

Maize Crop Quality 2024/25 - summary of results

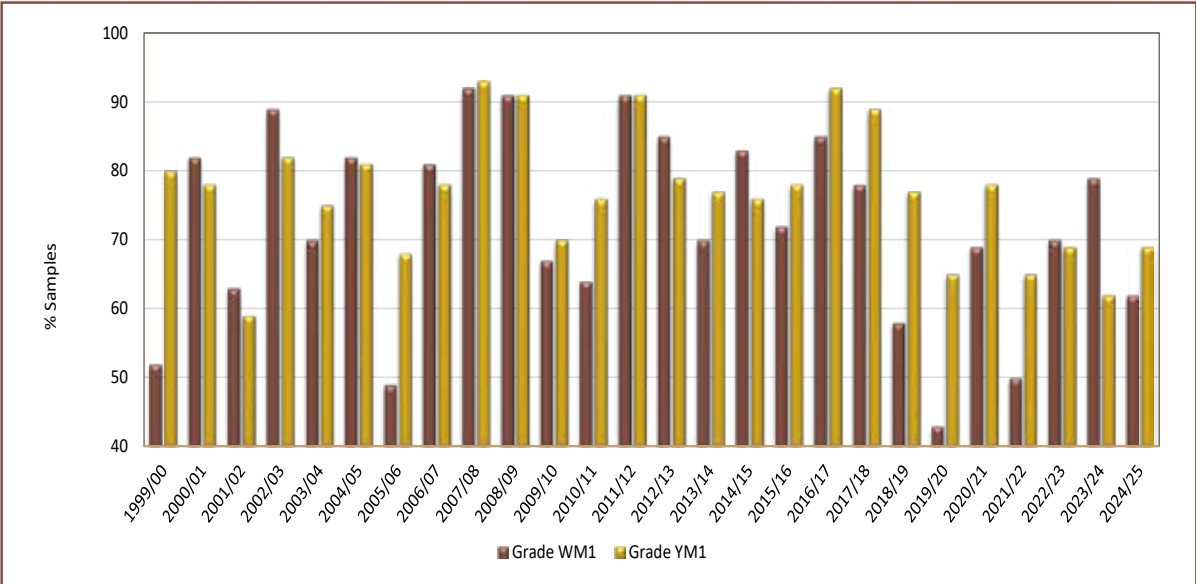
The weighted average quality results per class and grade per colour are summarised in Table 3 on page 28.

Table 4 on page 29 provides a comparison of the weighted average results of the main maize producing provinces, namely the Free State, Mpumalanga and North West during the 2024/25 production season.

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 second annual maize crop survey where samples were graded according to these regulations.

62% of white maize samples received for the purpose of the crop quality survey were graded as maize grade one (WM1), last season this figure was 79%. 69% of yellow maize samples received and graded were graded as grade one (YM1), compared to 62% the previous season. Graph 33 provides an overview of the percentages of maize graded as WM1 and YM1, since commencement of the annual maize crop quality survey in 1998.

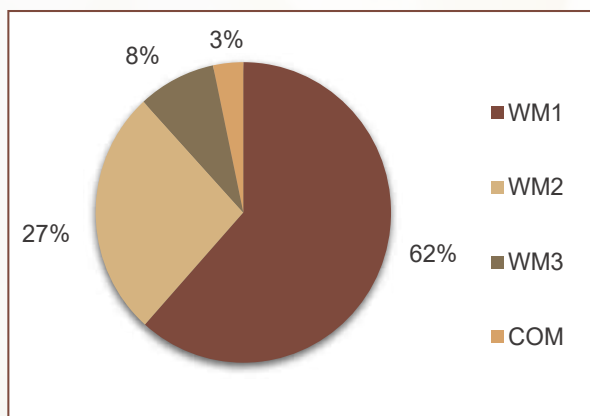


Graph 33: Percentage samples graded as Grade 1 over seasons

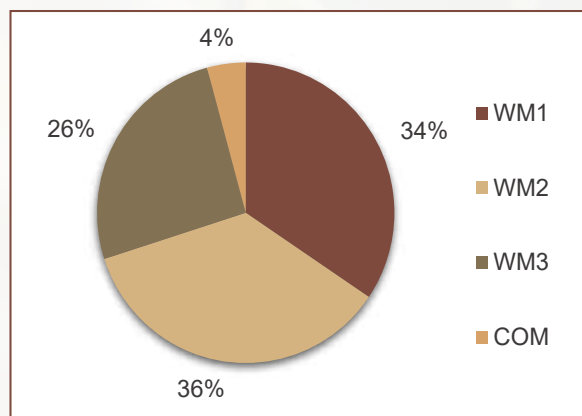
For comparison purposes, the samples were also graded according to the previous grading regulations as published in Government Notice No. R.473 of 8 May 2009. The percentages of samples per Class and grade according to the current as well as the previous grading regulations were determined. Please refer to Graphs 34 and 35 for the percentages of samples per Class and grade white maize as well as Graphs 36 and 37 for the percentages of samples per Class and grade yellow maize.

The average percentage total defective white maize kernels above (larger than) and below (smaller than) the 6.35 mm sieve increased by 2.5% to 6.0% compared to the previous season. The percentage defective kernels above the sieve increased by 3.4% on average, while the percentage defective kernels below the sieve decreased by 0.8%.

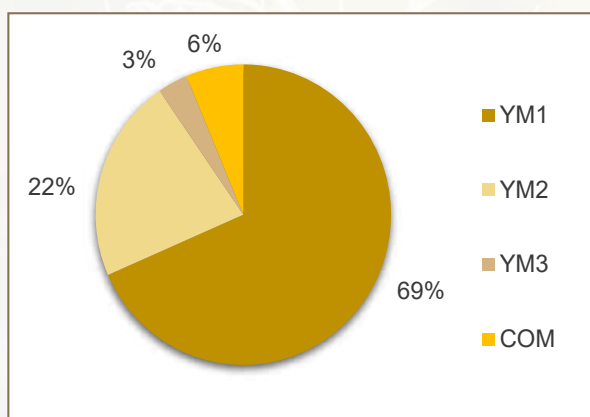
The average percentage total defective yellow maize kernels above the 6.35 mm sieve increased by 3.1% to 4.7%. Defective yellow kernels below the 6.35 mm sieve, decreased by 2.2% to 2.1%.



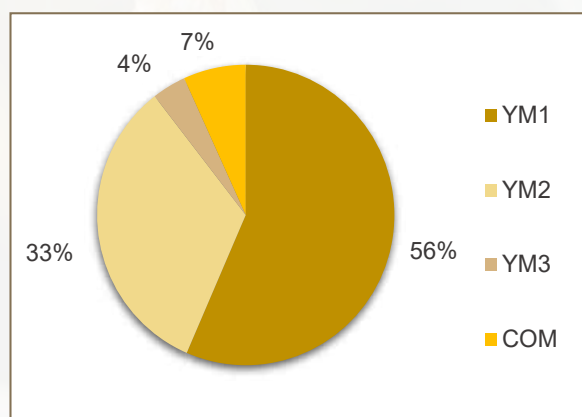
Graph 34: White maize - Percentage of samples per Class and grade according to the current grading regulations



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



Graph 36: Yellow maize - Percentage of samples per Class and grade according to the current grading regulations



Graph 37: Yellow maize - Percentage of samples per Class and grade according to the previous grading regulations

The average percentage Diplodia infected kernels this season was 1.5% in the white and 1.7% in the yellow maize samples. The previous season's averages were 0.2% and 0.3% respectively. Visual Fusarium infection on white maize kernels increased from 0.7% to 2.5% and in yellow maize from 1.2% to 2.6%.

The percentage white maize samples downgraded to Class Other maize due to foreign matter exceeding 0.75%, was 3% (13 samples) and that of yellow maize 4% (19 samples). None of the white maize samples were downgraded to class other due to other colour maize exceeding the 10% maximum permissible deviation for grade 3 white maize. One yellow maize sample was downgraded to class other due to the percentage other colour maize exceeding 5%.

Foreign matter, other colour maize kernels and defective kernels (above and below the 6.35 mm sieve) are reported collectively. The average percentage for white maize increased from 3.8% last season to 6.4% this season. Yellow maize also showed an increase from 5.3% to 7.1%.

The grading results of white and yellow maize according to the South African grading regulations are provided in Tables 5 to 8 (per grade and colour) and Tables 9 and 10 (per province) on pages 37 to 41.

Table 11 and Graphs 38 to 40 on pages 42 and 43 show the results over 10 seasons.

USA Grading

Of the 1 000 maize samples graded according to USA grading regulations, 21% were graded US1, 18% US2, 16% US3, 15% US4, 16% US5, 11% Sample grade and 3% Mixed grade. The percentage

samples graded as US1 varies substantially over seasons, varying from 59% (2023/24 and 2022/23) to 27% (2021/22), 62% (2020/21) and 30% (2019/20). The percentages samples graded as US Grades 2, 3, 4, 5, Sample as well Mixed grade were notably higher than in the previous seasons. 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 12 to 13 on pages 44 and 45 for USA grading results per grade as well as Tables 14 to 15 on page 46 for the results reported per province.

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 76.7 kg/hl compared to the 75.9 kg/hl of yellow maize. The average test weights of white and yellow maize were respectively 0.5 kg/hl and 0.2 kg/hl higher than in the previous season. The test weight in total varied from 66.0 kg/hl to 82.7 kg/hl.

Of the 38 samples (3.8%) that reported Bushel weight values below the minimum requirement (56.0 lbs or 72.1 kg/hl) for USA grade 1 maize, three originated in North West, five in Gauteng and 15 each in Mpumalanga and the Free State production regions. In the previous season, 5.6% of the samples were below the minimum requirement.

The 100 kernel mass ("as is" basis) of white maize was 36.8 g (31.4 g in 2023/24) and averaged higher than yellow maize's 33.7 g (last season 28.7 g). This trend towards higher white maize values is also observed in previous seasons.

The percentage white maize kernels above the 10 mm sieve increased by 8.3% to 27.1% compared to the 18.8% of the previous season. The percentage yellow maize kernels above the 10 mm sieve also increased from 5.8% last season to 11.2% this season. The percentage yellow maize kernels above the 10 mm sieve were on average 15.9% lower than white kernels and the percentage yellow kernels below the 8 mm sieve 15.1% 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. The lower the percentage below the sieve, the less susceptible is the sample to breakage. The breakage susceptibility values for both white and yellow maize were equal to the previous season. The percentage stress cracks observed varied overall from 0 to 29% and averaged 4%. Yellow maize also averaged 4%, while white maize averaged 5%, both similar to the previous season.

Refer to Tables 18 to 21 on pages 48 to 51 for the physical quality characteristics of white and yellow maize per grade. Table 22 and Graphs 41 to 45 on pages 52 and 53 provides the physical quality characteristics over 10 seasons. Tables 23 and 24 and Graphs 46 to 49 present the physical characteristics per province.

The milling index obtained from the SAGL Milling Index 2025 model, varied from an average of 78 for white maize (73 in 2023/24) to an average of 72 for yellow maize (76 in 2023/24). Grit Yield (GYA) values averaged 64 for white and 63 for yellow maize this season, both equal to the previous season. The development of the new model for Milling Index commenced in the 2012/13 season. Please refer to pages 93 and 94, Milling Index, in the Methods section of the report.

Roff milling and whiteness index (WI)

201 of the white maize samples were milled on the Roff laboratory mill this season. The average percentage extraction of total meal in white maize obtained with the Roff mill, averaged 76.4% (0.9% higher than the previous season) and varied from 71.7% to 84.2%. Please see Graphs 50 to 55 on page 58 for a comparison of the different fractions' percentages as well as the percentage total meal extraction obtained on the Roff mill for the last ten seasons.

The whiteness index averaged 31.1 for unsifted and 28.9 for sifted maize meal. The whiteness index of the previous season averaged 40.4 and 38.4 for unsifted and sifted maize meal respectively. Sieving the sample eliminates differences in the readings as a result of particle size. Finer particles appear whiter due to the increased surface area that increases light scattering. Larger particles allow light to penetrate deeper, where some colours are absorbed or trapped, causing the sample to appear darker or more coloured.

Higher WI values represent whiter maize meal samples. 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 25, 26 and 27 on pages 55 and 56.

Bühler MCKA milling and whiteness index (WI)

This is the second season that white maize was milled on the Bühler MCKA maize mill. Prior to milling, the samples were degermed using the Grainman degerminator. 456 white maize samples were milled on the Bühler MCKA mill. The average % extraction of all meal fractions was 77.3% and ranged from 63.8% to 89.1%.

The whiteness index of the flour obtained from the MCKA mill averaged 14.5 for unsifted and 13.2 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 Table 28 (results per grade), Table 29 (results per province) and Table 30 (results per region) on pages 59 to 61.

Nutritional Values

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

Please refer to Tables 31 to 33 on pages 63 to 65 for the nutritional results per grade and colour. Table 34 and Graphs 56 to 59 on pages 66 and 67 provide the results over a 10-season period. The nutritional values per province are provided in Tables 35 and 36 on page 68.

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

The average starch content of white maize was 74.0%, slightly lower than the 74.3% of the previous season. Yellow maize averaged 0.4% lower than white maize and compared well with the 73.5% of the previous season. Ten-year averages for white and yellow maize are 74.2% and 73.4% respectively.

The average crude fibre contents of white and yellow maize were 2.1% and 2.2% respectively this season. Both averaged 2.2% last season.

Mycotoxins

A discussion of the mycotoxin results obtained per region over the last 15 seasons, is provided on pages 69 to 89.

A table with the limit of quantification (LOQ) for each of the mycotoxins analysed is provided on page 95 under Methods.

See also page 90 for the National Mycotoxin Regulations.