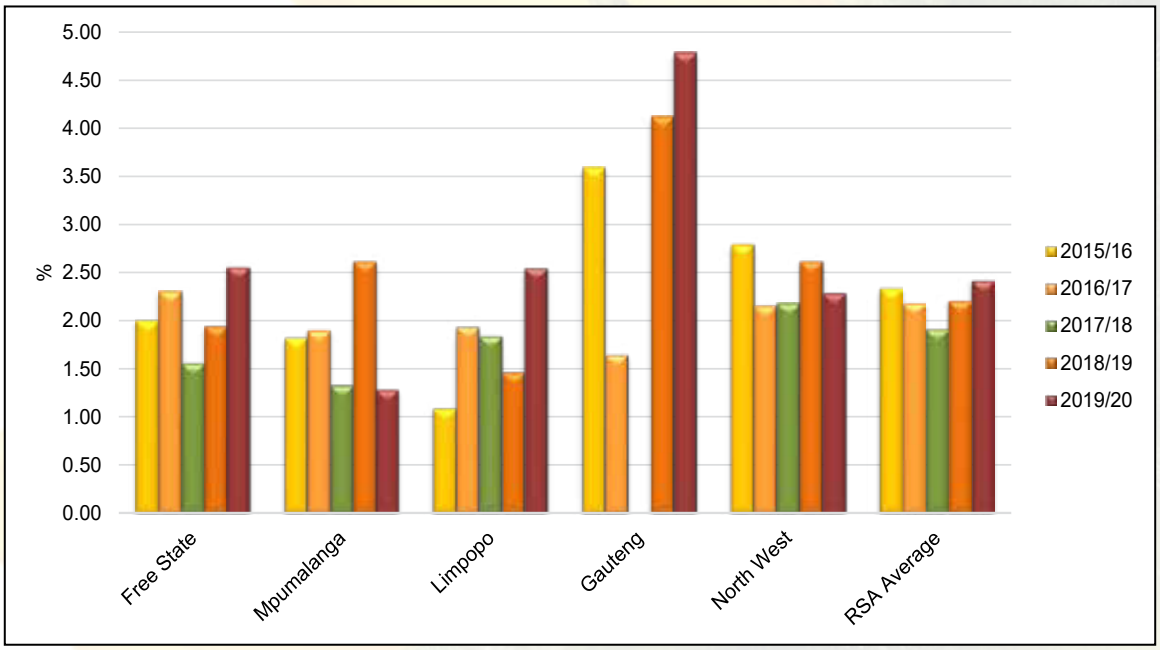
Sunflower Crop Quality 2019/20 – Summary of results

Sixty-three percent (111) of the 176 samples analysed for the purpose of this survey were graded as Grade FH1, with 65 of the samples downgraded to COSF (Class Other Sunflower Seed). This is the highest percentage (37%) of samples downgraded to Class Other since commencement of the sunflower crop surveys in 2012/13. Last season's percentage, namely 24%, was the second highest in the history of the crop surveys.

- Nineteen (29%) 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.
- Five samples (8%) were downgraded due to the percentage damaged sunflower seeds exceeding the maximum permissible deviation of 10% as well as presence of a sour odour.
- Fifteen samples in total (23%) were downgraded as a result of the presence of poisonous seeds. Thirteen samples were downgraded due to the presence of *Datura sp*. and one sample due to *Crotalaria sp*. exceeding the maximum permissible number, namely 1 per 1000 g. Another sample was downgraded due to *Xanthium strumarium* (cocklebur) seeds exceeding 7 per 1000 g.
- The remaining 40% (26) samples were downgraded as a result of a combination of one or more of the following deviations exceeding the maximum permissible deviation: damaged sunflower seeds, screenings, sclerotia, foreign matter, collective deviations as well as the presence of poisonous seeds (*Datura spp*.) or an musty odour.

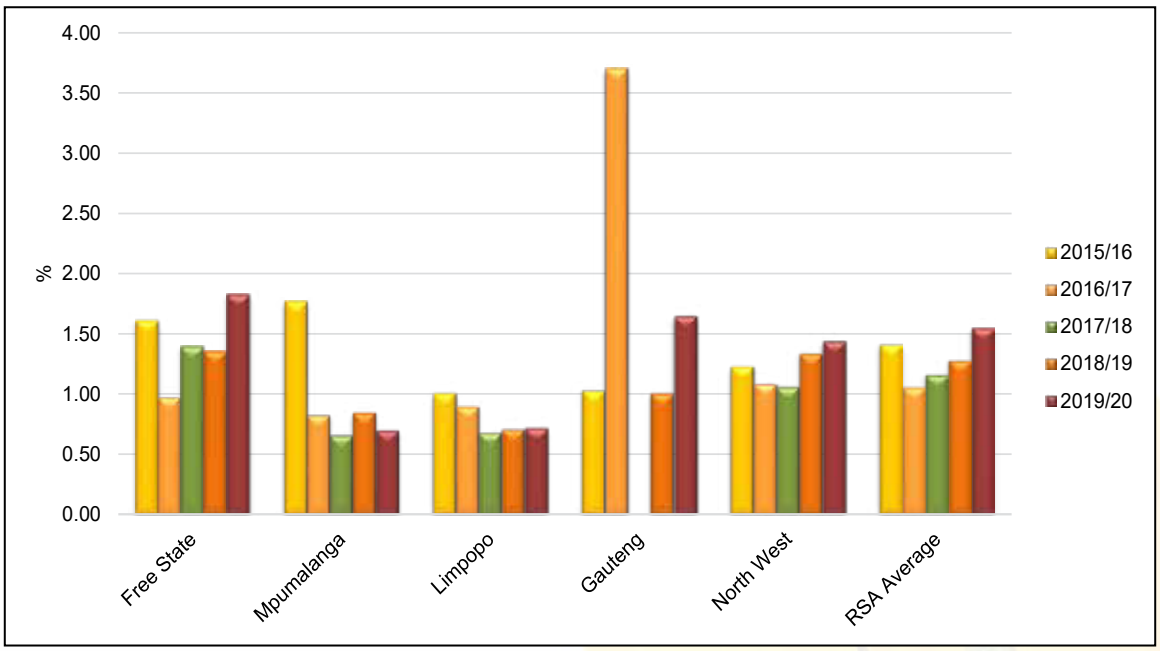
The sample from Gauteng province reported the highest average percentage screenings namely 4.79%, followed by the Free State (N = 84) and Limpopo (N = 13) with 2.56% and 2.55% respectively. North West province (N = 72) averaged 2.29% and Mpumalanga's six samples the lowest percentage screenings of 1.29%. The weighted national average was 2.42% compared to the 2.21% of the previous season.

Graph 16: Average percentage screenings per province over five seasons



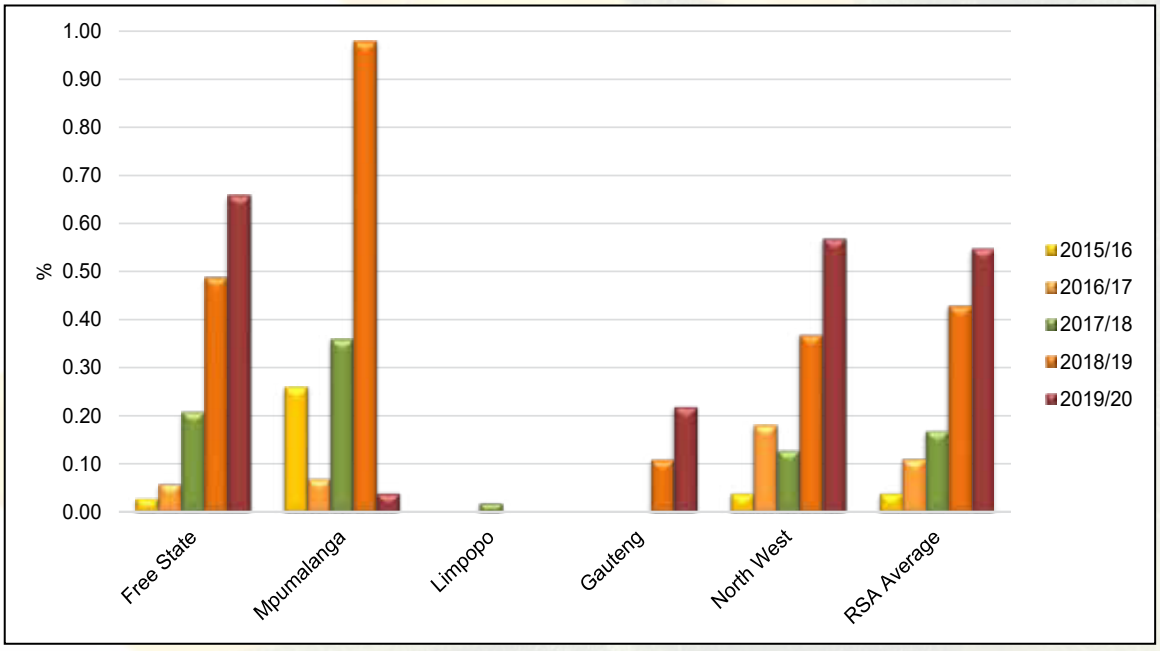
The highest weighted average percentage foreign matter (1.83%) was reported for the Free State provinces' regions. Gauteng and North West followed with 1.65% and 1.44% respectively. The lowest percentages were found in Mpumalanga with 0.70% and Limpopo with 0.72%. The South African average was 1.55% compared to the 1.28% and 1.16% of the previous two seasons. This season's average was also the highest reported since commencement of these crop surveys in the 2012/13 season. Please see Graph 17.

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



The number of samples received for this survey that contained sclerotia from the fungus *Sclerotinia sclerotiorum*, increased from 90 samples (51%) in the previous season, to 125 samples (71%) this season. 54% of these samples originated in the Free State province and 45% in North West. Single samples from Mpumalanga and Gauteng also reported sclerotia. Two samples (both from the Free State region) exceeded the maximum permissible deviation of 4%. Weighted average levels ranged from 0% in Limpopo to 0.57% in North West and 0.66% in the Free State. The national average of 0.55%, is the highest since the 0.53% of the 2013/14 season. Last season's average was 0.43%.

Graph 18: Average percentage sclerotia per province over five seasons

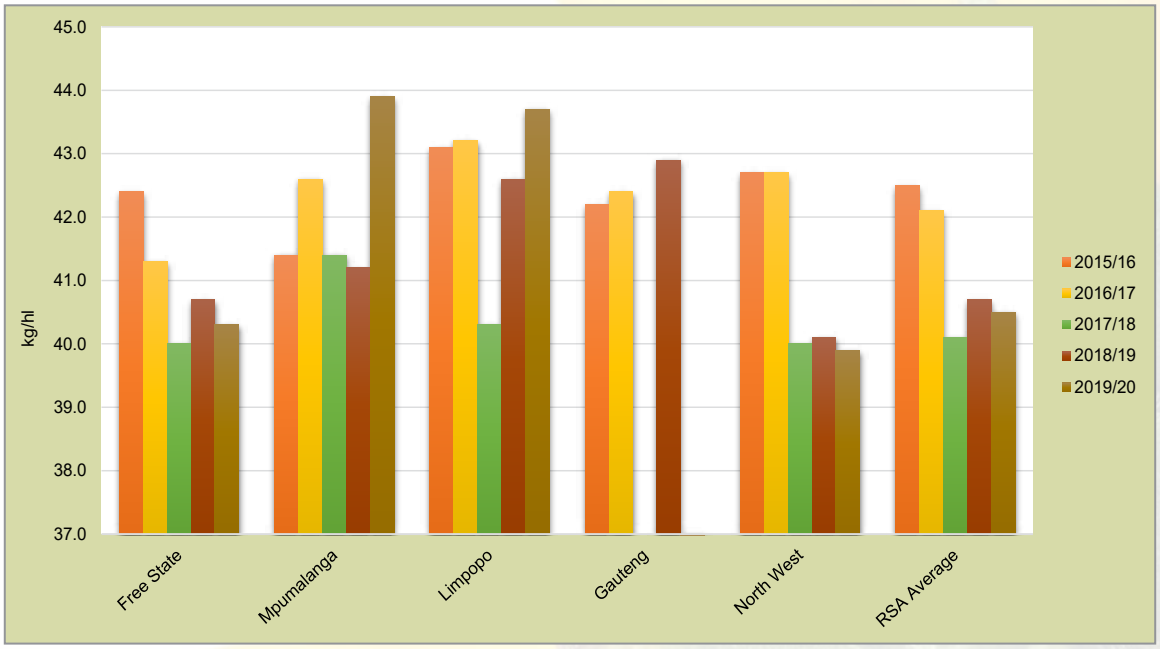


Test weight does not form part of the grading regulations for sunflower seed in South Africa. An approximation of the test weight of South African sunflower seed is provided in Table 3 for information purposes. The standard working procedure of the Kern 222 instrument, as described in ISO 7971-3:2019, 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								
	2019/20 Season			2018/19 Season			2017/18 Season		
	Weighted average	Range	No. of samples	Weighted average	Range	No. of samples	Weighted average	Range	No. of samples
Free State (Regions 21 - 28)	40.3	27.3 - 47.3	84	40.7	33.1 - 46.8	95	40.0	34.9 - 45.7	64
Mpumalanga (Regions 29 - 33)	43.9	43.7 - 44.0	6	41.2	39.8 - 42.8	8	41.4	35.0 - 42.2	8
Limpopo (Region 35)	43.7	38.7 - 47.4	13	42.6	37.8 - 45.4	12	40.3	38.5 - 43.1	5
Gauteng (Region 34)	34.2	-	1	42.9	42.5 - 43.6	3	-	-	-
North West (Region 12 - 20)	39.9	30.9 - 48.4	72	40.1	30.9 - 46.5	58	40.0	33.2 - 45.9	*98
RSA	***40.5***	***27.3 - 48.4***	***176***	***40.7***	***30.9 - 46.8***	***176***	***40.1***	***33.2 - 45.9***	***175***

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

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



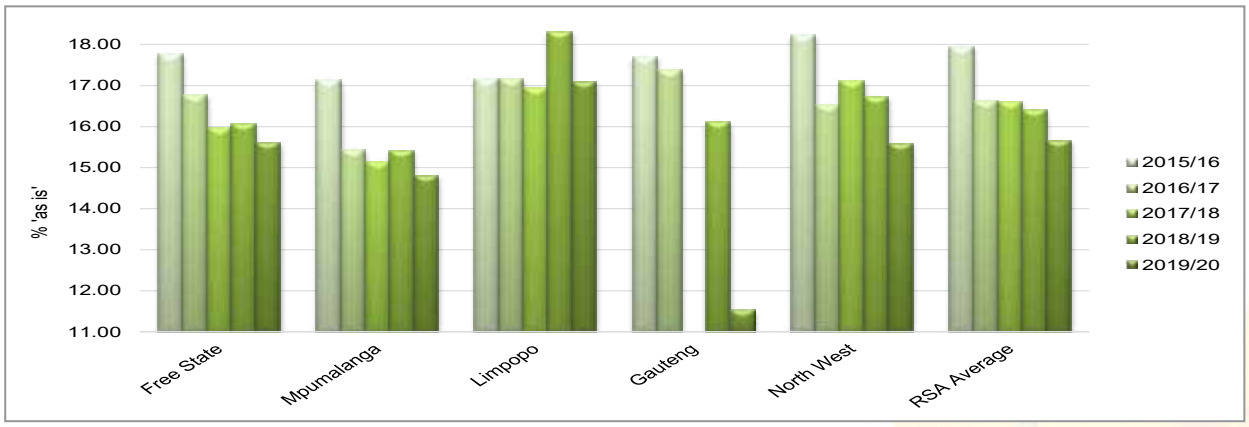
The nutritional component analyses, namely crude protein, -fat, -fibre and ash are reported as % (g/100 g) on an 'as received' or 'as is' basis.

The weighted average crude protein content this season was 15.66% and the lowest of the eight seasons for which crop survey results are available. The previous season's average was 16.40%. Limpopo had the highest weighted average crude protein content of 17.08%, followed by the Free State and North West with 15.61% and 15.58% respectively. Mpumalanga averaged 14.79%, while the single sample from Gauteng reported the lowest average of 11.54%. The weighted average crude fat percentage was 38.7%, the highest of the last five seasons and almost one percent higher than last season's 37.9%. Mpumalanga had the highest weighted average crude fat content of 39.7%, followed by North West with 39.2%. The lowest average fat content was the 35.6% of the sample from Gauteng.

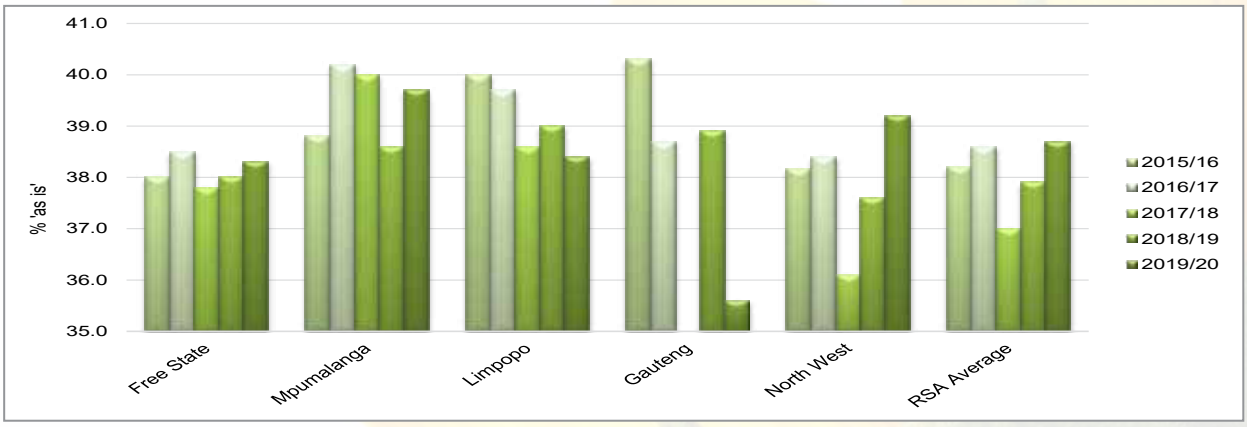
The weighted average percentage crude fibre was the second highest of the last eight seasons, equaling the 21.9% of the 2017/18 season. The highest average was reported in 2018/19, namely 22.4%. Average values varied between 20.1% in Limpopo to 25.4% in Gauteng. The weighted average ash content was 2.65%, slightly higher than the 2.60% of the previous season. The provincial averages ranged from 2.21% in Mpumalanga to 2.71% in Gauteng.

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

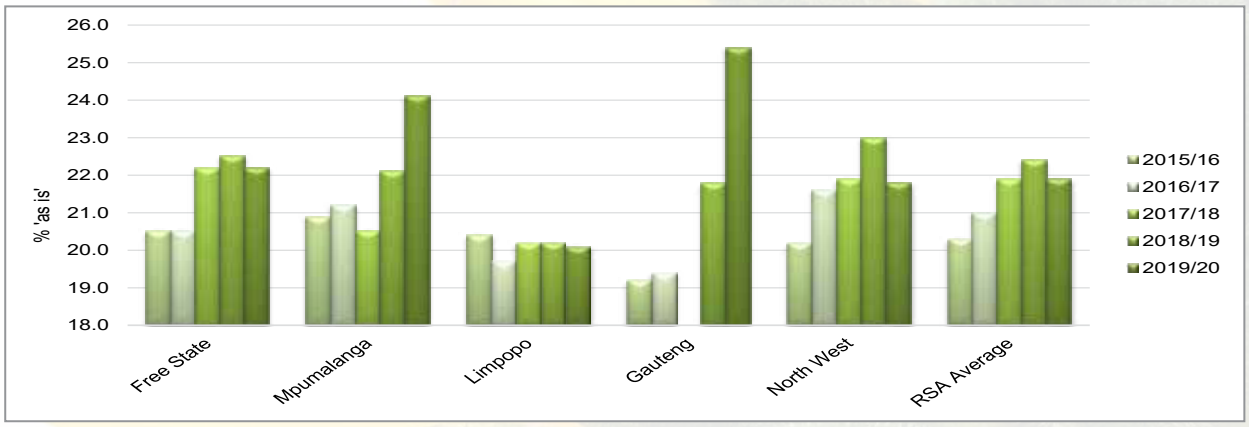
Graph 20: Average crude protein content per province over five seasons



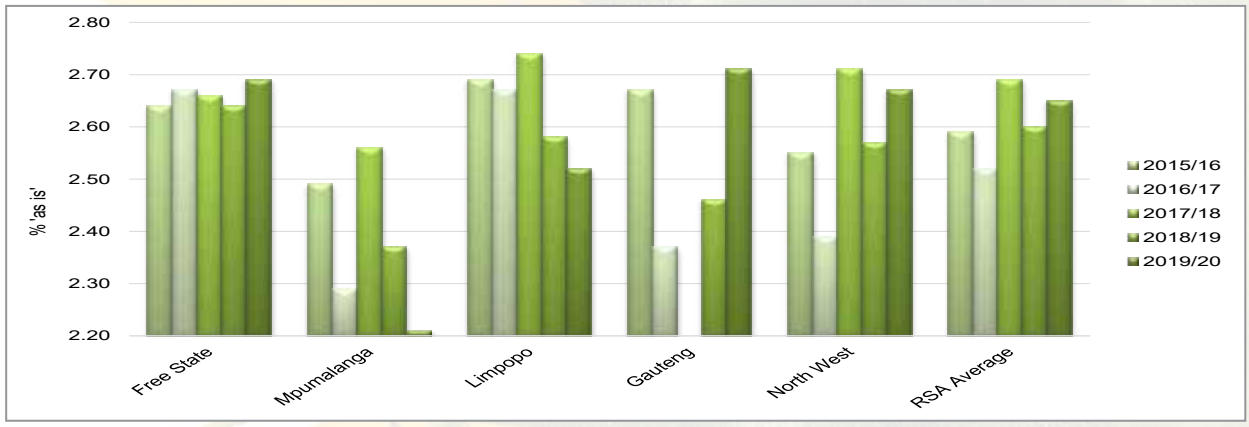
Graph 21: Average crude fat content per province over five seasons



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.

Table 4: Comparison between the moisture, crude protein and crude fat results of the sunflower crop quality and ARC cultivar trial samples of the 2019/20 season

Analysis	Moisture, % (17hr, 103°C)	Crude Protein, % (as is)	Crude Fat, % (as is)
Sunflower Crop Quality Survey results			
Average	4.8	15.66	38.7
Minimum	2.9	11.54	30.2
Maximum	7.5	19.84	47.0
Standard deviation	0.73	1.40	2.54
No. of samples	***176***	***176***	***176***
ARC Grains Crops Cultivar trial sample results			
Average	5.3	15.84	40.4
Minimum	3.2	11.44	25.6
Maximum	7.6	22.95	53.8
Standard deviation	0.88	2.42	7.22
No. of samples	***104***	***104***	***104***
% Difference between crop and cultivar samples	***-0.5***	***-0.18***	***-1.7***

See Table 5 on page 23 for a summary of the RSA Sunflower Crop Quality averages of the 2019/20 season compared to those of the 2018/19 season.

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