,00	0,27
NS 5258 R	0,66	0,19	0,00	0,33	0,04	0,00	0,25	0,06	0,19	0,91	0,00	0,18	0,95	0,31	0,15	0,18	0,24	0,37	0,00	0,62	0,43	0,25	0,05	0,27
SSS 5449 (tuc)	2,27	0,00	0,53	0,00	0,09	0,25	1,07	0,07	0,54	1,28	0,00	0,14	0,33	0,00	0,29	0,58	0,32	0,37	0,00	0,05	0,32	0,00	0,42	0,16
PAN 1532 R	2,34	0,32	0,00	0,00	0,17	0,27	0,57	0,05	0,47	0,68	0,00	0,34	0,32	0,00	0,32	0,11	0,00	0,22	0,25	0,35	0,24	0,11	0,35	0,26
RA 565 R	2,35	0,36	0,00	0,13	0,11	0,47	0,21	0,04	0,46	1,30	0,00	0,02	0,32	0,06	0,03	0,31	0,00	0,26	0,00	0,08	0,27	0,09	0,07	0,10
LS 6851 R	1,39	0,58	0,39	0,16	0,12	0,80	0,35	0,16	0,49	0,21	0,15	0,35	0,62	0,20	0,26	0,20	0,13	0,27	0,29	0,39	0,09	0,44	0,04	0,25
LG60155R	3,70	0,24	0,22	0,45	0,56	0,22	1,68	0,07	0,89	0,49	0,00	0,30	0,08	0,95	0,09	0,30	0,08	0,29	0,86	0,13	0,06	0,18	0,17	0,28
SSS 5052 (tuc)	0,76	0,56	0,14	0,00	0,55	0,41	0,75	0,17	0,42	1,51	0,00	0,34	0,37	0,35	0,24	0,17	0,00	0,37	0,00	0,23	0,23	0,36	0,13	0,19
DM 5302 RSF	0,98	0,00	0,00	0,25	0,04	0,00	0,30	0,23	0,23	0,37	0,00	0,02	0,12	0,28	0,04	0,41	0,00	0,16	0,00	0,16	0,12	0,30	0,58	0,23
PAN 1555 R	1,04	0,52	0,00	0,12	0,11	0,36	0,08	0,07	0,29	0,67	0,00	0,11	0,11	0,40	0,06	0,23	0,30	0,24	0,16	0,47	0,44	0,08	0,26	0,28
PAN 1521 R	1,50	0,96	0,45	0,00	0,51	0,09	0,56	0,16	0,53	0,05	0,00	0,15	0,50	0,33	0,05	0,10	0,13	0,16	0,00	0,18	0,25	0,29	0,46	0,24
RA 568 R	1,40	0,73	0,44	0,47	0,59	0,25	0,33	0,00	0,53	0,45	0,00	0,08	0,30	0,00	0,15	0,46	0,39	0,23	0,00	0,52	1,41	0,46	0,16	0,51
NS 5909 R	1,00	0,28	0,46	0,20	0,06	0,19	0,00	0,25	0,31	0,60	0,00	0,42	0,71	0,49	0,00	0,55	0,11	0,36	0,16	0,74	0,23	0,38	0,10	0,32
RA 660 R	4,85	0,32	0,35	0,35	0,31	0,55	0,14	0,42	0,91	0,85	0,00	0,23	0,35	0,13	0,13	0,15	0,00	0,23	0,00	0,06	0,09	0,13	0,05	0,07
DM 59R03	4,55	0,29	0,12	0,47	0,15	0,18	0,06	0,21	0,75	0,26	0,00	0,22	0,71	0,51	0,08	0,26	0,38	0,30	0,00	0,17	0,22	0,17	0,00	0,11
DM 60T05	1,36	0,76	0,13	0,16	0,12	0,43	0,23	0,08	0,41	0,81	0,00	0,13	0,18	0,14	0,04	0,00	0,30	0,20	0,15	0,43	0,24	0,29	0,00	0,22
SSS 6560 (tuc)	1,26	0,67	0,28	0,58	0,35	0,23	0,24	0,07	0,46	1,08	0,00	0,06	0,07	0,32	0,04	0,44	0,23	0,28	0,00	0,14	0,95	0,06	0,41	0,31
LS 6164 R	1,29	0,29	0,20	0,51	0,18	0,35	0,07	0,12	0,38	0,31	0,00	0,08	0,24	0,27	0,22	0,41	0,04	0,20	0,00	0,38	0,36	0,67	0,21	0,32
P61T38 R	2,03	0,62	0,15	0,22	0,26	0,38	0,50	0,05	0,53	0,92	0,00	0,10	0,50	0,27	0,82	0,38	0,00	0,37	0,29	0,34	0,69	0,16	0,61	0,42
LS 6860 R	2,07	0,00	0,33	0,00	0,67	0,25	0,51	0,32	0,52	0,52	0,00	0,00	0,31	0,00	0,18	0,05	0,17	0,15	0,11	0,38	0,04	0,11	0,29	0,19
NS 6448 R	1,35	0,00	0,32	0,17	0,75	0,18	0,25	0,14	0,40	0,58	0,00	0,13	0,69	0,55	0,15	0,68	0,34	0,39	0,06	1,15	0,15	0,07	0,40	0,37
P64T39 R	3,47	0,81	0,00	2,51	0,21	0,60	0,55	0,45	1,08	1,34	0,00	0,42	0,52	0,29	0,22	0,15	0,00	0,37	0,21	0,52	0,31	0,09	0,72	0,37
DM 68R09	1,57	0,17	0,21	0,25	0,17	0,86	0,56	0,29	0,51	0,61	0,00	0,24	0,97	0,27	0,32	0,26	0,00	0,33	0,00	0,87	0,20	0,08	0,20	0,27
PAN 1644 R	7,23	0,28	0,23	0,11	0,93	0,52	0,45	0,25	1,25	0,69	0,05	0,14	1,14	0,17	0,39	0,21	0,26	0,38	0,15	0,76	0,54	0,27	0,20	0,38
DM 6.8i RR	2,01	0,22	0,18	0,07	0,07	0,15	0,20	0,12	0,38	1,12	0,00	0,47	0,72	0,68	0,19	0,22	0,00	0,43	0,37	0,33	0,00	0,29	0,53	0,30
P71T74 R	0,87	0,36	0,00	0,50	0,22	0,37	0,52	0,15	0,37	0,24	0,00	0,04	0,77	0,14	0,10	0,63	0,00	0,24	0,00	0,45	0,16	0,23	0,15	0,20
Gem/Mean	1,82	0,36	0,22	0,28	0,32	0,30	0,38	0,14	0,48	0,70	0,01	0,17	0,50	0,27	0,17	0,26	0,14	0,28	0,12	0,38	0,30	0,22	0,26	0,25

Tabel 14 Massa van 100 sade (g) van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2020/21

Table 14 Mass 100 seeds (g) of the different soybean cultivars at the different trial localities, 2020/21

Kultivar Cultivar	Koel/Cool									Matig/Moderate									Warm					
	Belfast	Bethlehem PD1	Bethlehem PD2	Clarens	Kinross	Standerton	Villiers	Winterton	Gem/Mean	Barberspan	Bergville	Cedara	Greytown	Kroonstad	Leeudoringstad	Potchefstroom	Stoffberg	Gem/Mean	Groblersdal (Agricol)	Groblersdal (Agri Seed)	Marble Hall	Schweizer-Reneke PD1	Schweizer-Reneke PD2	Gem/Mean
PAN 1479 R	18,05	18,82	17,10	16,97	18,74	18,01	16,73	17,34	17,72	16,33	20,53	18,30	18,64	17,19	20,40	17,01	16,92	18,17	15,70	19,88	17,37	18,80	17,60	17,87
DM 52R19	17,61	17,65	16,16	15,79	18,45	15,41	14,80	15,80	16,46	14,60	23,25	17,29	15,75	16,64	19,40	15,41	16,05	17,30	16,33	15,57	14,43	16,80	17,80	16,19
DM 5953 RSF	17,21	18,22	15,49	15,30	17,20	16,60	13,46	16,25	16,22	17,40	19,52	16,11	14,87	14,86	16,47	15,33	15,42	16,25	16,22	15,04	13,34	19,00	17,27	16,17
RA 4918 R	15,86	16,20	14,94	14,41	16,80	17,29	14,20	16,72	15,80	15,13	16,84	18,09	16,38	15,70	16,27	14,96	14,52	15,99	15,80	14,20	13,74	17,07	17,27	15,61
DM 5351 RSF	17,93	18,22	15,76	15,17	18,63	16,72	13,77	17,83	16,75	15,67	17,71	18,51	16,96	16,66	18,47	17,07	15,51	17,07	15,78	17,73	13,36	17,73	17,73	16,47
NS 5258 R	15,72	15,10	14,07	14,19	17,19	14,81	12,42	14,61	14,76	13,20	15,70	16,43	14,39	13,93	16,53	13,01	14,22	14,68	14,30	12,95	13,16	16,40	17,60	14,88
SSS 5449 (tuc)	11,90	13,29	12,47	13,57	12,71	12,84	11,41	13,95	12,77	11,93	14,90	14,28	13,94	14,50	16,00	11,77	11,37	13,59	13,72	15,08	13,55	17,93	16,13	15,28
PAN 1532 R	13,65	13,61	14,12	15,68	14,34	13,78	14,47	15,09	14,34	13,13	16,18	17,11	14,41	15,71	15,67	14,16	14,31	15,09	15,05	12,88	13,78	17,20	19,80	15,74
RA 565 R	12,63	14,15	14,78	14,07	14,67	14,61	13,32	16,03	14,28	16,20	16,52	17,75	15,83	17,17	19,13	15,90	13,00	16,44	15,97	14,41	13,97	19,20	20,67	16,84
LS 6851 R	14,12	11,78	13,12	12,79	13,11	12,02	11,20	13,12	12,66	17,47	15,39	16,40	12,63	13,99	15,20	12,56	11,84	14,43	12,65	11,37	14,32	16,47	17,53	14,47
LG60155R	10,54	14,55	14,59	13,87	16,11	13,09	11,52	16,38	13,83	14,20	17,29	16,07	14,78	16,49	18,47	14,03	14,72	15,76	15,53	15,29	14,67	19,13	19,00	16,72
SSS 5052 (tuc)	12,95	12,35	12,67	13,78	12,52	11,48	10,60	14,49	12,60	15,00	15,34	16,41	14,00	15,14	15,00	13,44	12,34	14,58	15,44	13,61	13,36	17,60	18,53	15,71
DM 5302 RSF	13,20	15,64	14,94	15,57	15,28	15,35	13,68	14,65	14,79	20,67	17,32	16,22	15,12	16,05	19,40	13,52	14,70	16,63	16,27	17,20	14,18	19,20	19,93	17,36
PAN 1555 R	13,89	15,26	16,65	16,48	15,96	13,94	15,16	16,45	15,47	16,47	17,90	16,75	15,40	17,99	17,67	16,73	15,53	16,80	16,19	13,00	15,46	21,00	21,73	17,48
PAN 1521 R	13,67	15,35	14,37	14,79	17,08	14,28	13,63	16,41	14,95	17,00	16,00	17,75	14,31	17,97	17,00	13,99	14,16	16,02	15,77	15,42	16,15	19,53	21,40	17,66
RA 568 R	13,33	13,66	13,65	15,04	15,44	14,24	12,62	15,32	14,16	13,53	15,82	16,52	14,28	14,68	15,40	13,78	13,82	14,73	14,92	13,43	11,78	18,47	21,20	15,96
NS 5909 R	13,55	14,59	15,23	14,80	14,40	13,32	12,72	16,50	14,39	14,13	17,81	18,06	13,64	15,77	16,53	14,42	13,83	15,53	15,41	14,17	13,15	18,53	20,87	16,43
RA 660 R	13,15	13,51	14,23	14,44	11,52	13,04	13,13	15,47	13,56	14,47	16,42	16,36	13,19	16,31	16,67	13,94	14,03	15,17	13,86	12,03	12,78	17,67	19,27	15,12
DM 59R03	12,48	18,14	16,48	15,28	18,10	13,21	16,02	16,62	15,79	13,80	17,73	18,34	16,23	18,28	19,47	16,02	15,14	16,88	16,86	15,88	14,87	20,67	20,87	17,83
DM 60T05	12,83	14,00	14,32	14,24	13,91	13,53	12,14	15,74	13,84	15,73	15,55	16,00	13,59	15,31	16,00	13,94	13,92	15,01	15,00	12,93	13,27	17,80	18,47	15,49
SSS 6560 (tuc)	13,06	14,02	13,48	13,52	14,17	13,24	12,67	16,09	13,78	14,27	17,11	18,01	14,81	15,90	16,13	16,03	13,64	15,74	15,41	13,37	13,97	17,80	19,20	15,95
LS 6164 R	12,01	14,09	13,77	12,72	14,24	12,60	13,28	16,61	13,67	12,87	16,57	17,82	14,56	14,72	15,27	15,22	14,21	15,15	16,01	14,43	14,60	17,87	18,87	16,35
P61T38 R	14,01	14,50	14,15	14,51	15,45	13,46	13,68	15,61	14,42	12,20	17,24	17,50	13,84	16,42	14,67	16,74	15,00	15,45	14,21	11,27	13,46	16,80	20,33	15,21
LS 6860 R	16,61	17,25	16,82	16,79	17,30	15,81	14,60	18,45	16,70	16,27	19,23	18,14	15,75	18,41	18,00	17,42	18,10	17,66	17,67	14,55	15,97	18,67	21,73	17,72
NS 6448 R	14,58	13,88	15,16	14,30	16,30	12,30	13,83	15,74	14,51	12,40	17,44	17,29	14,89	16,51	15,07	15,91	13,24	15,34	14,58	11,47	12,45	18,40	19,67	15,31
P64T39 R	14,43	16,74	15,25	13,62	18,06	13,14	14,37	16,71	15,29	18,20	16,71	16,99	15,44	15,57	17,27	16,20	14,39	16,34	14,42	13,62	14,00	18,40	21,40	16,37
DM 68R09	15,15	15,11	14,50	14,04	17,18	11,97	13,26	15,66	14,61	13,27	15,67	17,02	14,87	15,47	18,07	16,06	13,63	15,51	14,34	10,55	13,00	18,07	19,40	15,07
PAN 1644 R	13,60	15,39	14,13	14,28	14,43	13,44	14,05	16,36	14,46	15,00	17,97	17,08	14,09	16,20	15,73	15,76	14,36	15,78	14,97	13,04	12,38	19,20	20,00	15,92
DM 6.8i RR	14,51	15,90	15,42	14,59	13,91	14,82	14,78	18,64	15,32	17,93	18,67	19,45	15,80	16,61	14,87	17,21	16,10	17,08	16,39	16,95	15,52	21,53	19,13	17,90
P71T74 R	13,51	15,30	14,36	13,87	15,32	14,15	14,74	18,32	14,95	20,20	17,40	18,06	15,86	16,49	18,33	17,36	16,64	17,54	16,16	14,14	13,42	20,73	19,00	16,69
Gem/Mean	14,19	15,21	14,74	14,62	15,62	14,08	13,54	16,10	14,76	15,29	17,26	17,20	14,94	16,09	16,95	15,16	14,49	15,92	15,36	14,18	13,98	18,46	19,31	16,26

Tabel 15 Oliepersentasie op vogvrye basis van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2020/21

Table 15 Oil percentage on moisture free basis of the different soybean cultivars at the different trial localities, 2020/21

Kultivar Cultivar	Koel/Cool									Matig/Moderate									Warm					
	Belfast	Bethlehem PD1	Bethlehem PD2	Clarens	Kinross	Standerton	Villiers	Winterton	Gem/Mean	Barberspan	Bergville	Cedara	Greytown	Kroonstad	Leeudoringstad	Potchefstroom	Stoffberg	Gem/Mean	Groblersdal (Agricol)	Groblersdal (Agri Seed)	Marble Hall	Schweizer-Reneke PD1	Schweizer-Reneke PD2	Gem/Mean
PAN 1479 R	16,07	17,51	18,97	19,11	19,52	18,12	18,37	21,16	18,60	20,05	20,41	20,10	19,32	18,96	20,52	19,47	20,54	19,92	22,70	20,10	21,84	19,86	21,73	21,25
DM 52R19	18,37	20,16	19,67	21,14	20,33	18,82	19,45	23,36	20,16	22,21	22,31	21,29	21,59	19,91	22,49	20,87	22,15	21,60	23,41	21,55	23,26	21,74	23,42	22,68
DM 5953 RSF	18,11	20,30	19,61	19,77	19,67	20,26	19,41	23,40	20,07	19,54	22,36	21,69	20,52	20,16	23,04	20,71	22,26	21,29	22,77	21,22	22,34	21,30	21,91	21,91
RA 4918 R	17,60	20,17	20,41	20,40	18,97	19,61	20,05	22,68	19,99	21,12	21,75	21,29	20,80	20,11	22,02	20,72	22,83	21,33	22,53	20,81	22,45	20,13	21,74	21,53
DM 5351 RSF	16,77	18,67	19,65	20,35	19,41	18,80	19,52	22,78	19,49	20,85	21,56	20,55	20,53	19,25	22,20	20,35	21,32	20,83	22,39	21,30	21,28	20,11	22,04	21,42
NS 5258 R	16,85	20,13	19,12	20,10	20,04	19,23	19,98	22,62	19,76	21,78	21,40	20,91	20,16	20,15	22,48	19,78	22,32	21,12	22,78	20,56	22,55	21,02	21,51	21,68
SSS 5449 (tuc)	16,82	19,28	19,10	19,76	19,02	20,00	19,03	22,48	19,44	21,57	21,38	21,54	20,51	19,94	21,50	19,67	22,69	21,10	22,92	21,57	22,64	20,16	20,72	21,60
PAN 1532 R	14,99	19,10	19,09	19,05	18,66	18,49	18,95	21,55	18,74	21,13	20,66	20,21	20,27	18,84	21,96	19,80	21,24	20,51	21,62	19,60	21,51	19,68	20,54	20,59
RA 565 R	16,80	19,50	19,62	19,92	20,53	19,24	19,41	22,66	19,71	19,32	21,64	20,99	20,80	19,45	22,05	20,61	22,25	20,89	23,19	21,47	22,62	20,83	21,27	21,88
LS 6851 R	16,86	19,84	19,06	19,63	19,35	19,36	19,95	22,36	19,55	19,43	21,21	21,45	21,09	19,54	21,76	21,24	20,81	20,82	23,18	20,96	23,83	21,08	21,12	22,03
LG60155R	16,34	18,45	18,76	19,44	19,30	18,36	18,64	21,52	18,85	21,90	20,77	19,88	20,58	19,11	21,54	19,42	21,38	20,57	23,00	20,70	21,40	20,05	21,41	21,31
SSS 5052 (tuc)	16,53	18,28	18,30	18,30	19,72	18,85	18,17	21,70	18,73	20,09	20,86	20,64	19,12	19,33	21,12	20,86	20,24	20,28	21,94	20,59	20,66	19,96	20,14	20,66
DM 5302 RSF	15,95	18,65	18,62	18,82	17,81	18,50	18,38	20,85	18,45	18,58	20,41	20,10	19,46	18,94	20,89	19,24	20,09	19,71	21,69	21,13	22,21	19,91	20,37	21,06
PAN 1555 R	16,59	18,83	18,27	18,61	19,23	18,38	19,01	21,53	18,81	20,49	20,66	20,73	19,73	17,96	21,30	19,56	21,08	20,19	22,12	19,54	20,35	20,10	19,29	20,28
PAN 1521 R	16,47	18,53	17,77	19,03	18,93	18,52	18,95	21,44	18,71	20,87	21,06	20,63	20,12	18,98	21,11	19,27	20,03	20,26	21,94	20,31	22,37	19,94	19,58	20,83
RA 568 R	17,47	19,83	19,74	20,22	19,32	19,56	19,02	22,74	19,74	19,89	21,21	21,92	20,49	19,40	22,07	20,28	21,05	20,79	22,62	21,47	22,02	20,42	20,62	21,43
NS 5909 R	17,27	18,94	18,92	19,26	20,22	18,87	19,51	22,61	19,45	20,33	21,19	21,68	20,25	19,05	22,12	20,68	20,53	20,73	23,13	20,63	21,57	21,16	22,07	21,71
RA 660 R	16,01	19,64	19,51	19,95	19,94	18,55	19,76	22,74	19,51	21,85	21,15	21,57	20,46	19,61	22,53	21,16	21,21	21,19	22,58	20,74	21,72	21,13	22,14	21,66
DM 59R03	15,73	18,00	17,94	17,29	18,45	18,17	19,10	21,85	18,32	20,44	20,55	20,08	19,86	18,97	21,70	20,18	22,24	20,50	22,60	21,08	22,37	20,03	20,71	21,36
DM 60T05	15,83	18,20	17,79	18,02	18,73	17,53	17,54	20,81	18,06	20,50	20,30	20,23	19,76	18,12	20,89	19,35	19,71	19,86	22,11	19,84	21,62	20,00	20,67	20,85
SSS 6560 (tuc)	17,08	18,19	18,38	17,47	19,62	19,08	19,23	21,47	18,82	21,38	20,40	21,37	20,77	18,99	21,11	19,88	21,55	20,68	22,72	20,09	21,26	20,50	21,17	21,15
LS 6164 R	16,46	18,90	18,18	17,15	18,75	18,11	18,77	21,31	18,45	21,35	20,77	20,95	20,25	17,64	21,55	19,36	20,20	20,26	22,27	20,29	21,42	20,27	19,17	20,68
P61T38 R	16,37	18,92	18,49	18,31	18,94	19,05	19,05	20,92	18,76	20,13	20,49	20,93	21,01	18,43	20,84	19,58	20,62	20,25	22,10	18,89	20,27	20,55	19,70	20,30
LS 6860 R	15,81	17,93	17,57	17,43	18,67	17,88	18,85	22,01	18,27	20,55	21,00	21,16	20,35	17,64	21,61	19,73	20,87	20,36	22,73	20,20	21,83	20,28	18,68	20,74
NS 6448 R	17,72	19,80	19,48	18,10	20,26	19,17	20,08	21,84	19,56	20,97	21,15	21,50	20,66	18,84	22,19	20,30	20,69	20,79	22,36	19,05	21,74	21,12	22,12	21,28
P64T39 R	16,54	17,74	18,44	17,02	19,11	18,28	19,63	21,44	18,53	20,96	20,40	20,54	20,04	18,91	21,53	20,04	20,69	20,39	22,63	19,83	22,47	19,87	20,83	21,13
DM 68R09	15,38	17,90	17,84	17,44	18,13	18,17	18,54	21,12	18,07	20,64	20,04	20,28	20,74	17,74	21,33	19,83	20,91	20,19	22,06	19,70	20,28	19,47	20,20	20,34
PAN 1644 R	15,47	18,64	18,78	18,77	19,28	18,22	18,42	20,74	18,54	19,94	19,90	20,32	19,45	19,13	21,79	20,30	19,99	20,10	22,43	19,14	20,64	19,47	20,35	20,41
DM 6.8i RR	16,03	17,43	17,43	16,96	18,70	17,30	18,64	20,37	17,86	19,38	20,19	20,21	20,01	16,17	20,86	18,01	20,19	19,38	21,79	21,23	21,22	19,40	18,15	20,36
P71T74 R	15,56	16,63	17,47	16,42	17,46	17,12	17,57	19,22	17,18	18,87	19,07	19,48	19,08	17,00	19,68	18,01	19,22	18,80	21,41	18,73	19,36	20,26	17,97	19,55
Gem/Mean	16,53	18,80	18,73	18,77	19,20	18,65	19,03	21,78	18,94	20,54	20,88	20,81	20,26	18,88	21,59	19,94	21,03	20,49	22,46	20,41	21,70	20,33	20,71	21,12

Tabel 16 Ru-proteïenpersentasie op vogvrye basis van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2020/21
Table 16 Percentage crude protein on moisture free basis of the different soybean cultivars at the different trial localities, 2020/21

Kultivar Cultivar	Koel/Cool									Matig/Moderate									Warm					
	Belfast	Bethlehem PD1	Bethlehem PD2	Clarens	Kinross	Standerton	Villiers	Winterton	Gem/Mean	Barberspan	Bergville	Cedara	Greytown	Kroonstad	Leeudoringstad	Potchefstroom	Stoffberg	Gem/Mean	Groblersdal (Agricol)	Groblersdal (Agri Seed)	Marble Hall	Schweizer-Reneke PD1	Schweizer-Reneke PD2	Gem/Mean
PAN 1479 R	42,89	42,07	41,62	40,69	41,11	41,34	41,09	40,00	41,35	35,36	42,38	40,28	42,67	40,50	42,92	41,63	40,63	40,80	39,51	42,36	42,05	37,22	34,96	39,22
DM 52R19	40,26	39,48	39,29	38,83	39,55	39,52	40,83	38,33	39,51	32,20	39,15	38,94	41,69	38,52	39,81	40,38	38,48	38,65	39,35	40,72	39,83	33,16	31,81	36,97
DM 5953 RSF	40,78	40,51	39,85	40,12	39,94	40,26	41,20	38,38	40,13	38,45	39,60	37,89	42,62	39,38	37,10	40,20	38,85	39,26	40,38	42,67	40,56	36,50	35,40	39,10
RA 4918 R	40,48	40,64	39,25	39,01	42,04	40,28	39,98	38,11	39,97	33,28	40,12	38,24	42,06	37,86	41,37	40,67	37,79	38,92	39,55	41,39	39,28	37,11	36,84	38,83
DM 5351 RSF	40,41	41,04	39,27	37,00	38,31	40,25	39,30	36,90	39,06	35,13	39,53	38,21	41,74	39,11	40,75	40,02	37,60	39,01	38,88	40,46	39,26	37,73	35,55	38,38
NS 5258 R	42,74	40,29	40,05	39,60	42,26	41,99	41,12	40,06	41,01	31,94	41,10	40,76	43,30	39,23	39,77	42,22	39,14	39,68	40,51	43,07	41,36	37,29	35,73	39,59
SSS 5449 (tuc)	42,21	40,38	39,49	40,75	39,58	39,49	40,83	38,65	40,17	34,59	40,59	39,27	43,15	38,95	41,50	43,21	38,40	39,96	40,54	42,43	41,95	38,98	38,18	40,42
PAN 1532 R	42,71	39,34	39,15	40,30	40,54	40,37	39,49	39,07	40,12	31,40	40,96	40,99	41,41	39,10	37,41	40,41	39,34	38,88	40,76	43,03	41,95	37,38	38,37	40,30
RA 565 R	41,32	39,64	38,28	39,82	38,62	39,56	39,60	38,77	39,45	38,71	40,15	39,02	41,76	38,57	39,94	40,06	37,96	39,52	39,11	41,52	40,33	36,18	36,71	38,77
LS 6851 R	42,91	39,68	38,25	41,12	41,86	39,19	38,55	39,43	40,12	41,80	41,52	40,69	41,98	39,77	40,72	39,16	40,69	40,79	39,74	42,04	40,48	37,48	34,91	38,93
LG60155R	41,92	41,49	39,38	41,15	40,65	42,38	41,05	41,89	41,24	31,10	41,51	42,42	41,65	40,08	42,67	42,00	41,03	40,31	39,94	44,15	41,83	38,19	36,93	40,21
SSS 5052 (tuc)	41,82	41,52	39,28	41,45	39,54	39,73	39,96	38,49	40,22	35,18	40,08	40,69	43,03	39,63	40,03	37,95	41,43	39,75	40,05	41,52	41,22	37,97	37,40	39,63
DM 5302 RSF	42,61	41,76	39,37	41,42	42,04	42,27	41,11	41,64	41,53	40,89	41,96	41,96	43,34	39,93	42,17	41,40	42,66	41,79	41,37	43,28	41,15	39,11	39,13	40,81
PAN 1555 R	41,01	40,54	38,63	40,59	39,87	40,42	39,93	39,50	40,06	35,37	40,99	40,75	42,74	41,05	42,04	41,23	40,77	40,62	41,27	42,25	43,28	39,73	39,20	41,15
PAN 1521 R	41,44	40,55	41,12	40,05	39,96	41,08	38,98	39,74	40,37	32,16	39,93	40,76	42,11	40,26	39,40	40,39	41,07	39,51	40,25	43,08	41,10	38,87	37,31	40,12
RA 568 R	41,47	41,02	38,03	39,69	40,12	40,68	40,47	38,88	40,05	40,21	40,63	39,07	42,22	38,71	39,47	41,82	42,19	40,54	39,98	42,36	40,69	38,96	38,27	40,05
NS 5909 R	41,02	39,37	38,54	38,91	39,50	40,26	37,60	38,35	39,19	35,49	40,04	40,30	41,27	39,06	39,19	39,06	40,07	39,31	39,34	41,80	40,59	36,62	34,23	38,52
RA 660 R	42,68	40,96	38,76	40,30	40,61	40,68	39,73	38,07	40,22	32,20	40,97	40,86	41,93	38,42	39,41	39,43	41,06	39,29	41,06	42,86	40,85	38,77	36,62	40,03
DM 59R03	42,80	40,23	40,92	41,54	40,95	40,58	38,69	39,55	40,66	36,02	40,76	40,09	42,17	40,52	40,00	39,38	39,10	39,75	39,96	42,67	40,21	39,83	37,54	40,04
DM 60T05	44,21	41,94	40,39	42,92	40,79	43,61	41,15	40,53	41,94	35,09	40,71	41,72	42,66	40,78	41,31	41,21	41,56	40,63	40,28	42,86	41,11	41,10	37,84	40,64
SSS 6560 (tuc)	42,36	40,94	38,95	41,80	39,62	40,15	38,14	39,37	40,17	32,11	41,09	39,74	41,11	39,76	41,16	41,03	38,79	39,35	40,44	42,74	41,23	38,66	36,71	39,96
LS 6164 R	42,31	39,09	39,05	41,61	40,02	40,14	38,34	38,88	39,93	32,47	39,97	39,86	41,67	39,61	37,99	41,00	40,27	39,11	40,38	42,14	40,85	38,74	36,77	39,78
P61T38 R	42,62	39,59	38,57	40,65	41,42	39,09	37,97	40,63	40,07	32,13	41,35	42,63	40,61	40,03	40,46	40,85	39,58	39,71	40,10	42,70	41,33	39,45	37,46	40,21
LS 6860 R	41,94	38,22	37,76	39,22	40,01	38,96	37,66	38,25	39,00	32,04	39,10	37,37	41,09	38,92	37,83	38,89	37,95	37,90	38,98	42,51	40,62	38,42	37,14	39,53
NS 6448 R	42,20	38,71	38,88	40,60	39,22	40,30	37,84	38,85	39,57	30,96	40,31	39,13	41,06	40,20	39,78	40,81	40,61	39,11	40,01	43,10	39,92	38,29	36,38	39,54
P64T39 R	42,45	40,49	39,19	41,77	39,98	41,71	38,99	39,54	40,51	32,89	40,51	40,08	41,59	39,24	40,51	40,34	39,50	39,33	40,87	43,25	41,17	39,72	36,16	40,23
DM 68R09	42,93	40,25	38,51	40,12	40,11	40,31	39,47	38,69	40,05	32,06	40,98	39,86	40,52	40,00	38,87	40,08	39,14	38,94	40,72	41,58	41,26	39,32	38,59	40,29
PAN 1644 R	42,53	40,54	38,84	41,09	40,38	40,89	40,19	40,30	40,60	35,54	41,47	40,97	43,67	40,62	39,59	40,82	41,92	40,58	41,07	43,00	42,19	40,36	38,41	41,01
DM 6.8i RR	40,06	37,07	37,34	38,97	37,95	39,07	36,52	38,78	38,22	30,74	39,61	38,43	39,65	39,07	36,82	39,89	37,53	37,72	38,94	41,10	40,03	37,95	36,55	38,91
P71T74 R	41,97	40,39	38,46	40,82	40,60	40,35	38,69	40,32	40,20	35,89	40,56	40,72	40,60	39,64	38,92	41,43	39,75	39,69	40,30	42,41	41,88	38,36	36,65	39,92
Gem/Mean	41,97	40,26	39,15	40,40	40,24	40,50	39,48	39,27	40,16	34,45	40,59	40,06	41,90	39,55	39,96	40,57	39,83	39,61	40,12	42,37	40,99	38,25	36,79	39,70

Tabel 17 Gemiddelde van die olie-en proteïen persentasie saamgevoeg (Protolie), 2020/21
Table 17 Average of the oil and protein percentage joined (Profat), 2020/21

Kultivar Cultivar	Koel/Cool									Matig/Moderate									Warm					
	Belfast	Bethlehem PD1	Bethlehem PD2	Clarens	Kinross	Standerton	Villiers	Winterton	Gem/Mean	Barberspan	Bergville	Cedara	Greytown	Kroonstad	Leeudoringstad	Potchefstroom	Stoffberg	Gem/Mean	Groblersdal (Agricol)	Groblersdal (Agri Seed)	Marble Hall	Schweizer-Reneke PD1	Schweizer-Reneke PD2	Gem/Mean
PAN 1479 R	58,96	59,58	60,59	59,80	60,63	59,46	59,46	61,16	59,96	55,41	62,79	60,38	61,99	59,46	60,33	61,10	61,17	60,33	62,21	62,46	63,89	57,08	56,69	60,47
DM 52R19	58,63	59,64	58,96	59,97	59,88	58,34	60,28	61,69	59,67	54,41	61,46	60,23	63,28	58,43	59,59	61,25	60,63	59,91	62,76	62,27	63,09	54,90	55,23	59,65
DM 5953 RSF	58,89	60,81	59,46	59,89	59,61	60,52	60,61	61,78	60,20	57,99	61,96	59,58	63,14	59,54	64,41	60,91	61,11	61,08	63,15	63,89	62,90	57,80	57,31	61,01
RA 4918 R	58,08	60,81	59,66	59,41	61,01	59,89	60,03	60,79	59,96	54,40	61,87	59,53	62,86	57,97	62,77	61,39	60,62	60,18	62,08	62,20	61,73	57,24	58,58	60,37
DM 5351 RSF	57,18	59,71	58,92	57,35	57,72	59,05	58,82	59,68	58,55	55,98	61,09	58,76	62,27	58,36	61,97	60,37	58,92	59,72	61,27	61,76	60,54	57,84	57,59	59,80
NS 5258 R	59,59	60,42	59,17	59,70	62,30	61,22	61,10	62,68	60,77	53,72	62,50	61,67	63,46	59,38	63,98	62,00	61,46	61,02	63,29	63,63	63,91	58,31	57,24	61,28
SSS 5449 (tuc)	59,03	59,66	58,59	60,51	58,60	59,49	59,86	61,13	59,61	56,16	61,97	60,81	63,66	58,89	58,91	62,88	61,09	60,55	63,46	64,00	64,59	59,14	58,90	62,02
PAN 1532 R	57,70	58,44	58,24	59,35	59,20	58,86	58,44	60,62	58,86	52,53	61,62	61,20	61,68	57,94	61,90	60,21	60,58	59,71	62,38	62,63	63,46	57,06	58,91	60,89
RA 565 R	58,12	59,14	57,90	59,74	59,15	58,80	59,01	61,43	59,16	58,03	61,79	60,01	62,56	58,02	62,77	60,67	60,21	60,51	62,30	62,99	62,95	57,01	57,98	60,65
LS 6851 R	59,77	59,52	57,31	60,75	61,21	58,55	58,50	61,79	59,68	61,23	62,73	62,14	63,07	59,31	64,43	60,40	61,50	61,85	62,92	63,00	64,31	58,56	56,03	60,96
LG60155R	58,26	59,94	58,14	60,59	59,95	60,74	59,69	63,41	60,09	53,00	62,28	62,30	62,23	59,19	61,57	61,42	62,41	60,55	62,94	64,85	63,23	58,24	58,34	61,52
SSS 5052 (tuc)	58,35	59,80	57,58	59,75	59,26	58,58	58,13	60,19	58,96	55,27	60,94	61,33	62,15	58,96	63,29	58,81	61,67	60,30	61,99	62,11	61,88	57,93	57,54	60,29
DM 5302 RSF	58,56	60,41	57,99	60,24	59,85	60,77	59,49	62,49	59,98	59,47	62,37	62,06	62,80	58,87	62,93	60,64	62,75	61,49	63,06	64,41	63,36	59,02	59,50	61,87
PAN 1555 R	57,60	59,37	56,90	59,20	59,10	58,80	58,94	61,03	58,87	55,86	61,65	61,48	62,47	59,01	60,70	60,79	61,85	60,48	63,39	61,79	63,63	59,83	58,49	61,43
PAN 1521 R	57,91	59,08	58,89	59,08	58,89	59,60	57,93	61,18	59,07	53,03	60,99	61,39	62,23	59,24	60,58	59,66	61,10	59,78	62,19	63,39	63,47	58,81	56,89	60,95
RA 568 R	58,94	60,85	57,77	59,91	59,44	60,24	59,49	61,62	59,78	60,10	61,84	60,99	62,71	58,11	61,26	62,10	63,24	61,29	62,60	63,83	62,71	59,38	58,89	61,48
NS 5909 R	58,29	58,31	57,46	58,17	59,72	59,13	57,11	60,96	58,64	55,82	61,23	61,98	61,52	58,11	61,53	59,74	60,60	60,07	62,47	62,43	62,16	57,78	56,30	60,23
RA 660 R	58,69	60,60	58,27	60,25	60,55	59,23	59,49	60,81	59,74	54,05	62,12	62,43	62,39	58,03	62,53	60,59	62,27	60,55	63,64	63,60	62,57	59,90	58,76	61,69
DM 59R03	58,53	58,23	58,86	58,83	59,40	58,75	57,79	61,40	58,97	56,46	61,31	60,17	62,03	59,49	63,01	59,56	61,34	60,42	62,56	63,75	62,58	59,86	58,25	61,40
DM 60T05	60,04	60,14	58,18	60,94	59,52	61,14	58,69	61,34	60,00	55,59	61,01	61,95	62,42	58,90	62,05	60,56	61,27	60,47	62,39	62,70	62,73	61,10	58,51	61,49
SSS 6560 (tuc)	59,44	59,13	57,33	59,27	59,24	59,23	57,37	60,84	58,98	53,49	61,49	61,11	61,88	58,75	59,10	60,91	60,34	59,63	63,16	62,83	62,49	59,16	57,88	61,10
LS 6164 R	58,77	57,99	57,23	58,76	58,77	58,25	57,11	60,19	58,38	53,82	60,74	60,81	61,92	57,25	62,01	60,36	60,47	59,67	62,65	62,43	62,27	59,01	55,94	60,46
P61T38 R	58,99	58,51	57,06	58,96	60,36	58,14	57,02	61,55	58,82	52,26	61,84	63,56	61,62	58,46	58,67	60,43	60,20	59,63	62,20	61,59	61,60	60,00	57,16	60,51
LS 6860 R	57,75	56,15	55,33	56,65	58,68	56,84	56,51	60,26	57,27	52,59	60,10	58,53	61,44	56,56	61,39	58,62	58,82	58,51	61,71	62,71	62,45	58,70	55,82	60,28
NS 6448 R	59,92	58,51	58,36	58,70	59,48	59,47	57,92	60,69	59,13	51,93	61,46	60,63	61,72	59,04	62,70	61,11	61,30	59,99	62,37	62,15	61,66	59,41	58,50	60,82
P64T39 R	58,99	58,23	57,63	58,79	59,09	59,99	58,62	60,98	59,04	53,85	60,91	60,62	61,63	58,15	60,40	60,38	60,19	59,52	63,50	63,08	63,64	59,59	56,99	61,36
DM 68R09	58,31	58,15	56,35	57,56	58,24	58,48	58,01	59,81	58,11	52,70	61,02	60,14	61,26	57,74	60,92	59,91	60,05	59,22	62,78	61,28	61,54	58,79	58,79	60,64
PAN 1644 R	58,00	59,18	57,62	59,86	59,66	59,11	58,61	61,04	59,14	55,48	61,37	61,29	63,12	59,75	58,61	61,12	61,91	60,33	63,50	62,14	62,83	59,83	58,76	61,41
DM 6.8i RR	56,09	54,50	54,77	55,93	56,65	56,37	55,16	59,15	56,08	50,12	59,80	58,64	59,66	55,24	59,78	57,90	57,72	57,36	60,73	62,33	61,25	57,35	54,70	59,27
P71T74 R	57,53	57,02	55,93	57,24	58,06	57,47	56,26	59,54	57,38	54,76	59,63	60,20	59,68	56,64	19,68	59,44	58,97	53,63	61,71	61,14	61,24	58,62	54,62	59,47
Gem/Mean	58,50	59,06	57,88	59,17	59,44	59,15	58,51	61,04	59,09	54,98	61,46	60,86	62,16	58,43	60,13	60,51	60,86	59,92	62,58	62,78	62,69	58,57	57,50	60,82

Tabel 18 Die saadopbrengs van elke kultivar by die verskillende lokaliteite, 2020/21
Table 18 The The seed yield of the cultivars at the different localities, 2020/21

Kultivar Cultivar	Koel/Cool										Matig/Moderate									Warm						
	Bapsfontein	Belfast	Bethlehem PD1	Bethlehem PD2	Clarens	Kinross	Standerton	Villiers	Winterton	Gem/Mean	Barberspan	Bergville	Cedara	Greytown	Kroonstad	Leeudoringstad	Potchefstroom	Stoffberg	Gem/Mean	Brits	Groblersdal (Agricol)	Groblersdal (Agri Seed)	Marble Hall	Schweizer-Reneke PD1	Schweizer-Reneke PD2	Gem/Mean
PAN 1479 R	2984	3951	3007	2074	2125	1795	2132	1903	3397	2597	1726	3396	4299	2274	2392	1946	2566	3456	2757	3508	3716	3471	2986	2795	2216	3115
DM 52R19	2223	3505	3363	2615	1768	2471	2912	2297	4088	2805	1759	3496	5012	2514	2153	1746	3577	4313	3071	3973	4433	3749	2670	3250	1891	3327
DM 5953 RSF	2874	3730	4592	4521	3092	3578	2434	2355	4612	3532	3321	4201	4337	2599	2380	2075	3110	3631	3207	3955	3363	3402	3517	3332	2323	3315
RA 4918 R	3081	4064	3633	2732	2090	2173	2503	2607	4530	3046	1706	3584	4747	2511	3532	2000	2832	3852	3096	5117	4076	3455	3089	3779	2474	3665
DM 5351 RSF	2288	4140	4119	3195	2051	3149	2874	2789	4585	3244	1647	3476	4826	2541	2913	1402	3248	3919	2997	3308	3514	3502	2480	4311	1849	3161
NS 5258 R	3005	3334	3372	2166	1828	2425	2427	2377	4474	2823	1253	3365	4509	2405	2356	2031	2664	3801	2798	4324	3793	3195	2470	3909	2134	3304
SSS 5449 (tuc)	2920	2507	3218	2975	2134	3131	2497	2624	3486	2832	1690	2417	3666	2329	3072	1828	2404	4125	2692	3225	2467	2911	2189	3707	2423	2820
PAN 1532 R	3045	2866	3147	2888	1814	3010	3204	1321	4032	2814	1489	4061	3915	2467	2911	1679	3114	3327	2870	3954	3872	3453	3007	3400	2302	3331
RA 565 R	2994	2703	3508	2621	2490	3070	3392	2516	5082	3153	1727	4320	4066	2844	3020	1686	3436	3898	3125	3925	3410	3446	2976	3587	2655	3333
LS 6851 R	3612	2276	3315	3481	2807	2855	3024	2894	4093	3151	1869	3903	4401	2252	3068	1767	3029	3344	2954	4025	4386	3501	2677	4144	2954	3614
LG60155R	2790	1800	4047	4285	2270	3553	3062	2365	3845	3113	1627	3880	2111	2643	2810	1636	3180	3810	2712	4535	3428	2958	2924	3313	2074	3205
SSS 5052 (tuc)	3991	1975	3471	3125	2666	2526	3187	2050	3922	2990	1643	4137	2831	2529	2340	1583	3080	3150	2662	3703	3793	3400	2905	4227	2246	3379
DM 5302 RSF	3120	3636	4454	3041	2541	2874	3285	2644	3397	3221	1438	3382	3701	2601	2593	1683	2718	3670	2723	4241	3309	3294	2584	3314	2462	3201
PAN 1555 R	3272	3438	3280	3012	2785	3595	2721	2962	4281	3261	1662	3907	4092	2625	3207	1232	2612	3341	2835	3502	3597	2865	2366	4593	1976	3150
PAN 1521 R	3897	3751	4521	4111	2972	4110	3268	2542	4281	3717	2549	4270	4516	2470	3229	2071	2777	3340	3153	4667	4309	3646	3365	4172	2237	3733
RA 568 R	3278	2938	3467	2976	2803	2203	3263	2649	4253	3092	1187	3525	3569	2513	3508	1852	2718	3453	2791	4523	4543	3380	2205	4054	2467	3529
NS 5909 R	3582	2614	3743	3044	2775	3405	3187	2585	4226	3240	2123	3891	4190	2565	2933	1979	2673	3393	2968	5319	3063	3103	2630	4157	2333	3434
RA 660 R	3640	2047	3646	3008	3004	2024	3055	3077	4557	3117	1448	3820	3780	2933	3245	2348	2990	3814	3047	4070	2985	3382	2721	4627	2681	3411
DM 59R03	2811	1910	4975	3574	2890	3712	3120	2785	4005	3309	1532	4405	3858	2390	3120	2161	3361	4158	3123	4659	3442	3646	3711	4000	2260	3620
DM 60T05	3863	2873	3979	3348	2893	2495	3177	2081	4916	3292	1787	4235	4135	2532	3259	1868	2875	3989	3085	4465	4498	3395	3462	4207	2217	3707
SSS 6560 (tuc)	3010	2376	3759	2850	2177	2988	2852	2569	3922	2945	1731	3775	3590	2699	3091	1277	2808	4218	2899	3501	4122	3354	2743	4045	2429	3366
LS 6164 R	3232	2544	3630	3391	2708	3083	2680	2984	4281	3170	1676	3849	4255	2296	3549	1971	3025	3714	3042	3909	3382	3377	2816	3168	2677	3222
P61T38 R	3152	2828	3780	2932	2600	3581	2848	2833	4391	3216	1780	3977	4121	2608	2663	1573	3246	4113	3010	3204	3701	3608	2764	3976	2304	3260
LS 6860 R	2210	2002	4159	3045	2223	2932	2634	3107	4364	2964	1274	3664	3901	2677	2857	1925	2921	3397	2827	4658	3354	2706	2457	3821	2501	3249
NS 6448 R	3489	3043	3654	2781	2577	2989	2754	2425	4944	3184	2038	4115	3904	2508	3175	1864	3318	3703	3078	3718	3871	2875	2934	4161	2501	3343
P64T39 R	3402	2638	4256	4571	2416	3947	3085	2475	4612	3489	1947	4232	3894	2872	3633	2282	3386	4019	3283	4481	3526	3301	2813	3985	2081	3365
DM 68R09	3496	2707	4252	2523	2515	3501	3474	2458	4226	3239	1739	4399	4178	2828	3162	2069	3009	4074	3182	3836	4458	3072	2873	4263	2873	3563
PAN 1644 R	3814	2198	4562	3219	2712	3545	3237	2901	4971	3462	1247	4220	4252	2588	3306	1719	3098	3745	3022	3757	3682	3335	2155	4765	2086	3297
DM 6.8i RR	3880	3509	4019	3846	2732	2896	3031	3096	4640	3516	1673	3651	5085	2447	2824	2325	3666	3785	3182	4811	4466	3322	3048	4552	2483	3780
P71T74 R	3475	2150	3439	3717	2423	3335	2946	3185	5496	3352	2300	3806	4308	2531	3166	1714	3392	3542	3095	3797	4385	3035	2643	3689	2235	3297
Gem/Mean	3214	2868	3812	3189	2496	3032	2942	2582	4330	3163	1753	3845	4068	2553	2982	1843	3028	3736	2976	4089	3765	3305	2806	3910	2345	3370
CV	10,8	22,8	13,9	15,8	15,7	24,9	2,0	14,6	10,9		6,9	13,1	13,0	7,4	19,2	7,5	15,0	2,9		21,8	3,2	7,8	16,7	4,2	7,9	

Tabel 19 Opbrengswaarskynlikheid (%) van kultivars geëvalueer in 2018/19, 2019/20 en 2020/21 vir die koeler droëland produksiegebiede by verskillende opbrengspotensiaal

Table 19 Yield probability (%) of cultivars in the 2018/19, 2019/20 and 2020/21 for the cooler dryland production areas as different yield potentials

Kultivar	Opbrengswaaarskynlikheid/Yield potential (t/ha)								Regressielyn/Regression line	
Cultivar	1.0	1,5	2.0	2,5	3.0	3,5	4.0	4,5	Fprob	R2
DM 5953 RSF	70	70	71	71	72	72	71	71	0,003	0,47
DM 5351 RSF	69	67	66	63	61	58	55	53	0,005	0,42
SSS 5449 (tuc)	64	56	49	40	32	24	19	14	<0.001	0,74
LS 6851 R	76	71	64	56	47	38	30	23	<0.001	0,63
SSS 5052 (tuc)	24	25	26	28	30	33	36	39	<0.001	0,79
DM 5302 RSF	76	72	66	59	52	45	38	32	<0.001	0,61
PAN 1521 R	74	74	74	73	72	71	69	68	<0.001	0,67
NS 5909 R	18	23	28	36	44	53	61	68	<0.001	0,85
LS 6164 R	54	51	49	46	44	41	39	37	<0.001	0,79
P61T38 R	35	36	36	38	40	42	44	45	<0.001	0,80
LS 6860 R	16	18	21	25	30	35	41	48	<0.001	0,83
NS 6448 R	53	51	48	44	41	38	35	33	<0.001	0,60
P64T39 R	40	46	52	58	65	70	75	80	<0.001	0,66
PAN 1644 R	22	28	34	42	50	59	67	73	<0.001	0,84

Tabel 20 Graanopbrengs (kg/ha^{-1}) van kultivars gedurende die 2019/20 en 2020/21 groeiseisoen ten opsigte van die verskillende lokaliteite wat in die koeler produksiegebiede geleë is
Table 20 Grain yield (kg/ha^{-1}) of cultivars during the 2019/20 and 2020/21 growing season for the various localities situated in the cooler production areas

Kultivar Cultivar	2019/20							2020/21								
	Bapsfontein	Belfast	Bethlehem	Clarens	Kinross	Winterton	Gem/Mean	Bapsfontein	Belfast	Bethlehem PD1	Bethlehem PD2	Clarens	Kinross	Standerton	Villiers	Winterton	Gem/Mean
PAN 1479 R	-	-	-	-	-	-	-	2984	3951	3007	2074	2125	1795	2132	1903	3397	2597
DM 52R19	-	-	-	-	-	-	-	2223	3505	3363	2615	1768	2471	2912	2297	4088	2805
DM 5953 RSF	3952	3535	4871	3500	5325	4434	4269	2874	3730	4592	4521	3092	3578	2434	2355	4612	3532
RA 4918 R	-	-	-	-	-	-	-	3081	4064	3633	2732	2090	2173	2503	2607	4530	3046
DM 5351 RSF	3909	3761	4113	2506	2780	4807	3646	2288	4140	4119	3195	2051	3149	2874	2789	4585	3244
NS 5258 R	-	-	-	-	-	-	-	3005	3334	3372	2166	1828	2425	2427	2377	4474	2823
SSS 5449 (tuc)	4178	2976	3555	1878	3442	3768	3300	2920	2507	3218	2975	2134	3131	2497	2624	3486	2832
PAN 1532 R	-	-	-	-	-	-	-	3045	2866	3147	2888	1814	3010	3204	1321	4032	2873
RA 565 R	-	-	-	-	-	-	-	2994	2703	3508	2621	2490	3070	3392	2516	5082	3153
LS 6851 R	3899	3217	2894	2058	2757	4586	3235	3612	2276	3315	3481	2807	2855	3024	2894	4093	3151
LG60155R	-	-	-	-	-	-	-	2790	1800	4047	4285	2270	3553	3062	2365	3845	3113
SSS 5052 (tuc)	5309	2420	2675	1525	4446	4407	3464	3991	1975	3471	3125	2666	2526	3187	2050	3922	2990
DM 5302 RSF	3578	3664	3086	1966	3677	3954	3321	3120	3636	4454	3041	2541	2874	3285	2644	3397	3221
PAN 1555 R	3760	3252	2435	1753	4053	4287	3257	3272	3438	3280	3012	2785	3595	2721	2962	4281	3261
PAN 1521 R	3778	3199	3727	3049	5101	4653	3918	3897	3751	4521	4111	2972	4110	3268	2542	4281	3717
RA 568 R	-	-	-	-	-	-	-	3278	2938	3467	2976	2803	2203	3263	2649	4253	3092
NS 5909 R	4112	3355	2407	1806	5136	4816	3605	3582	2614	3743	3044	2775	3405	3187	2585	4226	3240
RA 660 R	-	-	-	-	-	-	-	3640	2047	3646	3008	3004	2024	3055	3077	4557	3117
DM 59R03	-	-	-	-	-	-	-	2811	1910	4975	3574	2890	3712	3120	2785	4005	3309
DM 60T05	-	-	-	-	-	-	-	3863	2873	3979	3348	2893	2495	3177	2081	4916	3292
SSS 6560 (tuc)	3971	3083	2199	2124	4483	4687	3425	3010	2376	3759	2850	2177	2988	2852	2569	3922	2945
LS 6164 R	3877	3336	2071	1871	3698	4467	3220	3232	2544	3630	3391	2708	3083	2680	2984	4281	3170
P61T38 R	5470	3020	2341	1755	3431	4933	3492	3152	2828	3780	2932	2600	3581	2848	2833	4391	3216
LS 6860 R	4436	2310	1923	1597	3661	4686	3102	2210	2002	4159	3045	2223	2932	2634	3107	4364	2964
NS 6448 R	4310	3393	2207	1903	2480	4129	3070	3489	3043	3654	2781	2577	2989	2754	2425	4944	3184
P64T39 R	4132	3031	2640	2040	5588	4715	3691	3402	2638	4256	4571	2416	3947	3085	2475	4612	3489
DM 68R09	-	-	-	-	-	-	-	3496	2707	4252	2523	2515	3501	3474	2458	4226	3239
PAN 1644 R	3986	2741	2288	2073	4504	4444	3339	3814	2198	4562	3219	2712	3545	3237	2901	4971	3462
DM 6.8i RR	4568	3244	2623	1977	5116	4604	3689	3880	3509	4019	3846	2732	2896	3031	3096	4640	3391
P71T74 R	4270	3138	2490	1458	5680	4938	3662	3475	2150	3439	3717	2423	3335	2946	3185	5496	3352
P48T48 R	4074	2627	3039	2309	2079	4354	3080	-	-	-	-	-	-	-	-	-	-
LDC 5.3	3505	2931	2710	2444	4994	4413	3500	-	-	-	-	-	-	-	-	-	-
NA 5509 R	4130	2881	2968	1661	4385	4614	3440	-	-	-	-	-	-	-	-	-	-
PAN 1575 R	3959	3323	2927	1689	4114	4379	3399	-	-	-	-	-	-	-	-	-	-
LDC 5.9	4574	3026	2430	1907	5425	4183	3591	-	-	-	-	-	-	-	-	-	-
DM 5901 RSF	4855	3077	2818	1825	3990	4556	3520	-	-	-	-	-	-	-	-	-	-
PAN 1663	4140	3235	2871	1620	3976	4672	3419	-	-	-	-	-	-	-	-	-	-
LS 6161 R	4103	2632	2596	1781	3506	4507	3188	-	-	-	-	-	-	-	-	-	-
LS 6868 R	3905	2342	2411	1177	3475	4411	2954	-	-	-	-	-	-	-	-	-	-
DM 6968 RSF	3667	2464	2304	1380	5016	4468	3216	-	-	-	-	-	-	-	-	-	-
Gem/Mean	4157	3043	2772	1951	4154	4495	3429	3214	2868	3812	3189	2496	3032	2942	2582	4330	3161

Tabel 21 Opbrengswaarskynlikheid (%) van kultivars geëvalueer in 2018/19, 2019/20 en 2020/21 vir die matige droëland produksiegebiede by verskillende opbrengspotensiaal
Table 21 Yield probability (%) of cultivars in the 2018/19, 2019/20 and 2020/21 for the moderate dryland production areas as different yield potentials

Kultivar	Opbrengspotensiaal/Yield potential (t/ha)								Regressielyn/Regression line	
Cultivar	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	Fprob	R2
DM 5953 RSF	74	69	63	56	48	41	34	28	<0.001	0,76
DM 5351 RSF	8	14	23	37	52	68	81	89	<0.001	0,94
SSS 5449 (tuc)	63	53	44	35	26	18	13	9	<0.001	0,89
LS 6851 R	15	19	23	29	34	41	49	56	<0.001	0,96
SSS 5052 (tuc)	78	69	59	46	34	24	16	10	<0.001	0,76
DM 5302 RSF	38	31	24	17	13	9	7	5	<0.001	0,93
PAN 1521 R	75	70	66	60	53	48	41	35	<0.001	0,89
NS 5909 R	24	29	34	40	47	53	60	66	<0.001	0,96
LS 6164 R	72	67	62	57	51	44	39	34	<0.001	0,85
P61T38 R	12	18	27	39	52	66	76	85	<0.001	0,97
LS 6860 R	44	44	44	44	43	44	44	44	<0.001	0,96
NS 6448 R	44	50	55	62	68	72	77	81	<0.001	0,93
P64T39 R	73	75	78	80	81	82	83	84	<0.001	0,95
PAN 1644 R	44	46	50	54	58	61	65	68	<0.001	0,94
DM 6.8i RR	59	63	67	71	75	78	81	83	<0.001	0,91
P71T74 R	39	44	50	57	63	69	75	78	<0.001	0,93

Tabel 22 Graanopbrengs (kg/ha^{-1}) van kultivars gedurende die 2019/20 en 2020/21 groeiseisoen ten opsigte van die verskillende lokaliteite wat in die matige produksiegebiede geleë is
Table 22 Grain yield (kg/ha^{-1}) of cultivars during the 2019/20 and 2020/21 growing season for the various localities situated in the moderate production areas

Kultivar Cultivar	2019/20							2020/21								
	Bergville	Cedara	Greytown	Kroonstad	Leeudoringstad	Stoffberg	Gem/Mean	Barberspan	Bergville	Cedara	Greytown	Kroonstad	Leeudoringstad	Potchefstroom	Stoffberg	Gem/Mean
PAN 1479 R	-	-	-	-	-	-	-	1726	3396	4299	2274	2392	1946	2566	3456	2757
DM 52R19	-	-	-	-	-	-	-	1759	3496	5012	2514	2153	1746	3577	4313	3071
DM 5953 RSF	4682	3532	3635	3249	2710	1243	3175	3321	4201	4337	2599	2380	2075	3110	3631	3207
RA 4918 R	-	-	-	-	-	-	-	1706	3584	4747	2511	3532	2000	2832	3852	3096
DM 5351 RSF	3274	4286	4183	2720	2669	1204	3056	1647	3476	4826	2541	2913	1402	3248	3919	2997
NS 5258 R	-	-	-	-	-	-	-	1253	3365	4509	2405	2356	2031	2664	3801	2798
SSS 5449 (tuc)	4041	3899	3662	2535	2204	2132	3079	1690	2417	3666	2329	3072	1828	2404	4125	2692
PAN 1532 R	-	-	-	-	-	-	-	1489	4061	3915	2467	2911	1679	3114	3327	2870
RA 565 R	-	-	-	-	-	-	-	1727	4320	4066	2844	3020	1686	3436	3898	3125
LS 6851 R	4344	3370	3978	2428	2359	1630	3018	1869	3903	4401	2252	3068	1767	3029	3344	2954
LG60155R	-	-	-	-	-	-	-	1627	3880	2111	2643	2810	1636	3180	3810	2712
SSS 5052 (tuc)	3422	3447	3121	2804	2642	2735	3029	1643	4137	2831	2529	2340	1583	3080	3150	2662
DM 5302 RSF	4284	3883	3713	2312	1981	1593	2961	1438	3382	3701	2601	2593	1683	2718	3670	2723
PAN 1555 R	4793	4235	3773	2800	2773	1761	3356	1662	3907	4092	2625	3207	1232	2612	3341	2835
PAN 1521 R	3424	3147	3944	2836	2662	1744	2960	2549	4270	4516	2470	3229	2071	2777	3340	3153
RA 568 R	-	-	-	-	-	-	-	1187	3525	3569	2513	3508	1852	2718	3453	2791
NS 5909 R	4270	3747	3806	2647	2493	1650	3102	2123	3891	4190	2565	2933	1979	2673	3393	2968
RA 660 R	-	-	-	-	-	-	-	1448	3820	3780	2933	3245	2348	2990	3814	3047
DM 59R03	-	-	-	-	-	-	-	1532	4405	3858	2390	3120	2161	3361	4158	3123
DM 60T05	-	-	-	-	-	-	-	1787	4235	4135	2532	3259	1868	2875	3989	3085
SSS 6560 (tuc)	4078	3342	3976	2611	2493	1360	2977	1731	3775	3590	2699	3091	1277	2808	4218	2899
LS 6164 R	3670	3452	3666	2577	2758	2577	3117	1676	3849	4255	2296	3549	1971	3025	3714	3042
P61T38 R	4001	4143	4078	2606	2617	1410	3143	1780	3977	4121	2608	2663	1573	3246	4113	3010
LS 6860 R	3748	3898	3642	2757	3071	1795	3152	1274	3664	3901	2677	2857	1925	2921	3397	2827
NS 6448 R	4825	4692	3867	2573	3420	1662	3506	2038	4115	3904	2508	3175	1864	3318	3703	3078
P64T39 R	4347	3630	4071	3025	3143	1501	3286	1947	4232	3894	2872	3633	2282	3386	4019	3283
DM 68R09	-	-	-	-	-	-	-	1739	4399	4178	2828	3162	2069	3009	4074	3182
PAN 1644 R	4344	3998	4076	2910	3480	1524	3389	1247	4220	4252	2588	3306	1719	3098	3745	3022
DM 6.8i RR	4982	4417	4095	2755	3507	1522	3546	1673	3651	5085	2447	2824	2325	3666	3785	3182
P71T74 R	3908	3564	4316	3176	2471	991	3071	2300	3806	4308	2531	3166	1714	3392	3542	3095
P48T48 R	3718	3777	3645	3394	1057	1563	2859	-	-	-	-	-	-	-	-	-
LDC 5.3	5315	3856	3776	2692	2755	2933	3555	-	-	-	-	-	-	-	-	-
NA 5509 R	4318	3737	3683	3249	2590	1301	3146	-	-	-	-	-	-	-	-	-
PAN 1575 R	3775	4177	3242	2704	1853	1734	2914	-	-	-	-	-	-	-	-	-
LDC 5.9	4588	3709	3496	2707	3637	1138	3213	-	-	-	-	-	-	-	-	-
DM 5901 RSF	4837	3801	4257	2779	3413	1856	3491	-	-	-	-	-	-	-	-	-
PAN 1663	4133	3025	3067	2545	1316	1512	2600	-	-	-	-	-	-	-	-	-
LS 6161 R	3557	3559	3957	2749	2395	1563	2963	-	-	-	-	-	-	-	-	-
LS 6868 R	3857	3347	3782	2222	2257	1874	2890	-	-	-	-	-	-	-	-	-
DM 6968 RSF	3184	4400	3812	3008	2250	3056	3285	-	-	-	-	-	-	-	-	-
Gem/Mean	4133	3788	3797	2763	2606	1734	3137	1753	3845	4068	2553	2982	1843	3028	3736	2976

Tabel 23 Opbrengswaarskynlikheid (%) van kultivars geëvalueer in 2018/19, 2019/20 en 2020/21 vir die warm droëland produksiegebiede by verskillende opbrengspotensiaal

Table 23 Yield probability (%) of cultivars in the 2018/19, 2019/20 and 2020/21 for the warm dryland production areas as different yield potentials

Kultivar	Opbrengspotensiaal/Yield potential (t/ha)							Regressielyn/Regression line	
Cultivar	2,0	2,5	3,0	3,5	4,0	4,5	5,0	Fprob	R2
DM 5953 RSF	78	74	68	60	50	42	35	0,113	0,34
DM 5351 RSF	49	46	43	39	37	35	34	0,031	0,55
SSS 5449 (tuc)	37	32	26	22	19	18	18	0,213	0,24
LS 6851 R	55	54	52	51	49	47	46	0,026	0,59
SSS 5052 (tuc)	52	52	53	54	54	54	55	0,007	0,71
DM 5302 RSF	44	42	40	38	38	37	38	0,006	0,73
PAN 1521 R	65	66	68	68	69	67	66	0,015	0,65
NS 5909 R	25	31	39	49	60	69	75	0,027	0,58
SSS 6560 (tuc)	62	59	56	52	47	43	40	0,045	0,51
LS 6164 R	55	53	51	48	45	43	41	0,016	0,63
P61T38 R	72	66	59	49	39	32	26	0,061	0,45
LS 6860 R	16	21	29	41	54	65	74	0,005	0,76
NS 6448 R	61	60	58	54	51	48	46	0,030	0,57
P64T39 R	28	34	42	52	62	70	76	0,004	0,77
PAN 1644 R	21	24	29	37	46	55	62	0,001	0,85
DM 6.8i RR	72	71	70	67	63	58	54	0,129	0,34
P71T74 R	59	61	64	66	67	67	67	0,129	0,34

Tabel 24 Graanopbrengs (kg/ha^{-1}) van kultivars gedurende die 2019/20 en 2020/21 groeiseisoen ten opsigte van die verskillende lokaliteite wat in die warm produksiegebiede geleë is

Table 24 Grain yield (kg/ha^{-1}) of cultivars during the 2019/20 and 2020/21 growing season for the various localities situated in the warm production areas

Kultivar Cultivar	2019/20				2020/21						
	Hoopstad	Marble Hall	Schweizer-Reneke	Gem/Mean	Brits	Groblersdal (Agricol)	Groblersdal (Agri Seed)	Marble Hall	Schweizer-Reneke PD1	Schweizer-Reneke PD2	Gem
PAN 1479 R	-	-	-	-	3508	3716	3471	2986	2795	2216	3115
DM 52R19	-	-	-	-	3973	4433	3749	2670	3250	1891	3327
DM 5953 RSF	3688	3012	2334	3012	3955	3363	3402	3517	3332	2323	3315
RA 4918 R	-	-	-	-	5117	4076	3455	3089	3779	2474	3665
DM 5351 RSF	2824	2797	2426	2682	3308	3514	3502	2480	4311	1849	3161
NS 5258 R	-	-	-	-	4324	3793	3195	2470	3909	2134	3304
SSS 5449 (tuc)	2417	2226	1595	2079	3225	2467	2911	2189	3707	2423	2820
PAN 1532 R	-	-	-	-	3954	3872	3453	3007	3400	2302	3331
RA 565 R	-	-	-	-	3925	3410	3446	2976	3587	2655	3333
LS 6851 R	3512	3012	2099	2875	4025	4386	3501	2677	4144	2954	3614
LG60155R	-	-	-	-	4535	3428	2958	2924	3313	2074	3205
SSS 5052 (tuc)	2949	3012	2197	2719	3703	3793	3400	2905	4227	2246	3379
DM 5302 RSF	3257	3415	1779	2817	4241	3309	3294	2584	3314	2462	3201
PAN 1555 R	3190	2754	2147	2697	3502	3597	2865	2366	4593	1976	3150
PAN 1521 R	3506	3222	2368	3032	4667	4309	3646	3365	4172	2237	3733
RA 568 R	-	-	-	-	4523	4543	3380	2205	4054	2467	3529
NS 5909 R	3785	3139	2601	3175	5319	3063	3103	2630	4157	2333	3434
RA 660 R	-	-	-	-	4070	2985	3382	2721	4627	2681	3411
DM 59R03	-	-	-	-	4659	3442	3646	3711	4000	2260	3620
DM 60T05	-	-	-	-	4465	4498	3395	3462	4207	2217	3707
SSS 6560 (tuc)	2947	3578	1947	2824	3501	4122	3354	2743	4045	2429	3366
LS 6164 R	2625	3549	2146	2773	3909	3382	3377	2816	3168	2677	3222
P61T38 R	2697	3447	2183	2776	3204	3701	3608	2764	3976	2304	3260
LS 6860 R	4160	3541	1937	3213	4658	3354	2706	2457	3821	2501	3249
NS 6448 R	3018	3446	2120	2861	3718	3871	2875	2934	4161	2501	3343
P64T39 R	4202	2955	2912	3356	4481	3526	3301	2813	3985	2081	3365
DM 68R09	-	-	-	-	3836	4458	3072	2873	4263	2873	3563
PAN 1644 R	3991	3429	2458	3292	3757	3682	3335	2155	4765	2086	3297
DM 6.8i RR	3395	4496	2093	3328	4811	4466	3322	3048	4552	2483	3780
P71T74 R	2954	5001	1851	3269	3797	4385	3035	2643	3689	2235	3297
P48T48 R	2864	2673	1062	2199	-	-	-	-	-	-	-
LDC 5.3	2596	2091	2153	2280	-	-	-	-	-	-	-
NA 5509 R	3458	3113	1905	2825	-	-	-	-	-	-	-
PAN 1575 R	2816	3143	1341	2434	-	-	-	-	-	-	-
LDC 5.9	3482	3035	1846	2788	-	-	-	-	-	-	-
DM 5901 RSF	3497	3478	2542	3173	-	-	-	-	-	-	-
PAN 1663	3187	3232	1664	2694	-	-	-	-	-	-	-
LS 6161 R	3069	3239	2242	2850	-	-	-	-	-	-	-
LS 6868 R	2547	1725	1186	1819	-	-	-	-	-	-	-
DM 6968 RSF	3034	3733	2456	3074	-	-	-	-	-	-	-
Gem/Mean	3202	3196	2057	2818	4089	3765	3305	2806	3910	2345	3370

Tabel 25 Saamgevatte inligting van al die lokaliteite in die koel produksiegebiede, 2020/21

Table 25 Summerised information for all the localities in the cool production areas, 2020/21

Kultivar Cultivar	Dae tot blom/ Days to flowe-ring	Fisiologies ryp/ Physological mature	Oes datum/ Harvest date	Planthoogte/ Plant height	Peulhoogte/ Pod height	Omval/ Lod-ging	Groenstam/ Green stem	Oopspring/ Shattering	Planttelling/ Number of plants	Persentasie ongewenste sade/Percentage undesirable seed	Massa 100 sade/ Mass 100 seeds	Olie persen-tasie/Oil percentage	Ru-proteïen-persentasie/ Crude protein percentage	Opbrengs/ Yield
PAN 1479 R	56	119	143	74	8	1,13	2,63	1,17	241	0,19	17,72	18,60	41,35	2597
DM 52R19	56	120	139	62	4	1,17	1,38	1,17	213	0,36	16,46	20,16	39,51	2805
DM 5953 RSF	57	121	138	84	9	1,17	1,04	1,21	230	0,23	16,22	20,07	40,13	3532
RA 4918 R	59	121	141	68	6	1,13	1,08	1,25	227	0,13	15,80	19,99	39,97	3046
DM 5351 RSF	57	122	141	75	8	1,13	2,75	1,21	248	0,10	16,75	19,49	39,06	3244
NS 5258 R	58	120	140	64	5	1,17	1,04	1,08	229	0,19	14,76	19,76	41,01	2823
SSS 5449 (tuc)	64	128	144	84	10	1,13	1,71	1,21	235	0,54	12,77	19,44	40,17	2832
PAN 1532 R	66	131	146	81	10	1,13	1,71	1,00	238	0,47	14,34	18,74	40,12	2814
RA 565 R	65	133	145	81	10	1,13	1,33	1,04	237	0,46	14,28	19,71	39,45	3153
LS 6851 R	64	132	147	75	9	1,21	1,79	1,04	235	0,49	12,66	19,55	40,12	3151
LG60155R	66	132	148	79	8	1,17	1,17	1,08	217	0,89	13,83	18,85	41,24	3113
SSS 5052 (tuc)	66	131	150	90	12	1,13	1,92	1,00	257	0,42	12,60	18,73	40,22	2990
DM 5302 RSF	63	129	145	75	8	1,08	1,08	1,13	232	0,23	14,79	18,45	41,53	3221
PAN 1555 R	68	134	147	91	13	1,13	1,46	1,00	250	0,29	15,47	18,81	40,06	3261
PAN 1521 R	68	128	147	97	13	1,42	1,33	1,13	239	0,53	14,95	18,71	40,37	3717
RA 568 R	66	130	144	70	7	1,04	1,21	1,08	237	0,53	14,16	19,74	40,05	3092
NS 5909 R	69	134	148	91	11	1,29	2,58	1,00	243	0,31	14,39	19,45	39,19	3240
RA 660 R	69	133	147	76	10	1,08	1,29	1,08	243	0,91	13,56	19,51	40,22	3117
DM 59R03	71	135	148	98	13	1,54	2,04	1,00	227	0,75	15,79	18,32	40,66	3309
DM 60T05	70	136	149	85	12	1,13	2,29	1,04	269	0,41	13,84	18,06	41,94	3292
SSS 6560 (tuc)	69	134	153	97	13	1,25	1,83	1,04	237	0,46	13,78	18,82	40,17	2945
LS 6164 R	70	138	151	102	14	1,50	2,33	1,00	247	0,38	13,67	18,45	39,93	3170
P61T38 R	70	137	150	76	12	1,38	2,29	1,13	229	0,53	14,42	18,76	40,07	3216
LS 6860 R	72	141	157	103	14	1,33	2,46	1,00	225	0,52	16,70	18,27	39,00	2964
NS 6448 R	69	140	150	86	11	1,13	1,71	1,08	209	0,40	14,51	19,56	39,57	3184
P64T39 R	72	143	154	100	13	1,46	2,00	1,00	258	1,08	15,29	18,53	40,51	3489
DM 68R09	68	141	152	90	11	1,17	2,33	1,00	228	0,51	14,61	18,07	40,05	3239
PAN 1644 R	69	137	150	92	12	1,17	1,21	1,00	244	1,25	14,46	18,54	40,60	3462
DM 6.8i RR	72	142	154	103	13	1,63	2,21	1,00	235	0,38	15,32	17,86	38,22	3516
P71T74 R	73	143	158	105	15	1,63	2,33	1,00	244	0,37	14,95	17,18	40,20	3352
Gem/Mean	66	132	148	85	10	1,24	1,78	1,07	237	0,48	14,76	18,94	40,16	3163

Tabel 26 Saamgevatte inligting van al die lokaliteite in die matige produksiegebiede, 2020/21

Table 26 Summerised information for all the localities in the moderate production areas, 2020/21

Kultivar Cultivar	Dae tot blom/ Days to flowe-ring	Fisiologies ryp/ Physological mature	Oes datum/ Harvest date	Planthoogte/ Plant height	Peulhoogte/ Pod height	Omval/ Lod-ging	Groenstam/ Green stem	Oopspring/ Shattering	Planttelling/ Number of plants	Persentasie ongewenste sade/Percentage undesirable seed	Massa 100 sade/ Mass 100 seeds	Olie persen-tasie/Oil percentage	Ru-proteïen-persentasie/ Crude protein percentage	Opbrengs/ Yield
PAN 1479 R	38	108	133	68	6	1,00	2,10	1,20	267	0,26	18,17	19,92	40,80	2757
DM 52R19	40	110	133	64	7	1,05	1,76	1,00	219	0,14	17,30	21,60	38,65	3071
DM 5953 RSF	41	112	134	68	10	1,05	1,57	1,20	288	0,30	16,25	21,29	39,26	3207
RA 4918 R	46	109	133	69	8	1,00	2,00	1,20	259	0,24	15,99	21,33	38,92	3096
DM 5351 RSF	40	113	135	74	8	1,05	2,38	1,20	286	0,21	17,07	20,83	39,01	2997
NS 5258 R	42	110	134	68	6	1,00	1,48	1,20	244	0,37	14,68	21,12	39,68	2798
SSS 5449 (tuc)	51	112	134	70	11	1,00	1,81	1,20	236	0,37	13,59	21,10	39,96	2692
PAN 1532 R	52	118	140	72	12	1,00	1,62	1,00	269	0,22	15,09	20,51	38,88	2870
RA 565 R	53	119	139	71	12	1,00	1,62	1,80	267	0,26	16,44	20,89	39,52	3125
LS 6851 R	53	123	140	60	9	1,00	1,95	1,00	267	0,27	14,43	20,82	40,79	2954
LG60155R	55	120	138	64	9	1,00	1,52	1,00	206	0,29	15,76	20,57	40,31	2712
SSS 5052 (tuc)	56	119	140	85	17	1,00	1,43	1,00	308	0,37	14,58	20,28	39,75	2662
DM 5302 RSF	54	117	135	67	11	1,00	1,57	1,00	257	0,16	16,63	19,71	41,79	2723
PAN 1555 R	60	120	140	85	18	1,05	1,67	1,00	256	0,24	16,80	20,19	40,62	2835
PAN 1521 R	56	119	139	88	15	1,05	1,52	1,00	281	0,16	16,02	20,26	39,51	3153
RA 568 R	57	120	140	66	13	1,00	2,00	1,00	261	0,23	14,73	20,79	40,54	2791
NS 5909 R	58	122	144	85	19	1,00	1,86	1,00	233	0,36	15,53	20,73	39,31	2968
RA 660 R	58	121	140	70	13	1,00	1,24	1,00	228	0,23	15,17	21,19	39,29	3047
DM 59R03	57	121	142	82	13	1,14	1,90	1,20	249	0,30	16,88	20,50	39,75	3123
DM 60T05	59	120	142	72	14	1,00	1,95	1,00	285	0,20	15,01	19,86	40,63	3085
SSS 6560 (tuc)	56	123	144	90	16	1,10	2,33	1,00	246	0,28	15,74	20,68	39,35	2899
LS 6164 R	57	125	145	96	19	1,14	2,00	1,00	267	0,20	15,15	20,26	39,11	3042
P61T38 R	58	124	145	65	15	1,00	1,81	1,00	237	0,37	15,45	20,25	39,71	3010
LS 6860 R	61	126	144	98	19	1,10	1,62	1,00	227	0,15	17,66	20,36	37,90	2827
NS 6448 R	59	126	142	81	16	1,00	1,71	1,00	207	0,39	15,34	20,79	39,11	3078
P64T39 R	57	125	144	91	17	1,05	1,62	1,00	301	0,37	16,34	20,39	39,33	3283
DM 68R09	62	126	145	83	15	1,19	2,52	1,00	243	0,33	15,51	20,19	38,94	3182
PAN 1644 R	60	124	144	84	15	1,14	1,71	1,00	257	0,38	15,78	20,10	40,58	3022
DM 6.8i RR	64	130	150	106	20	1,14	2,38	1,00	231	0,43	17,08	19,38	37,72	3182
P71T74 R	62	129	150	102	19	1,00	2,71	1,00	287	0,24	17,54	18,80	39,69	3095
Gem/Mean	54	120	140	78	13	1,04	1,85	1,07	256	0,28	15,92	20,49	39,61	2976

Tabel 27 Saamgevatte inligting van al die lokaliteite in die warmer produksiegebiede, 2020/21

Table 27 Summerised information for all the localities in the warmer production areas, 2020/21

Kultivar Cultivar	Dae tot blom/ Days to flowe-ring	Fisiologies ryp/ Physological mature	Oes datum/ Harvest date	Planthoogte/ Plant height	Peulhoogte/ Pod height	Omval/ Lod-ging	Groenstam/ Green stem	Oopspring/ Shattering	Planttelling/ Number of plants	Persentasie ongewenste sade/Percentage undesirable seed	Massa 100 sade/ Mass 100 seeds	Olie persen-tasie/Oil percentage	Ru-proteïen-persentasie/ Crude protein percentage	Opbrengs/ Yield
PAN 1479 R	35	102	120	79	9	1,00	1,53	1,40	251	0,06	17,87	21,25	39,22	3115
DM 52R19	36	103	121	74	7	1,06	1,60	1,00	236	0,23	16,19	22,68	36,97	3327
DM 5953 RSF	36	103	121	80	9	1,00	1,47	1,20	258	0,20	16,17	21,91	39,10	3315
RA 4918 R	37	104	124	79	9	1,11	1,60	1,20	262	0,24	15,61	21,53	38,83	3665
DM 5351 RSF	37	105	127	84	11	1,11	2,60	1,20	233	0,27	16,47	21,42	38,38	3161
NS 5258 R	38	104	125	81	10	1,00	1,80	1,20	260	0,27	14,88	21,68	39,59	3304
SSS 5449 (tuc)	43	106	126	81	11	1,00	2,20	2,00	264	0,16	15,28	21,60	40,42	2820
PAN 1532 R	46	110	128	77	14	1,06	2,27	1,00	268	0,26	15,74	20,59	40,30	3331
RA 565 R	46	109	126	83	11	1,00	2,20	1,00	269	0,10	16,84	21,88	38,77	3333
LS 6851 R	46	111	128	67	11	1,00	2,33	1,00	240	0,25	14,47	22,03	38,93	3614
LG60155R	46	109	127	71	9	1,11	2,20	1,40	259	0,28	16,72	21,31	40,21	3205
SSS 5052 (tuc)	46	111	130	90	16	1,06	2,60	1,20	259	0,19	15,71	20,66	39,63	3379
DM 5302 RSF	44	106	127	80	11	1,00	2,40	1,20	258	0,23	17,36	21,06	40,81	3201
PAN 1555 R	51	112	130	96	19	1,00	2,00	1,20	267	0,28	17,48	20,28	41,15	3150
PAN 1521 R	47	110	130	90	15	1,06	1,80	1,00	269	0,24	17,66	20,83	40,12	3733
RA 568 R	46	108	128	71	11	1,00	2,20	1,00	270	0,51	15,96	21,43	40,05	3529
NS 5909 R	51	112	131	87	17	1,00	2,60	1,20	256	0,32	16,43	21,71	38,52	3434
RA 660 R	51	110	130	75	11	1,00	1,80	1,00	265	0,07	15,12	21,66	40,03	3411
DM 59R03	49	111	131	95	15	1,00	2,40	1,00	259	0,11	17,83	21,36	40,04	3620
DM 60T05	50	112	131	81	13	1,00	2,40	1,00	263	0,22	15,49	20,85	40,64	3707
SSS 6560 (tuc)	49	113	131	98	19	1,00	2,60	1,00	267	0,31	15,95	21,15	39,96	3366
LS 6164 R	50	113	131	104	21	1,00	2,33	1,00	272	0,32	16,35	20,68	39,78	3222
P61T38 R	52	115	131	73	15	1,00	2,13	1,00	268	0,42	15,21	20,30	40,21	3260
LS 6860 R	52	114	132	100	20	1,06	2,07	1,00	265	0,19	17,72	20,74	39,53	3249
NS 6448 R	53	113	132	87	16	1,00	1,93	1,20	258	0,37	15,31	21,28	39,54	3343
P64T39 R	50	114	132	98	22	1,00	2,20	1,00	260	0,37	16,37	21,13	40,23	3365
DM 68R09	55	117	132	98	15	1,33	2,33	1,00	252	0,27	15,07	20,34	40,29	3563
PAN 1644 R	56	116	132	100	18	1,00	2,47	1,00	258	0,38	15,92	20,41	41,01	3297
DM 6.8i RR	54	116	132	110	21	1,22	2,60	1,20	264	0,30	17,90	20,36	38,91	3780
P71T74 R	57	119	132	111	22	1,28	2,87	1,00	255	0,20	16,69	19,55	39,92	3297
Gem/Mean	47	110	128	87	14	1,05	2,18	1,13	260	0,25	16,26	21,12	39,70	3370

DEPARTMENT OF AGRICULTURE, FORESTRY AND FISHERIES

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

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

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

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

(a) made the regulations in the Schedule;

(b) determined that the said regulations shall come into operation on date of publication; and

(c) read together with section 3(2) of the said Act, repealed the Regulations published by Government Notice No. R478 of 20 June 2014.

SCHEDULE

Definitions

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

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

"bag" means bag manufactured from --

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

(b) polypropylene that complies with SABS specification CKS632 1246: 2012;

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

"consignment" means --

(a) a quantity of soya beans of the same class, which belongs to the same owner, delivered at any one time under cover of the same consignment note, delivery note or receipt note, or delivered by the same vehicle or bulk container, or loaded from the same bin of a grain elevator or from a ship's hold; or

(b) in the case where a quantity referred to in paragraph (a), is subdivided into different grades, each such quantity of each of the different grades.

"container" means a bag or a bulk container;

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

(a) have been damaged by frost, heat or weather conditions;

(b) have been visibly damaged by insects;

(c) are contaminated by moulds or infected by plant diseases;

(d) have a distinctly immature form or which are covered with a whitish membrane or where the testa have a green discolouration; and

(e) when the testa is removed, display discolouration, excluding green discolouration:

Provided that soya beans which were damaged by insects in the green pod stage and of which the discolouration as a result of the damaged is not larger half of the surface of the soya beans, shall not be deemed as defective soya beans;

"foreign matter" means all matter that --

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

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

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

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

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

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

"other grains" grains or pieces of grains of wheat, barley, oats, triticate, maize, rye and sorghum;

"pods" all whole or damaged soya bean pods;

"poisonous seeds" mean seeds or part of seeds of plant species that in terms of the foodstuffs, cosmetics and disinfectants Act No. 54 of 1972, may present a hazard to human or animal health when consumed, including seeds of *Argemone mexicana L, Convolvulus spp., Crotalaria spp., Datura spp., Ipomoea spp., Lolium temulentum, Ricinus communis* or *Xanthium spp.;*

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

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

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

"the Act" means the Agricultural Product Standards Act No. 119 of 1990;

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

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

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

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

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

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

(a) with a flat metal sheet of 1,0 mm thickness perforated with round holes of 4,75 mm in diameter that are arranged with the centres of holes at the points of intersection of an equilateral triangular grid with a pitch of 8 mm;

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

(c) the frame of which is at least 40 mm high;

(d) with the inner width of at least 200 mm and the inner length of at least 300 mm. or, in the case of a circular sieve, the inner diameter of at least 278 mm; and

(e) that fits into a tray with a solid bottom; and not less than 20 mm above the bottom of the tray.

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

Restriction on sale of soya beans

2. (1) No person shall sell soya beans in the Republic of South Africa --

(a) unless the soya beans are sold according to the classes set out in regulation 3;

(b) unless the soya beans comply with the standards for the class concerned set out in regulation 4;

(c) unless the soya beans, where applicable, comply with the grades of soya beans and the standards for grades set out in regulation 5 and 6 respectively;

d) unless the soya beans are packed in accordance with the packing requirements set out in regulation 7;

(e) unless the container or sale documents, as the case may be, are marked in accordance with the marking requirements set out in regulation 8; and

(f) if such soya beans contain a substance that renders it unfit for human or animal consumption or for processing into or thereof as food or feed.

(2) The Executive Officer may grant written exemption, entirely or partially to any person on such conditions as he or she may deem necessary, from the provision of subregulation (1): Provided that such exemption is done in terms of section 3(1) (c) of the Act.

PART I

QUALITY STANDARDS

Classes of soya beans

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

Standards for classes of soya beans

4. (1) A consignment of soya beans shall --

(a) be free from a musty, sour, khaki bush or other undesirable smell or odour;

(b) be free from any substance that renders it unsuitable for human or animal consumption or for processing into or utilisation as food or feed;

(c) contain not more poisonous seeds than permitted in terms of the Foodstuffs, Cosmetics and Disinfectants Act No. 54 of 1972;

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

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

(f) be free from animal filth;

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

(h) shall not exceed the maximum percentage of permissible deviation as determined in the Table in the Annexure for the grade.

(2) A consignment of soya beans is classified as Class SB if it --

(a) consists of any seeds of soya beans; and

(b) complies with the standards for the grade of Class SB soya beans as set out in regulation 5.

(3) A consignment of soya beans is classified as Class Other soya beans if it does not comply with the standards for Class SB.

Grades for soya beans

5. (1) Soya beans of Class SB shall be graded as Grade SB1.

(2) No grades are determined for Class Other soya beans.

Standards for grades of soya beans

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

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

PART II

PACKING AND MARKING REQUIREMENTS

Packing requirements

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

Marking requirements

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

PART III

SAMPLING

Obtaining sample

9. (1) A representative sample of a consignment of soya beans shall --

(a) in the case of soya beans delivered in bags and subject to regulation 10, be obtained by sampling at least ten per cent of the bags, chosen from that consignment at random, with a bag probe: Provided that at least 25 bags in a consignment shall be sampled and where a consignment consists of less than 25 bags, all the bags in that consignment shall be sampled; and

(b) in the case of soya beans delivered in bulk and subject to regulation 10, be obtained by sampling that consignment throughout the whole depth of the layer, in at least six different places, chosen at random in that bulk quantity, with a bulk sampling apparatus.

(2) The collective sample obtained in subregulation (1) (a) or (b) shall --

(a) have a total mass of at least 10 kg; and

(b) be thoroughly mixed by means of dividing before further examination.

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

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

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

Sampling if contents differ

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

(a) all the bags in the consignment concerned shall be sampled in order to do such separation;

(b) the bags concerned shall be placed separately; and

(c) each group of bags with similar contents in that consignment shall for the purpose of these regulations be deemed to be a separate consignment.

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

Working sample

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

PART IV

INSPECTION METHODS

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

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

(a) whether it has musty, sour, khaki bush or other undesirable odour;

(b) whether it contains soya beans in which or on which a substance is found, that renders it unfit for human or animal consumption or for processing into or for utilisation as food or feed;

(c) whether it contains poisonous seeds;

(d) whether it contains glass, metal, coal or dung;

(e) whether it contains any insects; and

(f) whether it contains animal filth.

Determination of moisture content

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

Determination of percentage of wet pods

14. The percentage of wet pods in a consignment of soya beans shall be determined as follows:

(a) Obtain a working sample of at least 10 kg of soya beans from a representative sample of the consignment.

(b) Remove all wet pods by hands from the working sample and determine the mass thereof.

(c) Express the mass thus determined as a percentage of the mass of the working sample concerned.

(d) Such percentage represents the percentage of wet pods in the consignment concerned.

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

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

(a) Obtain working samples of at least 200 g from a representative sample of the consignment.

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

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

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

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

Determination of the percentage defective soya beans

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

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

(b) Sieve the working sample with the 4,75 mm round-hole screen by moving the screen 20 strokes to and fro, alternately away from and towards the operator of the sieve for 20 seconds.

(c) Remove all defective soya beans from the other soya beans on the 4,75 mm round-hole screen by hand.

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

(e) Such percentage represents the percentage of defective soya beans in the consignment.

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

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

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

(b) Such percentage represents the percentage soya beans and pieces of soya beans in the consignment which passes through the 4,75 mm round-hole screen and not through a 1,8 mm slotted screen.

Determination of percentage of soiled beans

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

(a) Remove all soiled soya beans from the working sample obtained in regulation 17(a) by hand and determine the mass thereof.

(b) Express the mass thus determined, as a percentage of the mass of the working sample obtained in regulation 17(a).

(c) Such percentage represents the percentage of soiled soya beans in the consignment concerned.

PART V

MASS DETERMINATION

19. The mass of soya beans shall be determined by deducting the actual percentage sclerotia, screenings and foreign material found during the inspection process from the total mass of the consignment: Provided that the weighing instruments used for the determination of mass shall comply with the requirements of SANS 1649:2001 published in terms of the Legal Metrology Act No. 09 of 2014 for the specific class of instrument.

PART VI

OFFENCES AND PENALTIES

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

ANNEXURE

TABLE

STANDARDS FOR GRADES OF SOYA BEANS

Nature of deviation	*Maximum percentage permissible deviation (m/m)*
	Grade/Graad SB1
1	2
(a) Wet pods	0,2%
(b) Foreign matter, including stones, other grain and sunflower seeds: Provided that such deviations are individually within the limits specified in itmes (c), (d) and (e)	5%
(c) Other grain	0,5%
(d) Sunflower seed	0,1%
(e) Stones	1%
(f) Sclerotia	4%
(g) Soya beans and parts of soya beans above the 1,8 mm slotted screen which pass through the 4,75 mm round-hole screen	10%
(h) Defective soya beans on the 4,75 mm round-hole screen	10%
(i) Soiled soya beans	10%
(j) Deviation in (b) and (f) collectively: Providedthat such deviations are individually within the limits of said items	7%