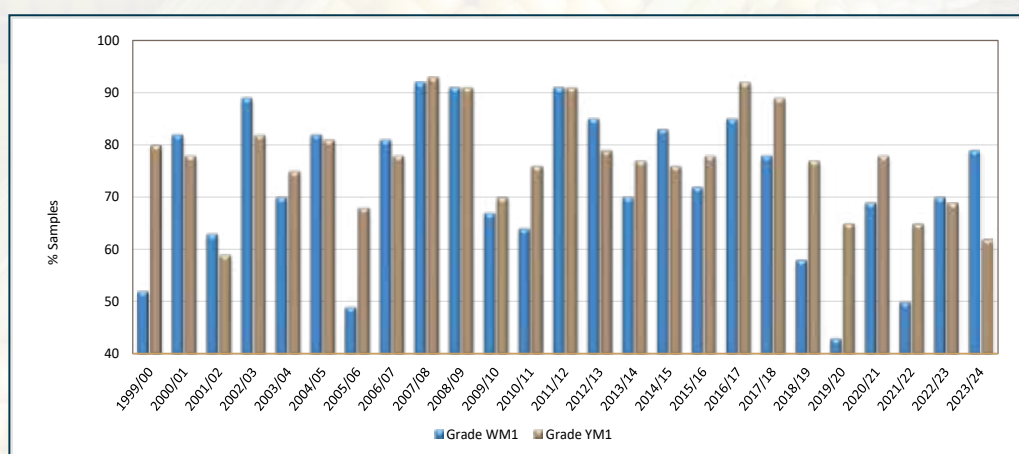


Maize Crop Quality 2023/24 - summary of results

RSA Grading

The latest maize grading regulations were published in Government Notices No. R. 4368 of 16 February 2024 and No. R. 4433 of 1 March 2024. This is the first maize crop survey where samples were graded according to these regulations.

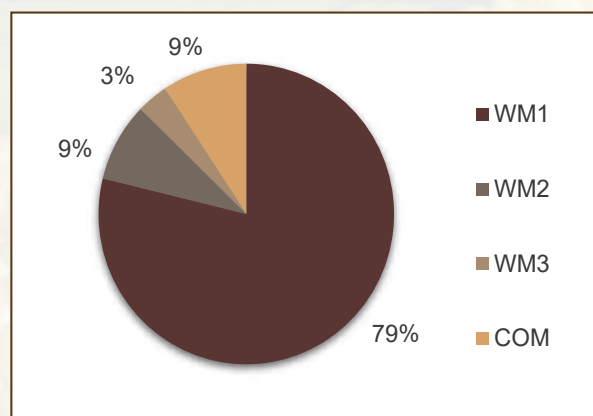
79% of white maize samples received for the purpose of the crop quality survey were graded as maize grade one, last season this figure was 70%. 62% of yellow maize samples received and graded were graded as grade one, compared to 69% the previous season. Please see Graph 33 for the percentages of samples (white and yellow) per season graded as grade 1, since commencement of the annual maize crop quality survey in 1998.



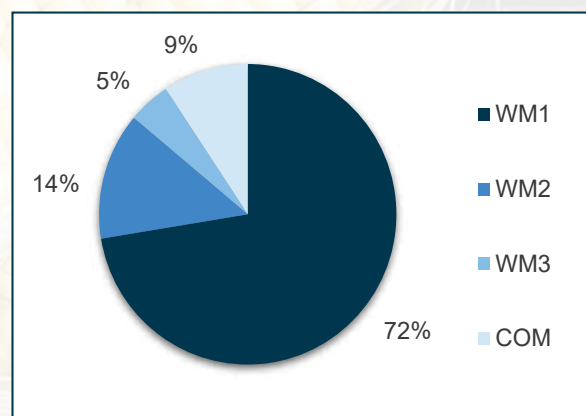
Graph 33: Percentage samples graded as Grade 1 over seasons

For comparison purposes, the samples were also graded according to the previous grading regulations as published in Government Notice No. R.473 of 8 May 2009. The percentages of samples per Class and grade according to the current as well as the previous grading regulations were determined. Please refer to Graphs 34 and 35 for the percentages of samples per Class and grade of white maize according to the current and previous grading regulations respectively. No differences in the percentages were observed for yellow maize.

The percentage total defective kernels above (larger than) and below (smaller than) the 6.35 mm sieve, 3.5% for white and 5.0% for yellow maize, is respectively 1.6% and 0.1% lower than the previous season. Defective white maize kernels above the 6.35 mm sieve decreased by 2.2% to 1.1% and yellow maize decreased by 1.2% to 1.6%. The percentage defective kernels below the 6.35 mm sieve for white maize increased from 1.7% to 2.3% while yellow maize increased from 2.3% to 3.3%.



Graph 34: White maize - Percentage of samples per Class and grade according to the current grading regulations



Graph 35: White maize - Percentage of samples per Class and grade according to the previous grading regulations

The average percentage Diplodia infected kernels in white and yellow maize was 0.2% and 0.3% respectively this season, the previous season's averages were 0.8% and 1.4% respectively. Fusarium infected white maize kernels were 0.7% compared to the 0.4% of 2022/23 and that of yellow maize 1.2% compared to 0.5% previously.

The percentage white maize samples downgraded to Class Other maize as a result of the percentage foreign matter exceeding 0.75%, was 4% (23 samples) and that of yellow maize 7% (35 samples). One white maize sample was downgraded due to other colour maize exceeding the 10% maximum permissible deviation for grade 3 white maize. The average percentage combined deviations of white maize was 3.8% compared to the 5.5% of the 2022/23 season and that of yellow maize 5.3% compared to 5.4% previously.

Please refer to Tables 5 to 9 and Graphs 36 to 38 on pages 40 to 53.

USA Grading

Of the 1 000 maize samples graded according to USA grading regulations, 59% was graded US1, 25% US2, 8% US3, 3% US4, 1% US5, 3% Sample grade and 1% Mixed grade. The percentage samples graded as US1 varies substantially over seasons, varying from 59% to 27%, 62%, 30% and 41% over the previous five seasons. The percentage samples graded as US2 compared well with the 23% of the previous season as did the percentages for Grades 3, 4, 5 and sample grade. The main reason for downgrading the samples was (as in previous seasons) the percentage total damaged kernels exceeding the maximum limit per grade, followed by broken corn and foreign material. Please see Tables 10 and 11 on pages 54 to 59.

Physical Quality characteristics

Bushel weight/Test weight is applied as a grading factor in the USA grading regulations and is also routinely done at most intake points locally for stock verification purposes. White maize had an average test weight of 76.2 kg/hl compared to the 75.7 kg/hl of yellow maize. The average test weights of white and yellow maize were respectively 0.1 kg/hl and 0.7 kg/hl lower than in the previous season. The test weight in total varied from 66.8 kg/hl to 81.5 kg/hl.

Of the 56 samples (5.6%) that reported Bushel weight values below the minimum requirement (56.0 lbs or 72.1 kg/hl) for USA grade 1 maize, four originated in the Eastern Cape, seven were from the North West production regions, 15 from the Free State, 24 from Mpumalanga and six from Gauteng. In the previous season, 2.1% of the samples were below the minimum requirement.

The 100 kernel mass ("as is" basis) of white maize was 31.4 g (35.3 g in 2022/23) and averaged higher than yellow maize's 28.7 g (last season 31.6 g). This trend is also observed in previous seasons. The percentage white maize kernels above the 10 mm sieve (18.8%) decreased by 5.7% compared to the previous season. The percentage yellow maize kernels above the 10 mm sieve (5.8%) was 1.2% lower than last season. The percentage yellow maize kernels above the 10 mm sieve was on average 13% lower than white kernels and the percentage yellow kernels below the 8 mm sieve 18.3% higher than that of white maize. Overall, yellow maize kernels remain smaller than white maize kernels as observed over time.

The percentages maize below the 6.35 mm and 4.75 mm sieves provides an indication of the breakage susceptibility. Both white and yellow maize were slightly less susceptible to breakage than during the previous season. The percentage stress cracks observed varied overall from 0 to 42% and averaged 4%. White maize also averaged 4% and yellow maize 5%, the previous season both averaged 8%.

Refer to Tables 14 to 18 on pages 61 to 71 and Graphs 39 to 42 on pages 71 and 72.

The milling index obtained from the SAGL Milling Index 2024 model, varied from an average of 73 (71 in 2022/23) for white maize to an average of 76 (72 in 2022/23) for yellow maize. Grit Yield (GYA) values averaged 63 for white and 64 for yellow maize, both averaged 63 in the previous season. The development of the new model for Milling Index was commenced in the 2012/13 season. Please refer to pages 117 and 118, Milling Index, in the Methods section of the report.

Roff milling and whiteness index (WI)

Half (50%) of the white maize samples were milled on the Roff laboratory mill this season. The average % extraction of total meal in white maize obtained with the Roff mill, averaged 75.5% (1.4% lower than the previous season) and varied from 61.4% to 80.5%. Please see Graphs 43 to 48 on page 77 for a comparison of the different fractions' percentages as well as the percentage total meal extraction obtained on the Roff mill since 2014/15.

The whiteness index averaged 40.4 for unsifted and 38.4 for sifted maize meal. Sieving the sample eliminates differences in the readings as a result of particle size. The whiteness index of the previous season averaged 40.4 and 36.8 for unsifted and sifted maize meal respectively.

The higher the WI value, the whiter the meal sample. The main contributing factors causing differences in WI values are the presence of other colour maize like yellow maize, the presence of defective kernels, the type of cultivar as well as the soil composition. Please see Tables 19 and 20 on pages 73 to 76.

Bühler MCKA milling and whiteness index (WI)

This was the first season that white maize was milled on the Bühler MCKA maize mill. Prior to milling, the samples were degermed using the Grainman degerminator. All 518 white maize samples were milled on the Bühler MCKA mill. The average % extraction of all meal fractions was 78.3% and ranged from 67.5% to 92.5%.

The whiteness index of the flour obtained from the MCKA mill averaged 19.2 for unsifted and 17.5 for sifted maize meal. The difference in whiteness index results between the two mills can be ascribed to particle size differences, with the Bühler MCKA mill producing meal with larger particle sizes than the Roff mill. Please see Tables 21 and 22 on pages 78 to 83.

Nutritional Values

The average fat content of both white and yellow maize was 3.9% this season. Both also averaged 4.0% the previous season as well as 4.0% for the 10-year average.

The average starch contents of both white (74.3%) and yellow (73.5%) maize were lower than in the previous season (decreasing by 0.8% and 0.4% respectively). Ten-year averages for white and yellow maize are 74.1% and 73.3% respectively.

The average crude fibre content of white and yellow maize was both 2.2% this season. White maize averaged 2.1% last season and yellow maize 2.2%.

The fat, starch, protein and crude fibre nutritional components are reported as % (g/100 g) on a dry base.

Please refer to Tables 23 to 26 on pages 84 to 91 and Graphs 49 to 52 on page 92.

Mycotoxins

A discussion of the mycotoxin results obtained per region over the last 14 seasons, are provided on pages 93 to 112.

A table with the limit of quantification (LOQ) for each of the mycotoxins analysed is provided on page 119 under Methods.

See also pages 113 and 114 for the National Mycotoxin Regulations.