

SOUTH AFRICAN COMMERCIAL MAIZE QUALITY 2004/2005

Acknowledgments

With gratitude to:

- * **The Maize Trust for its financial support in conducting this survey.**
- * **The Grain Silo Industry and its members in providing the samples to make this survey possible.**
- * **The National Association of Maize Millers and its members in providing samples of Maize delivered directly from the producer to the mill.**

Introduction

The final production estimate for maize for the 2004/2005 season by the National Crop Estimates Committee was 11 450 000 tons. This is 20,7 % more than the previous season's 9 482 000 tons. The average production from 1999/2000 to 2003/04 was 9,19 million tons. The major maize-producing region was the Free State (4 113 000 tons), followed by the North West (2 862 500 tons) and Mpumalanga (2 806 700 tons). White maize contributed 57 % to the total production, which is 4 % lower than the previous year.

1000 samples, proportionally representing white and yellow maize of each production region, were analysed for quality. All samples were graded according to RSA and USA grading regulations, and 100 kernel weight, kernel size, breakage susceptibility, stress cracks, milling index, and fat, protein, starch and whiteness index were determined. Mycotoxin analyses as well as testing for GM maize were performed on 100 randomly selected samples representative of white and yellow maize produced per region.

The 1000 samples analysed consisted of 601 white maize samples and 399 yellow maize samples. Of the 601 white maize samples analysed, 82 % were WM1, 14 % WM2, 4 % WM3 and only two samples were of the Class Other Maize white. Of the 399 yellow maize samples analysed, 81 % were YM1, 18 % YM2, 1 % YM3 and only one sample was of the Class Other Maize yellow.

Crop quality

This crop was of a good quality and 82 % of the crop graded as maize grade 1.

The average hectolitre mass was 77,5 kg/hl (77,8 during 2003/2004). The average hectolitre mass from 1995/96 was 76,7 kg/hl. The percentage of total defective kernels of 5,8 % was a little lower than the previous year's 6,3 %.

The fat content was 3,9 % (db), starch content 75,3 % (db) and protein 8,8 % (db). The fat content was about 0.1 % down in comparison with previous years (4,0 % db), the starch content was more or less the same as the last three seasons and the protein fell back to the average of the previous five years, namely 8,8 % (db). The five-year average for starch was 74,5 %.

The kernel size compared to the previous year and the 100 kernel weight averaged 34,4 % (1 % lower than the previous year). The kernels this season had the same breakability but less stress cracks than during the 2003/2004 season.

The milling index were 99,9, about 7 lower than the previous season's 106,9. The whiteness of the maize meal of the white maize averaged a little better (whiter) than last season.

Imported maize quality is being reported for the first time.

Imported Maize

South Africa has imported in total 221 364 tons of yellow maize from Argentina (205 856 tons) and the USA (15 508 tons) during the 2003/2004 production season. Only 724 tons of white maize was imported from Malawi during this season.

During the 2004/2005 production season the RSA has imported 212 195 tons of yellow maize (up to 10/03/2006) from Argentina. (SAGIS website.)

The quality of the imported maize compared to the average quality of the RSA maize for each of these seasons are given on page 55 and 56.

2003/2004 Imported maize

During the 2003/2004 production season the yellow maize that was imported graded as YM2. The difference between South African YM2 and the imported maize regarding grading was mainly a difference in kernel size that effected the percentage defective kernels above and below the 6.35 mm sieve and a higher percentage of pinked kernels. The kernel size percentage of the imported maize (>10 mm) was much lower than RSA maize.

The average fat content of the imported maize were 4,9% (db), this is 0,9 % higher than the average fat content of the RSA maize.

2004/2005 Imported maize

The yellow maize imported during the 2004/2005 production season graded as YM2 and Class Other Maize. The smaller kernels of the imported maize effected the percentage defective kernels above and below the 6.35 mm sieve. The hectolitre mass of the imported YM2 was about 10 kg/hl lower than the average of the local YM2 and of the COM about 17 kg/hl lower than the RSA COM. The kernel size (>10 mm) was smaller and the percentage of pinked kernels high.

While the protein and starch contents averaged more or less the same, the average of the fat content of imported YM2 was 4,8 % (db), while the average fat content of the RSA maize

of the same grade was 1,0 % lower.

Genetic Modification

Annually the SAGL screen 10 % of the crop samples to test for MON 810 (Bt maize event) and NK 603 (RUR).

The methodology the SAGL uses is a quantitative enzyme-linked immuno sorbent assay. The SAGL does however not report quantities recorded below the limit of detection and above the value of the reference standards used, the reason being that SAGL can not guarantee those values. (Please see page 48.) MON 810 were found in 78 % of the samples tested and NK 603 in 31 % of the samples tested.

Sampling

Samples received from the grain storers (about 98 % of these crop quality samples) are drawn in the following way:

With each delivery at the silo's a sample is drawn for grading purposes according to the Grading Regulations.

After the grading sample has been devided, 500g are thrown into a bag (50kg) representing a certain class and grade. When this bag is full, it is devided and a 2,5kg sample according to class and grade per silo bin is sent to the SAGL.

Samples of maize being delivered directly to the millers, are drawn in more or less the same way as at the silos.

Mycotoxins

No Aflatoxin or Ochratoxin could be detected on these maize samples. A few samples tested positive for Zearalenone.

The Fumonisin average was 1,06 ppm that is just lower than the previous season's 1,14 ppm. Fourteen samples tested higher than 2,0 ppm for Fumonisin.

Deoxynivalenol (DON) was detected in about 40 % of all the samples tested, giving an average of 0,6 ppm. Eight samples tested higher than 2,0 ppm for DON.