



Quality Report
2022/2023 Season

*South African
Soybean Crop*

**Compiled and issued by:
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South African

COMMERCIAL SOYBEAN QUALITY FOR THE 2022/2023 SEASON

Acknowledgements

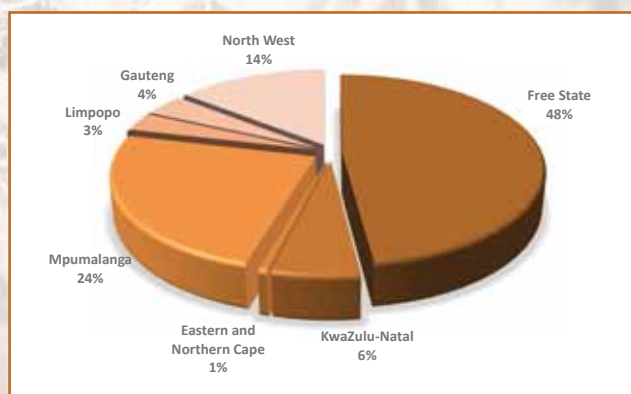
With gratitude to:

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- 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 2022/23 season, as overseen by the National Crop Estimates Liaison Committee (CELC), is 2 770 000 tons. This is the third consecutive all-time high record crop and represents a year on year increase of 24%. The major soybean producing provinces, namely the Free State and Mpumalanga, contributed 72% of the total crop.

Graph 1: Provincial contribution to the production of the 2022/23 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 38. One hundred and seventy-four 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. Twenty samples, randomly selected to represent the different production regions, as well as 18 cultivar samples were submitted to Precision Oil Laboratories for fatty acid profile analyses.

This is the twelfth 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 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 2022/23 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	2022/23			2021/22		
		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	3 750	3.75	800	3 000	3.75
	Total	1 000	3 750	3.75	800	3 000	3.75
Free State	Dryland	555 000	1 293 000	2.33	403 000	868 250	2.15
	Irrigation	10 000	37 000	3.70	12 000	44 250	3.69
	Total	565 000	1 330 000	2.35	415 000	912 500	2.20
Eastern Cape	Dryland	4 000	11 800	2.95	2 600	7 670	2.95
	Irrigation	300	1 100	3.67	400	1 330	3.33
	Total	4 300	12 900	3.00	3 000	9 000	3.00
KwaZulu-Natal	Dryland	32 000	112 000	3.50	26 000	93 000	3.58
	Irrigation	12 000	51 000	4.25	13 000	57 000	4.38
	Total	44 000	163 000	3.70	39 000	150 000	3.85
Mpumalanga	Dryland	294 000	632 000	2.15	292 000	680 400	2.33
	Irrigation	11 000	39 000	3.55	8 000	29 600	3.70
	Total	305 000	671 000	2.20	300 000	710 000	2.37
Limpopo	Dryland	4 000	10 400	2.60	4 500	11 700	2.60
	Irrigation	22 000	78 100	3.55	18 000	64 800	3.60
	Total	26 000	88 500	3.40	22 500	76 500	3.40
Gauteng	Dryland	46 000	98 600	2.14	41 500	86 750	2.09
	Irrigation	2 000	7 000	3.50	3 500	12 250	3.50
	Total	48 000	105 600	2.20	45 000	99 000	2.20
North West	Dryland	140 200	343 450	2.45	86 300	220 700	2.56
	Irrigation	14 800	51 800	3.50	13 700	49 300	3.60
	Total	155 000	395 250	2.55	100 000	270 000	2.70
RSA	Dryland	1 075 200	2 501 250	2.33	855 900	1 968 470	2.30
	Irrigation	73 100	268 750	3.68	69 400	261 530	3.77
	Total	1 148 300	2 770 000	2.41	925 300	2 230 000	2.41

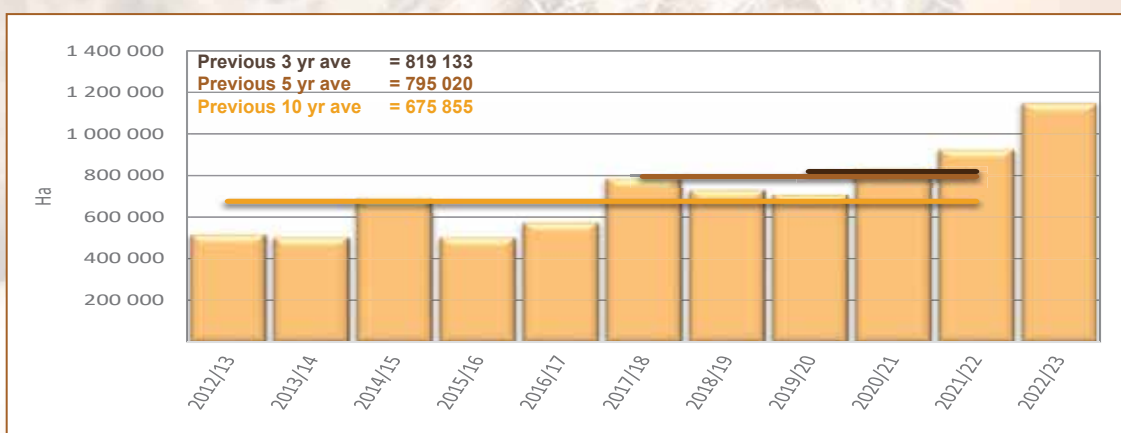
Figures provided by the CEC.

Compared to the 2021/22 production season, the area utilised for commercial soybean crop production increased by 24% (223 000 hectares). The area planted is also the highest figure on record for the third consecutive year. The average national yield equaled the 2.41 t/ha of the previous season which was a national record.

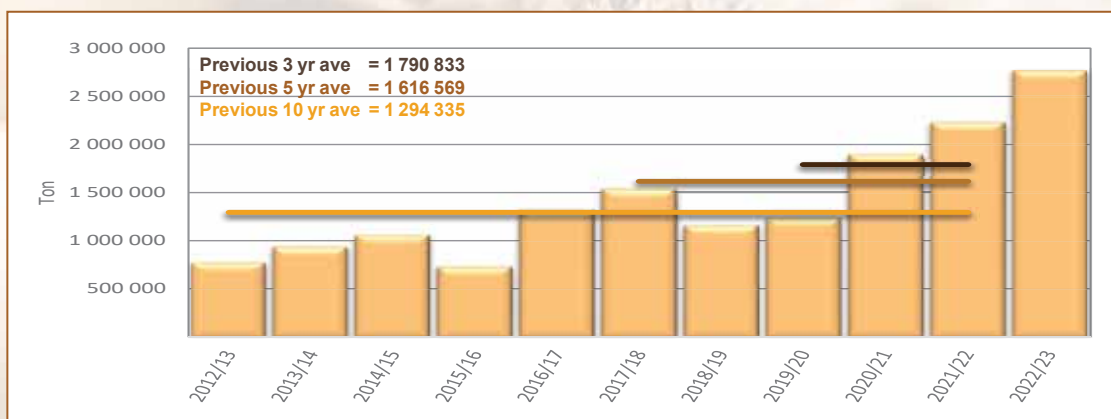
According to *The BFAP Baseline, Agricultural Outlook 2023 – 2032*, the area planted to soybeans is expected to be 1.1 million hectares by 2032. Soybean yields are expected to continue the rapid gains achieved in recent years, despite area expansion, reflecting the release of the latest seed technologies (improved germplasm and GM traits) following the introduction of the breeding technology levy. Planting of varieties most suited to specific areas has been instrumental to the improved performance of soybeans in the drier western parts of the country and producers have refined production practices, unlocking significant potential.

Soybeans account for half of the world's oilseed production. According to the *World Agricultural Supply and Demand Estimates Report (WASDE – 646)* an estimated 378.06 million metric tons of soybeans were produced during the 2022/23 season. Brazil (43%) and the United States (31%) are by far the largest contributors to this total. The world soybean production for the 2023/24 season is projected to be 396.85 million metric tons.

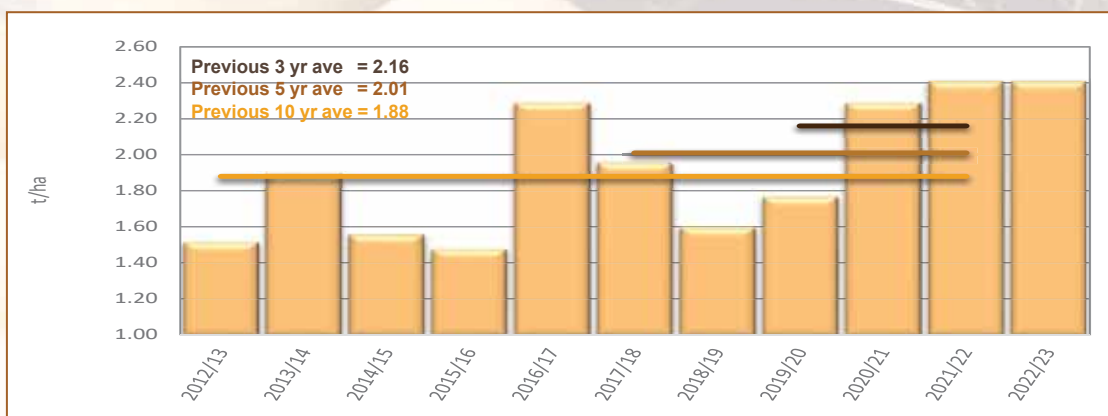
Graph 2: Total RSA area utilised for soybean production from 2012/13 to 2022/23



Graph 3: Soybean production in RSA from 2012/13 to 2022/23

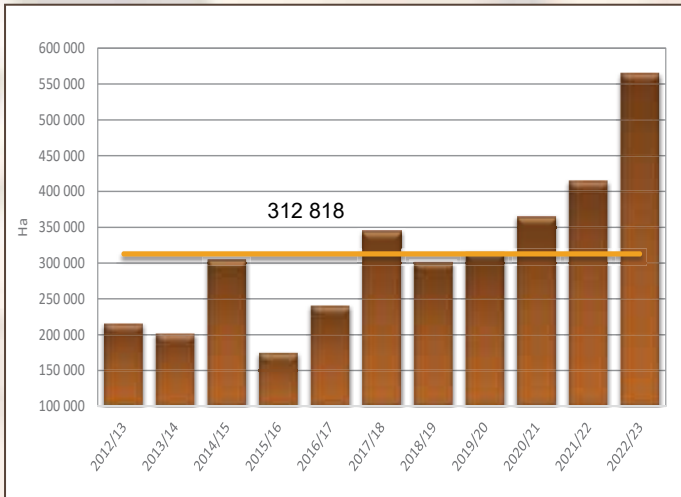


Graph 4: RSA soybean yield from 2012/13 to 2022/23

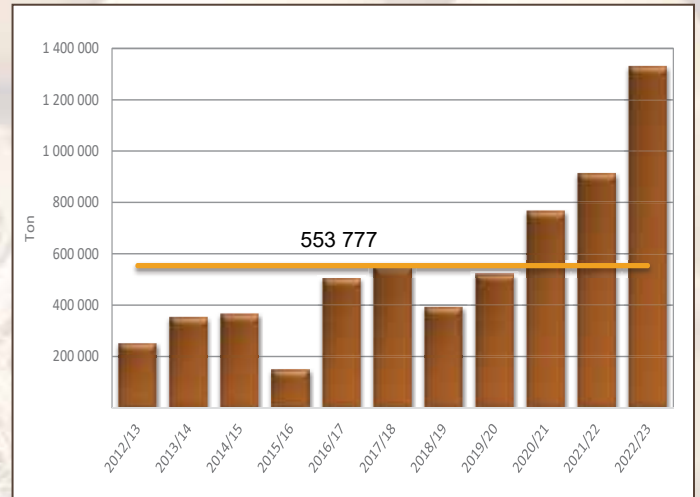


Figures provided by the CEC.

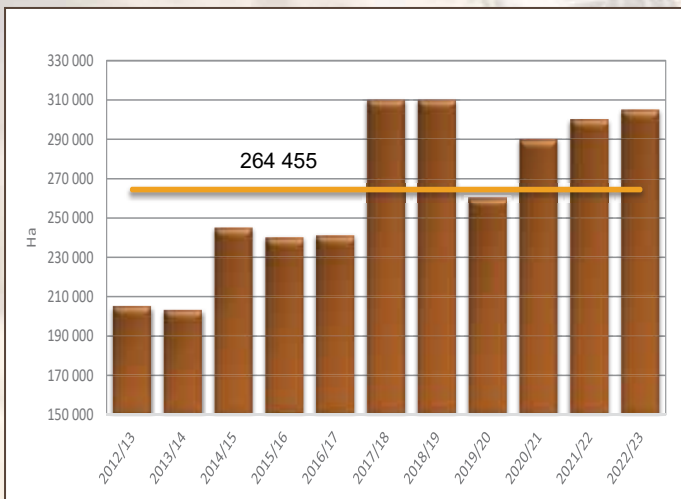
Graph 5: Area utilised for soybean production in the Free State since 2012/13



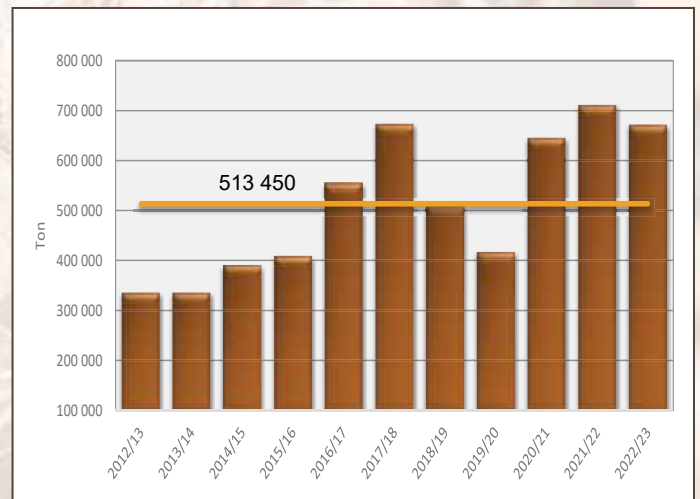
Graph 6: Soybean production in the Free State since 2012/13



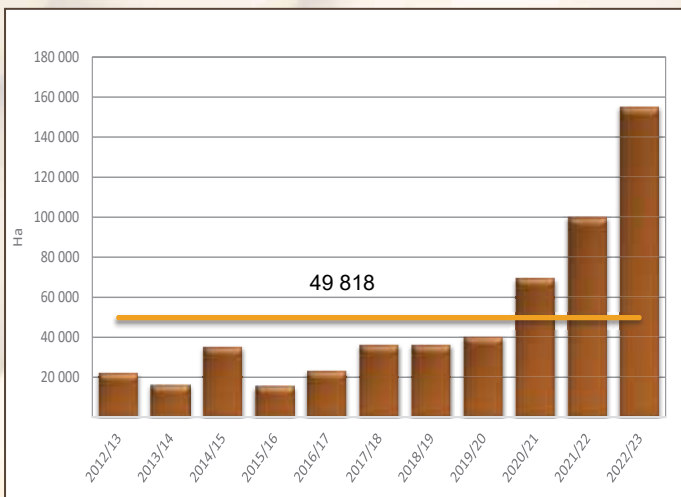
Graph 7: Area utilised for soybean production in Mpumalanga since 2012/13



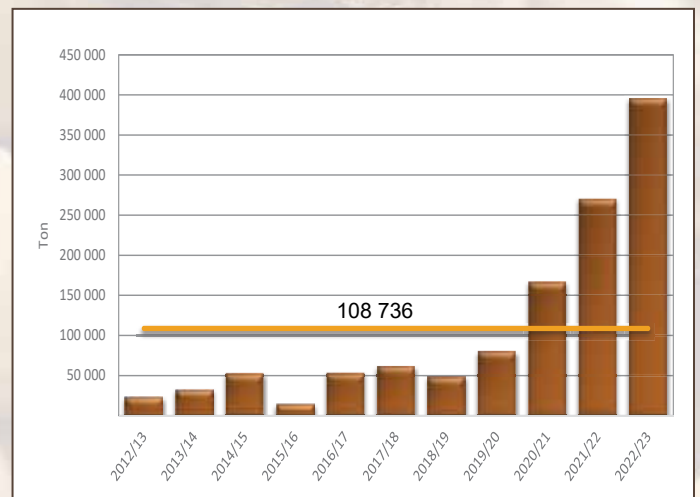
Graph 8: Soybean production in Mpumalanga since 2012/13



Graph 9: Area utilised for soybean production in North West since 2012/13



Graph 10: Soybean production in North West since 2012/13



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 2023 to January 2024), the amount of soybeans imported (3 346 tons) is even less than the 4 154 tons imported during the previous season. The ten-year import amount average is 67 957 tons. China remains the largest importer of soybeans worldwide, with 104.50 million metric tons during the 2022/23 season, followed by the European Union.

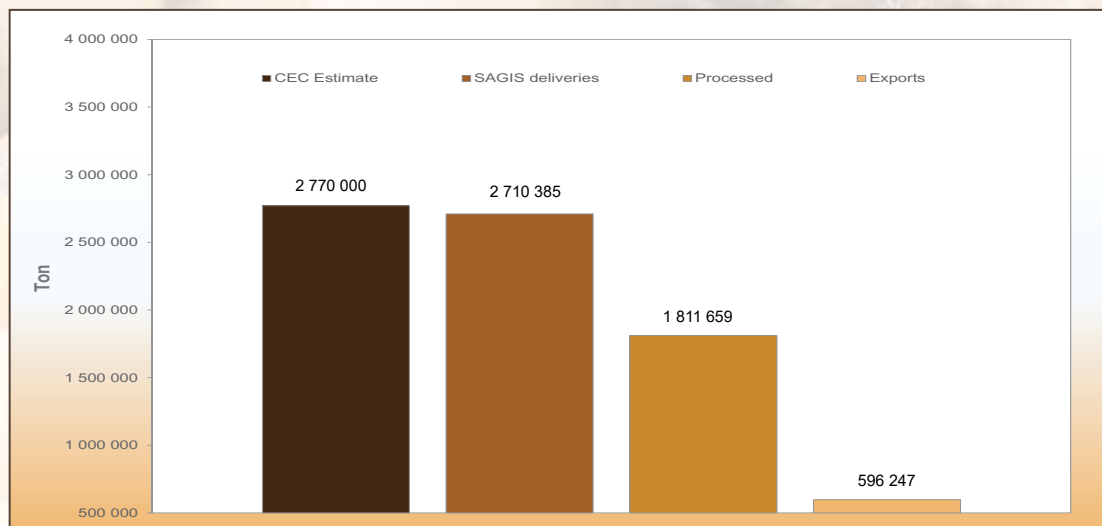
Oilseeds such as soybeans and sunflowers are crushed, producing both vegetable oil for human consumption and oilcake as well as protein meal for inclusion in animal feed rations. Soybeans yield more protein meal which is widely used in the animal feed industry. Of the 1.81 million tons of soybeans processed locally to date, 1.1% was used for human consumption, 8.3% for animal feed as full fat soya and the bulk crushed to produce oil and oilcake. The quantity of soybeans crushed so far, is 3% less than the total quantity crushed during the previous season, but 50% more than the 10-year average.

According to *BFAP Baseline*, rising poultry production could benefit soybean processing, which is set to expand by almost 40% by 2032, compared to the 2020-2022 base period. This expansion reflects a combination of additional use as a protein source in the poultry sector as well as further replacement of traditionally imported soybean meal. It will also enable further import replacement of vegetable oil, although the smaller oil yield from soybeans compared to sunflowers suggest that the replacement of imported vegetable oil will be slower than that of protein meal.

While South Africa's production of soybean, sunflower and canola oil is expected to rise, processing growth is substantially slower than in the past decade and imported oils will therefor still constitute around two thirds of additional vegetable oil consumption in South Africa by 2032 relative to 2022.

Soybean and soybean product exports have more than doubled compared to the previous season. 596 247 tons of soybeans/products have been exported so far this season compared to the 277 504 tons of the previous season and the 38 681 tons of the 10-year average. Exports to countries outside the African continent (Bangladesh, China, Malaysia, Thailand and Vietnam) have increased considerably over the last two years. Globally, soybean exports during the 2022/23 season amounted to an estimated 171.96 million metric tons, with Brazil exporting 56% and the United States 32% of this figure. The projected world soybean exports for the 2023/24 season currently stands at 173.61 million metric tons. Brazil and Argentina, followed by the USA are the largest exporters of soybean meal and Argentina and Brazil the largest exporters of soybean oil (*WASDE - 646*).

Graph 11: Soybean supply and demand overview for the current marketing season (Mar 2023 - Jan 2024)



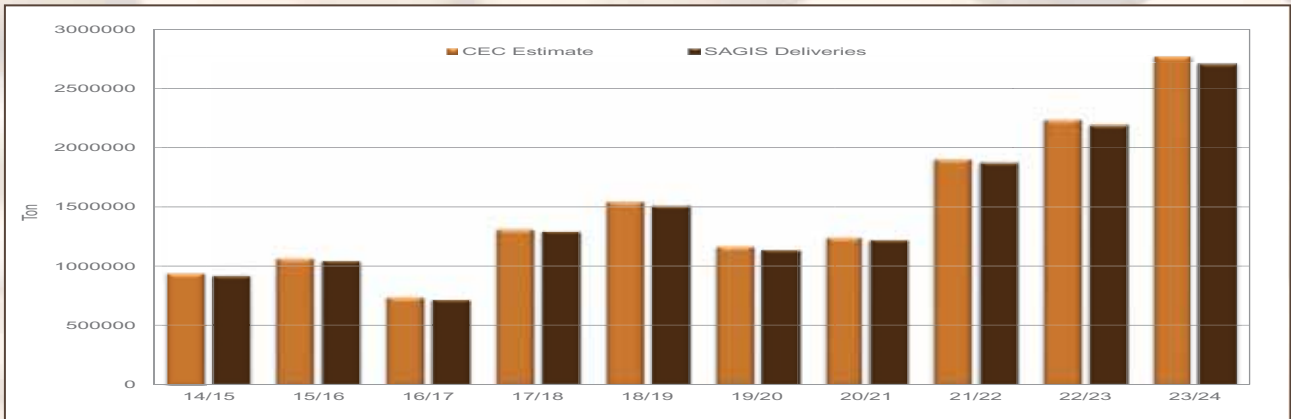
Information provided by SAGIS.

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

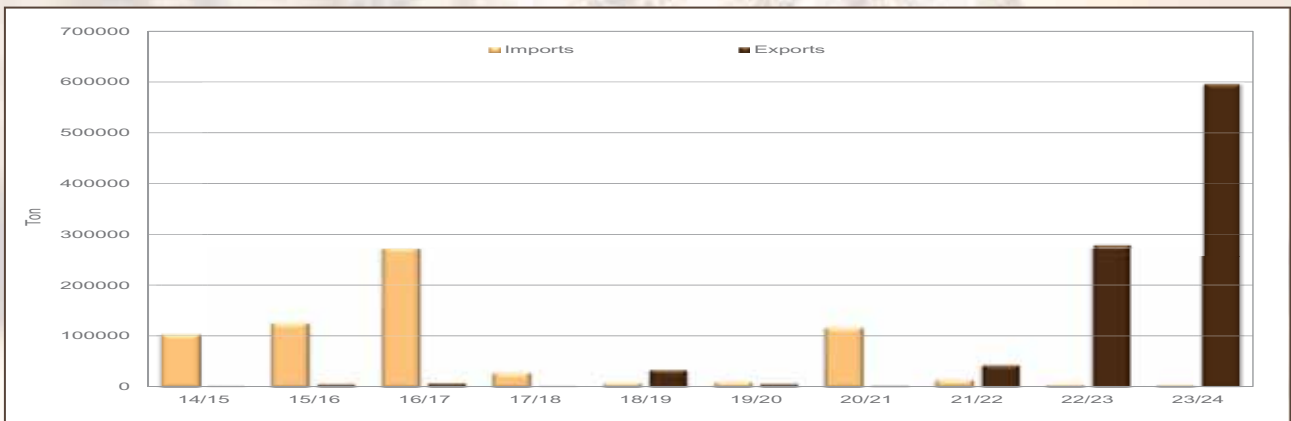
		Season (Mar - Feb)														Publication date: 2024/02/27			
		07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	Current Season Mar - Jan	10 Year average
		205 000	282 000	516 000	566 000	710 000	650 000	784 500	948 000	1 070 000	742 000	1 316 000	1 540 000	1 170 345	1 245 500	1 897 000	2 230 000	23/24	2013/14-2022/23
CEC (Crop Estimate)		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	2 230 000	2 770 000	1 294 335
SUPPLY																			
Opening stock (1 Mar)	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	168 387	171 897	155 374	
Prod deliveries	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	1 868 772	2 186 711	2 710 385	1 263 752	
Imports	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	13 448	4 154	3 346	67 957	
Surplus	3 300	900	700	1 500	1 800	1 698	2 572	0	10 526	1 122	2 519	4 497	0	1 968	4 289	7 570	9 917	3 506	
Total Supply	407 400	326 900	560 700	589 800	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	1 932 562	2 366 822	2 894 945	1 490 690	
DEMAND																			
Processed	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	1 710 221	1 907 982	1 811 659	1 273 905	
-human	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	22 279	21 739	19 808	23 945	
-animal feed (full fat soya)	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	167 480	189 605	150 419	155 440	
-crush (oil/cake)	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	1 520 462	1 696 638	1 641 432	1 094 520	
Withdrawn by producers	3 000	4 300	4 800	4 300	4 100	4 463	3 877	1 975	2 393	367	1 331	567	676	496	196	0	85	1 188	
Released to end-consumers	900	1 200	900	3 700	3 400	2 757	2 825	2 886	2 650	1 098	608	431	367	673	123	130	67	1 179	
Seed for planting purposes	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	11 079	8 971	10 603	8 071	
Net receipts(-)/dispt(+)	1 600	1 300	3 200	1 900	1 600	0	2 316	1 924	805	1 427	- 429	- 239	1 107	162	261	338	152	767	
Deficit	0	0	0	0	0	0	0	2 782	0	0	0	0	8 097	0	0	0	0	1 088	
Exports	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	42 295	277 504	596 247	38 881	
Total Demand	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	1 764 175	2 194 925	2 418 813	1 324 878	
Ending Stock (28 Feb)																			
- processed p/month	57 800	48 700	56 000	46 200	225 800	68 882	61 806	63 704	89 128	84 792	330 535	502 241	138 459	46 053	168 387	171 897	476 132	165 711	
- months' stock	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	1.2	1.1	2.9	106 159	

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

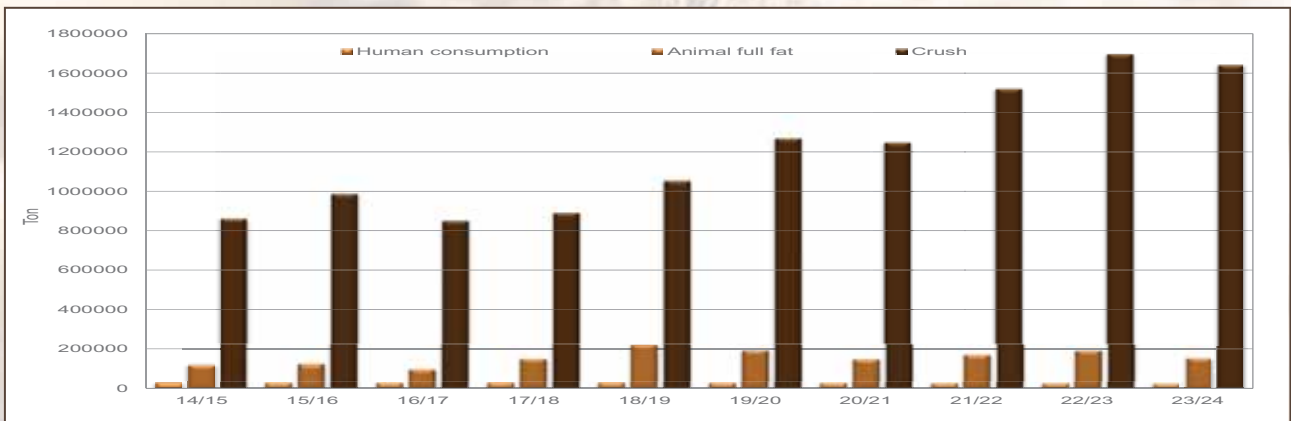
Graph 12: Soybeans: CEC Estimate vs SAGIS deliveries over 10 marketing seasons



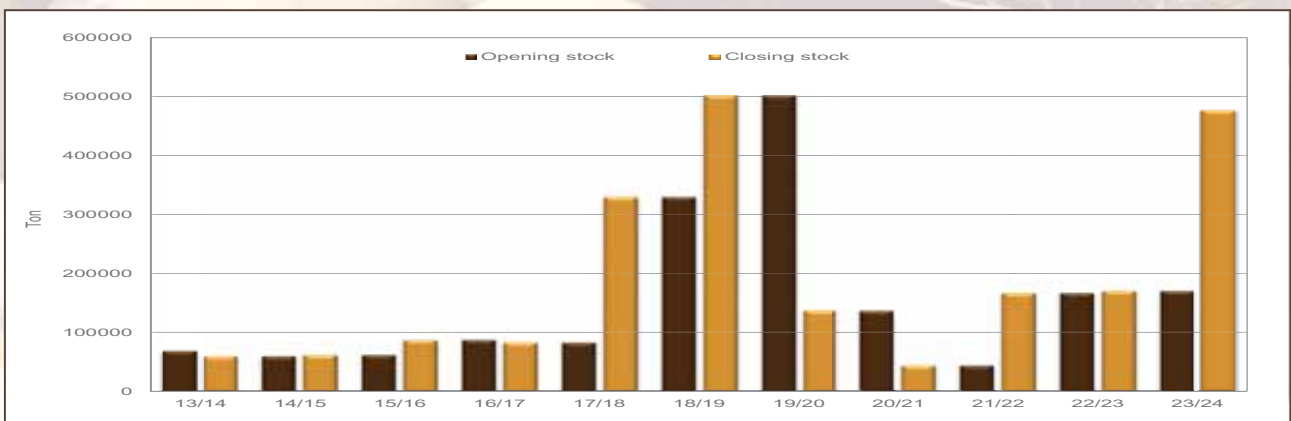
Graph 13: Soybeans: Imports and Exports over 10 marketing seasons



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



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



Information provided by SAGIS.

Season	SOYBEANS: IMPORTS FOR RSA PER COUNTRY (Tons)												
	Australia	Botswana	Brazil	Ethiopia	Malawi	Mozambique	Nigeria	Paraguay	Ukraine	USA	Zambia	Zimbabwe	Total
2014/15	0	0	61 705	0	7 520	202	0	0	0	0	25 264	8 286	102 977
2015/16	0	0	59 998	1 648	862	0	0	59 697	0	0	2 776	0	124 981
2016/17	0	0	0	3 314	0	0	204	263 576	0	0	4 004	0	271 098
2017/18	0	0	0	371	3 153	0	0	0	0	0	22 912	1 072	27 508
2018/19	0	0	0	160	1 953	343	0	0	645	0	3 844	0	6 945
2019/20	343	0	0	0	2 492	2 151	0	0	0	0	4 112	0	9 098
2020/21	0	0	55 000	0	2 037	1 623	0	0	0	52 534	4 909	0	116 103
2021/22	0	0	0	0	3 197	30	0	0	0	0	8 374	1 847	13 448
2022/23	0	0	0	0	0	0	0	0	0	0	4 154	0	4 154
2023/24	0	293	0	0	0	0	0	0	0	0	3 053	0	3 346

Season	SOYBEANS IMPORTS PER HARBOUR (Tons)					
	Harbours					Total
	East London	Durban	Cape Town	Port Elizabeth	Richards Bay	
2013/14	0	2 661	0	98	0	2 759
2014/15	0	61 705	0	0	0	61 705
2015/16	0	121 343	0	0	0	121 343
2016/17	0	267 094	0	0	0	267 094
2017/18	0	371	0	0	0	371
2018/19	0	805	0	0	0	805
2019/20	0	343	0	0	0	343
2020/21	0	107 534	0	0	0	107 534
2021/22	0	674	0	0	0	674
2022/23	0	0	0	0	0	0
2023/24*	0	0	0	0	0	0

*Progressive March 2023 - January 2024
Note: Includes Imports for RSA and Other Countries

Season	SOYBEANS: RSA EXPORTS PER COUNTRY (Tons)															
	Bangladesh	Botswana	China	Indonesia	Lesotho	Namibia	Malawi	Malaysia	Mozambique	Portugal	Thailand	Turkey	Eswatini	Vietnam	Zimbabwe	Total
2014/15	0	1	0	0	0	0	0	0	575	0	0	0	0	0	0	576
2015/16	0	220	0	0	0	0	0	0	4 457	0	0	0	0	0	0	4 677
2016/17	0	0	0	0	0	0	0	0	2 614	0	0	0	0	0	4 131	6 745
2017/18	0	4	0	0	0	0	0	0	410	0	0	0	0	0	0	414
2018/19	0	17	0	0	0	0	0	0	160	0	0	27 660	0	0	4 973	32 810
2019/20	0	189	0	0	0	0	0	0	291	0	0	0	0	0	4 856	5 336
2020/21	0	744	0	0	9	0	0	0	298	0	0	0	7	0	2	1 060
2021/22	0	1 020	0	0	0	0	764	986	8 094	0	0	0	0	0	31 431	42 295
2022/23	28 978	0	0	0	0	71	0	144 473	4 635	0	52 393	0	0	27 531	19 423	277 504
2023/24	54 755	0	147 497	501	0	0	0	269 972	3 320	29 807	33 000	0	2	55 848	1 545	596 247

Season	SOYBEANS EXPORTS PER HARBOUR (Tons)					
	Harbours					Total
	East London	Durban	Cape	Port Elizabeth	Richards Bay	
2013/14	0	15 044	0	0	0	15 044
2014/15	0	0	0	0	0	0
2015/16	0	0	0	0	0	0
2016/17	0	0	0	0	0	0
2017/18	0	0	0	0	0	0
2018/19	0	27 660	0	0	0	27 660
2019/20	0	0	0	0	0	0
2020/21	0	0	0	0	0	0
2021/22	0	986	0	0	0	986
2022/23	0	197 902	0	0	0	197 902
2023/24*	91 915	413 292	0	0	0	505 207

*Progressive March 2023 - January 2024



South African Grain Information Service NPC
Suid Afrikaanse Graaninligtingsdiens NMM

Reg no. 1997/019186/08

	OIL SEEDS PRODUCTS MANUFACTURED (PER MONTH)												Date published: 2024/03/01	
	Marketing year Mar 2021 - Feb 2022 Progressive: 12 Months	Mar 2023 Tons	Apr 2023 Tons	May 2023 Tons	June 2023 Tons	July 2023 Tons	Aug 2023 Tons	Sep 2023 Tons	Oct 2023 Tons	Nov 2023 Tons	Dec 2023 Tons	Jan 2024 Tons	Marketing year Mar 2023 - Feb 2024 Progressive: 11 Months (Mar - Jan)	
Palm Oil and Derivatives	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Soybean Oil	261 757	16 333	25 539	31 452	26 154	26 649	28 821	27 603	25 141	27 359	21 170	26 183	282 404	
Sunflower Oil	263 060	12 798	21 475	31 272	24 863	26 496	25 732	23 192	19 190	18 447	17 215	16 878	237 558	
Coconut Oil/ Groundnut Oil / Canola Oil / Corn (Maize) Oil / Blends or mixes of Oils which includes one of the above Oils / Biodiesel / Cottonseed Oil	68 734	7 215	7 803	5 780	6 975	4 565	6 521	7 272	6 449	7 207	6 905	6 457	73 149	
Sunflower Oilcake	300 155	12 573	21 412	32 773	26 355	27 359	28 724	25 168	21 638	19 689	17 286	17 856	250 833	
Coconut Oilcake	0	0	0	0	0	0	0	0	0	0	0	0	0	
Palmnut Oilcake	0	0	0	0	0	0	0	0	0	0	0	0	0	
Soybean Oilcake / Canola Oilcake / Cottonseed Oilcake	1 237 766	83 133	119 005	145 729	125 039	124 519	135 594	133 476	122 091	128 776	101 467	122 823	1 341 652	
Soybean Flours and Meals / Textured Vegetable Protein	41 078	4 154	3 312	4 344	4 518	4 344	4 043	4 870	4 760	4 465	2 899	4 071	45 780	
Soybean Fullfat	169 604	14 194	13 396	15 399	15 828	16 462	15 859	11 998	10 952	10 582	9 934	10 146	144 750	
Peanut Butter and Paste	33 700	2 082	2 406	3 717	3 115	2 390	3 025	2 673	2 856	1 878	1 967	2 138	28 247	
Total	2 375 854	152 482	214 348	270 466	232 847	232 784	248 319	236 252	213 077	218 403	178 843	206 552	2 404 373	

	OIL SEEDS PRODUCTS IMPORTED (PER MONTH)												Date published: 2024/03/01	
	Marketing year Mar 2021 - Feb 2022 Progressive: 12 Months	Marketing year Mar 2022 - Feb 2023 Progressive: 12 Months	Mar 2023 Tons	Apr 2023 Tons	May 2023 Tons	June 2023 Tons	July 2023 Tons	Aug 2023 Tons	Sep 2023 Tons	Oct 2023 Tons	Nov 2023 Tons	Dec 2023 Tons	Jan 2024 Tons	Marketing year Mar 2023 - Feb 2024 Progressive: 11 Months (Mar - Jan)
Palm Oil and Derivatives	524 513	495 286	41 627	43 561	46 814	46 092	46 927	45 459	51 516	48 623	39 625	28 575	31 888	470 707
Soybean Oil	68 481	52 125	2 974	4 672	6 653	1 020	1 509	3 811	11 871	6 059	1 026	221	882	40 698
Sunflower Oil	107 808	125 929	10 088	5 376	15 820	5 038	10 025	9 521	45 505	20 229	30 055	16 358	1 258	169 273
Coconut Oil / Groundnut Oil / Canola Oil / Corn (Maize) Oil / Blends or mixes of Oils which includes one of the above Oils / Biodiesel / Cottonseed Oil	10 035	5 537	755	103	163	129	211	650	197	284	307	302	321	3 422
Sunflower Oilcake	55 684	0	0	0	0	0	0	0	0	0	0	0	0	0
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	408 986	181 566	33 610	1 441	27 864	401	1 570	1 034	777	509	1 121	797	888	70 012
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	1 563	1 969	387	299	63	69	82	129	66	612	1 437	18	245	3 407
Total	1 177 070	862 411	89 441	55 452	97 377	52 749	60 324	60 604	109 932	76 316	73 571	46 271	35 482	757 519



South African Grain Information Service NPC
Suid Afrikaanse Graaninligtingsdiens NWM

Reg no. 1997/019186/08

	OIL SEEDS PRODUCTS EXPORTED (PER MONTH)												Date published: 204/03/01	
	Marketing year Mar 2021 - Feb 2022 Progressive: 12 Months	Mar 2023 Tons	Apr 2023 Tons	May 2023 Tons	June 2023 Tons	July 2023 Tons	Aug 2023 Tons	Sep 2023 Tons	Oct 2023 Tons	Nov 2023 Tons	Dec 2023 Tons	Jan 2024 Tons	Marketing year Mar 2023 - Feb 2024 Progressive: 11 Months (Mar - Jan)	
Palm Oil and Derivatives	14 421	1 235	839	789	1 384	937	993	1 198	982	1 204	618	1 159	11 338	
Soybean Oil	53 889	8 905	6 260	12 108	10 470	8 225	7 187	3 808	4 929	1 052	536	4 580	68 060	
Sunflower Oil	2 971	314	258	948	412	404	471	452	608	671	501	1 541	6 580	
Coconut Oil / Groundnut Oil / Canola Oil / Corn (Maize) Oil / Blends or mixes of Oils which includes one of the above Oils / Biodiesel / Cottonseed Oil	12 559	2 493	772	2 426	1 525	882	377	708	514	1 298	345	1 303	12 643	
Sunflower Oilcake	1 755	0	0	0	0	0	0	0	0	0	0	0	0	
Coconut Oilcake	0	0	0	0	0	0	0	0	0	0	0	0	0	
Palmmut Oilcake	0	0	0	0	0	0	0	0	0	0	0	0	0	
Soybean Oilcake / Canola Oilcake / Cottonseed Oilcake	18 052	192	584	810	554	659	1 356	1 407	969	1 256	1 250	1 046	10 083	
Soybean Flours and Meals / Textured Vegetable Protein	21 019	1 787	1 056	1 329	769	639	1 666	1 419	1 193	2 469	1 105	2 130	15 562	
Soybean Fullfat	3 450	0	0	0	0	0	0	0	0	0	0	0	0	
Peanut Butter and Paste	240	23	17	13	20	16	15	21	26	9	16	17	193	
Total	128 356	14 949	9 786	18 423	15 134	11 762	12 065	9 013	9 221	7 959	4 371	11 776	124 459	

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.

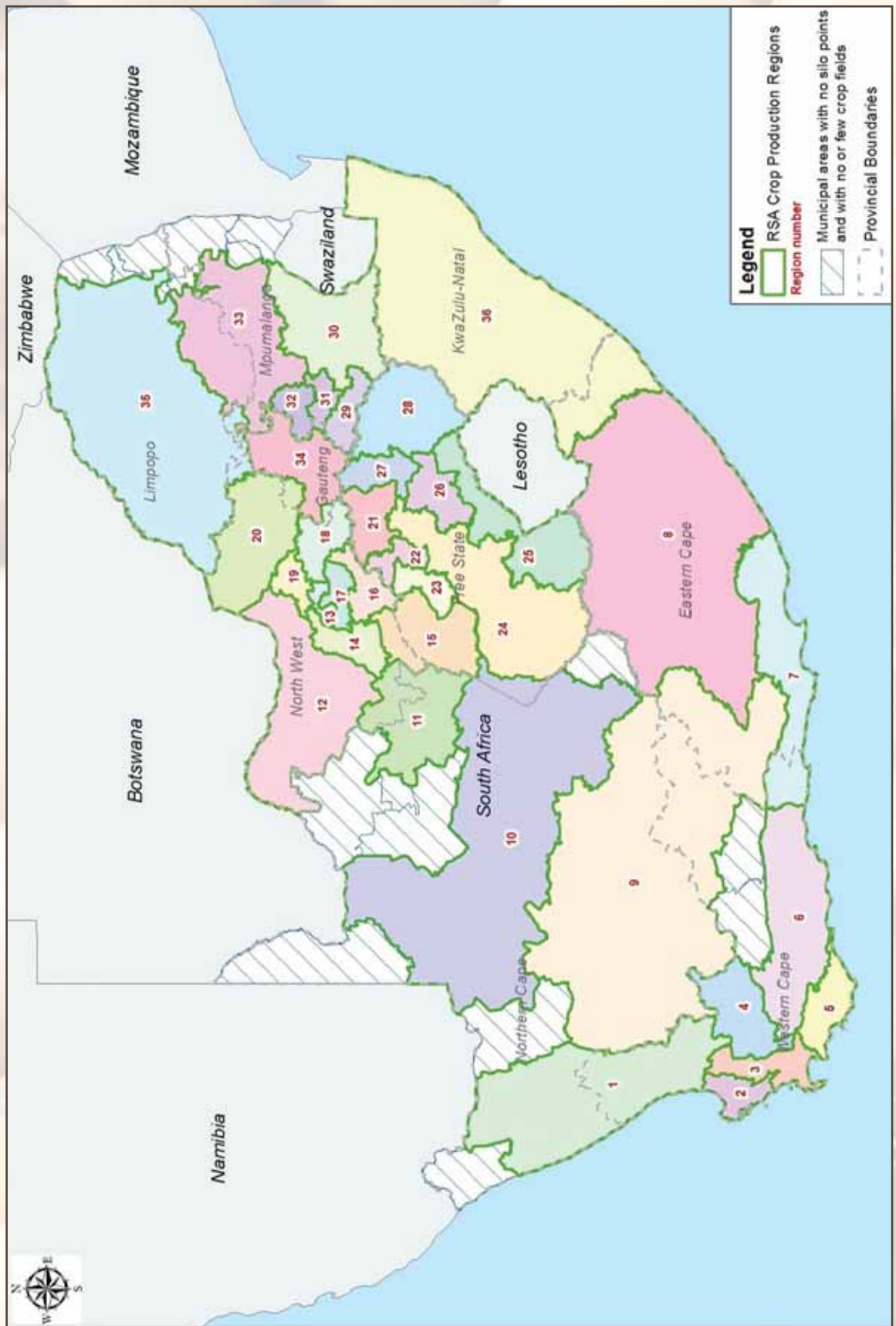
The regions are distributed as follows:

- 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 2022/23 production season, are named and described on pages 21 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.

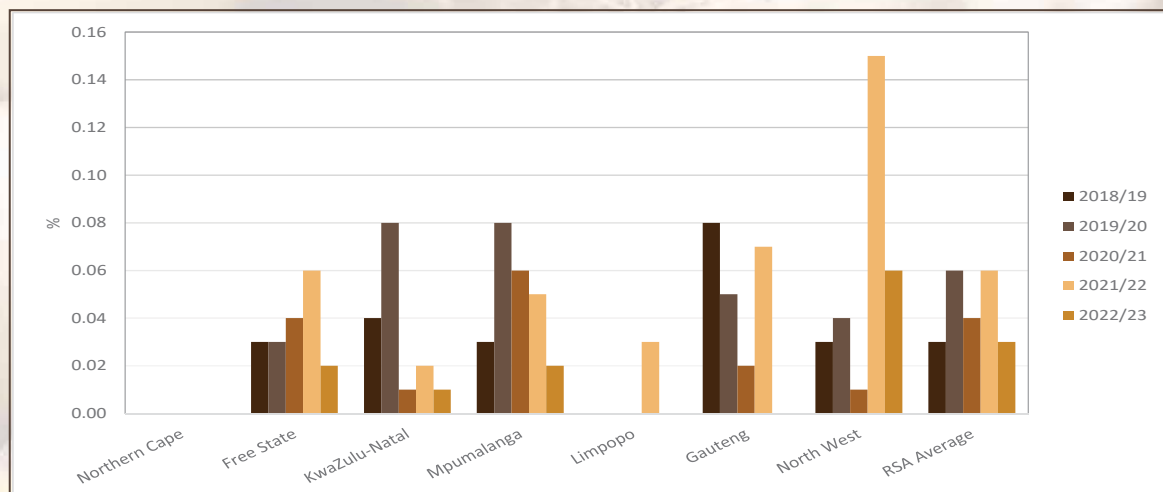
Soybean Crop Quality 2022/23 – Summary of results

Eighty-three percent (145) of the 174 samples analysed for the purpose of this survey were graded as Grade SB1, while 29 (17%) of the samples were downgraded to COSB (Class Other Soya Beans). During the previous two seasons, 19% (2021/22) and 20% (2020/21) of the samples were downgraded to COSB.

- Three of the 29 samples were downgraded as a result of the percentage other grain exceeding the maximum permissible deviation of 0.5%.
- Five samples were downgraded as a result of the percentage soiled soybeans present in the samples exceeding the maximum permissible deviation of 10%.
- Eleven samples were downgraded as a result of the number of *Crotolaria sp.* and two samples as a result of *Datura sp.* poisonous seeds present exceeding the maximum permissible number of 1 per 1000 g. A further two samples had both *Crotolaria sp.* and *Datura sp.* present.
- One sample was downgraded as a result of the number of *Ipomoea purpurea Roth.* and another as a result of *Convolvulus sp.* poisonous seeds present exceeding the maximum permissible number of 7 per 1000 g.
- The remaining four samples were downgraded as a result of a combination of two or more of the following deviations exceeding the maximum permissible deviation: foreign matter, other grain, collective deviations and the presence of poisonous seeds (*Datura sp.* and *Crotolaria sp.*).

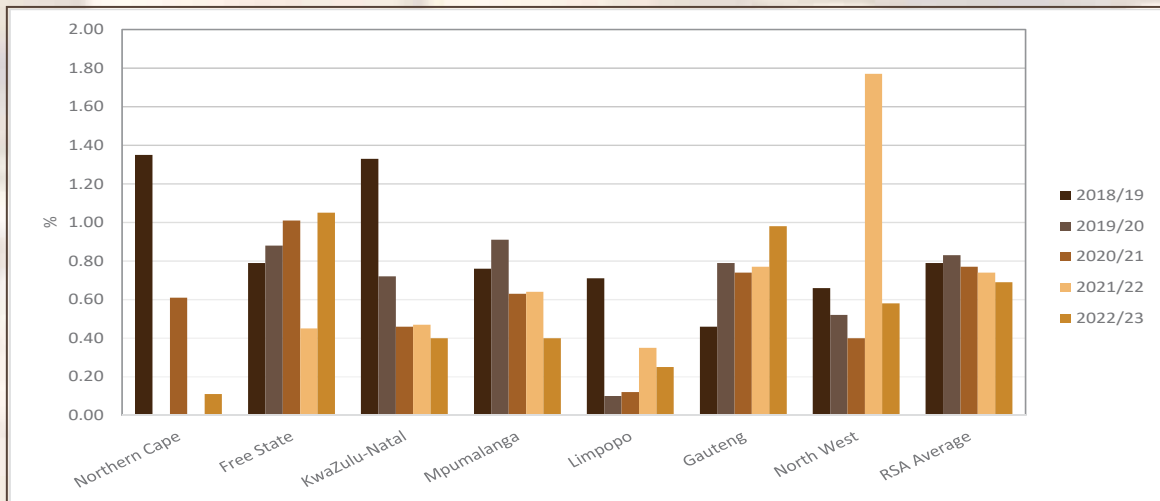
The percentage samples containing sclerotia from the fungus *Sclerotinia sclerotiorum* was 26%, compared to the 43% of the previous two seasons. 37% of the samples that contained sclerotia this season originated in Mpumalanga, 30% in the Free State, 28% in North West and one sample each in Gauteng and KwaZulu-Natal. All these percentages sclerotia found to be present in the samples were however still well below the maximum permissible level of 4%. The national weighted average percentage this season was 0.03% compared to the 0.06% of the previous season. See Graph 16.

Graph 16: Average percentage sclerotia per province over five seasons



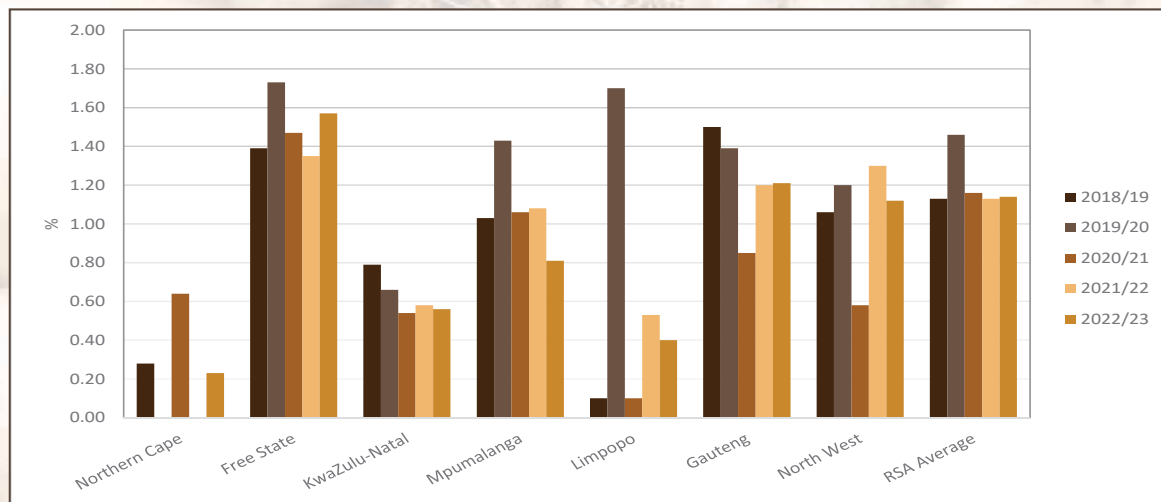
The samples received from the Free State province (66 samples) had the highest weighted average percentage foreign matter (1.05%), followed by Gauteng (3 samples) with 0.98% and North West (29 samples) with 0.58%. The lowest percentage foreign matter was observed on the two samples from the Northern Cape, namely 0.11%. The national weighted average of 0.69% 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 1.57%, followed by the 1.21% and 1.12% from Gauteng and North West respectively. The lowest weighted average value reported were 0.23% on the samples from the Northern Cape. The national weighted average percentage of 1.14% was similar to the 1.13% and 1.16% of the previous two seasons respectively. Please see Graph 18.

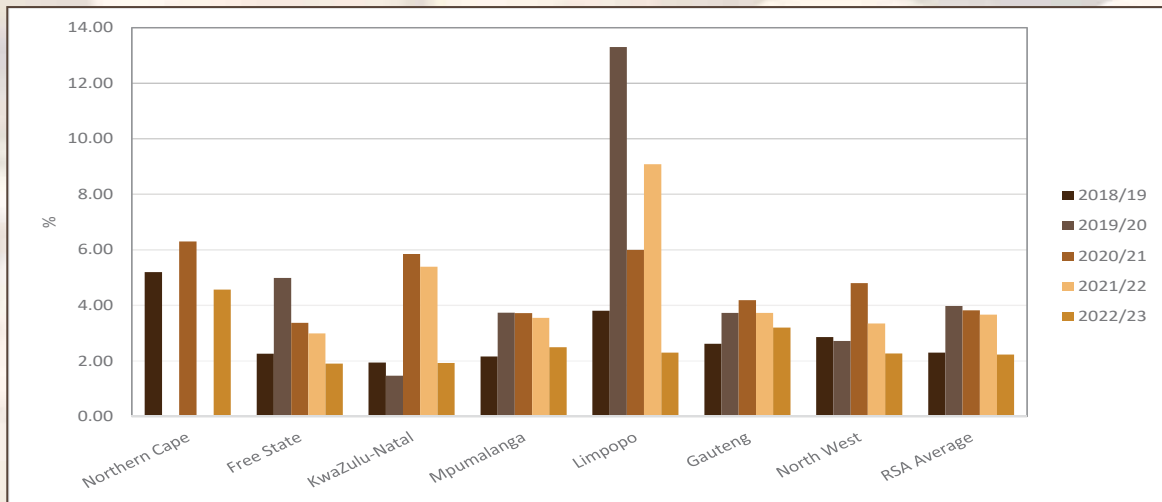
Graph 18: Average percentage soybeans and parts of soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve per province over five seasons



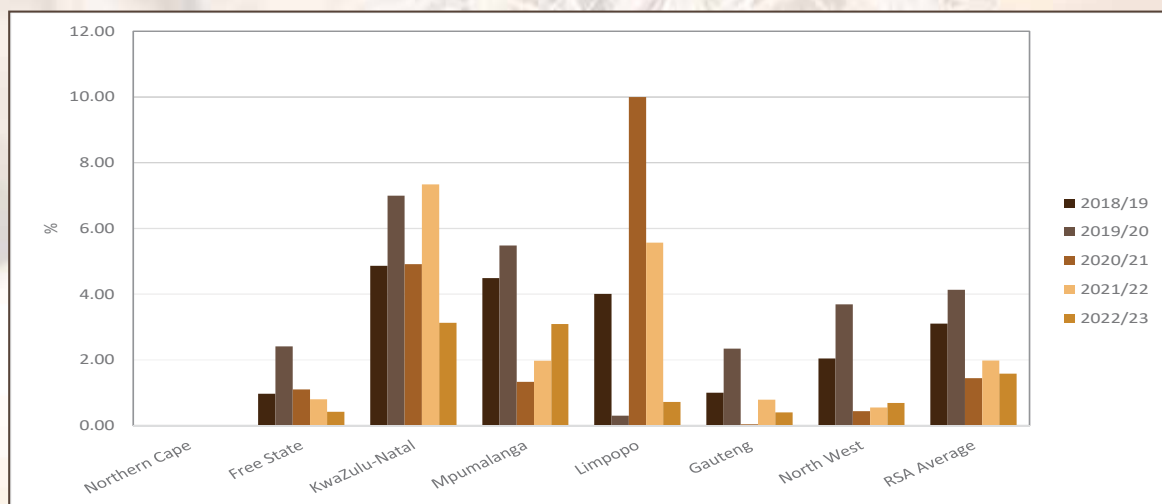
The lowest weighted average percentages defective soybeans on the 4.75 mm sieve, was reported on the Free State samples (1.90%) and the nine samples from KwaZulu-Natal (1.93%). The highest percentage, namely 4.57% was observed on the Northern Cape samples. The averages in the other provinces ranged from 2.27% to 3.20%. The national weighted average decreased from 3.67% last season to 2.23% this season. Please see Graph 19.

The national weighted average percentage soiled soybeans was 1.58%. The previous two seasons averaged 1.98% and 1.44% respectively. The highest weighted average percentages were observed in KwaZulu-Natal (3.13%) and Mpumalanga (64 samples) with 3.09%. The remaining weighted averages ranged between 0% and 0.72%. Please see Graph 20. Eighty-six of the samples analysed contained soiled soybeans. Five samples exceeded the maximum permissible deviation of 10% according to the grading regulations. The highest percentage reported was 27.05% on a sample from Mpumalanga. The rest of these samples originated in Mpumalanga and North West. Last season, eight samples 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



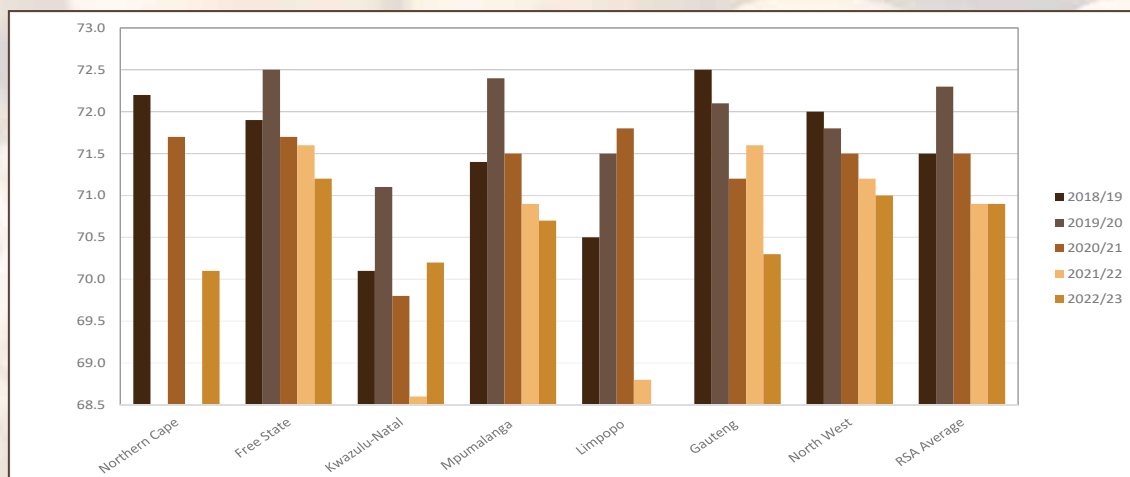
Test weight does not form part of the grading regulations for soybeans in South Africa. An approximation of the test weight of South African soybeans is provided in Table 2 for information purposes. The standard working procedure of the Kern 222 instrument, as described in ISO 7971-3:2019, was followed. 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.

Province	Test weight, kg/hl								
	2022/23 Season			2021/22 Season			2020/21 Season		
	Weighted average	Range	No. of samples	Weighted average	Range	No. of samples	Weighted average	Range	No. of samples
Northern Cape (Regions 10 - 11)	70.1	70.0 - 70.2	2	-	-	-	71.7	71.6 - 71.7	2
Free State (Regions 21 - 28)	71.2	64.3 - 73.2	*65	71.6	69.8 - 73.3	**36	71.7	68.9 - 75.0	**59
KwaZulu-Natal (Region 36)	70.2	69.0 - 72.1	9	68.6	65.7 - 71.1	14	69.8	67.7 - 71.2	10
Mpumalanga (Regions 29 - 33)	70.7	68.3 - 73.4	64	70.9	67.4 - 73.1	65	71.5	66.5 - 73.2	*65
Limpopo (Region 35)	67.4	-	1	68.8	63.7 - 72.7	3	71.8	-	1
Gauteng (Region 34)	70.3	68.7 - 71.3	3	71.6	70.7 - 72.3	9	71.2	70.3 - 71.8	5
North West (Region 12 - 20)	71.0	68.6 - 72.8	29	71.2	68.7 - 74.2	21	71.5	70.8 - 71.9	5
RSA	70.9	64.3 - 73.4	173	70.9	63.7 - 74.2	148	71.5	66.5 - 75.0	147

* 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'.

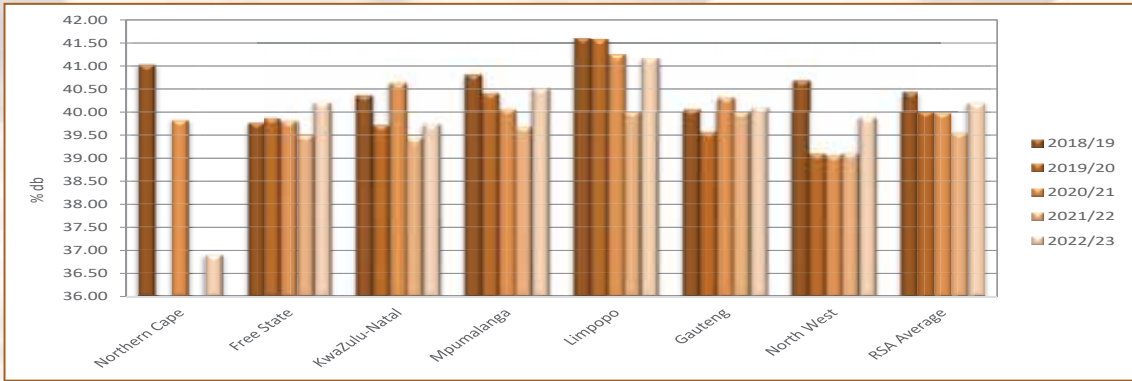
Season	2022/23		2021/22		2020/21		2019/20		2018/19	
Moisture, % (17hr, 103°C)	8.2		8.2		7.5		7.2		7.0	
Moisture basis	Dry basis	As is	Dry basis	As is	Dry basis	As is	Dry basis	As is	Dry basis	As is
Crude protein, %	40.19	36.90	39.54	36.31	39.96	36.95	39.99	37.12	40.43	37.60
Crude fat, %	19.9	18.3	19.6	18.0	19.5	18.0	18.0	16.7	19.1	17.8
Crude fibre, %	7.1	6.5	7.2	6.6	6.8	6.3	7.0	6.5	6.8	6.3
Ash, %	4.54	4.17	4.63	4.25	4.55	4.21	4.63	4.19	4.67	4.34
No. of samples	174		150		150		150		150	

The weighted average crude protein content this season was 40.19% compared to the 39.54% of the previous season. Limpopo (one sample) reported the highest value (41.16%) and the Northern Cape the lowest average (36.90%). The Free State and Mpumalanga averaged 40.19% and 40.50% respectively. The weighted average crude fat percentage of 19.9% was the highest since the 2011/12 season when this survey commenced. The samples from the Northern Cape had the highest weighted average crude fat content, namely 21.3%. The lowest fat average was observed in Gauteng province with 18.6%.

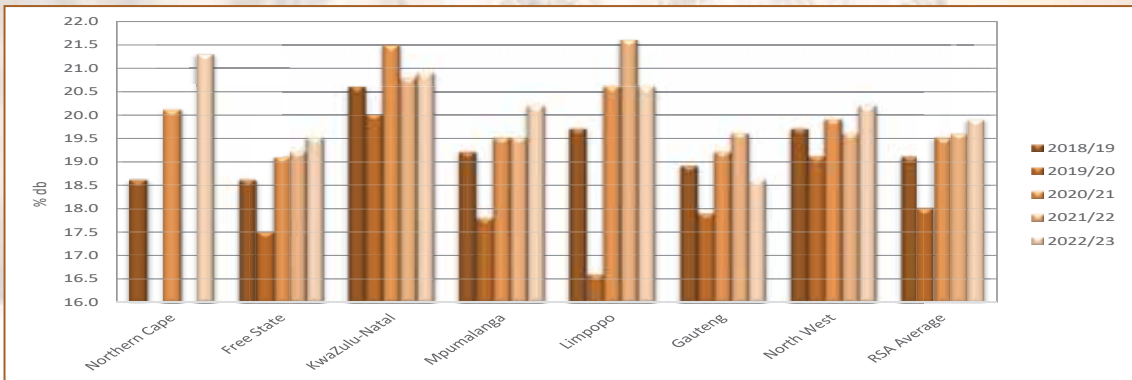
The weighted average percentage crude fibre varied from 6.1% in KwaZulu-Natal to 7.5% in Gauteng. The RSA weighted average was 7.1% compared to the 7.2% of the previous season. This season, the average ash content was 4.54%, the lowest average value of the twelve seasons that this survey has been conducted. Averages ranged from 5.24% in the Northern Cape to 4.70% in KwaZulu-Natal.

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

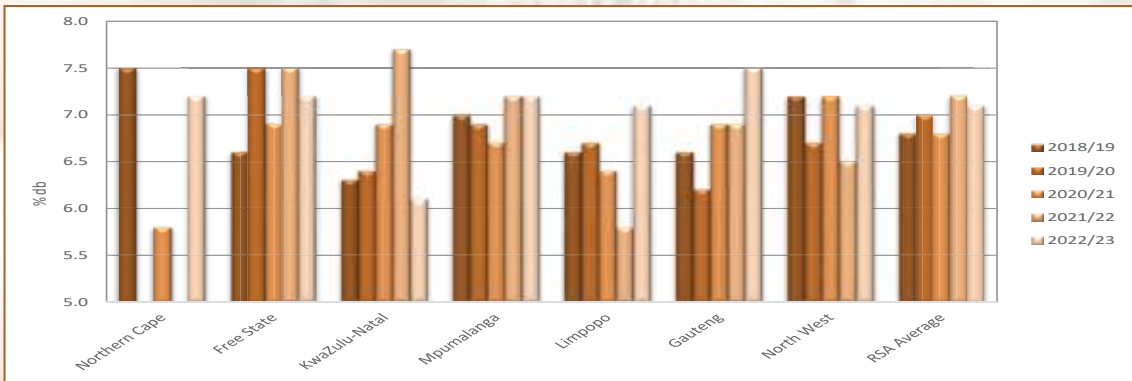
Graph 22: Average crude protein content per province over five seasons



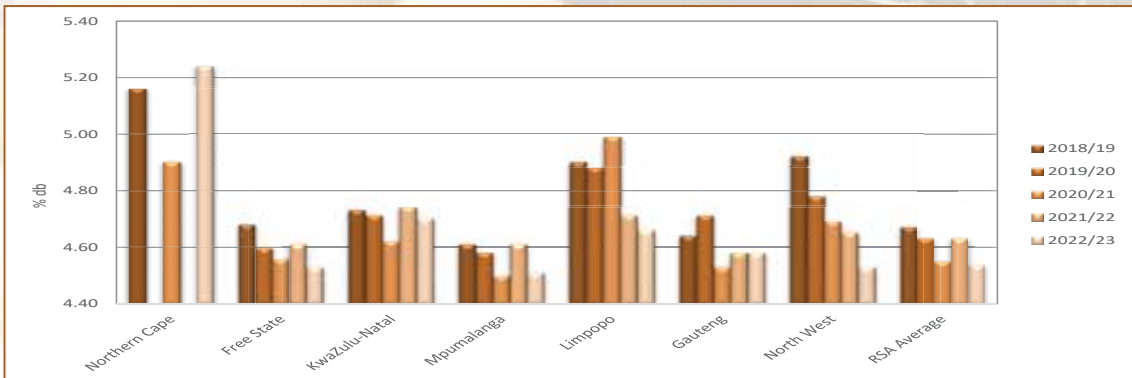
Graph 23: Average crude fat content per province over five seasons



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



Graph 25: Average ash content per province over five seasons



The 2022/23 season is the fifth 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 2022/23 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	8.2	40.19	36.90	19.9	18.3
Minimum	6.4	34.62	30.67	16.6	15.1
Maximum	11.5	44.28	40.91	40.5	36.0
Standard Deviation	1.11	1.51	1.49	2.01	1.80
No. of samples	174	174	174	174	174
ARC Grain Crops Cultivar trial sample results					
Average	8.8	40.68	37.10	20.3	18.5
Minimum	8.4	36.74	33.65	16.5	15.1
Maximum	9.4	43.69	39.58	23.4	21.2
Standard Deviation	0.19	1.38	1.38	1.57	1.57
No. of samples	96	96	96	96	96
% Difference between crop and cultivar samples	-0.6	-0.5	-0.2	-0.4	-0.2

A summary of the RSA Soybean Crop Quality averages of the 2022/23 season compared to those of the 2021/22 season, is provided in Table 5 on page 20.

Please see pages 25 to 33 for the average soybean quality per region.

Table 5: South African Soybean Crop Quality Averages 2022/23 vs 2021/22

Class and Grade Soya	2022/23			2021/22		
	SB1	COSB	Average	SB1	COSB	Average
<u>Grading:</u>						
(A) Wet pods, %	0.00	0.00	0.00	0.00	0.00	0.00
(B) Foreign matter, including stones, other grains and sunflower seeds: Provided that such deviations are individually within the limits specified in items (c), (d), and (e), %	0.46	1.79	0.69	0.50	1.72	0.74
(C) Other grain, %	0.05	0.71	0.16	0.06	0.15	0.08
(D) Sunflower seed, %	0.00	0.03	0.01	0.00	0.01	0.00
(E) Stones, %	0.01	0.01	0.01	0.01	0.03	0.01
(F) Sclerotia, %	0.02	0.05	0.03	0.05	0.11	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, %	1.00	1.84	1.14	1.00	1.65	1.13
(H) Defective soybeans on the 4.75 mm round hole sieve, %	2.28	1.99	2.23	3.22	5.56	3.67
(I) Soiled soybeans, %	1.31	2.93	1.58	1.20	5.24	1.98
(J) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	0.49	1.84	0.71	0.56	1.83	0.80
Poisonous seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	0	9	1	0	7	1
Poisonous seeds (<i>Argemone mexicana L.</i> , <i>Convolvulus sp.</i> , <i>Ipomoea purpurea Roth.</i> , <i>Lolium temulentum</i> , <i>Xanthium sp.</i>)	0	1	0	0	5	1
Undesirable odour	No	No	No	No	No	No
Live insects	No	No	No	No	No	No
Number of samples	145	29	174	121	29	150
<u>Nutritional analysis:</u>						
Moisture, % (17 hr, 103 °C)	8.3	7.8	8.2	8.2	8.2	8.2
Crude Protein, % (db)	40.23	39.98	40.19	39.64	39.13	39.54
Crude Fat, % (db)	20.0	19.7	19.9	19.5	19.7	19.6
Crude Fibre, % (db)	7.1	7.1	7.1	7.1	7.2	7.2
Ash, % (db)	4.53	4.59	4.54	4.62	4.68	4.63
Number of samples	145	29	174	121	29	150

Grain Production Regions

Silo/Intake stands per region indicating type of storage structure

Region 10: Griekwaland-West Region

GWK	Douglas (Bags/Bins)	GWK	Trans Oranje (Bags/Bins)
GWK	Luckhoff (Bins)	OVK	Havengabrug (Bins)
GWK	Marydale (Bins)	OVK	Morgenzon (Bins)
GWK	Modderrivier (Bags/Bins)	OVK	Oranjerivier (Bins/Bunkers)
GWK	Prieska (Bins)	OVK	Prieska (Bins/Bunkers)
GWK	Rietrivier (Bins)	OVK	Rietrivier (Bins)
GWK	Stoffelshoek (Bunkers)		

Region 11: Vaalharts Region

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

Region 12: North-West Western Region

NWK	Blaauwbank (Bins)	NWK	Mareetsane (Bins)
NWK	Buhrmannsdrif (Bins)	Senwes	Kameel (Bins)
NWK	Kameel (Bins)	Senwes	Vryburg (Bins)

Region 13: North-West Central Region (Sannieshof)

NWK	Biesiesvlei (Bins)	NWK	Oppaslaagte (Bins)
NWK	Bossies (Bins)	NWK	Sannieshof (Bins)
NWK	Gerdau (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 15: North-West Southern-Eastern Region

GWK	Christiana (Bins)	Senwes	Hoopstad (Bins)
Senwes	Bloemhof (Bins)	Senwes	Kingswood (Bins)
Senwes	Christiana (Bins)	Senwes	Kruising (Bunkers)
Senwes	Helpman Depot (Bags)	Senwes	Poppieland (Bunkers)
Senwes	Hertzogville (Bins)		

Region 16: North-West Central Eastern Region

Senwes	Bamboesspruit (Bins)	Senwes	Regina (Bins)
Senwes	Klerksdorp (Bins)	Senwes	Strydpoort (Bins)
Senwes	Leeudoringstad (Bins)	Senwes	Wolmaranstad (Bins)
Senwes	Makwassie (Bins)		

Region 17: North-West Central Region (Ottosdal)

NWK	Boschpoort (Bags/Bins/Bulk)	NWK	Vermaas (Bins)
NWK	Kleinharts (Bins)	Senwes	Hartbeesfontein (Bins)
NWK	Ottosdal (Bins)	Senwes	Melliadora (Bins)
NWK	Rostrataville (Bins)	Senwes	Werda (Bins)

Grain Production Regions

Silo/Intake stands per region indicating type of storage structure

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 19: North-West Central Region (Lichtenburg)

Afgri	Lichtenburg (Bunkers)	NWK	Lottie Halte (Bins)
NWK	Grootpan 1 (Bins)	NWK	Lusthof (Bins)
NWK	Grootpan 2 (Bins)	NWK	Lichtenburg Silo 3 (Bins)
NWK	Halfpad (Bins)	NWK	Lichtenburg Silo 5 (Bins)
NWK	Hibernia (Bins)	NWK	Mafikeng (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 24: Free State Central Region

Senwes	Bainsvlei (Bins)	Senwes	Kroonstad (Bins)
Senwes	Bloemfontein (Bins)	Senwes	Pietersburg (Bins)
Senwes	Brandfort (Bins)	Senwes	Theunissen (Bins)
Senwes	De Burg (Bins)	Senwes	Van Tonder (Bins)
Senwes	Geneva (Bins)	Senwes	Welgeleë (Bins)
Senwes	Hennenman (Bins)	Senwes	Winburg (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	Morgenzon (Bins)
Afgri	Carolina (Bins)	Afgri	Overvaal (Bins)
Afgri	Davel (Bins)	Afgri	Sandspruit (Bunkers)
Afgri	Eerstelingsfontein (Bunker)	Afgri	Hendriksvallei (Bunkers)
Afgri	Ermelo (Bins)	BKB	Waterval (Bunkers)
Afgri	Estancia (Bins)	TWK	Mkondo (Bins)
Afgri	Lothair (Bins)	TWK	Panbult (Panbult)
Afgri	Maizefield (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)

Grain Production Regions

Silo/Intake stands per region indicating type of storage structure

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)		

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	Bronkhorstspuit (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	(10) Griqualand-West Region				(11) Vaalharts Region				(12) North-West Western Region			
<u>Grading:</u>	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
(a) Wet pods, %	0.00	-	-	-	0.00	-	-	-	0.00	-	-	-
(b) Foreign matter, including stones, other grains and sunflower seeds: Provided that such deviations are individually within the limits specified in items (c), (d), and (e), %	0.12	-	-	-	0.10	-	-	-	0.70	-	-	-
(c) Other grain, %	0.00	-	-	-	0.00	-	-	-	0.50	-	-	-
(d) Sunflower seed, %	0.00	-	-	-	0.00	-	-	-	0.00	-	-	-
(e) Stones, %	0.00	-	-	-	0.00	-	-	-	0.00	-	-	-
(f) Sclerotia, %	0.00	-	-	-	0.00	-	-	-	0.00	-	-	-
(g) Soybeans and parts of Soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	0.30	-	-	-	0.15	-	-	-	0.14	-	-	-
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	5.64	-	-	-	3.50	-	-	-	3.00	-	-	-
(i) Soiled Soybeans, %	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, %	0.12	-	-	-	0.10	-	-	-	0.70	-	-	-
Poisonous seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	0	-	-	-	0	-	-	-	0	-	-	-
Poisonous seeds (<i>Argemone mexicana L.</i> , <i>Convolvulus sp.</i> , <i>Ipomoea purpurea Roth.</i> , <i>Lolium temulentum</i> , <i>Xanthium sp.</i>)	0	-	-	-	0	-	-	-	0	-	-	-
Number of samples	1				1				1			
<u>Nutritional analysis:</u>	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
Moisture, % (17 hr, 103 °C)	7.5	-	-	-	7.6	-	-	-	6.4	-	-	-
Crude protein, % (db)	36.54	-	-	-	37.26	-	-	-	38.63	-	-	-
Crude fat, % (db)	21.3	-	-	-	21.3	-	-	-	22.3	-	-	-
Crude Fibre, % (db)	7.4	-	-	-	6.9	-	-	-	8.4	-	-	-
Ash, % (db)	5.26	-	-	-	5.22	-	-	-	4.56	-	-	-
Number of samples	1				1				1			

South African

REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(13) North-West Central Region (Sannieshof)				(14) North-West Southern Region				(15) North-West Southern Region			
	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
Grading:												
(a) Wet pods, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(b) Foreign matter, including stones, other grains and sunflower seeds: Provided that such deviations are individually within the limits specified in items (c), (d), and (e), %	0.52	0.44	0.60	0.11	0.25	0.04	0.60	0.20	0.58	0.20	1.28	0.36
(c) Other grain, %	0.12	0.10	0.14	0.03	0.00	0.00	0.00	0.00	0.02	0.00	0.20	0.07
(d) Sunflower seed, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.13	0.04
(e) Stones, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(f) Sclerotia, %	0.13	0.10	0.16	0.04	0.06	0.00	0.10	0.05	0.01	0.00	0.10	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, %	0.85	0.80	0.90	0.07	0.60	0.10	1.00	0.31	1.50	0.56	1.82	0.41
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	2.05	2.00	2.10	0.07	3.45	1.12	4.48	1.27	2.15	1.00	5.00	1.25
(i) Soiled Soybeans, %	0.00	0.00	0.00	0.00	0.06	0.00	0.18	0.09	0.18	0.00	1.20	0.41
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	0.65	0.54	0.76	0.16	0.31	0.10	0.70	0.23	0.59	0.20	1.28	0.38
Poisonous seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	3	0	5	3.54	0	0	0	0.00	0	0	0	0.00
Poisonous seeds (<i>Argemone mexicana L.</i> , <i>Convolvulus sp.</i> , <i>Ipomoea purpurea Roth.</i> , <i>Lolium temulentum</i> , <i>Xanthium sp.</i>)	0	0	0	0.00	0	0	0	0.00	0	0	0	0.00
Number of samples	2				6				9			
Nutritional analysis:												
Moisture, % (17 hr, 103 °C)	8.0	7.1	8.9	1.27	7.1	6.9	7.2	0.12	7.3	6.9	8.9	0.61
Crude protein, % (db)	38.97	37.81	40.12	1.63	39.76	39.03	40.31	0.52	40.83	39.76	42.18	0.85
Crude fat, % (db)	20.4	19.6	21.2	1.13	20.8	20.3	21.2	0.40	19.8	19.0	20.6	0.48
Crude Fibre, % (db)	7.0	6.8	7.1	0.21	7.5	6.5	8.6	0.92	6.9	5.9	7.7	0.67
Ash, % (db)	4.61	4.49	4.73	0.17	4.46	4.39	4.55	0.06	4.57	4.36	4.95	0.17
Number of samples	2				6				9			

South African

REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(16) North-West Central Eastern Region				(17) North-West Central Northern Region (Ottosdal)				(18) North-West Central Region (Ventersdorp)			
	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
Grading:												
(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), %	0.86	0.04	2.40	1.05	0.30	-	-	-	1.47	0.26	2.68	1.71
(c) Other grain, %	0.00	0.00	0.00	0.00	0.00	-	-	-	0.23	0.06	0.40	0.24
(d) Sunflower seed, %	0.01	0.00	0.05	0.03	0.00	-	-	-	0.07	0.04	0.10	0.04
(e) Stones, %	0.00	0.00	0.00	0.00	0.00	-	-	-	0.00	0.00	0.00	0.00
(f) Sclerotia, %	0.10	0.00	0.20	0.12	0.10	-	-	-	0.00	0.00	0.00	0.00
(g) Soybeans and parts of Soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	1.05	0.16	1.72	0.66	2.40	-	-	-	2.17	2.00	2.34	0.24
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	1.53	0.80	2.20	0.63	1.80	-	-	-	1.81	1.00	2.62	1.15
(i) Soiled Soybeans, %	2.91	0.00	11.64	5.82	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, %	0.96	0.04	2.40	1.01	0.40	-	-	-	1.47	0.26	2.68	1.71
Poisonous seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	0	0	0	0.00	0	-	-	-	10	0	20	14.14
Poisonous seeds (<i>Argemone mexicana L.</i> , <i>Convolvulus sp.</i> , <i>Ipomoea purpurea Roth.</i> , <i>Lolium temulentum</i> , <i>Xanthium sp.</i>)	0	0	0	0.00	0	-	-	-	0	0	0	0.00
Number of samples	4				1				2			
Nutritional analysis:												
Moisture, % (17 hr, 103 °C)	7.2	7.0	7.3	0.13	7.8	-	-	-	7.5	6.7	8.3	1.13
Crude protein, % (db)	40.24	37.75	41.39	1.71	40.47	-	-	-	37.59	34.97	40.20	3.70
Crude fat, % (db)	20.4	19.5	21.3	0.88	19.5	-	-	-	19.9	19.0	20.7	1.20
Crude Fibre, % (db)	6.2	5.9	6.9	0.48	6.8	-	-	-	6.7	6.5	6.8	0.21
Ash, % (db)	4.44	4.15	4.72	0.23	4.41	-	-	-	4.49	4.36	4.62	0.18
Number of samples	4				1				2			

South African

REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(19) North-West Central Region (Lichtenburg)				(20) North-Western Eastern Region				(21) Free State North-Western Region (Viljoenskroon)			
<u>Grading:</u>	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
(a) Wet pods, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(b) Foreign matter, including stones, other grains and sunflower seeds: Provided that such deviations are individually within the limits specified in items (c), (d), and (e), %	0.40	0.35	0.45	0.07	0.38	0.26	0.50	0.17	2.84	0.16	7.65	2.56
(c) Other grain, %	0.07	0.00	0.14	0.10	0.00	0.00	0.00	0.00	1.10	0.00	5.40	2.10
(d) Sunflower seed, %	0.03	0.00	0.06	0.04	0.05	0.00	0.10	0.07	0.00	0.00	0.00	0.00
(e) Stones, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(f) Sclerotia, %	0.05	0.00	0.10	0.07	0.16	0.10	0.22	0.08	0.04	0.00	0.20	0.07
(g) Soybeans and parts of Soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	0.75	0.70	0.80	0.07	0.50	0.40	0.60	0.14	2.82	0.80	6.25	1.85
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	1.23	1.20	1.26	0.04	2.30	2.20	2.40	0.14	1.79	1.06	2.60	0.55
(i) Soiled Soybeans, %	0.00	0.00	0.00	0.00	3.25	0.50	6.00	3.89	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, %	0.45	0.45	0.45	0.00	0.54	0.48	0.60	0.08	2.88	0.16	7.65	2.59
Poisonous seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	5	0	10	7.07	0	0	0	0.00	4	0	20	8
Poisonous seeds (<i>Argemone mexicana L.</i> , <i>Convolvulus sp.</i> , <i>Ipomoea purpurea Roth.</i> , <i>Lolium temulentum</i> , <i>Xanthium sp.</i>)	0	0	0	0.00	0	0	0	0.00	0	0	0	0
Number of samples	2				2				9			
<u>Nutritional analysis:</u>	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
Moisture, % (17 hr, 103 °C)	8.3	8.3	8.3	0.00	8.3	6.8	9.8	2.12	7.5	7.0	8.9	0.64
Crude protein, % (db)	39.92	39.86	39.97	0.08	38.39	37.64	39.13	1.05	40.67	38.59	42.76	1.21
Crude fat, % (db)	18.9	18.9	18.9	0.00	19.8	19.7	19.8	0.07	19.7	17.3	20.8	1.01
Crude Fibre, % (db)	7.3	7.3	7.3	0.00	7.8	7.4	8.1	0.49	6.8	5.8	7.9	0.69
Ash, % (db)	4.52	4.48	4.56	0.06	4.73	4.72	4.73	0.01	4.52	4.24	4.84	0.16
Number of samples	2				2				9			

South African

REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(22) Free State North-Western Region (Bothaville)				(23) Free State North-Western Region (Bultfontein)				(24) Free State Central Region			
	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
Grading:												
(a) Wet pods, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(b) Foreign matter, including stones, other grains and sunflower seeds: Provided that such deviations are individually within the limits specified in items (c), (d), and (e), %	1.01	0.10	3.32	1.21	0.70	0.20	1.90	0.50	0.86	0.16	2.60	1.17
(c) Other grain, %	0.74	0.00	5.35	1.87	0.11	0.00	0.76	0.24	0.21	0.00	0.58	0.28
(d) Sunflower seed, %	0.02	0.00	0.10	0.04	0.02	0.00	0.10	0.04	0.00	0.00	0.00	0.00
(e) Stones, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.10	0.05
(f) Sclerotia, %	0.02	0.00	0.10	0.04	0.01	0.00	0.10	0.03	0.00	0.00	0.00	0.00
(g) Soybeans and parts of Soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	2.69	0.50	5.35	1.57	1.40	0.40	3.20	0.72	1.88	0.57	4.08	1.60
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	2.00	1.00	4.00	0.89	1.30	0.54	2.66	0.67	2.45	0.40	5.80	2.33
(i) Soiled Soybeans, %	0.58	0.00	2.80	0.95	0.03	0.00	0.20	0.07	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, %	1.03	0.10	3.32	1.22	0.71	0.20	1.90	0.50	0.86	0.16	2.60	1.17
Poisonous seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	5	0	20	7.56	6	0	30	9.96	10	0	30	14.14
Poisonous seeds (<i>Argemone mexicana L.</i> , <i>Convolvulus sp.</i> , <i>Ipomoea purpurea Roth.</i> , <i>Lolium temulentum</i> , <i>Xanthium sp.</i>)	0	0	0	0.00	0	0	0	0.00	0	0	0	0.00
Number of samples	8				12				4			
Nutritional analysis:												
Moisture, % (17 hr, 103 °C)	8.3	6.7	9.7	0.92	7.2	6.8	8.9	0.63	8.2	7.0	11.4	2.13
Crude protein, % (db)	40.50	37.20	41.62	1.45	40.33	37.73	42.88	1.39	38.50	34.62	42.25	3.12
Crude fat, % (db)	18.9	16.8	21.8	1.47	19.5	17.9	21.0	1.07	19.9	19.0	20.4	0.65
Crude Fibre, % (db)	7.0	6.0	7.9	0.64	7.1	6.1	8.5	0.76	7.5	6.3	8.6	1.14
Ash, % (db)	4.51	4.41	4.64	0.09	4.58	4.44	4.78	0.09	4.74	4.50	5.02	0.21
Number of samples	8				12				4			

South African

REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(26) Free State South-Eastern Region				(27) Free State Northern Region				(28) Free State Eastern Region			
	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
Grading:												
(a) Wet pods, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(b) Foreign matter, including stones, other grains and sunflower seeds: Provided that such deviations are individually within the limits specified in items (c), (d), and (e), %	5.54	0.38	10.70	7.30	0.51	0.07	0.94	0.62	0.41	0.02	2.24	0.60
(c) Other grain, %	0.25	0.00	0.50	0.35	0.25	0.00	0.50	0.35	0.10	0.00	2.00	0.38
(d) Sunflower seed, %	0.10	0.00	0.20	0.14	0.02	0.00	0.04	0.03	0.00	0.00	0.00	0.00
(e) Stones, %	0.00	0.00	0.00	0.00	0.05	0.00	0.10	0.07	0.01	0.00	0.20	0.04
(f) Sclerotia, %	0.16	0.12	0.20	0.06	0.00	0.00	0.00	0.00	0.01	0.00	0.10	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, %	3.48	1.05	5.90	3.43	0.50	0.20	0.80	0.42	0.85	0.00	4.40	1.00
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	2.12	2.10	2.14	0.03	1.07	0.66	1.48	0.58	2.11	0.40	3.80	0.93
(i) Soiled Soybeans, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.79	0.00	6.12	1.57
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	5.70	0.50	10.90	7.35	0.51	0.07	0.94	0.62	0.42	0.02	2.24	0.61
Poisonous seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	15	10	20	7.07	0	0	0	0.00	0	0	0	0.00
Poisonous seeds (<i>Argemone mexicana L.</i> , <i>Convolvulus sp.</i> , <i>Ipomoea purpurea Roth.</i> , <i>Lolium temulentum</i> , <i>Xanthium sp.</i>)	0	0	0	0.00	0	0	0	0.00	0	0	10	1.86
Number of samples	2				2				29			
Nutritional analysis:												
Moisture, % (17 hr, 103 °C)	8.1	8.0	8.2	0.14	7.4	6.8	7.9	0.78	8.5	7.1	11.5	0.90
Crude protein, % (db)	38.89	38.58	39.19	0.43	39.86	39.18	40.54	0.96	40.24	35.38	42.45	1.50
Crude fat, % (db)	18.0	17.6	18.3	0.49	18.8	17.8	19.8	1.41	19.6	16.6	23.5	1.63
Crude Fibre, % (db)	7.9	7.7	8.1	0.28	7.6	7.4	7.7	0.21	7.3	6.2	8.3	0.54
Ash, % (db)	4.62	4.60	4.63	0.02	4.43	4.35	4.50	0.11	4.48	4.27	4.73	0.12
Number of samples	2				2				29			

South African

REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(29) Mpumalanga Southern Region				(30) Mpumalanga Eastern Region				(31) Mpumalanga Central Region			
<u>Grading:</u>	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
(a) Wet pods, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(b) Foreign matter, including stones, other grains and sunflower seeds: Provided that such deviations are individually within the limits specified in items (c), (d), and (e), %	0.41	0.06	0.90	0.28	0.34	0.10	0.82	0.20	0.18	0.16	0.20	0.03
(c) Other grain, %	0.02	0.00	0.40	0.08	0.05	0.00	0.34	0.10	0.00	0.00	0.00	0.00
(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, %	0.01	0.00	0.08	0.02	0.07	0.00	0.73	0.19	0.00	0.00	0.00	0.00
(f) Sclerotia, %	0.01	0.00	0.10	0.02	0.02	0.00	0.10	0.04	0.00	0.00	0.00	0.00
(g) Soybeans and parts of Soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	0.97	0.14	3.22	0.64	0.57	0.08	1.07	0.27	0.18	0.16	0.20	0.03
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	2.59	1.20	5.20	1.10	1.98	1.00	3.00	0.54	1.65	1.64	1.66	0.01
(i) Soiled Soybeans, %	1.34	0.00	6.62	1.81	3.00	0.00	7.40	2.45	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, %	0.42	0.06	0.90	0.27	0.36	0.10	0.86	0.21	0.18	0.16	0.20	0.03
Poisonous seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	0	0	0	0.00	0	0	0	0.00	0	0	0	0.00
Poisonous seeds (<i>Argemone mexicana L.</i> , <i>Convolvulus sp.</i> , <i>Ipomoea purpurea Roth.</i> , <i>Lolium temulentum</i> , <i>Xanthium sp.</i>)	0	0	0	0.00	0	0	0	0.00	0	0	0	0.00
Number of samples	25				17				2			
<u>Nutritional analysis:</u>	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
Moisture, % (17 hr, 103 °C)	9.3	7.6	11.0	0.83	9.2	7.2	11.0	1.31	8.5	8.1	8.8	0.49
Crude protein, % (db)	40.10	38.16	43.69	1.37	40.20	38.58	41.59	0.91	39.91	39.33	40.48	0.81
Crude fat, % (db)	20.0	17.7	22.2	1.00	20.8	18.5	40.5	5.17	19.3	18.6	20.0	0.99
Crude Fibre, % (db)	7.5	6.1	8.5	0.76	7.7	6.3	8.9	0.74	7.3	7.2	7.3	0.07
Ash, % (db)	4.51	4.14	4.82	0.16	4.44	4.18	4.60	0.12	4.43	4.38	4.47	0.06
Number of samples	25				17				2			

South African

REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(32) Mpumalanga Western Region				(33) Mpumalanga Northern Region				(34) Gauteng Region			
	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
Grading:												
(a) Wet pods, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(b) Foreign matter, including stones, other grains and sunflower seeds: Provided that such deviations are individually within the limits specified in items (c), (d), and (e), %	0.50	0.30	0.70	0.28	0.47	0.10	1.83	0.55	0.98	0.20	2.11	1.00
(c) Other grain, %	0.00	0.00	0.00	0.00	0.12	0.00	0.45	0.16	0.03	0.00	0.10	0.06
(d) Sunflower seed, %	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.02	0.00	0.00	0.00	0.00
(e) Stones, %	0.00	0.00	0.00	0.00	0.01	0.00	0.10	0.02	0.00	0.00	0.00	0.00
(f) Sclerotia, %	0.05	0.00	0.10	0.07	0.04	0.00	0.23	0.07	0.06	0.00	0.19	0.11
(g) Soybeans and parts of Soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, %	1.58	1.16	2.00	0.59	0.81	0.20	4.12	0.91	1.21	0.10	2.34	1.12
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	1.73	1.46	2.00	0.38	3.02	0.42	6.00	1.66	3.20	2.40	4.00	0.80
(i) Soiled Soybeans, %	3.01	1.22	4.80	2.53	5.95	0.00	27.05	7.29	0.40	0.28	0.62	0.19
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	0.55	0.40	0.70	0.21	0.51	0.10	2.06	0.59	1.04	0.20	2.30	1.11
Poisonous seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	5	0	10	7.07	0	0	0	0.00	0	0	0	0.00
Poisonous seeds (<i>Argemone mexicana L.</i> , <i>Convolvulus sp.</i> , <i>Ipomoea purpurea Roth.</i> , <i>Lolium temulentum</i> , <i>Xanthium sp.</i>)	0	0	0	0.00	0	0	5	1.18	7	0	20	11.55
Number of samples	2				18				3			
Nutritional analysis:												
Moisture, % (17 hr, 103 °C)	8.7	8.3	9.0	0.49	7.8	7.3	8.7	0.36	8.5	8.1	8.8	0.38
Crude protein, % (db)	40.96	40.46	41.46	0.71	41.35	38.34	44.28	1.68	40.08	39.66	40.54	0.44
Crude fat, % (db)	19.1	18.8	19.3	0.35	20.1	17.7	22.9	1.58	18.6	18.2	19.1	0.46
Crude Fibre, % (db)	6.9	6.6	7.2	0.42	6.4	5.9	6.9	0.36	7.5	7.1	8.1	0.55
Ash, % (db)	4.44	4.38	4.50	0.08	4.61	4.23	4.94	0.23	4.58	4.50	4.71	0.11
Number of samples	2				18				3			

South African

REGIONAL SOYBEAN QUALITY

PRODUCTION REGION	(35) Limpopo Region				(36) KwaZulu-Natal Region			
	ave	min	max	stdev	ave	min	max	stdev
Grading:								
(a) Wet pods, %	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), %	0.25	-	-	-	0.40	0.08	0.96	0.29
(c) Other grain, %	0.16	-	-	-	0.04	0.00	0.12	0.06
(d) Sunflower seed, %	0.00	-	-	-	0.00	0.00	0.00	0.00
(e) Stones, %	0.00	-	-	-	0.02	0.00	0.20	0.07
(f) Sclerotia, %	0.00	-	-	-	0.01	0.00	0.10	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, %	0.40	-	-	-	0.56	0.10	0.90	0.25
(h) Defective Soybeans on the 4.75 mm round hole sieve, %	2.30	-	-	-	1.93	1.04	2.80	0.64
(i) Soiled Soybeans, %	0.72	-	-	-	3.13	0.40	6.44	2.19
(j) Deviations in (b) and (f) collectively: Provided that such deviations are individually within the limits of said items, %	0.25	-	-	-	0.41	0.08	0.96	0.29
Poisonous seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	0	-	-	-	0	0	0	0.00
Poisonous seeds (<i>Argemone mexicana L.</i> , <i>Convolvulus sp.</i> , <i>Ipomoea purpurea Roth.</i> , <i>Lolium temulentum</i> , <i>Xanthium sp.</i>)	0	-	-	-	0	0	0	0.00
Number of samples	1				9			
Nutritional analysis:								
Moisture, % (17 hr, 103 °C)	7.5	-	-	-	7.3	6.7	7.7	0.34
Crude protein, % (db)	41.16	-	-	-	39.72	37.93	42.05	1.37
Crude fat, % (db)	20.6	-	-	-	20.9	20.1	22.2	0.71
Crude Fibre, % (db)	7.1	-	-	-	6.1	5.4	6.6	0.35
Ash, % (db)	4.66	-	-	-	4.70	4.47	4.95	0.17
Number of samples	1				9			

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 6, 7 and 8 on pages 35 to 37 for the results.

C14:0	Myristic acid	C18:3n5	Eleostearic acid
C16:0	Palmitic acid	C18:3n3	n3 Linolenic acid
C16:1	Palmitoleic acid	C20:0	Arachidic acid
C17:0	Margaric acid	C20:1	Eicosenoic acid
C18:0	Stearic acid	C20:2	Eicosadienoic acid
C18:1 cis	cis Oleic acid	C22:0	Behenic acid
C18:1n7	Vaccenic acid	C24:0	Lignoceric acid
C18:2 cis	cis Linoleic acid	Unknown 1	
C18:3n6	n6 Linolenic acid	Unknown 2	

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

Table 6: Fatty acid profile results of a selection of crop quality samples from the 2022/23 season

Cultivar	Region	g Fatty acids/100 g Fatty Acids																	
		C14:0	C16:0	C16:1	C17:0	C18:0	C18:1 cis	C18:1 n7*	C18:2 cis	C18:3 n6	C18:3 n5	C18:3 n3	C20:0	C20:1	C20:2	C22:0	C24:0	Unknown 1	Unknown 2
North West	14	ND	10.50	LOQ	LOQ	5.05	21.23	1.5	52.5	ND	ND	7.8	0.437	0.157	ND	0.472	LOQ	ND	ND
	15	ND	10.37	LOQ	LOQ	5.13	21.23	1.4	53.2	ND	ND	7.2	0.443	0.157	ND	0.470	LOQ	ND	ND
	16	ND	10.39	LOQ	LOQ	5.22	19.98	1.3	53.4	ND	ND	8.2	0.454	0.150	ND	0.498	LOQ	ND	ND
	Min	-	10.37	-	-	5.05	19.98	1.3	52.5	-	-	7.2	0.437	0.150	-	0.470	-	-	-
	Max	-	10.50	-	-	5.22	21.23	1.5	53.4	-	-	8.2	0.454	0.157	-	0.498	-	-	-
	N	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Free State	21	ND	10.35	LOQ	LOQ	5.02	19.32	1.3	54.1	ND	ND	8.4	0.443	0.157	ND	0.474	LOQ	ND	ND
	22	ND	10.26	LOQ	LOQ	4.92	19.54	1.3	54.3	ND	ND	8.2	0.426	0.151	ND	0.440	LOQ	ND	ND
	23	ND	10.35	LOQ	LOQ	4.63	18.82	1.3	55.1	ND	ND	8.4	0.399	0.152	ND	0.426	LOQ	ND	ND
	24	ND	10.30	LOQ	LOQ	4.87	21.04	1.3	52.5	ND	ND	8.5	0.443	0.163	ND	0.472	0.143	ND	ND
	28	ND	10.53	LOQ	LOQ	5.11	18.56	1.4	54.3	ND	ND	8.8	0.392	LOQ	ND	0.392	LOQ	ND	ND
	28	ND	9.77	LOQ	LOQ	5.82	19.57	1.3	53.7	ND	ND	8.3	0.498	0.151	ND	0.477	LOQ	ND	ND
	28	ND	10.33	LOQ	LOQ	4.95	20.06	1.3	54.1	ND	ND	7.8	0.434	0.154	ND	0.448	LOQ	ND	ND
	Min	-	9.77	-	-	4.63	18.56	1.3	52.5	-	-	7.8	0.392	0.151	-	0.392	-	-	-
	Max	-	10.53	-	-	5.82	21.04	1.4	55.1	-	-	8.8	0.498	0.163	-	0.477	0.143	-	-
	N	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Mpumalanga	29	ND	10.75	LOQ	LOQ	6.83	20.40	1.4	51.4	ND	ND	7.8	0.481	LOQ	ND	0.397	LOQ	ND	ND
	29	ND	9.51	LOQ	LOQ	5.48	20.56	1.4	53.4	ND	ND	8.2	0.469	0.155	ND	0.497	0.148	ND	ND
	29	ND	9.80	LOQ	LOQ	5.56	19.71	1.3	53.0	ND	ND	9.0	0.472	0.143	ND	0.482	0.146	ND	ND
	30	ND	10.02	LOQ	LOQ	5.21	18.98	1.3	53.4	ND	ND	9.6	0.453	0.146	ND	0.474	LOQ	ND	ND
	30	ND	10.53	LOQ	LOQ	4.72	20.84	1.4	52.8	ND	ND	8.4	0.407	0.146	ND	0.441	LOQ	ND	ND
	33	ND	11.5	LOQ	LOQ	4.52	21.75	1.5	52.5	ND	ND	6.7	0.435	0.178	ND	0.475	0.143	ND	ND
	33	ND	9.72	LOQ	LOQ	5.19	19.70	1.4	53.0	ND	ND	9.6	0.450	0.141	ND	0.445	LOQ	ND	ND
	Min	-	9.51	-	-	4.52	18.98	1.3	51.4	-	-	6.7	0.407	0.141	-	0.397	0.143	-	-
	Max	-	11.45	-	-	6.83	21.75	1.5	53.4	-	-	9.6	0.481	0.178	-	0.497	0.148	-	-
	N	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Gauteng	34	ND	9.68	LOQ	LOQ	4.72	19.59	1.3	54.4	ND	ND	9.0	0.393	LOQ	ND	0.428	LOQ	ND	ND
Limpopo	35	ND	11.6	LOQ	LOQ	5.02	23.62	1.4	50.0	ND	ND	7.0	0.380	0.156	ND	0.369	LOQ	ND	ND
KwaZulu-Natal	36	ND	10.86	LOQ	LOQ	4.59	20.86	1.4	53.2	ND	ND	7.7	0.411	0.160	ND	0.461	LOQ	ND	ND
RSA	Min	-	9.51	-	-	4.52	18.56	1.3	50.0	-	-	6.7	0.380	0.141	-	0.369	0.143	-	-
	Max	-	11.6	-	-	6.83	23.62	1.5	55.1	-	-	9.6	0.498	0.178	-	0.498	0.148	-	-
	N	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	N	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20

Note:
 All fatty acids marked with an asterisk (*) are not SANAS accredited.
 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 7: Fatty acid profile results of a selection of cultivar samples from the 2022/23 season

Province	Locality	Region	Cultivar	g Fatty acids/100 g Fatty Acids																		
				C14:0	C16:0	C16:1	C17:0	C18:0	C18:1 cis	C18:1 n7*	C18:2 cis	C18:3 n6	C18:3 n5	C18:3 n3	C20:0	C20:1	C20:2	C22:0	C24:0	Unknown 1	Unknown 2	
Free State	Bethlehem	25	NS 5258 R	LOQ	9.82	LOQ	LOQ	5.53	20.37	1.3	53.7	ND	8.1	0.394	0.157	ND	0.377	LOQ	ND	ND		
			PAN 1521 R	LOQ	10.47	LOQ	LOQ	4.86	18.41	1.3	54.7	ND	9.0	0.410	LOQ	ND	0.388	LOQ	ND	ND		
			RA 660 R	LOQ	9.56	LOQ	LOQ	4.38	17.82	1.2	56.3	ND	9.6	0.352	LOQ	ND	0.391	LOQ	ND	ND		
			DM 59160 RSF	LOQ	10.0	LOQ	LOQ	4.10	16.92	1.4	55.9	ND	10.5	0.355	LOQ	ND	0.401	LOQ	ND	ND		
			LG60261PR	LOQ	10.5	LOQ	LOQ	4.32	17.51	1.1	53.9	ND	11.3	0.383	LOQ	ND	0.406	LOQ	ND	ND		
			Y657	LOQ	10.77	LOQ	LOQ	4.77	17.49	1.2	54.5	ND	10.0	0.407	LOQ	ND	0.442	LOQ	ND	ND		
			<i>Min</i>	-	9.56	-	-	4.10	16.92	1.1	53.7	-	8.1	0.352	-	-	0.377	-	-	-	-	
			<i>Max</i>	-	10.77	-	-	5.53	20.37	1.4	56.3	-	11.3	0.410	0.157	-	0.442	-	-	-	-	
			<i>N</i>	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Limpopo	Groblersdal	35	NS 5258 R	LOQ	10.79	LOQ	LOQ	5.27	22.84	1.3	52.0	ND	6.42	0.398	0.186	ND	0.392	0.142	ND
PAN 1521 R	LOQ	10.91				LOQ	LOQ	4.84	23.74	1.4	51.4	ND	6.19	0.440	0.178	ND	0.448	LOQ	ND	ND		
RA 660 R	LOQ	10.3				LOQ	LOQ	4.59	22.99	1.4	52.7	ND	6.56	0.414	0.169	ND	0.471	LOQ	ND	ND		
DM 59160 RSF	LOQ	10.71				LOQ	LOQ	4.36	22.11	1.6	52.7	ND	7.1	0.393	0.168	ND	0.458	LOQ	ND	ND		
LG60261PR	LOQ	11.3				LOQ	LOQ	4.99	24.04	1.3	49.3	ND	7.5	0.480	0.165	ND	0.493	0.147	ND	ND		
Y657	LOQ	11.4				LOQ	LOQ	5.18	21.96	1.4	51.5	ND	7.0	0.475	0.157	ND	0.511	0.143	ND	ND		
<i>Min</i>	-	10.3				-	-	4.36	21.96	1.3	49.3	-	6.19	0.393	0.157	-	0.392	0.142	-	-		
<i>Max</i>	-	11.4				-	-	5.27	24.04	1.6	52.7	-	7.5	0.480	0.186	-	0.511	0.147	-	-		
<i>N</i>	6	6				6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
KwaZulu-Natal	Greytown	36				NS 5258 R	LOQ	10.96	LOQ	LOQ	4.47	20.40	1.2	54.0	ND	7.7	0.329	0.167	ND	0.351	LOQ	ND
			PAN 1521 R	LOQ	10.89	LOQ	LOQ	3.86	21.70	1.4	53.2	ND	7.7	0.346	0.171	ND	0.388	LOQ	ND	ND		
			RA 660 R	LOQ	10.28	LOQ	LOQ	3.70	22.39	1.3	53.2	ND	7.9	0.332	0.159	ND	0.409	LOQ	ND	ND		
			DM 59160 RSF	LOQ	11.0	LOQ	LOQ	3.71	20.81	1.5	53.1	ND	8.5	0.339	0.150	ND	0.420	LOQ	ND	ND		
			LG60261PR	LOQ	11.4	LOQ	LOQ	3.95	20.32	1.3	52.4	ND	9.4	0.377	0.155	ND	0.437	LOQ	ND	ND		
			Y657	LOQ	11.7	LOQ	LOQ	4.10	19.91	1.3	53.2	ND	8.5	0.378	0.153	ND	0.454	LOQ	ND	ND		
			<i>Min</i>	-	10.28	-	-	3.70	19.91	1.2	52.4	-	7.7	0.329	0.150	-	0.351	-	-	-		
			<i>Max</i>	-	11.7	-	-	4.47	22.39	1.5	54.0	-	9.4	0.378	0.171	-	0.454	-	-	-		
			<i>N</i>	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
			RSA		<i>Min</i>	-	9.56	-	-	3.70	16.92	1.1	49.3	-	6.19	0.329	0.150	-	0.351	0.142	-	-
<i>Max</i>	-	11.7			-	-	5.53	24.04	1.6	56.3	-	11.3	0.480	0.186	-	0.511	0.147	-	-			
<i>N</i>	18	18			18	18	18	18	18	18	18	18	18	18	18	18	18	18	18			

Note:
 All fatty acids marked with an asterisk (*) are not SANAS accredited.
 Limit of detection (LOD) = 0.09 g Fatty acid/100 g Fatty acids.
 Values below the limit of quantitation cannot be accurately quantified.
 Limit of quantitation (LOQ) = 0.28 g Fatty acid/100 g Fatty acids.
 Values below the limit of detection are reported as ND (not detected).

Table 8: Fatty acid profile results per cultivar - 2022/23 season
g Fatty acids/100 g Fatty Acids

Cultivar	Locality	Region	C14:0	C16:0	C16:1	C17:0	C18:0	C18:1 n7*	C18:2 cis	C18:3 n6	C18:3 n5	C18:3 n3	C20:0	C20:1	C20:2	C22:0	C24:0	Unknown 1	Unknown 2
DM 59160 RSF	Groblersdal	35	LOQ	10.71	LOQ	LOQ	4.36	22.11	1.6	52.7	ND	7.1	0.393	0.168	ND	0.458	LOQ	ND	ND
	Bethlehem	25	LOQ	10.0	LOQ	LOQ	4.10	16.92	1.4	55.9	ND	10.5	0.355	LOQ	ND	0.401	LOQ	ND	ND
	Greytown	36	LOQ	11.0	LOQ	LOQ	3.71	20.81	1.5	53.1	ND	8.5	0.339	0.150	ND	0.420	LOQ	ND	ND
	Min		-	10.0	-	-	3.71	16.92	1.4	52.7	-	7.1	0.339	0.150	-	0.401	-	-	-
	Max		-	11.0	-	-	4.36	22.11	1.6	55.9	-	10.5	0.393	0.168	-	0.458	-	-	-
	N		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
LG60261IPR	Groblersdal	35	LOQ	11.3	LOQ	LOQ	4.99	24.04	1.3	49.3	ND	7.5	0.480	0.165	ND	0.493	0.147	ND	ND
	Bethlehem	25	LOQ	10.5	LOQ	LOQ	4.32	17.51	1.1	53.9	ND	11.3	0.383	LOQ	ND	0.406	LOQ	ND	ND
	Greytown	36	LOQ	11.4	LOQ	LOQ	3.95	20.32	1.3	52.4	ND	9.4	0.377	0.155	ND	0.437	LOQ	ND	ND
	Min		-	10.5	-	-	3.95	17.51	1.1	49.3	-	7.5	0.377	0.155	-	0.406	-	-	-
	Max		-	11.4	-	-	4.99	24.04	1.3	53.9	-	11.3	0.480	0.165	-	0.493	0.147	-	-
	N		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NS 5258 R	Groblersdal	35	LOQ	10.79	LOQ	LOQ	5.27	22.84	1.3	52.0	ND	6.42	0.398	0.186	ND	0.392	0.142	ND	ND
	Bethlehem	25	LOQ	9.82	LOQ	LOQ	5.53	20.37	1.3	53.7	ND	8.1	0.394	0.157	ND	0.377	LOQ	ND	ND
	Greytown	36	LOQ	10.96	LOQ	LOQ	4.47	20.40	1.2	54.0	ND	7.7	0.329	0.167	ND	0.351	LOQ	ND	ND
	Min		-	9.82	-	-	4.47	20.37	1.2	52.0	-	6.42	0.329	0.157	-	0.351	-	-	-
	Max		-	10.96	-	-	5.53	22.84	1.3	54.0	-	8.1	0.398	0.186	-	0.392	0.142	-	-
	N		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
PAN 1521 R	Groblersdal	35	LOQ	10.91	LOQ	LOQ	4.84	23.74	1.4	51.4	ND	6.19	0.440	0.178	ND	0.448	LOQ	ND	ND
	Bethlehem	25	LOQ	10.47	LOQ	LOQ	4.86	18.41	1.3	54.7	ND	9.0	0.410	LOQ	ND	0.388	LOQ	ND	ND
	Greytown	36	LOQ	10.89	LOQ	LOQ	3.86	21.70	1.4	53.2	ND	7.7	0.346	0.171	ND	0.388	LOQ	ND	ND
	Min		-	10.47	-	-	3.86	18.41	1.3	51.4	-	6.19	0.346	0.171	-	0.388	-	-	-
	Max		-	10.91	-	-	4.86	23.74	1.4	54.7	-	9.0	0.440	0.178	-	0.448	-	-	-
	N		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
RA 660 R	Groblersdal	35	LOQ	10.3	LOQ	LOQ	4.59	22.99	1.4	52.7	ND	6.56	0.414	0.169	ND	0.471	LOQ	ND	ND
	Bethlehem	25	LOQ	9.56	LOQ	LOQ	4.38	17.82	1.2	56.3	ND	9.6	0.352	LOQ	ND	0.391	LOQ	ND	ND
	Greytown	36	LOQ	10.28	LOQ	LOQ	3.70	22.39	1.3	53.2	ND	7.9	0.332	0.159	ND	0.409	LOQ	ND	ND
	Min		-	9.56	-	-	3.70	17.82	1.2	52.7	-	6.56	0.332	0.159	-	0.391	-	-	-
	Max		-	10.3	-	-	4.59	22.99	1.4	56.3	-	9.6	0.414	0.169	-	0.471	-	-	-
	N		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Y657	Groblersdal	35	LOQ	11.4	LOQ	LOQ	5.18	21.96	1.4	51.5	ND	7.0	0.475	0.157	ND	0.511	0.143	ND	ND
	Bethlehem	25	LOQ	10.77	LOQ	LOQ	4.77	17.49	1.2	54.5	ND	10.0	0.407	LOQ	ND	0.442	LOQ	ND	ND
	Greytown	36	LOQ	11.7	LOQ	LOQ	4.10	19.91	1.3	53.2	ND	8.5	0.378	0.153	ND	0.454	LOQ	ND	ND
	Min		-	10.77	-	-	4.10	17.49	1.2	51.5	-	7.0	0.378	0.153	-	0.442	-	-	-
	Max		-	11.7	-	-	5.18	21.96	1.4	54.5	-	10.0	0.475	0.157	-	0.511	0.143	-	-
	N		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
RSA	Min		-	9.56	-	-	3.70	16.92	1.1	49.31	-	6.19	0.329	0.150	-	0.351	-	-	-
	Max		-	11.7	-	-	5.53	24.04	1.6	56.28	-	11.3	0.480	0.186	-	0.511	0.147	-	-
	N		18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18

Note:
All fatty acids marked with an asterisk (*) are not SANAS accredited.
Limit of detection (LOD) = 0.09 g Fatty acid/100 g Fatty acids.
Limit of quantitation (LOQ) = 0.28 g Fatty acid/100 g Fatty acids.
Values below the limit of detection are reported as ND (not detected).
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 87 to 97 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 nutritional 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 (H₂SO₄) 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.

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



Facility Number: T0116

ANNEXURE A
SCHEDULE OF ACCREDITATION

Facility Number: **T0116**

Permanent Address of Laboratory:

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

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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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 ⁰ C) (2 hour; 130 ⁰ 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 ⁰ C) (72 hour; 103 ⁰ C)

Facility Number: T0116

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 ⁰ 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

Facility Number: T0116

Yeast and Bread Vitamin D₂ (HPLC) In-House method 029

Food and feed Multi-Mycotoxin:
-Aflatoxin G₁, B₁, G₂, B₂ and total
-Deoxynivalenol (DON), 15-ADON
-Fumonisin B₁, B₂, B₃
-Ochratoxin A
-T2, HT-2
- Zearalenone

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)

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Potchefstroom

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Potchefstroom

Republiek van Suid Afrika
Republic of South Africa

**VERSLAG VAN DIE NASIONALE
SOJABOON KULTIVARPROEWE
2022/23
REPORT OF THE NATIONAL
SOYBEAN CULTIVAR TRIALS**

Verantwoordelike beampte:

Responsible officer:

AS de Beer

L Bronkhorst

N Cochrane

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1 INTRODUCTION

The National Soybean Cultivar Trials (project M101/62 (P05000002) were planted for the 45th successive year this past growing season. A total of 33 trials (of the planned 34 trials) were planted at 29 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 32 cultivars. Cultivar characteristics are shown in Table 1.

Each trial plot consisted of four, 5 m rows. Four metres were harvested from each of the middle two rows, 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 (UPL inoculant) 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 plot.

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 lodgings, will not hamper mechanical harvesting
- 3 = Few lodgings, lodging less than what will hamper mechanical harvesting
- 4 = Few lodgings, 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 = Many 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 mean 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 DISCUSSIONS OF RESULTS

3.1 GENERAL

The rainfall and irrigation data are shown in Table 3.

Six (6) of the 33 trials planted could not be included (18.2%) in the report compared to the six (6) out of 27 trials (22.2%) in the 2021/22 season.

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

1. Cedara- flooding and hail damage
2. Chrissiesmeer – flooding
3. Cornelia – hail damage
4. Derby – high CV%
5. Frankfort - flooding
6. Lichtenburg – flooding followed by extreme drought

As in the previous seasons the evaluation of the trials was based on several 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 (48 days Groblersdal ARC) and the longest in the cooler areas (88 days at Kokstad).

The number of days to physiological maturity is shown in Table 5. The longest average days to maturity was experienced at Bethlehem PD1 (156 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 133 cm (highest) in the warm area compared to 68 cm (lowest) of the indeterminate cultivar RA5022BR (MG 5.0) in the cool region.

The average plant height between localities varied from a mean of 63 cm at Umtata to 122 cm at Hoopstad.

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 cultivar Y651 RR PRO (MG 6.5; indeterminate), had a mean pod height of 26 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 NS 5909 R (MG 5.9; indeterminate), LS 6860 R (MG 6.2; indeterminate), P57T19 R (MG 5.7; indeterminate), DM59R03 (MG 6.0; indeterminate), PAN 1555 R (MG 5.7, indeterminate), LGG60260IPR (MG 6.0; indeterminate), DM 59I60RSF IPRO (MG 6.0; indeterminate), LG60261 IPR (MG 6.0; indeterminate), Y651 RR PRO (MG 6.5; indeterminate), Y657 (VG 6.5; indeterminate), DM 61I63RSF IPRO (MG 6.6; indeterminate), DM 6.8i RR (MG 6.8; indeterminate) and P71T74 R (MG 7.1; indeterminate).

NS 5258 R (MG 4.9) (indeterminate) had the lowest reading of 8 cm in the cool area. 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 Groblersdal (Agri-Seeds). The highest lodging figures was reported for Y651 RR PRO, P71T74 R and DM 6.8 i RR at Groblersdal (Agri-Seeds) in the warm area.

3.2.5 Green stem (Table 10)

A high percentage of green stem was recorded at Barberspan while the cultivars P62T16R, DM 6.8i RR, RA5722BR, LG60261 IPR and RA6422 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)

No shattering occurred at any of the localities.

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 Groblersdal (ARC) due to bird damage.

3.2.8 Percentage undesirable seed (Table 13)

The lowest mean of 0.57% undesirable seeds was recorded for the moderate region. The range varied from 2.34% at Kinross to 0.19% at Potchefstroom (Limagrain) and Rietvlei.

3.2.9 Mass (g) 100⁻¹ seeds (Table 14)

The variation in seed mass among localities ranged between 10.61 g 100⁻¹ seeds at Schweizer-Reneke PD2 to 18.78 g 100⁻¹ seeds at Thabazimbi. The highest average seed mass was recorded for DM 53154RSF IPRO in the warm region, while LS 6851 R, had the smallest average seed in the cool area.

1.2.10 Oil percentage (Table 15)

RA4918R and NS 5258 R had an above average (>23%) for the moderate and warm areas as well as (>22%) for the cool area. The average oil percentages are 20.96% for the cool-, 22.00% moderate- and 22.48% for the warm areas.

1.2.11 Crude Protein percentage (Table 16)

PAN 1507 R had an above average percentage of 41.04% in the cool-, 39.84% in the moderate- and 40.84% in the warm area. The overall averages are 39.09% for the cool-, 37.97% for the moderate- and 39.42% in the warm areas.

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 PAN 1507 R and P57T19 R had the highest average profat value (>61%) 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 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.

P64T39 R showed an above average yield probability for all the yield potentials in the cool, moderate as well as the warm areas (Tables 19, 21 & 23). PAN 1521 R, RA660R and P71T74 R performed above average for both the moderate and warm areas (Tables 21 & 23). DM 5351 RSF and PAN 1644 R only performed above average for the cool area (Table 19), while RA565 R and DM 6.8i RR showed an above average yield probability in moderate area (Table 23).

Lokalfite, medewerkers en proeflokaliteit van kultivarproewe soos beplan vir, 2022/23
Localities, co-operators and trial locality of the cultivar trials for 2022/23

Nr No	Lokaliteit Locality	Proeflokaliteit Trial locality	Verantwoordelike beampte Responsible officer
1	Barberspan	J Basson	G de Beer & L Bronkhorst
2-3	Bapsfontein	Corteva Agriscience Research Centre	J Serfontein
4	Belfast	G Roos	L Bronkhorst
5-6	Bethlehem	Kleingraan Instituut ARC	L Bronkhorst
7	Cedara	Departmaent of Agriculture	J Arathoon
8	Chrissiesmeer	-	D van Staden
9	Clarens	D Terblanche	L Bronkhorst
10	Cornelia	-	G van Rensburg
11-12	Delmas (Agri Seed)	-	D van Staden
13	Derby	C Coetzer	G van Rensburg
14	Frankfort	-	D van Staden
15	Greytown	Pannar Proefplaas	A Jarvie
16	Grobiersdal (Agri Seed)	-	D van Staden
17	Grobiersdal (ARC)	-	L Bronkhorst
18	Hoopstad	R Taijaard	G de Beer & L Bronkhorst
19	Kinross	Vosstoffel Boerdery	L Bronkhorst
20	Kokstad	Research Stadion	MP Skhakhane
21	Kroonstad	Hoërskool Kroonstad	L Bronkhorst
22	Kroonstad (Agricol)	Bloukool	G van Rensburg
23	Leeudoringstad	D Bergh	G de Beer & L Bronkhorst
24	Lichtenburg	F du Plessis	G van Rensburg
25	Potchefstroom	Limagrain Research Station	F Middleton
26	Potchefstroom	Pannar Research station	A Jarvie
27	Rietvlei	-	A Venter
28-29	Schweizer Reneke	J du Plessis	G de Beer & L Bronkhorst
30	Standerton	E Buurman	G van Rensburg
31	Thabazimbi	-	F Middleton
32	Umtata	Dimanda High School	M Mtshobane
33	Winterton	Terry Muirhead	F Middleton

Table 1 Sojaboonsoaad eienskappe en inligting oor verskaffers, 2022/23
Table 1 Soybean seed characteristics and information about agents, 2022/23

Kultivar Cultivar	Volwassenheids- groeperings Maturity Group	Groeiwyse Growth habit	Hilum kleur Hilum colour	Blomkleur Flower colour	Hackler Pubescence	Op varieteits lys On variety list	Verskaffer Agent	Telersregte Breeding rights
RA4918 R	4.9	I	BL	P	T	JAYES	Agri Seed & Technology	JAYES
RA5022 BR	5.0	I	LB	W	G	NEE/NO	Agri Seed & Technology	NEE/NO
DM 5351RSF	5.0	I	BL	W	T	JAYES	GDM Seeds/Agricol	JAYES
DM 53154RSF IPRO	5.1	I	BL	P	T	JAYES	GDM Seeds/Agricol	JAYES
NS 5258 R	5.2	I	BL	W	B	JAYES	Limagrain (K2)	NEE/NO
PAN 1502 R	5.2	I	B	P	T	JAYES	Pannar	JAYES
Y540	5.4	I	B	W	-	JAYES	Southern Hemisphere Seeds	NEE/NO
LS 6851 R	5.5	D	B	P	W	JAYES	Limagrain	JAYES
RA565 R	5.5	I	B	P	G	JAYES	Agri Seed & Technology	JAYES
PAN 1507 R	5.5	I	IB	P	G	JAYES	Pannar	JAYES
RA5722BR	5.7	I	LB	W	G	NEE/NO	Agri Seed & Technology	NEE/NO
PAN 1521 R	5.7	I	IB	P	G	JAYES	Pannar	JAYES
PAN 1555 R	5.7	I	B	P	T	JAYES	Pannar	JAYES
P57T19 R	5.7	I	DB	P	B	JAYES	Pioneer	JAYES
RA5821 R	5.8	I	IB	P	G	JAYES	Agri Seed & Technology	JAYES
NS 5909 R	5.9	I	IB	P	G	JAYES	Limagrain (K2)	NEE/NO
DM59R03	6.0	I	LB	W	G	JAYES	GDM Seeds/Agricol	JAYES
LG60260IPR	6.0	I	IB	P	G	JAYES	Limagrain	-
RA660 R	6.0	I	B	P	G	JAYES	Agri Seed & Technology	JAYES
DM 59160RSF IPRO	6.0	I	IB	P	G	JAYES	GDM Seeds/Agricol	JAYES
LG60261IPR	6.1	I	LB	W	G	JAYES	Limagrain	-
LS 6860 R	6.2	I	B	P	W	JAYES	Limagrain	JAYES
P62T16 R	6.2	I	B	W	W	JAYES	Pioneer	JAYES
RA6422 R	6.4	I	IB	P	G	NEE/NO	Agri Seed & Technology	NEE/NO
P64T39 R	6.4	I	KL	W	G	JAYES	Pioneer	JAYES
Y651 RR PRO	6.5	I	IB	P	G	-	Southern Hemisphere Seeds	NEE/NO
RA6521BR	6.5	I	IB	P	G	NEE/NO	Agri Seed & Technology	NEE/NO
Y 657	6.5	I	B	P	-	JAYES	Southern Hemisphere Seeds	NEE/NO
DM 61163RSF IPRO	6.6	I	LB	W	G	JAYES	Southern Hemisphere Seeds	NEE/NO
PAN 1644 R	6.7	I	IB	P	G	JAYES	GDM Seeds/Agricol	JAYES
DM 6.8i RR	6.8	I	B	P	G	JAYES	Pannar	JAYES
P71T74 R	7.1	I	KL	W	G	JAYES	GDM Seeds/Agricol	JAYES

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

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

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

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

Tabel 2 Algemene inligting aangaande grond en verbouingspraktjke by die onderskeie proeflokaleite van die kultivarproewe, 2022/23
Table 2 General information in connection with soil and cultivation practices at the different trial localities, 2022/23

Lokal Locality	Plantdatum Date of planting	Spasiëring Spacing (cm)	Onkruid beheer Weed control
Bapsfontein PD1/B/I	29/12/2022	90	-
Bapsfontein PD2/B/I	29/12/2022	90	-
Barberspan/D	17/11/2022	76	Strongarm, Alahlor
Belfast/D	19/11/2022	76	Strongarm, Alahlor
Bethlehem PD1/D	26/10/2022	76	Strongarm, Alahlor
Bethlehem PD2/D	24/11/2022	76	Strongarm, Alahlor
Cedara/D	22/11/2022	45	-
Chrissiesmeer/D	26/10/2022	76	-
Clarens/D	25/11/2022	76	Strongarm, Alahlor
Cornelia/D	01/11/2022	45	-
Delmas/D	17/11/2022/	76	-
Derby/D	01/12/2022	45	-
Frankfort/D	06/12/2022	76	-
Greytown/D	09/11/2022	75	Glyphosate
Groblersdal Agri Seed/B/I	03/11/2022	90	-
Groblersdal ARC/B/I	30/11/2022	76	Strongarm, Alahlor
Hoopstad/D	29/10/2022/	76	None
Kinross/D	03/11/2022	76	Farmer spray paraquat
Kokstad/D	22/11/2022	45	Metolachlor, Glyphosate powermax
Kroonstad/D	06/12/2022	76	Strongarm, Alahlor
Kroonstad (Agricol)/D	02/12/2022	45	-
Leeudoringstad/D	31/10/2022	76	None
Lichtenburg/D	02/12/2022	45	-
Nggeleni/D	Nie geplant/Not planted	75	-
Potchefstroom (Limagrain)/D	23/11/2022	76	-
Potchefstroom (Pannar)/B/I	22/12/2022	90	-
Rietlei/B/I	8/12/2022	45	-
Schweizer Reneke/ PD1/D	28/10/2022	110	Round-up
Schweizer Reneke/ PD2/D	01/12/2022	110	Round-up
Standerton/D	25/10/2022	45	-
Thabazimbi/B/I	24/11/2022	76	-
Umtata/D	24/12/2022	75	Round-up
Winterton/D	30/11/2022	76	Round-up

Tabel 3 Reënval en besproeiing vir die verskillende lokaliteite (mm), 2022/23
Table 3 Rainfall and irrigation at the different localities (mm), 2022/23

Lokaliteit Locality	Maandelikse reënval (mm)/ Monthly rainfall (mm)												Totaal Total	
	Okt	Nov	Des	Jan	Feb	Mrt	Apr						Besproeiing Irrigation	Totaal Total
Barberspan	-	29	94	35	139	82	55	434	0	434	0	434	0	434
Belfast	-	98.2	138.6	51.6	138.6	58.6	40	525.6	0	525.6	0	525.6	0	525.6
Bethlehem	12	167.5	160.8	47.3	117.5	9	5	519.1	0	519.1	0	519.1	0	519.1
Clarens	88.9	279.65	116.59	129.79	131.06	39.12	50.8	835.91	0	835.91	0	835.91	0	835.91
Greytown	-	-	171	184	27.3	98.2	114.3	594.8	0	594.8	0	594.8	0	594.8
Groblersdal	-	3.05	111.25	16.76	2.79	3.56	-	137.41	0	137.41	0	137.41	0	137.41
Hoopstad	62	103	157	75	82	31	33	543	0	543	0	543	0	543
Kinross	27.18	224.54	104.64	61.98	168.4	31.75	32	650.49	0	650.49	0	650.49	0	650.49
Kokstad	0	53.09	196.09	242.82	207.52	62.48	36.07	798.07	0	798.07	0	798.07	0	798.07
Kroonstad	59.6	274.8	96.8	34.4	134.4	70.6	48.2	718.8	0	718.8	0	718.8	0	718.8
Leeudoringstad	52	215	124	67	118	20	40	636	0	636	0	636	0	636
Rietvlei	-	-	109	48	190	-	-	347	0	347	0	347	0	347
Schweizer Reneke PD1	65.5	115.6	78	80.3	100.3	45	19.8	504.5	0	504.5	0	504.5	0	504.5
Schweizer Reneke PD2	65.5	115.6	78	80.3	100.3	45	19.8	504.5	0	504.5	0	504.5	0	504.5

* 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, 2022/23
 Table 4 The number of days from planting to 50% flowering stage of the different soybean cultivars at the different trial localities, 2021/22

Kultivar	Koel/Cool					Matig/Moderate					Warm									
	Belfast	Bethlehem P1	Bethlehem P2	Clarens	Kinross	Kokstad	Winterton	Gem/Mean	Barberspan	Kroonstad	Leudoringstad	Potchstrroom (Limagrain)	Rietvel	Umtata	Gem/Mean	Groblersdal ARC	Hoopstad	Schweizer-P1	Schweizer-P2	Gem/Mean
RA4918 R	60	65	21	65	50	71	47	54	40	53	48	53	47	62	51	41	51	47	36	44
RA5022 BR	60	65	36	68	61	71	48	58	41	55	49	53	55	62	52	41	51	48	40	45
DM 5351 RSF	52	62	31	69	61	71	47	56	41	53	49	53	45	62	51	36	51	48	39	44
DM 53154 RSF IPRO	60	60	21	55	50	71	48	52	42	40	49	55	46	62	49	41	53	50	41	46
NS 5258 R	57	60	52	65	68	71	46	60	45	45	49	52	47	69	51	36	55	50	40	45
PAN 1502 R	67	78	71	81	61	87	56	72	57	59	52	59	67	62	59	51	69	61	58	60
Y540	79	76	69	81	66	83	52	72	49	59	60	60	61	62	59	48	59	62	56	56
LS 6851 R	94	67	69	76	90	87	56	77	58	55	63	62	64	69	62	48	69	64	57	60
RA 565 R	94	65	69	81	83	87	57	77	58	57	67	65	65	62	62	48	65	64	58	59
PAN 1507 R	101	67	83	86	78	92	61	81	62	65	62	71	68	62	65	48	70	71	61	63
RA5722BR	79	50	57	81	66	76	49	65	44	40	56	56	56	69	53	41	59	56	43	50
PAN 1521 R	101	65	91	88	90	92	65	85	61	59	65	68	74	62	65	48	70	67	62	62
PAN 1555 R	94	76	83	81	90	93	65	83	63	68	73	69	76	62	68	61	73	70	61	66
P57T19 R	94	65	90	88	88	88	62	82	45	59	64	63	67	62	60	51	68	66	61	62
RA5821R	94	71	52	94	88	88	67	79	60	59	67	67	67	62	64	41	67	67	60	59
NS 5909 R	94	65	83	81	88	94	66	82	62	59	69	67	75	62	66	51	75	72	60	65
DM 59R03 RSF	94	71	71	88	90	87	61	80	60	65	63	64	71	62	64	41	69	67	60	59
LG60260IPR	101	62	83	88	90	98	67	84	65	65	73	72	79	62	69	36	75	73	62	62
RA 660 R	94	65	69	81	90	87	64	79	62	59	66	67	71	62	64	51	70	68	63	63
DM 59160 RSF IPRO	94	91	83	84	88	84	56	83	62	59	69	72	75	69	68	48	72	73	60	63
LG60261IPR	94	81	80	84	90	91	67	84	67	65	68	71	75	62	68	57	75	74	60	67
LS 6860 R	94	96	83	76	90	95	69	86	64	68	67	70	76	62	68	46	72	70	64	63
P82T16R	94	65	76	81	90	92	62	80	60	55	62	67	76	62	64	57	69	72	61	65
RA6422 R	94	73	83	84	85	92	65	82	67	59	67	71	74	62	67	57	72	74	62	66
P84T39 R	94	67	90	94	78	97	66	84	59	59	68	68	75	62	65	49	72	72	60	63
Y651 RR PRO	94	91	91	88	90	97	70	89	64	67	71	70	76	62	68	48	76	73	63	65
RA6521BR	101	81	91	94	96	98	69	90	64	71	71	72	78	62	70	59	75	76	64	69
Y657	94	67	83	86	90	94	67	83	66	59	67	71	76	62	67	57	72	73	63	66
DM 61163 RSF IPRO	94	73	83	84	61	92	68	79	64	65	69	71	75	62	68	57	73	74	61	66
PAN 1644 R	94	50	83	81	78	90	65	77	61	65	69	69	72	62	66	57	71	73	63	66
DM 6.81 RR	94	86	83	86	96	95	68	87	65	65	70	69	74	62	67	41	71	76	64	63
P71T74 R	94	81	83	84	96	95	68	86	66	65	68	71	75	62	68	36	75	74	65	63
Gem/Mean	87	71	72	81	81	88	61	77	58	59	63	65	68	63	63	48	68	66	57	60

Tabel 5 Die aantal dae vanaf plant tot fisiologiesryp stadium van die verskillende soja boonkultivars by die verskillende profiel lokaliteite, 2022/23
 Table 5 The number of days from planting to physiological maturity of the different soybean cultivars at the different trial localities, 2022/23

Kultivar	Koel/Cool				Matig/Moderate				Warm											
	Belfast	Bethlehem PD1	Bethlehem PD2	Clarens	Kinross	Kokstad	Winterton	Gem/Mean	Barberspan	Kroonstad	Leudoringstad	Potchetstroom (Limagrain)	Umtata	Gem/Mean	Groblersdal ARC	Hoopstad	Schweizer-Reneke PD1	Schweizer-Reneke PD2	Thabazimbi	Gem/Mean
RA4918 R	129	112	131	129	132	134	118	126	125	112	128	121	122	122	105	131	135	108	107	117
RA5022 BR	129	140	124	129	145	136	119	132	121	120	130	120	129	124	115	129	131	109	109	119
DM 5351RSF	129	140	116	140	132	150	121	133	123	112	128	123	122	122	105	134	125	109	109	116
DM 53154RSF IPRO	109	140	131	129	145	140	124	131	121	120	127	119	129	123	105	135	136	110	110	119
NS 5258 R	136	112	124	129	132	134	123	127	121	112	131	122	122	122	106	131	135	109	106	117
PAN 1502 R	146	153	124	143	145	150	124	141	135	125	127	129	129	129	118	134	140	120	111	125
Y540	146	145	141	143	132	150	123	140	128	120	133	125	122	126	115	137	138	120	109	124
LS 6851 R	152	160	124	140	145	159	129	144	143	130	140	132	122	133	118	148	141	120	117	129
RA565 R	152	160	124	143	145	150	127	143	140	120	135	125	122	128	110	147	145	124	114	128
PAN 1507 R	146	153	137	135	145	153	127	142	140	130	132	127	129	132	126	149	145	126	116	132
RA5722BR	136	153	141	143	145	163	130	144	135	133	144	133	122	133	132	149	143	128	121	135
PAN 1521 R	136	160	116	143	145	163	128	140	136	125	144	124	129	132	110	148	141	128	118	129
PAN 1555 R	146	160	131	143	152	163	129	146	144	133	135	130	122	133	126	149	143	130	121	134
P57119 R	146	160	145	143	149	152	131	147	144	130	140	129	129	134	110	137	143	128	115	127
RA5821 R	158	145	131	143	145	150	127	143	135	125	141	127	129	132	115	136	140	126	109	125
NS 5909 R	158	153	145	143	152	163	131	149	140	133	141	126	122	132	118	150	151	130	122	134
DM59R03	158	170	145	143	152	159	130	151	138	130	140	132	129	134	110	149	146	130	115	130
LG60260IPR	158	160	145	143	152	163	130	150	139	130	143	134	122	134	110	149	148	130	118	131
RA660 R	146	155	145	143	145	153	125	145	141	125	140	130	122	132	115	151	149	130	114	132
DM 59160RSF IPRO	158	160	145	143	152	159	112	147	143	130	141	133	122	134	115	149	151	131	116	132
LG60261IPR	158	160	145	143	149	165	132	151	144	133	138	131	129	135	115	151	155	132	114	133
LS 6860 R	158	170	145	143	152	159	132	151	144	133	140	133	122	134	110	172	151	135	120	138
P62T16R	158	170	145	143	149	156	133	151	144	133	148	134	122	136	115	152	153	135	122	135
RA6422 R	158	166	145	143	152	157	136	151	149	137	140	137	122	137	132	158	153	139	125	141
P64T39 R	158	170	145	143	162	165	132	154	144	133	144	136	129	137	118	161	154	131	122	137
Y651 RR PRO	158	166	145	143	162	159	136	153	144	135	146	134	122	136	132	161	155	131	121	140
RA6521BR	158	166	145	143	162	159	133	152	143	137	146	140	122	138	132	158	155	134	125	141
Y657	158	160	145	143	145	150	132	148	143	130	138	132	129	134	118	154	153	132	115	134
DM 61163RSF IPRO	158	166	145	143	162	163	134	153	140	133	146	137	122	135	110	161	157	131	122	136
PAN 1644 R	128	160	145	143	145	161	131	145	145	133	144	132	122	135	118	161	151	132	122	137
DM 6.8i RR	158	163	145	143	151	162	131	150	145	133	144	134	122	136	124	163	153	133	123	139
P71T74 R	129	170	145	143	162	159	134	149	152	137	150	136	129	141	132	162	158	135	124	142
Gem/Mean	147	156	138	141	148	155	128	145	138	128	139	130	125	132	117	149	146	126	117	131

Table 6 Die aantal dae vanaf plant tot oes stadium van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2022/23
 Table 6 The number of days from planting to maturity of the different soybean cultivars at the different trial localities, 2022/23

Kultivar	Koel/Cool						Matig/Moderate						Warm						
	Belfast	Bethlehem PD1	Bethlehem PD2	Clarens	Kinross	Kokstad	Winterton	Gem/Mean	Barberspan	Kroonstad	Leondoringstad	Pitcheitstroom (Limagrain)	Umtata	Gem/Mean	Groblersdal ARC	Hoopstad	Schweizer-Reneke PD1	Schweizer-Reneke PD2	Thabazimbi
RA4918 R	146	160	146	143	162	155	152	152	138	136	148	131	137	132	150	145	124	130	136
RA5022 BR	146	160	146	143	162	155	152	152	138	148	148	150	143	132	150	145	124	130	136
DM 5351RSF	146	160	146	143	162	169	152	154	138	136	148	131	137	132	150	145	138	130	139
DM 53154RSF IPRO	146	173	155	143	162	169	152	157	138	148	148	131	140	132	165	145	138	130	142
NS 5258 R	146	166	146	143	162	155	152	153	138	136	148	131	137	132	150	158	124	130	139
PAN 1502 R	158	175	161	138	162	183	152	161	153	147	148	150	149	132	165	36	138	130	120
Y540	158	170	161	158	162	169	152	161	153	142	148	150	148	132	165	158	138	130	145
LS 6851 R	180	175	161	171	162	183	152	169	152	147	148	150	149	132	165	158	153	130	148
RA565 R	166	175	156	158	162	169	152	163	153	151	148	131	146	132	165	158	138	130	145
PAN 1507 R	171	175	161	167	166	183	152	168	153	147	148	131	145	141	165	158	153	130	149
RA5722BR	158	175	161	158	162	183	152	164	153	160	148	150	155	145	165	172	153	130	153
PAN 1521 R	158	178	170	158	162	169	152	164	153	147	164	150	152	141	165	158	153	130	149
PAN 1555 R	158	175	165	167	175	169	152	166	168	147	148	150	152	141	165	158	153	130	149
P57T19 R	166	180	161	167	175	183	152	169	153	151	148	131	146	132	165	158	153	130	148
RA5821 R	180	190	165	162	175	183	152	173	153	147	148	150	149	132	165	138	130	145	145
NS 5909 R	180	175	170	171	175	183	152	172	153	151	148	150	150	145	165	172	153	130	153
DM59R03	180	190	165	185	175	169	152	174	168	156	148	150	154	132	165	172	153	130	150
LG60260IPR	166	175	165	167	175	169	152	167	153	147	148	131	145	132	165	172	153	130	150
RA660 R	162	175	165	158	175	169	152	165	153	147	148	150	149	132	165	158	138	130	145
DM 59160RSF IPRO	170	175	161	167	180	169	152	168	168	151	164	148	152	136	165	172	153	130	151
LG60261IPR	185	180	170	171	175	189	152	175	153	151	148	150	150	145	165	172	153	130	153
LS 6860 R	180	190	174	185	187	183	152	179	168	160	148	148	151	145	178	172	153	130	156
P62T16R	185	190	174	180	184	183	152	178	168	156	164	148	153	145	178	172	153	130	156
RA6422 R	180	180	170	176	179	183	152	174	168	156	164	148	153	145	178	172	153	130	156
P64T39 R	175	190	170	185	189	183	152	178	168	160	164	148	158	132	178	172	153	130	153
Y651 RR PRO	170	190	174	180	184	183	152	176	153	160	148	131	151	145	178	172	153	127	155
RA6521BR	185	190	164	185	180	153	152	173	168	160	148	150	158	145	178	172	153	130	156
Y657	175	180	161	171	175	169	152	169	153	147	148	150	149	141	165	172	138	130	149
DM 61163RSF IPRO	175	180	174	176	189	153	152	171	168	156	164	148	131	153	145	178	153	130	156
PAN 1644 R	166	180	165	171	175	169	152	168	153	147	164	148	150	136	178	172	153	130	154
DM 6.8iRR	185	190	174	185	189	183	152	180	168	160	164	148	131	145	178	172	153	130	156
P71T74 R	180	190	174	185	189	189	152	180	168	160	164	148	150	145	178	172	153	130	156
Gem/Mean	168	178	163	166	173	174	152	168	156	149	153	148	141	138	167	160	147	130	148

Tabel 7 Die planthoogte van die verskillende soja-boonkultivars by die verskillende proef lokaliteite, 2022/23
 Table 7 The plant height of the different soybean cultivars at the different trial localities, 2022/23

Kultivar	Koel/Cool										Matig/Moderate						Warm							
	Bapfontein PD1	Bapfontein PD2	Belfast	Bethlehem PD1	Bethlehem PD2	Clarens	Kinross	Kokstad	Gem/Mean	Barberspan	Greytown	Kroonstad	Leudoringsstad	Potchefstroom (Limagrain)	Potchefstroom (Pannar)	Rietvlei	Umtata	Gem/Mean	Groblersdal ARC	Hoopstad	Schweizer-PD1	Schweizer-PD2	Thabazimbi	Gem/Mean
RA4918 R	60	60	77	64	68	56	80	90	69	82	87	61	75	81	86	63	69	75	65	67	80	92	93	79
RA5022 BR	51	41	66	77	73	71	84	84	68	60	74	67	80	81	73	59	71	71	75	95	85	89	82	85
DM 5351RSF	71	70	92	57	73	58	82	110	77	70	95	75	65	89	94	56	60	75	77	102	83	100	103	93
DM 53154RSF IPRO	79	74	97	74	97	68	80	120	86	60	100	65	88	89	94	66	55	77	78	100	83	92	103	91
NS 5258 R	62	66	79	57	72	53	77	96	70	77	81	57	80	85	91	58	50	72	67	95	81	96	98	88
PAN 1502 R	81	76	107	106	91	75	107	103	93	88	97	90	108	94	94	66	71	89	88	107	115	100	105	103
Y540	71	75	104	92	90	63	82	83	83	70	89	84	80	94	92	63	71	80	78	105	106	112	107	101
LS 6851 R	76	67	97	83	89	67	88	106	84	70	64	68	58	94	96	83	53	73	42	90	60	90	70	70
RA565 R	83	85	107	106	80	57	100	92	89	78	97	85	80	99	93	68	56	82	85	135	112	109	112	111
PAN 1507 R	77	77	108	92	101	72	102	115	93	80	105	88	93	100	96	66	60	86	85	115	115	120	113	110
RA5722BR	71	68	97	79	88	67	89	109	84	87	78	105	97	105	104	65	52	86	92	117	110	100	120	108
PAN 1521 R	78	88	110	115	100	104	117	102	102	97	106	110	120	103	98	-	83	102	102	115	110	107	118	110
PAN 1555 R	88	81	112	114	97	92	110	108	100	90	101	90	110	109	111	90	54	94	98	133	125	120	117	119
P57119 R	80	80	110	117	108	110	120	111	104	102	111	112	105	99	94	80	64	96	100	110	120	105	117	119
RA5821 R	78	70	112	120	99	95	113	92	98	80	90	97	90	102	92	66	69	86	87	123	115	100	108	107
NS 5909 R	92	94	117	108	87	72	108	111	99	70	105	97	90	104	110	70	71	90	83	142	125	133	112	119
DM59R03	89	82	118	127	100	115	123	103	107	96	105	110	100	122	105	75	50	95	88	125	130	130	118	118
LG60260IPR	88	78	113	106	95	82	105	107	97	80	118	90	98	114	113	79	56	93	92	120	115	125	123	115
RA660 R	66	68	98	84	82	68	95	100	83	87	96	77	93	90	83	64	61	81	85	113	105	95	105	101
DM 59160RSF IPRO	82	92	110	105	88	60	102	97	92	103	104	102	110	109	110	79	51	96	94	135	110	95	120	111
LG60261IPR	84	85	112	106	82	77	100	96	93	90	115	95	107	106	97	63	85	95	97	125	110	93	115	108
LS 6860 R	102	95	123	121	103	85	112	112	107	83	121	112	94	120	108	82	52	96	107	135	115	125	120	120
P62T16R	87	90	113	112	100	80	105	112	100	90	116	83	107	107	103	95	68	96	100	130	120	107	125	116
RA6422 R	107	94	117	108	98	70	113	105	102	87	107	117	110	111	100	72	72	97	97	141	123	115	128	121
P64T39 R	89	98	118	120	100	115	112	105	107	100	114	102	110	116	109	81	52	98	88	140	135	120	117	120
Y651 RR PRO	98	81	115	120	92	72	118	109	101	107	112	112	122	110	115	82	62	103	108	168	125	130	130	132
RA6521BR	69	68	97	114	87	65	103	101	88	100	107	92	115	116	108	92	76	101	88	143	123	119	130	121
Y657	89	89	117	116	98	78	107	109	100	105	115	90	109	114	100	79	47	95	90	135	120	125	123	119
DM 61163RSF IPRO	85	94	113	110	93	88	113	104	100	92	104	110	82	114	114	80	77	97	98	130	130	110	125	119
PAN 1644 R	84	84	110	121	100	80	105	101	98	85	106	95	112	109	99	77	65	93	93	135	123	127	115	119
DM 6.8i RR	104	96	128	121	107	93	123	127	112	108	117	107	112	122	119	86	67	105	110	130	138	143	130	130
P71174 R	103	96	122	125	95	90	114	119	108	103	114	112	122	120	111	74	71	103	108	145	140	133	138	133
Gem/Mean	82	80	107	102	92	78	103	104	94	87	102	92	98	104	100	73	63	90	89	122	112	111	114	110

Tabel 8 Die peulhoogte van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2022/23
 Table 8 The pod height of the different soybean cultivars at the different trial localities, 2022/23

Kultivar	Koel/Cool					Matig/Moderate								Warm											
	Bapfontein PD1	Bapfontein PD2	Belfast	Bethlehem PD1	Bethlehem PD2	Clarens	Kinross	Kokstad	Winterton	Gem/Mean	Barberspan	Greytown	Kroonstad	Leudoringstad	Potchefstroom (Limgrain)	Potchefstroom (Pannar)	Rietvei	Umtata	Gem/Mean	Groblersdal ARC	Hoopstad	Schweizer-Reneke PD1	Schweizer-Reneke PD2	Thabazimbi	Gem/Mean
RA4918 R	8	8	9	7	6	9	9	18	8	9	9	12	6	11	13	12	11	7	10	4	14	12	13	7	10
RA5022 BR	16	7	4	6	6	8	9	16	9	9	8	9	6	11	10	9	10	8	9	6	15	12	13	4	10
DM 5351RSF	10	14	9	7	7	8	11	17	12	11	9	12	7	10	11	12	6	9	10	6	12	12	13	5	10
DM 53154RSF IPRO	10	10	10	9	10	8	10	23	11	11	9	15	8	10	11	11	10	5	10	7	18	10	9	13	11
NS 5258 R	10	8	8	6	7	8	8	17	5	8	8	11	6	11	9	12	6	7	9	5	13	8	15	4	9
PAN 1502 R	18	19	13	15	12	14	13	27	11	16	25	19	8	25	16	15	17	9	17	9	22	20	10	10	14
Y540	14	11	13	12	9	10	10	22	11	12	11	12	9	11	17	15	16	8	12	7	20	18	15	10	14
LS 6851 R	17	10	11	12	9	12	13	20	13	13	10	12	10	7	15	15	21	7	12	3	18	10	12	4	9
RA565 R	19	14	14	14	10	10	15	20	15	15	15	10	17	8	20	17	13	4	13	9	30	15	18	12	17
PAN 1507 R	16	16	14	13	13	12	13	21	13	15	9	21	11	11	18	24	16	7	15	8	25	20	25	20	20
RA572BR	10	11	9	10	8	9	11	18	8	10	10	11	9	14	10	13	8	5	10	8	16	23	10	10	13
PAN 1521 R	14	18	13	17	14	16	13	22	9	15	23	20	15	23	19	20	-	11	18	10	23	15	21	17	17
PAN 1555 R	28	18	17	17	16	15	17	29	13	19	19	19	11	23	19	24	26	7	18	10	30	28	30	15	23
P57T19 R	19	18	13	18	16	17	21	27	14	18	25	23	13	28	22	20	22	7	20	10	25	25	23	17	20
RA5821 R	18	12	15	18	12	12	16	20	10	15	10	13	9	15	14	13	17	9	13	10	25	20	10	10	15
NS 5909 R	22	19	15	16	14	16	20	26	13	18	8	22	16	14	23	25	23	8	17	9	33	25	30	12	22
DM59R03	18	15	16	16	12	15	19	20	13	16	22	18	9	19	17	18	17	6	16	9	25	30	30	13	21
LG60260IPR	16	16	17	15	14	14	18	21	13	16	9	22	10	19	14	20	23	10	16	8	27	23	25	17	20
RA660 R	17	16	15	11	8	11	12	23	11	14	13	18	8	20	15	12	16	5	13	8	20	12	11	12	12
DM 59160RSF IPRO	19	19	16	14	11	10	15	26	11	16	25	21	9	23	19	20	18	6	18	9	27	20	19	22	19
LG60261IPR	19	16	12	16	15	13	18	20	10	16	16	10	24	11	29	18	19	10	18	13	24	21	23	22	21
LS 6860 R	27	14	15	17	15	15	16	25	13	17	12	22	10	15	18	19	20	10	16	10	33	22	30	22	23
P62T16R	16	18	13	12	12	11	17	19	16	15	20	15	8	19	18	16	23	6	16	13	29	25	21	20	22
RA6422 R	20	19	14	16	12	12	15	21	11	16	10	18	14	21	15	10	17	13	15	10	35	22	23	27	23
LS 6860 R	27	14	15	17	15	15	16	25	13	17	12	22	10	15	18	19	20	10	16	10	33	22	30	22	23
P64T39 R	16	17	16	14	13	13	14	22	10	15	22	23	11	19	25	19	22	5	18	7	30	25	22	22	21
Y651 RR PRO	25	17	16	22	16	15	21	24	12	19	25	23	18	26	22	25	24	6	21	14	42	22	30	23	26
RA6521BR	10	13	10	15	11	9	16	20	13	13	22	15	5	28	19	17	22	9	17	9	30	22	20	23	21
Y657	23	16	19	15	11	13	14	31	17	18	20	20	10	25	19	20	21	7	18	11	29	25	25	27	23
DM 61163RSF IPRO	27	17	16	16	12	13	15	22	12	17	16	19	10	19	23	21	12	10	16	11	31	25	20	17	21
PAN 1644 R	18	16	14	14	12	12	14	24	14	15	10	15	10	15	15	14	18	10	13	8	30	25	29	20	22
DM 6.81RR	22	19	15	15	13	11	16	21	11	16	22	18	8	23	21	19	23	9	18	10	30	30	30	18	24
P71T74 R	29	20	15	16	14	14	18	29	11	18	14	20	11	22	21	19	17	9	16	12	30	33	23	20	24
Gem/Mean	18	15	13	14	12	12	15	22	12	15	15	17	10	18	17	17	18	7	15	9	25	21	20	15	18

Tabel 9 Onvulwaarnemings (1-5) van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2022/23
 Table 9 Lodging dat (1-5) of the different soybean cultivars at the different trial localities, 2022/23

Kultivar	Koel/Cool						Matig/Moderate						Warm								
	Bapsfontein PD1	Bapsfontein PD2	Belfast	Bethlehem PD1	Bethlehem PD2	Gem/Mean	Barberspan	Greytown	Kroonstad	Leedoringsstad	Potchetstroom (Limagrain)	Potchetstroom (Panar)	Umtata	Gem/Mean	Groblersdal (Agr-Seeds)	Groblersdal ARC	Hoopstad	Schweizer-PD1	Schweizer-PD2	Thabazimbi	Gem/Mean
RA4918 R	1.00	1.00	1.00	1.00	1.00	1.07	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	3.00	1.00	1.00	1.00	1.00	2.00	1.50
RA5022 BR	1.33	1.00	1.00	1.00	1.00	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.00	1.00	1.00	1.00	1.00	1.06
DM 5351RSF	1.00	1.00	1.00	1.00	1.00	1.33	1.04	1.00	1.00	1.00	1.33	1.04	1.00	1.00	3.67	1.00	1.00	1.00	1.00	1.00	1.72
DM 53154RSF IPRO	1.00	1.00	1.00	1.00	1.00	1.33	1.04	1.00	1.00	1.00	1.33	1.04	1.00	1.00	2.00	1.00	1.00	1.00	1.00	1.00	1.17
NS 5258 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	3.00	1.00	1.00	1.00	1.00	1.00	1.61
PAN 1502 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	2.33	1.00	1.00	1.00	1.00	1.00	1.50
Y540	1.00	1.00	1.00	1.00	1.00	1.33	1.04	1.00	1.00	1.00	1.33	1.04	1.00	1.00	3.33	1.00	1.00	1.00	1.00	1.00	1.44
LS 6851 R	1.33	1.00	1.67	1.00	1.00	1.00	1.67	1.19	1.00	1.00	1.67	1.19	1.00	1.00	1.10	1.00	1.00	1.00	1.00	1.00	1.00
RA566 R	1.00	1.33	1.67	3.00	1.00	1.00	1.67	1.41	1.00	1.00	1.67	1.41	1.00	1.00	3.33	1.00	2.00	1.00	1.00	3.00	1.89
PAN 1507 R	1.33	1.00	1.33	1.00	1.00	1.33	1.11	1.00	1.00	1.00	1.33	1.11	1.00	1.00	2.67	1.00	1.00	1.00	1.00	1.67	1.39
RA5722BR	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	1.05	2.33	1.00	1.00	1.00	1.00	2.67	1.50
PAN 1521 R	1.67	1.00	2.00	1.33	1.00	1.00	2.00	1.33	1.00	1.00	1.00	1.00	1.00	1.00	2.33	1.00	1.00	2.00	1.00	2.67	1.67
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	3.67	1.00	2.00	1.00	1.00	1.33	1.67
P5719 R	1.00	1.00	1.67	3.33	1.00	1.00	1.33	1.37	1.00	1.00	1.33	1.37	1.00	1.00	3.67	1.00	1.00	1.00	1.00	2.33	1.67
RA5821 R	1.00	1.00	2.33	1.33	1.00	1.00	2.00	1.30	1.00	1.00	1.00	1.00	1.00	1.00	3.67	1.00	1.00	2.00	1.00	1.67	1.72
NS 5909 R	1.33	1.00	2.33	1.00	1.00	1.00	1.00	1.19	1.00	1.00	1.00	1.19	1.00	1.00	4.33	1.00	2.00	2.00	3.00	3.00	2.39
DM59R03	1.33	1.00	5.00	2.00	1.00	1.00	2.33	1.74	1.00	1.00	2.33	1.74	1.00	1.14	4.67	1.00	2.00	3.00	1.00	3.33	2.50
LG60260IPR	1.00	1.00	4.33	1.00	1.00	1.00	1.00	1.41	1.00	1.00	1.33	1.41	1.00	1.00	4.67	1.00	2.00	1.00	1.00	4.33	2.50
RA660 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	3.00	1.00	1.00	1.00	1.00	1.00	1.33
DM 59160RSF IPRO	1.67	1.33	2.00	1.00	1.00	1.33	1.26	1.00	1.00	1.00	1.33	1.26	1.00	1.05	4.67	1.00	1.00	1.00	1.00	3.67	2.06
LG60261IPR	1.00	1.00	1.67	1.00	1.00	1.00	1.33	1.11	1.00	1.00	1.33	1.11	1.00	1.00	1.67	1.00	1.00	1.00	1.00	1.00	1.11
LS 6860 R	2.33	1.67	1.67	1.67	1.00	1.00	3.00	1.59	1.00	1.00	1.67	1.00	1.00	1.14	4.00	1.00	2.00	1.00	1.00	4.00	2.33
P62T16R	2.00	1.33	2.00	1.00	1.00	1.00	2.67	1.44	1.00	1.00	1.00	1.44	1.00	1.05	4.67	1.00	4.00	1.00	1.00	3.00	2.44
RA6422 R	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.11	1.00	1.00	1.00	1.11	1.00	1.00	3.33	1.00	1.00	1.00	1.00	2.33	1.61
P64T39 R	1.67	1.00	3.67	2.33	1.00	1.00	1.67	1.59	1.00	1.00	1.67	1.59	1.00	1.10	4.67	1.00	2.00	1.00	1.00	5.00	2.44
Y651 RR PRO	1.00	1.00	2.33	1.00	1.00	1.00	1.00	1.15	1.00	1.00	1.33	1.00	1.00	1.10	5.00	1.00	2.00	1.00	1.00	1.00	1.83
RA6521BR	1.00	1.00	3.67	3.67	1.00	1.00	2.67	1.78	1.00	1.00	2.67	1.33	1.00	1.62	4.67	1.00	2.00	3.00	1.00	4.00	2.61
Y657	1.00	1.00	1.67	1.00	1.00	1.00	1.67	1.15	1.00	1.00	1.00	1.00	1.00	1.00	4.33	1.00	2.00	1.00	1.00	3.67	2.17
DM 61163RSF IPRO	1.00	1.33	2.00	1.00	1.00	1.00	1.67	1.22	1.00	1.00	1.33	1.00	1.00	1.19	4.67	1.00	2.00	1.00	1.00	3.67	2.22
PAN 1644 R	1.00	1.00	3.00	1.00	1.00	1.00	1.33	1.26	1.00	1.00	1.00	1.00	1.00	1.00	4.67	1.00	2.00	1.00	1.00	3.67	2.39
DM 6.81RR	1.00	1.00	4.00	3.00	1.00	1.00	1.00	1.70	1.00	1.00	1.67	1.00	1.00	1.43	5.00	1.00	3.00	1.00	1.00	4.33	2.72
P71174 R	2.00	1.00	3.67	2.33	1.00	1.00	1.33	1.59	1.00	1.00	1.33	1.59	1.00	1.29	5.00	1.00	2.00	1.67	1.00	4.67	2.56
Gem/Mean	1.23	1.07	2.03	1.44	1.00	1.00	1.00	1.55	1.26	1.00	1.00	1.22	1.05	1.08	3.57	1.00	1.53	1.30	1.13	2.67	1.87

Tabel 10 Groenstam (1-5) van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2022/23
 Table 10 Greenstem (1-5) of the different soybean cultivars at the different trial localities, 2022/23

Kultivar	Koel/Cool						Matig/Moderate						Warm												
	Bapsfontein PD1	Bapsfontein PD2	Belfast	Bethlehem PD1	Bethlehem PD2	Clarens	Kinross	Kokstad	Winterton	Gem/Mean	Barberspan	Greytown	Kroonstad	Leedoringsstad	Potchefstroom (Imagrain)	Potchefstroom (Pannar)	Umtata	Gem/Mean	Groblersdal ARC	Hoopstad	Schweizer-PD1	Schweizer-PD2	Thabazimbi	Gem/Mean	
RA4918 R	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	3.00	1.00	1.00	3.00	1.00	1.00	1.00	1.57	1.00	2.00	5.00	2.00	2.00	1.00	2.20
RA5022 BR	2.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.19	2.00	1.00	1.00	5.00	1.00	1.00	1.00	1.71	2.67	2.00	2.00	2.00	2.00	1.00	1.93
DM 5351RSF	1.00	1.00	1.00	1.00	1.00	1.00	2.67	1.00	1.33	1.22	2.00	1.33	1.00	2.00	1.00	1.00	1.00	1.33	3.33	5.00	5.00	2.00	2.00	1.00	3.27
DM 53154RSF IPRO	1.00	1.00	1.33	1.00	1.00	1.33	1.33	1.00	1.00	1.11	5.00	1.33	1.00	5.00	1.00	1.00	1.00	2.19	2.33	5.00	5.00	2.00	2.00	1.00	3.07
NS 5258 R	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	1.00	1.00	1.00	1.14	2.00	2.00	2.00	2.00	1.00	1.00	1.40
PAN 1502 R	1.00	1.00	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.04	3.00	1.00	1.00	1.00	1.00	1.00	1.00	1.29	2.33	1.67	1.00	1.00	1.00	1.00	1.40
Y540	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	5.00	1.33	1.00	2.00	1.00	1.00	1.00	1.76	1.33	2.00	2.00	2.00	2.00	1.00	1.67
LS 6851 R	1.00	1.67	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.19	5.00	1.67	1.00	2.00	1.00	1.00	1.00	1.81	4.33	2.00	2.00	1.00	1.00	1.00	2.07
RA565 R	1.00	1.00	1.67	1.00	1.00	1.00	1.00	1.00	1.00	1.07	4.00	1.00	1.00	1.00	1.00	1.00	1.00	1.43	2.67	3.00	1.00	1.00	1.00	1.00	1.73
PAN 1507 R	1.00	1.00	1.67	1.00	1.00	1.00	1.00	1.00	1.00	1.07	4.00	1.67	1.00	1.33	1.00	1.00	1.00	1.57	2.33	4.00	3.00	2.00	1.00	1.00	2.47
RA5722BR	2.33	1.33	2.67	1.33	1.00	1.00	1.00	1.00	1.67	1.48	5.00	3.67	1.67	4.00	1.00	1.00	1.00	2.48	4.33	5.00	5.00	4.00	1.00	1.00	3.87
PAN 1521 R	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	3.00	1.00	1.00	3.00	1.00	1.00	1.00	1.57	2.33	2.00	2.00	1.00	1.00	1.00	1.73
PAN 1555 R	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	4.00	1.00	1.00	1.67	1.00	1.00	1.00	1.52	2.67	4.00	1.00	1.00	1.00	1.00	1.93
P57T19 R	1.67	1.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.19	5.00	1.00	1.00	2.00	1.00	1.00	1.00	1.71	4.33	3.00	1.00	1.00	1.00	1.00	2.07
RA5821 R	1.00	1.00	2.33	1.00	1.00	1.00	1.00	1.00	1.00	1.15	3.00	1.33	1.00	4.00	1.00	1.00	1.00	1.76	2.33	2.00	2.00	1.00	1.00	1.00	1.67
NS 5909 R	1.00	2.33	3.33	1.00	1.00	1.00	1.00	1.00	1.33	1.44	3.00	2.00	1.00	2.00	1.00	1.00	1.00	1.57	4.33	4.00	3.00	3.00	1.00	1.00	3.07
DM59R03	1.00	1.00	1.67	1.00	1.00	1.00	1.00	1.00	1.00	1.07	4.00	1.67	1.00	4.00	1.00	1.00	1.00	1.95	3.00	3.00	3.00	3.00	1.00	1.00	2.60
LG602601PR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	3.00	2.00	1.00	2.67	1.00	1.00	1.00	1.67	3.00	3.00	2.00	2.00	1.00	1.00	2.20
RA660 R	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	3.00	1.00	1.00	1.00	1.00	1.00	1.00	1.29	3.33	1.00	1.00	2.00	1.00	1.00	1.67
DM 59160RSF IPRO	1.00	1.00	1.67	1.00	1.00	1.00	1.00	1.00	1.00	1.07	4.00	1.00	1.00	1.00	1.00	1.00	1.00	1.43	1.67	3.00	1.00	1.00	1.00	1.00	1.53
LG602611PR	1.00	1.00	3.67	1.33	1.00	1.00	1.00	1.00	1.00	1.33	4.00	1.67	1.00	4.00	1.00	1.00	1.00	1.95	2.67	4.00	2.00	5.00	1.00	1.00	2.93
LS 6860 R	2.00	1.33	3.33	1.00	1.00	1.00	1.00	1.00	1.00	1.41	3.00	1.00	1.00	2.00	1.00	1.00	1.00	1.43	2.00	2.00	1.00	1.00	1.00	1.00	1.80
P62T16R	1.33	1.67	3.67	1.00	1.00	1.00	1.33	1.00	1.00	1.44	5.00	1.33	1.00	4.00	1.00	1.00	1.00	2.05	2.67	3.00	3.00	3.00	1.00	1.00	2.53
RA6422 R	1.33	1.33	3.00	1.00	1.00	1.00	1.00	1.00	1.00	1.30	5.00	2.00	1.00	2.00	1.00	1.00	1.00	1.86	3.00	3.00	2.00	2.00	1.00	1.00	2.60
P64T39 R	1.00	1.00	1.67	1.00	1.00	1.00	1.33	1.00	1.33	1.15	4.00	1.33	1.00	1.00	1.00	1.00	1.00	1.48	3.33	2.00	2.00	3.00	1.00	1.00	2.27
Y651 RR PRO	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.04	4.00	1.33	1.00	1.00	1.00	1.00	1.00	1.48	3.33	4.00	2.00	3.00	1.00	1.00	2.67
RA6521BR	1.67	1.00	1.33	1.00	1.00	1.00	3.00	1.00	1.00	1.33	3.00	1.00	1.00	5.00	1.00	1.00	1.00	1.86	2.00	3.00	3.00	2.00	1.00	1.00	2.20
Y657	1.00	1.00	2.33	1.00	1.00	1.00	1.00	1.00	1.00	1.15	4.00	1.00	1.00	3.00	1.00	1.00	1.00	1.71	1.00	2.00	1.00	2.00	1.00	1.00	1.40
DM 61163RSF IPRO	2.33	1.00	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.19	4.00	1.67	1.00	1.00	1.00	1.00	1.00	1.52	1.67	3.00	1.00	1.00	1.00	1.00	1.53
PAN 1644 R	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	3.00	1.67	1.00	2.00	1.00	1.00	1.00	1.52	3.67	4.00	2.00	1.00	1.00	1.00	2.33
DM 6.8i RR	1.33	1.33	3.67	1.00	1.00	1.00	1.00	1.00	1.33	1.41	5.00	2.33	1.00	2.00	1.00	1.67	1.00	2.00	5.00	5.00	2.00	4.00	1.00	1.00	3.40
P71T74 R	1.00	1.00	2.33	1.00	1.00	1.00	1.00	1.00	1.00	1.15	4.00	2.33	1.00	3.00	1.00	1.67	1.00	2.00	3.33	4.00	2.00	2.00	1.00	1.00	2.47
Gem/Mean	1.23	1.14	1.84	1.02	1.00	1.01	1.15	1.00	1.07	1.16	3.75	1.46	1.02	2.46	1.00	1.04	1.00	1.68	2.76	3.05	2.25	2.13	1.01	1.01	2.24

Tabel 11 Oopsporing (1-5) van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2022/23
 Table 11 Shattering (1-5) of the different soybean cultivars at the different trial localities, 2022/23

Kultivar	Koel/Cool						Matig/Moderate						Warm												
	Bapfontein PD1	Bapfontein PD2	Belfast	Bethlehem PD1	Bethlehem PD2	Clarens	Kinross	Kokstad	Winterton	Gem/Mean	Barberspan	Greytown	Kroonstad	Leedoringsstad	Potcheitroom (Lmagrain)	Potcheitroom (Pannar)	Rietvel	Gem/Mean	Groblersdal ARC	Hoopstad	Schweizer-Reneke PD1	Schweizer-Reneke PD2	Thabazimbi	Gem/Mean	
RA4918 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	1.00	1.00	1.00	1.00
RA5022 BR	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	1.00	1.00	1.00	1.00
DM 5351RSF	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	1.00	1.00	1.00	1.00
DM 53154RSF IPRO	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	1.00	1.00	1.00	1.00
NS 5258 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	1.00	1.00	1.00	1.00
PAN 1502 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	1.00	1.00	1.00	1.00
Y540	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	1.00	1.00	1.00	1.00
LS 6851 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	1.00	1.00	1.00	1.00
RA565 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	1.00	1.00	1.00	1.00
PAN 1507 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	1.00	1.00	1.00	1.00
RA5722BR	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	1.00	1.00	1.00	1.00
PAN 1521 R	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	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	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	1.00	1.00	1.00	1.00
P57T19 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	1.00	1.00	1.00	1.00
RA5821 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	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
DM59R03	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	1.00	1.00	1.00	1.00
LG602601PR	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	1.00	1.00	1.00	1.00
RA660 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	1.00	1.00	1.00	1.00
DM 59160RSF IPRO	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	1.00	1.00	1.00	1.00
LG602611PR	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	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	1.00	1.00	1.00	1.00
P62T16R	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	1.00	1.00	1.00	1.00
RA6422 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	1.00	1.00	1.00	1.00
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	1.00	1.00	1.00	1.00
Y65T RR PRO	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	1.00	1.00	1.00	1.00
RA6521BR	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	1.00	1.00	1.00	1.00
Y657	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	1.00	1.00	1.00	1.00
DM 61163RSF IPRO	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	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	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	1.00	1.00	1.00	1.00
Gem/Mean	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	1.00	1.00	1.00	1.00

Table 12 Die plantelling drie weke na opkoms (x 1000) van die verskillende sojafoonkultivars by die verskillende proeflokaleite, 2022/23
 Table 12 The number of plants three weeks after germinations (x 1000) of the different soybean cultivars at the different trial localities, 2022/23

Kultivar	Koel/Cool					Matig/Moderate					Warm								
	Belfast	Bethlehem PD1	Bethlehem PD2	Clarens	Kinross	Kokstad	Winterton	Gem/Mean	Barberspan	Kroonstad	Leudoringstad	Pitcheersdorp (Limagrain)	Gem/Mean	Groblersdal ARC	Hoopstad	Schweizer-PD1	Schweizer-PD2	Thabazimbi	Gem/Mean
RA4918 R	237	295	240	347	268	194	345	275	247	250	320	219	259	149	427	213	195	282	253
RA5022 BR	98	302	205	275	261	156	227	218	250	195	263	203	228	159	510	270	263	339	308
DM 5351RSF	246	282	253	338	297	201	325	277	253	244	253	242	248	148	377	252	162	346	257
DM 53154RSF IPRO	282	306	318	368	281	296	299	307	350	278	250	269	287	169	377	261	175	287	254
NS 5258 R	281	310	283	278	294	299	300	292	237	249	347	271	276	200	507	292	186	426	322
PAN 1502 R	278	293	278	336	294	286	314	297	370	286	293	286	309	197	423	289	162	389	292
Y540	286	303	239	341	281	212	313	282	250	267	293	226	259	137	360	296	248	334	275
LS 6851 R	270	274	264	312	267	216	274	268	300	238	280	255	268	167	340	248	162	346	253
RA565 R	307	304	244	327	271	239	334	290	387	278	297	241	301	266	433	250	261	474	337
PAN 1507 R	267	302	288	309	282	210	332	284	317	275	307	224	281	169	433	296	237	355	298
RA5722BR	204	269	199	185	253	194	284	227	267	263	210	233	243	156	460	289	158	323	277
PAN 1521 R	281	337	303	357	281	259	327	306	273	331	243	209	264	142	407	298	156	346	270
PAN 1555 R	262	303	282	363	307	228	370	302	260	258	277	252	262	135	327	294	180	293	246
P57T19 R	296	321	285	338	280	273	328	303	273	254	323	237	272	169	433	316	132	350	280
RA5821 R	306	284	230	349	305	259	274	287	343	278	350	235	302	159	330	331	202	328	270
NS 5909 R	299	257	252	349	289	246	336	290	243	302	303	245	273	81	310	232	197	342	232
DM59R03	258	319	296	344	291	240	279	289	303	264	217	271	264	158	293	279	158	361	250
LG60260IPR	275	258	229	355	269	225	294	272	247	267	217	223	238	169	437	349	154	345	291
RA660 R	276	287	257	406	285	322	313	306	380	282	250	265	294	192	540	325	219	419	339
DM 59160RSF IPRO	196	264	154	196	261	202	303	225	280	247	240	202	242	143	433	118	193	331	244
LG60261IPR	271	274	263	308	293	293	341	292	237	209	290	243	245	167	367	178	204	364	256
LS 6860 R	251	266	198	329	257	245	283	261	230	258	223	212	231	117	340	149	149	280	207
P62T16R	309	305	289	331	298	233	283	293	300	271	287	229	272	196	437	186	204	308	266
RA6422 R	240	272	218	327	279	239	327	272	303	306	240	224	268	137	367	217	173	312	241
P64T39 R	258	293	236	347	268	248	328	283	307	268	330	246	288	124	513	285	175	276	275
Y651 RR PRO	177	277	173	274	251	181	348	240	293	240	233	177	236	116	397	219	191	303	245
RA6521BR	99	159	237	231	182	97	266	182	193	137	257	152	185	71	293	116	138	286	173
Y657	262	308	253	362	277	298	328	298	413	248	313	250	306	162	387	215	215	426	281
DM 61163RSF IPRO	203	255	167	313	225	167	320	236	283	247	203	210	236	123	360	184	118	300	217
PAN 1644 R	268	318	256	352	256	281	330	294	273	277	307	239	274	166	390	224	148	304	246
DM 6.8I RR	274	313	294	377	290	295	276	303	327	198	293	268	271	172	473	226	202	353	285
P71T74 R	236	297	274	375	266	260	292	286	330	293	293	228	286	179	447	173	162	326	257
Gem/Mean	252	288	249	325	274	237	309	276	291	258	275	234	265	156	403	246	184	339	266

Tabel 13 Persentasie ongewenste sade van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2022/23
 Table 13 Percentage undesirable seed of the different soybean cultivars at the different trial localities, 2022/23

Kultivar	Kool/Cool						Matig/Moderate						Warm											
	Beflast	Bethlehem PD1	Bethlehem PD2	Clarens	Delmas 1	Kinross	Kokstad	Winterton	Gem/Mean	Barberspan	Greytown	Kroonstad	Leudorringstad	Potchestroom (Limagrain)	Rietvel	Umtata	Gem/Mean	Groblersdal (Agr-Seeds)	Groblersdal ARC	Hopstad	Schweizer-Reneke PD1	Schweizer-Reneke PD2	Thabazimbi	Gem/Mean
RA4918 R	0.01	0.86	1.17	0.47	0.18	0.13	0.24	1.91	0.62	0.11	0.00	0.06	1.90	0.45	0.23	0.27	0.43	2.02	0.00	0.00	1.49	0.56	0.26	0.72
RA5022 BR	0.03	0.20	0.74	0.24	0.78	0.41	0.14	1.00	0.44	0.61	0.23	0.24	1.90	0.42	0.08	0.16	0.52	1.05	0.22	0.11	0.00	0.11	0.00	0.25
DM 535IRSF	0.18	1.22	0.63	0.22	0.15	0.02	0.30	0.09	0.35	0.47	0.21	0.09	0.38	0.00	0.10	0.49	0.25	1.84	0.39	0.00	1.24	0.00	0.40	0.65
DM 53154RSF IPRO	0.23	0.83	1.44	0.00	0.05	0.13	0.55	0.47	0.46	0.38	0.65	0.25	3.52	0.32	0.16	0.22	0.79	1.92	0.00	0.55	1.38	0.12	0.51	0.75
NS 5258 R	0.32	0.52	0.66	0.12	0.21	0.18	0.35	0.84	0.40	0.77	0.46	0.05	0.65	0.39	0.14	0.33	0.40	0.85	0.20	0.00	0.49	0.19	0.57	0.38
PAN 1502 R	0.44	1.68	1.43	0.23	0.40	1.78	0.40	0.82	0.90	0.87	0.08	0.91	0.33	0.00	0.41	1.35	0.56	0.99	0.31	0.14	0.37	0.00	0.32	0.36
Y540	0.04	0.40	0.94	0.28	1.74	0.73	0.18	1.72	0.75	0.27	0.30	0.19	0.38	0.16	0.11	0.26	0.24	0.41	0.34	0.09	0.41	0.41	0.51	0.36
LS 6851 R	0.84	1.21	0.65	0.22	0.55	3.10	0.56	1.10	1.03	1.38	0.00	0.67	1.00	0.46	0.38	0.45	0.62	1.55	0.81	0.10	0.40	0.08	0.19	0.52
RA565 R	0.79	2.73	0.48	0.53	2.24	0.63	0.25	1.27	1.12	4.60	0.57	0.48	0.61	0.00	0.15	0.39	0.97	0.06	0.72	0.88	0.00	0.09	0.50	0.38
PAN 1507 R	0.98	0.99	0.48	0.50	0.94	1.06	0.08	0.22	0.66	0.89	0.03	0.23	1.46	0.00	0.00	0.39	0.43	0.80	1.05	0.27	0.08	0.00	0.00	0.37
RA5722BR	0.00	0.50	0.98	0.03	0.50	0.45	0.20	1.32	0.50	0.67	0.44	0.08	1.52	1.35	0.20	1.04	0.76	0.45	0.26	1.13	0.42	0.21	0.54	0.50
PAN 1521 R	1.29	1.23	0.52	0.22	1.42	1.19	0.14	1.12	0.89	0.72	0.33	0.60	2.52	0.00	-	0.45	0.66	1.55	0.43	0.45	0.16	0.48	0.60	0.61
PAN 1555 R	0.35	1.53	0.42	0.05	0.96	2.42	0.21	0.62	0.82	1.20	0.00	0.19	0.65	0.00	0.00	0.70	0.39	1.19	2.63	1.31	0.00	0.42	1.46	1.17
P57T19 R	0.25	1.20	0.56	0.00	0.66	2.60	0.28	0.00	0.69	0.89	0.00	0.41	0.92	0.00	0.10	0.44	0.39	0.58	1.08	0.33	0.48	0.50	0.86	0.64
RA5821 R	0.20	0.38	0.54	0.72	1.05	7.30	0.37	1.10	1.46	0.54	0.00	0.30	1.28	0.00	0.29	0.28	0.38	0.39	1.73	0.17	0.59	0.19	0.76	0.64
NS 5909 R	0.27	1.02	1.18	0.04	1.07	1.72	0.36	1.29	0.87	0.21	0.46	0.11	0.45	0.00	0.19	1.07	0.36	1.13	1.21	0.17	0.00	0.32	0.98	0.64
DM59R03	0.38	1.77	0.25	0.15	2.24	3.53	0.34	0.30	1.12	1.60	0.29	0.18	0.91	0.00	0.27	0.62	0.55	2.16	0.64	0.00	0.81	0.14	0.70	0.74
LG60260IPR	1.94	1.07	0.93	0.27	1.61	1.20	0.33	1.00	1.04	0.56	0.48	1.30	1.69	0.00	0.00	1.17	0.74	2.01	0.60	0.49	0.33	0.15	0.67	0.71
RA660 R	0.16	0.81	1.22	0.17	1.47	4.47	0.35	0.33	1.12	1.29	0.57	0.30	1.88	0.00	0.11	0.32	0.64	0.44	0.74	0.54	0.13	0.33	0.75	0.49
DM 59160RSF IPRO	0.68	1.02	0.71	0.69	1.36	3.52	0.21	1.51	1.21	0.85	0.67	0.85	1.14	0.50	0.32	0.53	0.69	0.21	0.63	1.09	0.00	0.00	0.87	0.47
LG60261IPR	2.01	2.70	0.67	0.04	5.34	3.62	0.17	0.96	1.94	0.55	0.48	0.52	0.93	0.52	0.14	0.48	0.52	0.85	0.75	0.71	0.08	0.37	0.96	0.62
LS 6860 R	1.02	0.84	0.46	0.22	0.57	1.11	0.63	1.89	0.84	0.51	0.18	0.08	1.29	0.00	0.36	0.66	0.44	0.44	2.46	0.53	0.00	0.18	0.54	0.69
P62T16R	0.97	1.18	1.07	0.92	0.46	3.35	0.50	1.25	1.21	0.75	0.76	0.00	0.62	0.21	0.47	0.12	0.42	0.68	1.77	0.49	0.51	1.45	1.58	1.08
RA6422 R	0.26	0.67	0.65	0.12	1.13	1.70	0.53	1.00	0.76	0.93	0.51	0.29	1.01	0.56	0.36	0.37	0.58	1.20	4.28	0.83	0.27	0.58	0.42	1.26
P64T39 R	0.87	0.94	1.19	0.52	0.57	1.41	0.34	1.44	0.91	0.95	0.00	0.15	1.82	0.00	0.17	0.73	0.55	0.70	1.96	0.49	0.44	0.23	0.78	0.77
Y651 RR PRO	0.40	1.05	0.36	0.62	4.68	4.70	0.29	0.63	1.59	3.02	1.23	0.27	2.44	0.34	0.00	1.30	1.23	0.44	2.37	0.18	0.00	0.09	0.38	0.58
RA6521BR	1.28	1.40	0.27	0.23	0.36	2.03	0.37	0.70	0.83	0.98	0.44	0.16	1.34	0.17	0.00	1.39	0.64	0.84	1.54	0.39	0.00	0.00	0.98	0.63
Y657	0.53	1.19	0.56	0.15	0.89	11.04	0.30	0.87	1.94	2.20	0.26	0.44	1.07	0.25	0.19	0.28	0.67	0.54	0.11	0.94	0.09	0.13	0.31	0.35
DM 61163RSF IPRO	0.64	1.23	0.59	0.11	0.97	2.14	0.54	2.05	1.03	1.35	0.78	0.00	1.84	0.00	0.13	1.04	0.73	1.56	0.75	0.00	0.48	0.00	0.30	0.52
PAN 1644 R	1.64	1.03	0.52	0.00	1.26	4.37	0.38	0.98	1.27	1.68	0.32	0.96	1.44	0.07	0.32	1.44	0.89	1.70	1.06	0.00	0.24	0.19	0.50	0.62
DM 6.8i RR	1.11	1.55	1.12	0.21	0.59	1.30	0.28	1.27	0.93	0.62	0.16	0.22	0.38	0.00	0.18	0.93	0.36	2.01	0.75	0.15	0.00	0.54	0.49	0.66
P7T174 R	1.85	1.49	1.27	0.05	0.57	1.64	0.68	1.02	1.07	0.19	0.91	0.40	1.44	0.00	0.26	0.67	0.55	1.47	2.39	0.12	0.22	0.49	0.41	0.85
Gem/Mean	0.69	1.14	0.77	0.26	1.16	2.34	0.34	1.00	0.96	1.02	0.37	0.34	1.27	0.19	0.19	0.64	0.57	1.06	1.07	0.40	0.35	0.27	0.60	0.62

Tabel 14 Massa van 100 sade (g) van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2022/23
 Table 14 Mass 100 seeds (g) of the different soybean cultivars at the different trial localities, 2022/23

Kultivar	Koel/Cool						Matig/Moderate						Warm											
	Belfast	Bethlehem P1	Bethlehem P2	Clarens	Delmas	Kinross	Kokstad	Winterton	Gem/Mean	Barberspan	Greytown	Kroonstad	Leudoringstad	Potcheitstroom (Limagrain)	Rietvel	Umtata	Gem/Mean	Groblersdal (Agr-Seeds)	Groblersdal ARC	Hoopstad	Schwetzer Reneke P1	Schwetzer Reneke P2	Thabazimbi	Gem/Mean
RA4918 R	16.50	17.32	13.73	14.56	14.14	15.64	15.32	18.58	15.72	14.40	17.70	15.65	18.73	16.92	13.33	17.42	16.31	17.69	17.66	18.67	18.73	11.33	18.74	17.14
RA5022 BR	15.70	18.12	13.67	15.01	12.69	13.82	16.41	17.83	15.41	13.53	17.89	16.54	13.87	17.04	13.56	17.65	15.73	18.40	18.57	16.07	18.73	10.50	19.97	17.04
DM 5351RSF	17.17	17.21	14.34	15.57	14.40	15.45	16.98	19.41	16.32	15.60	17.36	16.34	16.00	17.17	13.63	16.75	16.12	17.60	17.82	18.27	18.93	9.97	18.85	16.91
DM 53164RSF IPRO	18.56	18.33	15.59	16.82	16.32	16.39	17.02	21.07	17.51	14.53	17.42	18.68	20.53	18.73	15.41	15.44	17.53	19.89	19.82	20.13	20.47	9.80	20.34	18.41
NS 5258 R	15.21	17.39	12.74	14.71	13.53	14.60	14.34	18.22	15.09	14.67	17.48	15.29	13.60	16.13	12.66	16.57	15.20	16.55	16.84	18.27	17.93	10.47	18.54	16.43
PAN 1502 R	15.25	15.86	14.05	14.73	11.61	11.22	16.37	19.86	14.87	20.20	19.70	16.55	16.40	17.11	14.20	17.18	17.33	19.52	19.74	18.00	18.80	10.20	17.81	17.35
Y540	12.82	14.80	12.09	12.51	9.87	11.03	13.66	16.40	12.90	14.13	17.51	14.49	15.80	14.09	13.48	16.97	15.21	17.37	16.98	16.13	15.80	10.23	18.69	15.87
LS 6851 R	14.34	12.94	11.85	12.03	9.36	8.51	12.01	16.35	12.17	16.60	16.92	12.96	13.80	12.76	11.81	15.54	14.34	14.58	17.33	17.13	15.00	11.17	17.81	15.50
RA565 R	15.15	16.27	14.86	14.03	11.26	11.27	14.61	18.30	14.47	17.80	18.32	15.83	18.00	15.65	15.45	14.88	16.56	18.04	19.29	20.00	19.27	10.30	19.57	17.74
PAN 1507 R	13.71	14.77	14.05	13.20	11.75	11.49	14.79	17.73	13.94	17.33	17.28	15.45	16.53	13.87	13.54	16.16	15.74	17.38	18.90	19.87	19.33	10.00	18.97	17.41
RA5722BR	17.95	16.58	14.92	16.06	12.35	13.13	16.47	19.34	15.78	17.33	19.58	17.27	15.27	17.50	14.16	17.00	16.87	17.60	20.23	20.27	17.80	11.13	18.02	17.51
PAN 1521 R	12.97	16.75	14.77	13.92	10.17	11.97	15.29	19.01	14.36	18.73	18.94	17.58	19.87	15.46	-	16.66	17.87	18.90	19.66	19.07	18.60	10.87	18.59	17.61
PAN 1555 R	13.66	16.79	15.01	15.13	11.67	10.56	15.51	19.45	14.72	17.47	19.21	16.22	16.60	15.68	15.38	15.89	16.64	19.28	19.60	16.73	19.60	10.00	18.60	17.30
P57T19 R	18.13	18.05	16.42	15.79	11.51	10.93	16.85	20.15	15.98	16.87	18.37	17.46	17.07	15.23	13.40	16.77	16.45	17.18	18.46	17.13	19.20	11.27	19.50	17.12
RA5821 R	14.49	16.39	13.57	13.49	9.75	10.01	14.33	17.60	13.70	20.00	18.85	16.62	18.27	14.99	13.41	14.38	16.64	18.30	17.12	16.13	19.33	11.83	18.89	16.93
NS 5909 R	14.52	15.07	13.98	13.36	9.39	10.36	14.56	17.79	13.63	19.73	16.17	15.82	15.60	15.08	14.31	15.55	16.04	19.15	19.02	19.40	19.67	10.00	20.46	17.95
DM59R03	15.51	17.85	14.66	15.01	12.37	12.17	15.10	19.77	15.30	16.53	19.87	16.94	17.60	17.21	15.38	15.00	16.93	19.39	20.01	16.67	20.53	10.40	20.24	17.87
LG60260IPR	11.38	13.47	13.33	11.43	12.24	10.91	12.41	16.10	12.66	16.13	15.27	14.06	11.13	13.86	12.96	14.94	14.05	15.30	16.42	14.80	16.07	11.20	18.14	15.32
RA660 R	13.94	14.95	13.25	12.00	9.00	9.31	14.25	16.94	12.96	14.93	17.88	14.62	15.13	13.49	14.41	13.04	14.79	17.88	17.85	15.20	16.33	11.10	18.79	16.19
DM 59160RSF IPRO	12.52	13.55	11.67	11.19	10.20	10.10	12.80	16.80	12.35	20.20	12.90	13.54	10.40	12.18	11.74	13.69	13.52	16.68	17.09	20.07	14.87	10.80	16.82	16.05
LG60261IPR	12.77	12.93	12.22	11.76	8.22	10.33	13.53	16.11	12.23	19.20	15.31	14.63	13.20	11.63	13.31	15.74	14.72	18.05	18.22	18.27	16.00	10.30	18.62	16.58
LS 6860 R	15.11	17.03	15.30	14.46	11.95	11.84	14.70	19.24	14.95	17.40	18.18	17.21	16.00	15.18	15.38	16.53	16.55	19.38	20.91	18.80	16.93	10.00	19.54	17.59
P62T16R	15.50	15.43	13.81	13.05	10.85	9.59	13.40	18.32	13.74	17.40	17.85	15.70	17.73	15.01	13.98	15.04	16.10	18.24	19.43	17.20	19.07	10.20	20.35	17.41
RA6422 R	16.11	15.86	14.50	13.68	9.98	11.38	14.86	18.80	14.40	18.40	16.61	16.84	13.13	14.61	14.65	15.90	15.73	18.01	19.06	16.33	18.93	12.27	18.09	17.11
P64T39 R	13.65	15.98	13.10	13.35	11.46	12.64	13.26	17.87	13.91	17.00	17.49	15.62	14.13	15.22	13.86	14.61	15.42	17.30	18.10	19.07	17.20	11.27	20.32	17.21
Y651 RR PRO	13.56	14.24	12.40	12.39	10.87	11.45	14.27	15.95	13.14	15.47	14.40	14.11	12.80	13.68	13.18	14.99	14.09	15.54	17.50	19.67	16.07	10.40	17.12	16.05
RA6521BR	11.89	13.44	13.25	11.75	11.68	13.38	11.99	17.24	13.08	16.53	15.03	14.49	15.40	14.48	12.98	15.02	14.85	15.12	17.05	20.20	17.27	10.27	17.46	16.23
Y657	13.22	14.03	12.23	11.95	9.60	8.91	13.53	16.39	12.48	18.47	16.13	13.59	16.00	12.31	12.87	15.00	14.91	16.58	16.01	17.13	18.00	11.07	18.12	16.15
DM 6163RSF IPRO	13.31	14.40	12.84	12.46	12.25	12.88	13.29	18.38	13.73	19.40	16.64	16.61	17.13	14.78	14.19	16.36	16.45	16.91	20.29	19.80	18.67	10.13	17.81	17.27
PAN 1644 R	12.75	15.24	12.62	12.76	9.47	10.37	13.44	17.64	13.04	20.27	17.74	15.47	13.80	13.22	14.01	14.20	15.53	17.65	16.87	16.20	20.07	10.27	18.21	16.54
DM 6.81 RR	14.16	16.74	13.81	13.41	10.37	12.37	14.55	19.63	14.38	17.40	18.19	16.76	16.13	14.37	15.14	15.84	16.26	17.82	20.34	19.20	16.73	10.10	19.02	17.20
P71T74 R	13.59	15.91	13.32	12.93	11.29	11.94	13.67	18.30	13.87	18.60	18.65	15.35	15.87	13.76	13.76	14.94	15.85	17.18	19.59	18.07	18.67	10.70	18.82	17.17
Gem/Mean	14.52	15.74	13.69	13.58	11.30	11.75	14.49	18.14	14.15	17.26	17.46	15.76	15.67	14.95	13.86	15.68	15.82	17.64	18.49	18.06	18.08	10.61	18.78	16.94

Tabel 15 Oliepersentasie op vogrywe basis van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2022/23
 Table 15 Oil percentage on moisture free basis of the different soybean cultivars at the different trial localities, 2022/23

Kultivar	Koel/Cool										Matig/Moderate						Warm							
	Belfast	Bethlehem PD1	Bethlehem PD2	Clarens	Delmas	Kinross	Kokstad	Winterton	Gem/Mean	Barberspan	Greytown	Kroonstad	Leudoringstad	Potchefstroom (Limagrain)	Rietvel	Umtata	Gem/Mean	Groblersdal (Agri-Seeds)	Groblersdal ARC	Hoopstad	Schweizer- Reneke PD1	Schweizer- Reneke PD2	Thabazimbi	Gem/Mean
	23.27	23.06	22.39	22.47	22.29	22.13	22.37	23.06	22.63	24.75	22.14	22.64	22.28	22.91	24.54	22.30	23.08	23.47	24.85	22.15	23.10	23.28	22.26	23.19
RA4918 R	21.82	22.61	21.79	21.27	22.66	21.00	21.82	22.75	21.97	23.26	21.84	22.34	21.76	22.40	24.62	22.68	22.70	23.74	23.96	22.37	22.31	22.55	22.48	22.90
RA5022 BR	21.19	21.73	22.61	21.89	22.45	21.67	22.45	23.65	22.21	23.12	22.36	22.21	22.47	22.49	25.00	23.26	22.99	23.49	23.99	22.73	22.71	22.79	21.99	22.95
DM 5351RSF	20.93	21.09	19.89	21.64	21.95	21.04	21.79	22.83	21.40	22.61	20.97	21.87	20.80	21.12	24.20	23.36	22.13	18.58	23.49	22.04	21.54	22.20	21.76	21.60
DM 53154RSF IPRO	21.76	29.77	22.02	21.48	22.28	21.85	19.61	23.15	22.74	23.76	21.72	22.26	22.07	22.68	25.61	23.04	23.02	23.50	24.32	22.55	23.37	22.35	22.13	23.04
NS 5258 R	19.48	20.13	20.95	20.25	19.78	19.02	22.08	21.94	20.45	20.87	21.19	22.13	21.28	21.19	23.06	21.05	21.54	22.82	22.75	22.26	21.74	21.10	22.11	22.13
PAN 1502 R	20.98	22.29	22.15	21.59	20.24	21.38	20.69	23.26	21.57	23.60	22.72	22.67	23.38	22.62	25.05	21.06	23.01	24.14	24.87	23.54	22.99	22.39	22.59	23.42
LS 6851 R	19.77	21.41	21.36	20.37	22.17	19.34	21.35	23.61	21.17	21.78	22.59	22.71	22.32	22.52	24.05	21.54	22.50	24.08	24.49	23.25	23.06	22.50	22.33	23.29
RA565 R	20.62	21.70	21.34	21.64	20.54	19.89	20.69	19.40	20.73	21.99	22.75	23.45	23.22	21.75	23.49	22.46	22.73	24.43	24.46	22.46	22.91	22.13	21.93	23.05
PAN 1507 R	19.45	21.57	20.36	20.31	21.30	20.56	20.65	22.03	20.78	21.86	21.39	21.15	21.97	21.18	23.73	21.90	21.88	22.51	22.85	21.83	22.12	21.92	21.94	22.20
RA5722BR	20.19	20.84	22.27	20.60	19.91	20.43	21.09	21.63	20.87	22.16	21.03	21.36	20.86	20.76	23.29	22.34	21.69	23.52	21.92	20.92	21.99	21.92	21.18	22.91
PAN 1521 R	19.54	21.04	20.19	19.59	20.85	19.23	20.31	22.73	20.44	21.06	21.29	21.71	21.62	21.77	-	21.62	21.51	22.52	23.24	22.24	22.54	21.87	21.85	22.38
PAN 1555 R	19.99	19.98	21.26	20.11	20.80	18.99	20.78	22.65	20.57	21.64	20.88	21.96	20.74	21.47	23.28	22.01	21.71	22.78	23.38	21.65	22.25	21.30	21.76	22.19
P57T19 R	20.30	21.11	21.12	18.99	23.07	19.54	20.49	23.83	21.06	21.50	21.93	22.42	22.70	21.98	24.85	21.45	22.40	23.76	24.34	23.65	23.12	22.36	21.76	23.17
RA5821 R	19.45	21.04	20.97	19.14	21.10	18.28	21.08	22.73	20.47	22.08	21.91	22.27	21.95	21.20	24.74	21.70	22.26	23.05	22.87	22.40	22.15	21.42	21.98	22.31
NS 5909 R	19.95	21.34	21.75	20.55	21.20	18.92	20.85	23.28	20.98	21.54	21.53	22.26	22.91	21.90	23.46	22.12	22.25	23.31	24.04	22.53	23.21	21.57	21.95	22.77
DM59R03	19.22	21.10	22.66	19.05	21.79	19.13	19.97	22.43	20.67	21.89	20.58	21.00	22.33	21.79	24.32	20.26	21.74	22.49	23.66	21.67	22.52	21.14	22.08	22.26
LG60260IPR	18.57	20.34	19.87	19.53	19.89	19.77	20.20	23.11	20.16	22.22	21.36	21.56	20.35	21.42	23.01	22.30	21.75	23.58	24.37	22.54	22.68	21.63	22.01	22.80
RA660 R	21.06	21.75	20.78	21.15	21.43	19.70	21.33	23.04	21.28	21.89	21.79	22.75	22.16	22.34	24.25	21.18	22.94	23.39	23.97	23.30	23.95	22.10	22.81	23.25
DM 59160RSF IPRO	19.21	20.79	21.10	20.39	22.38	20.00	20.55	22.74	20.90	20.80	21.26	22.44	22.83	21.00	23.88	20.25	21.78	23.45	23.51	22.02	22.94	21.49	22.06	22.58
LG60261IPR	18.17	19.87	20.66	19.62	21.45	20.20	19.98	23.03	20.49	21.23	20.71	21.36	21.07	20.18	22.87	20.51	21.13	22.15	22.57	20.66	21.22	20.12	21.57	21.38
LS 6860 R	18.29	20.69	20.66	19.62	21.45	20.20	19.98	23.03	20.49	21.23	21.79	22.01	22.67	22.24	22.55	22.38	22.12	21.42	22.75	22.70	22.80	21.07	21.76	22.08
P62T16R	19.73	21.93	21.44	20.84	23.07	20.61	21.76	24.34	21.72	22.46	22.40	22.95	23.43	22.70	25.53	21.73	23.03	24.18	25.00	23.65	23.81	22.58	22.71	23.66
RA6422 R	20.09	20.94	21.45	20.92	19.80	20.80	20.38	23.33	20.96	21.28	21.86	21.31	22.56	21.79	24.73	21.24	22.11	20.18	23.51	22.84	23.19	21.51	21.76	22.17
P64T39 R	19.14	19.88	19.41	19.22	21.06	20.87	19.75	27.26	20.82	22.35	20.24	20.85	21.74	20.89	23.40	20.61	21.44	22.62	23.49	22.15	22.37	21.11	21.28	22.17
Y651 RR PRO	19.46	20.90	21.01	19.87	20.85	19.86	20.29	22.65	20.61	22.02	21.90	20.98	21.24	22.11	23.94	21.25	21.92	22.30	23.70	22.54	22.63	21.47	21.86	22.42
RA6521BR	19.24	20.29	21.06	19.09	21.29	20.01	19.80	22.23	20.38	21.40	21.50	20.71	20.56	19.92	22.32	21.34	21.11	21.64	23.25	22.00	22.01	19.87	21.55	21.72
Y657	19.64	19.58	20.95	19.98	20.98	19.47	20.33	22.01	20.37	22.05	20.31	20.99	20.71	20.04	24.14	21.44	21.38	22.60	22.97	21.54	21.73	20.52	33.20	23.76
DM 61163RSF IPRO	19.50	19.71	20.09	18.88	19.93	19.17	19.85	21.62	19.84	21.22	20.16	20.75	20.59	20.16	21.86	22.00	20.96	21.54	22.54	21.69	21.81	20.75	21.41	21.62
PAN 1644 R	19.76	20.80	21.46	19.61	20.31	19.08	20.44	22.30	20.47	22.24	20.55	21.68	21.84	20.72	24.32	21.54	21.84	22.93	22.87	22.24	22.60	21.31	21.70	22.28
DM 6.81 RR	18.57	20.37	21.78	18.85	19.63	20.02	19.39	21.91	20.07	21.43	20.44	20.39	22.26	20.75	22.99	21.13	21.34	21.88	22.87	21.17	22.03	20.07	22.55	21.76
P71T74 R	17.74	19.38	19.49	18.39	19.83	19.50	19.32	21.01	19.33	20.95	19.47	19.92	20.71	19.33	22.41	21.53	20.62	20.83	21.35	21.22	22.16	19.79	21.29	21.11
Gem/Mean	19.88	21.22	21.13	20.22	21.10	20.01	20.68	22.72	20.87	22.01	21.39	21.78	21.86	21.48	23.85	21.71	22.00	22.72	23.51	22.27	22.55	21.57	22.30	22.48

Tabel 16 Ru-proteïenpersentasie op vogrywe basis van die verskillende sojaboontkultivars by die verskillende proef lokaliteite, 2022/23
 Table 16 Percentage crude protein on moisture free basis of the different soybean cultivars at the different trial localities, 2022/23

Kultivar	Koei/Cool										Matig/Moderate						Warm							
	Belfast	Bethlehem PD1	Bethlehem PD2	Clarens	Delmas	Kinross	Kokstad	Winterton	Gem/Mean	Barberspan	Greytown	Kroonstad	Leendoringstad	Potcheitroom (Limagrain)	Rietvel	Umtata	Gem/Mean	Groblersdal (Agri-Seeds)	Groblersdal ARC	Hoopstad	Schweizer-PD1	Schweizer-PD2	Thabazimbi	Gem/Mean
RA4918 R	38.07	37.43	38.09	36.37	41.72	39.26	33.37	41.02	38.17	27.75	39.27	39.06	41.11	38.70	35.79	37.99	37.10	39.70	37.75	39.34	40.22	38.88	38.76	39.11
RA5022 BR	38.77	37.52	38.53	39.73	39.85	38.88	34.61	39.92	38.48	30.17	41.19	39.01	40.40	39.35	34.28	38.66	37.58	40.10	38.72	39.02	39.19	39.23	39.32	39.26
DM 5351RSF	37.72	38.92	37.10	37.47	38.99	37.29	34.69	38.14	37.54	29.39	37.61	37.56	38.69	36.74	34.55	36.24	35.83	39.64	39.06	37.49	38.36	38.04	39.45	38.67
DM 53154RSF IPRO	39.53	39.89	38.02	38.94	40.75	39.61	36.16	40.04	39.12	32.12	40.82	40.38	41.47	40.37	34.49	37.78	38.20	41.26	39.41	39.23	41.00	38.97	39.52	39.90
NS 5258 R	38.77	39.90	39.18	37.25	40.82	39.19	37.24	40.98	39.17	30.23	41.41	39.75	39.87	40.48	30.71	35.20	36.81	41.28	40.52	38.85	40.96	39.63	40.76	40.33
PAN 1502 R	41.00	39.25	39.05	38.15	42.78	41.43	32.70	40.91	39.41	38.17	40.03	39.42	41.01	39.76	36.28	40.02	39.24	40.60	40.48	39.57	39.87	39.61	39.79	39.99
Y540	38.23	37.23	36.43	35.99	42.52	38.97	32.49	39.08	37.62	30.20	39.13	37.98	38.65	38.21	32.41	37.54	36.30	39.29	38.03	37.67	36.56	38.23	40.00	38.30
LS 6851 R	40.90	38.43	38.94	37.97	40.19	41.44	33.64	39.51	38.88	34.61	41.14	39.03	39.56	37.97	33.83	35.96	37.44	38.39	40.02	38.20	38.11	38.94	39.74	38.90
RA565 R	41.07	38.39	38.20	37.22	40.96	40.02	38.45	39.45	39.22	34.85	40.29	37.57	39.33	39.18	35.86	39.71	38.11	39.88	39.02	39.25	37.82	39.18	40.09	39.21
PAN 1507 R	43.20	39.89	40.60	40.01	42.84	42.85	36.61	42.29	41.04	37.23	41.84	42.11	42.02	40.98	36.48	38.24	39.84	41.59	41.22	40.98	41.03	40.12	40.06	40.83
RA5722BR	38.01	37.38	38.21	37.81	40.47	39.18	36.24	39.97	38.41	35.13	39.17	38.85	39.04	38.81	35.65	38.18	37.83	40.37	40.65	39.41	38.78	37.41	39.78	39.40
PAN 1521 R	40.19	39.71	38.55	39.27	41.99	40.87	34.57	40.98	39.52	36.55	41.69	40.53	40.87	39.91	-	38.19	39.62	40.82	40.10	39.97	38.20	38.56	40.27	39.65
PAN 1555 R	39.40	39.81	39.05	38.64	40.24	42.46	34.33	40.45	39.25	39.12	40.71	38.74	41.78	39.26	32.63	37.96	38.60	39.92	40.35	40.14	40.27	40.58	40.38	40.27
P57T19 R	39.80	40.15	41.27	42.13	41.36	42.66	35.43	39.49	40.29	35.98	41.60	40.63	41.11	40.27	34.62	39.98	39.17	40.73	39.22	39.43	39.37	38.79	41.55	39.85
RA5821 R	41.26	40.19	39.80	40.55	41.13	41.95	34.36	40.66	39.99	37.21	40.28	39.14	40.54	39.98	32.97	39.25	38.48	41.37	40.74	39.45	39.58	39.13	39.92	40.03
NS 5909 R	40.50	38.10	37.94	37.34	41.76	42.07	34.48	39.16	38.92	36.86	39.82	39.24	39.48	39.61	37.56	36.51	38.44	39.32	40.28	38.47	38.69	39.17	40.16	39.35
DM59R03	41.08	39.50	37.58	40.99	40.24	41.49	33.36	40.15	39.30	35.86	41.18	41.42	40.06	38.57	33.41	38.47	38.42	41.06	39.58	40.05	39.42	39.87	40.91	40.15
LG60260IPR	40.58	40.52	37.55	38.74	44.20	41.77	33.73	39.77	39.61	32.41	40.34	40.52	39.87	37.78	33.51	37.57	37.43	38.47	38.18	38.78	38.66	39.59	40.20	38.98
RA660 R	40.22	38.88	39.19	38.24	41.10	42.15	34.82	40.44	39.38	37.35	41.27	39.04	41.09	38.35	34.89	39.09	38.73	41.38	39.29	39.55	37.06	39.08	39.78	39.36
DM 59160RSF IPRO	41.43	38.60	38.56	37.05	39.67	42.34	34.56	39.81	39.00	39.62	39.23	38.30	40.37	38.30	32.69	39.01	38.22	40.52	39.16	39.64	38.33	39.56	39.06	39.38
LG60261IPR	42.06	39.49	39.16	38.84	43.73	42.32	35.76	40.19	40.19	35.47	39.98	39.41	40.26	39.28	33.83	39.97	38.31	39.43	40.38	40.24	39.34	40.15	39.57	39.85
LS 6860 R	40.55	38.04	38.75	37.51	41.12	40.22	32.14	39.29	38.45	33.70	39.84	38.46	38.97	35.60	35.17	39.95	37.38	39.34	39.40	37.78	37.80	39.19	40.54	39.01
P62T16R	39.77	37.56	39.58	36.95	37.88	39.97	31.81	37.73	37.66	34.60	39.30	37.93	38.94	37.43	31.28	38.50	36.85	39.14	38.03	38.16	37.62	38.23	39.54	38.45
RA6422 R	39.84	37.53	39.73	36.13	42.56	39.76	34.63	38.75	38.62	38.51	38.64	38.26	38.80	37.44	32.76	38.97	37.63	38.68	38.62	37.98	37.33	38.24	39.62	38.41
P64T39 R	41.37	39.99	41.01	39.43	41.68	40.98	35.02	40.48	40.00	34.51	41.33	40.38	40.81	38.35	33.00	39.51	38.27	40.45	40.15	39.98	39.28	40.32	41.10	40.21
Y651 RR PRO	39.01	38.01	38.30	36.40	41.68	40.37	33.09	38.17	38.13	33.68	37.94	38.18	38.44	36.77	31.34	36.64	36.14	37.81	38.03	37.28	36.29	38.47	39.57	37.91
RA6521BR	38.38	38.78	39.22	37.20	37.79	40.11	31.76	40.98	38.03	31.10	38.30	38.78	39.13	38.78	30.87	37.76	36.39	39.27	38.74	37.92	37.31	39.35	40.45	38.84
Y657	41.70	40.44	39.69	38.37	42.31	41.37	36.37	40.49	40.09	35.03	41.68	40.56	41.51	40.68	33.32	40.43	39.03	40.04	39.72	40.43	39.28	39.69	39.53	39.78
DM 61163RSF IPRO	39.63	40.34	39.74	38.33	41.75	42.06	33.38	40.44	39.46	38.33	40.70	39.37	40.45	39.17	38.66	37.99	39.24	39.19	39.79	39.26	38.67	39.72	40.91	39.59
PAN 1644 R	40.74	39.83	40.11	39.16	42.67	42.42	35.20	40.58	40.09	36.30	41.68	39.50	40.63	40.61	34.17	36.83	38.53	39.94	41.13	39.86	39.53	39.65	40.68	40.13
DM 6.81RR	38.80	37.83	37.98	34.83	43.12	40.45	33.84	38.13	38.12	34.63	39.09	38.65	38.91	38.06	32.17	39.68	37.31	38.82	38.64	38.52	37.11	38.26	40.00	38.56
P71T74 R	40.89	38.99	41.07	37.44	41.18	41.20	35.98	40.22	39.62	38.12	41.94	39.41	40.77	39.39	32.58	38.59	38.69	39.77	41.26	39.83	37.32	40.13	40.99	39.88
Gem/Mean	40.08	38.95	38.94	38.14	41.28	40.85	34.53	39.91	39.09	34.84	40.26	39.29	40.12	38.88	33.93	38.32	37.97	39.92	39.55	39.12	38.70	39.19	40.06	39.42

Tabel 17 Gemiddelde van die olie-en proteien persentasie saamgevoeg (Protolite), 2022/23

Table 17 Average of the oil and protein percentage joined (Profafai), 2022/23

Kultivar	Koel/Cool										Matig/Moderate						Warm							
	Belfast	Bethlehem PD1	Bethlehem PD2	Clarens	Delmas 1	Kinross	Kokstad	Winterton	Gem/Mean	Barberspan	Greytown	Kroonstad	Leudoringstad	Potchefstroom (Limagrain)	Rietvel	Umtata	Gem/Mean	Groblersdal (Agr-Seeds)	Groblersdal	Hoopstad	Schweizer-PD1	Schweizer-PD2	Thabazimbi	Gem/Mean
RA4918 R	61.34	60.49	60.48	58.84	64.01	61.39	55.74	64.08	60.80	52.50	61.41	61.70	63.39	61.61	60.33	60.29	60.18	63.17	62.60	61.49	63.32	62.16	61.02	62.29
RA5022 BR	60.59	60.13	60.32	61.00	62.51	59.88	56.43	62.67	60.44	53.43	63.03	61.35	62.16	61.75	58.90	61.34	60.28	63.84	62.68	61.39	61.50	61.78	61.80	62.17
DM 5351RSF	58.91	60.65	59.71	59.36	61.44	58.96	57.14	61.79	59.75	52.51	59.97	59.77	61.16	59.23	59.55	59.50	58.81	63.13	63.05	60.22	61.07	60.83	61.44	61.62
DM 53154RSF IPRO	60.46	60.98	57.91	60.58	62.70	60.65	57.95	62.87	60.51	54.73	61.79	62.25	62.27	61.49	58.69	61.14	60.34	59.84	62.90	61.27	62.54	61.17	61.28	61.50
NS 5258 R	60.53	69.67	61.20	58.73	63.10	61.04	56.85	64.13	61.91	53.99	63.13	62.01	61.94	63.16	56.32	58.24	59.83	64.78	64.84	61.40	64.33	61.98	62.89	63.37
PAN 1502 R	60.48	59.38	60.00	58.40	62.56	60.45	54.78	62.85	59.86	59.04	61.22	61.55	62.29	60.95	59.34	61.07	60.78	63.42	63.23	61.83	61.61	60.71	61.90	62.12
Y540	59.21	59.52	58.58	57.58	62.76	60.35	53.18	62.34	59.19	53.80	61.85	60.65	62.03	60.83	57.46	58.60	59.32	63.43	62.90	61.21	59.55	60.62	62.59	61.72
LS 6851 R	60.67	59.84	60.30	58.34	62.36	60.78	54.99	63.12	60.05	56.39	63.73	61.74	61.88	60.49	57.88	57.50	59.94	62.47	64.51	61.45	61.17	61.44	62.07	62.19
RA565 R	61.69	60.09	59.54	58.86	61.50	59.91	59.14	58.85	59.95	56.84	63.04	61.02	62.55	60.93	59.35	62.17	60.84	64.31	63.48	61.71	60.73	61.31	62.02	62.26
PAN 1507 R	62.65	61.46	60.96	60.32	64.14	63.41	57.26	64.32	61.82	59.09	63.23	63.26	63.99	62.16	60.21	60.14	61.73	64.10	64.07	62.81	63.15	62.07	62.00	63.03
RA5722BR	58.20	58.22	60.48	58.41	60.38	59.61	57.33	61.60	59.28	57.29	60.23	60.21	59.90	59.57	58.94	60.52	59.52	63.89	62.57	60.33	60.77	59.33	60.96	61.31
PAN 1521 R	59.73	60.75	58.74	58.86	62.84	60.10	54.88	63.71	59.95	57.61	62.98	62.24	62.49	61.68	0.00	59.81	52.40	63.34	63.34	62.21	60.74	60.43	62.12	62.03
PAN 1555 R	59.39	59.79	60.31	58.75	61.04	61.45	55.11	62.70	59.82	60.76	61.59	60.70	62.52	60.73	55.91	59.97	60.31	62.70	63.73	61.79	62.52	61.88	62.14	62.46
P57T19 R	60.10	61.26	62.39	61.12	64.43	62.20	55.92	63.32	61.34	57.48	63.53	63.05	63.81	62.25	59.47	61.43	61.57	64.49	63.56	63.08	62.49	61.15	63.31	63.01
RA5821 R	60.71	61.23	60.77	59.69	62.23	60.23	55.44	63.39	60.46	59.29	62.19	61.41	62.49	61.18	57.71	60.95	60.75	64.42	63.61	61.85	61.73	60.55	61.90	62.34
NS 5909 R	60.45	59.44	59.69	57.89	62.96	60.99	55.33	62.44	59.90	58.40	61.35	61.50	62.39	61.51	61.02	58.63	60.69	62.63	64.32	61.00	61.90	60.74	62.11	62.12
DM59R03	60.30	60.60	60.24	60.04	62.03	60.62	53.33	62.58	59.97	57.75	61.76	62.42	62.39	60.36	57.73	58.73	60.16	63.55	63.24	61.72	61.94	61.01	62.99	62.41
LG60260IPR	59.15	60.86	57.42	58.27	64.09	61.54	53.93	62.88	59.77	54.63	61.70	62.08	60.22	59.20	56.52	59.87	59.17	62.05	62.55	61.32	61.34	61.22	62.21	61.78
RA660 R	61.28	60.63	59.97	59.39	62.53	61.85	56.15	63.48	60.66	59.24	63.06	61.79	63.25	60.69	59.14	60.27	61.06	64.77	63.26	62.85	61.01	61.18	62.59	62.61
DM 59160RSF IPRO	60.64	59.39	59.66	57.44	62.05	62.34	55.11	62.55	59.90	60.42	60.49	60.74	63.20	59.30	56.57	59.26	60.00	63.97	62.67	61.66	61.27	61.05	61.12	61.96
LG60261IPR	60.23	59.36	59.82	58.72	62.61	61.17	55.99	61.58	59.94	56.70	60.69	60.77	61.33	59.46	56.70	60.48	59.45	61.58	62.95	60.90	60.56	60.27	61.14	61.23
LS 6860 R	58.84	58.73	59.41	57.13	62.57	60.42	52.12	62.32	58.94	54.93	61.63	60.47	61.64	57.84	57.72	62.33	59.51	60.76	62.15	60.48	60.60	60.26	62.30	61.09
P62T16R	59.50	59.49	61.02	57.79	60.95	60.58	53.57	62.07	59.37	57.06	61.70	60.88	62.37	60.13	56.81	60.23	59.88	63.32	63.03	61.81	61.43	60.81	62.25	62.11
RA6422 R	59.93	58.47	61.18	57.05	62.36	60.56	55.01	62.08	59.58	59.79	60.50	59.57	61.36	59.23	57.49	60.21	59.74	58.86	62.13	60.82	60.52	59.75	61.38	60.58
P64T39 R	60.51	59.87	60.42	58.65	62.74	61.85	54.77	67.74	60.82	56.86	61.57	61.23	62.55	59.24	56.40	60.12	59.71	63.07	63.64	62.13	61.65	61.43	62.38	62.38
Y651 RR.PRO	58.47	58.91	59.31	56.27	62.53	60.23	53.38	60.82	58.74	55.70	59.84	59.16	59.68	58.88	55.28	57.89	58.06	60.11	61.73	59.82	58.92	59.94	61.43	60.33
RA6521BR	57.62	59.07	60.28	56.29	59.08	60.12	51.56	63.21	58.40	52.50	59.80	59.49	59.69	58.70	53.19	59.10	57.50	60.91	61.99	59.92	59.32	59.22	62.00	60.56
Y657	61.34	60.02	60.64	58.35	63.29	60.84	56.70	62.50	60.46	57.08	61.99	61.55	62.22	60.72	57.46	61.87	60.41	62.64	62.69	61.97	61.01	60.21	72.73	63.54
DM 6163RSF IPRO	59.13	60.05	59.83	57.21	61.68	61.23	53.23	62.06	59.30	59.55	60.86	60.12	61.04	59.33	60.52	59.99	60.20	60.73	62.33	60.95	60.48	60.47	62.32	61.21
PAN 1644 R	60.50	60.63	61.57	58.77	62.98	61.50	55.64	62.88	60.56	58.54	62.23	61.18	62.47	61.33	58.49	58.37	60.37	62.87	64.00	62.10	62.13	60.96	62.38	62.41
DM 6.81 RR	57.37	58.20	59.76	53.68	62.75	60.47	53.23	60.04	58.19	56.06	59.53	59.04	61.17	58.81	55.16	60.81	58.65	60.70	61.51	59.69	59.14	58.33	62.55	60.32
P71T74 R	58.63	58.37	60.56	55.83	61.01	60.70	55.30	61.23	58.95	59.07	61.41	59.33	61.48	58.72	54.99	60.12	59.30	60.60	62.61	61.05	59.48	59.92	62.28	60.99
Gem/Mean	59.95	60.17	60.08	58.36	62.38	60.86	55.20	62.63	59.96	56.84	61.66	61.07	61.98	60.36	55.98	60.03	59.70	62.64	63.06	61.38	61.25	60.76	62.36	61.91

Tabel 18 Die saadopbrengs van elke kultivar by die verskillende lokaliteite. 2022/23
 Table 18 The seed yield of the cultivars at the different localities. 2022/23

Kultivar	Koel/Cool						Matig/Moderate						Warm																	
	Bapfontein PD1	Bapfontein PD2	Clarens	Delmas PD1	Delmas PD2	Gem/Mean	Barberspan	Greytown	Kroonstad	Kroonstad (Agricol)	Leedoringsstad	Potchefström (Limagrain)	Potchefström (Pannar)	Rietvllei	Umtata	Gem/Mean	Grobisdal (Agrl-Seeds)	Grobisdal ARC	Hoopstad	Schweizer-PD1	Schweizer-PD2	Thabazimbi	Gem/Mean							
RA4918 R	1728	1741	3499	2821	2674	1437	3047	2937	2562	3041	4360	5504	2946	2776	4941	3512	3066	4088	4357	4134	4370	4072	3924	3221	4001	6110	4161	3939	4496	4321
RA5022 BR	1255	634	2881	3404	2598	2643	2407	3339	3020	3471	3296	4785	2828	2356	4552	4456	3251	3643	4515	3642	4509	3662	3843	3314	4445	5669	3805	4165	2970	4061
DM 5351RSF	1946	1692	3247	2164	2241	1871	2731	2975	3280	2861	4230	6161	2950	2642	5015	3642	2982	4081	4317	4317	4750	4868	3633	3718	4750	4653	3917	4687	3224	4167
DM 53154RSF IPRO	2369	1721	3693	2353	2652	2147	3279	2506	2691	3367	4488	5715	3082	3205	5025	3665	2162	2960	4479	3967	2453	4318	3604	3727	3970	6581	4917	3690	3730	4469
NS 5258 R	1558	1774	4064	2075	2429	1733	3080	3152	3180	2603	3387	6168	2933	3028	4986	3578	2703	3643	4251	4169	3336	4112	3756	2684	3355	5962	4368	4478	3414	4244
PAN 1502 R	2398	1639	2633	3094	1811	2421	1819	2740	1593	2405	3340	4988	2573	2274	4595	3392	3261	3112	3429	3749	3988	4599	3600	3355	3887	5962	4368	4478	3414	4244
YS40	1911	1728	3183	3805	2270	1933	2471	3131	2412	2906	2988	5825	2880	3163	5804	3915	3160	3422	3917	4558	3996	3935	3941	3385	4000	5736	4776	4705	4203	4467
LS 6851 R	2213	1568	2300	3595	2118	1951	1789	3582	1692	2628	3030	5198	2639	2385	4140	3525	3495	3351	3796	3820	4291	3613	3602	3955	2986	6464	4353	4218	4003	4330
RA565 R	1851	1584	2802	3798	2214	1934	2180	3370	2139	2563	3822	5278	2795	2551	5321	3770	3262	3334	3781	3958	3922	3937	3759	3567	4785	5548	4044	4805	3202	4325
PAN 1507 R	2025	1930	2105	3037	2007	1584	1801	3159	1923	2089	2512	5379	2463	2539	4806	3358	3596	3247	5578	4153	4790	3026	3677	3747	3880	4433	4419	4076	3532	4014
RA5722BR	898	1140	3134	3418	2238	1958	2394	3351	2197	2028	3478	5283	2626	2509	4335	3830	3051	4807	3772	3758	4197	2791	3672	3844	3899	6275	4515	3784	3679	4333
PAN 1521 R	1826	1694	3071	3372	2554	3134	2009	3313	2163	2597	3727	4643	2842	2469	4869	4344	4072	4331	3941	3965	3952	4081	4003	3720	3905	6369	4591	4492	3894	4495
PAN 1555 R	2061	1900	2867	2971	1980	2200	1303	3337	1320	2265	4412	5501	2676	2425	4931	3374	3701	3337	3656	3514	3755	3757	3606	3435	3503	4183	3946	4690	2924	3780
P57T19 R	2018	1680	2593	2995	2568	3016	2085	3345	1789	2770	4416	4814	2841	3019	4756	3918	3239	4154	2805	3248	4304	4177	3735	2995	3796	4413	3609	4225	2568	3601
RA5821 R	1733	1423	1916	3126	2491	2693	1924	3058	1758	2667	3603	5056	2637	2228	5276	4657	2996	4309	4002	4399	3708	4104	3964	3375	3305	5853	4923	3876	3470	4134
NS 5909 R	1970	1931	1959	3034	1953	1719	1624	3914	1447	1837	3073	5557	2501	2285	4119	3928	3982	3741	3827	3301	4040	3511	3637	3649	3716	5830	4900	4425	2097	4436
DM59R03	2191	1495	2308	2938	2500	2729	2010	3561	1718	2704	4023	4682	2738	2290	4888	3859	3093	3393	4122	4005	3502	3996	3683	3244	4340	5855	4548	5116	2942	4341
LG60260IPR	1677	1438	2504	3050	2016	1962	1673	2981	1995	2359	3005	4496	2430	2236	4573	3841	3390	3744	3893	3619	4149	3921	3707	3732	3919	6016	4774	3990	4113	4424
RA660 R	1396	1733	2916	3473	2051	1933	1438	3414	1675	3093	3677	5806	2717	2766	5626	3797	3959	3824	3704	4462	3483	3445	3896	4306	4631	6085	4905	4045	4134	4684
DM 59160RSF IPRO	1985	1791	2518	3093	2095	1343	1689	3659	1985	2807	4490	6144	2800	3053	4611	3939	3914	4185	3501	4444	4802	3597	4005	4253	4290	5802	5078	4166	3826	4569
LG60261IPR	1926	1462	1139	2898	1936	2146	1390	3066	1582	2314	3918	5428	2434	2358	5041	3666	4108	2987	3213	4119	3945	4448	3765	4090	4025	5260	5142	4988	3655	4527
LS 6860 R	1708	1429	1806	2505	1921	1715	1091	2741	999	1906	3611	4425	2155	2198	4085	3766	3450	3679	2771	3481	4424	3827	3520	3557	2937	4687	4271	4294	2318	3677
P62T16R	1706	1676	1686	2929	2327	1987	1846	3285	1399	2056	3028	5643	2464	3428	5421	3601	2492	4569	3544	4004	4797	4279	4015	3315	4347	5305	4455	4430	1811	3944
RA6422 R	2094	1526	2425	3221	2468	1657	1381	3205	1930	2687	3428	5154	2598	3148	4807	3890	3942	4302	4160	4043	3572	3466	3926	3898	3826	4524	4959	4827	3736	4295
P64T39 R	1891	1877	2301	3397	1955	2729	1365	3863	1405	2428	3596	5431	2686	2044	4908	4209	4128	3969	3470	4413	3682	4182	3889	3452	3844	5556	5066	4751	3526	4366
Y651 RR PRO	1770	1536	1801	2752	1385	1754	1601	3009	1321	2207	2066	5561	2230	2941	4874	3519	4236	3496	3805	3744	4871	3446	3881	3285	3381	4460	4776	4944	3031	3979
RA6521BR	921	771	1688	2605	2031	1280	1071	3145	1397	1717	4032	5274	2161	3212	3979	3180	2985	4156	4381	3631	3499	3684	3632	3696	2623	4906	4493	3732	3733	3864
Y657	2173	1875	2374	3259	2362	2010	1483	3294	1506	3231	4483	5086	2760	3236	5404	4037	3064	3262	3556	4513	3853	3732	3851	3326	4190	5517	5506	5043	3239	4470
DM 61163RSF IPRO	1809	1592	2429	2562	2081	2496	1717	3698	1836	1851	3610	4979	2555	4004	4226	4098	3119	4390	3796	3502	4663	3039	3871	3714	4049	5849	5029	4389	3794	4471
PAN 1644 R	1690	1892	2455	3515	2402	2423	1944	3023	1683	2759	3888	5305	2748	2034	5399	3989	3036	3535	3493	4236	3803	3477	3667	3322	4595	5642	5261	4604	2905	4388
DM 6.81 RR	1582	1341	2337	3401	2246	2124	1408	3639	1343	2459	3951	4879	2559	2951	5281	3828	4190	3892	3040	3908	4011	3338	3827	2799	4397	4981	4653	3450	3548	3971
P71174 R	2083	1198	2021	2932	2173	2017	1604	3446	1541	2788	3639	5499	2578	2318	5563	3459	3791	3827	3434	4128	3145	4063	3746	3307	4746	5604	5003	4173	3273	4351
Gem/Mean	1824	1575	2520	3050	2211	2090	1895	3257	1890	2546	3650	5301	2651	2690	4880	3805	3373	3740	3752	3966	3954	3827	3776	3531	4007	5506	4592	4350	3493	4246
CV	18.6	16.0	16.0	12.8	15.1	14.7	18.6	13.9	19.0	12.2	19.1	10.7	26.5	8.6	14.7	11.8	21.5	8.1	15.5	10.7	17.8	15.6	12.5	17.9	5.0	7.1	5.5	20.2		

Tabel 19 Opbrengswaarskynlikheid (%) van kultivars geëvalueer in 2020/21, 2021/22 en 2022/23 vir die koeler produksiegebiede by verskillende opbrengspotensiale
 Table 19 Yield probability (%) of cultivars in the 2020/21, 2021/22 and 2022/23 for the cooler production areas at different yield potentials

Kultivar	Opbrengswaarskynlikheid/Yield potential (t/ha)								Regressie lyn/Regression line	
	2.0	2.5	3.0	3.5	4.0	4.5	Fprob	R2		
Cultivar	2.0	2.5	3.0	3.5	4.0	4.5	Fprob	R2		
RA4918 R	59	56	54	51	47.5	45	<0.001	0.70		
DM 5351RSF	62	61	60	58	57	56	<0.001	0.69		
NS 5258 R	52	50	46	44	41	38	<0.001	0.59		
LS 6851 R	45	43	41	38	37	35	<0.001	0.88		
RA565 R	47	48	50	52	53	55	<0.001	0.88		
PAN 1521 R	81	76	69	62	54	46	<0.001	0.77		
PAN 1555 R	42	43	45	46	47	49	<0.001	0.86		
NS 5909 R	31	35	38	43	47	51	<0.001	0.87		
DM59R03	66	62	58	54	51	46	<0.001	0.74		
RA660 R	38	41	45	49	52	56	<0.001	0.87		
LS 6860 R	21	23	26	29	33	37	<0.001	0.88		
P64T39 R	54	54	54	54	53	53	<0.001	0.73		
PAN 1644 R	51	54	56	59	63	65	<0.001	0.92		
DM 6.8 IRR	49	51	52	53	55	56	<0.001	0.87		
P71T74 R	40	45	51	56	62	67	<0.001	0.90		

Tabel 20 Graanopbrengs (kg/ha⁻¹) van kultivars gedurende die 2021/22 en 2022/23 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 2021/22 and 2022/23 growing season for the various localities situated in the cooler production areas

Cultivar	2021/22										2022/23										
	Bapstontein PD2	Belfast	Bethlehem PD1	Bethlehem PD2	Delmas	Standerton	Winterton	Gem/Mean	Bapstontein PD1	Bapstontein PD2	Belfast	Bethlehem PD1	Bethlehem PD2	Clarens	Delmas 1	Delmas 2	Kinross	Kokstad	Standerton	Winterton	Gem/Mean
RA4918 R	2784	4307	3345	2402	4438	3623	4917	3448	1728	1741	3499	2821	2674	1437	3047	2937	2562	3041	4360	5504	2946
RA5022 BR	-	-	-	-	-	-	-	-	1255	634	2881	3404	2598	2843	2407	3339	3020	3296	4785	2828	2828
DM 5351RSF	3597	4539	3512	2720	4601	3482	4917	3786	1946	1692	3247	2164	2241	1721	2731	2975	2861	4230	6161	2950	3082
DM 5354RSF IPRO	-	-	-	-	-	-	-	-	2369	1721	3693	2353	2662	2147	3279	2506	2691	3367	4488	5715	3082
NS 5258 R	2996	4082	3389	1884	4081	2856	5059	3300	1558	1724	4064	2075	2429	1733	3080	3152	3180	2603	3387	6168	2933
PAN 1502 R	-	-	-	-	-	-	-	-	2398	1639	2633	3094	1811	2421	1819	2740	1593	2405	3340	4988	2573
Y540	3335	4575	4289	2243	3994	2906	5135	3622	1911	1728	3183	3805	2270	1933	2471	3131	2412	2906	2988	5825	2680
LS 6851 R	3068	3970	3813	2325	3144	3879	4841	3524	2213	1568	2300	3595	2218	1951	1789	3582	1692	2628	3030	5198	2639
RA565 R	3427	3502	4035	1834	4519	3892	5304	3686	1851	1584	2802	3798	2214	1934	2180	3370	2139	2563	3822	5278	2795
PAN 1507 R	-	-	-	-	-	-	-	-	2025	1930	2105	3037	2007	1564	1801	3159	1923	2089	2512	5379	2463
RA5722BR	-	-	-	-	-	-	-	-	898	1140	3134	3418	2238	1958	2394	3351	2197	2028	3478	5283	2626
PAN 1521 R	2670	4116	4362	3434	3389	4208	4628	3702	1826	1694	3071	3372	2554	3134	2009	3337	2163	2597	3727	4643	2842
PAN 1555 R	3507	3208	4013	2253	3979	4358	4448	3348	2061	1900	2867	2971	1980	2200	1303	3337	320	2265	4412	5501	2676
P57T19 R	3093	3666	4500	3583	3670	3975	5179	3660	2018	1680	2593	2995	2568	3016	2085	3345	1789	2770	4416	4814	2841
RA5821 R	-	-	-	-	-	-	-	-	1733	1423	1916	3126	2491	2693	1924	3058	1798	1867	3803	5056	2637
NS 5909 R	2057	3177	3900	2734	3573	4437	5277	3376	1970	1931	1959	3034	1953	1719	1624	3014	1447	1837	3073	5557	2501
DM59R03	2927	4011	4027	3865	3686	5047	4170	3844	2191	1495	2308	2938	2500	2729	2010	3561	1718	2704	4023	4682	2738
LG60260IPR	-	-	-	-	-	-	-	-	1677	1438	2504	3050	2016	1962	1673	2981	1995	2359	3005	4496	2430
RA660 R	3440	4158	4193	1922	3912	3929	5026	3644	1396	1333	2916	3473	2051	1933	1438	3414	1675	3093	3677	5806	2717
DM 59160RSF IPRO	-	-	-	-	-	-	-	-	1985	1791	2518	3093	2096	1343	1689	3659	1985	2807	4490	6144	2800
LG60261IPR	-	-	-	-	-	-	-	-	1926	1462	1139	2898	1936	1246	1390	3066	1582	2314	3918	5428	2434
LS 6860 R	2715	3243	3605	2580	3725	4435	4852	3310	1708	1429	1806	2505	1921	1715	1091	2741	999	1906	3611	4425	2155
P62T16R	3323	3703	4365	2525	3059	4263	4764	3373	1706	1686	1686	2929	2327	1967	1846	3285	1399	2056	3028	5643	2464
RA6422 R	-	-	-	-	-	-	-	-	2094	1526	2425	3221	2468	1657	1381	3205	1930	2687	3428	5154	2598
P64T39 R	3135	2980	4700	3972	3403	4614	3838	3547	1891	1877	2301	3397	1955	2729	1365	3863	1405	2428	3596	5431	2686
Y651 RR PRO	-	-	-	-	-	-	-	-	1770	1536	1801	2752	1385	1754	1601	3009	1321	2207	2066	5561	2230
RA6521BR	-	-	-	-	-	-	-	-	921	771	1688	2605	2031	1280	1071	3145	1397	1717	4032	5274	2161
Y657	3934	5017	3929	2322	4155	4468	6094	4180	2173	1875	2374	3259	2362	2010	1463	3294	1506	3231	4483	5086	2760
DM 61163RSF IPRO	-	-	-	-	-	-	-	-	1809	1592	2429	2562	2081	2496	1717	3698	1836	1851	3610	4979	2855
PAN 1644 R	2785	4136	4367	2407	4187	4041	5048	3741	1690	1892	2455	3515	2402	2423	1944	3023	1683	2759	3888	5305	2748
DM 6.8i RR	1920	3856	3413	2903	3752	4329	5320	3378	1582	1341	2337	3401	2246	2124	1408	3639	1343	2459	3951	4879	2559
P71T74 R	2719	4074	4619	3087	3722	4896	4753	3719	2083	1198	2021	2932	2173	2017	1604	3446	1541	2788	3639	5499	2578
PAN 1479 R	2790	3057	2689	1491	3550	3400	4050	2762	-	-	-	-	-	-	-	-	-	-	-	-	-
DM 5953RSF	2260	4678	4192	3710	3998	3257	5200	3865	-	-	-	-	-	-	-	-	-	-	-	-	-
SSS 5449 (uc)	3078	4108	3634	2421	4003	3770	4792	3638	-	-	-	-	-	-	-	-	-	-	-	-	-
SSS 5052 (uc)	2784	2927	3491	1558	3971	3850	4127	3115	-	-	-	-	-	-	-	-	-	-	-	-	-
DM 5302RSF	3326	4541	4211	2802	3624	4576	4595	3902	-	-	-	-	-	-	-	-	-	-	-	-	-
RA5921 R	3411	4428	3753	2439	4108	3776	4541	3618	-	-	-	-	-	-	-	-	-	-	-	-	-
PAN 1588 R	3042	3280	3684	1636	3488	4191	4492	3269	-	-	-	-	-	-	-	-	-	-	-	-	-
LS 6164 R	2973	3624	4276	3043	3268	4788	4132	3491	-	-	-	-	-	-	-	-	-	-	-	-	-
Y627	3351	3786	3451	2338	3537	4072	6171	3591	-	-	-	-	-	-	-	-	-	-	-	-	-
PAN 1692 R	3139	3549	3523	2249	3634	4041	5593	3546	-	-	-	-	-	-	-	-	-	-	-	-	-
NS 6448 R	2982	3813	3928	2387	3314	4688	6563	3598	-	-	-	-	-	-	-	-	-	-	-	-	-
RA6520RS	1359	3202	4188	3080	3430	3801	4949	3034	-	-	-	-	-	-	-	-	-	-	-	-	-
DM 68R09	3548	3970	4549	2819	3795	3927	2921	3396	-	-	-	-	-	-	-	-	-	-	-	-	-
Gem/Mean	2983	3853	3936	2593	3772	4055	4865	3538	1824	1575	2520	3050	2211	2090	1895	3257	1890	2546	3650	5301	2651

Table 21 Opbrengswaarskynlikheid (%) van die kultivars geëvalueer in 2020/21, 2021/22 en 2022/23 vir die matige produksiegebiede by verskillende opbrengspotensiale
 Table 21 Yield probability (%) in the 2020/21, 2021/22 and 2022/23 for the moderate production areas at different yield potentials

Kultivar	Opbrengswaarskynlikheid/Yield potential (t/ha)										Regressie lyn/Regression line	
	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	Fprob	R2		
Cultivar	48	49	51	53	55	57	59	61	<0.001	0.86		
RA4918R	33	37	42	47	52	57	62	66	<0.001	0.74		
DM5351RSF	35	37	40	42	44	47	49	52	<0.001	0.81		
NS5258R	54	51	49	46	44	42	40	37	<0.001	0.89		
LS6851R	61	60	58	57	56	54	53	51	<0.001	0.88		
RA565R	62	61	59	57	55	53	52	50	<0.001	0.85		
PAN1521R	36	37	38	39	40	41	42	42	<0.001	0.94		
PAN1555R	56	52	47	42	38	33	30	26	<0.001	0.81		
NS5909R	54	54	53	52	51	51	50	49	<0.001	0.89		
DM59R03	52	53	55	56	58	59	60	61	<0.001	0.88		
RA660R	37	35	33	31	29	28	26	25	<0.001	0.81		
LS6860R	62	61	61	60	59	59	57	57	<0.001	0.83		
P64T39R	47	49	51	53	55	57	59	61	<0.001	0.88		
PAN1644R	66	64	62	60	58	56	54	52	<0.001	0.74		
DM6.8RR	52	53	53	54	55	55	56	56	<0.001	0.88		
P71T74R												

Tabel 22 Graanopbrengs (kg/ha⁻¹) van kultivars gedurende die 2020/21 en 2021/22 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	2021/22										2020/23									
	Barberspan	Bergville	Cedara	Greytown	Kroonstad	Leudorngstad	Potchetstroom	Gem/Mean	Barberspan	Greytown	Kroonstad	Kroonstad (Agricol)	Leudorngstad	Potchetstroom (Limgrain)	Potchetstroom (Fannar)	Rietvel	Umtata	Gem/Mean		
RA4918 R	1641	3331	4126	3125	3229	2780	5457	3384	2776	4941	3512	3066	4088	4357	4134	4370	4072	3924		
RA5022 BR	-	-	-	-	-	-	-	-	2356	4552	4456	3251	3642	4515	3642	4509	3662	3843		
DM 5351RSF	3131	2992	5278	3517	2898	1126	5457	3485	2642	5015	3648	2028	2982	4081	4317	3113	4868	3633		
DM 53154RSF IPRO	-	-	-	-	-	-	-	-	3205	5025	3865	2162	2960	4479	3967	2453	4318	3604		
NS 5258 R	1505	2907	4287	3414	2937	2696	5337	3298	3028	4986	3578	2703	3336	4251	4169	3336	4112	3756		
PAN 1502 R	-	-	-	-	-	-	-	-	2274	4595	3392	3261	3112	3429	3749	3988	4599	3600		
Y640	3149	3443	4219	2874	2992	3219	4993	3556	3163	5804	3915	3160	3422	3917	4558	3596	3935	3941		
LS 6851 R	2359	4010	4683	2957	3766	2889	4895	3651	2385	4140	3525	3495	3351	3796	3820	4291	3613	3602		
RA665 R	2708	3570	4482	3049	3460	3862	5070	3743	2551	5321	3770	3262	3334	3781	3958	3922	3937	3759		
PAN 1507 R	-	-	-	-	-	-	-	-	2539	4806	3358	3596	3247	3578	4153	4790	3026	3677		
RA5722BR	-	-	-	-	-	-	-	-	2509	4335	3830	3051	4807	3772	3758	4197	2791	3672		
PAN 1521 R	2324	3953	4375	2572	3628	2615	4890	3479	2489	4869	4344	4072	4331	3941	3965	3952	4081	4006		
PAN 1555 R	2415	3770	4448	2615	3540	2470	4797	3436	2425	4931	3374	3701	3337	3656	3514	3755	3757	3606		
P57T19 R	2290	3510	4802	2790	3159	1484	5124	3308	3019	4756	3918	3239	4154	2805	3248	4304	4177	3735		
RA5821 R	-	-	-	-	-	-	-	-	2228	5276	4657	2996	4309	4002	4399	3708	4104	3984		
NS 5909 R	2883	3731	4464	2916	3336	1718	4628	3382	2285	4119	3928	3982	3741	3827	3301	4040	3511	3637		
DM59R03	2945	3734	4239	2688	3204	3118	5342	3610	2290	4888	3859	3093	3393	4122	4005	3502	3996	3683		
LG60260IPR	-	-	-	-	-	-	-	-	2236	4573	3841	3390	3744	3893	3619	4149	3921	3707		
RA660 R	2957	3356	4826	3004	3403	2326	5506	3625	2766	5626	3797	3959	3824	3704	4462	3483	3445	3896		
DM 59160RSF IPRO	-	-	-	-	-	-	-	-	3053	4611	3939	3914	4185	3501	4444	4802	3597	4005		
LG60261IPR	-	-	-	-	-	-	-	-	2358	5041	3666	4108	2987	3213	4119	3945	4448	3765		
LS 6860 R	2383	3063	4334	2449	3057	1458	4372	3017	2198	4085	3766	3450	3679	2771	3481	4424	3827	3520		
P62T16R	2000	3613	4318	2641	3415	2362	5487	3402	3428	5421	3601	2492	4569	3544	4004	4797	4279	4015		
RA6422 R	-	-	-	-	-	-	-	-	3148	4907	3890	3942	4302	4160	4043	3572	3466	3926		
P64T39 R	-	-	-	-	-	-	-	-	2044	4908	4209	4128	3969	3470	4413	3682	4182	3889		
Y651 RR PRO	-	-	-	-	-	-	-	-	2941	4874	3519	4236	3496	3805	3744	4871	3446	3881		
RA652TBR	-	-	-	-	-	-	-	-	3212	3979	3180	2985	4156	4381	3631	3499	3664	3632		
Y657	3181	4448	4018	2903	3438	3811	5298	3671	3236	5404	4037	3064	3262	3556	4513	3853	3732	3851		
DM 61163RSF IPRO	-	-	-	-	-	-	-	-	4004	4226	4098	3119	4390	3796	3502	4663	3039	3871		
PAN 1644 R	2980	3666	4877	2981	3693	3628	4808	3805	2034	5399	3989	3036	3535	3493	4236	3803	3477	3667		
DM 6.8i RR	3384	3143	5090	2656	3747	4075	5059	3679	2951	5281	3828	4190	3892	3040	3908	4011	3338	3827		
P71T74 R	2924	3300	4991	2507	3328	3277	5271	3657	2318	5563	3459	3791	3827	3434	4128	3145	4053	3746		
PAN 1479 R	2638	2842	4103	2861	2638	1677	4067	2975	-	-	-	-	-	-	-	-	-	-		
DM 5953RSF	2397	2901	4650	2768	2951	2551	4993	3316	-	-	-	-	-	-	-	-	-	-		
SSS 5449 (luc)	2420	2848	4014	3100	2721	1386	4917	3058	-	-	-	-	-	-	-	-	-	-		
SSS 5052 (luc)	2480	3044	4226	2774	3263	1463	4710	3137	-	-	-	-	-	-	-	-	-	-		
DM 5302RSF	2786	2890	4215	3194	3810	2531	5026	3493	-	-	-	-	-	-	-	-	-	-		
RA6921 R	2607	3717	4486	2922	3019	3460	4503	3531	-	-	-	-	-	-	-	-	-	-		
PAN 1588 R	2215	3441	3678	2727	3426	2351	4612	3207	-	-	-	-	-	-	-	-	-	-		
LS 6164 R	2146	3081	4295	2752	3574	2041	5189	3297	-	-	-	-	-	-	-	-	-	-		
Y627	2438	3918	4019	2937	3177	3119	4721	3475	-	-	-	-	-	-	-	-	-	-		
PAN 1692 R	2431	3138	4382	2867	3263	2475	5189	3395	-	-	-	-	-	-	-	-	-	-		
NS 6448 R	3017	3167	4868	2756	3406	2447	4906	3509	-	-	-	-	-	-	-	-	-	-		
RA6520RS	2052	3820	4144	3297	3461	2092	4977	3406	-	-	-	-	-	-	-	-	-	-		
DM68R09	2957	3303	4667	2919	3653	2659	4895	3579	-	-	-	-	-	-	-	-	-	-		
Gem/Mean	2607	3415	4438	2877	3314	2539	5000	3456	2690	4880	3805	3373	3740	3752	3966	3954	3827	3776		

Tabel 23 Opbrengswaarskynlikheid (%) van kultivars geëvalueer in 2020/21, 2021/22 en 2022/23 vir die warm produksiegebiede by verskillende opbrengspotensiale
 Table 23 Yield probability (%) of cultivars in the 2020/21, 2021/22 and 2022/23 for the warm production areas at different yield potentials

Kultivar	Opbrengswaarskynlikheid/Yield potential (t/ha)										Regressielyn/Regression line	
	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	Fprob	R2		
Cultivar												
RA4918 R	47	49	52	55	58	61	64	66	<0.001	0.85		
DM 5351RSF	41	40	40	40	40	39	39	39	<0.001	0.82		
NS 5258 R	38	40	43	45	47	50	52	54	<0.001	0.75		
LS 6851 R	58	56	55	54	52	51	49	47	<0.001	0.73		
RA565 R	44	44	46	46	47	48	49	49	<0.001	0.88		
PAN 1521 R	55	57	59	62	63	65	67	68	<0.001	0.91		
PAN 1555 R	53	48	42	36	31	25	21	18	<0.001	0.76		
NS 5909 R	44	47	50	53	56	59	61	64	<0.001	0.85		
DM59R03	61	59	58	55	53	51	48	46	<0.001	0.81		
RA660 R	66	65	63	62	61	59	58	56	<0.001	0.84		
LS 6860 R	51	46	40	36	30	26	23	19	<0.001	0.73		
P64T39 R	51	53	56	58	60	62	64	66	<0.001	0.92		
PAN 1644 R	39	43	48	53	58	62	67	71	<0.001	0.88		
DM 6.8iRR	54	52	51	48	47	45	43	42	<0.001	0.79		
P71T74 R	51	52	53	54	55	56	57	58	<0.001	0.88		

Tabel 24 Graanopbrengs (kg/ha⁻¹) van kultivars gedurende die 2020/21 en 2021/22 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 2020/21 and 2021/22 growing season for the various localities situated in the warm production areas

Kultivar	2021/22						2022/23							
	Groblersdal (Agr-Seeds)	ARC	Hoopstad	Pyramid	Schweizer- Reneke PD1	Schweizer- Reneke PD2	Gem/Mean	Groblersdal (Agr-Seeds)	ARC	Hoopstad	Schweizer- Reneke PD1	Schweizer- Reneke PD2	Thabazimbi	Gem/Mean
RA4918 R	3443	4548	5455	2584	3337	1443	3468	3221	4001	6110	4161	3939	4496	4321
RA5022 BR	-	-	-	-	-	-	-	3314	4445	5669	3805	4165	2970	4061
DM 5351RSF	3333	4211	4954	1736	3611	1687	3255	3718	4750	4653	3971	4687	3224	4167
DM 53164RSF IPRO	-	-	-	-	-	-	-	3727	3970	6581	4917	3890	3730	4469
NS 5258 R	3512	3415	5075	2313	3495	1375	3197	2684	5255	6048	3738	3805	4774	4384
PAN 1502 R	-	-	-	-	-	-	-	3355	3887	5962	4368	4478	3414	4244
Y540	3422	3810	5266	2075	3450	1656	3280	3385	4000	5736	4776	4705	4203	4467
LS 6851 R	3823	4823	4152	2883	2524	1850	3343	3955	2986	6464	4353	4218	4003	4330
RA565 R	3441	4588	5046	2324	2883	1510	3299	3567	4785	5548	4044	4805	3202	4325
PAN 1507 R	-	-	-	-	-	-	-	3747	3880	4433	4419	4076	3532	4014
RA5722BR	-	-	-	-	-	-	-	3844	3899	6275	4515	3784	3679	4333
PAN 1521 R	3856	4577	4225	2419	3889	1655	3437	3720	3905	6369	4591	4492	3894	4495
PAN 1555 R	3518	4076	4312	2334	3909	1896	3341	3435	3503	4183	3946	4690	2924	3780
P57T19 R	3094	3757	4600	2456	3315	1593	3136	2995	3796	4413	3609	4225	2568	3601
RA5821 R	-	-	-	-	-	-	-	3375	3305	5853	4923	3876	3470	4134
NS 5909 R	3789	5217	4013	2251	3732	1794	3466	3649	3716	5830	4900	4425	4097	4436
DM59R03	3429	4327	4196	2419	3429	2445	3374	3244	4340	5855	4548	4116	2942	4341
LG60260IPR	-	-	-	-	-	-	-	3732	3919	6016	4774	3990	4113	4424
RA660 R	3542	4733	4584	3096	3491	2154	3600	4306	4631	6085	4905	4045	4134	4684
DM 59160RSF IPRO	-	-	-	-	-	-	-	4253	4290	5802	5078	4166	3826	4569
LG60261IPR	-	-	-	-	-	-	-	4090	4025	5260	5142	4988	3655	4527
LS 6860 R	3390	4704	3671	2591	3598	1810	3294	3557	2937	4687	4271	4294	2318	3677
P62T16R	3670	5074	4399	2572	3625	1932	3545	3315	4347	5305	4455	4430	1811	3944
RA6422 R	-	-	-	-	-	-	-	3898	3826	4524	4959	4827	3736	4295
P64T39 R	3889	4558	5449	2612	4072	2027	3768	3452	3844	5556	5066	4751	3526	4366
Y651 RR PRO	-	-	-	-	-	-	-	3285	3381	4460	4776	4944	3031	3979
RA6521BR	-	-	-	-	-	-	-	3696	2623	4906	4493	3732	3733	3864
Y657	4066	5360	4851	1636	4201	2071	3698	3326	4190	5517	5506	5043	3239	4470
DM 61163RSF IPRO	-	-	-	-	-	-	-	3714	4049	5849	5029	4389	3794	4471
PAN 1644 R	4215	4942	5203	2700	3109	1910	3680	3322	4595	5642	5261	4604	2905	4388
DM 681RR	2911	4327	5012	2072	3180	2064	3261	2799	4397	4981	4653	3450	3548	3971
P71T74 R	3782	4928	4963	2758	3804	1936	3695	3307	4746	5604	5003	4173	3273	4351
PAN 1479 R	2997	3053	3989	2470	2381	1065	2659	-	-	-	-	-	-	-
DM 5953RSF	3148	3739	5385	2045	2110	1379	2968	-	-	-	-	-	-	-
SSS 5449 (tuc)	3636	3493	4156	2330	2704	1223	2924	-	-	-	-	-	-	-
SSS 5052 (tuc)	4045	4298	4350	1801	3183	1485	3194	-	-	-	-	-	-	-
DM 5302RSF	3391	4693	4992	2758	1796	1281	3152	-	-	-	-	-	-	-
RA5921 R	3987	4205	4446	2384	3210	1786	3336	-	-	-	-	-	-	-
PAN 1588 R	4083	4801	3403	2299	3431	1829	3307	-	-	-	-	-	-	-
LS 6164 R	3229	4724	3853	2254	3017	1533	3102	-	-	-	-	-	-	-
Y627	3944	5067	4209	2254	4016	1846	3556	-	-	-	-	-	-	-
PAN 1692 R	3494	4359	3727	3548	3350	1456	3156	-	-	-	-	-	-	-
NS 6448 R	3608	5216	4694	2959	3357	1678	3585	-	-	-	-	-	-	-
RA6520RS	3541	4732	3976	2001	3520	1994	3294	-	-	-	-	-	-	-
DM68R09	3526	4853	4460	2439	3374	2197	3475	-	-	-	-	-	-	-
Gem/Mean	3586	4475	4533	2387	3316	1736	3339	3531	4007	5506	4592	4350	3493	4246

Tabel 25 Saamgevatte inligting van al die lokaliteite in die koel produksiegebiede, 2022/23
 Table 25 Summarised information for all the localities in the cool production areas, 2022/23

Kultivar/Cultivar	Dae tot blom/ Days to flowering	Fisiologies ryp/ Physiological mature	Oes datum/ Harvest date	Plant hoogte/ Plant height	Peulhoogte/ Pod height	Omval/ Lodging	Groenstam/ Green stem	Opsprong/ Shattering	Planttelling/ Number of plants	Persentasie sade/Percent tage undesirable seed	Massa 100 sade/ Mass 100 seeds	Opbrengs/ Yield
RA4918 R	54	126	152	69	9	1.07	1.00	1.00	275	0.62	15.72	2946
RA5022 BR	58	132	152	68	9	1.07	1.19	1.00	218	0.44	15.41	2828
DM 5351RSF	56	133	154	77	11	1.04	1.22	1.00	277	0.35	16.32	2950
DM 53154RSF IPRO	52	131	157	86	11	1.04	1.11	1.00	307	0.46	17.51	3082
NS 5258 R	60	127	153	70	8	1.00	1.00	1.00	292	0.40	15.09	2933
PAN 1502 R	72	141	161	93	16	1.00	1.04	1.00	297	0.90	14.87	2573
Y540	72	140	161	83	12	1.04	1.00	1.00	282	0.75	12.90	2880
LS 6851 R	77	144	169	84	13	1.19	1.19	1.00	268	1.03	12.17	2639
RA565 R	77	143	163	89	15	1.41	1.07	1.00	290	1.12	14.47	2795
PAN 1507 R	81	142	168	93	15	1.11	1.07	1.00	284	0.66	13.94	2463
RA5722BR	65	144	164	84	10	1.00	1.48	1.00	227	0.50	15.78	2626
PAN 1521 R	85	140	164	102	15	1.33	1.00	1.00	306	0.89	14.36	2842
PAN 1555 R	83	146	166	100	19	1.00	1.00	1.00	302	0.82	14.72	2676
P57T19 R	82	147	169	104	18	1.37	1.19	1.00	303	0.69	15.98	2841
RA5821 R	79	143	173	98	15	1.30	1.15	1.00	287	1.46	13.70	2637
NS 5909 R	82	149	172	99	18	1.19	1.44	1.00	290	0.87	13.63	2501
DM59R03	80	151	174	107	16	1.74	1.07	1.00	289	1.12	15.30	2738
LG60260IPR	84	150	167	97	16	1.41	1.00	1.00	272	1.04	12.66	2430
RA660 R	79	145	165	83	14	1.00	1.00	1.00	306	1.12	12.96	2717
DM 59160RSF IPRO	83	147	168	92	16	1.26	1.07	1.00	225	1.21	12.35	2800
LG60261IPR	84	150	175	93	16	1.11	1.33	1.00	292	1.94	12.23	2434
LS 6860 R	86	151	179	107	17	1.59	1.41	1.00	261	0.84	14.95	2155
P62T16R	80	151	178	100	15	1.44	1.44	1.00	293	1.21	13.74	2464
RA6422 R	82	151	174	102	16	1.11	1.30	1.00	272	0.76	14.40	2598
P64T39 R	84	154	178	107	15	1.59	1.15	1.00	283	0.91	13.91	2686
Y651 RR PRO	89	153	176	101	19	1.15	1.04	1.00	240	1.59	13.14	2230
RA6521BR	90	152	173	88	13	1.78	1.33	1.00	182	0.83	13.08	2161
Y657	83	148	169	100	18	1.15	1.15	1.00	298	1.94	12.48	2760
DM 61163RSF IPRO	79	153	171	100	17	1.22	1.19	1.00	236	1.03	13.73	2555
PAN 1644 R	77	145	168	98	15	1.26	1.00	1.00	294	1.27	13.04	2748
DM 6.81 RR	87	150	180	112	16	1.70	1.41	1.00	303	0.93	14.38	2559
P71T74 R	86	149	180	108	18	1.59	1.15	1.00	286	1.07	13.87	2578
Gem/Mean	77	145	168	94	15	1.26	1.16	1.00	276	0.96	14.15	2651

Tabel 26 Saamgevatte inligting van al die lokaliteite in die matige produksiegebiede, 2022/23

Table 26 Summarised information for all the localities in the moderate production areas, 2022/23

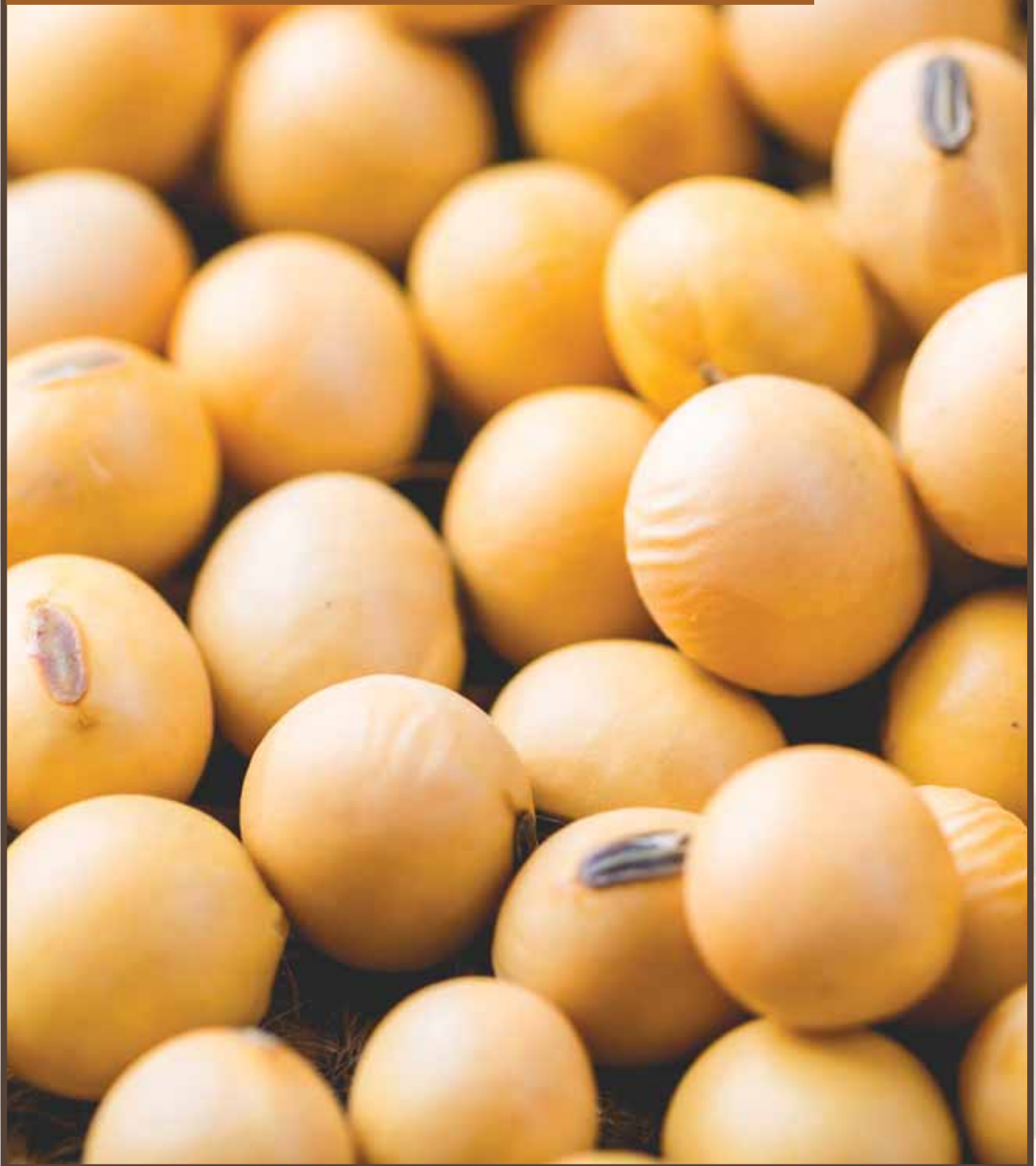
Kultivar/Cultivar	Dae tot blom/ Days to flowering	Fisiologies ryp/ Physiological maturity	Oes datum/ Harvest date	Plant hoogte / Plant height	Peulhoogte/ Pod height	Omvul/ Lodging	Groenstam/ Green stem	Opspring/ Shattering	Planttelling / Number of plants	Perentasie ongewenste sade/Percentage undesirable seed	Massa 100 sade/ Mass 100 seeds	Opbrengs/ Yield
RA4918 R	51	122	137	75	10	1.00	1.57	1.00	259	0.43	16.31	3924
RA5022 BR	52	124	143	71	9	1.00	1.71	1.00	228	0.52	15.73	3843
DM 5351RSF	51	122	137	75	10	1.05	1.33	1.00	248	0.25	16.12	3633
DM 53154RSF IPRO	49	123	140	77	10	1.05	2.19	1.00	287	0.79	17.53	3604
NS 5258 R	51	122	137	72	9	1.00	1.14	1.00	276	0.40	15.20	3756
PAN 1502 R	59	129	149	89	17	1.00	1.29	1.00	309	0.56	17.33	3600
Y540	59	126	148	80	12	1.05	1.76	1.00	259	0.24	15.21	3941
LS 6851 R	62	133	149	73	12	1.10	1.81	1.00	268	0.62	14.34	3602
RA565 R	62	128	146	82	13	1.10	1.43	1.00	301	0.97	16.56	3759
PAN 1507 R	65	132	145	86	15	1.00	1.57	1.00	281	0.43	15.74	3677
RA5722BR	53	133	155	86	10	1.05	2.48	1.00	243	0.76	16.87	3672
PAN 1521 R	65	132	152	102	18	1.00	1.57	1.00	264	0.77	17.87	4003
PAN 1555 R	68	133	152	94	18	1.00	1.52	1.00	262	0.39	16.64	3606
P57T19 R	60	134	146	96	20	1.00	1.71	1.00	272	0.39	16.45	3735
RA5821 R	64	132	149	86	13	1.00	1.76	1.00	302	0.38	16.64	3964
NS 5909 R	66	132	150	90	17	1.00	1.57	1.00	273	0.36	16.04	3637
DM59R03	64	134	154	95	16	1.14	1.95	1.00	264	0.55	16.93	3683
LG60260IPR	69	134	145	93	16	1.00	1.67	1.00	238	0.74	14.05	3707
RA660 R	64	132	149	81	13	1.00	1.29	1.00	294	0.64	14.79	3896
DM 59160RSF IPRO	68	134	152	96	18	1.05	1.43	1.00	242	0.69	13.52	4005
LG60261IPR	68	135	150	95	18	1.00	1.95	1.00	245	0.52	14.72	3765
LS 6860 R	68	134	151	96	16	1.14	1.43	1.00	231	0.44	16.55	3520
P62T16R	64	136	153	96	16	1.05	2.05	1.00	272	0.42	16.10	4015
RA6422 R	67	137	153	97	15	1.00	1.86	1.00	268	0.58	15.73	3926
P64T39 R	65	137	158	98	18	1.10	1.48	1.00	288	0.55	15.42	3889
Y651 RR PRO	68	136	151	103	21	1.10	1.48	1.00	236	1.23	14.09	3881
RA6521BR	70	138	158	101	17	1.62	1.86	1.00	185	0.64	14.85	3632
Y657	67	134	149	95	18	1.00	1.71	1.00	306	0.67	14.91	3851
DM 61163RSF IPRO	68	135	153	97	16	1.19	1.52	1.00	236	0.73	16.45	3871
PAN 1644 R	66	135	152	93	13	1.00	1.52	1.00	274	0.89	15.53	3667
DM 6.8i RR	67	136	154	105	18	1.43	2.00	1.00	271	0.36	16.26	3827
P71T74 R	68	141	158	103	16	1.29	2.00	1.00	286	0.55	15.85	3746
Gem	63	132	149	90	15	1.08	1.68	1.00	265	0.58	15.82	3776

Tabel 27 Saamgevatte inligting van al die lokaliteite in die warmer produksiegebiede, 2022/23

Table 27 Summarised information for all the localities in the warmer production areas, 2022/23

Kultivar/Cultivar	Dae tot blom/ Days to flowering	Fisiologies ryp/ Physio logical mature	Oes datum/ Harvest date	Planthoog- tel/ Plant height	Peulhoog- tel/ Pod height	Omvul/ Lodging	Groen- stam/ Green stem	Oop- spring/ Shattering	Planttel- ling/ Number of plants	Persentasie ongewenste sade/Percent- tage undesirable seed	Massa 100 sade/ Mass 100 seeds	Opbrengrs/ Yield
RA4918 R	44	117	136	79	10	1.50	2.20	1.00	253	0.72	17.14	4321
RA5022 BR	45	119	136	85	10	1.06	1.93	1.00	308	0.25	17.04	4061
DM 5351RSF	44	116	139	93	10	1.72	3.27	1.00	257	0.65	16.91	4167
DM 53154RSF IPRO	46	119	142	91	11	1.17	3.07	1.00	254	0.75	18.41	4469
NS 5258 R	45	117	139	88	9	1.61	1.40	1.00	322	0.38	16.43	4384
PAN 1502 R	60	125	120	103	14	1.50	1.40	1.00	292	0.36	17.35	4244
Y540	56	124	145	101	14	1.44	1.67	1.00	275	0.36	15.87	4467
LS 6851 R	60	129	148	70	9	1.00	2.07	1.00	253	0.52	15.50	4330
RA565 R	59	128	145	111	17	1.89	1.73	1.00	337	0.38	17.74	4325
PAN 1507 R	63	132	149	110	20	1.39	2.47	1.00	298	0.37	17.41	4014
RA5722BR	50	135	153	108	13	1.50	3.87	1.00	277	0.50	17.51	4333
PAN 1521 R	62	129	149	110	17	1.67	1.73	1.00	270	0.61	17.61	4495
PAN 1555 R	66	134	149	119	23	1.67	1.93	1.00	246	1.17	17.30	3780
P57T19 R	62	127	148	110	20	1.67	2.07	1.00	280	0.64	17.12	3601
RA5821 R	59	125	145	107	15	1.72	1.67	1.00	270	0.64	16.93	4134
NS 5909 R	65	134	153	119	22	2.39	3.07	1.00	232	0.64	17.95	4436
DM59R03	59	130	150	118	21	2.50	2.60	1.00	250	0.74	17.87	4341
LG60260IPR	62	131	150	115	20	2.50	2.20	1.00	291	0.71	15.32	4424
RA660 R	63	132	145	101	12	1.33	1.67	1.00	339	0.49	16.19	4684
DM 59160RSF IPRO	63	132	151	111	19	2.06	1.53	1.00	244	0.47	16.05	4569
LG60261IPR	67	133	153	108	21	1.11	2.93	1.00	256	0.62	16.58	4527
LS 6860 R	63	138	156	120	23	2.33	1.80	1.00	207	0.69	17.59	3677
P62T16R	65	135	156	116	22	2.44	2.53	1.00	266	1.08	17.41	3944
RA6422 R	66	141	156	121	23	1.61	2.60	1.00	241	1.26	17.11	4295
P64T39 R	63	137	153	120	21	2.44	2.27	1.00	275	0.77	17.21	4366
Y651 RR PRO	65	140	155	132	26	1.83	2.67	1.00	245	0.58	16.05	3979
RA6521BR	69	141	156	121	21	2.61	2.20	1.00	173	0.63	16.23	3864
Y657	66	134	149	119	23	2.17	1.40	1.00	281	0.35	16.15	4470
DM 6163RSF IPRO	66	136	156	119	21	2.22	1.53	1.00	217	0.52	17.27	4471
PAN 1644 R	66	137	154	119	22	2.39	2.33	1.00	246	0.62	16.54	4388
DM 6.8i RR	63	139	156	130	24	2.72	3.40	1.00	285	0.66	17.20	3971
P71T74 R	63	142	156	133	24	2.56	2.47	1.00	257	0.85	17.17	4351
Gem	60	131	148	110	18	1.87	2.24	1.00	266	0.62	16.94	4246

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21 April 2017



 GOVERNMENT NOTICES • GOEWERMENTSKENNISGEWINGS

DEPARTMENT OF AGRICULTURE, FORESTRY AND FISHERIES

NO. R. 370

21 APRIL 2017

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

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

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

- (a) made the regulations in the Schedule;
- (b) determined that the said regulations shall come into operation on date of publication; and
- (c) read together with section 3(2) of the said Act, repealed the Regulations published by Government Notice No. R478 of 20 June 2014.

SCHEDULE
Definitions

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

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

"**bag**" means bag manufactured from –

- (a) jute or phormium or a mixture of jute and phormium; or
- (b) polypropylene that complies with SABS specification CKS632 1246: 2012;

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

"**consignment**" means –

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

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"container" means a bag or a bulk container;

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

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

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

"foreign matter" means all matter that --

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

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

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

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

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

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

"pods" all whole or damaged soya bean pods;

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

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

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

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

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

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

- (a) with a flat bottom of metal sheet of 1,0 mm thickness with apertures 12,7 mm long and 1,8 mm wide with rounded ends. The spacing between the slots in the same row must be 2,43 mm wide and the spacing between the rows of slots must be 2,0 mm wide. The slots must be alternately oriented with a slot always opposite the solid inter segment of the next row of slots;
- (b) of which the upper surface of the sieve is smooth;
- (c) with a round frame of suitable material with an inner diameter of between 300 mm and 310 mm maximum and at least 50 mm high; and
- (d) that fits onto a tray with a solid bottom and must be at least 20 mm above the bottom of the tray.

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

- (a) with a flat metal sheet of 1,0 mm thickness perforated with round holes of 4,75 mm in diameter that are arranged with the centres of holes at the points of intersection of an equilateral triangular grid with a pitch of 8 mm;
- (b) of which the upper surface of the sieve is smooth;
- (c) the frame of which is at least 40 mm high;
- (d) with the inner width of at least 200 mm and the inner length of at least 300 mm. or, in the case of a circular sieve, the inner diameter of at least 278 mm; and
- (e) that fits into a tray with a solid bottom; and not less than 20 mm above the bottom of the tray.

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

Restriction on sale of soya beans

2. (1) No person shall sell soya beans in the Republic of South Africa --
 - (a) unless the soya beans are sold according to the classes set out in regulation 3;
 - (b) unless the soya beans comply with the standards for the class concerned set out in regulation 4;

- (c) unless the soya beans, where applicable, comply with the grades of soya beans and the standards for grades set out in regulation 5 and 6 respectively;
- d) unless the soya beans are packed in accordance with the packing requirements set out in regulation 7;
- (e) unless the container or sale documents, as the case may be, are marked in accordance with the marking requirements set out in regulation 8; and
- (f) if such soya beans contain a substance that renders it unfit for human or animal consumption or for processing into or thereof as food or feed.

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

PART I

QUALITY STANDARDS

Classes of soya beans

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

Standards for classes of soya beans

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

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

Grades for soya beans

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

Standards for grades of soya beans

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

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

PART II

PACKING AND MARKING REQUIREMENTS

Packing requirements

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

Marking requirements

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

PART III

SAMPLING

Obtaining sample

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

- (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 patten, 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.

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- (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

<i>Nature of deviation</i>	<i>Maximum percentage permissible deviation (m/m)</i>
	Grade/Graad SB1
1	2
(a) Wet pods	0,2%
(b) Foreign matter, including stones, other grain and sunflower seeds: Provided that such deviations are individually within the limits specified in items (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: Provided that such deviations are individually within the limits of said items	7%

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