

Sunflower Crop Quality 2022/23 – Summary of results

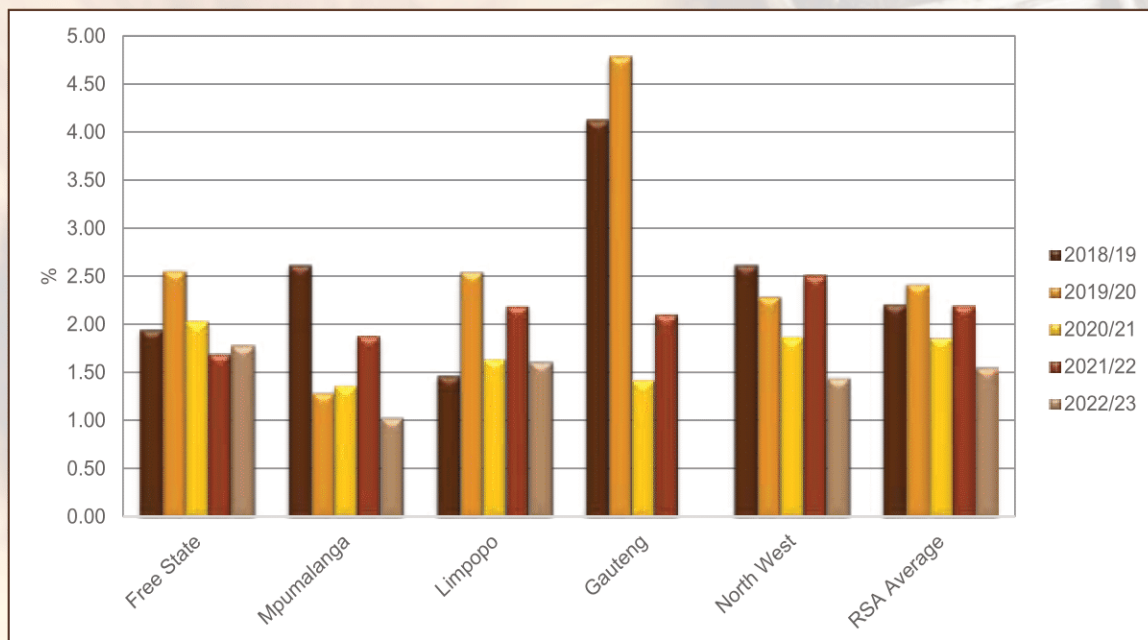
Eighty-three percent (145) of the 174 samples analysed for the purpose of this survey were graded as Grade FH1, with 29 (17%) of the samples downgraded to COSF (Class Other Sunflower Seed). The percentage of samples graded FH1 increased compared to the previous season's 75%. The ten-year weighted average of the percentage samples graded as FH1 is 79%.

The grading results of the 29 samples downgraded to COSF can be summarised as follows:

- Percentage screenings exceeding the maximum permissible deviation of 4% was present in eight samples.
- Percentage sclerotia from the fungus *Sclerotinia sclerotiorum* exceeding the maximum permissible deviation of 4% was present in two samples.
- Percentage foreign matter exceeding the maximum permissible deviation of 4% was present in five samples.
- Percentage collective deviations exceeding the maximum permissible deviation of 6% was present in 14 samples.
- Poisonous seeds (*Datura sp.*) exceeding the maximum permissible number of 1 per 1000 g were present in eleven samples.
- One sample was downgraded due to the presence of a musty odour and another due to the presence of a musty and sour odour.
- Eleven of the 29 samples downgraded to COSF were as a result of a combination of two or more of the above mentioned deviations.

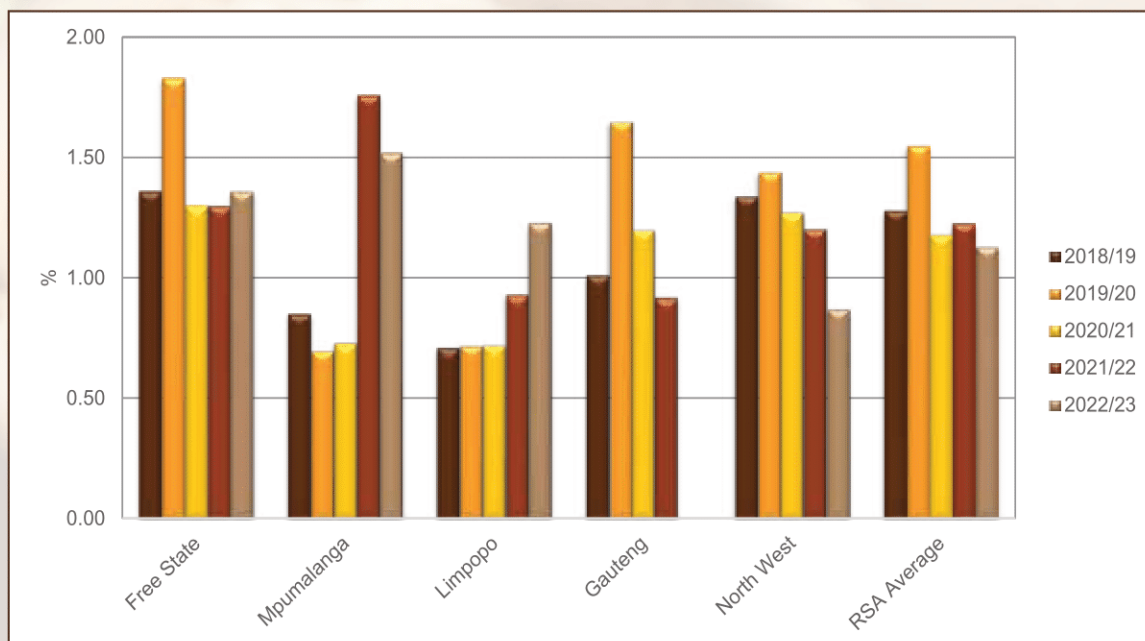
The samples from the Free State province (N = 64) reported the highest average percentage screenings namely 1.78%, followed by Limpopo (N = 17) and North West (N = 82) with 1.61% and 1.44% respectively. Mpumalanga (N = 11) reported the lowest percentage screenings of 1.03%. The weighted national average was 1.55% compared to the 2.20% of the previous season.

Graph 16: Average percentage screenings per province over five seasons



The highest weighted average percentage foreign matter (1.52%) was reported for the samples from the Mpumalanga regions. The Free State and Limpopo followed with 1.36% and 1.23% respectively. The lowest percentage was found in North West (0.87%). The national average was 1.13% compared to the 1.23% and 1.18% of the previous two seasons. Please see Graph 17.

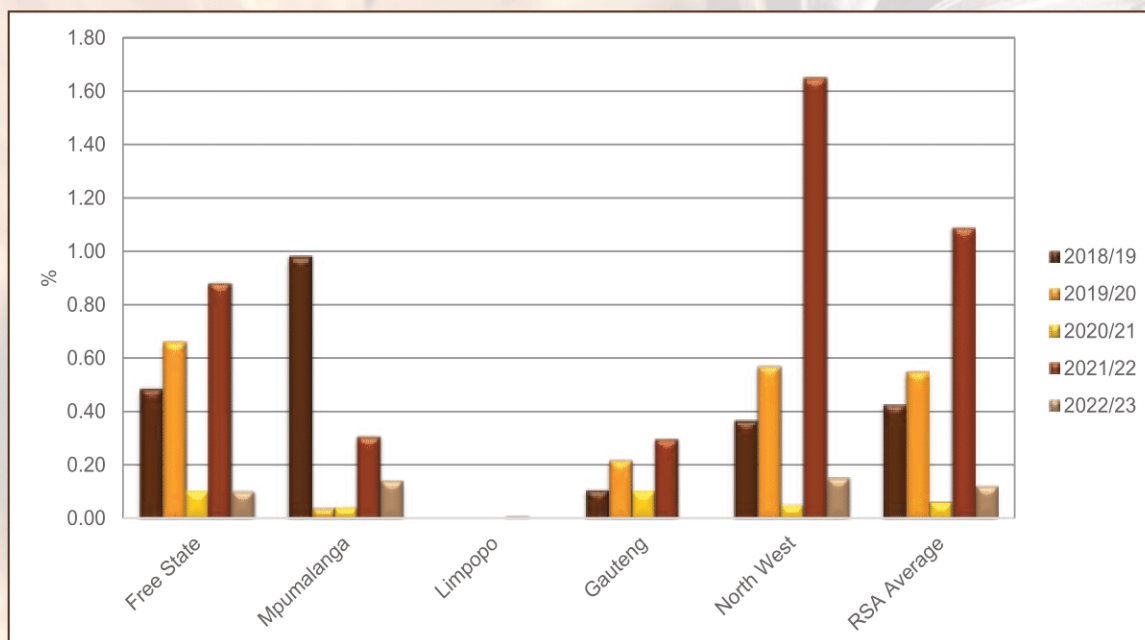
Graph 17: Average percentage foreign matter per province over five seasons



The percentage samples received for this survey that contained sclerotia from the fungus *Sclerotinia sclerotiorum* decreased from 70% in the previous season to 22% this season. The current season's 22% equals that of the 2020/21 season. 62% of the samples containing sclerotia this season originated in North West province, 28% in the Free State and 10% in Mpumalanga.

Two of the samples received exceeded the maximum permissible deviation of 4% for sclerotia. The highest percentage reported was 4.30% originating in the Free State, followed by 4.08% originating in North West. The national average of 0.12% is the second lowest of the past six seasons.

Graph 18: Average percentage sclerotia per province over five seasons



Test weight does not form part of the grading regulations for sunflower seed in South Africa. An approximation of the test weight of South African sunflower seed is provided in Table 3 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 sunflower seed 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 Sunflower Seed, Oil of the Canadian Grain Commission: $y = 0.1936x + 2.2775$ (138 to 182 g/0.5 L) and $y = 0.1943x + 2.1665$ (183 to 227 g/0.5 L). Please also see Graph 19 for a comparison of the test weight per province over the last five seasons.

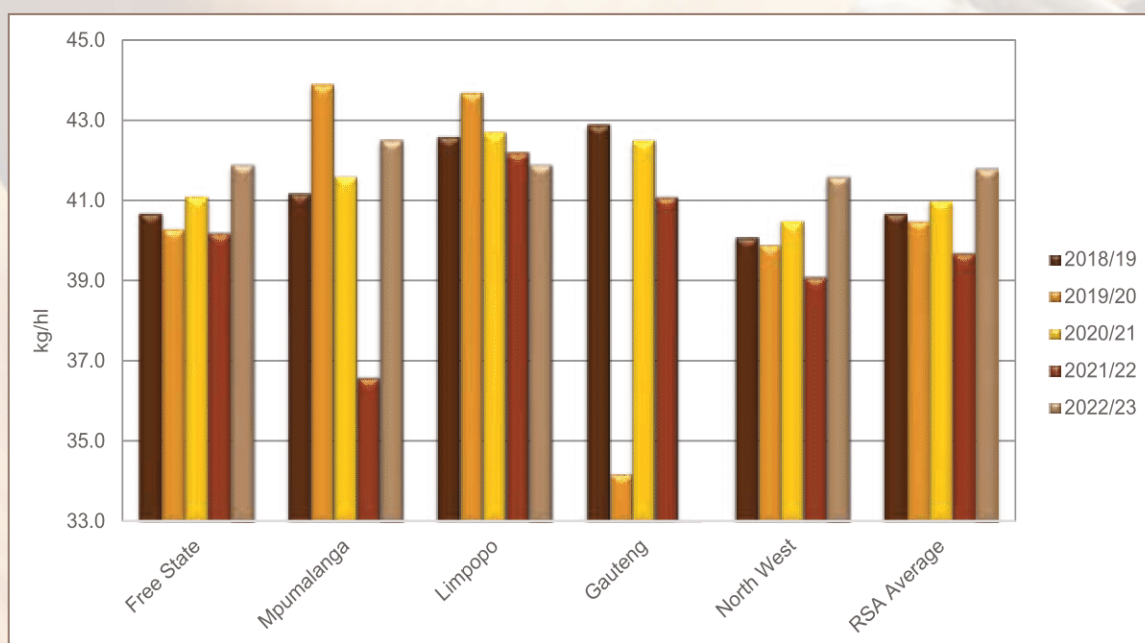
Table 3: Approximation of test weight per province over three seasons

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
Free State (Regions 21 - 28)	41.9	34.8 - 47.0	64	40.2	33.1 - 43.9	*45	41.1	38.0 - 44.9	*44
Mpumalanga (Regions 29 - 33)	42.5	40.9 - 45.2	11	36.6	35.2 - 44.5	13	41.6	40.4 - 42.5	7
Limpopo (Region 35)	41.9	36.4 - 47.2	17	42.2	39.9 - 47.3	27	42.7	40.5 - 44.4	19
Gauteng (Region 34)	-	-	-	41.1	-	1	42.5	-	1
North West (Region 12 - 20)	41.6	32.2 - 45.4	82	39.1	32.0 - 42.4	**86	40.5	30.4 - 43.7	85
RSA	41.8	32.2 - 47.2	174	39.7	32.0 - 47.3	172	41.0	30.4 - 44.9	156

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

**Three samples with outlier values were not taken into account for calculation purposes.

Graph 19: Comparison of the test weight per province over five seasons



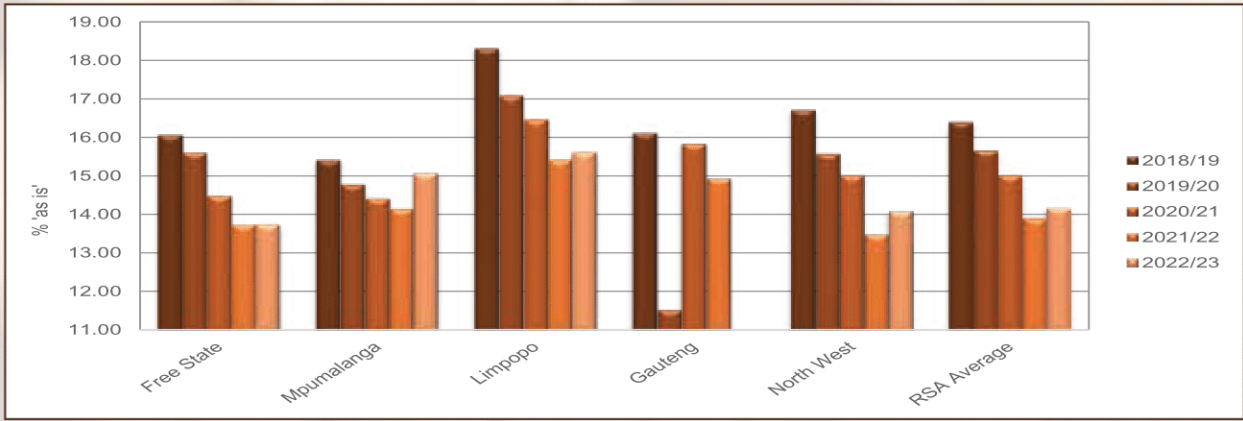
The nutritional component analyses, namely crude protein, -fat, -fibre and ash are reported as % (g/100 g) on an 'as received' or 'as is' basis.

The weighted average crude protein content this season was 14.17%. The last four seasons reported the lowest average values of the eleven seasons for which crop survey results are available. The 2021/22 season's average was 13.90%, the 2019/20 season was 15.02% and the 2019/20 season 15.66%. Limpopo had the highest weighted average crude protein content of 15.62%, followed by Mpumalanga with 15.08, North West with 14.09% and the Free State with the lowest average of 13.74%. The weighted average crude fat percentage was 39.9% compared to the 38.1% of the previous season. The samples from Mpumalanga had the highest crude fat content of 40.5%, followed by North West with 40.2%. The Free State and Limpopo averaged 39.7% and 39.1% respectively.

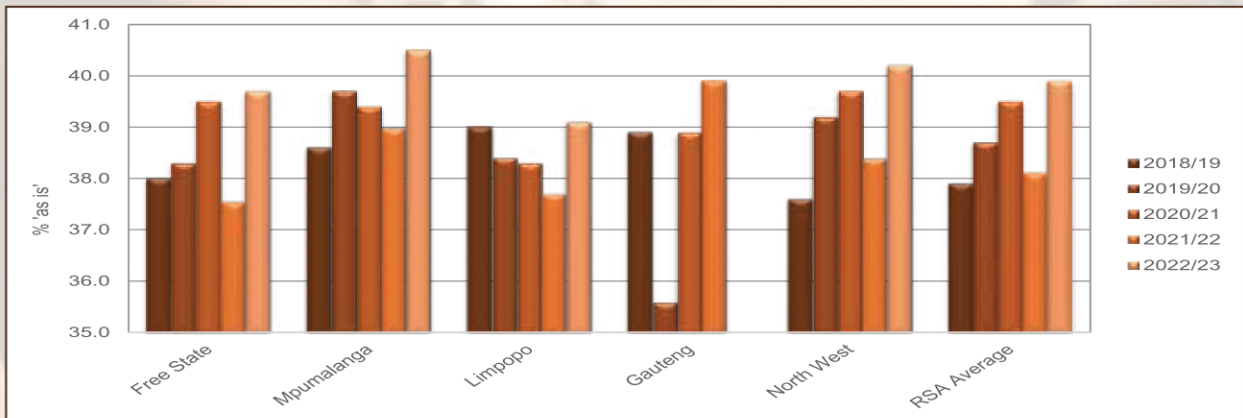
The weighted average percentage crude fibre was 22.9%, the second highest weighted average value since the start of this survey in 2012/13. Average values varied from a low of 21.9% in Limpopo to a high of 23.2% in the Free State. The weighted average ash content was 2.61%, equal to last season. The provincial averages ranged from 2.50% in Limpopo to 2.64% in North West.

Graphs 20 to 23 on page 21 provide comparisons between provinces and over seasons for the nutritional components discussed above.

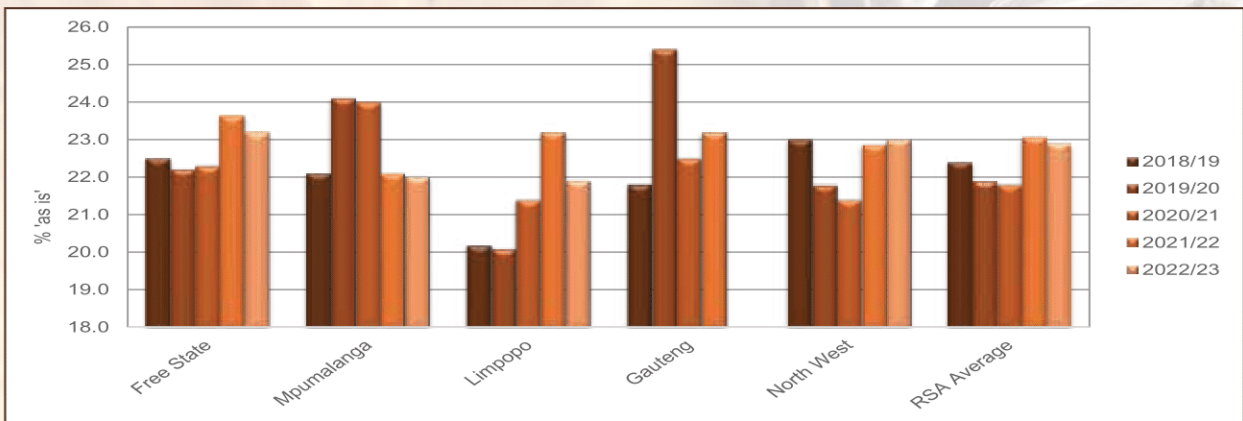
Graph 20: Average crude protein content per province over five seasons



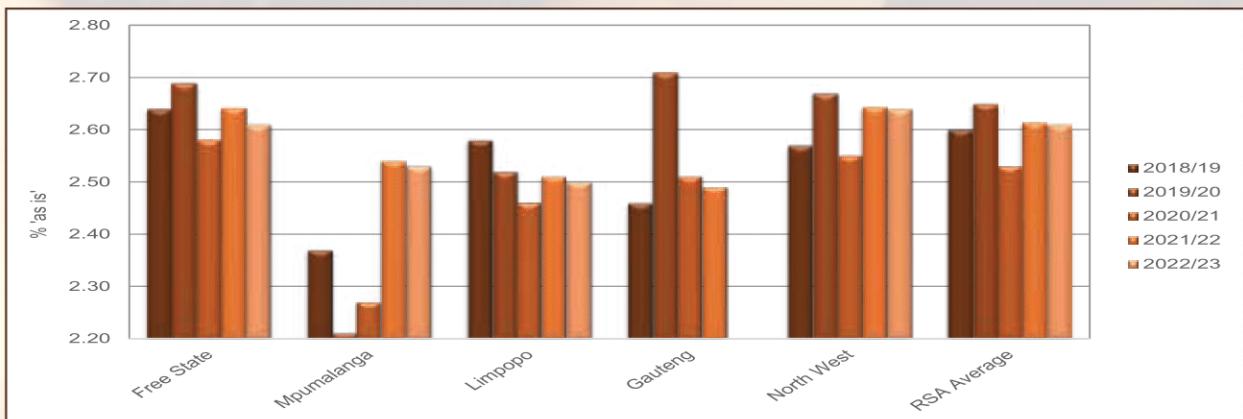
Graph 21: Average crude fat content per province over five seasons



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



Graph 23: Average ash content per province over five seasons



Please see a comparison of the moisture, crude protein and crude fat results between the crop survey and ARC Grain Crops sunflower cultivar trials' samples in Table 4.

See Table 5 on page 23 for a summary of the RSA Sunflower Crop Quality averages of the 2022/23 season compared to those of the 2021/22 season.

Table 4: Comparison between the moisture, crude protein and crude fat results of the sunflower crop quality and ARC cultivar trial samples of the 2022/23 season			
Analysis	Moisture, % (5hr, 105°C)	Crude Protein, % (as is)	Crude Fat, % (as is)
Sunflower Crop Quality Survey results			
Average	4.8	14.17	39.9
Minimum	2.8	10.80	30.6
Maximum	8.3	18.53	47.2
Standard deviation	0.65	1.50	2.35
No. of samples	174	174	174
ARC Grains Crops Cultivar trial sample results			
Average	5.3	15.16	44.2
Minimum	3.4	10.95	37.2
Maximum	6.5	22.64	53.4
Standard deviation	0.59	3.14	3.30
No. of samples	160	160	160
% Difference between crop and cultivar samples	-0.5	-0.99	-4.3

Please also see pages 24 to 30 for the average sunflower quality per region.

Graphs 20 to 23 on page 21 provide comparisons between provinces and over seasons for the nutritional components discussed above.

Please also see pages 24 to 30 for the average sunflower quality per region.