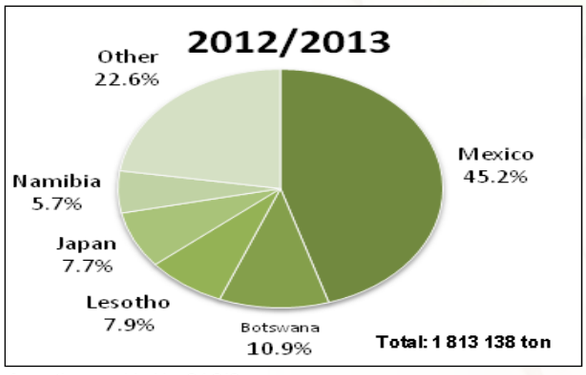
3. Imported and Exported Maize

A total of 10 562 tons of white maize was imported from Zambia during the 2012/2013 season. No samples were forwarded to SAGL for quality analysis purposes.

During the season under review, 413 152 tons of yellow maize and 1 399 986 tons of white maize were exported. Please see graph 25 below for the major destinations for RSA exports of maize.

Graph 25: Major destinations for RSA maize exports during the 2012/2013 season



Information provided by SAGIS.

4. Maize Crop Quality 2012/2013 - summary of results

4.1 RSA Grading

The maize crop was of good quality, with 85% of white and 79% yellow maize, graded as maize grade one. The percentage defective kernels above and below the 6.35 mm sieve, 4.6% for white and 4.5% for yellow, were comparable and slightly lower than the previous season's 4.5% and 5.0% for white and yellow maize respectively. The percentage Diplodia infected kernels was equal to the previous season's 0.6%, while Fusarium infected kernels increased with 0.7% this season. Foreign matter and other colour maize did not pose any problems.

The average percentage total deviations of white maize decreased with 0.1% and that of yellow maize with 0.4% compared to the previous season. The average percentage total deviations on South African maize this season was at 4.9% slightly lower than the 5.1% of the 2011/2012 season.

4.2 USA Grading

Of the 1000 maize samples graded according to USA grading regulations, 79% were graded US1, 13% US2, 3% US3, 2% US4, 1% US5 while mixed and sample grade represented 2%. The main reason for downgrading the samples were the percentage total damaged kernels exceeding the maximum limit per grade.

4.3 Physical Quality factors

Hectolitre mass/Bushel weight/Test weight is applied as a grading factor in the USA grading regulations. White maize had an average hectolitre mass of 78.2 kg/hl compared to the 76.6 kg/hl of yellow maize. The hectolitre mass in total varied from 67.8 kg/hl to 82.9 kg/hl and averaged 77.4 kg/hl, slightly higher than the ten year average. Only sixteen samples reported values below the minimum requirement (56.0 lbs or 72.1 kg/hl) for USA grade 1 maize.

The 100 kernel mass averaged 29.0 g which is 1.4 g lower than the previous season and also 3.6 g lower than the ten year average.

Yellow maize kernels were on average smaller than white kernels. The breakage susceptibility of both white and yellow maize compared well with the 2011/2012 season (which was the lowest of the previous ten seasons). The % stress cracks varied from 0 – 37%, averaged 5% and compared well with previous seasons.

The milling index varied from 46.9 to 119.5 and averaged 95.1, slightly higher than the previous season. The average milling index for white maize is higher (97.0) than that of yellow maize (93.2).

4.4 Roff milling and whiteness index (WI)

The average % extraction of total meal in white maize obtained with the Roff mill averaged 79.2% (equal to the previous season) and varied from 71.8% to 84.3%.

The whiteness index averaged 25.1 for unsifted and 15.9 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 28.5 for unsifted maize meal. Sifted maize meal averaged 23.6.

The higher the WI value obtained, the whiter the meal sample. The main contributing factors causing differences in WI values are the presence of defective kernels and other colour maize like yellow maize, the type of cultivar as well as the soil composition.

4.5 Nutritional Values

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

In general, white maize tends to have a higher fat content than yellow maize, but a lower starch content. The protein content of white maize tend to be slightly higher than that of yellow maize.

The average fat content of the 2012/2013 crop samples was 4.0%, equal to the 2011/2012 samples and slightly higher than the weighted ten year average of 3.9%. The average protein content (9.2%) was 0.5% higher than the previous season's average as well as the ten year weighted average. The starch content this season decreased on average with 1.2% compared to the 72.8% of the previous season and is also 0.6% lower than the ten year weighted average of 72.2%.

The fat content of white maize was equal to the previous season and 0.2% higher than that of yellow maize. The protein content of white maize was equal to that of yellow maize. The starch content of both white and yellow maize is lower than the previous season by 1.2% and 1.1% respectively.

Please refer to Table 19 on page 57.

4.6 Mycotoxins

The average Fumonisin level (Sum of B_1, B_2 and B_3) on all 100 samples tested was 257 µg/kg (ppb) and ranged from 0 (not detected (ND)) to 4 395 µg/kg. This average is slightly higher than the previous season. Of the 100 samples tested, 45 samples tested positive for fumonisin levels and the average of these positive results was 571 µg/kg. The previous season, 33 samples tested positive, with an average of 551 µg/kg.

The highest Deoxynivalenol (DON) level detected was 617 µg/kg compared to the 485 µg/kg of last season. The average level of all samples tested this season was 21 µg/kg. 4 samples tested positive for DON last season compared to the 9 of this season. The average of the positive results decreased from 262 µg/kg in 2011/2012 to 225 µg/kg in 2012/2013.

Only one sample tested positive for 15-acetyl-deoxynivalenol (15-ADON) residues, with a level of 82 µg/kg. The 15-ADON residues were detected on the sample that also contained the highest DON level, as would be expected.

Only two samples tested positive for Zearalenone, the lowest value being 20 µg/kg and the highest 41 µg/kg, averaging 31 µg/kg. The previous season, 2 samples tested positive as well, with the average of the positive results being 249 µg/kg.

HT-2 Toxin and T-2 Toxin residues were detected on only one sample, the levels were 72 and 232 µg/kg respectively.

No Aflatoxin or Ochratoxin A were detected in the samples.

Mycotoxin levels lower than the limit of quantitation (< LOQ) as well as the limit of detection (< LOD) were seen as having tested negative for calculation purposes. Please see mycotoxin results in Table 21 on pages 60 - 63.

4.7 Genetic Modification (GM)

The SAGL screened 100 (10%) of the crop samples to test for the presence of the Cry1Ab, Cry2Ab and/or CP4 EPSPS traits. Important to remember is that the crop quality samples received by the SAGL are composite samples per class and grade, made up of individual deliveries to grain silos.

SAGL used the EnviroLogix QuickComb kit for bulk grain to quantitatively determine the presence of genetically modified maize.

The detection range for the Cry1Ab trait is 0.4% to 5%. 97% of the samples tested positive for Cry1Ab with values larger than 0.4% (Limit of quantification (LOQ)).

The detection range for the Cry2Ab trait is 0.5% to 5%. 73% of the samples gave values larger than the LOQ of 0.5% (positive results).

The detection range for the CP4 EPSPS trait is 0.25% to 5%. 95% of the samples tested positive for CP4 EPSPS with values larger than 0.25% (LOQ).

Values higher than 5%, the highest value of the detection range for all three traits, are reported as > 5%. This methodology has a precision coefficient of variation of 20%.

Please see GM results in Table 20 on page 59 as well as page 71 for a summary of the Events and Trade names/Brands represented by these three traits.