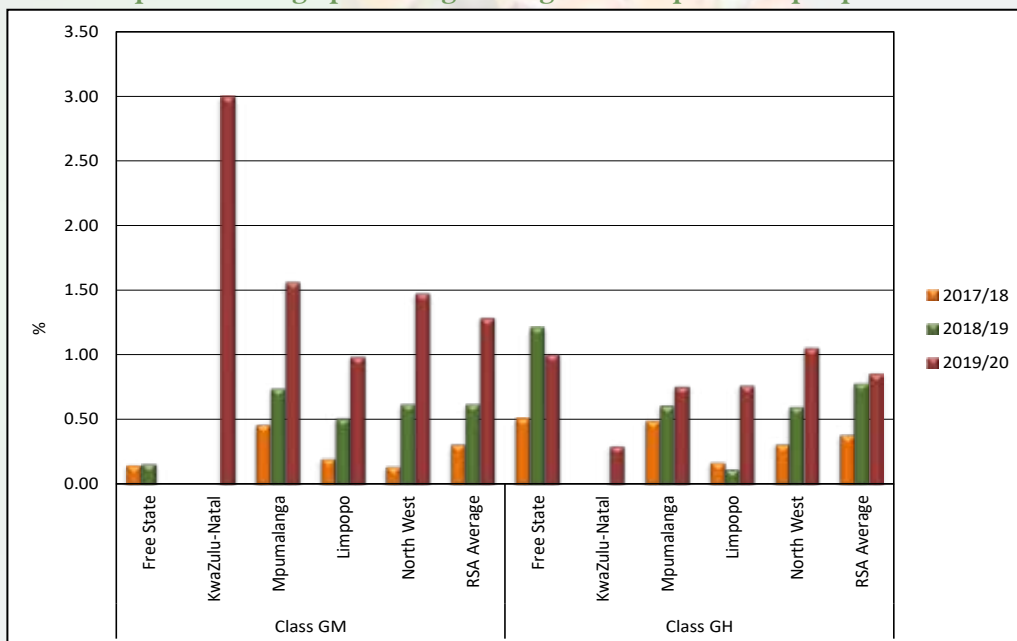


Sorghum Crop Quality 2019/20 – Summary of results

Seventy percent (28) of the 40 samples analysed for the purpose of this survey was determined to be class GM. Of these, 12 samples (43%) were graded as Grade GM1, with the same percentage graded GM3. Two samples each was graded GM2 and Class Other Sorghum (COS). Of the 12 samples determined to be class GH, 83% (10) was graded GH1 and the remaining two samples were grade GH2. Five GM samples from Limpopo included in this survey were white sorghum samples.

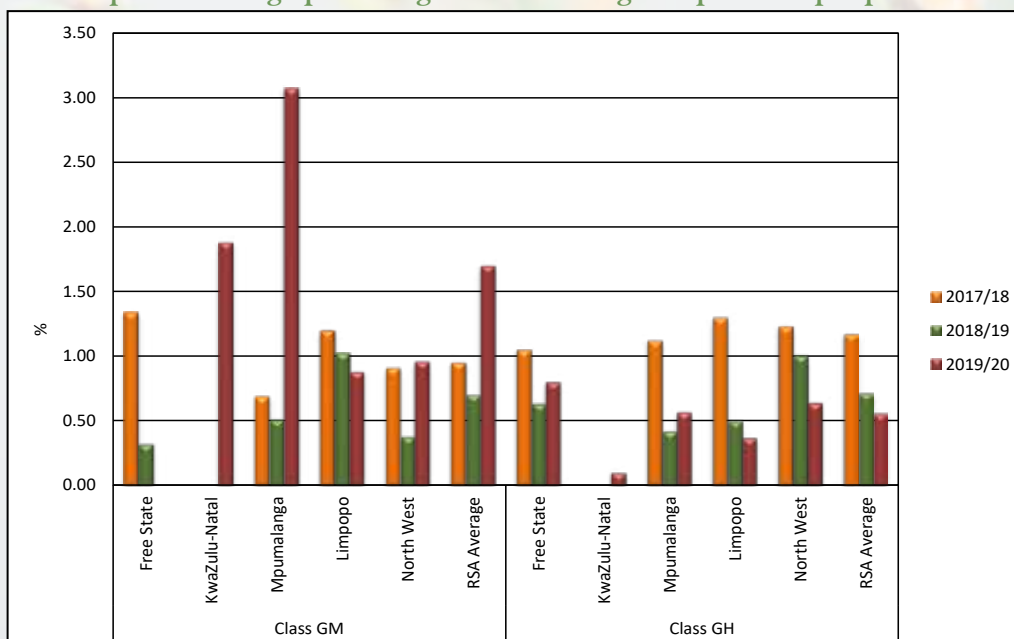
Please see Graphs 16 to 18 for the weighted average percentages foreign matter, defective sorghum and small kernel sorghum per class per province over three seasons. The single sample received from KwaZulu-Natal had the highest percentage foreign matter (3%) for GM sorghum, while North West (3 samples) showed the highest foreign matter percentage (1.06%) for GH sorghum. The national weighted averages were 1.29% and 0.86% for GM and GH sorghum respectively.

Graph 16: Average percentage foreign matter per class per province

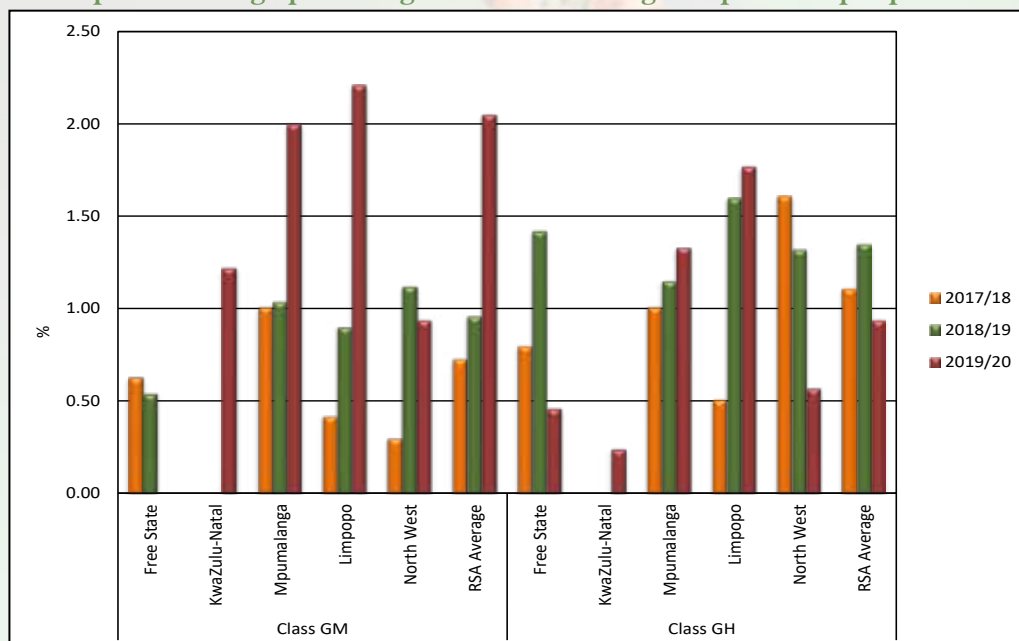


The percentage defective GM sorghum was the highest (3.07%) in the 10 samples from Mpumalanga, the Free State (3 samples) had the highest percentage defective GH sorghum (0.80%). The national averages were 1.70% for GM and 0.56% for GH. In contrast to the previous two seasons, GM sorghum showed the highest percentages small kernels (national average 2.05%), with the samples from Limpopo (N = 16) having the highest percentage namely 2.21%. GH sorghum had the lowest percentage small kernels on the sample from KwaZulu-Natal (0.24%) and averaged 0.94%.

Graph 17: Average percentage defective sorghum per class per province

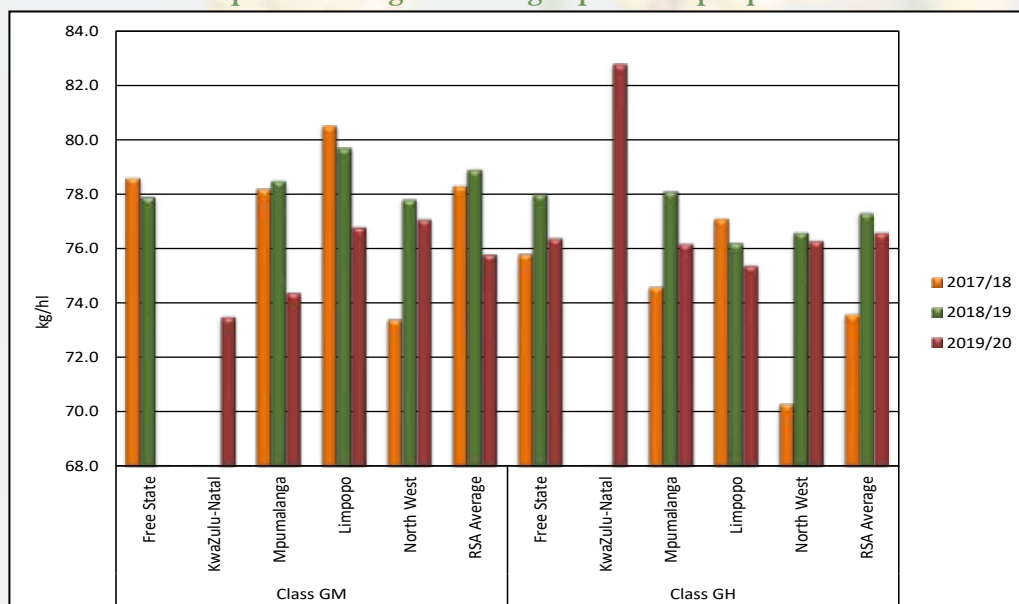


Graph 18: Average percentage small kernel sorghum per class per province



Also in contrast to the previous season, GH sorghum had the highest weighted average test weight, namely 76.6 kg/hl, while GM sorghum averaged 75.8 kg/hl. Please refer to Graph 19. Test weight values for GH sorghum ranged between 72.0 kg/hl and 82.2 kg/hl, GM values varied from 49.1 kg/hl to 80.8 kg/hl. If the 49.1 kg/hl on a sample from Mpumalanga is omitted from the calculations as an outlier, the average hectolitre mass of GM sorghum becomes 76.8 kg/hl and the range 69.2 kg/hl to 80.8 kg/hl. Test weight was determined on unscreened samples.

Graph 19: Average test weight per class per province

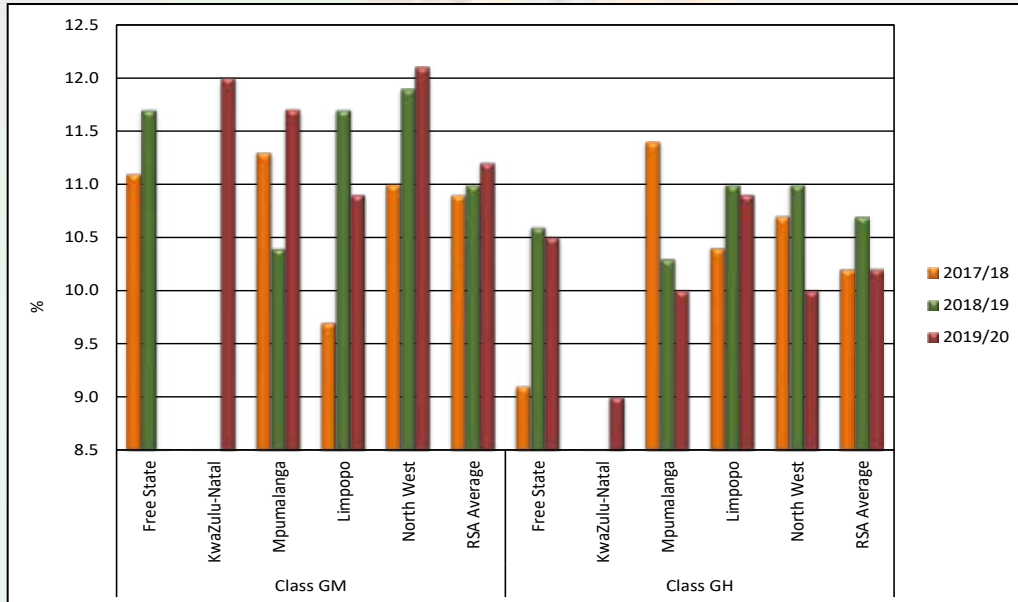


GH sorghum also had the highest 1 000 kernel mass values, ranging between 18.5 and 27.5 g (14% moisture basis) and averaging 23.8 g. GM sorghum averaged slightly lower at 23.5 g and varied between 19.0 and 31.5 g.

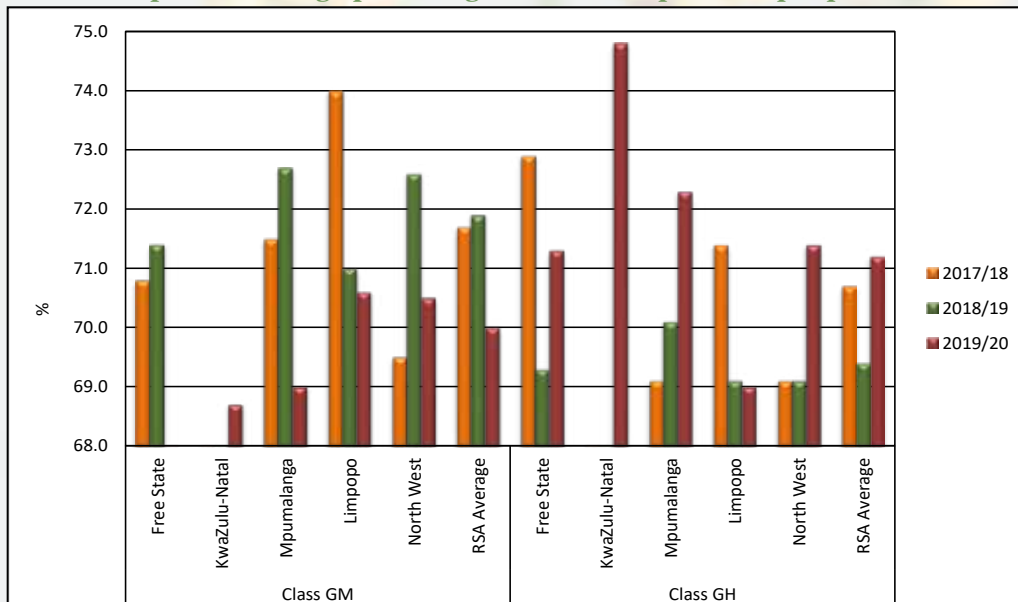
The image analysis results showed that the GM sorghum on average had longer kernels, but the GH sorghum's kernels were slightly wider. The variation (indicated by the standard deviation) in these parameters is similar for both GM and GH sorghum. Kernel roundness, defined as W/L% (width divided by length, expressed as a percentage) showed a wider variation as can be expected, with a standard deviation of 5.8% for GM and 5.1% for GH sorghum. A totally round kernel will have a W/L% of 100.

The crude protein and total starch contents of the samples were calculated and reported on a dry basis. North West had the highest protein average of 12.1% for GM sorghum, while Limpopo averaged the lowest with 10.9%. Limpopo again averaging 10.9% was however now the highest average for GH sorghum, the sample from KwaZulu-Natal averaged the lowest at 9.0%. Nationally, GM and GH sorghum averaged 11.2% and 10.2% respectively. The highest total starch content for GM sorghum was reported in Limpopo (70.6%), followed closely by North West with 70.5%. The highest total starch content for GH sorghum, namely 74.8%, was reported on the KwaZulu-Natal sample. The weighted total starch content of GM sorghum was 70.0% and that of GH sorghum 71.2%. 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. Please see a summary of the Hunter L a b values obtained below, the average and range (in brackets) are provided. For comparison purposes the values obtained in the 2018/19 and 2017/18 seasons are also included.

2019/20 season GM sorghum: L 73.16 (62.39 – 79.29), a 4.31 (1.72 – 5.11) and b 10.25 (9.33 – 11.64)

2019/20 season GH sorghum: L 68.61 (67.10 – 73.83), a 5.24 (4.32 – 5.88) and b 9.68 (8.94 – 10.31)

2018/19 season GM sorghum: L 73.48 (69.86 – 76.27), a 4.51 (3.86 – 5.47) and b 10.53 (9.73 – 11.65)

2018/19 season GH sorghum: L 68.88 (67.28 – 69.89), a 4.76 (4.04 – 5.97) and b 9.57 (7.63 – 10.20)

2017/18 season GM sorghum: L 73.81 (67.49 – 83.08), a 4.43 (1.68 – 5.62) and b 10.17 (8.00 – 11.52)
2017/18 season GH sorghum: L 70.00 (66.17 – 73.93), a 4.71 (3.78 – 5.47) and b 9.16 (7.91 – 10.49)

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 40 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 B₁; B₂; G₁; G₂, Fumonisin B₁; B₂; B₃, Deoxynivalenol, 15-ADON, HT-2 Toxin, T-2 Toxin, Zearalenone and Ochratoxin A is possible in one run.

As in the 2017/18 season, none of the samples tested positive for any of these mycotoxins. Last season, Fumonisin, Deoxynivalenol (DON) and Zearalenone residues were found on some of the samples. None of the levels however raised any concerns.

Please see mycotoxin results in Table 10 on pages 28 and 29.

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

