

South African Sunflower Crop



*Quality Report
2012/2013 Season*



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COMMERCIAL SUNFLOWER QUALITY FOR THE 2012/2013 SEASON

Acknowledgements

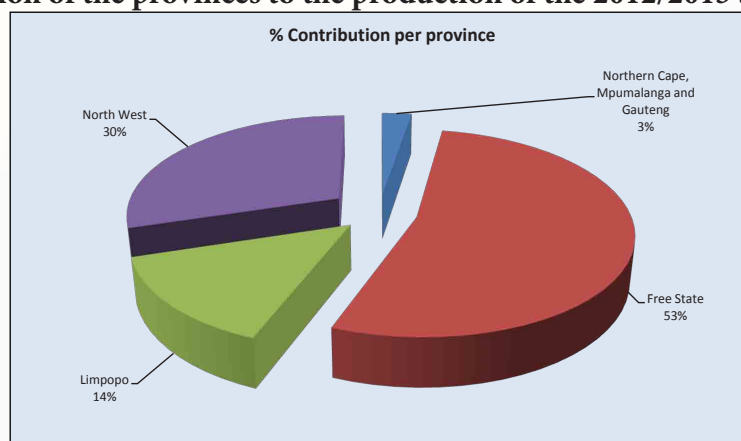
With gratitude to:

- *The Oil & Protein Seed Development Trust for its financial support in conducting this survey.*
- *The Grain Silo Industry and its members for their cooperation in providing the samples to make this survey possible.*

Introduction

The final commercial sunflower crop figure of the 2012/2013 season as overseen by the National Crop Estimates Liaison Committee (CELC) is 557 000 tons. The final calculated crop figure was adjusted downward by 9 600 tons (1.69%). The commercial sunflower crop increased by 6.7% (35 000 tons) from the 2011/2012 season. The major sunflower-producing provinces, namely the Free State and North West provinces, contributed 83% of the total crop.

Graph 1: Contribution of the provinces to the production of the 2012/2013 sunflower crop



Information provided by the CEC.

During the harvesting season, a representative sample of each delivery of sunflowers 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 21. One hundred and fifty two composite sunflower samples, proportionally representing the different production regions, were analysed for quality. The samples were graded, milled and chemically analysed for moisture, crude protein, crude fat, crude fibre as well as ash content.

This is the first annual sunflower 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 one national and twelve international proficiency testing schemes as part of our ongoing quality assurance procedures to demonstrate technical competency and international comparability.

The goal of this crop quality survey is to accumulate quality data on the commercial sunflower crop on a national level. This valuable data reveal general tendencies, highlight quality differences in the commercial sunflower produced in different local production regions and provide important information on the quality of commercial sunflower intended for export (if any). A detailed database containing information collected over several seasons is essential and will assist with decision making processes.

The results are available on the SAGL website (www.sagl.co.za). The hard copy reports are posted to all the Directly Affected Groups and interested parties. The report is also available for download in a PDF format from the website.

In addition to the quality information, production figures (obtained from the Crop Estimates Committee (CEC)) relating to hectares planted, tons produced and yields obtained on a national as well as provincial basis, over an eleven season period, are provided in this report. SAGIS (South African Grain Information Service) supply and demand information over several years is provided in table and graph format. The national grading regulations as published in the Government Gazette of 8 May 2009, are also included.

Production

Sunflower seed production is very suitable for South African climatic conditions. Sunflower is the fourth largest grain crop produced in South Africa after maize, wheat and soybeans.

The area utilized for sunflower production increased from 453 350 hectares in the previous season to 504 700 hectares this season. The yield decreased slightly from 1.15 t/ha to 1.10 t/ha.

Weak emergence, Sclerotinia and bird (pigeon) damage (especially in the eastern part of Mpumalanga) were the main problems the sunflower industry had to face. A solution to the problem of Sclerotinia is not yet available, as it would take some time to include resistance genes that had been identified in wild species in breeding programs.

The Bureau for Food and Agricultural Policy (BFAP) Baseline, Agricultural Outlook 2013 – 2022, reported that due to the drought experienced by summer grain producers in the western parts of the summer rainfall areas in 2013, producers are expected to increase sunflower plantings in 2014 because of its drought resistant characteristics, despite the lower average real gross income per hectare achieved in 2013.

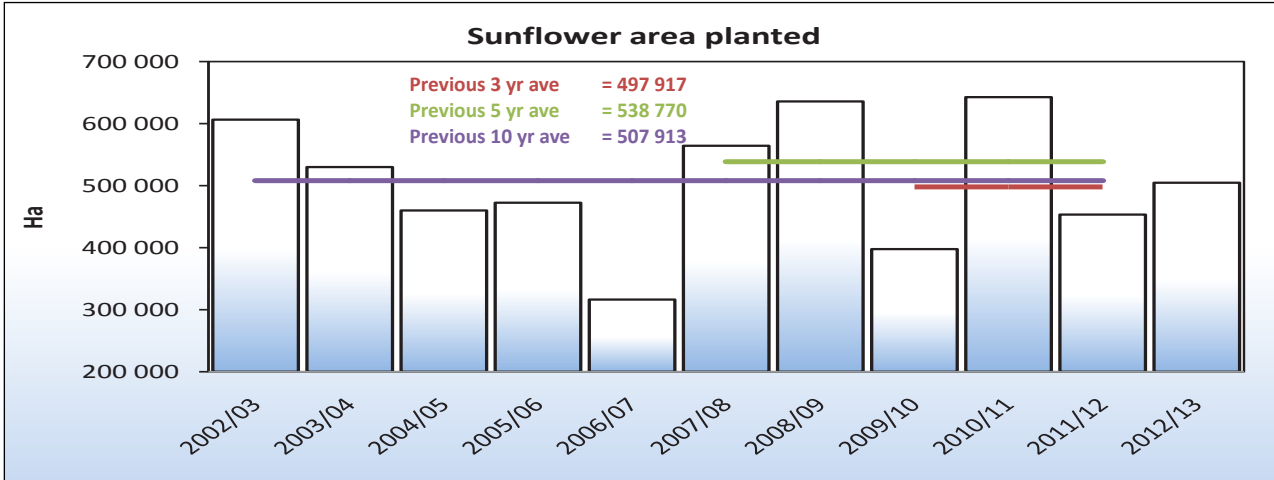
Over the long run sunflower production is anticipated to stabilize around 800 000 tons produced of approximately 500 000 hectares with national yields averaging approximately 1.6 t/ha. Even with a slight decline in the area under production, the local demand for sunflower will be met, which dampen the potential increase in prices.

Table 1: World Sunflower Seed Production

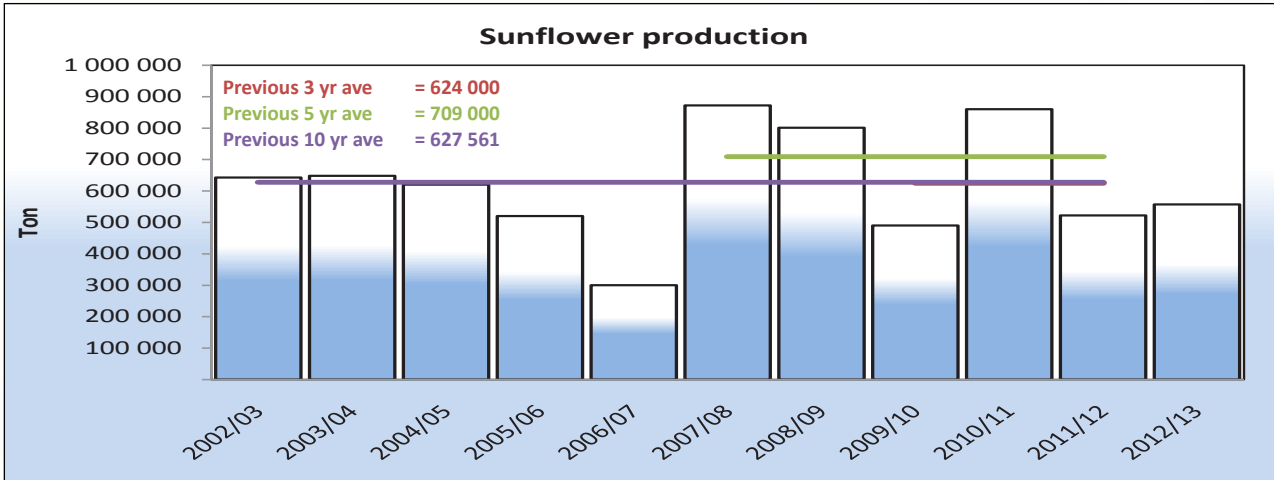
Season	2008/09	2009/10	2010/11	2011/12	2012/13 (Revised)	2013/14 (Forecast)
Area Harvested (1,000 Ha)	24,725	24,250	23,923	25,856	25,225	25,892
Yield (MT/Ha)	1.4	1.4	1.4	1.5	1.4	1.6
Production (1,000 MT)						
Argentina	3,200	2,650	3,665	3,775	3,000	2,900
European Union	6,909	7,001	6,975	8,323	7,060	8,624
China	1,750	1,650	1,710	1,700	1,730	1,750
Russia	7,270	6,600	5,820	9,500	7,993	9,300
Ukraine	7,100	7,300	8,000	9,500	8,387	9,800
United States	1,553	1,377	1,241	925	1,264	922
India	1,150	1,000	650	620	620	660
Turkey	850	790	1,020	940	1,100	1,450
Other	4,517	3,425	4,113	4,226	4,414	4,784
TOTAL	34,753	32,171	33,572	39,509	35,568	40,190

2013 U.S. Sunflower Crop Quality Report compiled by the National Sunflower Association.

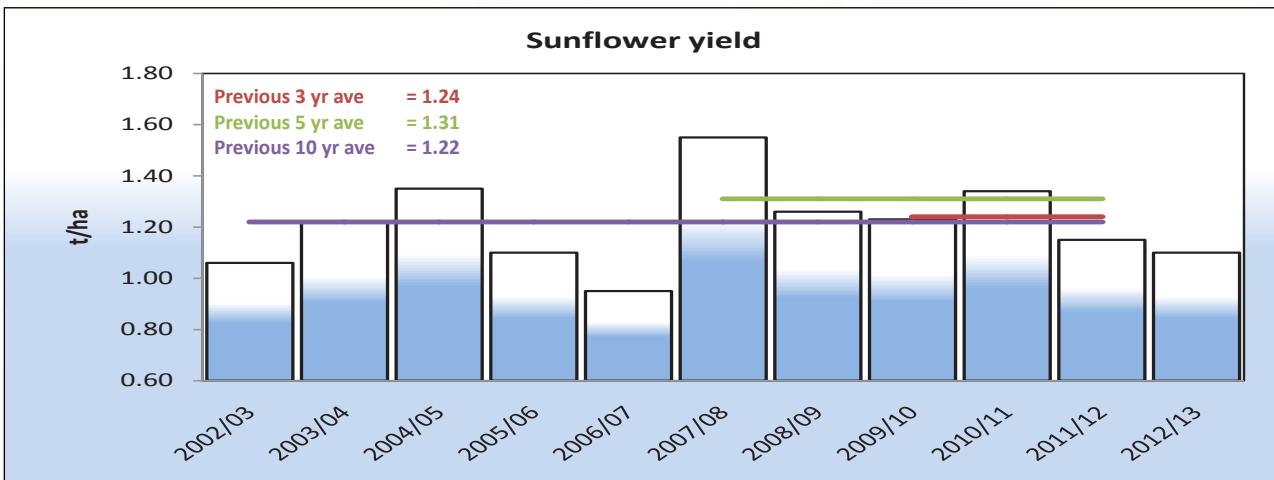
Graph 2: Total RSA area utilized for sunflower production from 2002/03 to 2012/13



Graph 3: Sunflower production in RSA from 2002/03 to 2012/13



Graph 4: RSA Sunflower yield from 2002/03 to 2012/13



Information provided by the CEC.

RSA Production Regions

The RSA is divided into 36 grain production regions.

The regions are distributed as follows:

Region 1: Namakwaland

Regions 2 and 3: Swartland

Regions 4 to 6: Rûens

Regions 7 and 8: Eastern Cape

Region 9: Karoo

Region 10: Griqualand West

Region 11: Vaalharts

Regions 12 to 20: North West

Regions 21 to 28: Free State

Regions 29 to 33: Mpumalanga

Region 34: Gauteng

Region 35: Limpopo

Region 36: KwaZulu-Natal

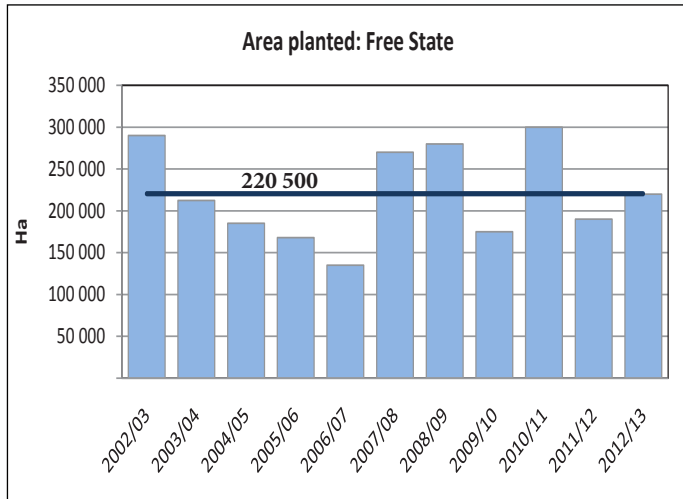
These production regions are described on pages 13 to 20 (in the header of the quality data per region tables), providing the depot names (bin/bunkers/bags/dams) for each region. Please also see figure 1 for the different provinces.

Figure 1: RSA Production Regions

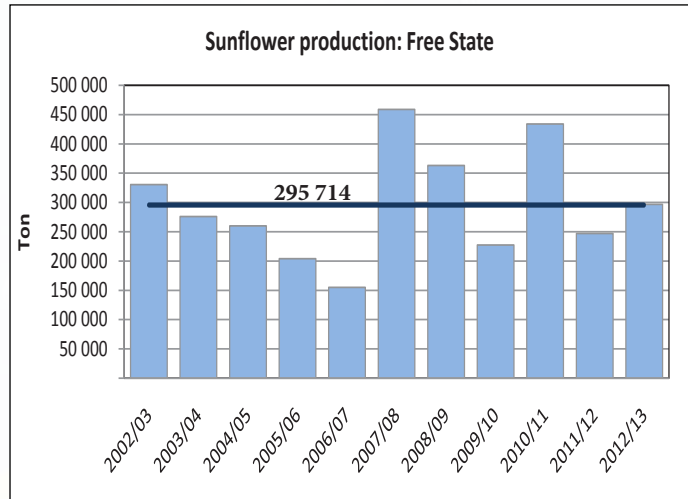


Sunflower seed is not produced in the Southern production regions of the Western and Eastern Cape or in Kwazulu-Natal. Canola is the key oilseed crop produced in the winter rainfall area and is mainly utilized as a rotational crop. The total area under canola production nearly doubled in the past five years.

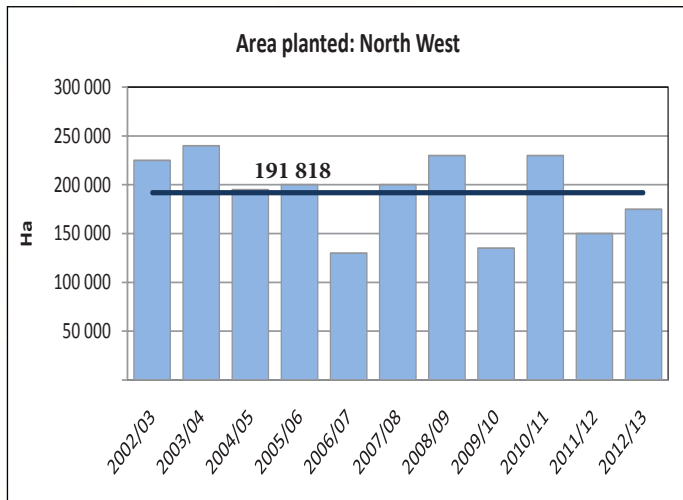
Graph 5: Area utilized for sunflower production in the Free State since 2002/03



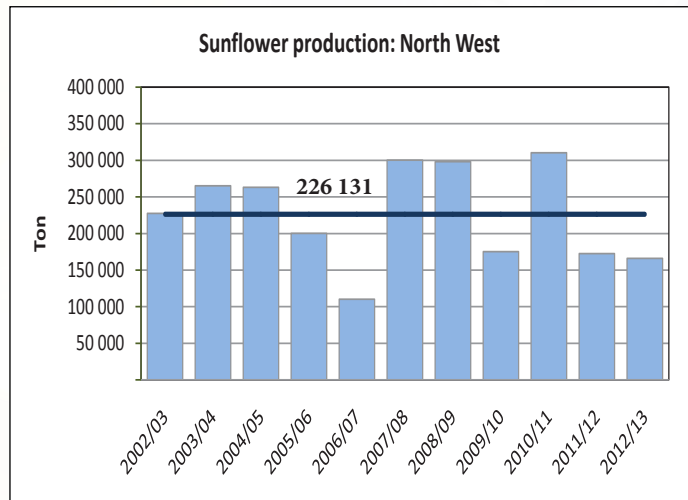
Graph 6: Sunflower production in the Free State since 2002/03



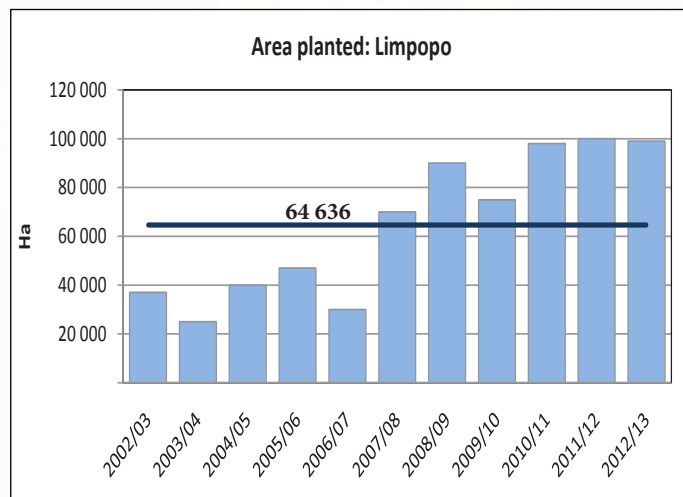
Graph 7: Area utilized for sunflower production in North West since 2002/03



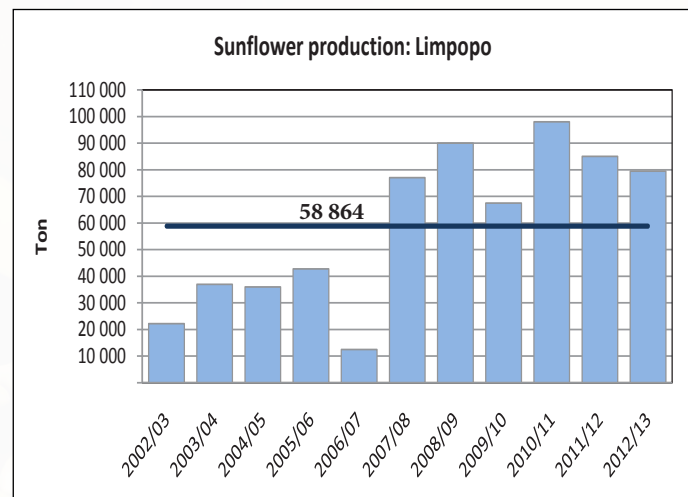
Graph 8: Sunflower production in North West since 2002/03



Graph 9: Area utilized for sunflower production in Limpopo since 2002/03



Graph 10: Sunflower production in Limpopo since 2002/03



Information provided by the CEC.

— Eleven year average

Supply and Demand

Please note that the marketing years of sunflower has changed from 1 January - 31 December to 1 March - 28 February. All SAGIS information provided in this report is reported according to the amended marketing years.

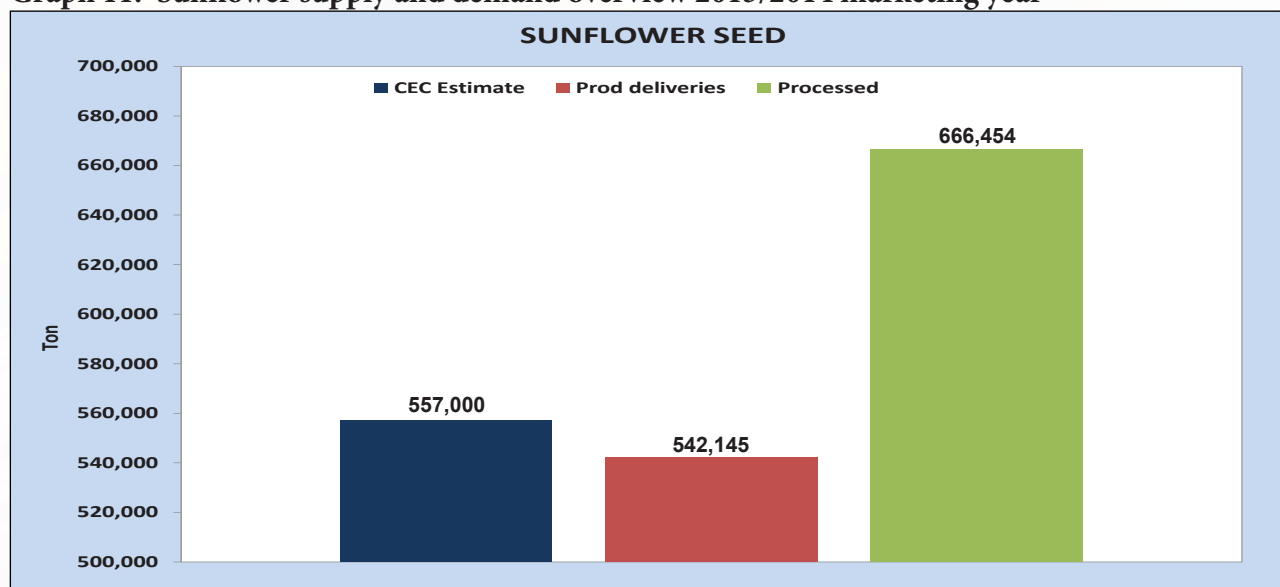
Opening stock decreased by almost 30 000 tons compared to the previous marketing year and was lower than the ten year average. During the 2013/2014 marketing year 94 475 tons of sunflower and sunflower seed products were imported compared to the 11 737 tons of the previous year. South Africa is a net importer of vegetable oils. Domestic consumption of sunflower oil is projected to increase by 1.7% per year over the baseline period to a total of 439 000 tons in 2022 (BFAP Baseline, Agricultural Outlook 2013 – 2022).

Of the 666 454 tons of sunflower seeds processed during this year, only 1 162 tons was used for human consumption and 2 770 tons for animal feed (mainly pet bird feeds). The vast majority of sunflower seed is crushed to produce oil and oilcake. The amount of sunflower seeds crushed this year increased by 16.5% (93 929 tons) compared to the previous year. According to BFAP, contrary to soybean oilcake consumption that has tripled in the past decade, the demand for sunflower oilcake has remained flat and is projected to remain relatively flat around 400 000 tons with no further major increase in the level of demand anticipated.

No significant exports occurred. Globally, the USA and Ukraine are the largest exporters of sunflower seeds and Russia and the Ukraine the largest exporters of sunflower oil (combined 69% of total oil exports).

Ending stock is 43% lower than last year, due to an increase in total demand.

Graph 11: Sunflower supply and demand overview 2013/2014 marketing year

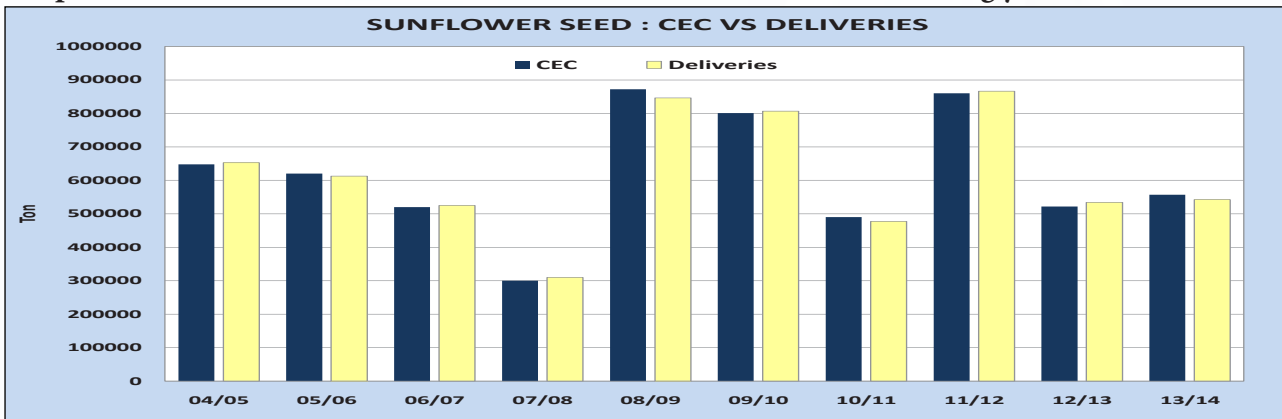


Information provided by SAGIS.

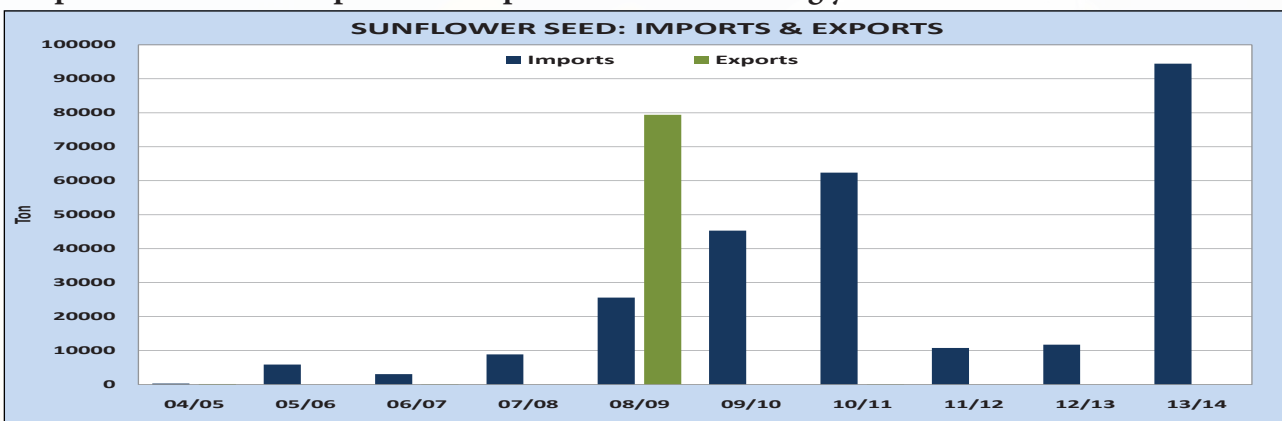
SUNFLOWERSEED: SUPPLY AND DEMAND TABLE BASED ON SAGIS' INFO (TON)

	Season (Mar - Feb)																	Publication date: 2014-03-25			10 Year average
	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	03/04 - 12/13				
CEC (Crop Estimate)	562,100	1,109,000	530,600	638,300	928,800	642,600	648,000	620,000	520,000	300,000	872,000	801,000	490,000	860,000	522,000	557,000	627,560				
SUPPLY																					
Opening stock (1 Mar)	111,000	88,000	303,300	50,300	109,600	189,400	41,300	69,900	40,700	90,400	64,700	164,300	157,200	18,800	109,000	81,302	94,570				
Prod deliveries	587,000	1,087,000	553,400	709,600	901,200	617,200	652,900	612,700	524,900	310,100	846,600	806,900	477,300	866,300	534,251	542,145	624,915				
Imports	3,000	0	400	7,600	1,700	18,800	300	5,900	3,100	8,900	25,600	45,300	62,400	10,800	11,737	94,475	19,284				
Surplus	10,000	6,100	0	0	0	0	0	3,800	2,300	1,500	4,100	700	2,000	3,800	5,485	4,693	2,369				
Total Supply	711,000	1,181,100	857,100	767,500	1,012,500	825,400	694,500	692,300	571,000	410,900	941,000	1,017,200	698,900	899,700	660,473	722,615	741,137				
DEMAND																					
Processed	600,000	837,800	776,500	622,000	748,900	762,300	616,900	644,300	472,300	339,500	685,300	847,200	671,500	782,200	572,519	666,454	639,402				
-human	0	0	0	800	100	1,300	700	1,300	1,200	2,100	2,400	1,900	1,600	1,300	904	1,162	1,470				
-animal feed	0	100	2,100	2,200	2,100	1,800	3,200	2,600	3,100	3,500	3,400	3,300	3,100	2,900	3,022	2,770	2,992				
-crush (oil and oilcake)	600,000	837,700	774,400	619,000	746,700	759,200	613,000	640,400	468,000	333,900	679,500	842,000	666,800	778,000	568,593	662,522	634,939				
Withdrawn by producers	0	900	14,800	19,600	16,000	8,000	2,700	1,500	2,000	1,900	4,900	5,700	1,700	3,500	2,521	2,524	3,442				
Released to end-consumers	0	500	2,100	2,900	2,900	1,900	2,400	2,700	3,500	3,000	2,800	4,800	4,100	3,700	3,154	2,906	3,205				
Seed for planting purposes	3,000	4,200	1,700	2,000	3,000	1,600	1,300	2,200	1,200	1,800	3,300	2,700	1,700	2,500	2,700	2,898	2,100				
Net receipts(-)/disp(+)	20,000	-9,100	6,800	3,200	2,900	500	-2,000	900	1,500	0	1,000	-400	1,000	-1,200	-1,716	1,484	-42				
Deficit	0	0	4,600	6,900	3,900	9,600	3,100	0	0	0	0	0	0	0	0	0	1,270				
Exports	0	56,000	300	1,300	45,500	200	200	0	100	0	79,400	0	100	0	27	8	8,003				
Total Demand	623,000	890,300	806,800	657,900	823,100	784,100	624,600	651,600	480,600	346,200	776,700	860,000	680,100	790,700	579,205	676,274	657,381				
Ending Stock (28 Feb)	88,000	290,800	50,300	109,600	189,400	41,300	69,900	40,700	90,400	64,700	164,300	157,200	18,800	109,000	81,268	46,341	83,757				
- processed p/month	50,000	69,800	64,700	51,800	62,400	63,500	51,400	53,700	39,400	28,300	57,100	70,600	65,000	65,200	47,700	55,538	54,190				
- months' stock	1.8	4.2	0.8	2.1	3.0	0.7	1.4	0.8	2.3	2.3	2.9	2.2	0.3	1.7	1.7	0.8	1.6				

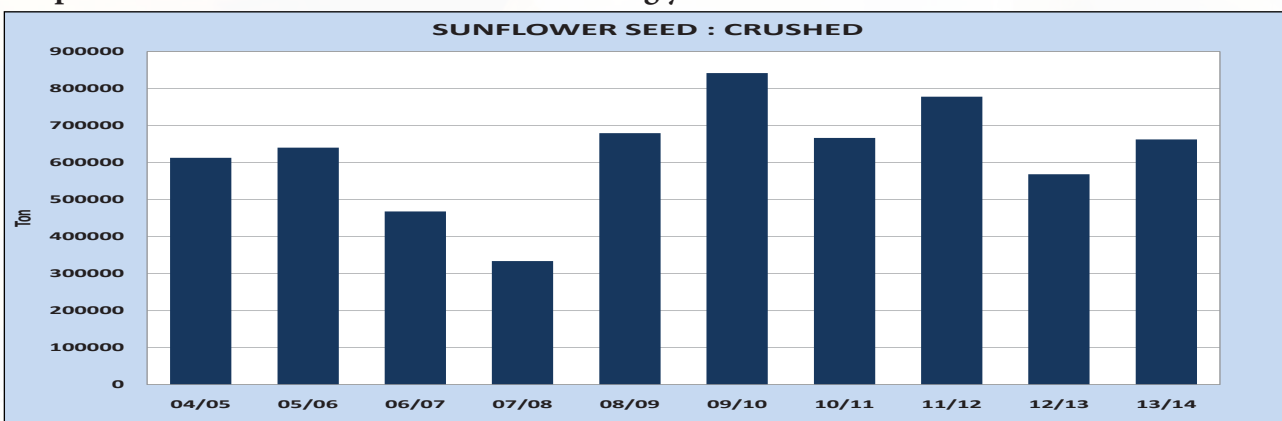
Graph 12: Sunflower: CEC Estimate vs SAGIS deliveries over 10 marketing years



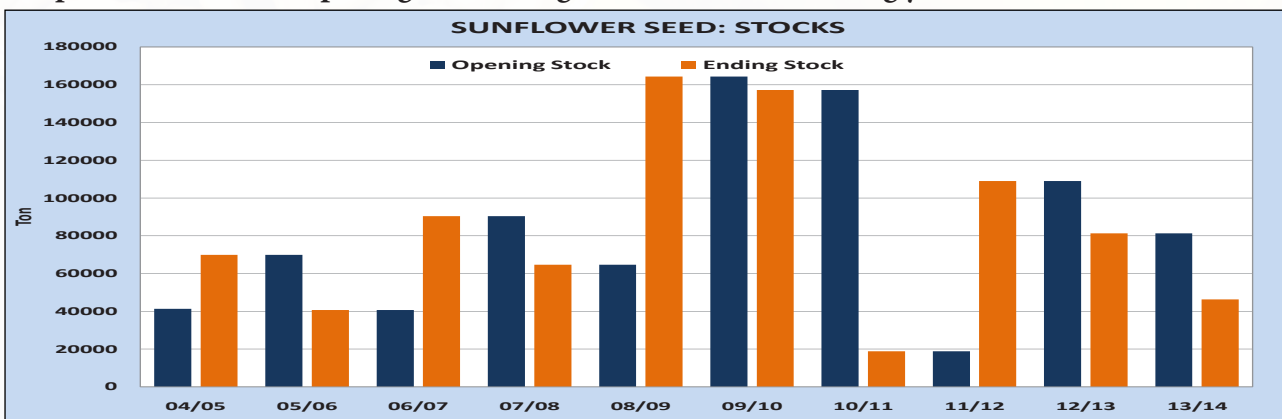
Graph 13: Sunflower: Imports and Exports over 10 marketing years



Graph 14: Sunflower: Crushed over 10 marketing years



Graph 15: Sunflower: Opening and closing stock over 10 marketing years



Information provided by SAGIS.

Sunflower Crop Quality 2012/2013 – Summary of results

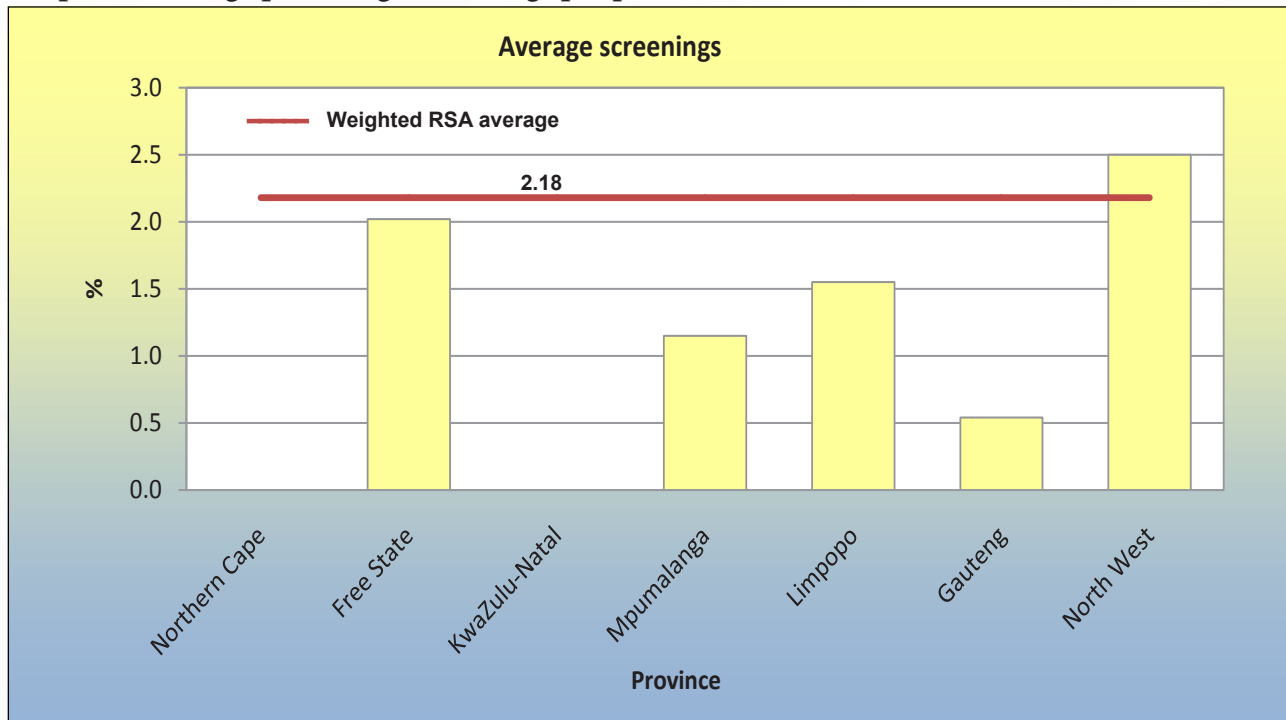
Sunflower, native to Central North America was domesticated before maize. Spanish explorers carried the seeds with them to Europe resulting in sunflower now being cultivated worldwide. Russian agronomists were responsible for the first agricultural hybrids. There are two types of sunflowers, oil types containing $\pm 40\%$ oil/fat and non-oil types with $\pm 30\%$ oil/fat. Oil types represent 80 – 95% of sunflower seed production worldwide.¹

Nutrition scientists are recommending that more attention be paid to our daily intake of complex plant foods like seeds, nuts and whole grain. Sunflower seeds are not only recommended for their low saturated, zero trans and high poly- and monounsaturated fat content, they also provide nutrients vital for health and maintenance of the body. Sunflower seeds provide protein, fibre, vitamins, minerals and phytochemicals.²

Eighty percent (121) of the 152 samples analysed for the purpose of this survey were graded as Grade FH1 and thirty one of the samples were downgraded to COSF (Class Other Sunflower Seed). Twenty one of the samples were downgraded as a result of the percentage of either the screenings or the collective deviations or a combination of both exceeding the maximum permissible deviations of 4% and 6% respectively. Eight of the samples were downgraded as a result of the percentage of either the foreign matter or a combination of the foreign matter and collective deviations exceeding the maximum permissible deviations of 4% and 6% respectively. Of the remaining two samples, one was downgraded due to the percentage damaged sunflower seeds exceeding 10% and the other as a result of the presence of stones.

The North West province (77 samples) reported the highest weighted average percentage screenings namely 2.50%, followed by the Free State's 58 samples with 2.02%. Gauteng (2 samples) reported the lowest average percentage screenings of 0.54%.

Graph 16: Average percentage screenings per province



The highest weighted percentage foreign matter (2.58%) was reported for the 9 Limpopo samples. The North West and Free State provinces averaged 1.60% and 1.21% respectively. The lowest average percentage was found in Mpumalanga (6 samples) at 0.91%.

Graph 17: Average percentage foreign matter per province

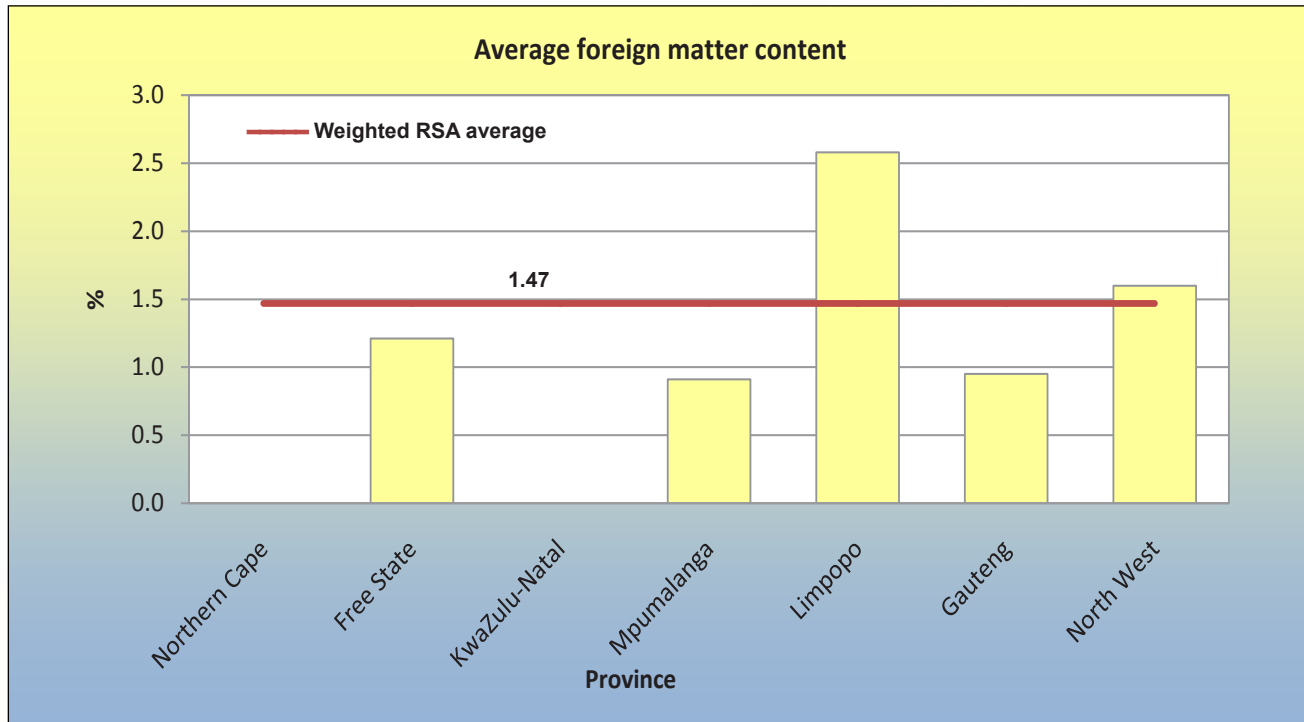


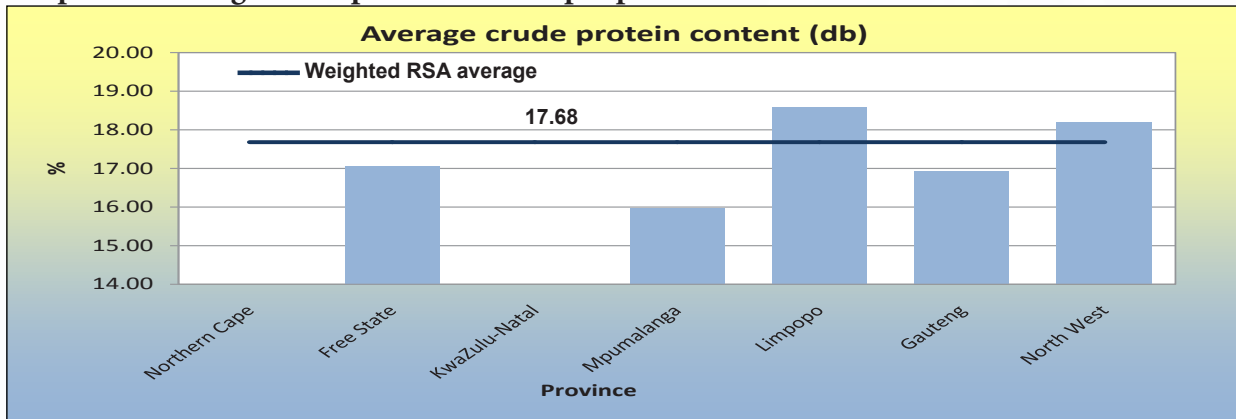
Table 2: Sunflower seed quality per province 2012/2013 season

Province	*Hectolitre mass, kg/hl		Moisture, %		Crude protein, % (db)		Crude fat, % (db)		Ash, % (db)		Crude fibre, % (db)		No. of samples
	Average	Range	Average	Range	Average	Range	Average	Range	Average	Range	Average	Range	
Free State (Regions 21 - 28)	43.8	38.3 - 47.7	4.9	3.6 - 6.3	17.06	11.88 - 20.16	41.9	38.7 - 48.2	2.71	2.35 - 3.68	21.4	16.2 - 24.0	58
Mpumalanga (Regions 29 - 33)	42.5	38.1 - 45.7	4.6	3.9 - 5.6	15.97	13.68 - 18.82	42.4	39.7 - 45.0	2.56	2.27 - 2.83	21.7	20.0 - 25.3	6
Limpopo (Region 35)	44.6	42.6 - 47.5	5.4	4.6 - 6.0	18.60	14.86 - 23.02	40.4	34.9 - 42.3	2.75	2.41 - 3.83	21.0	18.8 - 22.5	9
Gauteng (Region 34)	42.7	42.6 - 42.8	4.1	4.0 - 4.2	16.92	16.75 - 17.09	42.9	42.1 - 43.6	2.44	2.39 - 2.49	19.8	19.4 - 20.1	2
North West (Region 12 - 20)	43.0	31.5 - 47.3	5.3	4.0 - 6.6	18.19	14.58 - 20.75	40.8	34.3 - 46.3	2.66	1.98 - 3.03	20.8	13.8 - 25.3	77
Total	43.4	31.5 - 47.7	5.1	3.6 - 6.6	17.68	13.68 - 23.02	41.3	34.3 - 48.2	2.68	1.98 - 3.83	21.1	13.8 - 25.3	152

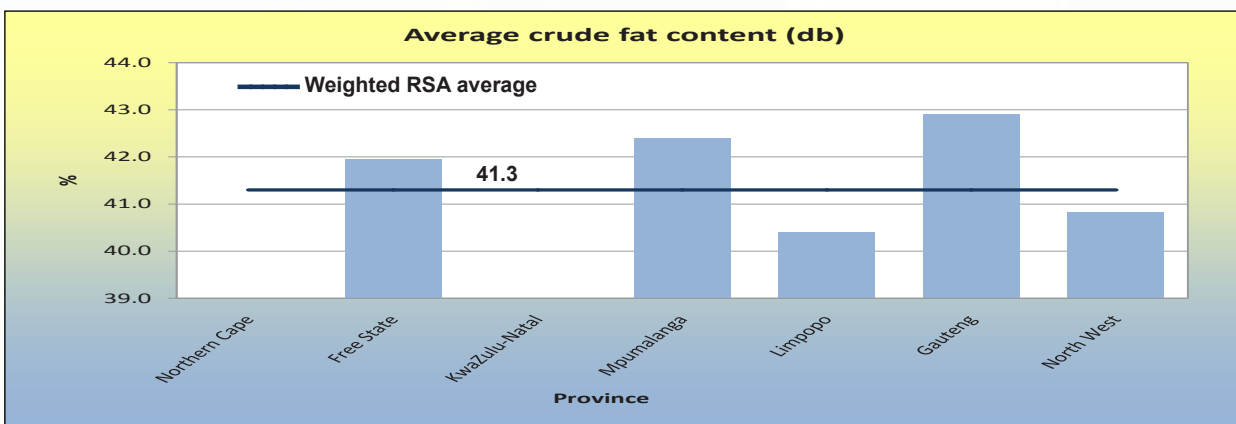
*Hectolitre mass does not form part of the grading regulations for sunflower seed in South Africa. An approximation of the hectolitre mass of South African sunflower seeds is provided for information purposes. The g/1 L filling weight of sunflower seed was determined by means of the Kern 222 apparatus. The sample weight in hectolitres was determined by extrapolating the Test Weight Conversion Chart for Sunflower Seed, Oil of the Canadian Grain Commission.

The crude protein, crude fat, ash as well as crude fibre components are reported as % (g/100g) on a dry/moisture free basis (db). Since this is the first crop quality survey on sunflower, no data is available for seasonal comparison purposes.

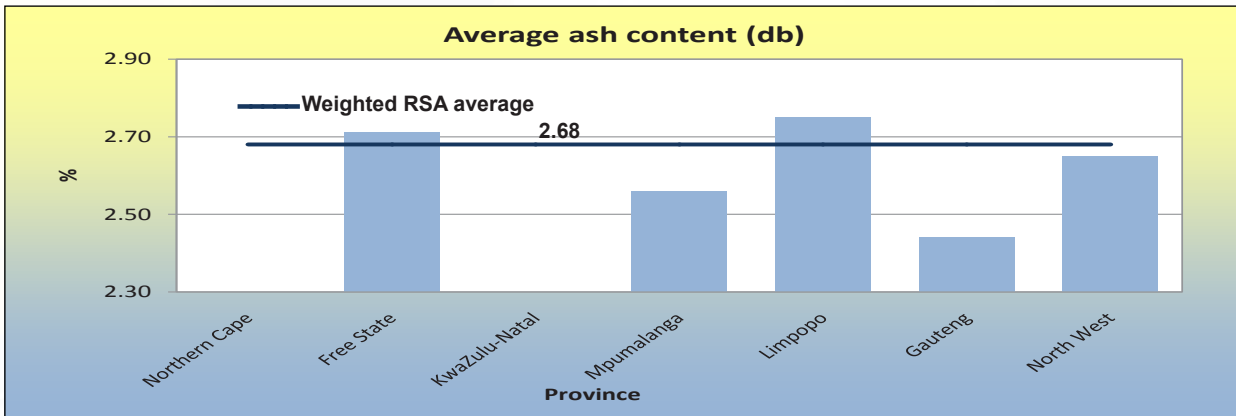
Graph 18: Average crude protein content per province



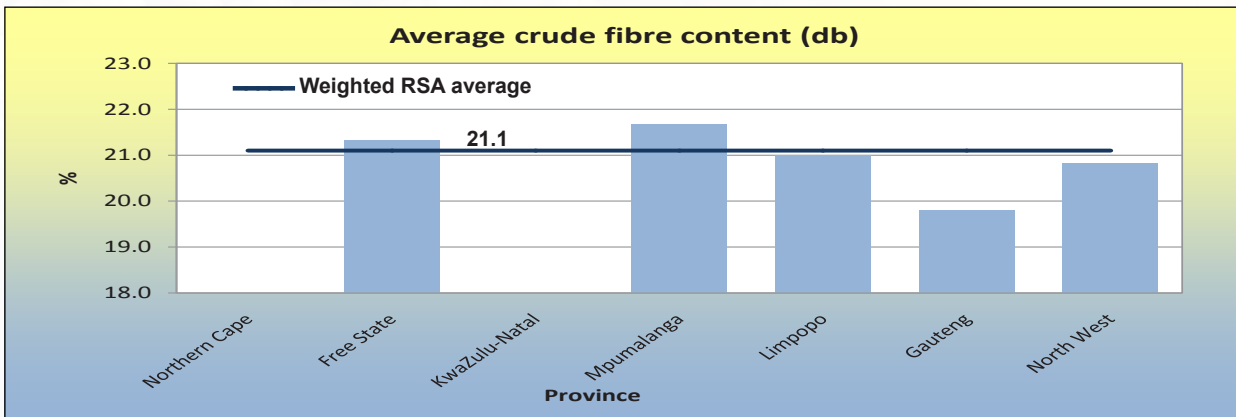
Graph 19: Average crude fat content per province



Graph 20: Average ash content per province



Graph 21: Average crude fibre content per province



See Table 3 for a summary of the RSA Sunflower Crop Quality averages of the 2012/2013 season as well as pages 13 to 20 for the average sunflower quality per region.

References

1. Animal Feed Resources Information System, www.feedipedia.org
2. National Sunflower Association, www.sunflowernsa.com

Table 3: South African Sunflower Crop Quality Averages 2012/2013

Class and Grade Sunflower	FH1	COSF	Average
<u>Grading:</u>			
1. Damage sunflower seed, %	0.07	2.75	0.61
2. Screenings, %	1.73	3.95	2.18
3. Sclerotinia, %	0.00	0.04	0.01
4. Foreign Matter, %	1.17	2.64	1.47
5. Deviations in 2,3 and 4 collectively. Provided that such deviations are individually within the limits of said items, %	2.90	6.63	3.66
Musty, sour, khaki brush or other undesired smell	No	No	No
Substance present that renders the seed unsuitable for human or animal consumption or for processing into or utilization thereof as food or feed	No	No	No
Noxious seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	0	0	0
Noxious 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	121	31	152
<u>Chemical analysis:</u>			
Moisture, % (1hr, 130 °C)	5.0	5.5	5.1
Crude Protein, % (db)	17.56	18.12	17.68
Crude Fat, % (db)	41.4	41.0	41.3
Ash, % (db)	2.65	2.80	2.68
Crude Fibre, % (db)	21.0	21.2	21.1
Number of samples	121	31	152

**SOUTH AFRICAN
REGIONAL SUNFLOWER QUALITY**

PRODUCTION REGION	(12)				(13)				(14)			
	North West Western Region				North West Central Region (Sannieshof)				North West Southern Region			
Intake silos	Bloubank Buhmannsdrif Kameel Kraaipan Madibogo Mafikeng Mareetsane Piet Plessis Springbokpan Vergeleë Vryburg Vryhof				Biesiesvlei Bossies Gerdau Oppaslaagte Sannieshof				Amalia Barberspan Delareyville Excelsior Geysdorp Hallat's Hope Migdol Nooitgedacht Schweizer-Reneke Taaibospan			
<u>Grading:</u>	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
1. Damage sunflower seed, %	0.14	0.00	0.86	0.28	1.06	0.00	10.50	3.15	0.41	0.00	4.59	1.32
2. Screenings, %	3.14	1.08	5.44	1.30	2.22	0.93	3.91	0.82	2.66	0.58	5.00	1.26
3. Sclerotinia, %	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.01	0.00	0.00	0.00	0.00
4. Foreign Matter, %	1.63	0.70	5.08	1.37	1.63	0.00	5.95	1.64	1.41	0.28	3.38	0.98
5. Deviations in 2,3 and 4 collectively: Provided that such deviations are individually within the limits of said items, %	4.77	1.79	10.52	2.38	3.86	0.93	8.62	2.14	4.07	1.74	7.26	1.76
Noxious seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Noxious seeds (<i>Argemone mexicana L.</i> , <i>Convolvulus sp.</i> , <i>Ipomoea purpurea Roth.</i> , <i>Lolium temulentum</i> , <i>Xanthium sp.</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Number of samples	11				11				12			
<u>Chemical analysis:</u>	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
Moisture, % (1hr, 130 °C)	5.5	4.9	6.1	0.48	5.4	4.6	6.4	0.54	5.5	4.6	6.6	0.73
Crude Protein, % (db)	18.69	17.57	20.46	0.74	18.35	15.70	19.46	1.13	18.63	17.78	20.75	0.82
Crude Fat, % (db)	39.4	34.3	46.2	3.10	40.6	38.8	42.2	1.30	40.9	36.6	45.0	2.90
Ash, % (db)	2.77	2.53	3.00	0.16	2.67	2.30	2.90	0.17	2.67	2.10	3.01	0.22
Crude Fibre, % (db)	21.3	13.8	25.3	2.99	21.4	19.8	23.3	0.97	20.3	16.3	23.6	2.5
Number of samples	11				11				12			

**SOUTH AFRICAN
REGIONAL SUNFLOWER QUALITY**

PRODUCTION REGION	(15)				(16)				(17)			
	North West South-Eastern Region				North West Central Eastern Region				North West Central Northern Region (Ottosdal)			
Intake silos	Bloemhof Christiana Hertzogville Hoopstad Kingswood				Bamboesspruit Klerksdorp Leeudoringstad Makwassie Regina Strydpoort Wolmaranstad				Bospoort Lethabong (Hartbeesfontein) Kleinharts Melliiodora Ottosdal Rostrataville Vermaas Werda			
<u>Grading:</u>	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
1. Damage sunflower seed, %	0.00	-	-	-	0.36	-	-	-	0.00	0.00	0.00	0.00
2. Screenings, %	2.01	-	-	-	0.64	-	-	-	2.56	1.31	7.50	1.80
3. Sclerotinia, %	0.00	-	-	-	0.00	-	-	-	0.00	0.00	0.00	0.00
4. Foreign Matter, %	0.86	-	-	-	1.25	-	-	-	1.69	0.47	2.93	0.86
5. Deviations in 2,3 and 4 collectively: Provided that such deviations are individually within the limits of said items, %	2.87	-	-	-	1.89	-	-	-	4.25	2.04	9.11	2.15
Noxious seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	0	-	-	-	0	-	-	-	0	0	0	0
Noxious seeds (<i>Argemone mexicana L.</i> , <i>Convolvulus sp.</i> , <i>Ipomoea purpurea Roth.</i> , <i>Lolium temulentum</i> , <i>Xanthium sp.</i>)	0	-	-	-	0	-	-	-	0	0	0	0
Number of samples	1				1				10			
<u>Chemical analysis:</u>	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
Moisture, % (1hr, 130 °C)	5.4	-	-	-	5.6	-	-	-	5.1	4.0	6.5	0.79
Crude Protein, % (db)	19.04	-	-	-	18.04	-	-	-	18.38	17.07	20.58	1.20
Crude Fat, % (db)	37.7	-	-	-	39.3	-	-	-	40.4	37.8	42.6	1.54
Ash, % (db)	2.68	-	-	-	2.73	-	-	-	2.65	2.37	2.91	0.19
Crude Fibre, % (db)	23.0	-	-	-	21.4	-	-	-	20.6	19.4	22.7	1.04
Number of samples	1				1				10			

**SOUTH AFRICAN
REGIONAL SUNFLOWER QUALITY**

PRODUCTION REGION	(18)				(19)				(20)			
	North West Central Region (Ventersdorp)				North West Central Region (Lichtenburg)				North West Eastern Region			
Intake silos	Bodenstein Buckingham Coligny Enselspruit Makokskraal Potchefstroom Ventersdorp				Grootpan Halfpad Hibernia Lichtenburg Lottiehalte Lusthof				Battery Boons Brits Derby Koster Rustenburg Swartruggens Syferbult Syferbult			
<u>Grading:</u>	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
1. Damage sunflower seed, %	5.13	0.00	60.79	17.53	0.00	0.00	0.00	0.00	0.07	0.00	0.45	0.17
2. Screenings, %	2.49	0.91	5.44	1.48	2.12	1.15	3.73	0.95	2.34	1.21	4.05	0.85
3. Sclerotinia, %	0.09	0.00	1.09	0.31	0.00	0.00	0.00	0.00	0.03	0.00	0.41	0.11
4. Foreign Matter, %	1.32	0.44	3.26	0.69	1.93	0.86	3.67	1.16	1.86	0.67	7.48	1.83
5. Deviations in 2,3 and 4 collectively: Provided that such deviations are individually within the limits of said items, %	3.90	1.35	9.04	2.14	4.05	2.14	6.09	1.41	4.23	2.25	9.22	1.79
Noxious seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Noxious seeds (<i>Argemone mexicana L.</i> , <i>Convolvulus sp.</i> , <i>Ipomoea purpurea Roth.</i> , <i>Lolium temulentum</i> , <i>Xanthium sp.</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Number of samples	12				6				13			
<u>Chemical analysis:</u>	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
Moisture, % (1hr, 130 °C)	5.4	4.3	6.4	0.59	5.1	4.9	5.7	0.31	5.1	4.2	5.9	0.49
Crude Protein, % (db)	17.81	15.53	19.04	1.04	18.89	18.49	19.56	0.45	17.04	14.58	20.66	2.03
Crude Fat, % (db)	41.7	39.9	46.3	1.65	40.2	38.0	41.8	1.43	42.3	37.8	44.9	1.96
Ash, % (db)	2.64	2.44	2.81	0.14	2.76	2.69	2.84	0.07	2.49	1.98	3.03	0.28
Crude Fibre, % (db)	20.6	19.4	21.7	0.78	20.1	19.3	21.6	0.95	20.9	18.2	23.3	1.68
Number of samples	12				6				13			

**SOUTH AFRICAN
REGIONAL SUNFLOWER QUALITY**

PRODUCTION REGION	(21) Free State North-Western Region (Viljoenskroon)				(22) Free State North-Western Region (Bothaville)				(23) Free State North-Western Region (Bultfontein)			
	Intake silos				Allanridge Bothaville Mirage Odendaalsrus Schoonspruit Schuttendraai				Bultfontein Losdoorns Protespan Tierfontein Wesselsbron Willemsrust			
<u>Grading:</u>	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
1. Damage sunflower seed, %	0.05	0.00	0.53	0.16	0.17	0.00	0.87	0.39	0.92	0.00	6.26	2.36
2. Screenings, %	1.42	0.62	2.23	0.52	1.29	0.29	2.52	0.84	3.62	1.25	7.94	2.62
3. Sclerotinia, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4. Foreign Matter, %	1.01	0.24	2.01	0.66	0.84	0.38	2.20	0.77	1.84	0.60	4.88	1.48
5. Deviations in 2,3 and 4 collectively: Provided that such deviations are individually within the limits of said items, %	2.43	1.07	3.77	0.80	2.13	0.83	3.76	1.27	5.46	2.26	9.60	2.54
Noxious seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Noxious seeds (<i>Argemone mexicana L.</i> , <i>Convolvulus sp.</i> , <i>Ipomoea purpurea Roth.</i> , <i>Lolium temulentum</i> , <i>Xanthium sp.</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Number of samples	11				5				7			
<u>Chemical analysis:</u>	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
Moisture, % (1hr, 130 °C)	4.7	4.1	5.3	0.34	4.7	4.1	4.9	0.35	5.5	4.8	6.3	0.65
Crude Protein, % (db)	17.52	16.76	18.25	0.46	18.04	16.96	20.16	1.29	18.31	17.45	19.18	0.57
Crude Fat, % (db)	41.3	40.1	42.9	0.77	41.5	38.7	42.6	1.60	41.1	39.0	43.8	1.54
Ash, % (db)	2.68	2.35	2.86	0.16	2.68	2.52	2.81	0.12	2.78	2.62	3.07	0.14
Crude Fibre, % (db)	21.5	18.4	23.3	1.72	21.0	19.9	22.3	0.97	22.1	20.5	23.2	0.88
Number of samples	11				5				7			

**SOUTH AFRICAN
REGIONAL SUNFLOWER QUALITY**

PRODUCTION REGION	(24) Free State Central Region				(25) Free State South-Western Region				(26) Free State South-Eastern Region			
Intake silos	Bloemfontein				Bethlehem				Arlington			
	Brandfort				Clocolan				Kaallaagte			
	De Brug				De Wetsdorp				Libertas			
	Geneva				Ficksburg				Marquard			
	Hennenman				Fouriesburg				Meets			
	Koffiefontein				Marseilles				Monte Video			
	Kroonstad				Modderpoort				Senekal			
	Petrusburg				Slabberts				Steynsrus			
	Schuttendraai				Tweespruit							
	Theunissen				Westminster							
	Van Tonder				Zastron							
	Welgeleë											
	Winburg											
<u>Grading:</u>	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
1. Damage sunflower seed, %	0.00	0.00	0.00	0.00	0.01	0.00	0.10	0.03	0.29	0.00	1.55	0.55
2. Screenings, %	3.39	0.38	6.10	2.63	2.63	0.53	5.26	1.38	1.66	0.35	4.73	1.42
3. Sclerotinia, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.01
4. Foreign Matter, %	1.32	0.74	2.29	0.70	0.89	0.36	2.13	0.53	1.94	0.47	5.47	1.80
5. Deviations in 2,3 and 4 collectively: Provided that such deviations are individually within the limits of said items, %	4.71	1.26	7.45	3.14	3.52	0.91	6.55	1.74	3.60	1.28	8.50	2.70
Noxious seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Noxious seeds (<i>Argemone mexicana L.</i> , <i>Convolvulus sp.</i> , <i>Ipomoea purpurea Roth.</i> , <i>Lolium temulentum</i> , <i>Xanthium sp.</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Number of samples	4				10				10			
<u>Chemical analysis:</u>	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
Moisture, % (1hr, 130 °C)	4.8	4.2	5.6	0.62	4.5	3.6	6.0	0.62	5.6	4.5	6.3	0.52
Crude Protein, % (db)	17.74	16.70	19.57	1.35	15.37	11.88	18.38	1.64	17.09	15.08	18.62	1.02
Crude Fat, % (db)	40.9	40.4	42.1	0.81	42.6	40.2	48.2	2.46	41.7	40.7	43.1	0.78
Ash, % (db)	2.66	2.54	2.86	0.14	2.64	2.52	2.84	0.10	2.73	2.63	2.82	0.06
Crude Fibre, % (db)	21.0	19.9	22.3	1.16	21.5	20.4	23.2	1.06	21.6	19.8	23.8	1.40
Number of samples	4				10				10			

**SOUTH AFRICAN
REGIONAL SUNFLOWER QUALITY**

PRODUCTION REGION	(27) Free State Northern Region				(28) Free State Eastern Region				(29) Mpumalanga Southern Region						
	Intake silos				Gottenburg Heilbron Hoogte Mooigeleë Petrus Steyn Wolwehoek				Afrikaskop Vrede Ascent Warden Cornelia Windfield Daniëlsrus Eeram Frankfort Harrismith Jim Fouché Kransfontein Memel Reitz Tweeling Villiers				Balfour Grootvlei Holmdene Platrand Val Greylingstad Harvard Leeuspruit Standerton		
<u>Grading:</u>	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev			
1. Damage sunflower seed, %	0.09	0.00	0.16	0.08	0.02	0.00	0.16	0.06	0.07	0.00	0.29	0.15			
2. Screenings, %	1.52	1.16	2.10	0.51	1.10	0.20	4.06	1.27	0.76	0.12	1.46	0.70			
3. Sclerotinia, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
4. Foreign Matter, %	0.80	0.41	1.50	0.61	0.72	0.40	1.30	0.34	0.43	0.20	0.80	0.26			
5. Deviations in 2,3 and 4 collectively: Provided that such deviations are individually within the limits of said items, %	2.32	1.72	2.66	0.52	1.81	0.70	5.06	1.40	1.18	0.38	2.26	0.93			
Noxious seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	0	0	0	0	0	0	0	0	0	0	0	0			
Noxious seeds (<i>Argemone mexicana L.</i> , <i>Convolvulus sp.</i> , <i>Ipomoea purpurea Roth.</i> , <i>Lolium temulentum</i> , <i>Xanthium sp.</i>)	0	0	0	0	0	0	0	0	0	0	0	0			
Number of samples	3				8				4						
<u>Chemical analysis:</u>	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev			
Moisture, % (1hr, 130 °C)	4.4	4.3	4.5	0.10	4.5	3.9	5.9	0.70	4.2	3.9	4.7	0.36			
Crude Protein, % (db)	16.95	15.18	18.56	1.70	16.49	13.18	19.04	1.91	16.52	15.07	18.82	1.67			
Crude Fat, % (db)	43.4	41.3	44.5	1.79	43.4	40.0	47.4	2.56	42.2	39.7	43.5	1.73			
Ash, % (db)	2.74	2.58	2.87	0.15	2.82	2.40	3.68	0.39	2.44	2.27	2.80	0.24			
Crude Fibre, % (db)	20.2	19.3	21.2	0.95	20.7	16.2	24.0	2.16	21.2	20.2	21.8	0.71			
Number of samples	3				8				4						

**SOUTH AFRICAN
REGIONAL SUNFLOWER QUALITY**

PRODUCTION REGION	(32)				(33)				(34)			
	Mpumalanga Western Region				Mpumalanga Northern Region				Gauteng			
Intake silos	Argent				Driefontein				Bloekomspruit			
	Dryden				Lydenburg				Bronkhorstspruit			
	Endicott				Marble Hall				Glenroy			
	Elof				Middelburg				Goeie Hoek			
	Hawerklip				Stoffberg				Kaalfontein			
	Kendal				Pan				Middelvlei			
	Ogies				Arnot				Nigel			
					Wonderfontein				Oberholzer			
									Raarthsvlei			
<u>Grading:</u>	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
1. Damage sunflower seed, %	0.82	-	-	-	0.00	-	-	-	0.07	0.00	0.14	0.10
2. Screenings, %	1.24	-	-	-	2.62	-	-	-	0.54	0.17	0.90	0.52
3. Sclerotinia, %	0.00	-	-	-	0.00	-	-	-	0.00	0.00	0.00	0.00
4. Foreign Matter, %	2.65	-	-	-	1.07	-	-	-	0.95	0.54	1.35	0.57
5. Deviations in 2,3 and 4 collectively: Provided that such deviations are individually within the limits of said items, %	3.89	-	-	-	3.69	-	-	-	1.48	0.71	2.25	1.09
Noxious seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	0	-	-	-	0	-	-	-	0	0	0	0
Noxious seeds (<i>Argemone mexicana L.</i> , <i>Convolvulus sp.</i> , <i>Ipomoea purpurea Roth.</i> , <i>Lolium temulentum</i> , <i>Xanthium sp.</i>)	0	-	-	-	0	-	-	-	0	0	0	0
Number of samples	1				1				2			
<u>Chemical analysis:</u>	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
Moisture, % (1hr, 130 °C)	5.6	-	-	-	5.0	-	-	-	4.1	4.0	4.2	0.14
Crude Protein, % (db)	16.04	-	-	-	13.68	-	-	-	16.92	16.75	17.09	0.24
Crude Fat, % (db)	40.6	-	-	-	45.0	-	-	-	42.9	42.1	43.6	1.06
Ash, % (db)	2.83	-	-	-	2.75	-	-	-	2.44	2.39	2.49	0.07
Crude Fibre, % (db)	25.3	-	-	-	20.0	-	-	-	19.8	19.4	20.1	0.49
Number of samples	1				1				2			

**SOUTH AFRICAN
REGIONAL SUNFLOWER QUALITY**

PRODUCTION REGION	(35)			
	Limpopo			
Intake silos	Alma			Tzaneen
	Bela-Bela (Warmbad)			Vaalwater
	Crecy			
	Immerpan			
	Lehau			
	Modimolle (Nylstroom)			
	Mokopane (Potgietersrus)			
	Mookgophong (Naboomspruit)			
	Northam			
	Nutfield			
	Pienaarsrivier			
	Polokwane (Pietersburg)			
	Roedtan			
	Settlers			
	<u>Grading:</u>	ave	min	max
1. Damage sunflower seed, %	0.00	0.00	0.00	0.00
2. Screenings, %	1.55	0.44	2.56	0.77
3. Sclerotinia, %	0.00	0.00	0.00	0.00
4. Foreign Matter, %	2.58	0.53	4.78	1.68
5. Deviations in 2,3 and 4 collectively: Provided that such deviations are individually within the limits of said items, %	4.13	1.91	7.33	1.87
Noxious seeds (<i>Crotalaria sp.</i> , <i>Datura sp.</i> , <i>Ricinis communis</i>)	0	0	0	0
Noxious 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
Number of samples	9			
<u>Chemical analysis:</u>	ave	min	max	stdev
Moisture, % (1hr, 130 °C)	5.4	4.6	6.0	0.47
Crude Protein, % (db)	18.60	14.86	23.02	2.15
Crude Fat, % (db)	40.4	34.9	42.3	2.34
Ash, % (db)	2.75	2.41	3.83	0.44
Crude Fibre, % (db)	21.0	18.8	22.5	1.11
Number of samples	9			

METHODS

SAMPLING PROCEDURE:

A working group determined the process to be followed to ensure that the crop quality samples which are sent to the SAGL by the various grain silo owners/agricultural businesses, are representative of the total crop.

Each delivery is sampled as per the grading regulations for grading purposes.

After grading, the grading samples are placed in separate containers according to class and grade.

After 80% of the expected harvest has been received, the silo divides the content of each container with a multi slot divider in order to obtain a 3 kg sample (this should be done for each class and grade separately).

If there is more than one container per class and grade, the combined contents of the containers is mixed thoroughly before dividing it with a multi slot divider to obtain the required 3 kg sample.

The samples are marked clearly with the name of the depot, the bin/bag/bunker/dam number(s) represented by each individual sample as well as the class and grade and are then forwarded to the SAGL.

GRADING:

Full grading was done in accordance with the Regulations relating to the Grading, Packing and Marking of Sunflower Seed intended for sale in the Republic of South Africa (No. R. 493 of 8 May 2009).

See pages 23 to 30 of this report.

CHEMICAL ANALYSIS:

Milling

Prior to the chemical analyses, the Sunflower samples were milled on a Retch ZM 200 mill fitted with a 1.0 mm screen.

Moisture

The moisture content of the milled samples was determined as a loss in weight when dried in an oven at 130 °C for 1 hour.

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 protein content.

Crude Fat

In-House method 024 was used for the determination of the crude fat in the samples. After sample preparation the fat is extracted by petroleum ether with the aid of the Soxhlet extraction apparatus, followed by the removal of the solvent by evaporation and weighing the dried residue thus obtained. The residue is expressed as % crude fat.

Ash

Ash is defined as the quantity of mineral matter which remains as incombustible residue of the tested substance, after application of the described working method. In-house method No. 011, based on AACCI method 08-02.01 Rapid (Magnesium Acetate) method, was used for the determination.

Crude Fibre

In-House method 020 was used for the determination of the crude fibre in the samples. Crude fibre is the loss on ignition of the dried residue remaining after digestion of the sample with 1.25% H₂SO₄ (Sulphuric acid) and 1.25% NaOH (Sodium hydroxide) solutions under specific conditions.

This method is based on AACCI method 32-10.01, latest edition and the method described in the Government Gazette No. R. 31 of 25 January 2008.



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 Co. reg no: 1997/018518/08

Facility Accreditation Number: **T0116**

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

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

CHEMICAL & PHYSICAL ANALYSIS

The facility is accredited in accordance with the recognised International Standard

ISO/IEC 17025:2005

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

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



M R Josias
Chief Executive Officer

Effective Date: **01 November 2009**
Certificate Expires: **31 October 2014**

No. R. 493

8 May 2009

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

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

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

- (a) made the regulations in the Schedule; and
- (b) determined that the said regulations shall come into operation on the date of publication thereof.

SCHEDULE

Definitions

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

"bag" means a bag manufactured from --

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

"bulk container" means any vehicle or container in which bulk sunflower seed is transported or stored;

"consignment" means --

- (a) a quantity of sunflower seeds 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 a grade, each such quantity of such grade;

"container" means a bag or a bulk container;

"cultivar list" means the list of cultivars determined from time to time by the Executive Officer: Agricultural Product Standards and which is obtainable from the Executive Officer: Agricultural Product Standards, Private Bag X258, Pretoria, 0001;

"damaged sunflower seed" means sunflower seeds or portions thereof of which the nucleus is visibly discoloured as a result of external heat or heating due to internal fermentation;

"foreign matter" means --

- (a) loose and empty shells above the sieve that occur in the consignment concerned;
- (b) all matter other than glass, dung, coal, stones, metal, screenings, sclerotinia, sunflower seed and the nucleus of sunflower seed that occur in the consignment concerned;

"insect" means any live insect that is injurious to stored sunflower seed irrespective of the stage of development of the insect;

"poisonous seeds" means seeds or part of seeds of plant species that may in terms of the Foodstuffs, Cosmetics and Disinfectants Act, 1972 (Act No. 54 of 1972), represent a hazard to human or animal health when consumed, including seeds of *Argemone mexicana* L., *Convolvulus* spp., *Crotalaria* spp., *Datura* spp., *Ipomoea* spp., *Lolium temulentum*, *Ricinus communis* or *Xanthium* spp.;

"sclerotinia" *Sclerotinia sclerotiorum* is a fungus that produces hard masses of fungi tissue and is also known as sclerotinia. The sclerotinia varies in size and form and consists of a dark black exterior, a white interior and a rough surface texture;

"screenings" means all material that passes through the standard sieve;

"standard sieve" is a slotted 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 ($\pm 0,03$ mm). 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 at least 300 mm and at least 50 mm high;
- (d) that fits onto a tray with a solid bottom and must be at least 20 mm above bottom of the tray;

"sunflower seed" means the achene of plants of *Helianthus annuus* (L); and

"the Act" means the Agricultural Product Standards Act, 1990 (Act No. 119 of 1990).

Restriction on sale of sunflower seed

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

- (a) unless the sunflower seed is sold according to the classes set out in regulation 3
- (b) unless the sunflower seed comply with the standards for the classes concerned set out in regulation 4;
- (c) unless the sunflower seed, where applicable, comply with the grades of sunflower seed and the standards for grades set out in regulation 5 and 6 respectively;
- (d) unless the sunflower seed is 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 sunflower seed contains a substances that renders it unfit for human or animal consumption or for processing into or utilisation thereof as food or feed.

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

**PART I
QUALITY STANDARDS**

Classes of sunflower seed

3. Sunflower seed shall be classified as --

- (a) Class FH;
- (b) Class FS; and
- (c) Class Other Sunflower Seed.

Standards for classes of sunflower seed

4. (1) A consignment of sunflower seed shall --

- (a) be free from a musty, sour, khaki bush or other undesired odour;
- (b) be free from any substance that renders it unsuitable for human or animal consumption or for processing into or utilisation as food or feed;
- (c) contain not more poisonous seeds than permitted in terms of the Foodstuffs, Cosmetics and Disinfectants Act, 1972 (Act No. 54 of 1972);
- (d) shall be free from glass, metal, coal or dung;
- (e) with the exception of Class Other sunflower seed, be free from insects; and
- (f) with the exception of Class Other sunflower seed, have a moisture content of not more than 10 per cent.

(2) A consignment of sunflower seed shall be classified as --

- (a) Class FH if it --
 - (i) consists of at least 80 percent (m/m) sunflower seeds of a cultivar with a high oil content as specified in the cultivar list; and
 - (ii) Complies with the standard for Grade 1 set out in regulation 6.
- (b) Class FS if it --
 - (i) consists of at least 80 percent (m/m) sunflower seeds of a cultivar with a low oil content as specified in the cultivar list; and
 - (ii) Complies with the standards for Grade 1 set out in regulation 6.
- (c) Class Other Sunflower Seed if it does not comply with the requirements for Class FH or Class FS.

Grades for sunflower seed

5. (1) There is only one grade for the Classes FH and FS Sunflower Seeds, namely Grade 1.
- (2) No grades are determined for Class Other sunflower seed.

Standards for grades of sunflower seed

6. A consignment of Grade 1 sunflower seed shall be graded as:
- (a) Grade 1 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. Sunflower seed of different classes and grades shall be packed in different containers or stored separately.

Marking requirements

8. Every container or the accompanying sale documents of a sunflower seed shall be marked or endorsed with the class and, where applicable, the grade of the sunflower seed.

**PART III
SAMPLING****Obtaining a sample**

9. (1) A representative sample of a consignment of sunflower seed shall --
- (a) in the case of sunflower seed delivered in bags and subject to regulation 10, be obtained by sampling at least 10 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 sunflower seed 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 sub regulation (1)(a) or(b) shall --
- (a) have a total mass of at least 5 kg; and
- (b) be thoroughly mixed by means of dividing before further examination.
- (3) If it is suspected that that 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) 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 sunflower seed taken from different bags in a consignment in terms of regulation 9(1), it appears that the contents of those bags differ substantially --

- (a) the bags concerned shall be separated from each other;
- (b) all the bags in the consignment concerned shall be sampled in order to do such separation; and
- (c) each group of bags with similar contents in that consignment shall for the purpose of these regulations be deemed to be separate consignment.

(2) If, after the discharge of a consignment of sunflower seed in bulk has commenced, it is suspected that the consignment could be of a class or grade other than that determined by means of the initial sampling, the discharge shall immediately be stopped and that part of the consignment remaining in the bulk container, as well as the sunflower seed that is 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 sunflower seed that is flowing in bulk.

Working sample

11. (1) A working sample of sunflower seed shall be obtained by dividing the representative sample of the consignment according to the ICC 101/1 method.

**PART IV
INSPECTION METHODS**

Determination of undesired smell, harmful substances, poisonous seeds, stones, glass, metal, coal, dung, and insect content

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

- (a) whether it has a musty, sour, khaki bush or other undesired smell;
- (b) whether it contains sunflower seed in or on which a substance occurs that renders it unsuitable for human or animal consumption or for processing into or utilization thereof as food or feed;
- (c) whether it contains poisonous seeds;
- (d) whether it contains stones, glass, metal, coal or dung; and
- (e) whether it contains any insects.

Determination of moisture content

13. The moisture content of a consignment of sunflower seed may be determined according to any suitable method: Provided that the result thus obtained is in accordance with the maximum permissible deviation for a class 1 moisture meter as detailed in ISO 7700/2, based upon results of the 72 hour, 103°C oven dried method [AACC Method 44-15A].

Determination of percentage screenings

14. The percentage screenings in a consignment of sunflower seed is determined as follows:

- (a) Obtain a working sample of at least 50 g from a representative sample of the consignment.

- (b) Place the sample on the standard sieve and screen the sample by moving the sieve 50 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 sieve. Move the sieve, which rests on a table or other suitable smooth surface, 250 mm to 460 mm away from and towards the operator with each stroke. The prescribed 50 strokes must be completed within 50 to 60 seconds: Provided that the screening process may also be performed in some or other container or an automatic sieving apparatus.
- (c) Determine the mass of the material that has passed through the sieve and express it as percentage of the mass of the working sample.
- (d) Such percentage represents the percentage screenings in the consignment.

Determination of percentage foreign matter

15. The percentage foreign matter in a consignment sunflower seed shall be determined as follows:
- (a) Obtain a working sample of at least 20 g of a screened sample.
 - (b) Remove all foreign matter by hand and determine the mass thereof.
 - (c) Express the mass thus determined as a percentage of the mass of the working sample.
 - (d) Such a percentage represents the percentage foreign matter in the consignment.

Determination of percentage sunflower seed of another class

16. The percentage sunflower seed of another class in a consignment sunflower seed shall be determined as follows:
- (a) Remove all sunflower seeds of another class from the working sample in 15(a) obtained by hand and determine the mass thereof.
 - (b) Express the mass thus determined as a percentage of the working sample in 15(a) obtained.
 - (c) Such percentage represents the percentage sunflower seed of another class in the consignment.

Determination of the percentage damaged sunflower seed

17. The percentage damaged sunflower seed in a consignment sunflower seed shall be determined as follows:
- (a) Shell the seeds in the working sample in 15(a) obtained by hand or with a machine so that the nucleus portions thereof are retained.
 - (b) Remove all damaged sunflower seeds from the quantity thus shelled and determine the mass thereof.
 - (c) Express the mass thus determined as a percentage of the working sample in 15(a) obtained.
 - (d) Such a percentage represents the percentage damaged sunflower seed in the consignment.

Determination of percentage sclerotinia

18. The percentage sclerotinia in a consignment of sunflower seed shall be determined as follows:

- (a) Remove all sclerotinia in the working sample in 15(a) obtained by hand and determine the mass thereof.
- (b) Express the mass thus determined as a percentage of the working sample in 15(a) obtained.
- (c) Such a percentage represents the percentage sclerotinia in the consignment.

**PART IV
OFFENCE AND PENALTIES**

19. Any person who contravenes or 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 terms of section 11 of the Act.

ANNEXURE/AANHANGSEL

TABLE1/TABEL1

STANDARDS FOR GRADES OF SUNFLOWER SEED/
STANDAARDE VIR GRADE VAN SONNEBLOMSAAD

Deviation/Afwyking	Maximum permissible deviation/ Maksimum toelaatbare afwyking	
	Class/Klas FH	Class/Klas FS
	Grade1/Grade1	
1. Damaged sunflower seed/Beskadigde sonneblomsaad	10%	
2. Screenings/Sifsels	4%	
3. Sclerotinia	4%	
4. Foreign Matter/Vreemde voorwerpe	4%	
5. Deviation in 2,3 and 4 collectively: Provided that such deviations are individually within the limits of said items/Afwykinge in 2, 3 en 4 gesamentlik: Met dien verstande dat sodanige afwykinge individueel binne die perke van genoemde items is	6%	



