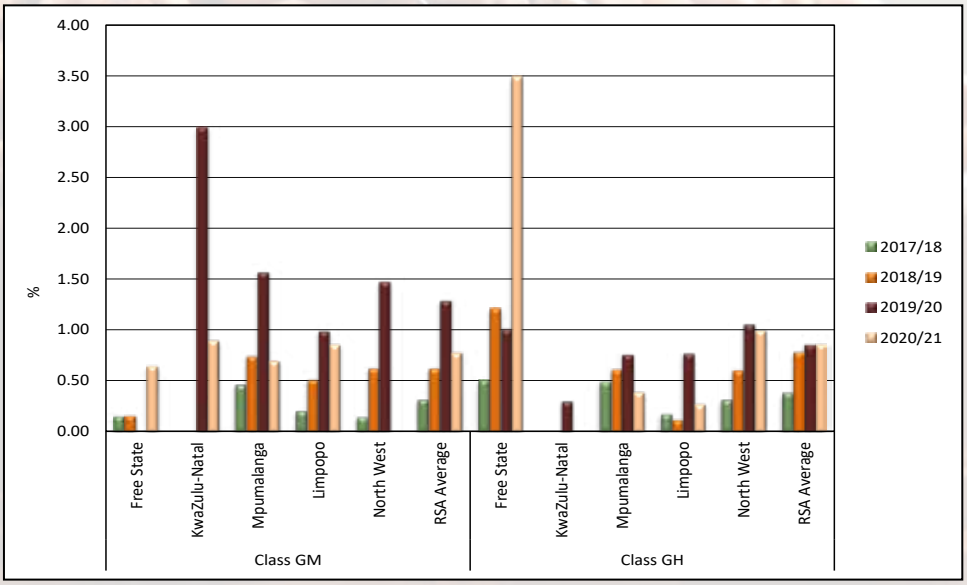
Seventy-three percent (30) of the 41 samples analysed for the purpose of this survey was determined to be class GM. Of these, 22 samples (73%) were graded as Grade GM1. Three samples each was graded GM2 and GM3 respectively and two samples were graded Class Other Sorghum (COS). Of the 11 samples determined to be class GH, 82% (9 samples) was graded GH1 and the remaining two samples were grade GH2 and Class Other respectively. No white sorghum samples were received this season for inclusion in the survey.

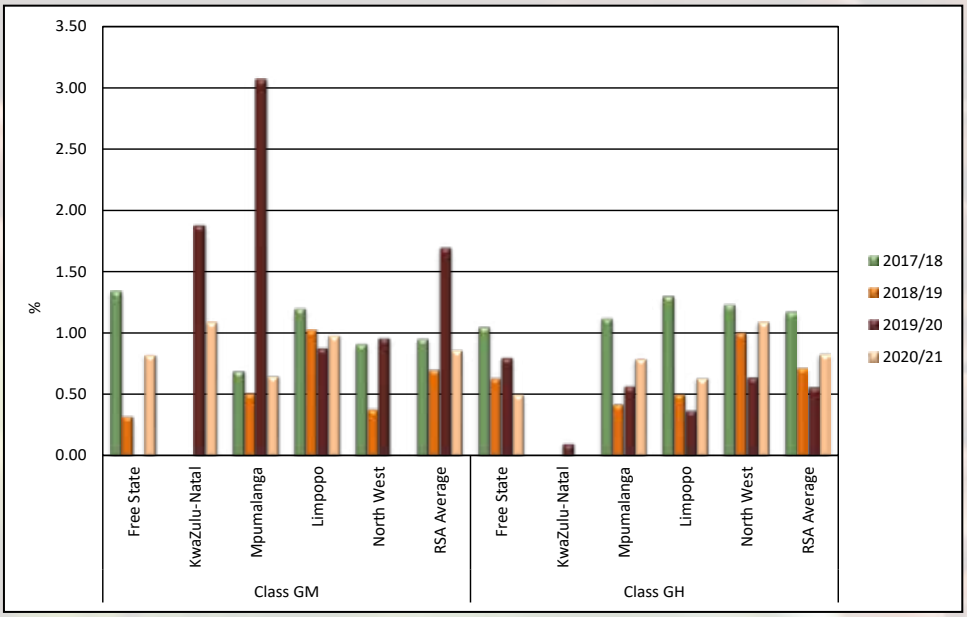
Please see Graphs 16 to 18 for the weighted average percentages foreign matter, defective sorghum and small kernel sorghum per class per province over four seasons. The two samples received from KwaZulu-Natal had the highest average percentage foreign matter (0.90%) for GM sorghum, while the single sample from the Free Sate showed the highest foreign matter percentage (3.50%) for GH sorghum. The national weighted averages were 0.78% and 0.86% for GM and GH sorghum respectively.

Graph 16: Average percentage foreign matter per class per province

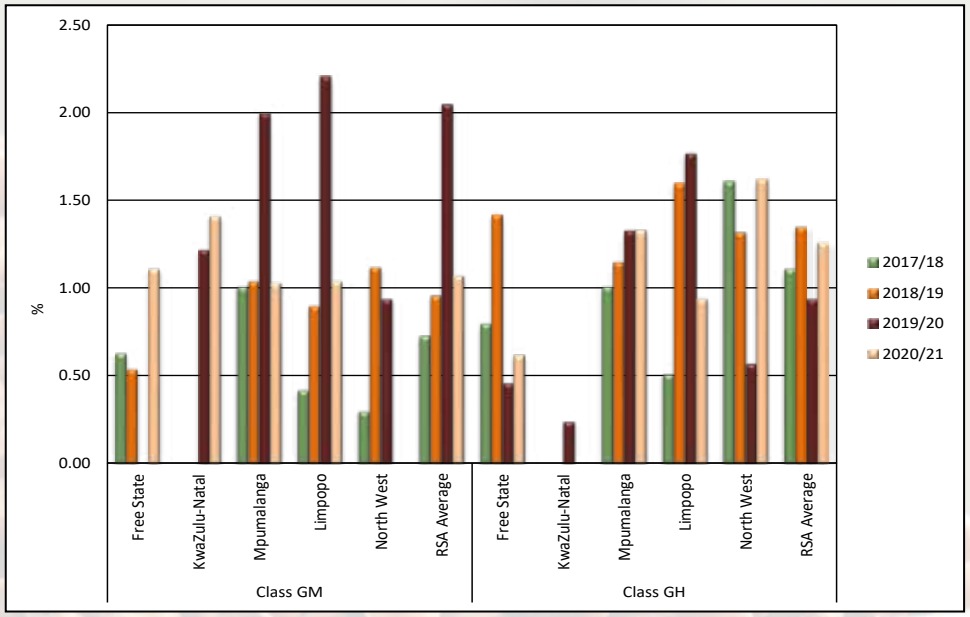


The percentage defective GM sorghum was the highest (1.09%) in KwaZulu-Natal, North West (4 samples) had the highest percentage defective GH sorghum, also 1.09%. The national averages were 0.86% for GM and 0.83% for GH. GH sorghum showed the highest percentage small kernels (national average 1.26%), with the samples from North West having the highest percentage namely 1.62% and the Free State sample the lowest with 0.62%. GM sorghum had the lowest percentages small kernels in Mpumalanga (10 samples) and Limpopo (14 samples) with 1.03% and 1.04% respectively, the weighted average for the class was 1.07%.

Graph 17: Average percentage defective sorghum per class per province



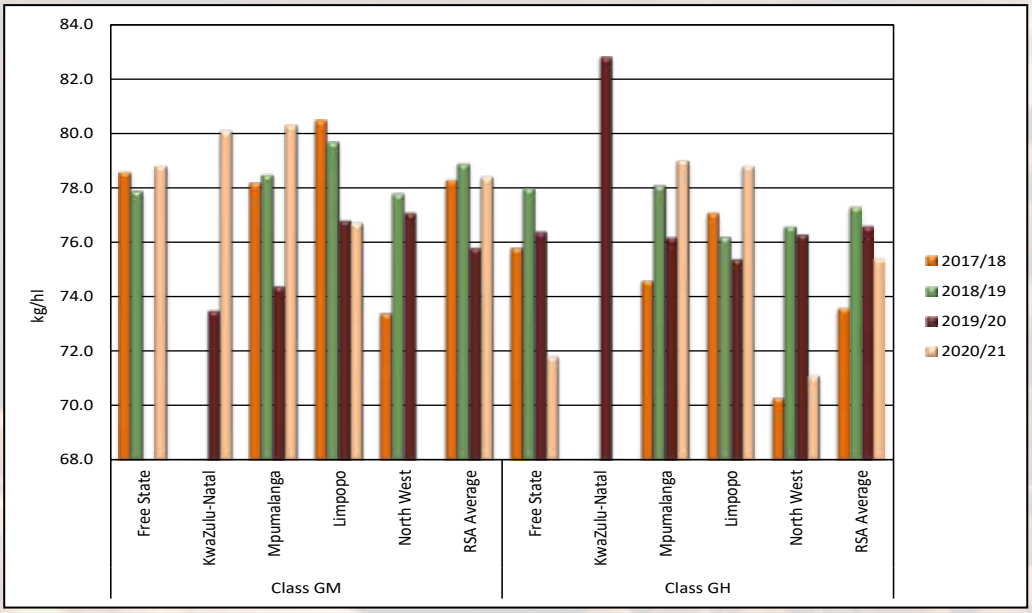
Graph 18: Average percentage small kernel sorghum per class per province



GM sorghum had the highest weighted average test weight, namely 78.4 kg/hl, while GH sorghum averaged 75.4 kg/hl. Please refer to Graph 19. Test weight values for GM sorghum ranged between 65.0 kg/hl and 83.4 kg/hl, with Mpumalanga reporting the highest average and Limpopo the lowest. GH values varied from 61.1 kg/hl to 79.6 kg/hl. Mpumalanga again reported the highest average with the lowest GH average reported in North West. Test weight was determined on unscreened samples.

GM sorghum also had the highest 1 000 kernel mass values, ranging between 20.1 and 31.8 g (14% moisture basis) and averaging 27.3 g. GH sorghum averaged just over 1 g lower at 26.2 g and varied between 22.0 and 28.8 g. Last season these averages were 23.5 g and 23.8 g respectively.

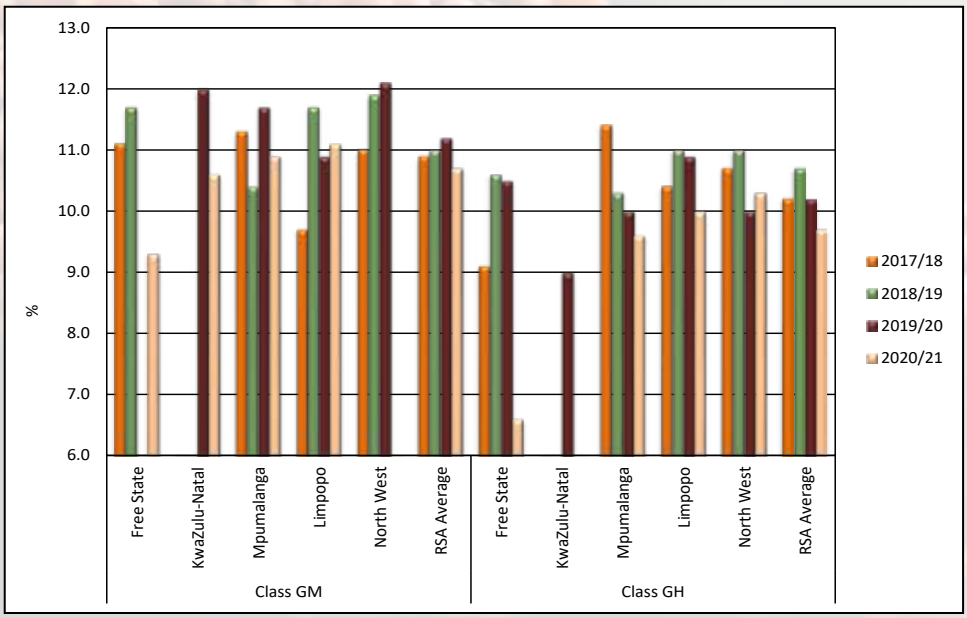
Graph 19: Average test weight per class per province



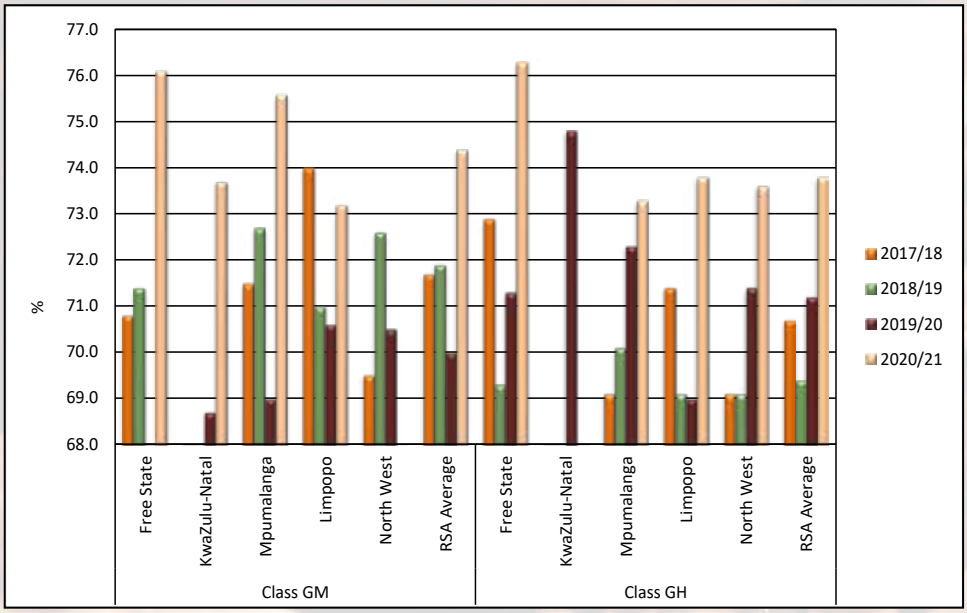
The image analysis results showed that the GM sorghum on average had longer kernels and also slightly wider kernels than the GH sorghum. The variation (indicated by the standard deviation) in these parameters is similar for both GM and GH sorghum. Kernel elongation, defined as W/L% (width divided by length, expressed as a percentage) showed a wider variation as the length and width parameters as can be expected, with average standard deviations of 5.0% for GM and 4.5% for GH sorghum. A totally round kernel will have a W/L% of 100. GM sorghum's volume to surface ratio was over the last four seasons on average 3% higher than that of GH sorghum.

The crude protein and total starch contents of the samples were calculated and reported on a dry basis. Limpopo had the highest protein average of 11.1% for GM sorghum, while the Free State averaged the lowest with 9.3%. North West had the highest average for GH sorghum with 10.3% and the Free State again averaged the lowest with 6.6%. Nationally, GM and GH sorghum averaged 10.7% and 9.7% respectively. The highest average total starch content for GM sorghum was reported in the Free State (76.1%) and the lowest (73.2%) in Limpopo. The highest average total starch content for GH sorghum, namely 76.3%, was reported in the Free State as with GM sorghum. The weighted total starch content of GM sorghum was 74.4% and that of GH sorghum 73.8%. In the 2019/20 season, these values were 70.0 % and 71.2% respectively. Please see Graphs 20 and 21.

Graph 20: Average percentage crude protein per class per province



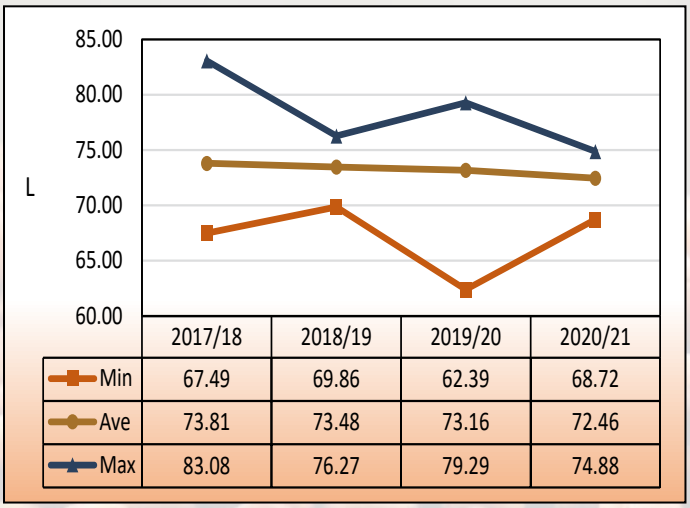
Graph 21: Average percentage total starch per class per province



Hunterlab colour determinations were done on a milled fraction of dehulled sample above the 1.8 mm slotted sieve. The Hunterlab spectrophotometer separates the components of reflected color into a three-dimensional colour scale, namely the Hunter L, a, b scale where L represents lightness (100 being white and 0 being black), a represents green to red variation and b represents variation from blue to yellow.

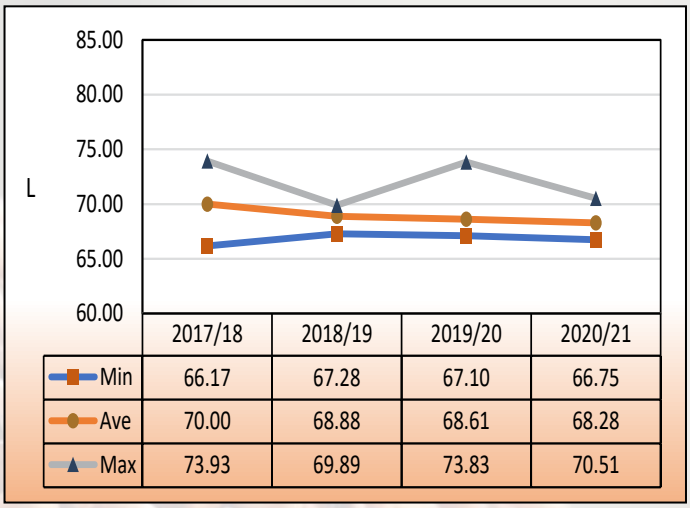
Please see Graphs 22 to 27 for a comparison of the ranges in the L, a, b values obtained on GM and GH sorghum over four seasons. The minimum and maximum values are based on a single composite sample's result in a specific season.

Graph 22: Range of Hunterlab L values on GM sorghum over four seasons



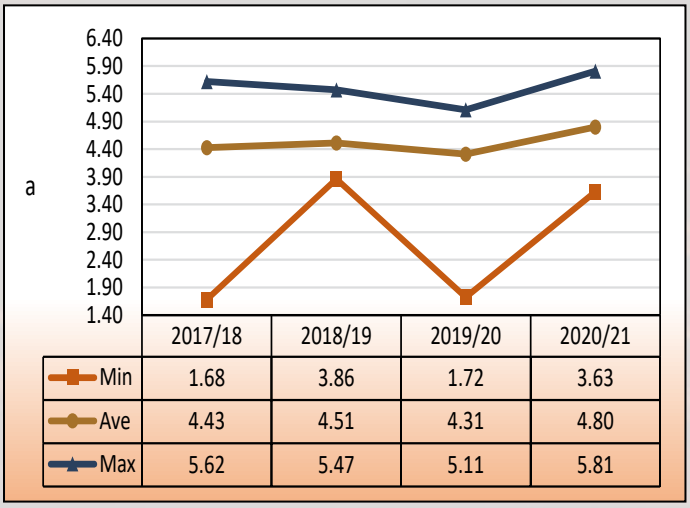
	2017/18	2018/19	2019/20	2020/21
Min	67.49	69.86	62.39	68.72
Ave	73.81	73.48	73.16	72.46
Max	83.08	76.27	79.29	74.88

Graph 23: Range of Hunterlab L values on GH sorghum over four seasons



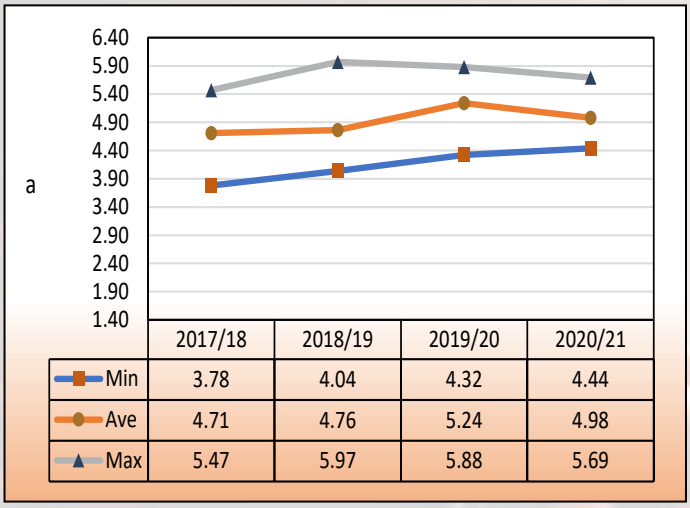
	2017/18	2018/19	2019/20	2020/21
Min	66.17	67.28	67.10	66.75
Ave	70.00	68.88	68.61	68.28
Max	73.93	69.89	73.83	70.51

Graph 24: Range of Hunterlab a values on GM sorghum over four seasons



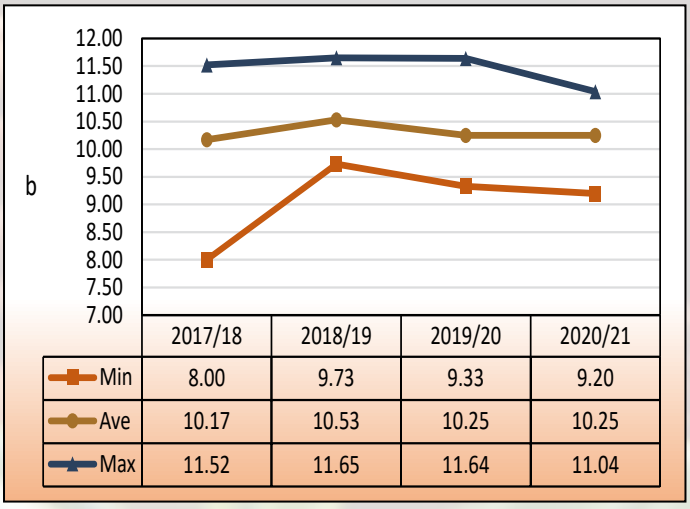
	2017/18	2018/19	2019/20	2020/21
Min	1.68	3.86	1.72	3.63
Ave	4.43	4.51	4.31	4.80
Max	5.62	5.47	5.11	5.81

Graph 25: Range of Hunterlab a values on GH sorghum over four seasons



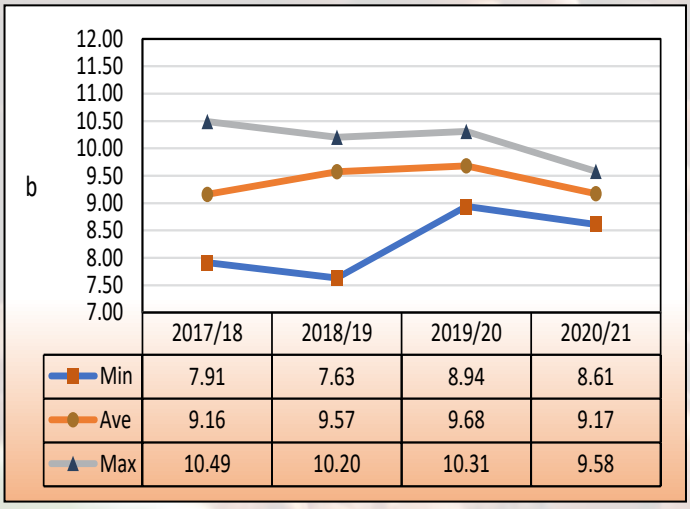
	2017/18	2018/19	2019/20	2020/21
Min	3.78	4.04	4.32	4.44
Ave	4.71	4.76	5.24	4.98
Max	5.47	5.97	5.88	5.69

Graph 26: Range of Hunterlab b values on GM sorghum over four seasons



	2017/18	2018/19	2019/20	2020/21
Min	8.00	9.73	9.33	9.20
Ave	10.17	10.53	10.25	10.25
Max	11.52	11.65	11.64	11.04

Graph 27: Range of Hunterlab b values on GH sorghum over four seasons



	2017/18	2018/19	2019/20	2020/21
Min	7.91	7.63	8.94	8.61
Ave	9.16	9.57	9.68	9.17
Max	10.49	10.20	10.31	9.58

Although there are currently no acceptable ranges for these parameters defined, the colour must be within the consumer-acceptable range, which traditionally are products with a slightly pink hue. Not only the dehulling process, but also other traits such as pigmentation differences determine the end product colour.

Mycotoxin analyses were performed on all 41 sorghum crop samples. The samples were tested by means of a SANAS ISO/IEC 17025 accredited multi-mycotoxin method using UPLC-MS/MS. With this technique simultaneous quantification and confirmation of Aflatoxin B_1; B_2; G_1; G_2, Fumonisin B_1; B_2; B_3, Deoxynivalenol, 15-ADON, HT-2 Toxin, T-2 Toxin, Zearalenone and Ochratoxin A is possible in one run.

None of the samples tested positive for any of these mycotoxins as in the 2017/18 and 2019/20 seasons. Fumonisin, Deoxynivalenol (DON) and Zearalenone residues were found on some samples of the 2018/19 season. None of the levels however raised any concerns.

Please see mycotoxin results in Table 10 on pages 29 and 30.

The Methods section of this report on pages 31 and 32 provide a description of the procedures and methodologies followed.