Soybean Crop Quality 2023/24 – Summary of results

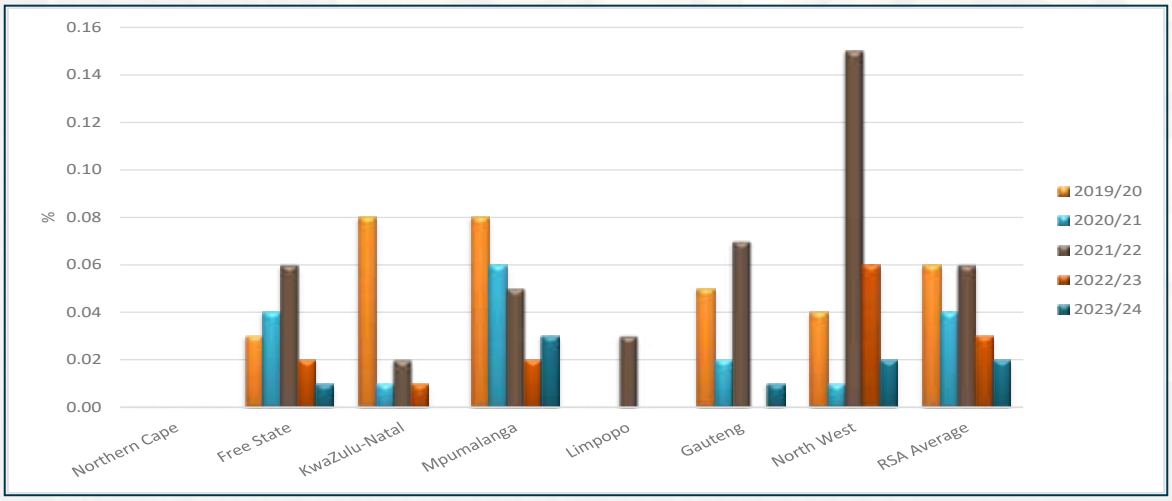
Eighty-two percent (164) of the 200 samples analysed for the purpose of this survey were graded as Grade SB1, while 36 (18%) of the samples were downgraded to COSB (Class Other Soya Beans). During the previous two seasons, 17% (2022/23) and 19% (2021/22) of the samples were downgraded to COSB.

- Three samples exceeded the maximum permissible deviation of 5% foreign matter.
- Two samples exceeding the maximum permissible deviation of 0.5% other grain.
- One sample exceeded the maximum permissible deviation of 10% for soybeans and part of soybeans above the 1.8 mm slotted screen which pass through the 4.75 mm round hole screen.
- Twenty samples exceeded the maximum permissible deviation of 10% defective soybeans on the 4.75 mm round hole screen.
- Five samples exceeded the maximum permissible deviation of 10% soiled soybeans.
- Five samples exceeded the maximum permissible number (1/1000 g) of *Crotolaria sp.* and *Datura sp.* poisonous seeds.
- Five samples exceeded the maximum permissible number (7/1000 g) of *Convolvulus sp.* and *Ipomoea purpurea Roth.* poisonous seeds.
- Four samples were downgraded to Class Other due to a combination of two or more of the above mentioned deviations.

Twenty six percent of the samples contained sclerotia from the fungus *Sclerotinia sclerotiorum*. This percentage is equal to the previous season. 81% of the samples that contained sclerotia this season originated in Mpumalanga, 10% in the Free State, 8% in North West and 2% in Gauteng.

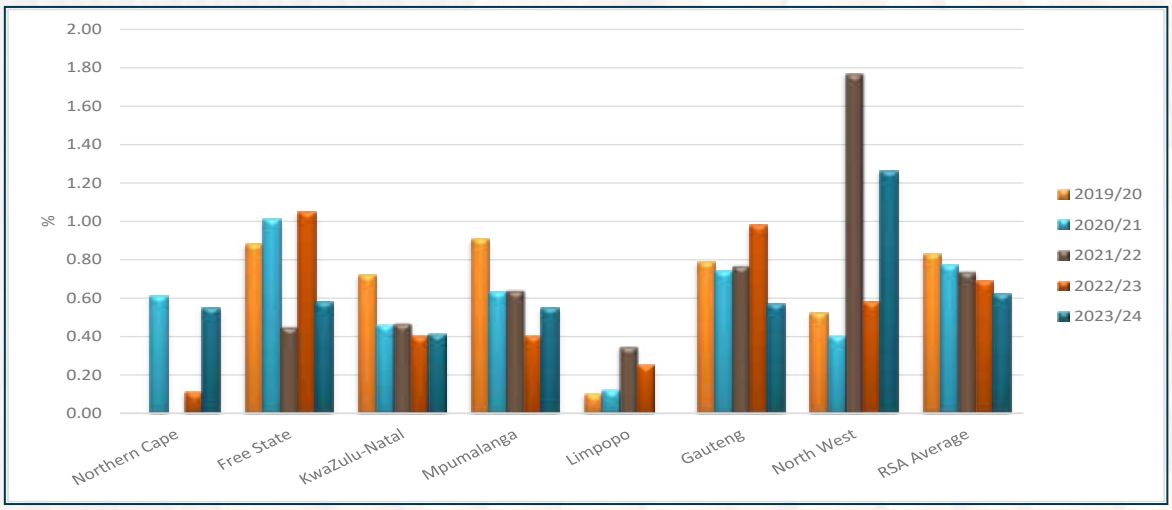
As in previous years, sclerotia was present in very low levels, ranging between 0.01% and 0.18%. The national weighted average percentage this season was 0.02%, 0.03% in the previous season. The maximum permissible level of sclerotia is 4%. See Graph 16.

Graph 16: Average percentage sclerotia per province over five seasons



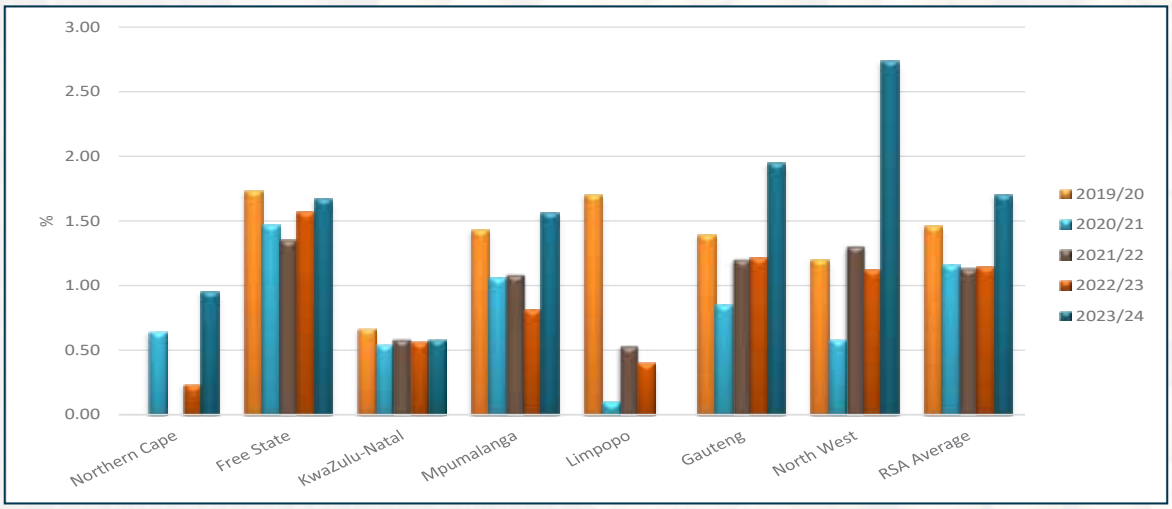
The samples received from North West province (19 samples) had the highest weighted average percentage foreign matter (1.26%) and the three samples from KwaZulu-Natal averaged the lowest with 0.41%. The averages for the Northen Cape, Free State, Mpumalanga and Gauteng ranged between 0.55 % to 0.58%. The national weighted average of 0.62% was the lowest since the 2012/13 season. Please refer to Graph 17.

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



North West reported the highest weighted average percentage soybeans and parts of soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, namely 2.74%, followed by the 1.95% and 1.67% from Gauteng (10 samples) and the Free State (44 samples) respectively. The lowest weighted average value reported was 0.58% on the samples from KwaZulu-Natal. The national weighted average percentage of 1.70% was the highest since the 2015/16 season. Please see Graph 18.

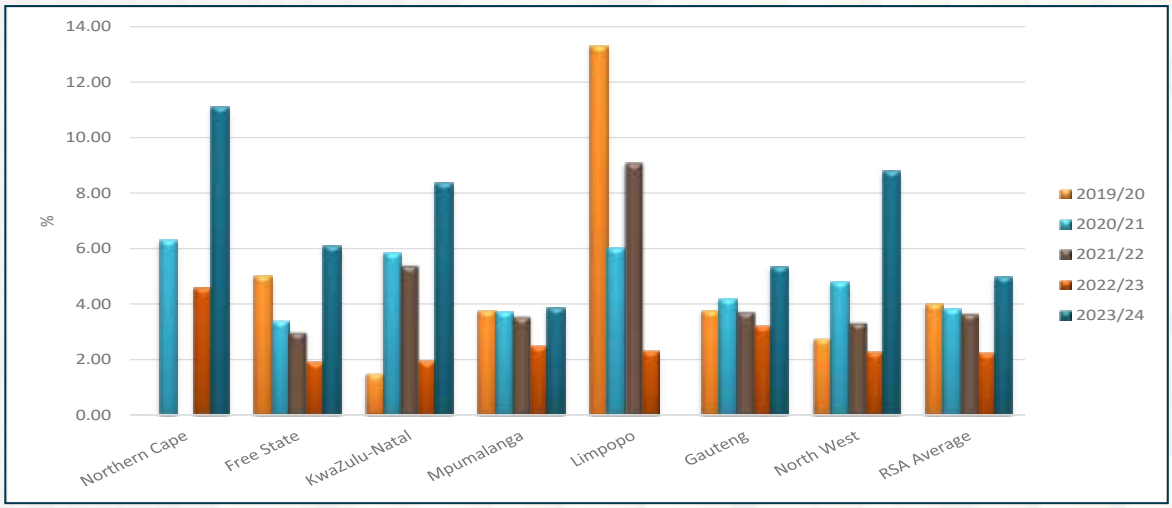
Graph 18: Average percentage soybeans and parts of soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve per province over five seasons



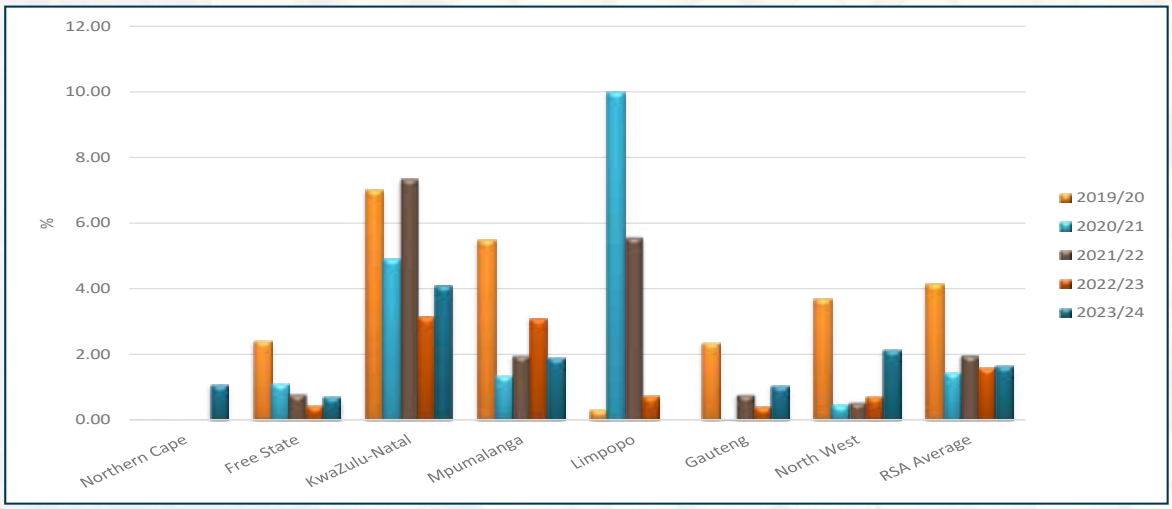
The lowest weighted average percentages defective soybeans on the 4.75 mm sieve, was reported on the 123 samples from Mpumalanga (3.85%) followed by the 5.33% from Gauteng. The highest percentage, namely 11.10% was observed on the single sample from the Northern Cape. The averages in the other provinces ranged from 6.07% to 8.78%. The national weighted average increased from 2.23% last season to 4.98% this season. Please see Graph 19.

The national weighted average percentage soiled soybeans was 1.64%. The previous two seasons averaged 1.58% and 1.98% respectively. The highest weighted average percentages were observed in KwaZulu-Natal (4.08%) and North West (2.13%). The remaining weighted averages ranged between 0.70% and 1.89%. Please see Graph 20. Sixty four percent (127) of samples graded contained soiled soybeans. Five samples exceeded the maximum permissible deviation of 10% according to the grading regulations, the same number than the previous season. The highest percentage reported was 16.44% on a sample from Mpumalanga. The rest of these samples originated in Mpumalanga and North West.

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



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



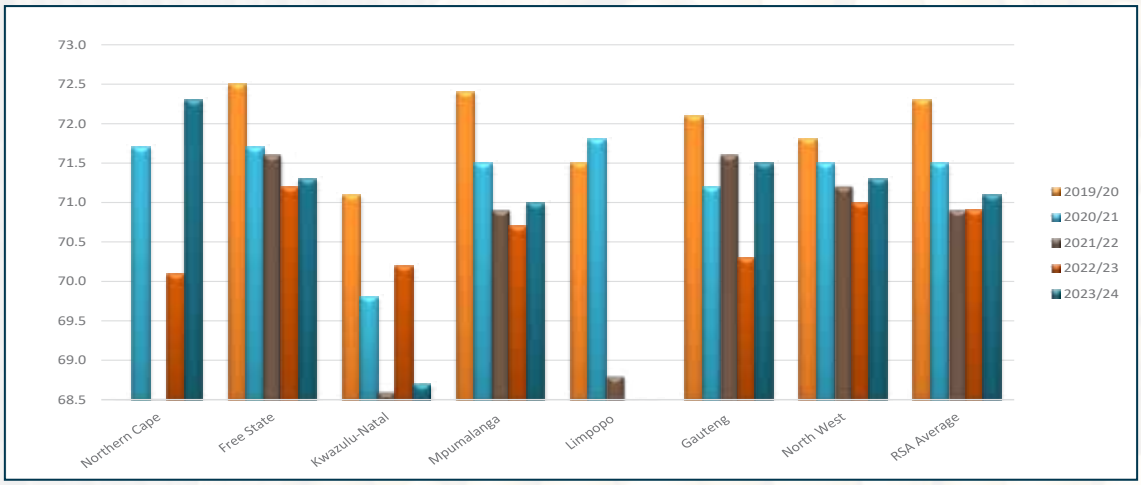
Test weight does not form part of the grading regulations for soybeans in South Africa. An approximation of the test weight of South African soybeans is provided in Table 2 for information purposes. The standard working procedure of the Kern 222 instrument, as described in ISO 7971-3:2019, was followed. The g/1 L filling mass of the soybean samples was determined and divided by two. The test weight was then extrapolated by means of the following formulas obtained from the Test Weight Conversion Chart for Soybean of the Canadian Grain Commission: $y = 0.1898x + 2.2988$ (291 to 350 g/0.5 L) and $y = 0.1895x + 2.3964$ (351 to 410 g/0.5 L). Please see Graph 21 for a comparison of the test weight per province over the last five seasons.

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

Province	Test weight, kg/hl								
	2023/24 Season			2022/23 Season			2021/22 Season		
	Weighted average	Range	No. of samples	Weighted average	Range	No. of samples	Weighted average	Range	No. of samples
Northern Cape (Regions 10 - 11)	72.3	-	1	70.1	70.0 - 70.2	2	-	-	-
Free State (Regions 21 - 28)	71.3	68.4 - 74.2	44	71.2	64.3 - 73.2	65*	71.6	69.8 - 73.3	**36
KwaZulu-Natal (Region 36)	68.7	68.2 - 69.4	3	70.2	69.0 - 72.1	9	68.6	65.7 - 71.1	14
Mpumalanga (Regions 29 - 33)	71.0	68.3 - 73.0	**121	70.7	68.3 - 73.4	64	70.9	67.4 - 73.1	65
Limpopo (Region 35)	-	-	-	67.4	-	1	68.8	63.7 - 72.7	3
Gauteng (Region 34)	71.5	70.4 - 73.0	10	70.3	68.7 - 71.3	3	71.6	70.7 - 72.3	9
North West (Region 12 - 20)	71.3	66.5 - 73.1	19	71.0	68.6 - 72.8	29	71.2	68.7 - 74.2	21
RSA	***71.1***	***66.5 - 74.2***	***198***	***70.9***	***64.3 - 73.4***	***173***	***70.9***	***63.7 - 74.2***	***148***

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

Graph 21: Comparison of the test weight per province over five seasons



The nutritional component analyses, namely crude protein, - fat, - fibre and ash are reported on a dry/moisture-free basis (db) for the current as well as the previous surveys. For comparison purposes the national average 'as is' or wet basis results for the last five seasons are provided in Table 3. These 'as is' average values were calculated by converting each individual value from dry basis to 'as is'.

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

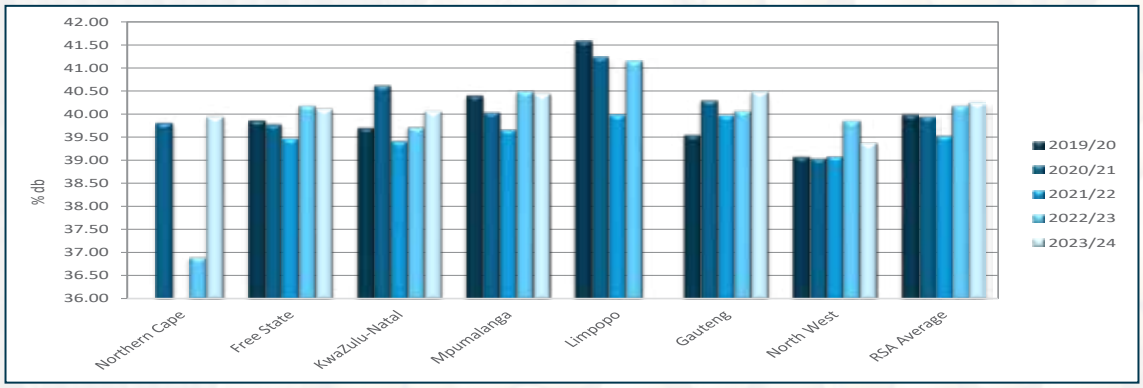
Season	2023/24		2022/23		2021/22		2020/21		2019/20	
Moisture, % (17hr, 103°C)	7.6		8.2		8.2		7.5		7.2	
Moisture basis	**Dry basis**	**As is**	**Dry basis**	**As is**	**Dry basis**	**As is**	**Dry basis**	**As is**	**Dry basis**	**As is**
Crude protein, %	40.26	37.21	40.19	36.90	39.54	36.31	39.96	36.95	39.99	37.12
Crude fat, %	20.5	19.0	19.9	18.3	19.6	18.0	19.5	18.0	18.0	16.7
Crude fibre, %	6.6	6.1	7.1	6.5	7.2	6.6	6.8	6.3	7.0	6.5
Ash, %	4.61	4.26	4.54	4.17	4.63	4.25	4.55	4.21	4.63	4.19
No. of samples	***200***		***174***		***150***		***150***		***150***	

The weighted average crude protein content this season was 40.26%, similar to the 40.19% of the previous season. The averages between provinces ranged from 39.35% in the Northen Cape to 40.49% in Gauteng. The weighted average crude fat percentage of 20.5% was the highest since the 2011/12 season when this survey commenced. The samples from KwaZulu-Natal had the highest average crude fat content, namely 22.2%. The lowest fat average was observed in Gauteng province with 20.4%.

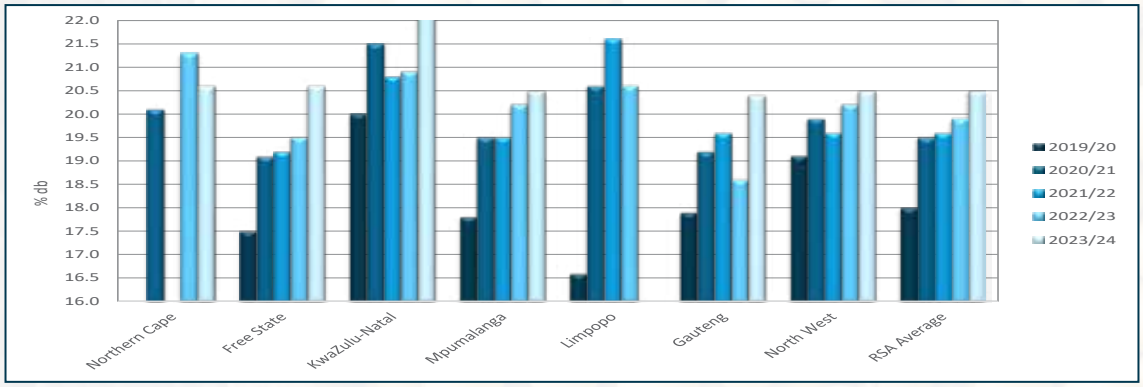
The weighted average percentage crude fibre varied from 6.2% in North West to 6.9% in the Northern Cape. The RSA weighted average was 6.6% compared to the 7.1% of the previous season. This season, the weighted average ash content was 4.61%, last season's average was 4.54%. Averages ranged from 4.57% in Mpumalanga to 4.81% in the Northern Cape.

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

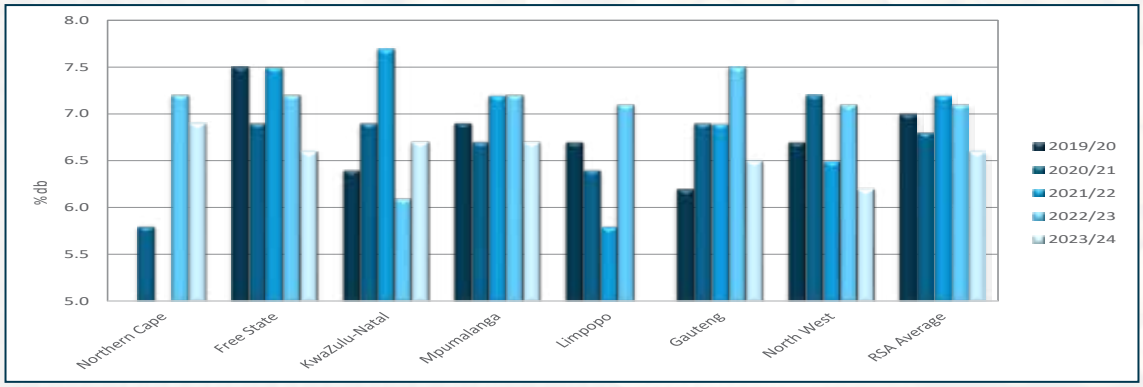
Graph 22: Average crude protein content per province over five seasons



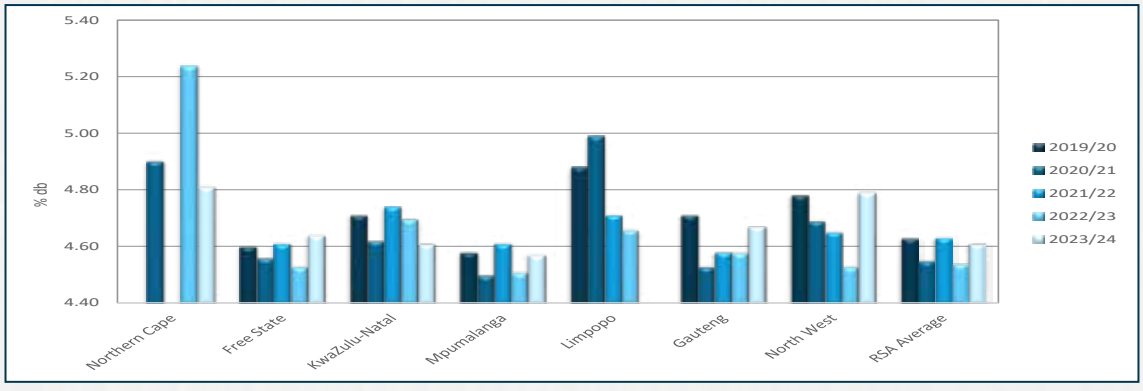
Graph 23: Average crude fat content per province over five seasons



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



Graph 25: Average ash content per province over five seasons



The 2023/24 season is the sixth 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 2023/24 season

Analysis	Moisture, % (17hr, 103°C)	Crude Protein, % (db)	Crude Protein, % (as is)	Crude Fat, % (db)	Crude Fat, % (as is)
Soybean Crop Quality Survey results					
Average	**7.6**	**40.26**	**37.21**	**20.5**	**19.0**
Minimum	5.9	35.13	32.92	18.3	17.1
Maximum	11.3	44.29	41.15	23.3	21.9
Standard Deviation	0.87	1.37	1.25	0.97	0.91
No. of samples	*200*	*200*	*200*	*200*	*200*
ARC Grain Crops Cultivar trial sample results					
Average	**8.3**	**40.04**	**36.71**	**20.3**	**18.6**
Minimum	7.9	35.93	33.02	18.4	16.8
Maximum	8.7	42.66	38.94	22.5	20.7
Standard Deviation	0.25	1.54	1.41	1.09	1.02
No. of samples	*30*	*30*	*30*	*30*	*30*
% Difference between crop and cultivar samples	***-0.7***	***0.2***	***0.5***	***0.2***	***0.4***

A summary of the RSA Soybean Crop Quality averages of the 2023/24 season compared to those of the 2022/23 season, is provided in Table 5 on page 24.

Please see pages 29 to 36 for the average soybean quality per region.