

SOUTHERN AFRICAN

Wheat Crop
Quality Report
2011/2012 Season



INDEX

	Page
Introduction	1
Production and protein distribution graphs	2
South African Winter Cereal Production	3
Average yield per province (graph)	3
RSA chart	4
Bread Wheat Grading table	4
Quality of the 2011/2012 season	5
Protein distribution per production area (graphs)	6
Wheat class and grade per production area (pie charts)	6
Weighted average protein, falling number, hectolitre mass and mixogram peak times per region compared over the last three seasons	7
Protein, falling number, hectolitre mass and mixogram peak time over ten seasons (graphs)	8
Regional quality	9 - 12
Regional quality weighted averages (table)	13
Comparison of Flour Quality over last four seasons (tables)	14
Comparison of rheological quality over seasons (graphs)	15 - 16
Correlation graphs for protein content, loaf volume and gluten content	17
Cultivars	18
Wheat seed figures	18
Mycotoxins	19
Mycotoxin results table	20
Quality data plus rheological graphs per production region	21 - 52
Summary of RSA wheat quality of 2009/2010 and 2011/2012	53 - 54
Summary of RSA wheat quality of 2010/2011 and 2011/2012	55 - 56
Methods	57 - 59
SAGIS Wheat Imports / Exports 2010/2011 Season	60
SAGIS Wheat Imports / Exports 2011/2012 Season	61
SAGIS Wheat Exports and Imports per country 2010/2011 Season	62
SAGIS Wheat Exports and Imports per country 2011/2012 Season	63
SAGIS Wheat Supply and Demand table	64
Quantity of wheat imported to the RSA	65 - 66
Quality of imported wheat 2010/2011 season	67 - 68
Average quality data of imported wheat during the 2010/2011 season table	68
Imported wheat quality compared to RSA crop quality during the 2010/2011 production season	69 - 82
Accuracy Award	83
SANAS Certificate and Schedule of Accreditation	84 - 86
Grading Regulations for Bread Wheat, Regulation No. R. 1186 of 17 December 2010	87 - 99

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SOUTH AFRICAN

COMMERCIAL WHEAT QUALITY FOR THE 2011/2012 SEASON

Acknowledgements

With gratitude to:

- *The Winter Cereal Trust for its financial support in conducting this survey.*
- *The Grain Silo Industry and its members for their cooperation in providing the samples to make this survey possible.*
- *The National Chamber of Milling and its members for providing samples of wheat delivered directly to the mills.*

Introduction

The final wheat production of 2 005 000 tons for the 2011/2012 season, was 40% higher than the previous season's 1 430 000 tons. This is 5.5% higher than the 10 year average of 1 899 803 tons (2002/2003 to 2011/2012 seasons). A total area of 604 700 hectares was utilized for wheat production. The average yield increased from 2.56 t/ha in the previous season to 3.32 t/ha this season. (Figures obtained from the Crop Estimates Committee).

The whole wheat protein average was 11.8% compared to the 12.1% of the previous season and the ten year average of 12.0%. The average hectolitre mass was 80.7 kg/hl and slightly higher than the 80.3 kg/hl of the 2010/2011 season. The average mixogram peak time of 3.0 minutes was similar to the previous two seasons.

The percentage of samples in this survey graded as B1, decreased from 44% the previous season to 41% this season, the main contributing factor being the lower protein contents compared to the previous season observed in most of the production regions. The average falling number this season was 387 seconds. Only eleven of the samples analysed gave falling number values below 250 seconds, all of these samples were from the Free State production regions.

The overall flour and dough quality were good, slightly weaker than the previous season but compared well with the previous three seasons. Consistency in quality is one of the most important quality factors.

During the harvesting season, a representative sample of each delivery of wheat was taken according to the prescribed wheat regulation.

A sub-sample of each of these grading samples was collected in a bin according to grade and class per silo bin at each silo. This composite bin sample was then divided and a 3 kg sample was sent to the Southern African Grain Laboratory (SAGL) for the annual wheat crop quality survey. SAGL analysed 433 samples to proportionally represent the production of wheat in all the different production regions.

The samples were fully graded and thousand kernel mass was done. Small samples were milled on the Quadromat mill, followed by a mixograph analysis.

Cultivar identification was done on these samples and sales figures of seed sold by the commercial grain silo owners were obtained.

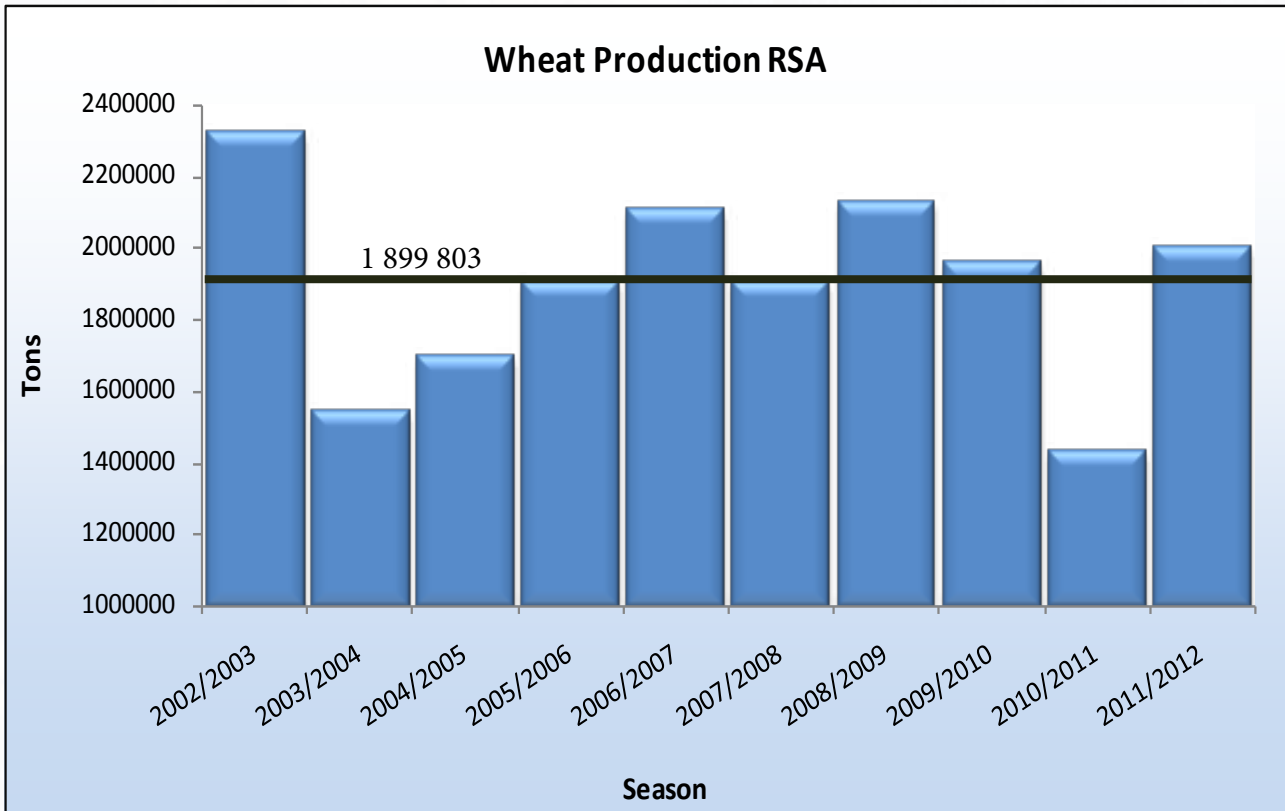
Composite samples were made up per class and grade for each production region and milled on the Bühler mill. Rheological tests, namely gluten, mixogram, farinogram, alveogram, extensogram and 100-gram baking tests, were then performed.

The results (as averages per region) are made available weekly on the SAGL website (www.sagl.co.za) as soon as the first samples are received. The hard copy reports are distributed to all interested parties and can also be downloaded from the website.

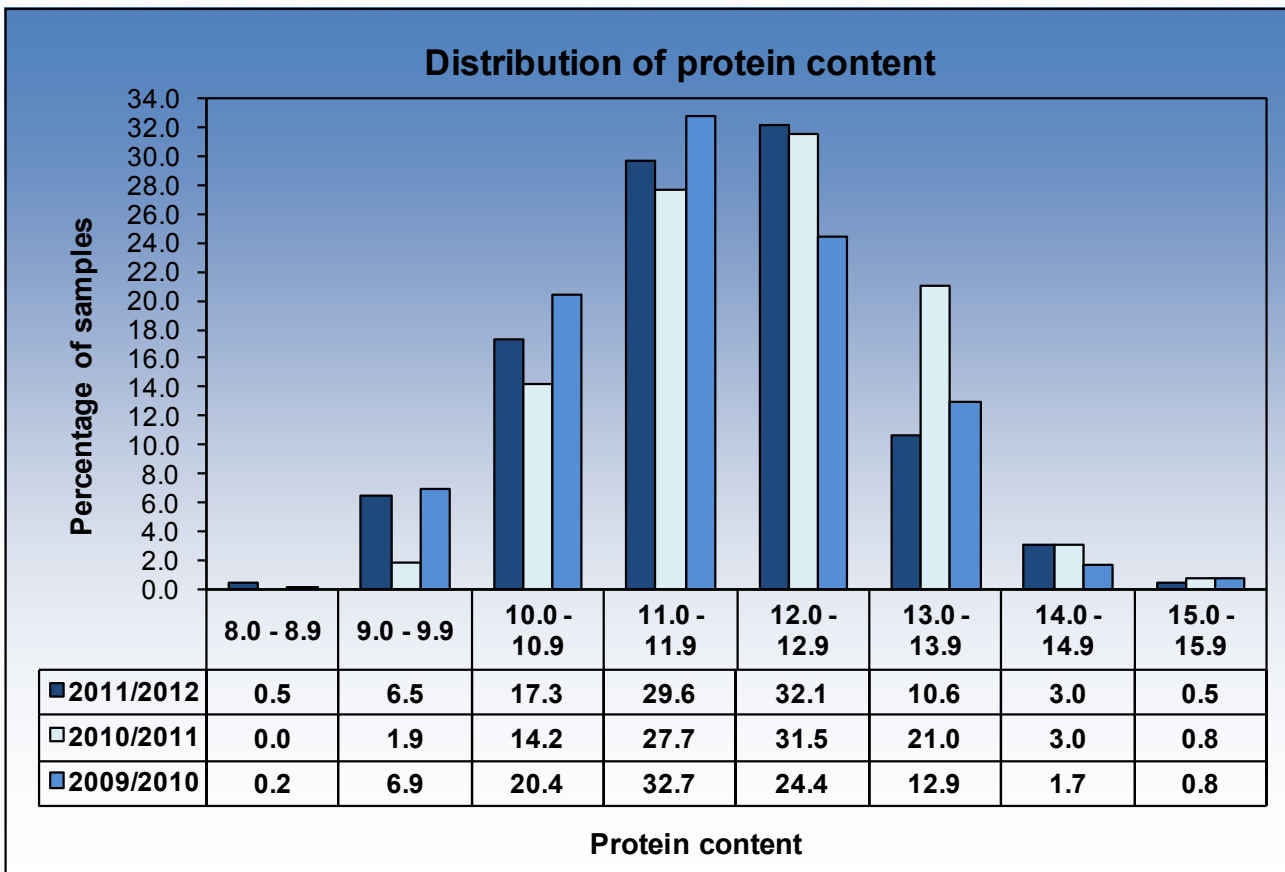
Summaries comparing the quality of the local wheat for the 2009/2010 and 2011/2012 as well as the 2010/2011 and 2011/2012 seasons are provided.

Data on imported wheat are also included in the report.

WHEAT PRODUCTION IN THE RSA OVER THE LAST 10 SEASONS



DIFFERENCES IN THE DISTRIBUTION OF PROTEIN CONTENT OVER THE LAST 3 SEASONS



South African Winter Cereal Production

Wheat is by far the biggest winter cereal crop planted in South Africa. Other winter crops are barley for malting purposes and canola. Summer field crops are better suited for the South African climatic conditions. Maize has the largest crop size of the different crops, followed by wheat, then soya-beans, sunflower seed, malting barley, sorghum, groundnuts, canola and dry beans.

South Africa (made up of nine provinces) is divided into 36 crop production regions with wheat planted in about 32 of these regions. These production regions are described on pages 21 to 52 (in the header of the left page) giving the specific intake silo names for each region.

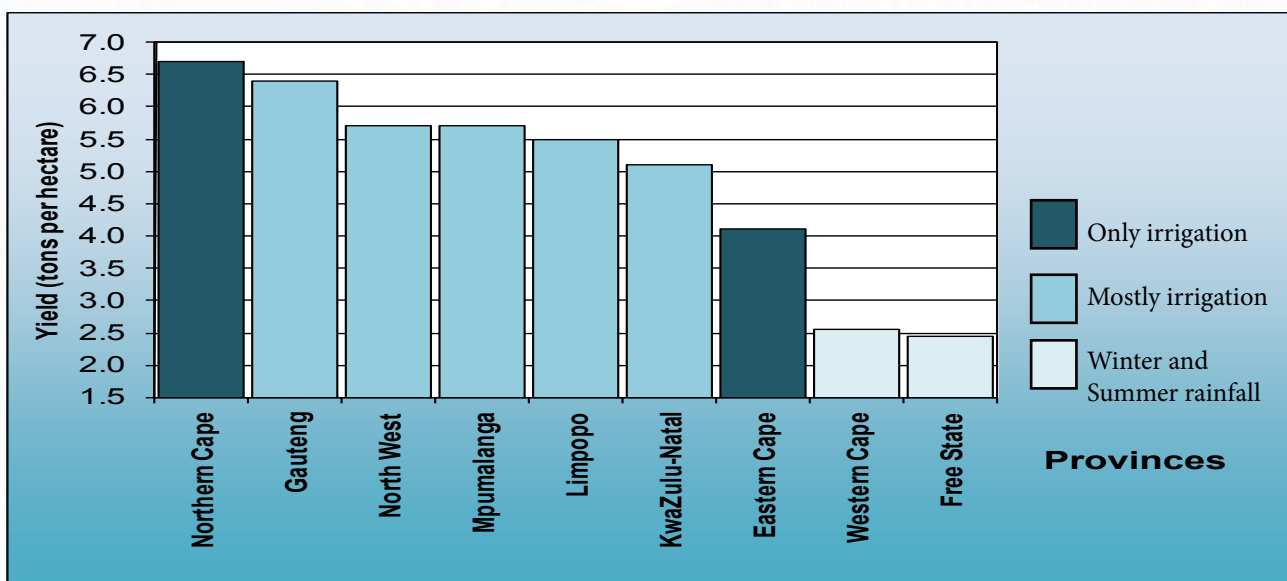
The three main wheat producing provinces are Western Cape (winter rainfall), Free State (summer rainfall) and the Northern Cape (irrigation). Other provinces worth mentioning is Limpopo (irrigation) and North-West (mainly irrigation). The local production is not sufficient for domestic requirements and South Africa has to import wheat to meet its domestic consumption.

The Western Cape province produced 675 750 tons and the Free State province followed with 551 250 tons. These two provinces were responsible for 64% of the total wheat produced. The Northern Cape produced 281 400 tons, Limpopo 170 500 tons and North West 125 400 tons. (Final production estimate by the Crop Estimates Committee, CEC).

The yield in the main production areas ranged from 6.7 tons per hectare (t/ha) in the Northern Cape (irrigation area) to 2.6 t/ha in the Western Cape and 2.5 t/ha in the Free State. In the Western Cape and Free State, yields increased from the 2.1 t/ha and 1.9 t/ha averaged during the previous season. Gauteng gave a yield of 6.4 t/ha, followed by North West and Mpumalanga both with 5.7 t/ha. Limpopo averaged a yield of 5.5 t/ha, KwaZulu-Natal 5.1 t/ha and the Eastern Cape 4.1 t/ha. See graph below.

South Africa has three major wheat-breeding programs. The South African breeders can only release a new cultivar or an introduction cultivar if it has better agronomical as well as better flour quality characteristics than the cultivars planted commercially in a specific area. Producers continuously strive to improve the wheat yield and quality by selecting the best cultivars for commercial production in a specific area. Grading standards are also set high to ensure adequate quality control.

Average yield per province
(Irrigation versus summer and winter rainfall areas)



(Based on final production estimate figures obtained from the CEC)

RSA WHEAT PRODUCTION AREAS



BREAD WHEAT GRADING TABLE 2011/2012

Grade	Minimum			Maximum percentage permissible deviation (m/m)									
	Hectolitre mass, kg/hl	Falling number, seconds	Protein content, %	A	B	C	D	E	F	G	H	I	J
				Heavily frost damaged kernels	Field fungi	Storage fungi	Screenings	Other grain and unthreshed ears	Gravel, stones, turf and glass	Foreign matter plus F	Heat damaged kernels	Damaged kernels plus H	Combined deviations (D+E+G+I)
Grade 1	77	220	12	5	2	0.5	3	1	0.5	1	0.5	2	5
Grade 2	76	220	11	5	2	0.5	3	1	0.5	1	0.5	2	5
Grade 3	74	220	10	5	2	0.5	3	1	0.5	1	0.5	2	5
Grade 4	72	200	9	5	2	0.5	3	1	0.5	1	0.5	2	5
Utility grade	70	150	8	10	2	0.5	10	4	0.5	3	0.5	5	10
Other Wheat	<70	<150	<8	>10	>2	>0.5	>10	>4	>0.5	>3	>0.5	>5	>10
Minimum size of working samples	1 kg	300 g clean	Apparatus instructions	25 g sifted	25 g sifted	25 g sifted	500 g unsifted	50 g sifted	100 g sifted	100 g sifted	100 g sifted	25 g sifted	-

Crop quality of the 2011/2012 season

The highest percentage of samples analysed (32.1%) had protein contents ranging from 12.0 - 12.9%. The second highest percentage of 29.6% was for protein contents 11.0 - 11.9% and thirdly 17.3% for 10.0 - 10.9% protein content. The Other Summer rainfall and Irrigation areas (Mpumalanga, Gauteng and Limpopo regions) had the highest average protein content of 12.1% closely followed by the Summer rainfall area (Free State) with 12.0%. The Winter rainfall area and Irrigation areas both averaged protein contents of 11.6%.

The average hectolitre mass values for the Irrigation areas (81.5 kg/hl) and Other Summer rainfall and Irrigation areas (81.7 kg/hl) compared well. The Winter rainfall area had an average hectolitre mass of 80.9 kg/hl, with the Free State (Summer rainfall area) averaging the lowest of 79.8 kg/hl, which will still grade as Grade 1 wheat.

The weighted average thousand kernel mass of 38.0 g was 1.5 g lower than the previous season. The weighted average screenings (1.8 mm sieve) of 1.56% was slightly lower than the 1.68% in the 2010/2011 season.

The weighted average falling number was 387 seconds. Eleven samples gave falling number values of less than 250 seconds and of these, seven had falling number values lower than 220 seconds. These samples were all from the Free State.

The weighted mixogram peak time on flour from the Quadromat mill averaged 3.0 minutes, similar to the ten year average (2.9 minutes) and equal to the weighted mixogram peak time of the flour from the Bühler mill.

The weighted average Bühler extraction was 74.1%, with a weighted average Kent Jones colour of -2.8 KJ.

The farinogram had a weighted average water absorption of 61.3% (63.2% the previous season) and a weighted average development time of 4.1 minutes (5.5 minutes previous season). The weighted average alveogram strength was 35.0 cm² and the weighted average P/L value 0.89 (36.2 cm² and 1.29 the previous season). The weighted average extensogram strength was 90 cm² (97 cm² previous season).

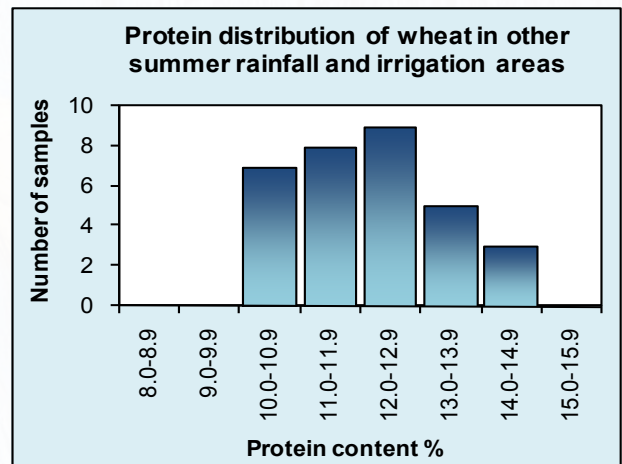
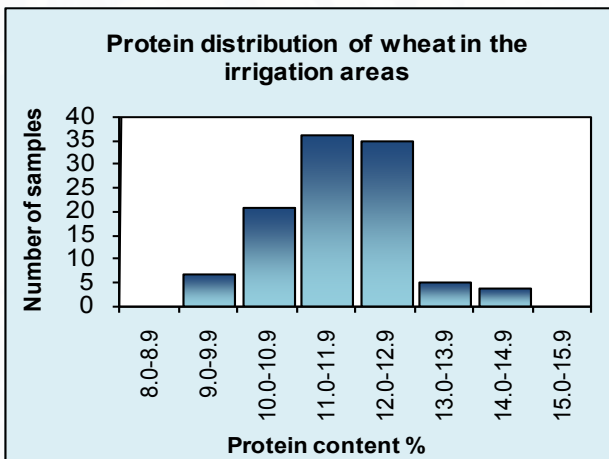
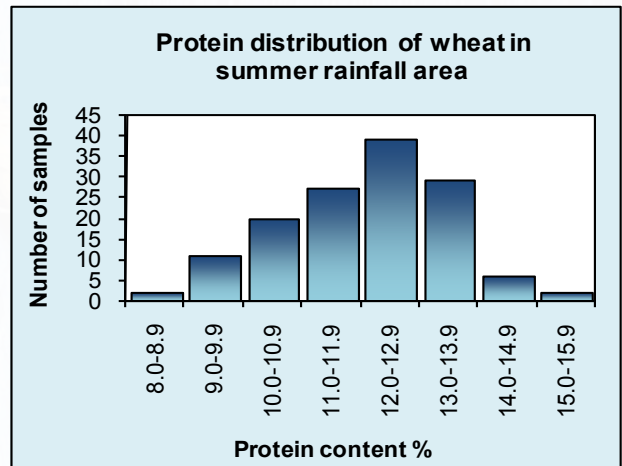
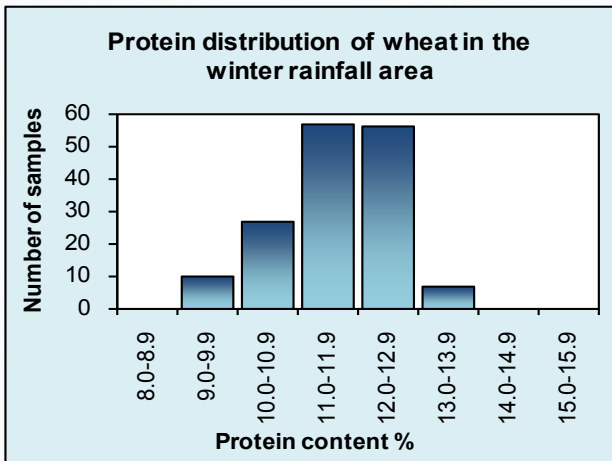
The loaves baked using the 100 g straight-dough optimized bread making method, which refers to the relationship between the protein content and the bread volume, was evaluated and scored from “Excellent” to “Good”. The average scores were “Excellent” to “Very Good”.

Wheat grades

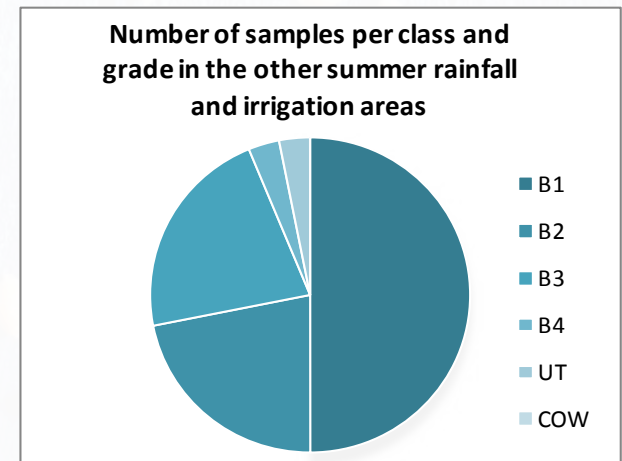
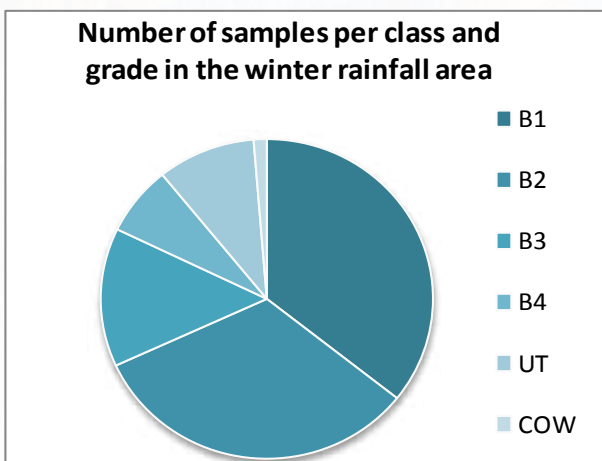
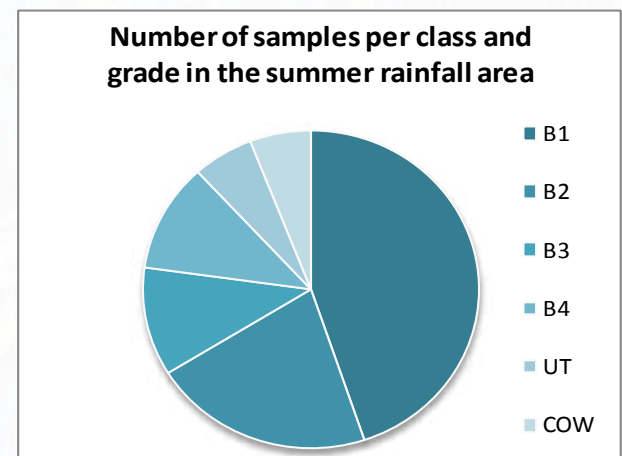
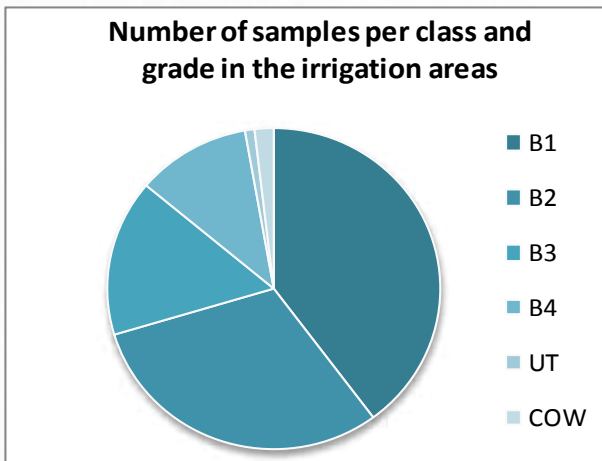
The 344 representative crop samples were graded as follows: 40.6% was graded B1, 27.7% was graded B2, 14.1% was graded B3, 9.0% was graded B4, 5.8% UT (Utility Grade) and 2.8% COW (Class Other Wheat).

Grade B1 wheat in the Free State province amounted to 45% (51% in the previous season) and grade B1 in Other Summer rainfall and Irrigation areas amounted to 50% (45% in the previous season). In the Irrigation areas 40% (48% in the previous season) of the wheat graded as B1 and in the Western Cape Province 36% graded as B1 (33% in the previous season).

Protein distribution graphs per production area



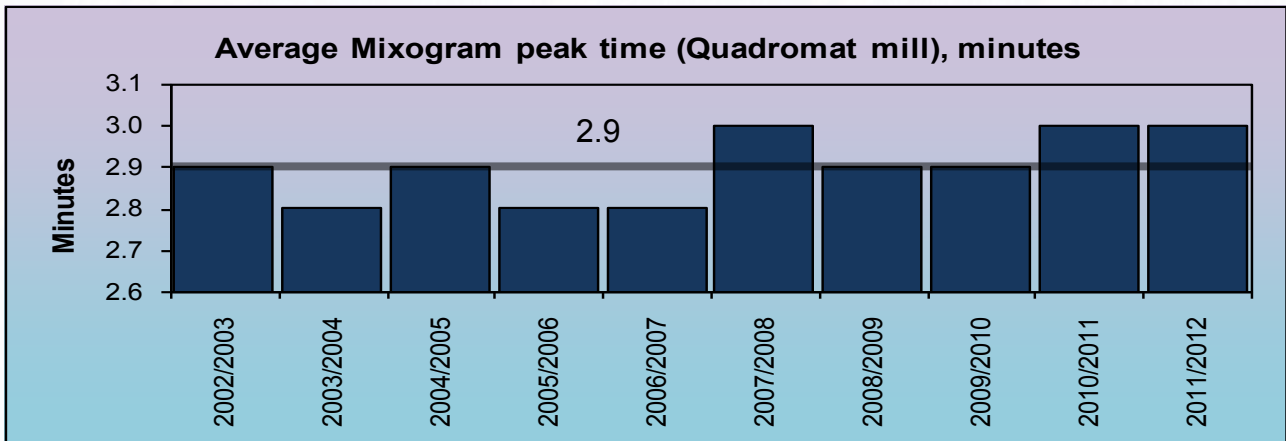
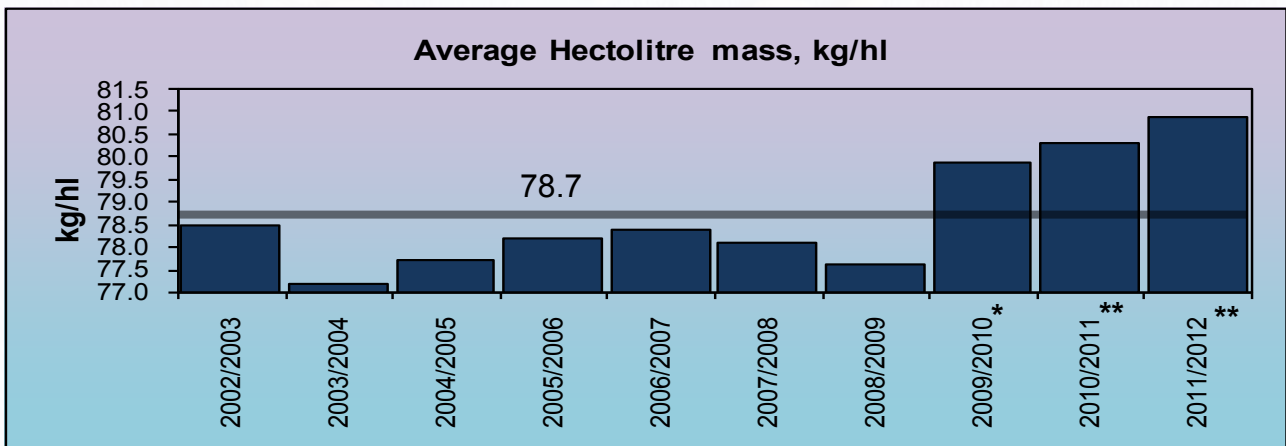
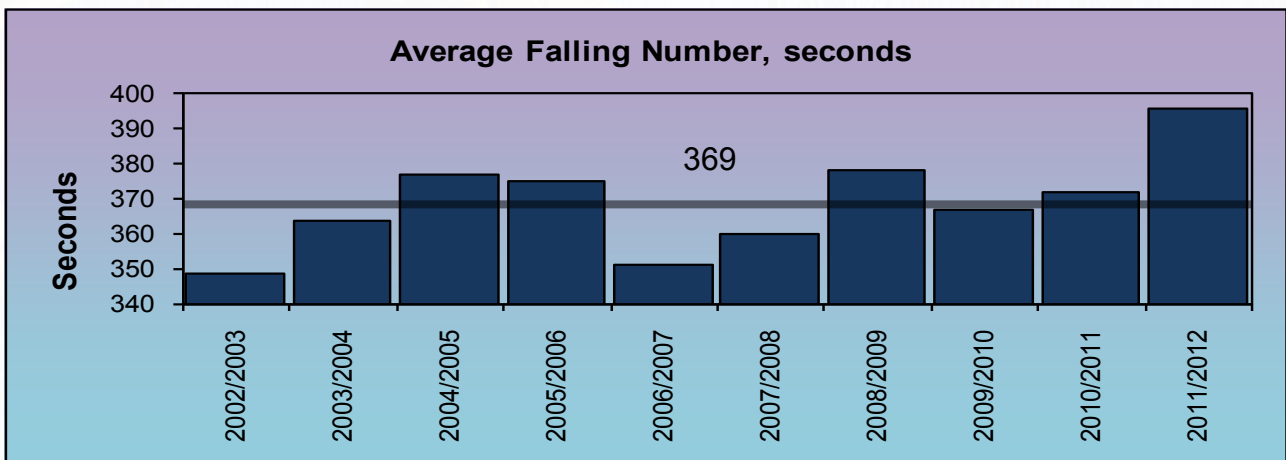
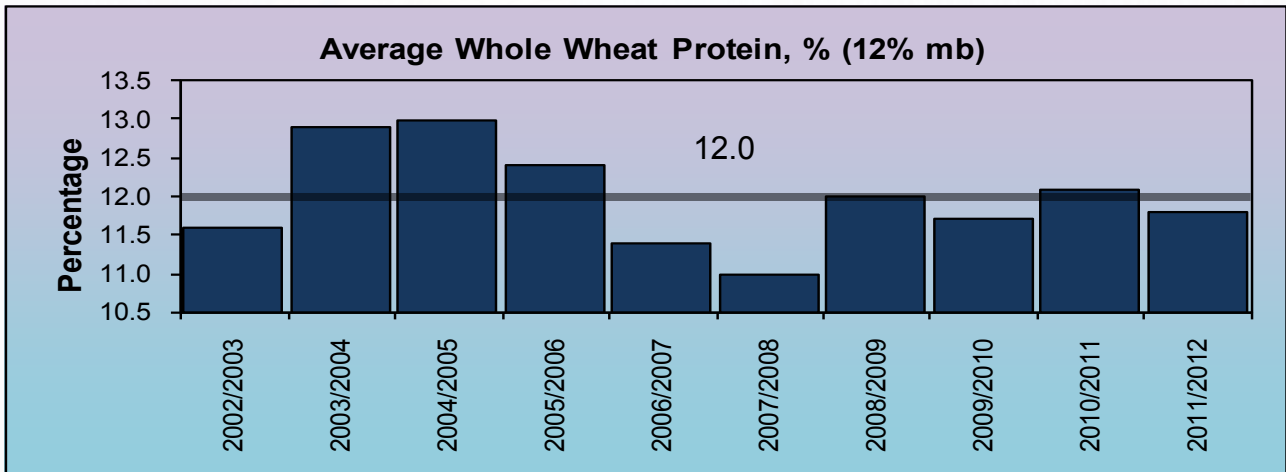
Wheat class and grades per production area



WEIGHTED AVERAGE RESULTS FOR THE LAST THREE SEASONS

Region	2011/2012					2010/2011					2009/2010				
	Protein (12% mb), %	FN, sec	Hlm, kg/hl	Mixo PT, min	<i>n</i>	Protein (12% mb), %	FN, sec	Hlm, kg/hl	Mixo PT, min	<i>n</i>	Protein (12% mb), %	FN, sec	Hlm, kg/hl	Mixo PT, min	<i>n</i>
1	11.9	394	80.4	3.2	3	12.2	393	79.7	2.9	3	11.2	299	78.7	2.9	4
2	12.3	421	77.9	3.0	14	12.3	422	77.7	2.7	12	11.4	314	77.8	2.6	30
3	11.7	412	81.2	3.1	55	11.7	410	79.7	2.7	44	10.9	351	79.5	2.5	63
4	11.4	406	80.8	3.0	37	11.2	387	81.2	2.7	25	10.6	382	80.1	2.5	23
5	11.9	420	82.0	2.9	25	11.8	355	79.6	2.7	20	11.1	379	80.0	2.5	30
6	11.1	413	81.1	2.6	23	12.5	355	80.2	2.6	11	11.8	355	79.3	2.4	24
7	11.1	378	83.3	3.1	5	12.9	401	81.7	2.4	1	12.2	375	79.5	2.7	2
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	11.6	388	82.6	2.7	35	12.4	413	82.4	2.5	32	12.1	421	82.6	2.2	27
11	11.4	375	80.2	2.6	17	11.9	395	80.9	2.7	14	12.5	454	80.6	2.8	26
12	12.6	400	81.6	2.8	6	12.8	405	81.4	3.1	5	13.1	414	79.2	2.6	7
13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	9.8	508	81.3	3.3	1	11.6	415	79.7	2.9	4	12.4	369	78.6	2.5	7
15	10.8	399	81.0	2.6	10	11.9	375	81.2	3.0	9	12.1	400	81.2	2.9	6
16	11.1	411	80.5	3.2	3	11.8	434	78.9	2.6	3	12.3	418	76.4	2.4	3
17	12.2	347	78.9	3.1	4	11.9	416	80.6	2.9	8	11.7	361	79.3	2.5	8
18	12.2	374	80.4	2.5	4	12.7	386	79.6	4.2	2	12.3	361	80.7	2.6	2
19	12.4	401	80.8	3.6	8	11.9	389	81.2	3.4	8	11.4	361	79.8	2.6	10
20	11.8	406	80.9	3.0	8	11.6	411	80.3	3.1	15	11.3	393	79.4	2.9	10
21	12.4	372	81.1	3.1	3	11.8	397	81.7	3.1	5	12.0	384	81.4	2.5	5
22	11.4	345	80.4	3.2	3	11.7	357	81.4	3.4	6	12.1	367	82.6	3.0	8
23	10.9	292	79.0	3.2	30	11.4	362	81.4	3.1	22	11.6	325	81.5	3.1	15
24	11.9	381	81.2	3.1	15	12.0	356	80.1	3.4	16	11.8	322	80.8	3.0	29
25	12.0	339	78.7	3.7	27	13.1	240	78.2	3.8	25	11.7	361	78.8	3.5	35
26	12.6	362	79.0	3.4	16	13.3	305	80.2	3.7	13	12.2	348	79.9	3.5	22
27	12.9	365	80.6	3.4	5	13.6	328	79.1	3.7	8	12.0	411	79.8	3.3	7
28	12.6	343	80.6	3.2	37	13.1	298	78.8	3.4	31	12.2	372	79.0	3.7	34
29	-	-	-	-	-	12.6	421	85.0	2.8	1	-	-	-	-	-
30	13.9	432	82.4	3.1	6	13.0	407	76.9	4.2	1	-	-	-	-	-
31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32	12.1	415	82.1	3.1	3	12.2	396	82.6	3.5	1	11.5	278	81.6	2.9	5
33	11.4	468	80.7	3.2	6	-	-	-	-	-	11.8	372	78.6	3.5	9
34	11.7	407	83.8	3.1	5	11.5	436	82.3	2.2	11	12.3	416	80.3	2.6	5
35	11.6	456	81.0	3.1	12	11.9	415	80.6	2.9	8	11.8	386	79.7	3.2	14
36	12.0	473	82.4	2.9	7	12.7	432	82.2	2.9	8	12.8	348	81.2	3.1	10
Ave.	11.8	387	80.7	3.0	433	12.1	372	80.3	3.0	372	11.7	367	79.9	2.9	480

WEIGHTED AVERAGE QUALITY OVER 10 SEASONS



* Includes addition of 2 kg/hl according to Hectolitre mass Dispensation.

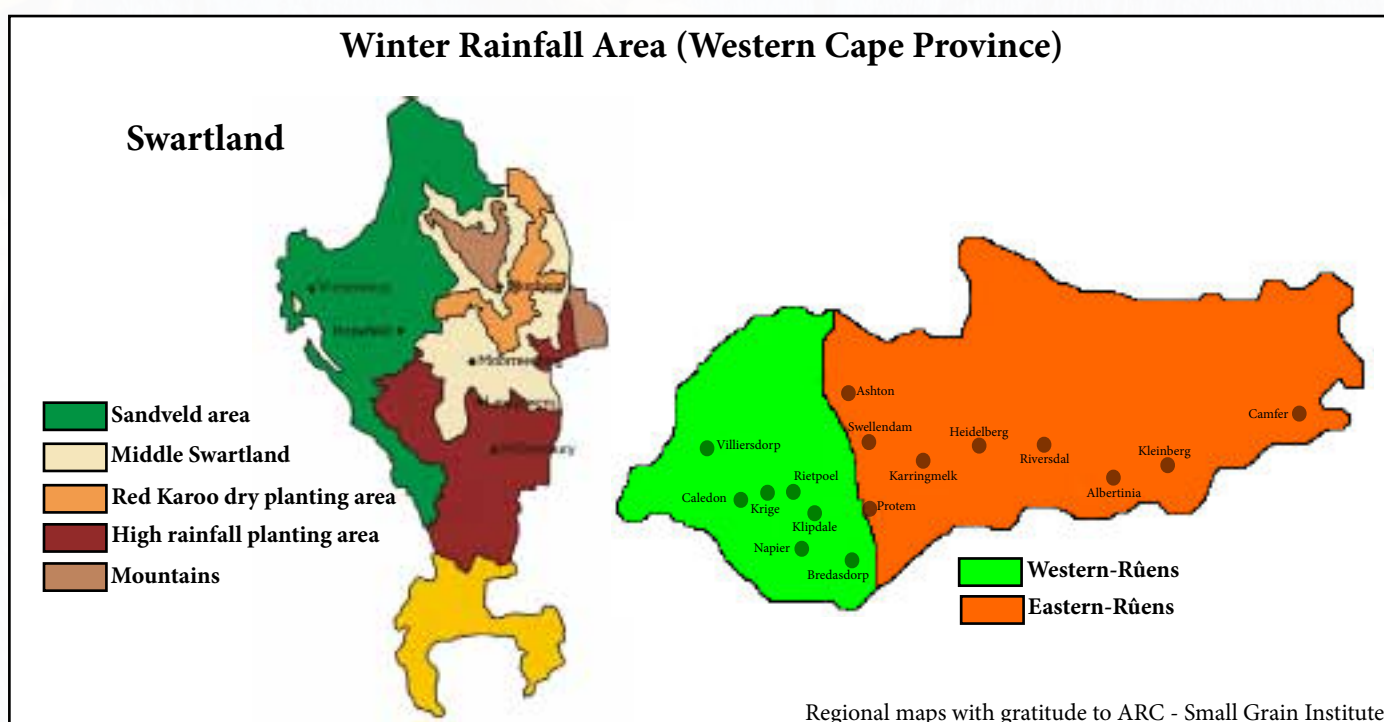
** Hectolitre mass determined using Kern 222 instrument.

REGIONAL QUALITY

WINTER RAINFALL AREA (Western Cape)

Production regions 1 to 6 fall within the winter rainfall area (Western Cape Province). Region 1 is Namaqualand, regions 2 to 4 are the Swartland area and regions 5 and 6 the Rûens area. The Western Cape had the highest production of all the provinces this season, namely 675 750 tons (35%) (CEC).

The hectolitre mass averaged 80.9 kg/hl. The thousand kernel mass averaged 38.2 gram, which is 1.7 g lower than the previous season. The average falling number was 412 seconds. The average whole wheat protein content of 11.6% (12% mb) was the lowest of the different production areas together with that of the Irrigation areas.



The screenings of 1.65% was lower than the previous season's 1.82%. The Bühler extraction averaged 73.3% (average of wheat grades B1 to B4, UT and COW) and the average colour of the flour was -2.9 KJ units. This colour indicates a very white flour that is preferred by millers and bakers.

The mixogram peak time (Quadromat mill) averaged 3.0 minutes. The average farinogram absorption was 61.2%. The average alveogram strength was 33.0 cm² and showed a 3.0 cm² increase on the previous season. The average strength on the extensogram was 78 cm². The alveogram strength in the Free State was 37.3 cm² and in the irrigation areas 33.6 cm².

The 100-gram baking test showed a very good relationship between protein content and bread volume.

SUMMER RAINFALL AREA

(Free State)

Production regions 21 to 28, which fall within the Free State Province, made the second highest contribution to the total production figure, namely 551 250 tons (29%) (CEC).

The 2.5 tons/ha average yield in the Free State was higher than the 1.9 tons/ha of the previous season, but still the lowest yield overall.

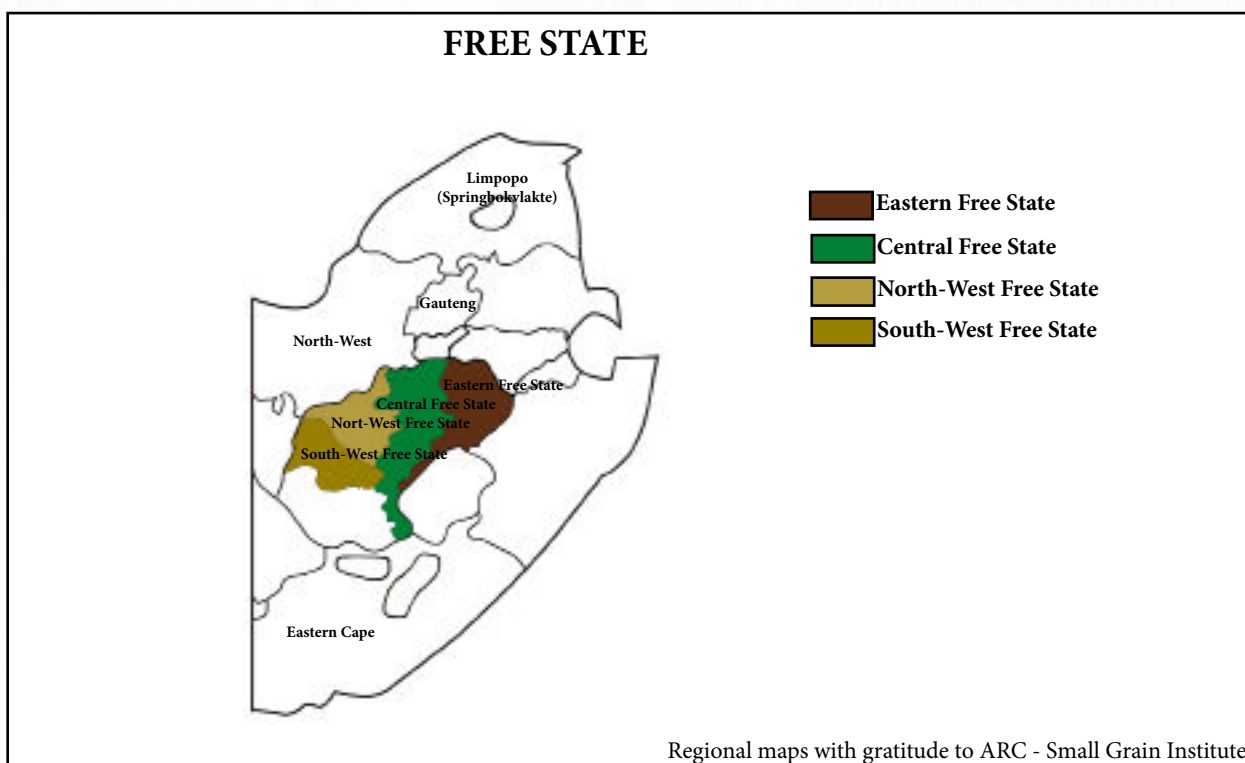
The average hectolitre mass was 79.8 kg/hl. The physical characteristic thousand kernel mass (35.1 g) was lower than the previous season's 38.1 g. The average screenings was 1.60%. The average protein content decreased from 12.6% the previous season to 12.0% (12% mb) this season. Despite the fact that the samples which gave the lowest falling number values overall in this survey originated in the Free State production regions, the average falling number of 339 seconds was still within the ideal range.

The mixogram (Quadromat) peak time of 3.3 minutes was slightly shorter than the previous season, still giving the Free State the longest average mixogram peak time of the different production areas.

The average Bühler extraction percentage in the Free State was 73.3% (73.7% previous season). The Kent Jones flour colour was -2.5 KJ units (-0.9 KJ units in the previous season).

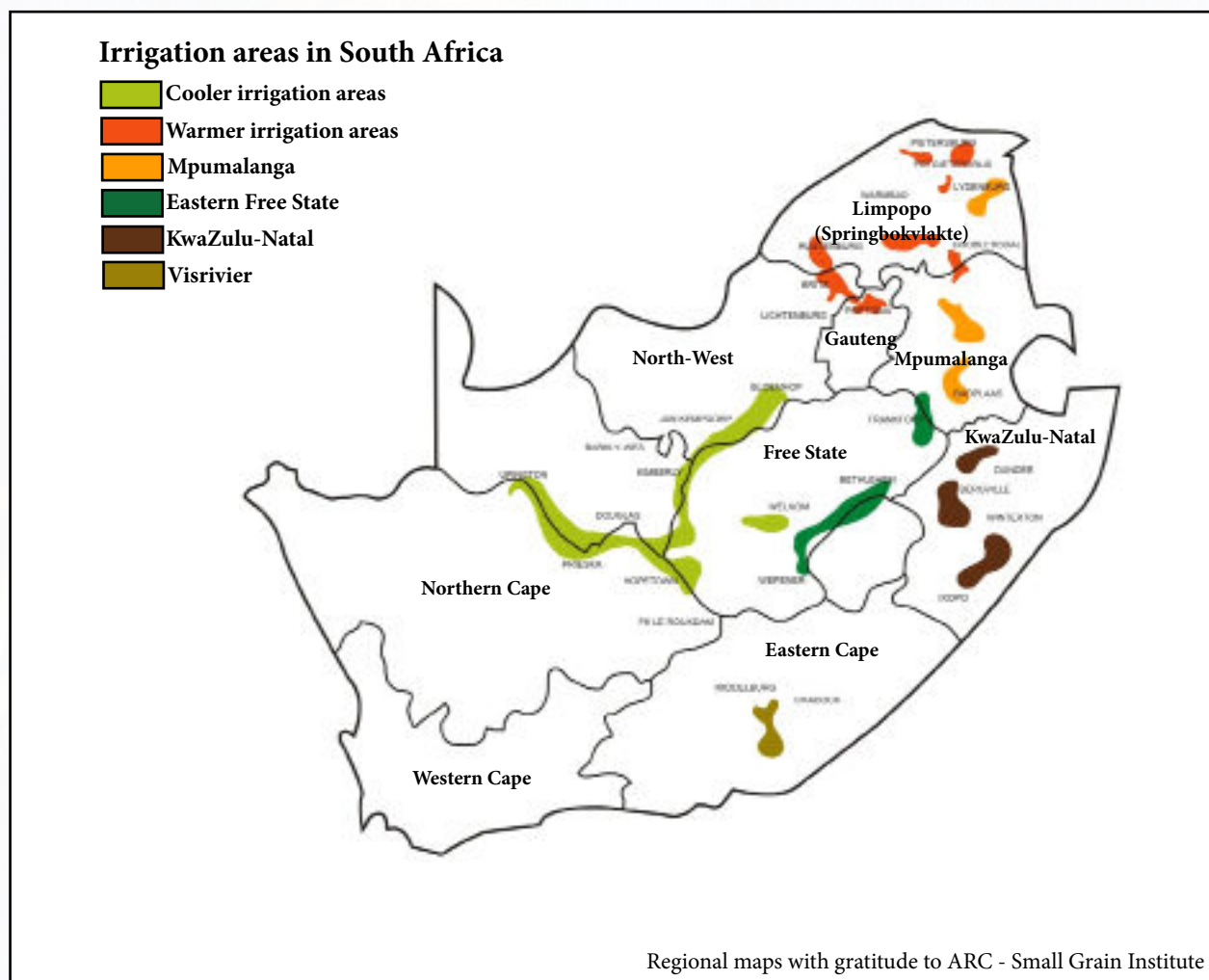
The average farinogram water absorption was 61.2%, compared to the 64.3% of 2010/2011. The overall farinogram water absorption decreased by 2% this season. The average alveogram strength was 37.3 cm² and extensogram strength 96 cm², both decreased from the previous season.

The 100-gram baking test showed that the relationship between protein content and bread volume was excellent between the different grades.



IRRIGATION AREAS

(Northern Cape, North West (plus other irrigation areas))



Production regions 7, 10 - 12, 14 - 20 and 36 falls within the irrigation areas. These areas produced 465 550 tons of wheat this season which is 24% of the total production.

The average hectolitre mass was 81.5 kg/hl and the thousand kernel mass was 40.7 g (40.3 g the previous season). The average falling number was 395 seconds. The average screenings was 1.45% and the protein averaged 11.6% (12% mb), 0.5% lower than in 2010/2011.

The average mixogram (Quadromat) peak time was 2.8 minutes which was equal to the previous season.

The average Bühler extraction percentage was 75.0 (76.0% during the previous season), with an average flour colour of -2.9 KJ units.

As with the average protein content, the average wet and dry contents also decreased this year, as can be expected. The Irrigation areas had the highest average wet and dry gluten content (29.4% and 10.1% respectively) this season, with the Western Cape the lowest (28.1% and 9.7%).

The average farinogram water absorption was 61.7% (62.8% during previous season), with an average farinogram development time of 4.4 minutes.

The average alveogram strength was 33.6 cm² and the average P/L 0.84 (36.0 cm² and 1.01 respectively the previous season).

The average extensogram strength was 89 cm². The relationship between protein content and 100 g bread volume was shown to be excellent.

OTHER SUMMER RAINFALL AND IRRIGATION AREAS (Mpumalanga, Limpopo and Gauteng)

Other summer rainfall regions, excluding the Free State, are mainly regions 30, 32, 33 (Mpumalanga), 34 (Gauteng) and 35 (Limpopo). They produced in total 212 730 tons during this season (11% of the total production).

The average hectolitre mass was 81.7 kg/hl, the highest of the four production areas. The average thousand kernel mass was 39.5 g (41.4 g the previous season).

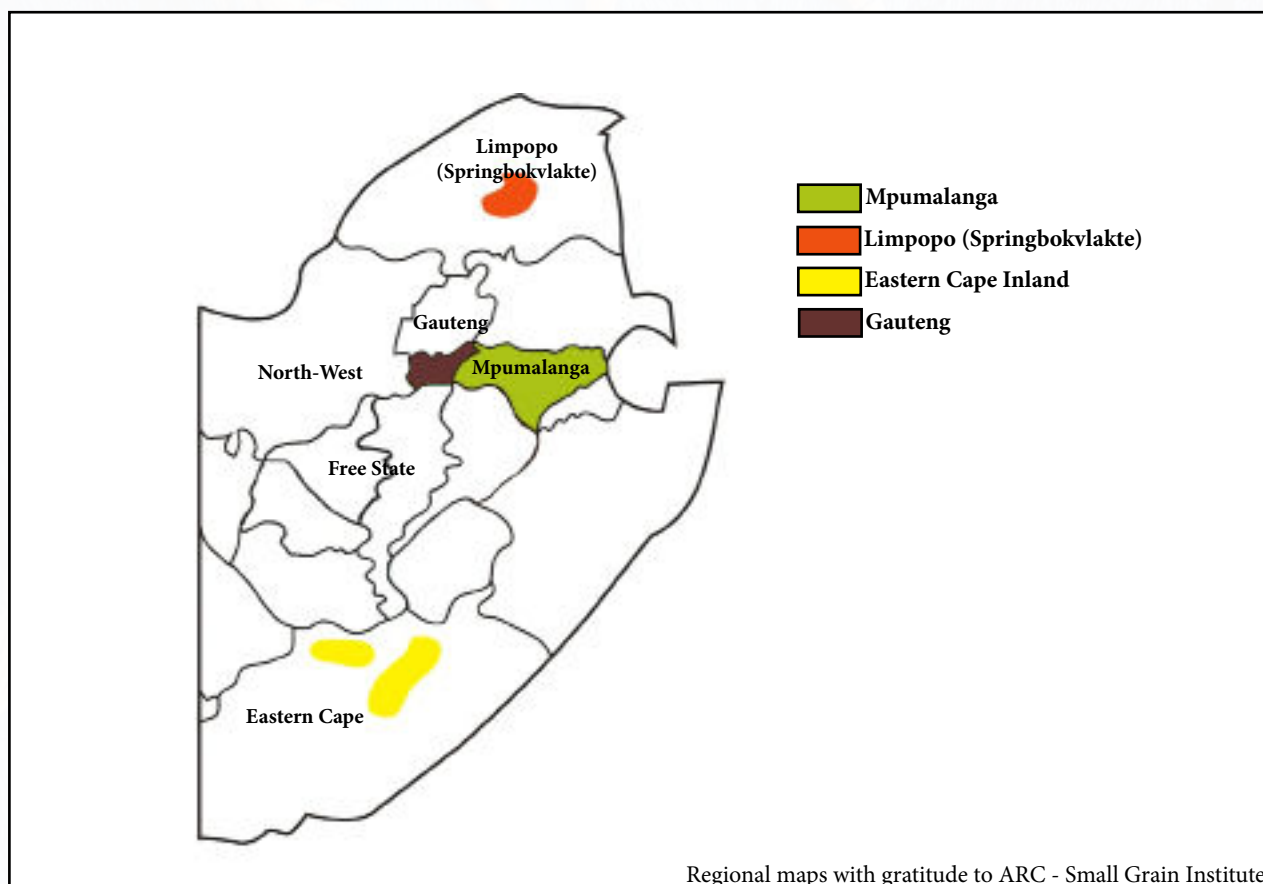
The average falling number was 442 seconds, with the average percentage screenings 1.36%. The average protein content was 12.1% (12% mb), which is 0.3% higher than the previous season.

The average mixogram (Quadromat) peak time was 3.1 minutes, 0.5 minutes longer than in the 2010/2011 season.

The average Bühler extraction was 75.2%, with an average colour of -2.7 KJ units (76.0% and -2.0 KJ units the previous season). The farinogram average water absorption was 60.9% (63.3% the previous season) and had an average development time of 4.4 minutes.

The average alveogram strength was 36.9 cm² and the average extensogram strength 98 cm², both significantly higher than in 2010/2011. The P/L values over the four production areas ranged from 0.82 locally to 0.98 in the Winter rainfall area. These four averages all fell within the optimum range.

The 100-gram baking test showed a very good relationship between protein content and bread volume.



REGIONAL QUALITY WEIGHTED AVERAGES

	<i>Winter rainfall area (Western Cape)</i>			<i>Summer rainfall area (Free State)</i>			<i>Irrigation areas</i>			<i>Other Summer rainfall and Irrigation areas</i>			<i>RSA average</i>		
Individual samples n	157			136			108			32			433		
Regions	1 - 6			21 - 28			7, 10 - 12, 14 - 20, 36			30 - 35			All		
Hectolitre mass dirty, kg/hl	80.9			79.8			81.5			81.7			80.7		
1000 kernel mass (13% mb), g	38.2			35.1			40.7			39.5			38.0		
Falling number, sec	412			339			395			442			387		
Screenings (1,8 mm), %	1.65			1.60			1.45			1.36			1.56		
Protein (12% mb), % (ww)	11.6			12.0			11.6			12.1			11.8		
Mixogram peak time, min (Quadromat)	3.0			3.3			2.8			3.1			3.0		
Individual samples per class and grade, n	<i>56</i>	<i>51</i>	<i>22</i>	<i>61</i>	<i>29</i>	<i>15</i>	<i>43</i>	<i>33</i>	<i>17</i>	<i>16</i>	<i>7</i>	<i>7</i>	<i>176</i>	<i>120</i>	<i>61</i>
	<i>11</i>	<i>15</i>	<i>2</i>	<i>15</i>	<i>8</i>	<i>8</i>	<i>12</i>	<i>1</i>	<i>2</i>	<i>1</i>	<i>1</i>	<i>0</i>	<i>39</i>	<i>25</i>	<i>12</i>
Composite samples per class and grade, n = 100	<i>B1</i>	<i>B2</i>	<i>B3</i>	<i>B1</i>	<i>B2</i>	<i>B3</i>	<i>B1</i>	<i>B2</i>	<i>B3</i>	<i>B1</i>	<i>B2</i>	<i>B3</i>	<i>B1</i>	<i>B2</i>	<i>B3</i>
	<i>B4</i>	<i>UT</i>	<i>COW</i>	<i>B4</i>	<i>UT</i>	<i>COW</i>	<i>B4</i>	<i>UT</i>	<i>COW</i>	<i>B4</i>	<i>UT</i>	<i>COW</i>	<i>B4</i>	<i>UT</i>	<i>COW</i>
Composite samples, n	<i>5</i>	<i>5</i>	<i>3</i>	<i>8</i>	<i>7</i>	<i>3</i>	<i>10</i>	<i>7</i>	<i>5</i>	<i>5</i>	<i>4</i>	<i>3</i>	<i>28</i>	<i>23</i>	<i>14</i>
	<i>3</i>	<i>5</i>	<i>1</i>	<i>5</i>	<i>2</i>	<i>1</i>	<i>6</i>	<i>0</i>	<i>0</i>	<i>1</i>	<i>1</i>	<i>0</i>	<i>15</i>	<i>8</i>	<i>2</i>
Bühler extraction, %	73.1	73.6	74.0	73.9	73.1	73.3	74.9	75.5	75.5	75.3	74.7	75.9	74.4	74.2	74.8
	72.9	72.5	75.4	73.5	72.0	71.2	74.4	-	-	75.0	75.7	-	73.8	72.8	73.3
Flour colour, KJ	-2.8	-3.0	-3.0	-2.5	-2.3	-2.8	-2.9	-2.9	-3.1	-2.8	-2.6	-2.8	-2.7	-2.7	-3.0
	-3.2	-2.8	-3.0	-2.6	-2.1	-2.9	-2.9	-	-	-1.8	-3.2	-	-2.8	-2.7	-3.0
Flour protein (12% mb), %	11.3	10.4	9.5	11.9	10.7	9.6	11.8	10.7	9.7	11.9	10.1	9.6	11.7	10.5	9.6
	8.7	11.1	9.6	10.0	9.4	9.9	9.5	-	-	10.5	11.1	-	9.6	10.6	9.7
Wet gluten (14% mb), %	31.4	27.8	24.5	32.0	28.7	25.3	32.5	29.6	27.2	31.7	26.7	26.2	32.0	28.4	26.0
	24.6	29.9	24.9	26.6	25.4	26.2	25.7	-	-	29.0	28.0	-	26.0	28.5	25.6
Dry gluten (14% mb), %	10.8	9.8	8.4	11.2	9.9	8.5	11.1	10.3	9.3	11.2	9.1	8.8	11.1	9.8	8.8
	8.6	10.2	8.7	9.1	8.5	9.3	8.7	-	-	9.4	9.9	-	8.8	9.7	9.0
Farinogram:	62.0	61.5	61.1	62.2	61.4	60.7	62.6	61.5	61.5	62.4	60.5	59.9	62.3	61.3	60.9
Water absorption (14% mb), %	59.8	61.3	59.5	60.5	59.4	60.6	60.5	-	-	58.8	60.1	-	60.3	60.7	60.1
Farinogram:	5.1	4.0	2.8	5.6	3.7	2.9	5.6	4.5	3.5	5.9	2.8	3.3	5.6	3.8	3.2
Development time, min	1.9	4.5	4.0	2.9	3.1	2.2	3.0	-	-	4.0	6.2	-	2.8	3.1	4.4
Alveogram:	37.9	32.9	29.1	44.4	38.0	32.3	40.1	32.5	27.6	44.5	34.5	29.7	41.7	34.6	29.4
Strength (S), cm²	26.5	35.4	27.8	33.3	25.7	33.0	29.2	-	-	26.5	40.8	-	29.8	33.7	30.4
Alveogram:	0.78	1.04	1.21	0.79	0.96	1.10	0.82	0.76	0.87	0.75	0.99	0.77	0.79	0.92	0.97
P/L	1.24	0.86	0.87	0.96	0.98	0.93	0.93	-	-	0.48	0.97	-	0.97	0.90	0.90
Extensogram:	90	75	64	119	94	86	108	87	67	121	92	76	110	87	72
Strength, cm²	60	89	67	82	65	97	77	-	-	64	117	-	74	86	82
Mixogram peak time, min	2.8	2.9	3.0	3.1	3.2	3.2	2.7	2.7	2.5	3.0	3.2	2.9	2.9	3.0	2.8
	3.4	3.3	2.8	3.1	2.9	3.5	3.0	-	-	2.8	3.8	-	3.1	3.3	3.2
Relationship between protein and bread volume	VG	EX	VG	EX	EX	EX	EX	EX	EX	VG	VG	EX	EX	EX	EX
	VG	G	G	EX	EX	EX	EX	-	-	VG	EX	-	EX	VG	VG

EX = Excellent

VG = Very Good

G = Good

Comparison of Flour Quality over the last four seasons

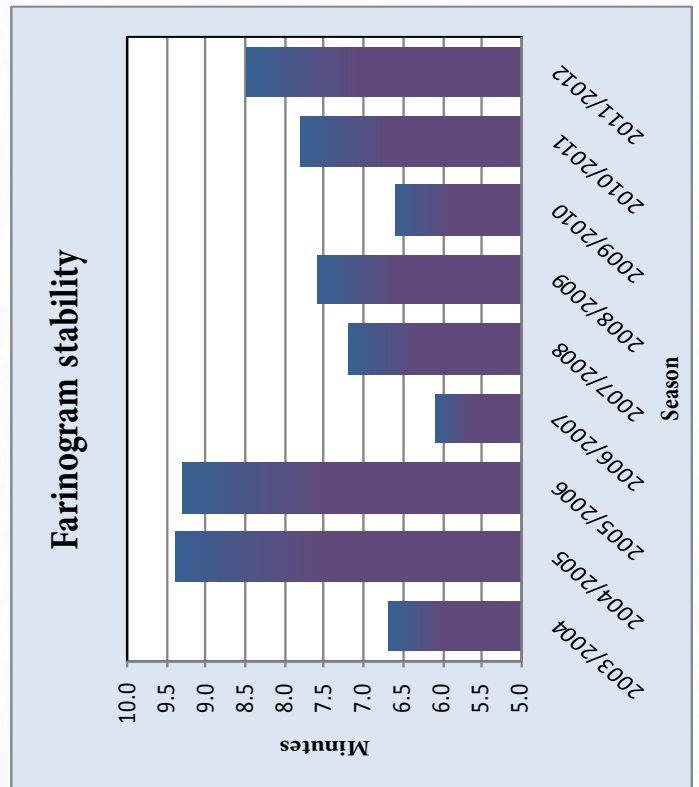
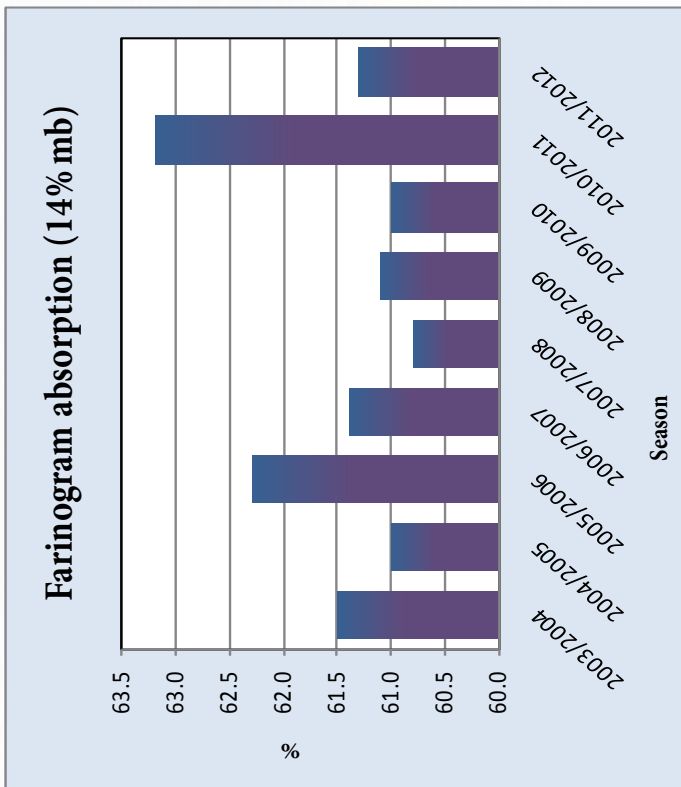
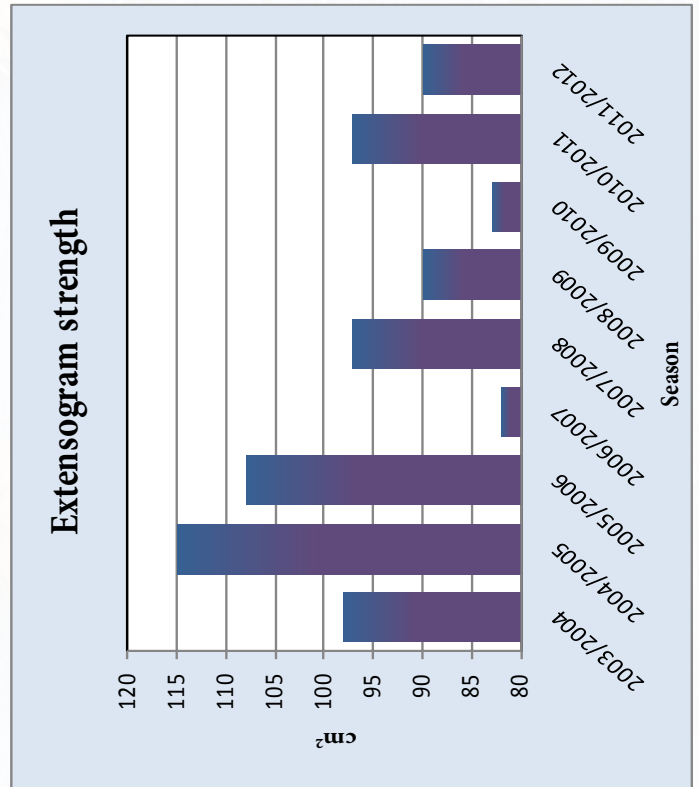
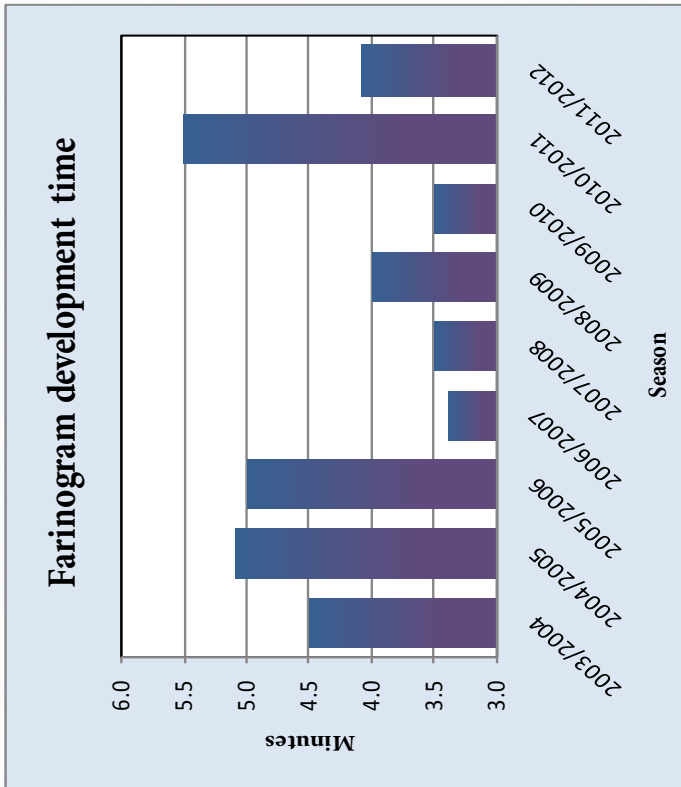
Flour Quality 2011/2012 season			
Flour protein (12% mb) (%)	10.6	Farinogram abs. (14% mb) (%)	61.3
Bread volume 100g (cm ³)	852	Farinogram dev. time (min.)	4.1
Mixogram (Bühler) peak time (min)	3.0	Alveogram strength (cm ²)	35.0
Wet gluten (14% mb) (%)	28.7	Alveogram P/L	0.89
Dry gluten (14% mb) (%)	9.9	Extensogram strength (cm ²)	90

Flour Quality 2010/2011 season			
Flour protein (12% mb) (%)	11.0	Farinogram abs. (14% mb) (%)	63.2
Bread volume 100g (cm ³)	832	Farinogram dev. time (min.)	5.5
Mixogram (Bühler) peak time (min)	2.8	Alveogram strength (cm ²)	36.2
Wet gluten (14% mb) (%)	29.7	Alveogram P/L	1.29
Dry gluten (14% mb) (%)	10.4	Extensogram strength (cm ²)	97

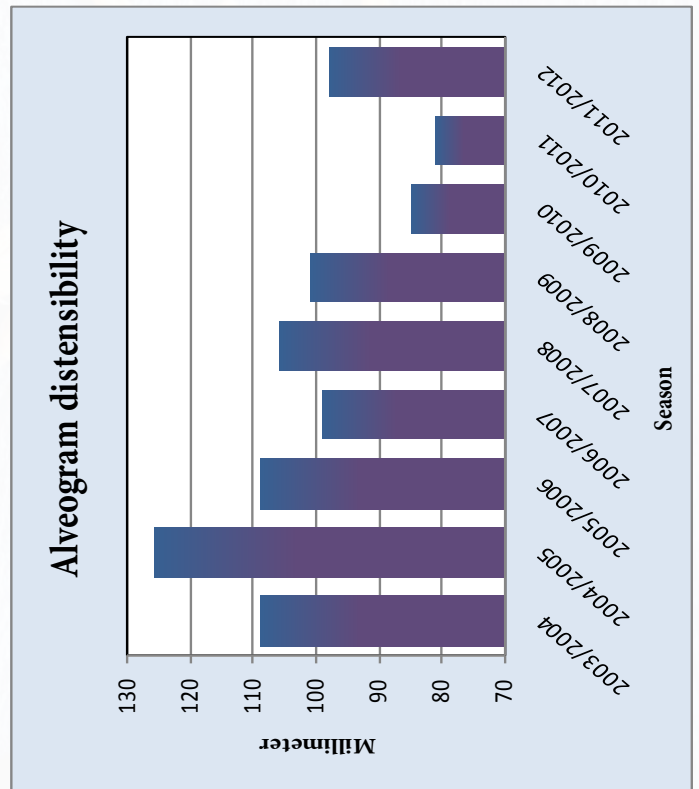
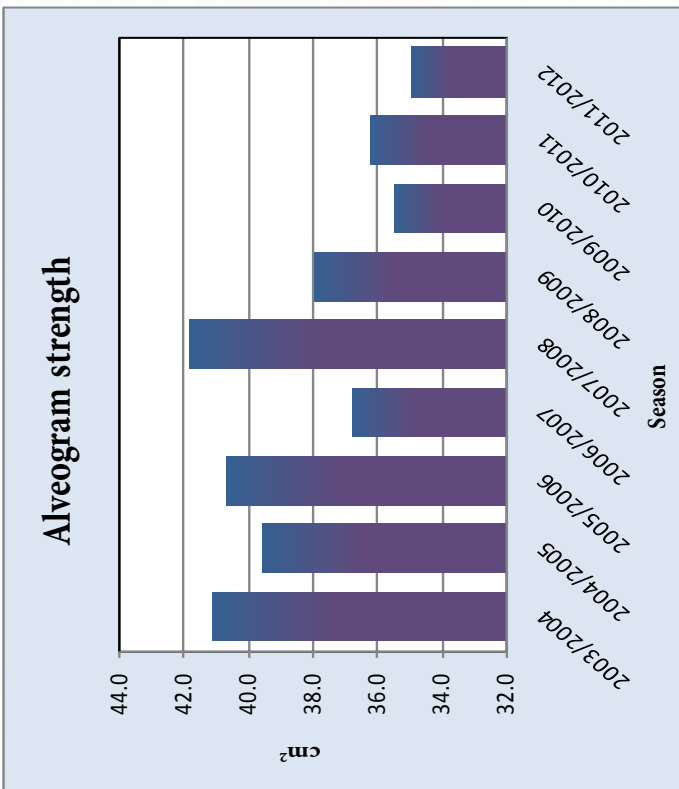
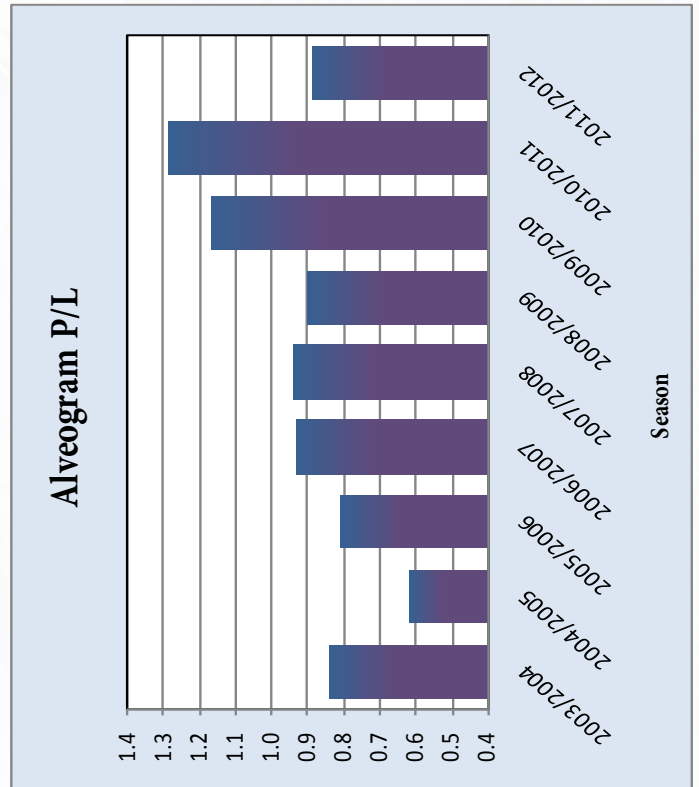
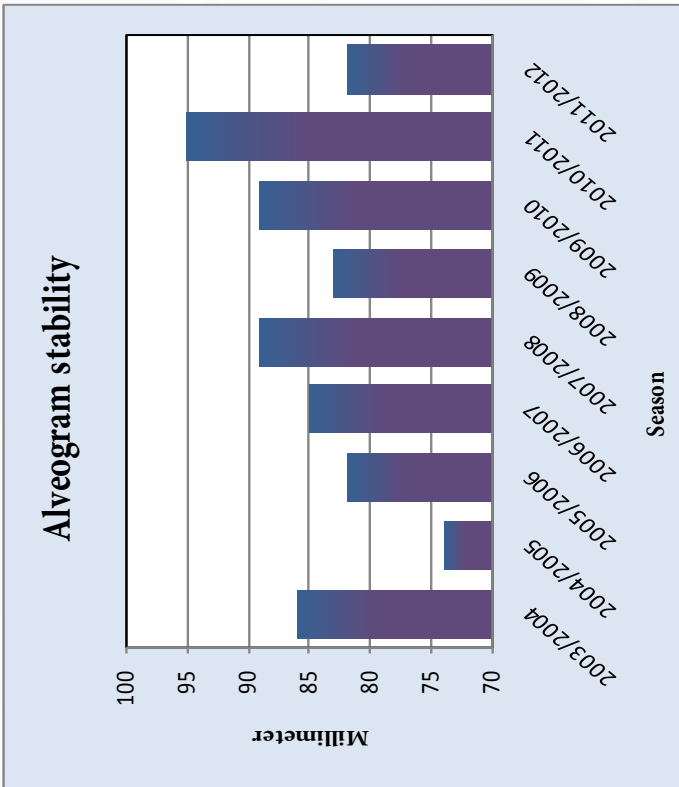
Flour Quality 2009/2010 season			
Flour protein (12% mb) (%)	10.5	Farinogram abs. (14% mb) (%)	61.0
Bread volume 100g (cm ³)	843	Farinogram dev. time (min.)	3.5
Mixogram (Bühler) peak time (min)	2.6	Alveogram strength (cm ²)	35.5
Wet gluten (14% mb) (%)	28.6	Alveogram P/L	1.17
Dry gluten (14% mb) (%)	10.0	Extensogram strength (cm ²)	83

Flour Quality 2008/2009 season			
Flour protein (12% mb) (%)	11.1	Farinogram abs. (14% mb) (%)	61.1
Bread volume 100g (cm ³)	902	Farinogram dev. time (min.)	4.0
Mixogram (Bühler) peak time (min)	2.6	Alveogram strength (cm ²)	38.0
Wet gluten (14% mb) (%)	-	Alveogram P/L	0.90
Dry gluten (14% mb) (%)	-	Extensogram strength (cm ²)	90

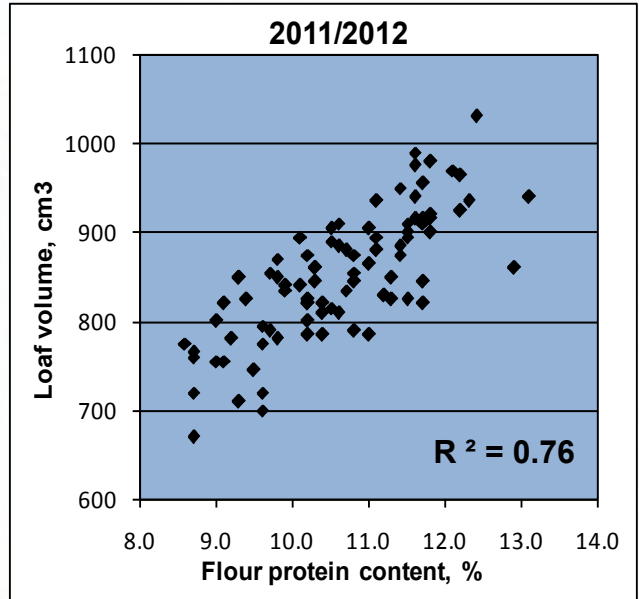
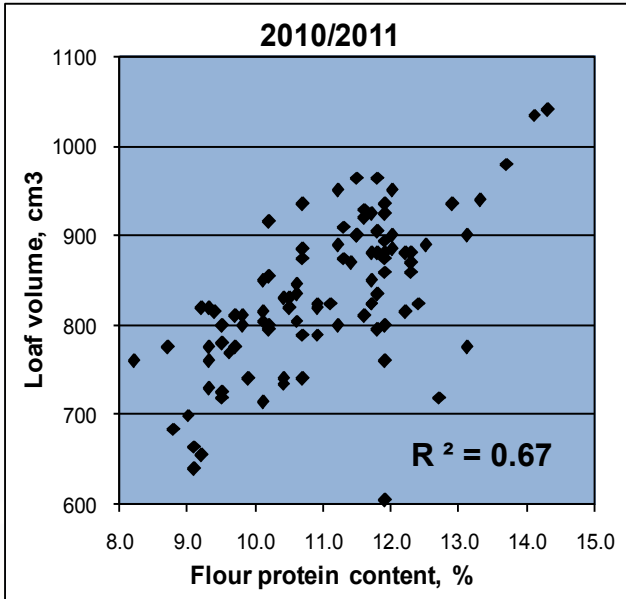
Comparison of rheological quality over seasons



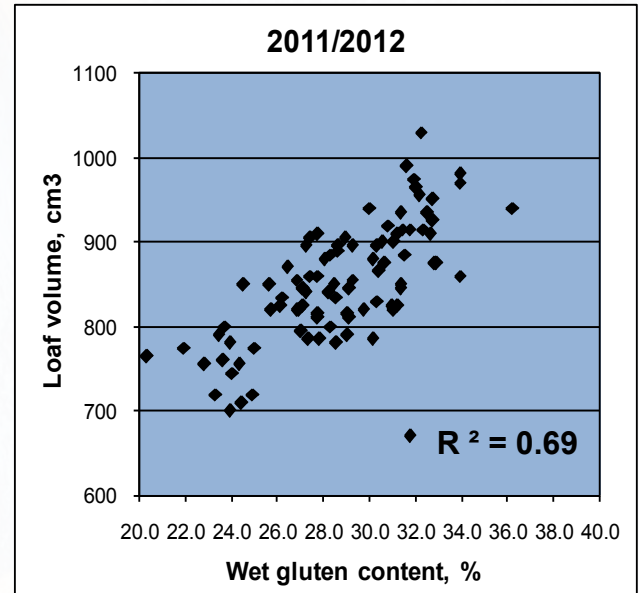
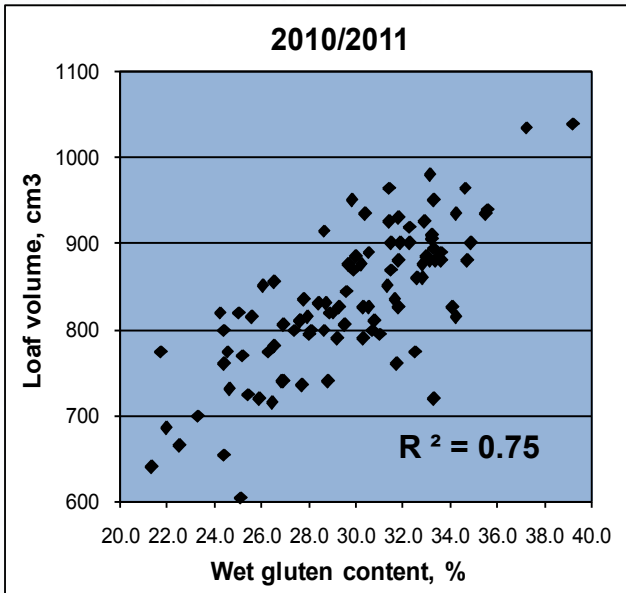
Comparison of rheological quality over seasons (continue)



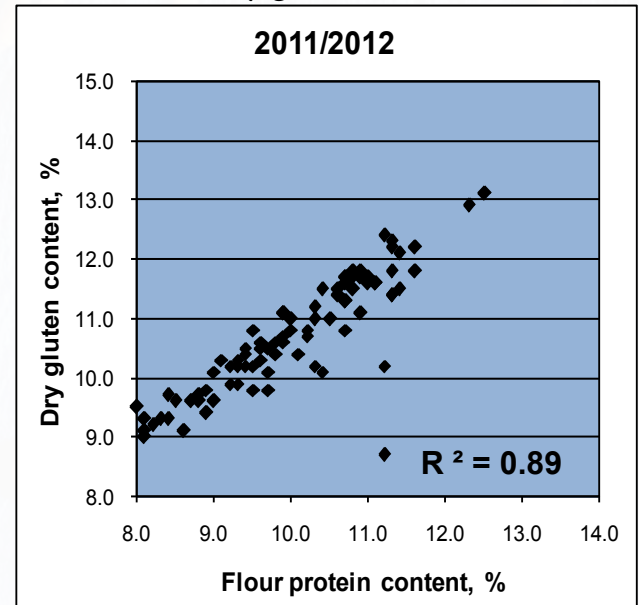
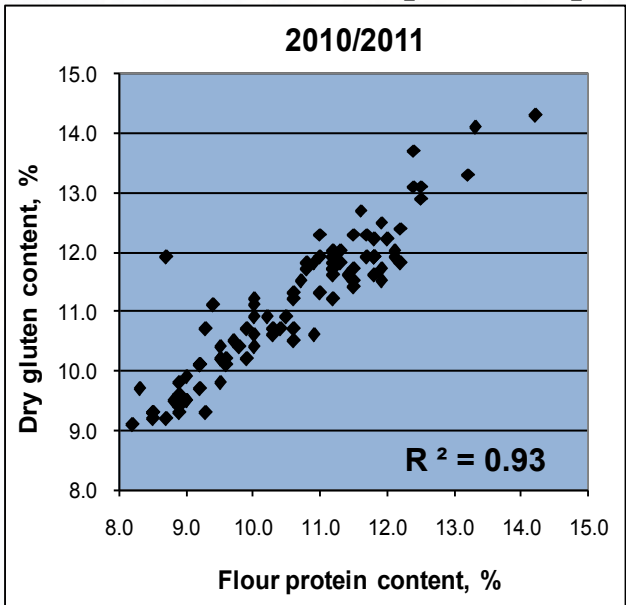
Comparison of protein content vs loaf volume



Comparison of wet gluten content vs loaf volume



Comparison of protein content vs dry gluten content



Cultivars

In the Western Cape, SST 027 (33%) and SST 88 (32%) dominated the market. SST 015 (25%) was also a popular cultivar.

Farmers in the Vaal and Orange River areas preferred SST 835 (36%), Duzi (27%) and SST 843 (18%).

The most preferred cultivars in the North West were SST 835 (26%) and SST 843 (24%), followed by Duzi (15%).

Regions 21 to 24 of the Free State were dominated by SST 843 (29%), SST 835 (23%) and PAN 3120 (15%). Elands dominated regions 25 to 28 (31%). SST 356, Matlabas and SST 835 were also popular cultivars with 20%, 11% and 9% respectively.

In the Eastern Cape, Mpumalanga, Gauteng, Limpopo and KwaZulu-Natal, SST 843 (35%) was the dominant cultivar, followed by SST 835 (30%) and Duzi (16%).

The above information was calculated from the cultivar identification done on all 344 crop samples.

WHEAT SEED SOLD BY COMMERCIAL GRAIN SILO OWNERS TO WHEAT PRODUCERS FOR THE 2011 PLANTING SEASON

<u>Cultivar</u>	<u>%</u>	<u>Cultivar</u>	<u>%</u>
SST 027	14.66	PAN 3355	0.24
SST 056	13.31	Gariep	0.23
SST 835	12.81	Baviaans	0.20
Duzi	10.20	SST 826	0.19
SST 88	9.66	Buffels	0.15
SST 843	8.48	SST 374	0.12
SST 015	5.77	SST 866	0.11
SST 047	4.49	PAN 3368	0.10
SST 356	3.47	PAN 3379	0.099
CRN 826	2.97	PAN 3471	0.078
SST 822	1.92	Steenbras	0.073
Elands	1.77	PAN 3434	0.060
Krokodil	1.45	PAN 3478	0.052
SST 806	1.20	PAN 3144	0.038
SST 877	1.10	SST 884	0.035
SST 347	0.92	SST 387	0.033
SST 875	0.88	Komati	0.026
Kariega	0.82	Olifants	0.023
SST 876	0.76	SST 895	0.013
Matlabas	0.46	Scheepers 69	0.011
SST 867	0.38	PAN 3377	0.006
PAN 3118	0.37	SST 322	0.002
PAN 3120	0.25	SST 334	<u>0.0004</u>
			100

Note: These figures are not absolute, but the best and only figures available.

Mycotoxins

Mycotoxins are secondary metabolites produced by fungi on agricultural commodities intended for human and animal consumption. These mycotoxins are potentially dangerous to humans and animals since they are, amongst other also carcinogens. Aside from health risks, mycotoxin contamination can also reduce the value of the crops. Environmental factors such as temperature, humidity, soil and storage conditions influence toxin production.

During 2010 SAGL implemented a multi-mycotoxin screening method using UPLC-MS/MS. With this technique simultaneous quantification and confirmation of Aflatoxin G₁; B₁; G₂; B₂, Fumonisin B₁; B₂; B₃, Deoxynivalenol, T2-toxin, Zearalenone and Ochratoxin A are possible in one run.

Fourty samples (representing different regions as well as different classes and grades) were selected randomly for mycotoxin analyses.

Deoxynivalenol were detected on two of the samples tested.

The European Union specifies the following maximum levels for mycotoxins on wheat:

Aflatoxins

- All cereals and all products derived from cereals, including processed cereal products, with the exception of maize, rice, processed cereal-based foods for infants and young children and dietary foods for special medical purposes intended specifically for infants, B₁ ≤ 2.0 µg/kg.
- All cereals and all products derived from cereals, including processed cereal products, with the exception of maize, rice, processed cereal-based foods for infants and young children and dietary foods for special medical purposes intended specifically for infants, sum of B₁ + B₂ + G₁ + G₂ ≤ 4.0 µg/kg.

Ochratoxin A

- Unprocessed cereals, ≤ 5.0 µg/kg.
- All products derived from unprocessed cereals, including processed cereal products and cereals intended for direct human consumption, ≤ 3.0 µg/kg.

Deoxynivalenol

- Unprocessed cereals other than durum wheat, oats and maize, ≤ 1250 µg/kg.
- Cereals intended for direct human consumption, cereal flour, bran and germ as end product marketed for direct human consumption, with the certain exceptions (see full regulation) ≤ 750 µg/kg.
- Bread (including small bakery wares), pastries, biscuits, cereal snacks and breakfast cereals, ≤ 500 µg/kg.

Zearalenone

- Unprocessed cereals other than maize ≤ 100 µg/kg.
- Cereals intended for direct human consumption, cereal flour, bran and germ as end product marketed for direct human consumption and the germ with the certain exceptions (see full regulation) ≤ 75 µg/kg.
- Bread (including small bakery wares), pastries, biscuits, cereal snacks and breakfast cereals, excluding maize-snacks and maize-based breakfast cereals, ≤ 50 µg/kg.

Mycotoxin results for the 2011/2012 season

Region	Grade	Aflatoxin µg/kg				Fumonisin µg/kg			DON µg/kg	Ochratoxin A µg/kg	Zearalenone µg/kg	T2 - Toxin µg/kg
		G ₁	B ₁	G ₂	B ₂	B ₁	B ₂	B ₃				
		LOD										
		5 µg/kg	5 µg/kg	5 µg/kg	5 µg/kg	100 µg/kg	40 µg/kg	40 µg/kg	100 µg/kg	5 µg/kg	20 µg/kg	20 µg/kg
1	UT	0	0	0	0	0	0	0	0	0	0	0
2	B1	0	0	0	0	0	0	0	0	0	0	0
3	B1	0	0	0	0	0	0	0	0	0	0	0
3	B2	0	0	0	0	0	0	0	0	0	0	0
4	B2	0	0	0	0	0	0	0	0	0	0	0
4	B3	0	0	0	0	0	0	0	0	0	0	0
5	B1	0	0	0	0	0	0	0	0	0	0	0
5	B2	0	0	0	0	0	0	0	0	0	0	0
6	B2	0	0	0	0	0	0	0	0	0	0	0
6	B3	0	0	0	0	0	0	0	0	0	0	0
7	B2	0	0	0	0	0	0	0	0	0	0	0
10	B1	0	0	0	0	0	0	0	0	0	0	0
10	B2	0	0	0	0	0	0	0	0	0	0	0
11	B1	0	0	0	0	0	0	0	0	0	0	0
11	B2	0	0	0	0	0	0	0	0	0	0	0
12	B1	0	0	0	0	0	0	0	0	0	0	0
14	B4	0	0	0	0	0	0	0	0	0	0	0
15	B3	0	0	0	0	0	0	0	0	0	0	0
16	B4	0	0	0	0	0	0	0	0	0	0	0
17	B1	0	0	0	0	0	0	0	0	0	0	0
18	B1	0	0	0	0	0	0	0	0	0	0	0
19	B1	0	0	0	0	0	0	0	0	0	0	0
20	B1	0	0	0	0	0	0	0	0	0	0	0
21	B1	0	0	0	0	0	0	0	0	0	0	0
22	B2	0	0	0	0	0	0	0	0	0	0	0
23	B2	0	0	0	0	0	0	0	0	0	0	0
23	B4	0	0	0	0	0	0	0	0	0	0	0
24	B3	0	0	0	0	0	0	0	0	0	0	0
25	B1	0	0	0	0	0	0	0	0	0	0	0
25	B3	0	0	0	0	0	0	0	0	0	0	0
26	B1	0	0	0	0	0	0	0	0	0	0	0
27	B1	0	0	0	0	0	0	0	0	0	0	0
28	B1	0	0	0	0	0	0	0	0	0	0	0
28	B2	0	0	0	0	0	0	0	119	0	0	0
30	B1	0	0	0	0	0	0	0	0	0	0	0
32	B1	0	0	0	0	0	0	0	0	0	0	0
33	B3	0	0	0	0	0	0	0	0	0	0	0
34	B1	0	0	0	0	0	0	0	111	0	0	0
35	B2	0	0	0	0	0	0	0	0	0	0	0
36	B1	0	0	0	0	0	0	0	0	0	0	0
Average		0	0	0	0	0	0	0	6	0	0	0
Number of samples		40	40	40	40	40	40	40	40	40	40	40

Note: All results <LOD and non detected are reported as 0 for calculation purposes

LOD: Limit of detection, see table

µg/kg = ppb (parts per billion)

**SOUTH AFRICAN
WINTER RAINFALL WHEAT
Western Cape Province**

PRODUCTION REGION	(1) Namaqualand						(2) Swartland Western Region					
	Intake silos											
	Bitterfontein Graafwater Landplaas Vanrhynsdorp Vredendal						Bergrivier Darling Koperfontein Vredenburg					
WHEAT												
	ave	min	max	stdev		ave	min	max	stdev			
Protein (12% mb), %	11.9	10.7	13.1	1.20		12.3	11.2	13.3	0.63			
Falling number, sec	394	375	418	21.83		421	359	456	27.37			
1000 Kernel mass (13% mb), g	34.2	33.0	34.8	1.01		35.4	31.7	41.0	2.97			
Hectolitre mass (dirty), kg/hl	80.4	78.8	81.4	1.38		77.9	75.0	79.4	1.38			
Screenings (<1.8mm), %	4.41	4.09	4.88	0.41		2.64	0.68	6.00	1.48			
Total damaged kernels, %	0.64	0.42	1.02	0.33		0.41	0.28	0.64	0.10			
Number of samples	3						14					
CULTIVARS												
	SST 027 33.0						SST 88 49.0					
cultivars	SST 015 25.0						SST 027 30.4					
with highest %	SST 047 15.7						SST 015 17.6					
occurrence	SST 88 15.7						SST 047 3.1					
	SST 825 7.0											
Number of samples	3						14					
MIXOGRAM (Quadromat)												
	ave	min	max	stdev		ave	min	max	stdev			
Peak time, min	3.2	2.8	3.5	0.35		3.0	2.2	3.5	0.42			
Tail height (6min), mm	49	44	55	5.57		51	48	53	1.75			
Number of samples	3						14					
BÜHLER EXTRACTION, %												
	B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW
	-	-	-	-	72.0	-	72.4	73.9	-	-	71.3	-
FLOUR												
Protein (12% mb), %	-	-	-	-	10.8	-	11.7	10.2	-	-	11.2	-
Colour, KJ	-	-	-	-	-2.6	-	-2.6	-2.9	-	-	-2.5	-
GLUTEN												
Wet gluten (14% mb), %	-	-	-	-	29.0	-	31.3	26.8	-	-	30.3	-
Dry gluten (14% mb), %	-	-	-	-	10.0	-	10.9	9.2	-	-	10.3	-
FARINOGRAM												
Water absorption (14% mb), %	-	-	-	-	61.3	-	61.4	59.9	-	-	61.1	-
Development time, min	-	-	-	-	3.4	-	4.3	4.7	-	-	5.3	-
Stability, min	-	-	-	-	9.4	-	11.1	9.1	-	-	10.6	-
Mixing tolerance index, BU	-	-	-	-	26	-	30	35	-	-	33	-
EXTENSOGRAM (45 min pull)												
Area, cm ²	-	-	-	-	89	-	106	86	-	-	93	-
Maximum height, BU	-	-	-	-	376	-	386	334	-	-	366	-
Extensibility, mm	-	-	-	-	167	-	193	182	-	-	181	-
ALVEOGRAM												
Strength (S), cm ²	-	-	-	-	34.2	-	36.9	32.7	-	-	34.6	-
Stability (P), mm	-	-	-	-	85	-	83	77	-	-	86	-
Distensibility (L), mm	-	-	-	-	90	-	106	101	-	-	94	-
Configuration ratio (P/L)	-	-	-	-	0.94	-	0.78	0.76	-	-	0.91	-
MIXOGRAM												
Peak time, min	-	-	-	-	3.2	-	2.9	2.9	-	-	2.9	-
100g BAKING TEST												
Loaf volume, cm ³	-	-	-	-	790	-	845	820	-	-	830	-
Evaluation	-	-	-	-	2	-	2	0	-	-	1	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

1

2

FARINOGRAM

1

2

EXTENSOGRAM

1

2

ALVEOGRAM

1

2

**SOUTH AFRICAN
WINTER RAINFALL WHEAT
Western Cape Province**

PRODUCTION REGION	(3) Swartland Central Region				(4) Swartland Eastern Region							
	Intake silos				Intake silos							
	Eendekuil				Ceres							
	Klipheuwel				Gouda							
	Koringberg				Halfmanshof							
	Malmesbury				Leliedam							
	Moorreesburg				Porterville							
	Moravia				Riebeeck-Wes							
	Piketberg											
	Pools											
	Ruststasie											
WHEAT												
	ave	min	max	stdev	ave	min	max	stdev				
Protein (12% mb), %	11.7	9.5	13.0	0.96	11.4	9.5	13.0	0.97				
Falling number, sec	412	292	472	29.45	406	347	454	28.66				
1000 Kernel mass (13% mb), g	37.9	31.3	46.0	2.93	36.2	32.5	39.6	1.95				
Hectolitre mass (dirty), kg/hl	81.2	78.3	84.2	1.27	80.8	77.6	83.2	1.09				
Screenings (<1.8mm), %	1.56	0.20	2.92	0.81	0.74	0.08	5.00	1.22				
Total damaged kernels, %	0.52	0.08	2.86	0.45	0.59	0.18	1.62	0.37				
Number of samples	55				37							
CULTIVARS												
	SST 88		35.1		SST 027		30.8					
cultivars	SST 027		31.1		SST 015		29.8					
with highest %	SST 015		29.2		SST 88		26.4					
occurrence	SST 047		3.4		SST 047		7.2					
	Kariega, SST 056		0.4		SST 57		4.7					
Number of samples	55				37							
MIXOGRAM (Quadromat)												
	ave	min	max	stdev	ave	min	max	stdev				
Peak time, min	3.1	2.5	3.8	0.31	3.0	2.2	4.0	0.30				
Tail height (6min), mm	51	40	59	3.40	49	42	56	3.74				
Number of samples	55				37							
BÜHLER EXTRACTION, %	B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW
	73.2	73.3	73.7	72.8	72.3	-	72.6	73.1	73.7	73.3	73.0	-
FLOUR												
Protein (12% mb), %	11.5	10.5	9.5	8.7	11.7	-	11.5	10.4	9.6	8.6	10.6	-
Colour, KJ	-2.9	-3.0	-2.9	-3.2	-3.0	-	-2.8	-3.2	-3.2	-3.3	-3.0	-
GLUTEN												
Wet gluten (14% mb), %	31.2	27.7	24.0	20.3	31.0	-	30.5	27.7	25.0	21.9	29.1	-
Dry gluten (14% mb), %	10.6	9.7	8.0	7.1	10.7	-	10.4	9.8	8.8	7.5	9.8	-
FARINOGRAM												
Water absorption (14% mb), %	62.4	61.5	61.8	60.0	60.9	-	61.5	60.8	59.3	58.4	60.9	-
Development time, min	5.2	3.2	2.8	1.7	4.5	-	4.5	4.2	3.2	2.0	4.5	-
Stability, min	10.3	8.3	7.0	5.8	9.1	-	10.1	8.0	7.7	6.1	7.5	-
Mixing tolerance index, BU	35	26	37	44	33	-	32	41	36	42	47	-
EXTENSOGRAM (45 min pull)												
Area, cm ²	92	91	74	69	117	-	86	74	75	67	74	-
Maximum height, BU	343	350	328	320	399	-	336	313	304	310	302	-
Extensibility, mm	190	181	160	153	210	-	184	167	176	156	175	-
ALVEOGRAM												
Strength (S), cm ²	40.4	35.9	31.7	28.1	41.9	-	37.9	32.1	30.3	26.3	34.7	-
Stability (P), mm	91	92	93	89	79	-	80	82	75	70	78	-
Distensibility (L), mm	105	86	74	65	124	-	110	86	94	93	109	-
Configuration ratio (P/L)	0.87	1.07	1.26	1.37	0.64	-	0.73	0.95	0.80	0.75	0.72	-
MIXOGRAM												
Peak time, min	2.8	2.8	3.1	3.8	2.9	-	3.0	3.2	3.0	3.3	4.8	-
100g BAKING TEST												
Loaf volume, cm ³	825	815	745	765	820	-	900	810	775	775	810	-
Evaluation	2	1	1	0	3	-	0	0	0	0	1	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

3

4

FARINOGRAM

3

4

EXTENSOGRAM

3

4

ALVEOGRAM

3

4

**SOUTH AFRICAN
WINTER RAINFALL WHEAT
Western Cape Province**

PRODUCTION REGION	(5) Rüens Western Region				(6) Rüens Eastern Region							
	Intake silos											
	Bredasdorp Caledon Klipdale Krige Napier Protem Rietpoel Villiersdorp				Albertinia Ashton Camfer Heidelberg Karringmelksrivier Kleinberg Protem Riversdal Swellendam							
WHEAT												
	ave	min	max	stdev	ave	min	max	stdev				
Protein (12% mb), %	11.9	10.3	13.0	0.62	11.1	9.4	13.6	1.17				
Falling number, sec	420	386	488	26.12	413	350	476	29.21				
1000 Kernel mass (13% mb), g	39.8	33.3	43.3	1.96	42.5	35.7	48.5	3.64				
Hectolitre mass (dirty), kg/hl	82.0	76.7	83.5	1.66	81.1	79.3	82.6	0.96				
Screenings (<1.8mm), %	2.09	0.18	4.03	0.85	1.89	0.50	9.00	1.65				
Total damaged kernels, %	0.77	0.06	2.50	0.67	0.85	0.18	1.74	0.42				
Number of samples	25				23							
CULTIVARS												
		SST 027	39.4			SST 88	39.8					
cultivars		SST 88	28.7			SST 027	32.3					
with highest %		SST 015	24.4			SST 015	23.0					
occurrence		SST 047	6.8			SST 056	2.0					
		SST 825	0.5			SST 047	1.7					
Number of samples	25				23							
MIXOGRAM (Quadromat)												
	ave	min	max	stdev	ave	min	max	stdev				
Peak time, min	2.9	2.6	3.2	0.18	2.6	2.2	3.0	0.22				
Tail height (6min), mm	51	47	55	2.35	48	42	55	3.68				
Number of samples	25				23							
BÜHLER EXTRACTION, %	B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW
	73.8	73.7	-	-	-	75.4	73.4	74.2	74.5	72.6	74.0	-
FLOUR												
Protein (12% mb), %	11.6	10.7	-	-	-	9.6	10.2	10.2	9.3	8.7	11.0	-
Colour, KJ	-2.9	-3.0	-	-	-	-3.0	-2.9	-3.0	-3.0	-3.0	-2.9	-
GLUTEN												
Wet gluten (14% mb), %	31.4	28.5	-	-	-	24.9	32.8	28.3	24.4	31.7	30.1	-
Dry gluten (14% mb), %	11.0	9.9	-	-	-	8.7	11.2	10.3	8.3	11.2	10.3	-
FARINOGRAM												
Water absorption (14% mb), %	61.7	61.9	-	-	-	59.5	62.8	63.4	62.1	61.1	62.5	-
Development time, min	5.3	4.8	-	-	-	4.0	6.0	3.0	2.4	2.0	4.7	-
Stability, min	9.3	8.9	-	-	-	7.2	10.1	6.5	6.1	5.6	8.8	-
Mixing tolerance index, BU	37	39	-	-	-	46	34	40	41	48	34	-
EXTENSOGRAM (45 min pull)												
Area, cm ²	91	76	-	-	-	67	77	48	44	44	71	-
Maximum height, BU	338	315	-	-	-	269	293	220	211	226	285	-
Extensibility, mm	192	174	-	-	-	173	187	149	140	131	175	-
ALVEOGRAM												
Strength (S), cm ²	38.7	35.8	-	-	-	27.8	35.8	27.8	25.2	25.1	31.7	-
Stability (P), mm	81	88	-	-	-	75	83	93	91	89	88	-
Distensibility (L), mm	117	97	-	-	-	86	102	62	58	56	82	-
Configuration ratio (P/L)	0.69	0.91	-	-	-	0.87	0.81	1.50	1.57	1.59	1.07	-
MIXOGRAM												
Peak time, min	2.8	3.0	-	-	-	2.8	2.5	2.4	2.8	3.2	2.7	-
100g BAKING TEST												
Loaf volume, cm ³	915	835	-	-	-	720	875	800	710	670	785	-
Evaluation	0	0	-	-	-	2	0	0	2	2	2	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

5

6

FARINOGRAM

5

6

EXTENSOGRAM

5

6

ALVEOGRAM

5

6

SOUTH AFRICAN

IRRIGATION WHEAT

Eastern Cape and Vaal and Orange river area

PRODUCTION REGION	(7) Eastern Cape Southern Region						(10) Griqualand-West					
Intake silos	Avontuur Humansdorp Paterson Uitenhage						Britstown Douglas Havenga Brug Marydale Modderivier Oranjerivierstasie Prieska Rietrivier Upington					
WHEAT												
	ave	min	max	stdev								
Protein (12% mb), %	11.1	9.1	12.4	1.35	11.6	9.4	13.7	0.94				
Falling number, sec	378	356	407	22.39	388	345	457	21.72				
1000 Kernel mass (13% mb), g	45.7	44.9	46.9	0.73	43.1	35.7	50.2	3.57				
Hectolitre mass (dirty), kg/hl	83.3	81.4	85.0	1.49	82.6	80.0	85.8	1.67				
Screenings (<1.8mm), %	0.29	0.20	0.35	0.06	1.14	0.07	3.72	0.92				
Total damaged kernels, %	0.51	0.12	1.18	0.43	0.33	0.06	1.06	0.22				
Number of samples	5						35					
CULTIVARS												
	SST 835			46.4	SST 835			35.0				
cultivars	SST 027			21.6	Duzi			26.3				
with highest %	SST 88			16.8	SST 843			20.1				
occurrence	SST 015			11.0	SST 822			8.0				
	SST 843			4.2	PAN 3434			2.8				
Number of samples	5						35					
MIXOGRAM (Quadromat)												
	ave	min	max	stdev								
Peak time, min	3.1	2.5	4.3	0.72	2.7	2.0	3.3	0.34				
Tail height (6min), mm	50	45	55	3.58	49	41	56	3.16				
Number of samples	5						35					
BÜHLER EXTRACTION, %	B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW
	75.6	-	-	-	-	-	74.7	74.7	76.1	75.0	-	-
FLOUR												
Protein (12% mb), %	11.3	-	-	-	-	-	11.4	10.4	9.8	9.4	-	-
Colour, KJ	-2.9	-	-	-	-	-	-3.1	-3.1	-3.3	-3.0	-	-
GLUTEN												
Wet gluten (14% mb), %	30.9	-	-	-	-	-	32.9	29.7	28.4	26.1	-	-
Dry gluten (14% mb), %	10.7	-	-	-	-	-	11.3	10.1	9.7	8.9	-	-
FARINOGRAM												
Water absorption (14% mb), %	62.9	-	-	-	-	-	64.5	63.7	62.2	60.7	-	-
Development time, min	3.0	-	-	-	-	-	4.5	4.4	4.0	4.2	-	-
Stability, min	9.9	-	-	-	-	-	7.7	6.9	6.2	6.4	-	-
Mixing tolerance index, BU	21	-	-	-	-	-	42	52	56	55	-	-
EXTENSOGRAM (45 min pull)												
Area, cm ²	86	-	-	-	-	-	83	70	68	76	-	-
Maximum height, BU	390	-	-	-	-	-	312	288	268	309	-	-
Extensibility, mm	162	-	-	-	-	-	192	172	181	176	-	-
ALVEOGRAM												
Strength (S), cm ²	38.4	-	-	-	-	-	38.1	32.3	29.2	28.1	-	-
Stability (P), mm	113	-	-	-	-	-	91	91	81	76	-	-
Distensibility (L), mm	63	-	-	-	-	-	95	77	83	86	-	-
Configuration ratio (P/L)	1.79	-	-	-	-	-	0.96	1.18	0.98	0.88	-	-
MIXOGRAM												
Peak time, min	3.3	-	-	-	-	-	2.5	2.6	2.4	2.5	-	-
100g BAKING TEST												
Loaf volume, cm ³	825	-	-	-	-	-	875	820	850	825	-	-
Evaluation	2	-	-	-	-	-	0	0	0	0	-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

7

10

FARINOGRAM

7

10

EXTENSOGRAM

7

10

ALVEOGRAM

7

10

**SOUTH AFRICAN
IRRIGATION WHEAT
Vaal and Orange river area**

**MAINLY IRRIGATION WHEAT
North-West Province**

PRODUCTION REGION	(11) Vaalharts				(12) North-West Western Region							
Intake silos	Barkly-West Hartswater Jan Kemp Magogong Taung				Bloubank Buhmannsdrif Kameel Kraaipan Madibogo Mafikeng Mareetsane Piet Plessis Springbokpan Vergeleë				Vryburg Vryhof			
WHEAT	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
Protein (12% mb), %	11.4	9.6	12.4	0.88	12.6	10.9	14.7	1.31				
Falling number, sec	375	340	404	17.82	400	356	420	24.37				
1000 Kernel mass (13% mb), g	42.2	39.3	45.7	1.89	38.4	33.4	44.9	4.48				
Hectolitre mass (dirty), kg/hl	80.2	78.9	82.7	1.09	81.6	78.9	84.2	2.32				
Screenings (<1.8mm), %	1.43	0.08	2.22	0.78	1.09	0.95	1.36	0.15				
Total damaged kernels, %	0.74	0.22	1.98	0.54	0.37	0.00	0.90	0.36				
Number of samples	17				6							
CULTIVARS												
	SST 835 36.2				Duzi 38.3							
cultivars	Duzi 27.9				SST 843 19.5							
with highest %	SST 843 15.5				SST 835 18.2							
occurrence	SST 877 12.0				PAN 3120 10.0							
	Baviaans 7.2				SST 877 5.3							
Number of samples	17				6							
MIXOGRAM (Quadromat)	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
Peak time, min	2.6	2.2	3.2	0.29	2.8	2.3	4.5	0.85				
Tail height (6min), mm	49	44	53	2.83	49	44	57	4.94				
Number of samples	17				6							
BÜHLER EXTRACTION, %	B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW
	75.7	76.1	76.2	75.9	-	-	75.0	-	-	-	-	-
FLOUR												
Protein (12% mb), %	11.4	10.8	10.1	9.1	-	-	12.1	-	-	-	-	-
Colour, KJ	-3.0	-3.0	-3.1	-2.9	-	-	-2.9	-	-	-	-	-
GLUTEN												
Wet gluten (14% mb), %	32.7	30.6	28.6	25.7	-	-	33.9	-	-	-	-	-
Dry gluten (14% mb), %	11.3	10.7	10.4	8.6	-	-	11.4	-	-	-	-	-
FARINOGRAM												
Water absorption (14% mb), %	62.5	62.0	61.2	59.1	-	-	63.0	-	-	-	-	-
Development time, min	5.5	4.2	3.7	2.3	-	-	4.7	-	-	-	-	-
Stability, min	8.1	7.1	5.9	5.4	-	-	8.6	-	-	-	-	-
Mixing tolerance index, BU	45	45	53	57	-	-	35	-	-	-	-	-
EXTENSOGRAM (45 min pull)												
Area, cm ²	93	77	75	66	-	-	102	-	-	-	-	-
Maximum height, BU	327	281	282	258	-	-	334	-	-	-	-	-
Extensibility, mm	208	193	190	182	-	-	226	-	-	-	-	-
ALVEOGRAM												
Strength (S), cm ²	34.3	30.4	27.5	22.6	-	-	39.1	-	-	-	-	-
Stability (P), mm	75	77	72	57	-	-	78	-	-	-	-	-
Distensibility (L), mm	105	90	97	101	-	-	118	-	-	-	-	-
Configuration ratio (P/L)	0.71	0.86	0.74	0.56	-	-	0.66	-	-	-	-	-
MIXOGRAM												
Peak time, min	2.5	2.4	2.4	2.5	-	-	2.4	-	-	-	-	-
100g BAKING TEST												
Loaf volume, cm ³	950	875	895	820	-	-	970	-	-	-	-	-
Evaluation	0	0	0	0	-	-	0	-	-	-	-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

11

12

FARINOGRAM

11

12

EXTENSOGRAM

11

12

ALVEOGRAM

11

12

**SOUTH AFRICAN
MAINLY IRRIGATION WHEAT
North-West Province**

PRODUCTION REGION	(14) North-West Southern Region				(15) North-West South-Eastern Region							
	ave	min	max	stdev	ave	min	max	stdev				
Intake silos	Amalia Barberspan Delareyville Excelsior Geysdorp Hallat's Hope Migdol Nooitgedacht Schweizer-Reneke Taaibospan				Bloemhof Christiana Hertzogville Hoopstad Kingwood							
WHEAT												
Protein (12% mb), %	9.8	-	-	-	10.8	9.1	12.0	0.93				
Falling number, sec	508	-	-	-	399	365	425	22.35				
1000 Kernel mass (13% mb), g	41.7	-	-	-	39.8	36.6	46.2	2.94				
Hectolitre mass (dirty), kg/hl	81.3	-	-	-	81.0	79.1	82.4	1.24				
Screenings (<1.8mm), %	1.89	-	-	-	1.94	1.37	3.14	0.55				
Total damaged kernels, %	0.60	-	-	-	0.24	0.08	0.62	0.16				
Number of samples	1				10							
CULTIVARS												
cultivars with highest % occurrence	SST 88 46.0				SST 835 36.6							
	SST 015 32.0				Duzi 17.9							
	SST 027 22.0				SST 843 17.0							
					PAN 3120 12.2							
					Baviaans 8.4							
Number of samples	1				10							
MIXOGRAM (Quadromat)												
Peak time, min	ave	min	max	stdev	ave	min	max	stdev				
Tail height (6min), mm	3.3	-	-	-	2.6	2.4	2.9	0.18				
	45	-	-	-	48	45	51	1.95				
Number of samples	1				10							
BÜHLER EXTRACTION, %												
	B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW
	-	-	-	74.7	-	-	74.4	75.1	74.8	73.4	-	-
FLOUR												
Protein (12% mb), %	-	-	-	9.0	-	-	11.4	11.1	9.8	8.7	-	-
Colour, KJ	-	-	-	-2.7	-	-	-2.8	-2.6	-3.1	-3.1	-	-
GLUTEN												
Wet gluten (14% mb), %	-	-	-	22.8	-	-	31.5	31.3	26.4	23.3	-	-
Dry gluten (14% mb), %	-	-	-	7.7	-	-	10.6	10.9	8.9	7.7	-	-
FARINOGRAM												
Water absorption (14% mb), %	-	-	-	60.2	-	-	61.8	62.1	60.3	60.0	-	-
Development time, min	-	-	-	1.9	-	-	4.5	4.2	4.2	1.7	-	-
Stability, min	-	-	-	6.3	-	-	8.2	6.5	6.8	4.6	-	-
Mixing tolerance index, BU	-	-	-	38	-	-	39	49	54	57	-	-
EXTENSOGRAM (45 min pull)												
Area, cm ²	-	-	-	79	-	-	105	77	76	52	-	-
Maximum height, BU	-	-	-	356	-	-	351	267	300	243	-	-
Extensibility, mm	-	-	-	157	-	-	217	203	181	151	-	-
ALVEOGRAM												
Strength (S), cm ²	-	-	-	27.5	-	-	38.2	30.4	27.5	25.1	-	-
Stability (P), mm	-	-	-	89	-	-	76	70	74	71	-	-
Distensibility (L), mm	-	-	-	64	-	-	123	116	82	82	-	-
Configuration ratio (P/L)	-	-	-	1.39	-	-	0.62	0.60	0.90	0.87	-	-
MIXOGRAM												
Peak time, min	-	-	-	3.3	-	-	2.5	2.5	2.8	2.9	-	-
100g BAKING TEST												
Loaf volume, cm ³	-	-	-	755	-	-	885	935	870	720	-	-
Evaluation	-	-	-	0	-	-	0	0	0	0	-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

14

15

FARINOGRAM

14

15

EXTENSOGRAM

14

15

ALVEOGRAM

14

15

**SOUTH AFRICAN
MAINLY IRRIGATION WHEAT
North-West Province**

PRODUCTION REGION	(16) North-West Central Eastern Region					(17) North-West Central Northern Region (Ottosdal)						
	Intake silos											
	Bamboesspruit Klerksdorp Leeudoringstad Makwassie Regina Strydpoort Wolmaranstad					Bospoort Lethabong (Hartbeesfontein) Kleinharts Melliodora Ottosdal Rostrataville Vermaas Werda						
WHEAT	ave	min	max	stdev		ave	min	max	stdev			
Protein (12% mb), %	11.1	10.7	11.4	0.36		12.2	10.5	14.3	1.58			
Falling number, sec	411	361	440	43.49		347	272	380	50.46			
1000 Kernel mass (13% mb), g	35.0	33.0	36.6	1.83		34.7	32.1	36.7	1.97			
Hectolitre mass (dirty), kg/hl	80.5	79.8	81.0	0.61		78.9	78.5	79.5	0.44			
Screenings (<1.8mm), %	3.36	3.06	3.80	0.39		2.65	2.16	3.50	0.60			
Total damaged kernels, %	0.13	0.08	0.16	0.05		0.40	0.24	0.58	0.17			
Number of samples	3					4						
CULTIVARS												
	PAN 3120		32.0			SST 835		43.8				
cultivars	SST 835		22.3			SST 843		15.3				
with highest %	Gariep		11.0			Gariep		9.5				
occurrence	PAN 3118		10.3			PAN 3120		9.3				
	Elands		8.7			SST 877		8.5				
Number of samples	3					4						
MIXOGRAM (Quadromat)	ave	min	max	stdev		ave	min	max	stdev			
Peak time, min	3.2	2.8	3.5	0.35		3.1	2.9	3.4	0.22			
Tail height (6min), mm	50	47	52	2.52		51	44	58	5.85			
Number of samples	3					4						
BÜHLER EXTRACTION, %	B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW
	-	-	-	72.3	-	-	73.0	75.4	73.2	74.9	-	-
FLOUR												
Protein (12% mb), %	-	-	-	10.2	-	-	13.1	11.0	9.1	10.8	-	-
Colour, KJ	-	-	-	-2.9	-	-	-2.9	-2.7	-3.1	-2.8	-	-
GLUTEN												
Wet gluten (14% mb), %	-	-	-	27.1	-	-	36.2	30.4	24.3	29.1	-	-
Dry gluten (14% mb), %	-	-	-	9.5	-	-	12.5	10.5	8.1	9.5	-	-
FARINOGRAM												
Water absorption (14% mb), %	-	-	-	62.1	-	-	63.6	60.9	61.2	61.0	-	-
Development time, min	-	-	-	3.3	-	-	7.3	5.0	2.0	4.7	-	-
Stability, min	-	-	-	8.6	-	-	11.8	8.0	5.0	7.8	-	-
Mixing tolerance index, BU	-	-	-	28	-	-	28	47	59	42	-	-
EXTENSOGRAM (45 min pull)												
Area, cm ²	-	-	-	85	-	-	129	101	63	101	-	-
Maximum height, BU	-	-	-	372	-	-	372	346	268	332	-	-
Extensibility, mm	-	-	-	167	-	-	250	210	168	219	-	-
ALVEOGRAM												
Strength (S), cm ²	-	-	-	34.1	-	-	50.3	33.8	26.3	37.8	-	-
Stability (P), mm	-	-	-	95	-	-	85	71	79	73	-	-
Distensibility (L), mm	-	-	-	72	-	-	140	122	71	129	-	-
Configuration ratio (P/L)	-	-	-	1.32	-	-	0.61	0.58	1.11	0.57	-	-
MIXOGRAM												
Peak time, min	-	-	-	3.7	-	-	2.5	2.5	2.8	2.8	-	-
100g BAKING TEST												
Loaf volume, cm ³	-	-	-	825	-	-	940	865	755	845	-	-
Evaluation	-	-	-	0	-	-	2	0	0	0	-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

16

17

FARINOGRAM

16

17

EXTENSOGRAM

16

17

ALVEOGRAM

16

17

**SOUTH AFRICAN
MAINLY IRRIGATION WHEAT
North-West Province**

PRODUCTION REGION	(18) North-West Central Region (Ventersdorp)					(19) North-West Central Region (Lichtenburg)						
	Intake silos					Intake silos						
	Bodenstein Buckingham Coligny Enselspruit Makokskraal Potchefstroom Ventersdorp					Grootpan Halfpad Hibernia Lichtenburg Lottiehalte Lusthof						
WHEAT	ave	min	max	stdev		ave	min	max	stdev			
Protein (12% mb), %	12.2	10.9	13.1	0.92		12.4	10.1	14.2	1.55			
Falling number, sec	374	350	406	24.45		401	350	437	29.84			
1000 Kernel mass (13% mb), g	37.6	37.0	38.7	0.78		35.5	32.0	39.2	2.11			
Hectolitre mass (dirty), kg/hl	80.4	80.2	80.5	0.13		80.8	78.7	82.5	1.34			
Screenings (<1.8mm), %	1.39	1.21	1.60	0.20		1.75	1.25	2.75	0.54			
Total damaged kernels, %	1.69	0.86	3.22	1.05		0.38	0.18	0.94	0.27			
Number of samples	4					8						
CULTIVARS												
	SST 843 44.0					SST 843 66.3						
cultivars	SST 835 35.5					SST 835 29.9						
with highest %	Duzi 16.8					Krokodil 1.9						
occurrence	Krokodil 3.8					SST 876 1.4						
						Duzi 0.6						
Number of samples	4					8						
MIXOGRAM (Quadromat)	ave	min	max	stdev		ave	min	max	stdev			
Peak time, min	2.5	2.0	3.3	0.56		3.6	2.5	4.7	0.72			
Tail height (6min), mm	51	45	57	5.20		57	51	68	6.48			
Number of samples	4					8						
BÜHLER EXTRACTION, %	B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW
	75.6	-	-	-	-	-	73.9	75.3	-	-	-	-
FLOUR												
Protein (12% mb), %	11.7	-	-	-	-	-	12.3	10.5	-	-	-	-
Colour, KJ	-3.0	-	-	-	-	-	-3.0	-3.2	-	-	-	-
GLUTEN												
Wet gluten (14% mb), %	32.1	-	-	-	-	-	32.5	27.4	-	-	-	-
Dry gluten (14% mb), %	10.8	-	-	-	-	-	11.3	9.6	-	-	-	-
FARINOGRAM												
Water absorption (14% mb), %	61.4	-	-	-	-	-	62.0	60.6	-	-	-	-
Development time, min	5.8	-	-	-	-	-	9.3	6.0	-	-	-	-
Stability, min	8.1	-	-	-	-	-	16.1	10.3	-	-	-	-
Mixing tolerance index, BU	44	-	-	-	-	-	29	40	-	-	-	-
EXTENSOGRAM (45 min pull)												
Area, cm ²	122	-	-	-	-	-	150	123	-	-	-	-
Maximum height, BU	361	-	-	-	-	-	455	418	-	-	-	-
Extensibility, mm	241	-	-	-	-	-	244	220	-	-	-	-
ALVEOGRAM												
Strength (S), cm ²	38.4	-	-	-	-	-	47.7	38.4	-	-	-	-
Stability (P), mm	70	-	-	-	-	-	91	79	-	-	-	-
Distensibility (L), mm	143	-	-	-	-	-	105	105	-	-	-	-
Configuration ratio (P/L)	0.49	-	-	-	-	-	0.87	0.75	-	-	-	-
MIXOGRAM												
Peak time, min	2.5	-	-	-	-	-	3.3	3.3	-	-	-	-
100g BAKING TEST												
Loaf volume, cm ³	955	-	-	-	-	-	935	905	-	-	-	-
Evaluation	0	-	-	-	-	-	0	0	-	-	-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

18

19

FARINOGRAM

18

19

EXTENSOGRAM

18

19

ALVEOGRAM

18

19

**SOUTH AFRICAN
MAINLY IRRIGATION WHEAT
North-West Province**

**SUMMER RAINFALL WHEAT
(AND IRRIGATION)
Free State Province (Central)**

PRODUCTION REGION	(20)						(21)					
	North-West Eastern Region						Free State North-Western Region (Viljoenskroon)					
Intake silos	Battery Boons Brits Derby Koster Rustenburg Swartruggens Syferbult						Attie Groenebloem Heuningspruit Koppies Rooiwal Vierfontein Viljoenskroon Vredefort Weiveld					
WHEAT												
	ave	min	max	stdev			ave	min	max	stdev		
Protein (12% mb), %	11.8	10.4	12.8	0.89			12.4	12.0	13.0	0.53		
Falling number, sec	406	377	443	23.84			372	350	404	28.54		
1000 Kernel mass (13% mb), g	40.9	36.4	49.4	4.85			34.8	33.0	36.0	1.57		
Hectolitre mass (dirty), kg/hl	80.9	79.7	83.9	1.41			81.1	80.2	81.7	0.81		
Screenings (<1.8mm), %	1.54	0.89	2.53	0.62			2.30	1.00	3.13	1.14		
Total damaged kernels, %	0.28	0.18	0.38	0.06			0.38	0.18	0.56	0.19		
Number of samples	8						3					
CULTIVARS												
	Duzi			43.6			SST 843			56.7		
cultivars	SST 843			29.3			SST 835			24.0		
with highest %	SST 835			21.8			PAN 3120			6.0		
occurrence	PAN 3434			3.5			Matlabas			5.3		
	Olifants			1.1			Elands, SST 877			4.0		
Number of samples	8						3					
MIXOGRAM (Quadromat)												
	ave	min	max	stdev			ave	min	max	stdev		
Peak time, min	3.0	2.3	3.7	0.58			3.1	2.7	3.3	0.35		
Tail height (6min), mm	51	46	58	3.93			53	50	55	2.52		
Number of samples	8						3					
BÜHLER EXTRACTION, %	B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW
	74.5	75.6	77.4	-	-	-	75.0	-	-	72.9	-	-
FLOUR												
Protein (12% mb), %	11.6	10.6	9.8	-	-	-	11.5	-	-	11.0	-	-
Colour, KJ	-3.0	-2.6	-3.0	-	-	-	-2.9	-	-	-2.2	-	-
GLUTEN												
Wet gluten (14% mb), %	30.0	27.7	28.5	-	-	-	31.2	-	-	28.9	-	-
Dry gluten (14% mb), %	10.7	9.9	9.5	-	-	-	11.4	-	-	10.0	-	-
FARINOGRAM												
Water absorption (14% mb), %	61.7	60.6	62.5	-	-	-	60.8	-	-	61.8	-	-
Development time, min	6.8	4.2	3.7	-	-	-	6.2	-	-	2.3	-	-
Stability, min	12.7	7.5	5.1	-	-	-	10.3	-	-	9.6	-	-
Mixing tolerance index, BU	27	54	65	-	-	-	41	-	-	12	-	-
EXTENSOGRAM (45 min pull)												
Area, cm ²	129	89	52	-	-	-	126	-	-	101	-	-
Maximum height, BU	430	319	193	-	-	-	428	-	-	387	-	-
Extensibility, mm	221	199	186	-	-	-	219	-	-	183	-	-
ALVEOGRAM												
Strength (S), cm ²	41.1	30.9	27.4	-	-	-	40.7	-	-	42.0	-	-
Stability (P), mm	84	71	69	-	-	-	78	-	-	94	-	-
Distensibility (L), mm	109	99	107	-	-	-	120	-	-	95	-	-
Configuration ratio (P/L)	0.77	0.72	0.64	-	-	-	0.65	-	-	0.99	-	-
MIXOGRAM												
Peak time, min	3.0	2.9	2.3	-	-	-	2.8	-	-	3.2	-	-
100g BAKING TEST												
Loaf volume, cm ³	940	910	780	-	-	-	910	-	-	905	-	-
Evaluation	0	0	0	-	-	-	0	-	-	0	-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

20

21

FARINOGRAM

20

21

EXTENSOGRAM

20

21

ALVEOGRAM

20

21

SOUTH AFRICAN

SUMMER RAINFALL WHEAT (AND IRRIGATION)

Free State Province (Central)

PRODUCTION REGION	(26) Free State South-Eastern Region (Senekal)					(27) Free State Northern Region						
	Intake silos											
	Arlington Kaallaagte Libertas Marquard Meets Monte Video Senekal Steynsrus					Gottenburg Heilbron Hoogte Mooigeleë Petrus Steyn Wolwehoek						
WHEAT	ave	min	max	stdev		ave	min	max	stdev			
Protein (12% mb), %	12.6	10.9	14.3	1.00		12.9	11.4	13.5	0.86			
Falling number, sec	362	292	430	30.81		365	322	396	29.69			
1000 Kernel mass (13% mb), g	32.3	25.5	38.3	3.32		33.8	31.2	35.6	1.64			
Hectolitre mass (dirty), kg/hl	79.0	75.8	83.3	1.99		80.6	78.3	82.3	1.76			
Screenings (<1.8mm), %	2.04	0.72	3.34	0.76		0.80	0.15	1.48	0.58			
Total damaged kernels, %	0.39	0.00	1.32	0.44		0.41	0.18	0.76	0.23			
Number of samples	16					5						
CULTIVARS												
	Elands 28.4					Elands 48.6						
cultivars	SST 356 24.6					PAN 3120 18.2						
with highest %	Matlabas 8.6					SST 835 10.0						
occurrence	SST 843 7.8					SST 356 9.0						
	SST 835 5.9					SST 347 7.0						
Number of samples	16					5						
MIXOGRAM (Quadromat)	ave	min	max	stdev		ave	min	max	stdev			
Peak time, min	3.4	2.8	4.5	0.43		3.4	3.0	3.7	0.26			
Tail height (6min), mm	54	47	59	3.85		56	49	59	4.45			
Number of samples	16					5						
BÜHLER EXTRACTION, %	B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW
	72.8	72.4	-	76.4	-	-	73.7	73.6	-	-	-	-
FLOUR												
Protein (12% mb), %	12.2	11.1	-	10.1	-	-	12.4	10.4	-	-	-	-
Colour, KJ	-2.2	-1.0	-	-2.9	-	-	-2.0	-2.3	-	-	-	-
GLUTEN												
Wet gluten (14% mb), %	32.0	29.2	-	28.2	-	-	32.2	27.3	-	-	-	-
Dry gluten (14% mb), %	11.6	9.9	-	9.7	-	-	11.2	9.4	-	-	-	-
FARINOGRAM												
Water absorption (14% mb), %	61.6	60.5	-	59.2	-	-	60.8	59.5	-	-	-	-
Development time, min	4.5	5.3	-	3.8	-	-	7.4	2.2	-	-	-	-
Stability, min	13.2	10.6	-	6.6	-	-	17.1	8.2	-	-	-	-
Mixing tolerance index, BU	18	33	-	50	-	-	22	31	-	-	-	-
EXTENSOGRAM (45 min pull)												
Area, cm ²	131	84	-	78	-	-	126	103	-	-	-	-
Maximum height, BU	433	357	-	295	-	-	428	408	-	-	-	-
Extensibility, mm	221	166	-	189	-	-	218	185	-	-	-	-
ALVEOGRAM												
Strength (S), cm ²	44.3	34.6	-	31.0	-	-	45.0	35.5	-	-	-	-
Stability (P), mm	84	81	-	62	-	-	80	83	-	-	-	-
Distensibility (L), mm	111	95	-	133	-	-	123	88	-	-	-	-
Configuration ratio (P/L)	0.76	0.85	-	0.47	-	-	0.65	0.94	-	-	-	-
MIXOGRAM												
Peak time, min	3.5	3.2	-	2.7	-	-	3.3	3.8	-	-	-	-
100g BAKING TEST												
Loaf volume, cm ³	965	895	-	840	-	-	1030	785	-	-	-	-
Evaluation	0	0	-	0	-	-	0	1	-	-	-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

26

27

FARINOGRAM

26

27

EXTENSOGRAM

26

27

ALVEOGRAM

26

27

SOUTH AFRICAN

SUMMER RAINFALL WHEAT (AND IRRIGATION)

Free State Province (North-Western)

PRODUCTION REGION	(22) Free-State North-Western Region (Bothaville)				(23) Free-State North-Western Region (Bultfontein)							
	ave	min	max	stdev	ave	min	max	stdev				
Intake silos	Allanridge Bothaville Mirage Odendaalsrus Schoonspruit Schuttendraai				Bultfontein Losdoorns Protespan Tierfontein Wesselsbron Willemsrust							
WHEAT												
Protein (12% mb), %	11.4	10.4	12.3	0.95	10.7	8.2	13.3	1.30				
Falling number, sec	345	331	367	19.09	292	83	402	93.38				
1000 Kernel mass (13% mb), g	35.7	34.5	36.4	1.07	35.2	27.1	44.5	4.01				
Hectolitre mass (dirty), kg/hl	80.4	79.6	81.0	0.74	79.0	74.5	82.0	2.12				
Screenings (<1.8mm), %	1.03	0.72	1.43	0.36	1.92	0.34	7.05	1.45				
Total damaged kernels, %	2.23	1.30	3.78	1.35	0.67	0.00	5.26	1.19				
Number of samples	3				30							
CULTIVARS												
cultivars with highest % occurrence	SST 843		32.7		PAN 3120		21.3					
	SST 835		23.7		PAN 3118		18.0					
	PAN 3120		19.7		SST 835		17.3					
	PAN 3355		8.7		SST 843		11.2					
Number of samples	3				30							
MIXOGRAM (Quadromat)												
Peak time, min	ave	min	max	stdev	ave	min	max	stdev				
Tail height (6min), mm	3.2	3.2	3.3	0.06	3.2	2.2	5.0	0.69				
Number of samples	3				30							
BÜHLER EXTRACTION, %	B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW
	74.1	73.9	-	-	-	-	76.5	73.4	73.0	73.4	71.8	71.2
FLOUR												
Protein (12% mb), %	11.3	10.2	-	-	-	-	11.8	10.5	9.3	9.0	10.1	9.9
Colour, KJ	-2.6	-2.9	-	-	-	-	-2.9	-3.0	-2.9	-3.1	-2.6	-2.9
GLUTEN												
Wet gluten (14% mb), %	31.3	26.9	-	-	-	-	33.9	28.6	25.6	23.7	27.2	26.2
Dry gluten (14% mb), %	10.7	9.3	-	-	-	-	11.6	9.7	8.4	8.1	9.0	9.3
FARINOGRAM												
Water absorption (14% mb), %	64.0	61.2	-	-	-	-	62.1	61.9	59.3	60.6	59.1	60.6
Development time, min	5.5	2.7	-	-	-	-	5.9	2.5	2.0	2.0	3.5	2.2
Stability, min	9.9	8.5	-	-	-	-	7.3	8.1	5.8	5.3	6.0	5.5
Mixing tolerance index, BU	32	27	-	-	-	-	49	26	45	56	56	53
EXTENSOGRAM (45 min pull)												
Area, cm ²	102	95	-	-	-	-	116	93	72	73	80	97
Maximum height, BU	344	374	-	-	-	-	344	363	303	309	306	361
Extensibility, mm	211	186	-	-	-	-	242	188	170	170	184	193
ALVEOGRAM												
Strength (S), cm ²	47.7	39.3	-	-	-	-	37.6	36.4	25.8	28.6	27.7	33.0
Stability (P), mm	103	88	-	-	-	-	70	89	69	84	63	80
Distensibility (L), mm	101	97	-	-	-	-	146	90	90	73	116	86
Configuration ratio (P/L)	1.02	0.91	-	-	-	-	0.48	0.99	0.77	1.15	0.54	0.93
MIXOGRAM												
Peak time, min	2.8	3.2	-	-	-	-	2.3	2.8	2.8	3.3	2.8	3.5
100g BAKING TEST												
Loaf volume, cm ³	850	820	-	-	-	-	980	890	850	800	895	835
Evaluation	1	0	-	-	-	-	0	0	0	0	0	0

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

22

23

FARINOGRAM

22

23

EXTENSOGRAM

22

23

ALVEOGRAM

22

23

**SOUTH AFRICAN
SUMMER RAINFALL WHEAT (AND IRRIGATION)
Free State Province (Eastern)**

PRODUCTION REGION	(25) Free State South-Western Region (Bethlehem)				(28) Free State Eastern Region							
	Intake silos				Tweeling Villiers Vrede Warden Windfield							
	Bethlehem				Afrikaskop							
	Clocolan				Ascent							
	De Wetsdorp				Cornelia							
	Ficksburg				Daniëlsrus							
	Fouriesburg				Eeram							
	Marseilles				Frankfort							
	Modderpoort				Harrismith							
	Slabberts				Jim Fouché							
	Tweespruit				Kransfontein							
	Westminster				Memel							
	Zastron				Reitz							
WHEAT												
	ave	min	max	stdev	ave	min	max	stdev				
Protein (12% mb), %	12.0	9.1	14.0	1.32	12.6	9.7	15.5	1.30				
Falling number, sec	339	189	461	59.15	343	247	431	46.64				
1000 Kernel mass (13% mb), g	34.3	25.0	42.5	4.12	36.9	30.7	43.1	2.68				
Hectolitre mass (dirty), kg/hl	78.7	75.2	81.6	1.84	80.6	76.5	83.4	1.96				
Screenings (<1.8mm), %	2.04	0.75	4.02	0.88	0.88	0.12	4.17	0.78				
Total damaged kernels, %	0.23	0.06	0.70	0.17	0.27	0.00	0.80	0.18				
Number of samples	27				37							
CULTIVARS												
	Matlabas		24.6		Elands		24.6					
cultivars	Elands		24.0		SST 356		23.1					
with highest %	SST 356		21.9		SST 835		20.3					
occurrence	Baviaans		6.0		SST 843		10.6					
	Gariep		5.9		Matlabas		9.9					
Number of samples	27				37							
MIXOGRAM (Quadromat)												
	ave	min	max	stdev	ave	min	max	stdev				
Peak time, min	3.7	2.8	5.3	0.68	3.2	2.3	4.0	0.44				
Tail height (6min), mm	54	46	68	4.79	54	44	64	5.45				
Number of samples	27				37							
BÜHLER EXTRACTION, %												
	B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW
	72.6	71.7	72.5	72.3	-	-	73.8	74.1	-	-	72.2	-
FLOUR												
Protein (12% mb), %	11.8	10.3	9.7	10.6	-	-	12.2	10.8	-	-	8.7	-
Colour, KJ	-2.4	-2.4	-2.6	-1.9	-	-	-2.4	-2.2	-	-	-1.6	-
GLUTEN												
Wet gluten (14% mb), %	30.8	27.1	23.4	28.3	-	-	32.7	29.2	-	-	23.6	-
Dry gluten (14% mb), %	10.8	9.6	8.4	9.6	-	-	11.3	10.2	-	-	7.9	-
FARINOGRAM												
Water absorption (14% mb), %	62.7	61.3	61.4	60.9	-	-	63.6	62.5	-	-	59.7	-
Development time, min	5.5	2.5	2.2	4.3	-	-	4.2	4.8	-	-	2.7	-
Stability, min	12.6	7.9	10.9	10.5	-	-	10.7	8.6	-	-	7.2	-
Mixing tolerance index, BU	28	31	24	30	-	-	28	34	-	-	34	-
EXTENSOGRAM (45 min pull)												
Area, cm ²	121	94	102	80	-	-	107	78	-	-	49	-
Maximum height, BU	442	371	414	340	-	-	363	311	-	-	237	-
Extensibility, mm	202	184	180	169	-	-	209	177	-	-	140	-
ALVEOGRAM												
Strength (S), cm ²	48.5	39.0	39.4	35.9	-	-	45.7	35.2	-	-	23.7	-
Stability (P), mm	106	94	106	88	-	-	92	89	-	-	83	-
Distensibility (L), mm	92	85	73	91	-	-	111	87	-	-	59	-
Configuration ratio (P/L)	1.15	1.11	1.45	0.97	-	-	0.83	1.02	-	-	1.41	-
MIXOGRAM												
Peak time, min	3.7	3.6	4.0	3.3	-	-	3.1	2.8	-	-	2.9	-
100g BAKING TEST												
Loaf volume, cm ³	920	845	790	885	-	-	925	855	-	-	760	-
Evaluation	0	0	0	0	-	-	0	0	-	-	0	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

25

28

FARINOGRAM

25

28

EXTENSOGRAM

25

28

ALVEOGRAM

25

28

SOUTH AFRICAN

SUMMER RAINFALL WHEAT (AND IRRIGATION) Free State Province (South-Western)

OTHER SUMMER RAINFALL AND IRRIGATION WHEAT

Mpumalanga

PRODUCTION REGION	(24) Free State Central Region				(30) Mpumalanga Eastern Region							
	Intake silos	Bloemfontein Brandfort De Brug Geneva Hennenman Koffiefontein Kroonstad Petrusburg Theunissen Van Tonder	Welgeleë Winburg		Amersfoort Badplaas Carolina Davel Ermelo Estancia Lothair Maizefield Mkondo Morgenzon	Overvaal Panbult						
WHEAT												
	ave	min	max	stdev	ave	min	max	stdev				
Protein (12% mb), %	11.9	9.8	14.4	1.28	13.9	13.7	14.1	0.20				
Falling number, sec	381	326	443	31.26	432	415	452	14.14				
1000 Kernel mass (13% mb), g	35.6	25.4	46.1	6.06	43.0	41.5	44.7	1.22				
Hectolitre mass (dirty), kg/hl	81.2	76.2	84.2	2.65	82.4	81.9	82.8	0.33				
Screenings (<1.8mm), %	1.74	0.44	3.64	0.78	1.00	0.85	1.07	0.08				
Total damaged kernels, %	0.20	0.08	0.38	0.08	0.35	0.26	0.40	0.05				
Number of samples	15				6							
CULTIVARS												
		SST 835	27.3		SST 843	51.7						
cultivars		SST 843	14.3		Duzi	39.0						
with highest %		PAN 3120	11.8		SST 835	9.3						
occurrence		PAN 3118	11.5									
		CRN 826	9.6									
Number of samples	15				6							
MIXOGRAM (Quadromat)												
	ave	min	max	stdev	ave	min	max	stdev				
Peak time, min	3.1	2.7	3.8	0.33	3.1	2.8	3.7	0.32				
Tail height (6min), mm	51	46	59	4.24	57	54	59	1.94				
Number of samples	15				6							
BÜHLER EXTRACTION, %												
	B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW
	73.0	72.6	74.4	72.5	-	-	74.4	-	-	-	-	-
FLOUR												
Protein (12% mb), %	11.7	11.8	9.7	9.2	-	-	12.9	-	-	-	-	-
Colour, KJ	-2.5	-2.5	-3.0	-3.0	-	-	-3.2	-	-	-	-	-
GLUTEN												
Wet gluten (14% mb), %	31.7	32.3	26.8	23.9	-	-	33.9	-	-	-	-	-
Dry gluten (14% mb), %	11.0	11.3	8.8	8.2	-	-	12.3	-	-	-	-	-
FARINOGRAM												
Water absorption (14% mb), %	61.7	62.7	61.4	59.9	-	-	64.7	-	-	-	-	-
Development time, min	5.5	5.7	4.5	2.0	-	-	7.7	-	-	-	-	-
Stability, min	11.5	12.7	7.4	6.9	-	-	15.6	-	-	-	-	-
Mixing tolerance index, BU	30	32	47	39	-	-	26	-	-	-	-	-
EXTENSOGRAM (45 min pull)												
Area, cm ²	123	110	83	79	-	-	143	-	-	-	-	-
Maximum height, BU	437	396	342	368	-	-	438	-	-	-	-	-
Extensibility, mm	206	201	178	157	-	-	246	-	-	-	-	-
ALVEOGRAM												
Strength (S), cm ²	46.0	45.9	31.7	28.9	-	-	60.2	-	-	-	-	-
Stability (P), mm	88	95	87	85	-	-	100	-	-	-	-	-
Distensibility (L), mm	117	104	81	70	-	-	122	-	-	-	-	-
Configuration ratio (P/L)	0.75	0.91	1.07	1.21	-	-	0.82	-	-	-	-	-
MIXOGRAM												
Peak time, min	3.3	3.3	2.8	3.2	-	-	3.3	-	-	-	-	-
100g BAKING TEST												
Loaf volume, cm ³	915	915	855	780	-	-	860	-	-	-	-	-
Evaluation	0	0	0	0	-	-	3	-	-	-	-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

24

30

FARINOGRAM

24

30

EXTENSOGRAM

24

30

ALVEOGRAM

24

30

**SOUTH AFRICAN
OTHER SUMMER RAINFALL WHEAT AND IRRIGATION
Mpumalanga**

PRODUCTION REGION	(32) Mpumalanga Western Region				(33) Mpumalanga Northern Region							
	Intake silos											
	Argent Dryden Endicott Elof Hawerklip Kendal Ogies				Driefontein Lydenburg Marble Hall Middelburg Stoffberg Pan Arnot Wonderfontein							
WHEAT												
	ave	min	max	stdev	ave	min	max	stdev				
Protein (12% mb), %	12.1	11.3	12.8	0.75	11.4	10.6	12.6	0.77				
Falling number, sec	415	361	472	55.54	468	408	529	48.95				
1000 Kernel mass (13% mb), g	35.1	32.2	37.7	2.76	39.1	34.6	41.7	2.40				
Hectolitre mass (dirty), kg/hl	82.1	81.4	82.7	0.67	80.7	76.0	82.8	2.80				
Screenings (<1.8mm), %	2.14	1.57	2.82	0.63	1.90	1.24	3.07	0.71				
Total damaged kernels, %	0.25	0.18	0.30	0.06	0.66	0.48	0.78	0.12				
Number of samples	3				6							
CULTIVARS												
	SST 843 36.3				SST 843, Duzi 37.2							
cultivars	SST 835 35.7				SST 835 16.7							
with highest %	SST 877 16.0				SST 876 9.0							
occurrence	PAN 3355 12.0											
Number of samples	3				6							
MIXOGRAM (Quadromat)												
	ave	min	max	stdev	ave	min	max	stdev				
Peak time, min	3.1	2.8	3.8	0.58	3.2	2.8	4.0	0.46				
Tail height (6min), mm	51	49	53	2.08	50	45	57	4.26				
Number of samples	3				6							
BÜHLER EXTRACTION, %												
	B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW
	75.4	73.0	-	-	-	-	76.2	76.2	76.6	75.0	-	-
FLOUR												
Protein (12% mb), %	11.6	9.6	-	-	-	-	11.5	10.2	9.9	10.5	-	-
Colour, KJ	-2.8	-2.1	-	-	-	-	-2.4	-2.3	-2.5	-1.8	-	-
GLUTEN												
Wet gluten (14% mb), %	31.6	23.9	-	-	-	-	30.3	27.8	27.2	29.0	-	-
Dry gluten (14% mb), %	11.1	8.5	-	-	-	-	10.8	9.4	9.2	9.4	-	-
FARINOGRAM												
Water absorption (14% mb), %	61.8	60.0	-	-	-	-	60.7	61.0	59.6	58.8	-	-
Development time, min	4.9	1.8	-	-	-	-	6.7	2.3	2.2	4.0	-	-
Stability, min	7.6	5.0	-	-	-	-	13.1	8.3	6.4	6.5	-	-
Mixing tolerance index, BU	44	55	-	-	-	-	26	29	39	52	-	-
EXTENSOGRAM (45 min pull)												
Area, cm ²	107	93	-	-	-	-	122	94	72	64	-	-
Maximum height, BU	370	412	-	-	-	-	449	360	283	244	-	-
Extensibility, mm	211	164	-	-	-	-	202	187	179	184	-	-
ALVEOGRAM												
Strength (S), cm ²	39.3	33.3	-	-	-	-	41.3	37.0	25.5	26.5	-	-
Stability (P), mm	76	97	-	-	-	-	82	89	66	59	-	-
Distensibility (L), mm	126	64	-	-	-	-	110	91	100	124	-	-
Configuration ratio (P/L)	0.60	1.52	-	-	-	-	0.75	0.98	0.66	0.48	-	-
MIXOGRAM												
Peak time, min	2.5	3.8	-	-	-	-	3.3	3.3	2.8	2.8	-	-
100g BAKING TEST												
Loaf volume, cm ³	990	700	-	-	-	-	895	785	840	815	-	-
Evaluation	0	3	-	-	-	-	0	1	0	1	-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

32

33

FARINOGRAM

32

33

EXTENSOGRAM

32

33

ALVEOGRAM

32

33

SOUTH AFRICAN

OTHER SUMMER RAINFALL WHEAT AND IRRIGATION

Gauteng and Limpopo Provinces

PRODUCTION REGION	(34) Gauteng				(35) Limpopo							
	Intake silos				Alma Bela-Bela (Warmbad) Crecy Immerpan Lehau Modimolle (Nylstroom) Mokopane (Potgietersrus) Naboomspruit Northam Nutfield Pienaarsrivier Polokwane (Pietersburg) Roedtan Settlers Tzaneen Vaalwater							
WHEAT	ave	min	max	stdev	ave	min	max	stdev				
Protein (12% mb), %	11.7	10.2	12.6	0.95	11.6	10.4	13.9	1.07				
Falling number, sec	407	384	424	18.62	456	321	536	65.73				
1000 Kernel mass (13% mb), g	38.4	34.6	40.8	2.50	39.4	36.9	44.9	2.61				
Hectolitre mass (dirty), kg/hl	83.8	82.7	84.5	0.84	81.0	77.9	82.9	1.35				
Screenings (<1.8mm), %	0.73	0.04	1.58	0.68	1.33	0.33	2.58	0.78				
Total damaged kernels, %	0.30	0.18	0.48	0.14	0.76	0.00	1.96	0.69				
Number of samples	5				12							
CULTIVARS												
cultivars	SST 843		55.2		SST 843		37.3					
with highest % occurrence	SST 835		31.2		Duzi		32.0					
	SST 877		10.6		SST 835		18.8					
	Duzi		3.0		Buffels		4.0					
					Kariega		3.5					
Number of samples	5				12							
MIXOGRAM (Quadromat)	ave	min	max	stdev	ave	min	max	stdev				
Peak time, min	3.1	2.8	3.3	0.26	3.1	2.1	4.3	0.72				
Tail height (6min), mm	52	48	57	3.39	51	44	61	5.60				
Number of samples	5				12							
BÜHLER EXTRACTION, %	B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW
	75.3	73.7	74.6	-	75.7	-	75.1	75.7	76.5	-	-	-
FLOUR												
Protein (12% mb), %	11.6	10.3	9.3	-	11.1	-	11.8	10.3	9.6	-	-	-
Colour, KJ	-2.8	-3.0	-3.3	-	-3.2	-	-2.6	-2.8	-2.6	-	-	-
GLUTEN												
Wet gluten (14% mb), %	31.9	27.4	24.5	-	28.0	-	31.0	27.7	27.0	-	-	-
Dry gluten (14% mb), %	11.1	9.1	8.1	-	9.9	-	10.9	9.3	9.0	-	-	-
FARINOGRAM												
Water absorption (14% mb), %	62.7	60.2	59.7	-	60.1	-	61.9	60.9	60.5	-	-	-
Development time, min	4.7	3.2	4.8	-	6.2	-	5.7	3.7	3.0	-	-	-
Stability, min	7.5	7.4	7.7	-	12.3	-	13.1	7.3	5.5	-	-	-
Mixing tolerance index, BU	46	39	46	-	32	-	27	44	52	-	-	-
EXTENSOGRAM (45 min pull)												
Area, cm ²	101	102	94	-	117	-	130	77	62	-	-	-
Maximum height, BU	323	368	370	-	518	-	456	308	256	-	-	-
Extensibility, mm	227	197	183	-	170	-	213	174	170	-	-	-
ALVEOGRAM												
Strength (S), cm ²	37.8	34.9	36.7	-	40.8	-	43.9	32.9	26.9	-	-	-
Stability (P), mm	78	75	85	-	90	-	92	78	73	-	-	-
Distensibility (L), mm	119	112	98	-	93	-	99	99	92	-	-	-
Configuration ratio (P/L)	0.66	0.67	0.87	-	0.97	-	0.93	0.79	0.79	-	-	-
MIXOGRAM												
Peak time, min	2.6	2.8	3.3	-	3.8	-	3.2	3.0	2.5	-	-	-
100g BAKING TEST												
Loaf volume, cm ³	975	860	850	-	880	-	900	860	795	-	-	-
Evaluation	0	0	0	-	0	-	0	0	0	-	-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

34

35

FARINOGRAM

34

35

EXTENSOGRAM

34

35

ALVEOGRAM

34

35

**SOUTH AFRICAN
OTHER SUMMER RAINFALL WHEAT AND IRRIGATION
KwaZulu-Natal Province**

(36)	
PRODUCTION REGION	KwaZulu-Natal
Intake silos	Bergville Bloedrivier Dannhauser Dundee Mizpah New Amalfi Paulpietersburg Vryheid Winterton
WHEAT	
	ave min max stdev
Protein (12% mb), %	12.0 10.4 13.1 0.94
Falling number, sec	473 367 573 70.55
1000 Kernel mass (13% mb), g	38.0 35.3 44.3 3.15
Hectolitre mass (dirty), kg/hl	82.4 80.1 83.2 1.04
Screenings (<1.8mm), %	1.49 0.77 2.52 0.74
Total damaged kernels, %	0.20 0.06 0.32 0.10
Number of samples	7
CULTIVARS	
	SST 835 52.1
cultivars	SST 843 23.1
with highest %	SST 806 12.6
occurrence	SST 877 12.1
Number of samples	7
MIXOGRAM (Quadromat)	
	ave min max stdev
Peak time, min	2.9 2.4 3.6 0.51
Tail height (6min), mm	49 46 51 1.99
Number of samples	7
BÜHLER EXTRACTION, %	
	B1 B2 B3 B4 UT COW
	76.3 76.4 - - - -
FLOUR	
Protein (12% mb), %	11.7 10.7 - - - -
Colour, KJ	-2.5 -2.9 - - - -
GLUTEN	
Wet gluten (14% mb), %	32.6 30.1 - - - -
Dry gluten (14% mb), %	10.7 10.2 - - - -
FARINOGRAM	
Water absorption (14% mb), %	62.4 60.7 - - - -
Development time, min	5.0 3.8 - - - -
Stability, min	8.7 7.6 - - - -
Mixing tolerance index, BU	44 40 - - - -
EXTENSOGRAM (45 min pull)	
Area, cm ²	82 72 - - - -
Maximum height, BU	324 272 - - - -
Extensibility, mm	178 182 - - - -
ALVEOGRAM	
Strength (S), cm ²	35.2 31.0 - - - -
Stability (P), mm	80 70 - - - -
Distensibility (L), mm	108 115 - - - -
Configuration ratio (P/L)	0.74 0.61 - - - -
MIXOGRAM	
Peak time, min	2.7 2.7 - - - -
100g BAKING TEST	
Loaf volume, cm ³	910 880 - - - -
Evaluation	0 0 - - - -

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

36

FARINOGRAM

36

EXTENSOGRAM

36

ALVEOGRAM

36

RSA WHEAT CROP QUALITY SUMMARY

RSA Crop Quality 2009/2010 and 2011/2012 Seasons

Country of origin	RSA Crop Average 2009/2010							RSA Crop Average 2011/2012						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	159	138	79	30	58	16	480	176	120	61	39	25	12	433
WHEAT GRADING														
Protein (12% mb), %	12.84	11.50	10.62	9.64	11.51	11.29	11.68	12.78	11.52	10.48	10.33	11.72	10.78	11.77
Moisture, %	11.5	11.3	11.3	10.8	11.0	11.0	11.3	11.1	11.0	10.9	10.9	11.0	11.4	11.0
Falling number, sec	382	375	359	339	365	240	367	397	393	384	372	376	274	387
1000 Kernel mass (13% mb), g	38.7	39.5	40.4	40.2	38.1	36.6	39.2	37.7	38.8	38.9	38.2	34.1	36.7	38.0
Hlm (dirty), kg/hl	80.8	80.0	79.5	79.7	79.0	75.2	79.9	81.1	81.0	80.7	79.9	78.8	79.9	80.7
Screenings (<1,8mm), %	1.36	1.30	1.47	1.44	3.03	3.36	1.63	1.32	1.36	1.36	2.21	3.20	2.62	1.56
Gravel, stones, turf and glass, %	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Foreign matter, %	0.05	0.05	0.09	0.09	0.11	0.12	0.07	0.08	0.09	0.10	0.10	0.14	0.13	0.09
Other grain & unthreshed ears, %	0.25	0.26	0.30	0.35	0.65	0.64	0.33	0.24	0.29	0.27	0.30	0.64	0.20	0.28
Heat damaged kernels, %	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Immature kernels, %	0.07	0.05	0.04	0.03	0.06	0.01	0.05	0.05	0.04	0.02	0.03	0.03	0.03	0.04
Insect damaged kernels, %	0.19	0.26	0.29	0.27	0.52	1.10	0.30	0.37	0.43	0.43	0.36	0.84	0.24	0.42
Heavily frost damaged kernels, %	0.00	0.00	0.00	0.00	0.00	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sprouted kernels, %	0.09	0.11	0.16	0.14	0.36	2.73	0.23	0.03	0.02	0.04	0.02	0.10	0.42	0.04
Total damaged kernels, %	0.36	0.43	0.50	0.44	0.96	3.96	0.60	0.46	0.48	0.49	0.41	0.96	0.70	0.50
Combined deviations, %	2.02	2.04	2.34	2.32	4.76	8.07	2.63	2.10	2.23	2.23	3.06	4.94	3.65	2.45
Field fungi, %	0.19	0.19	0.21	0.15	0.16	0.54	0.20	0.10	0.11	0.14	0.19	0.06	0.06	0.12
Storage fungi, %	0.01	0.01	0.01	0.00	0.01	0.03	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.01
Ergot, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Noxious seeds (<i>Crotalaria spp., etc.</i>)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Noxious seeds (<i>Agronome mexicana, etc.</i>)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Live insects	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Undesirable odour	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	26	28	20	10	11	5	100	28	23	15	15	8	2	90
BÜHLER EXTRACTION, %	74.8	75.1	74.8	73.8	74.9	74.1	74.7	74.4	74.2	74.8	73.8	72.8	73.3	74.1
FLOUR														
Colour, KJ	-2.2	-2.3	-2.3	-2.3	-2.2	-1.7	-2.2	-2.7	-2.7	-3.0	-2.8	-2.7	-3.0	-2.8
Protein (12% mb), %	11.7	10.6	9.6	8.6	10.6	10.4	10.5	11.7	10.5	9.6	9.6	10.6	9.7	10.6
Wet Gluten (14% mb), %	32.1	29.0	25.9	22.2	29.1	28.3	28.6	32.0	28.4	26.0	26.0	28.5	25.6	28.7
Dry Gluten (14% mb), %	11.3	10.1	9.0	7.9	10.2	9.6	10.0	11.1	9.8	8.8	8.8	9.7	9.0	9.9
100g BAKING TEST														
Baking water absorption, %	61.5	60.3	59.3	58.2	60.4	59.5	60.2	61.7	60.3	59.3	59.2	60.6	59.1	60.4
Loaf volume, cm³	902	853	803	727	847	868	843	916	847	811	802	821	778	852
Evaluation	1	0	0	0	0	0	0	0	0	0	0	1	1	0
FARINOGRAM														
Water absorption, %	62.3	61.3	60.5	59.3	60.6	58.3	61.0	62.3	61.3	60.9	60.3	60.7	60.1	61.3
Development time, min	4.8	3.4	2.9	2.0	3.7	2.7	3.5	5.6	3.8	3.2	2.8	4.4	3.1	4.1
Stability, mm	8.4	6.8	5.7	3.8	6.9	4.9	6.6	10.7	8.1	6.7	6.8	8.9	6.4	8.5
Mixing tolerance index, BU	39	44	52	71	48	71	49	34	39	47	43	37	50	39

RSA Crop Quality of 2009/2010 and 2011/2012 Seasons

Country of origin	RSA Crop Average 2009/2010							RSA Crop Average 2011/2012						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	26	28	20	10	11	5	100	28	23	14	15	8	2	90
ALVEOGRAM														
Strength (S) , cm ²	42.4	36.5	32.7	25.0	35.4	26.8	35.5	41.7	34.6	29.4	29.8	33.7	30.4	35.0
Stability (P), mm	93	90	90	87	83	61	89	85	83	80	79	82	78	82
Distensibility (L), mm	97	86	75	58	90	101	85	112	94	86	89	96	86	98
P/L	1.03	1.13	1.31	1.80	0.97	0.61	1.17	0.79	0.92	0.97	0.97	0.90	0.90	0.89
EXTENSOGRAM														
Strength, cm ²	96	85	74	61	87	71	83	110	87	72	74	86	82	90
Max. height, BU	355	344	327	304	345	295	337	379	337	294	311	349	315	340
Extensibility, mm	187	174	158	139	173	171	170	211	184	174	170	175	183	188
MIXOGRAM														
Peak time, min	2.6	2.6	2.7	2.8	2.5	2.8	2.6	2.9	3.0	2.8	3.1	3.3	3.2	3.0
Absorption, %	61.8	60.4	59.4	58.5	60.6	60.3	60.4	61.9	60.4	59.4	59.4	60.6	59.5	60.5
MYCOTOXINS														
	ROSA							UPLC-MS/MS						
Afla G ₁ (µg/kg) [max. value]	1 000 [4 000]							0 [0]						
Afla B ₁ (µg/kg) [max. value]								0 [0]						
Afla G ₂ (µg/kg) [max. value]								0 [0]						
Afla B ₂ (µg/kg) [max. value]								0 [0]						
Fum B ₁ (µg/kg) [max. value]	-							0 [0]						
Fum B ₂ (µg/kg) [max. value]	-							0 [0]						
Deoxynivalenol (µg/kg) [max. value]	50 [48 000]							6 [119]						
Ochratoxin A (µg/kg) [max. value]	0 [1]							0 [0]						
Zearalenone (µg/kg) [max. value]	-							0 [0]						
T-2 Toxin (µg/kg) [max. value]	-							0 [0]						
No. of samples	30							40						

RSA WHEAT CROP QUALITY SUMMARY

RSA Crop Quality 2010/2011 and 2011/2012 Seasons

Country of origin	RSA Crop Average 2010/2011							RSA Crop Average 2011/2012						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	164	93	48	23	28	16	372	176	120	61	39	25	12	433
WHEAT GRADING														
Protein (12% mb), %	12.91	11.53	10.69	11.20	12.28	13.31	12.14	12.78	11.52	10.48	10.33	11.72	10.78	11.77
Moisture, %	11.8	11.7	11.6	11.6	11.8	12.2	11.8	11.1	11.0	10.9	10.9	11.0	11.4	11.0
Falling number, sec	385	389	371	359	358	180	372	397	393	384	372	376	274	387
1000 Kernel mass (13% mb), g	39.1	40.0	39.9	40.8	38.5	39.3	39.5	37.7	38.8	38.9	38.2	34.1	36.7	38.0
Hlm (dirty), kg/hl	80.9	80.4	80.6	80.8	78.1	76.6	80.3	81.1	81.0	80.7	79.9	78.8	79.9	80.7
Screenings (<1,8mm), %	1.34	1.61	1.51	2.66	3.48	1.49	1.68	1.32	1.36	1.36	2.21	3.20	2.62	1.56
Gravel, stones, turf and glass, %	0.00	0.00	0.00	0.00	0.00	0.07	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Foreign matter, %	0.07	0.08	0.07	0.10	0.18	0.42	0.10	0.08	0.09	0.10	0.10	0.14	0.13	0.09
Other grain & unthreshed ears, %	0.28	0.34	0.33	0.43	0.85	0.26	0.35	0.24	0.29	0.27	0.30	0.64	0.20	0.28
Heat damaged kernels, %	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Immature kernels, %	0.06	0.02	0.02	0.02	0.06	0.10	0.04	0.05	0.04	0.02	0.03	0.03	0.03	0.04
Insect damaged kernels, %	0.24	0.28	0.29	0.27	0.35	0.28	0.27	0.37	0.43	0.43	0.36	0.84	0.24	0.42
Heavily frost damaged kernels, %	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sprouted kernels, %	0.04	0.03	0.03	0.06	0.15	1.43	0.11	0.03	0.02	0.04	0.02	0.10	0.42	0.04
Total damaged kernels, %	0.34	0.33	0.35	0.35	0.56	1.83	0.42	0.46	0.48	0.49	0.41	0.96	0.70	0.50
Combined deviations, %	2.03	2.36	2.26	3.55	5.07	3.99	2.55	2.10	2.23	2.23	3.06	4.94	3.65	2.45
Field fungi, %	0.18	0.12	0.10	0.14	0.29	1.12	0.20	0.10	0.11	0.14	0.19	0.06	0.06	0.12
Storage fungi, %	0.02	0.01	0.01	0.02	0.03	0.14	0.02	0.01	0.01	0.02	0.02	0.01	0.01	0.01
Ergot, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Noxious seeds (<i>Crotalaria spp.</i> , etc.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Noxious seeds (<i>Agronome mexicana</i> , etc.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Live insects	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Undesirable odour	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	29	24	17	11	10	8	99	28	23	15	15	8	2	90
BÜHLER EXTRACTION, %	75.1	75.1	75.0	74.7	74.4	74.2	74.9	74.4	74.2	74.8	73.8	72.8	73.3	74.1
FLOUR														
Colour, KJ	-2.0	-2.1	-2.0	-1.9	-1.5	0.4	-1.8	-2.7	-2.7	-3.0	-2.8	-2.7	-3.0	-2.8
Protein (12% mb), %	12.0	10.5	9.7	9.8	11.5	12.1	11.0	11.7	10.5	9.6	9.6	10.6	9.7	10.6
Wet Gluten (14% mb), %	32.7	28.4	25.7	28.0	31.4	31.1	29.7	32.0	28.4	26.0	26.0	28.5	25.6	28.7
Dry Gluten (14% mb), %	11.6	9.9	9.0	9.6	11.1	11.1	10.4	11.1	9.8	8.8	8.8	9.7	9.0	9.9
100g BAKING TEST														
Baking water absorption, %	62.3	60.5	59.6	59.9	61.8	62.4	61.1	61.7	60.3	59.3	59.2	60.6	59.1	60.4
Loaf volume, cm ³	882	824	766	789	846	853	832	916	847	811	802	821	778	852
Evaluation	2	1	1	1	2	2	1	0	0	0	0	1	1	0
FARINOGRAM														
Water absorption, %	64.2	62.7	61.7	62.3	63.8	64.0	63.2	62.3	61.3	60.9	60.3	60.7	60.1	61.3
Development time, min	7.0	5.3	5.0	4.0	5.2	4.7	5.5	5.6	3.8	3.2	2.8	4.4	3.1	4.1
Stability, mm	9.1	7.3	7.5	6.0	8.1	7.6	7.8	10.7	8.1	6.7	6.8	8.9	6.4	8.5
Mixing tolerance index, BU	33	39	38	43	37	40	37	34	39	47	43	37	50	39

RSA Crop Quality of 2010/2011 and 2011/2012 Seasons

Country of origin	RSA Crop Average 2010/2011							RSA Crop Average 2011/2012						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	29	24	17	11	10	8	99	28	23	14	15	8	2	90
ALVEOGRAM														
Strength (S) , cm ²	43.1	32.6	30.5	29.2	39.5	39.4	36.2	41.7	34.6	29.4	29.8	33.7	30.4	35.0
Stability (P), mm	98	91	92	91	98	102	95	85	83	80	79	82	78	82
Distensibility (L), mm	94	78	69	70	87	78	81	112	94	86	89	96	86	98
P/L	1.08	1.21	1.44	1.55	1.28	1.57	1.29	0.79	0.92	0.97	0.97	0.90	0.90	0.89
EXTENSOGRAM														
Strength, cm ²	110	93	85	80	101	109	97	110	87	72	74	86	82	90
Max. height, BU	381	357	358	323	371	378	362	379	337	294	311	349	315	340
Extensibility, mm	204	181	166	170	193	203	187	211	184	174	170	175	183	188
MIXOGRAM														
Peak time, min	2.8	2.6	2.8	2.6	2.8	3.2	2.8	2.9	3.0	2.8	3.1	3.3	3.2	3.0
Absorption, %	62.2	60.4	59.6	59.8	61.7	62.3	61.0	61.9	60.4	59.4	59.4	60.6	59.5	60.5
MYCOTOXINS														
Afla G ₁ (µg/kg) [max. value]	0 [0]							0 [0]						
Afla B ₁ (µg/kg) [max. value]	0 [0]							0 [0]						
Afla G ₂ (µg/kg) [max. value]	0 [0]							0 [0]						
Afla B ₂ (µg/kg) [max. value]	0 [0]							0 [0]						
Fum B ₁ (µg/kg) [max. value]	0 [0]							0 [0]						
Fum B ₂ (µg/kg) [max. value]	0 [0]							0 [0]						
Deoxynivalenol (µg/kg) [max. value]	0 [0]							6 [119]						
Ochratoxin A (µg/kg) [max. value]	0 [0]							0 [0]						
Zearalenone (µg/kg) [max. value]	0 [0]							0 [0]						
T-2 Toxin (µg/kg) [max. value]	0 [0]							0 [0]						
No. of samples	30							40						

METHODS

GRADING:

Full grading was done in accordance with the Regulations relating to the grading, packing and marking of wheat intended for sale in the Republic of South Africa (No. R. 1186 of 17 December 2010).

Hectolitre mass, screenings, protein and falling number were determined. The determination of deviations relating to wheat kernels comprised foreign matter including gravel, stones, turf and glass; other grain and unthreshed ears; damaged kernels including heat-damaged kernels, immature kernels, insect-damaged kernels and sprouted kernels; heavily frost-damaged kernels; field fungi; storage fungi; ergot; noxious seeds; possible presence of undesirable odours and live insects.

Hectolitre mass means the mass in kilogram per hectolitre and was determined according to ISO 7971-3 by means of the Kern 222 instrument.

During earlier seasons the hectolitre mass was determined by means of the Two-level funnel method. In the 2009/2010 season the hectolitre mass value was adjusted by the addition of 2 kg/hl to all hectolitre mass values as per an Industry-wide Hectolitre Mass Dispensation published by the National Department of Agriculture.

Hectolitre mass provides a measure of the bulk density of grain and is also useful as a guide to grain soundness and potential milling extraction.

Screenings means all material that passes through a standard sieve. For the definition of a standard sieve please refer to the definitions of Regulation No. R. 1186 on pages 87 - 99 of this report.

Damaged wheat means wheat -

- (a) which have been damaged by insects;
- (b) which have been distinctly discoloured (orange-brown, dark brown or black) by external heat or as a result of heating caused by internal fermentation in wheat with an excessive moisture content, excluding wheat kernels in respect of which the discolouration is confined to the germ end;
- (c) which are immature and have a distinctly green colour; and
- (d) in which germination has proceeded to such an extent that the skin covering the embryo has been broken or the developing sprouts and/or rootlets are clearly visible.

THOUSAND KERNEL MASS:

This is the weight in grams of one thousand kernels of grain and provides a measure of grain size and density. This determination does not include kernels that are broken or chipped.

FALLING NUMBER MILLING:

At least 300 g of wheat is cleaned by using the standard 1.8 mm sieve and by removing coarser impurities by hand. The sample is then milled on the falling number hammer mill fitted with a 0.8 mm screen.

MOISTURE:

ICC Standard No. 110/1, latest edition is used to determine the moisture content of wheat flour. This method determines moisture content as a loss in weight of a sample when dried in an oven at 130°C for 90 minutes or 2 hours for flour and whole wheat flour respectively.

PROTEIN:

The Dumas combustion analysis technique is used, according to AACCI method 46-30.01, latest edition.

This method prescribes a generic combustion method for the determination of crude protein. Combustion at high temperature in pure oxygen sets nitrogen free, which is measured by thermal conductivity detection. The total nitrogen content of the flour sample is determined and converted to equivalent protein by multiplication with a factor of 5.7 to obtain the protein content.

FALLING NUMBER:

This method is based upon the rapid gelatinization of an aqueous suspension of meal or flour in a boiling water bath and subsequent measurement of the liquefaction of the starch paste by the alpha-amylase in the sample. The method measures the alpha-amylase activity.

ICC Standard No. 107/1, latest edition is used to determine the falling number. Only the altitude-corrected value is reported.

QUADROMAT MILLING:

Cleaned wheat samples are conditioned by adding 3 ml water per 100 g wheat, 18 hours prior to

milling. The samples are then milled on the Quadromat junior laboratory mill.

MIXOGRAPH:

A 35 g mixograph is used. The amount of flour weighed is adjusted according to the flour moisture content and the amount of water added to the flour is adjusted according to the flour protein content. Industry Accepted Method 020 based on AACCI method 54-40.02, latest edition is followed.

Mixogram peak time is the time measured in minutes that a dough takes to reach its maximum consistency or first indication of dough weakening. The peak time is a measure of optimum dough development and thus a measure of protein quality.

Mixogram tail height at 6 minutes is the distance in millimetres measured from the base line of the paper at 6 minutes to the graph centre point at 6 minutes. This figure is an indication of the weakening effect of the dough. Higher values indicate flours that are more tolerant to mixing.

BÜHLER MILLING:

Cleaned wheat samples are dampened to between 15.0% and 16.0% moisture according to the wheat moisture and kernel hardness and allowed to stand for 20 hours. Samples are then milled on a standard Bühler MLU 202 mill and passed through a bran finisher.

BÜHLER EXTRACTION:

The extraction represents the flour yield after milling plus flour obtained from bran that passed through a bran finisher. Flour extraction is calculated from the mass of the total products. Bühler MLU 202 mill set for South African wheat, mill settings and sieve sizes deviate from AACCI method 26-21.02, latest edition.

COLOUR:

The Kent Jones colour is determined by following FTP Method No. 0007/3, 7/1991. This method determines the influence of the branny material present in flour by measuring reflectance with a light source in the green band of the light spectrum. The lower the Kent Jones colour, the lighter the flour.

GLUTEN:

Wheat gluten is the water-insoluble complex protein fraction separated from wheat flours. The ability of wheat flour to produce dough with good gas retaining properties is attributed to gluten.

The gluten content of wheat flour is determined by means of AACCI Method 38-12.02, latest edition. Wet gluten is washed from meal or flour by an automatic washing apparatus (Glutomatic). Wet gluten is a plastic elastic substance composed principally of two protein fractions. Glutenin, the higher molecular weight fraction, contributes elasticity and Gliadin, the lower molecular weight fraction, provides extensibility.

The wet gluten is dried under standardized conditions in a Glutork to obtain the dry gluten. The total wet and total dry gluten contents are expressed as percentages of the sample on a 14% moisture basis.

FARINOGRAPH:

AACCI method 54-21.01, latest edition constant flour weight procedure is followed, using 300 g of flour on a 14% moisture basis.

The farinograph measures and records the resistance of a dough to mixing, as it is formed from flour and water, developed and broken down. The dough is subjected to a prolonged, relatively gentle mixing action at a constant temperature.

The water absorption is the amount of water required for a dough to reach a definite consistency (500 Brabender units). The amount of water added to the flour is expressed as a percentage of the flour mass and reported on a 14% moisture basis.

The development time is the time from the beginning of water addition until the dough reaches its optimum consistency and the point immediately before the first indication of weakening. A long mixing time can be associated with flours with a high percentage of gluten-forming proteins.

The stability is the time during which the top of the curve intercepts a horizontal line through the centre of the curve. This gives an indication of the dough's tolerance to mixing: the longer the stability, the longer the mixing time that the dough

can withstand. A dough with a longer stability can also withstand a longer fermentation period.

The **mixing tolerance** index value is the difference, in Brabender units, between the top of the curve at the peak and the top of the curve measured 5 minutes after the peak is reached. The value gives an indication of the extent to which breakdown of the dough occurs. The higher the value, the more and the quicker the breakdown of the dough occurs. This value is similar to the mixogram tail height.

EXTENSOGRAPH:

ICC Standard No. 114/1, latest edition is followed.

The **strength** gives an indication of the total force (work) needed to stretch the dough and is represented by the area under the curve.

The **maximum height** gives an indication of the dough's resistance to stretching and is measured as the mean of the maximum heights of the curves of the two test pieces.

The **extensibility** is the mean length at the base of the 2 curves and indicates the stretchability of the dough.

ALVEOGRAPH:

ICC Standard No. 121, latest edition is followed.

The **alveograph** measures the resistance of the dough to stretching and also how extensible the dough is. The alveograph stretches the dough in more than one direction (as is happening during proofing), whereas the extensograph stretches the dough in only one direction.

Strength (S): The area under the curve gives an indication of the dough strength.

Stability (P): Obtained by multiplying the maximum height of the curve with a constant factor of 1.1. This value is an indication of the resistance of the dough to extension.

Distensibility (L): The length of the curve, measured along the base line, gives an indication of the extensibility of the dough and also predicts the handling characteristics of the dough.

P/L-value: This ratio is obtained by dividing the P-value by the L-value, thus providing an approximate indication of the shape of the curve that combines stability and extensibility.

100 g BAKING TEST:

This procedure, according to Industry Accepted Method 022 based on AACCI Method 10-10.03, latest edition, provides an optimized bread-making method for evaluating bread wheat flour quality and a variety of dough ingredients by a straight-dough method in which all ingredients are incorporated in the initial mixing step.

Keys for the evaluation of the 100g Baking test:

- 0 - Excellent
- 1 - Very Good
- 2 - Good
- 3 - Questionable
- 4 - Poor
- 5 - Very Poor
- 6 - Extremely Poor

Please note:

This 100 g Baking test evaluation does not give an indication of the baking quality of the flour, but refers to the relationship between the protein content and the bread volume.

MYCOTOXIN ANALYSES

Mycotoxins, produced by moulds or fungi, are natural contaminants of food and feedstuffs with serious implications for public health and economics, in particular with relation to the international food trade.

During 2010 SAGL implemented a multi-mycotoxin screening method using UPLC - MS/MS. 40 of the 433 wheat crop samples were tested for Aflatoxin G₁; B₁; G₂; B₂, Fumonisin B₁; B₂; B₃, Deoxynivalenol, T₂ - Toxin, Zearalenone and Ochratoxin A.



WHEAT IMPORTS / EXPORTS

2010/11 Season

Progressive: 2010/10/02 - 2011/09/30

Published: 2011/10/04

Updated: 2011/11/25

Imported from:	Total Tons	Destined for:		
		RSA	Africa	Overseas
Overseas	1716292	1649515	60374	6403
RSA	0	0	0	0
Africa	0	0	0	0
	1716292	1649515	60374	6403
Less: RSA for RSA		0	0	n/a
	1716292	1649515	60374	6403

Exported from:	Total Tons	Destined for:		
		RSA	Africa	Overseas
Overseas	66424	0	60021	6403
RSA	152611	0	152611	0
Africa	0	0	0	0
	219035	0	212632	6403
Less: RSA for RSA	0	0	n/a	n/a
	219035	0	212632	6403



WHEAT IMPORTS / EXPORTS

2011/12 Season

Progressive: 2011/10/01 - 2012/05/25

Published: 2012/05/29

Imported from:	Total Tons	Destined for:		
		RSA	Africa	Overseas
Overseas	1108431	1084320	24111	0
RSA	0	0	0	0
Africa	0	0	0	0
	1108431	1084320	24111	0
Less: RSA for RSA		0	0	n/a
	1108431	1084320	24111	0

Exported from:	Total Tons	Destined for:		
		RSA	Africa	Overseas
Overseas	28280	0	28280	0
RSA	165824	0	165824	0
Africa	0	0	0	0
	194104	0	194104	0
Less: RSA for RSA	0	0	n/a	n/a
	194104	0	194104	0

WHEAT EXPORTS

2010/11 Season

Progressive: 2010/10/02 - 2011/09/30

Published: 2011/10/04

Updated: 2011/11/25

COUNTRY	AFRICA TONS		OVERSEAS TONS
Botswana	84542	Madagascar	6403
Lesotho	75445		
Mozambique	234		
Namibia	19803		
Swaziland	18026		
Zambia	12593		
Zimbabwe	1989		
	212632		

WHEAT IMPORTS

FROM COUNTRY	FOR AFRICA TONS	FOR RSA TONS	FOR OVERSEAS TONS
Argentina	28975	629600	0
Australia	5116	181637	0
Brazil	8808	58551	0
Canada	0	79697	0
Germany	2017	88581	0
Uruguay	0	25249	0
USA	15458	586200	6403
	60374	1649515	6403

WHEAT EXPORTS

2011/12 Season

Progressive: 2011/10/01 - 2012/05/25

Published: 2012/05/29

COUNTRY	AFRICA TONS		OVERSEAS TONS
Botswana	65667		
Lesotho	72918		
Mozambique	1689		
Namibia	9417		
Swaziland	20161		
Zambia	17739		
Zimbabwe	6513		
	194104		0

WHEAT IMPORTS

FROM COUNTRY	FOR AFRICA TONS	FOR RSA TONS	FOR OVERSEAS TONS
Argentina	2608	372938	0
Australia	7348	149389	0
Brazil	0	171630	0
Canada	0	45252	0
Germany	665	105964	0
Lithuania	0	8880	0
Russia	13490	124938	0
Uruguay	0	18684	0
USA	0	86645	0
	24111	1084320	0

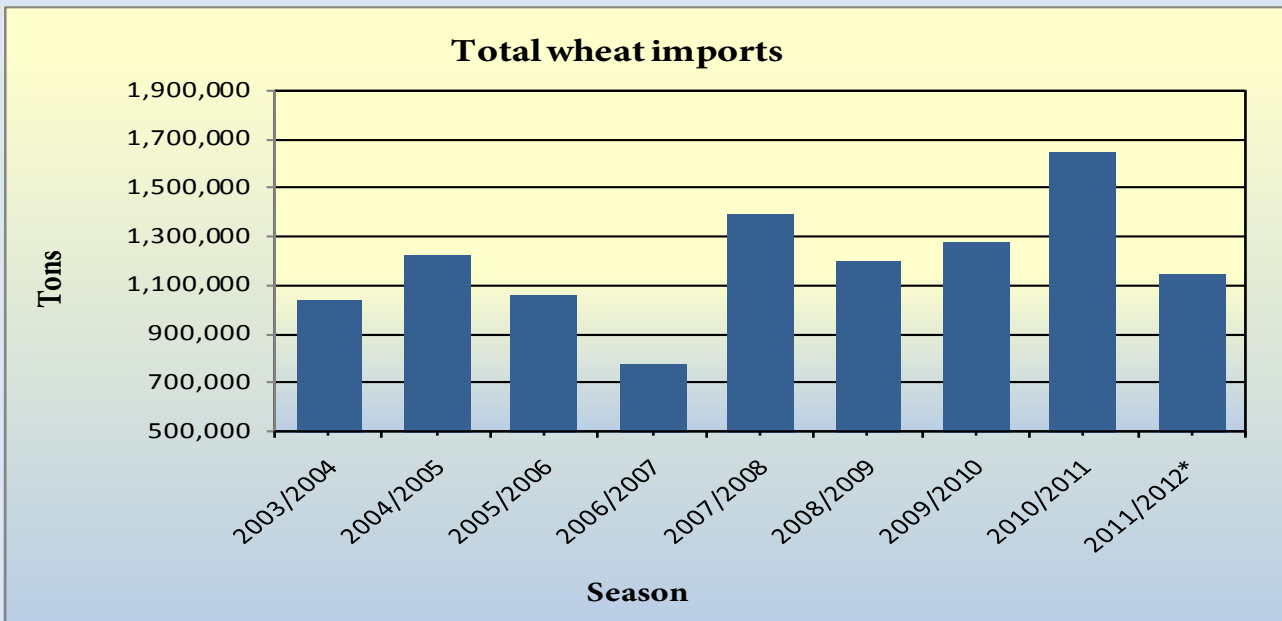
Imported Wheat

Quantity of wheat imported to the RSA

The graphs and table given below and on the next page, are based on progressive import figures per country obtained from the SAGIS web page as well as final calculated crop production figures from the Crop Estimates Committee.

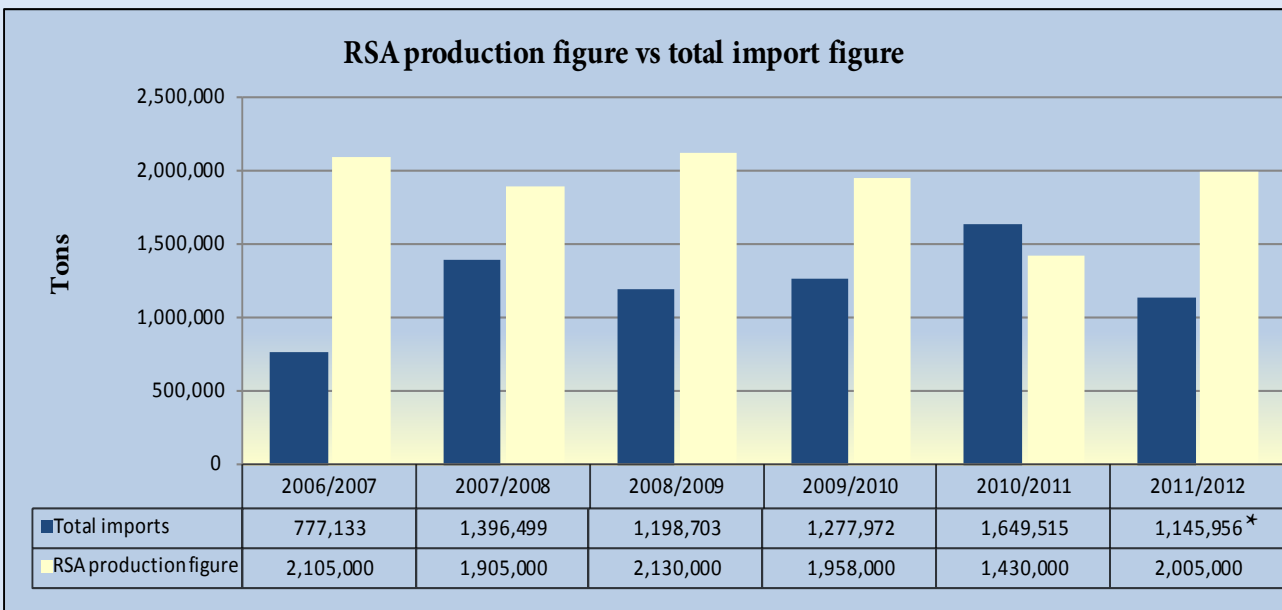
Import figures per season are calculated from 1 October to 30 September of the following year.

Total wheat imports since the 2003/2004 season



*2011/2012 season figure includes imports up to 15/06/2012.

RSA production figure versus the total import figure for the previous five seasons as well as the current season



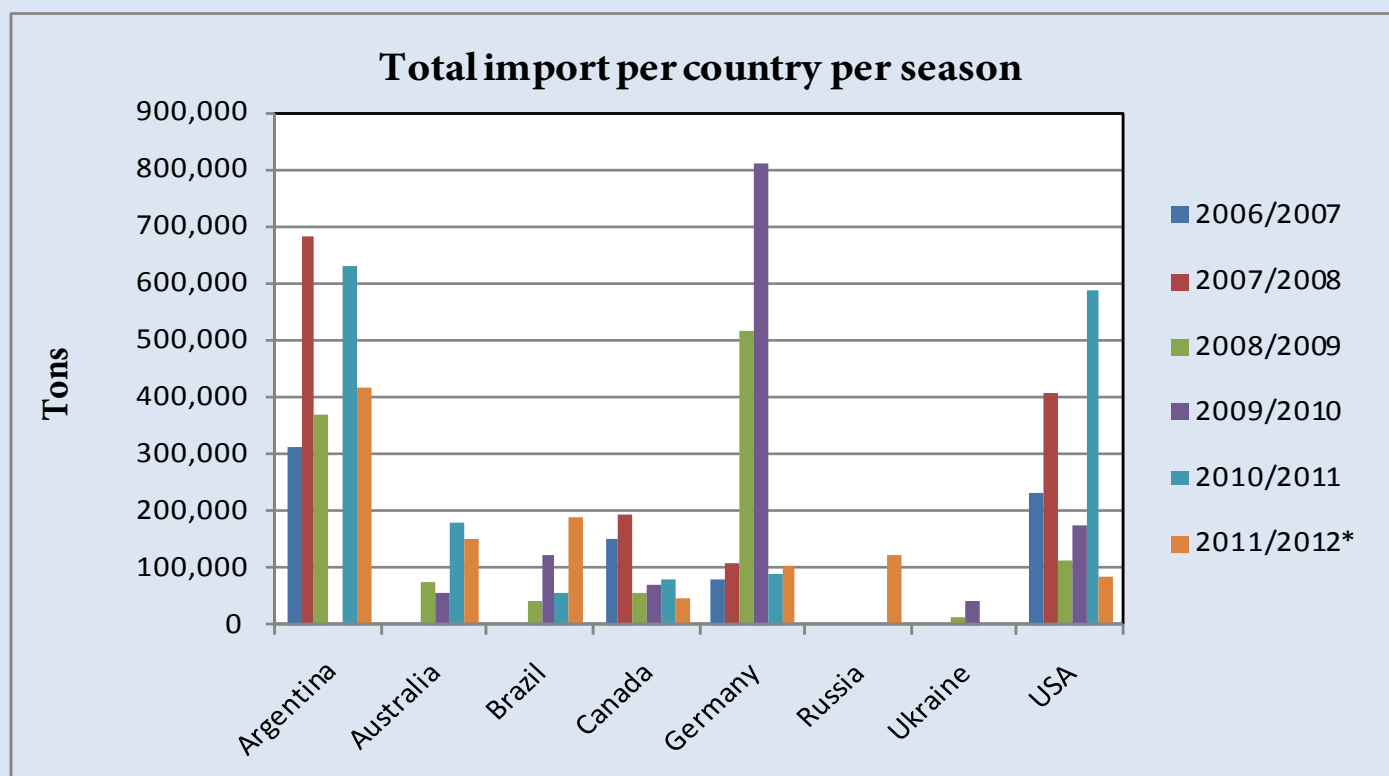
*2011/2012 season figure includes imports up to 15/06/2012.

Total wheat imports per country per season since the 2003/2004 season

	Season									Total
	2003/2004	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009	2009/2010	2010/2011	2011/2012	
Argentina	268,218	574,600	392,930	310,524	684,160	368,739	-	629,600	415,405	3,644,176
Australia	298,504	154,112	59,927	-	-	74,714	55,312	181,637	149,389	973,595
Brazil	-	-	-	-	-	42,449	123,944	58,551	190,799	415,743
Canada	-	43,766	62,643	153,694	194,764	54,831	72,911	79,697	45,252	707,558
France	25,016	-	9,920	-	-	-	-	-	-	34,936
Germany	12,199	115,332	354,718	80,649	111,013	518,002	809,934	88,581	105,964	2,196,392
Lithuania	-	-	-	-	-	-	1,611	-	8,880	10,491
Poland	-	-	-	-	-	13,013	-	-	-	13,013
Russia	-	-	-	-	-	-	-	-	124,938	124,938
UK	22,420	27,586	-	-	-	-	-	-	-	50,006
Ukraine	-	29,935	85,979	-	-	13,521	41,230	-	-	170,665
Uruguay	-	-	-	-	-	-	-	25,249	18,684	43,933
USA	413,429	281,165	88,651	232,266	406,562	113,434	173,030	586,200	86,645	2,381,382
Total	1,039,786	1,226,496	1,054,768	777,133	1,396,499	1,198,703	1,277,972	1,649,515	1,145,956*	10,766,828

*2011/2012 season figure includes imports up to 15/06/2012.

Total imports per country per season over the previous five seasons as well as the current season



*2011/2012 season figure includes imports up to 15/06/2012.

Please note that countries from which a total of less than 100,000 tons of wheat have been imported, have not been included in the graph above.

Quality of imported wheat (1 October 2010 to 30 September 2011) (Previous season)

The quality of all wheat imported into South Africa is also monitored by the SAGL. The range of analyses done on the local crop for the purpose of the annual crop quality survey is also done on the imported wheat. These results are only made available at the end of each season.

For grading as well as dough and baking quality results of the imported wheat per country, please refer to pages 69 to 82. This imported wheat quality is compared to a summary of the local crop quality of the same (2010/2011) season.

To simplify the comparison between the quality of the different countries of import and South African wheat the average values were compared, as with some of the countries, quite a difference in quality were observed between the different grades.

Looking at the average grading quality, specifically the whole wheat protein and hectolitre mass results, the Canadian wheat had the best grading quality, followed by the Brazilian and South African wheat.

The ability of wheat flour to produce dough with good gas-holding capability is attributable to gluten due to the fact that gluten imparts the elasticity and extensibility characteristics to the dough. Good quality gluten is capable of producing a loaf of bread with a high volume and good crumb texture. When evaluating gluten quality (strength), the protein content should also be taken into account. The Canadian and South African wheat showed the best average gluten quality.

In general bakers prefer flour with higher water absorption (60.0 – 65.0%) as this result in higher dough yields. The farinogram development times of the imported wheat (Australia and Canada excluded) were much shorter than the South African wheat. A short stability, as observed on the wheat from Germany and Uruguay, is an indication that the dough will not have a good tolerance to mixing and may be over- or under mixed very easily. In general, longer development times of 3.5 to 6.0 minutes and stabilities of 8.0 to 12.0 minutes will be an indication of good baking quality, which is associated with better protein quality. It is important to remember that higher protein content does not necessarily equates to better quality.

The alveogram strength is determined by the protein quality and the Canadian and South African wheat had the highest strength values. The imported wheat samples tended to have short distensibility values on the alveogram which may result in lower volumes. The short distensibility values also resulted in high P/L values (stability value divided by distensibility value). The ideal P/L value is between 0.80 and 1.20.

The imported wheat samples showed a tendency towards longer mixogram mixing times, especially Uruguay, but also Argentina, Germany and the USA. The mixing time is an indication of the amount of time needed to mix the dough to optimum development. The most acceptable range is between 2.8 to 3.5 minutes. The longer the mixing time, the larger the risk that the dough will not be mixed to optimum development, which may negatively influence the bread quality and cause lower loaf volumes. Longer mixing times can also have cost implications due to higher energy inputs required.

The Argentinean and Brazilian wheat showed the worst correlation between the protein content and 100g loaf volume.

Average quality data of imported wheat during the 2010/2011 season (previous season)

	Argentina	Australia	Brazil	Canada	Germany	Uruguay	USA	RSA
Protein, % (12% mb)	10.88	10.96	12.21	12.49	11.18	11.21	11.52	12.14
Hlm, kg/hl	81.3	79.5	81.0	81.4	79.1	77.5	80.3	80.3
Screenings, %	2.15	1.37	2.32	2.88	2.60	3.55	3.85	1.68
Number of samples	30	6	7	9	12	2	46	372
Extraction, %	74.1	73.7	72.7	72.7	74.1	70.2	72.5	74.9
Flour colour, KJ	-1.6	-2.6	-1.2	-2.0	-0.7	-1.6	-1.2	-1.8
Wet gluten, % (14% mb)	23.7	26.2	29.0	30.0	25.0	24.5	25.9	29.7
Dry gluten, % (14% mb)	8.5	9.4	10.1	11.1	8.9	8.4	9.2	10.4
Farinogram								
Water absorption, % (14% mb)	60.1	59.9	63.4	60.0	58.3	58.9	57.2	63.2
Development time, min	2.1	3.8	2.6	3.7	1.9	1.9	2.2	5.5
Stability, min	7.8	9.2	6.2	10.5	3.3	2.5	8.0	7.8
Alveogram								
Strength, cm²	31.1	31.5	35.5	38.2	29.9	29.8	31.7	36.2
P/L	2.72	1.39	2.14	1.10	1.59	1.77	1.24	1.29
Extensogram								
Strength, cm²	90	102	81	114	86	78	107	97
Mixogram								
Peak time, min	4.5	3.4	3.6	3.6	4.4	7.0	4.5	2.8
100 g Baking test								
Volume, cm³	677	828	766	877	727	760	801	832
Evaluation	4	0	4	0	3	1	1	1
Number of samples	30	6	7	9	12	2	46	99



2010/2011 IMPORTED WHEAT QUALITY - ARGENTINA (1 Oct 2010 to 30 Sep 2011)

2010/2011 Imported Wheat Quality Versus 2010/2011 RSA Wheat Quality

Country of origin	Argentina							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	1	5	19	5	-	-	30	164	93	48	23	28	16	372
WHEAT GRADING														
Protein (12% mb), %	12.16	11.26	10.61	11.30	-	-	10.88	12.91	11.53	10.69	11.20	12.28	13.31	12.14
Moisture, %	11.6	12.2	12.0	11.3	-	-	11.9	11.8	11.7	11.6	11.6	11.8	12.2	11.8
Falling number, sec	467	435	416	445	-	-	426	385	389	371	359	358	180	372
1000 Kernel mass (13% mb), g	30.8	34.4	35.8	30.9	-	-	34.6	39.1	40.0	39.9	40.8	38.5	39.3	39.5
Hlm (dirty), kg/hl	81.5	81.6	81.1	81.5	-	-	81.3	80.9	80.4	80.6	80.8	78.1	76.6	80.3
Screenings (<1,8mm), %	2.40	1.95	1.89	3.26	-	-	2.15	1.34	1.61	1.51	2.66	3.48	1.49	1.68
Gravel, stones, turf and glass, %	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.01
Foreign matter, %	0.08	0.05	0.09	0.08	-	-	0.08	0.07	0.08	0.07	0.10	0.18	0.42	0.10
Other grain & unthreshed ears, %	0.24	0.10	0.17	0.22	-	-	0.17	0.28	0.34	0.33	0.43	0.85	0.26	0.35
Heat damaged kernels, %	0.00	0.00	0.03	0.16	-	-	0.05	0.00	0.00	0.00	0.00	0.00	0.02	0.00
Immature kernels, %	0.22	0.06	0.02	0.08	-	-	0.04	0.06	0.02	0.02	0.02	0.06	0.10	0.04
Insect damaged kernels, %	0.24	0.15	0.15	0.20	-	-	0.16	0.24	0.28	0.29	0.27	0.35	0.28	0.27
Heavily frost damaged kernels, %	0.08	0.00	0.01	0.00	-	-	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.01
Sprouted kernels, %	0.00	0.02	0.13	0.00	-	-	0.08	0.04	0.03	0.03	0.06	0.15	1.43	0.11
Total damaged kernels, %	0.46	0.22	0.32	0.44	-	-	0.33	0.34	0.33	0.35	0.35	0.56	1.83	0.42
Combined deviations, %	3.18	2.32	2.47	4.00	-	-	2.73	2.03	2.36	2.26	3.55	5.07	3.99	2.55
Field fungi, %	0.16	0.14	0.22	0.12	-	-	0.19	0.18	0.12	0.10	0.14	0.29	1.12	0.20
Storage fungi, %	0.08	0.03	0.03	0.00	-	-	0.02	0.02	0.01	0.01	0.02	0.03	0.14	0.02
Ergot, %	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Noxious seeds (<i>Crotalaria spp.</i> , etc.)	0	0	0	0	-	-	0	0	0	0	0	0	0	0
Noxious seeds (<i>Agronome mexicana</i> , etc.)	0	0	0	0	-	-	0	0	0	0	0	0	0	0
Live insects	0	0	0	0	-	-	0	0	0	0	0	0	0	0
Undesirable odour	No	No	No	No	-	-	No	No	No	No	No	No	No	No
	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	1	5	19	5	-	-	30	29	24	17	11	10	8	99
BÜHLER EXTRACTION, %	74.0	74.8	74.1	73.3	-	-	74.1	75.1	75.1	75.0	74.7	74.4	74.2	74.9
FLOUR														
Colour, KJ	-1.7	-1.2	-1.7	-1.6	-	-	-1.6	-2.0	-2.1	-2.0	-1.9	-1.5	0.4	-1.8
Protein (12% mb), %	11.0	10.1	9.5	10.2	-	-	9.8	12.0	10.5	9.7	9.8	11.5	12.1	11.0
Wet Gluten (14% mb), %	28.0	24.7	22.8	25.5	-	-	23.7	32.7	28.4	25.7	28.0	31.4	31.1	29.7
Dry Gluten (14% mb), %	9.8	8.9	8.1	8.9	-	-	8.5	11.6	9.9	9.0	9.6	11.1	11.1	10.4
100g BAKING TEST														
Baking water absorption, %	60.9	60.0	59.3	59.8	-	-	59.6	62.3	60.5	59.6	59.9	61.8	62.4	61.1
Loaf volume, cm³	740	659	656	762	-	-	677	882	824	766	789	846	853	832
Evaluation	4	5	4	2	-	-	4	2	1	1	1	2	2	1
FARINOGRAM														
Water absorption, %	62.3	60.1	60.3	58.5	-	-	60.1	64.2	62.7	61.7	62.3	63.8	64.0	63.2
Development time, min	7.2	2.0	1.8	2.0	-	-	2.1	7.0	5.3	5.0	4.0	5.2	4.7	5.5
Stability, mm	12.4	6.3	3.3	6.4	-	-	4.6	9.1	7.3	7.5	6.0	8.1	7.6	7.8
Mixing tolerance index, BU	23	38	53	37	-	-	47	33	39	38	43	37	40	37

2010/2011 Imported Wheat Quality Versus 2010/2011 RSA Wheat Quality

Country of origin	Argentina							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	1	5	19	5	-	-	30	29	24	17	11	10	8	99
ALVEOGRAM														
Strength (S) , cm ²	38.2	31.7	29.8	33.9	-	-	31.1	43.1	32.6	30.5	29.2	39.5	39.4	36.2
Stability (P), mm	119	116	118	94	-	-	114	98	91	92	91	98	102	95
Distensibility (L), mm	56	45	42	72	-	-	48	94	78	69	70	87	78	81
P/L	2.12	2.76	3.04	1.57	-	-	2.72	1.08	1.21	1.44	1.55	1.28	1.57	1.29
EXTENSOGRAM														
Strength, cm ²	100	96	85	98	-	-	90	110	93	85	80	101	109	97
Max. height, BU	435	454	427	469	-	-	439	376	357	358	323	371	378	362
Extensibility, mm	157	146	138	149	-	-	142	205	181	166	170	193	203	187
MIXOGRAM														
Peak time, min	3.8	4.8	4.5	4.1	-	-	4.5	2.8	2.6	2.8	2.6	2.8	3.2	2.8
Absorption, %	60.9	60.0	59.3	60.0	-	-	59.6	62.2	60.4	59.6	59.8	61.7	62.3	61.0
MYCOTOXINS														
Afla G ₁ (µg/kg) [max. value]	0 [0]							0 [0]						
Afla B ₁ (µg/kg) [max. value]	0 [0]							0 [0]						
Afla G ₂ (µg/kg) [max. value]	0 [0]							0 [0]						
Afla B ₂ (µg/kg) [max. value]	0 [0]							0 [0]						
Fum B ₁ (µg/kg) [max. value]	0 [0]							0 [0]						
Fum B ₂ (µg/kg) [max. value]	-							0 [0]						
Deoxynivalenol (µg/kg) [max. value]	0 [0]							0 [0]						
Ochratoxin A (µg/kg) [max. value]	0 [0]							0 [0]						
Zearalenone (µg/kg) [max. value]	0 [0]							0 [0]						
T-2 Toxin (µg/kg) [max. value]	0 [0]							0 [0]						
No. of samples	15							30						

2010/2011 IMPORTED WHEAT QUALITY - AUSTRALIA (1 Oct 2010 to 30 Sep 2011)

2010/2011 Imported Wheat Quality Versus 2010/2011 RSA Wheat Quality

Country of origin	Australia							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	2	-	2	-	2	-	6	164	93	48	23	28	16	372
WHEAT GRADING														
Protein (12% mb), %	12.22	-	10.23	-	10.45	-	10.96	12.91	11.53	10.69	11.20	12.28	13.31	12.14
Moisture, %	10.9	-	10.8	-	10.8	-	10.8	11.8	11.7	11.6	11.6	11.8	12.2	11.8
Falling number, sec	333	-	274	-	254	-	287	385	389	371	359	358	180	372
1000 Kernel mass (13% mb), g	37.7	-	41.3	-	38.3	-	39.1	39.1	40.0	39.9	40.8	38.5	39.3	39.5
Hlm (dirty), kg/hl	80.7	-	79.1	-	78.8	-	79.5	80.9	80.4	80.6	80.8	78.1	76.6	80.3
Screenings (<1,8mm), %	1.41	-	1.14	-	1.55	-	1.37	1.34	1.61	1.51	2.66	3.48	1.49	1.68
Gravel, stones, turf and glass, %	0.00	-	0.00	-	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.01
Foreign matter, %	0.05	-	0.09	-	0.06	-	0.07	0.07	0.08	0.07	0.10	0.18	0.42	0.10
Other grain & unthreshed ears, %	0.19	-	0.44	-	0.20	-	0.28	0.28	0.34	0.33	0.43	0.85	0.26	0.35
Heat damaged kernels, %	0.00	-	0.00	-	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00
Immature kernels, %	0.00	-	0.00	-	0.00	-	0.00	0.06	0.02	0.02	0.02	0.06	0.10	0.04
Insect damaged kernels, %	0.00	-	0.00	-	0.00	-	0.00	0.24	0.28	0.29	0.27	0.35	0.28	0.27
Heavily frost damaged kernels, %	0.00	-	0.00	-	0.00	-	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.01
Sprouted kernels, %	0.12	-	0.78	-	3.21	-	1.37	0.04	0.03	0.03	0.06	0.15	1.43	0.11
Total damaged kernels, %	0.12	-	0.78	-	3.21	-	1.37	0.34	0.33	0.35	0.35	0.56	1.83	0.42
Combined deviations, %	1.77	-	2.45	-	5.02	-	3.08	2.03	2.36	2.26	3.55	5.07	3.99	2.55
Field fungi, %	0.16	-	0.28	-	0.44	-	0.29	0.18	0.12	0.10	0.14	0.29	1.12	0.20
Storage fungi, %	0.00	-	0.08	-	0.08	-	0.05	0.02	0.01	0.01	0.02	0.03	0.14	0.02
Ergot, %	0.00	-	0.00	-	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Noxious seeds (<i>Crotalaria spp.</i> , etc.)	0	-	0	-	0	-	0	0	0	0	0	0	0	0
Noxious seeds (<i>Agronome mexicana</i> , etc.)	0	-	0	-	0	-	0	0	0	0	0	0	0	0
Live insects	0	-	0	-	0	-	0	0	0	0	0	0	0	0
Undesirable odour	No	-	No	-	No	-	No	No	No	No	No	No	No	No
	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	2	-	2	-	2	-	6	29	24	17	11	10	8	99
BÜHLER EXTRACTION, %	74.2	-	72.4	-	74.7	-	73.7	75.1	75.1	75.0	74.7	74.4	74.2	74.9
FLOUR														
Colour, KJ	-2.9	-	-2.9	-	-2.2	-	-2.6	-2.0	-2.1	-2.0	-1.9	-1.5	0.4	-1.8
Protein (12% mb), %	11.0	-	9.1	-	9.4	-	9.8	12.0	10.5	9.7	9.8	11.5	12.1	11.0
Wet Gluten (14% mb), %	29.2	-	23.9	-	25.5	-	26.2	32.7	28.4	25.7	28.0	31.4	31.1	29.7
Dry Gluten (14% mb), %	10.9	-	8.6	-	8.7	-	9.4	11.6	9.9	9.0	9.6	11.1	11.1	10.4
100g BAKING TEST														
Baking water absorption, %	61.0	-	59.0	-	59.2	-	59.7	62.3	60.5	59.6	59.9	61.8	62.4	61.1
Loaf volume, cm ³	883	-	753	-	850	-	828	882	824	766	789	846	853	832
Evaluation	0	-	0	-	0	-	0	2	1	1	1	2	2	1
FARINOGRAM														
Water absorption, %	61.0	-	58.8	-	60.0	-	59.9	64.2	62.7	61.7	62.3	63.8	64.0	63.2
Development time, min	7.5	-	1.8	-	2.0	-	3.8	7.0	5.3	5.0	4.0	5.2	4.7	5.5
Stability, mm	15.7	-	7.6	-	4.3	-	9.2	9.1	7.3	7.5	6.0	8.1	7.6	7.8
Mixing tolerance index, BU	16	-	28	-	48	-	31	33	39	38	43	37	40	37

2010/2011 Imported Wheat Quality Versus 2010/2011 RSA Wheat Quality

Country of origin	Australia							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	2	-	2	-	2	-	6	29	24	17	11	10	8	99
ALVEOGRAM														
Strength (S) , cm ²	38.8	-	29.7	-	26.0	-	31.5	43.1	32.6	30.5	29.2	39.5	39.4	36.2
Stability (P), mm	97	-	87	-	87	-	90	98	91	92	91	98	102	95
Distensibility (L), mm	75	-	69	-	56	-	66	94	78	69	70	87	78	81
P/L	1.31	-	1.27	-	1.59	-	1.39	1.08	1.21	1.44	1.55	1.28	1.57	1.29
EXTENSOGRAM														
Strength, cm ²	127	-	91	-	88	-	102	110	93	85	80	101	109	97
Max. height, BU	460	-	430	-	383	-	424	376	357	358	323	371	378	362
Extensibility, mm	186	-	148	-	163	-	165	205	181	166	170	193	203	187
MIXOGRAM														
Peak time, min	3.9	-	3.1	-	3.3	-	3.4	2.8	2.6	2.8	2.6	2.8	3.2	2.8
Absorption, %	61.0	-	59.0	-	59.2	-	59.7	62.2	60.4	59.6	59.8	61.7	62.3	61.0
MYCOTOXINS														
Afla G ₁ (µg/kg) [max. value]	0 [0]							0 [0]						
Afla B ₁ (µg/kg) [max. value]	0 [0]							0 [0]						
Afla G ₂ (µg/kg) [max. value]	0 [0]							0 [0]						
Afla B ₂ (µg/kg) [max. value]	0 [0]							0 [0]						
Fum B ₁ (µg/kg) [max. value]	0 [0]							0 [0]						
Fum B ₂ (µg/kg) [max. value]	-							0 [0]						
Deoxynivalenol (µg/kg) [max. value]	0 [0]							0 [0]						
Ochratoxin A (µg/kg) [max. value]	0 [0]							0 [0]						
Zearalenone (µg/kg) [max. value]	0 [0]							0 [0]						
T-2 Toxin (µg/kg) [max. value]	0 [0]							0 [0]						
No. of samples	2							30						

2010/2011 IMPORTED WHEAT QUALITY - BRAZIL (1 Oct 2010 to 30 Sep 2011)

2010/2011 Imported Wheat Quality Versus 2010/2011 RSA Wheat Quality

Country of origin	Brazil							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	5	-	-	2	-	-	7	164	93	48	23	28	16	372
WHEAT GRADING														
Protein (12% mb), %	12.75	-	-	10.85	-	-	12.21	12.91	11.53	10.69	11.20	12.28	13.31	12.14
Moisture, %	11.4	-	-	11.8	-	-	11.5	11.8	11.7	11.6	11.6	11.8	12.2	11.8
Falling number, sec	246	-	-	415	-	-	294	385	389	371	359	358	180	372
1000 Kernel mass (13% mb), g	33.1	-	-	35.4	-	-	33.7	39.1	40.0	39.9	40.8	38.5	39.3	39.5
Hlm (dirty), kg/hl	81.0	-	-	81.0	-	-	81.0	80.9	80.4	80.6	80.8	78.1	76.6	80.3
Screenings (<1,8mm), %	1.98	-	-	3.17	-	-	2.32	1.34	1.61	1.51	2.66	3.48	1.49	1.68
Gravel, stones, turf and glass, %	0.00	-	-	0.00	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.01
Foreign matter, %	0.04	-	-	0.08	-	-	0.05	0.07	0.08	0.07	0.10	0.18	0.42	0.10
Other grain & unthreshed ears, %	0.10	-	-	0.32	-	-	0.16	0.28	0.34	0.33	0.43	0.85	0.26	0.35
Heat damaged kernels, %	0.00	-	-	0.00	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00
Immature kernels, %	0.27	-	-	0.24	-	-	0.26	0.06	0.02	0.02	0.02	0.06	0.10	0.04
Insect damaged kernels, %	0.02	-	-	0.13	-	-	0.05	0.24	0.28	0.29	0.27	0.35	0.28	0.27
Heavily frost damaged kernels, %	0.00	-	-	0.00	-	-	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.01
Sprouted kernels, %	0.72	-	-	0.00	-	-	0.51	0.04	0.03	0.03	0.06	0.15	1.43	0.11
Total damaged kernels, %	1.00	-	-	0.41	-	-	0.83	0.34	0.33	0.35	0.35	0.56	1.83	0.42
Combined deviations, %	3.12	-	-	3.98	-	-	3.37	2.03	2.36	2.26	3.55	5.07	3.99	2.55
Field fungi, %	0.50	-	-	0.12	-	-	0.39	0.18	0.12	0.10	0.14	0.29	1.12	0.20
Storage fungi, %	0.05	-	-	0.00	-	-	0.03	0.02	0.01	0.01	0.02	0.03	0.14	0.02
Ergot, %	0.00	-	-	0.00	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Noxious seeds (<i>Crotalaria spp.</i> , etc.)	0	-	-	0	-	-	0	0	0	0	0	0	0	0
Noxious seeds (<i>Agronome mexicana</i> , etc.)	0	-	-	0	-	-	0	0	0	0	0	0	0	0
Live insects	0	-	-	0	-	-	0	0	0	0	0	0	0	0
Undesirable odour	No	-	-	No	-	-	No	No	No	No	No	No	No	No
	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	5	-	-	2	-	-	7	29	24	17	11	10	8	99
BÜHLER EXTRACTION, %	71.9	-	-	74.7	-	-	72.7	75.1	75.1	75.0	74.7	74.4	74.2	74.9
FLOUR														
Colour, KJ	-1.2	-	-	-1.2	-	-	-1.2	-2.0	-2.1	-2.0	-1.9	-1.5	0.4	-1.8
Protein (12% mb), %	11.6	-	-	9.8	-	-	11.1	12.0	10.5	9.7	9.8	11.5	12.1	11.0
Wet Gluten (14% mb), %	31.2	-	-	23.5	-	-	29.0	32.7	28.4	25.7	28.0	31.4	31.1	29.7
Dry Gluten (14% mb), %	10.7	-	-	8.5	-	-	10.1	11.6	9.9	9.0	9.6	11.1	11.1	10.4
100g BAKING TEST														
Baking water absorption, %	61.6	-	-	59.6	-	-	61.1	62.3	60.5	59.6	59.9	61.8	62.4	61.1
Loaf volume, cm³	837	-	-	588	-	-	766	882	824	766	789	846	853	832
Evaluation	2	-	-	6	-	-	4	2	1	1	1	2	2	1
FARINOGRAM														
Water absorption, %	64.5	-	-	60.8	-	-	63.4	64.2	62.7	61.7	62.3	63.8	64.0	63.2
Development time, min	2.9	-	-	1.8	-	-	2.6	7.0	5.3	5.0	4.0	5.2	4.7	5.5
Stability, mm	7.6	-	-	2.9	-	-	6.2	9.1	7.3	7.5	6.0	8.1	7.6	7.8
Mixing tolerance index, BU	22	-	-	42	-	-	28	33	39	38	43	37	40	37

2010/2011 Imported Wheat Quality Versus 2010/2011 RSA Wheat Quality

Country of origin	Brazil							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	5	-	-	2	-	-	7	29	24	17	11	10	8	99
ALVEOGRAM														
Strength (S) , cm ²	36.7	-	-	32.6	-	-	35.5	43.1	32.6	30.5	29.2	39.5	39.4	36.2
Stability (P), mm	110	-	-	124	-	-	114	98	91	92	91	98	102	95
Distensibility (L), mm	61	-	-	42	-	-	56	94	78	69	70	87	78	81
P/L	1.80	-	-	2.98	-	-	2.14	1.08	1.21	1.44	1.55	1.28	1.57	1.29
EXTENSOGRAM														
Strength, cm ²	82	-	-	80	-	-	81	110	93	85	80	101	109	97
Max. height, BU	395	-	-	435	-	-	406	376	357	358	323	371	378	362
Extensibility, mm	150	-	-	127	-	-	143	205	181	166	170	193	203	187
MIXOGRAM														
Peak time, min	3.3	-	-	4.6	-	-	3.6	2.8	2.6	2.8	2.6	2.8	3.2	2.8
Absorption, %	61.6	-	-	59.6	-	-	61.1	62.2	60.4	59.6	59.8	61.7	62.3	61.0
MYCOTOXINS														
Afla G ₁ (µg/kg) [max. value]	0 [0]							0 [0]						
Afla B ₁ (µg/kg) [max. value]	0 [0]							0 [0]						
Afla G ₂ (µg/kg) [max. value]	0 [0]							0 [0]						
Afla B ₂ (µg/kg) [max. value]	0 [0]							0 [0]						
Fum B ₁ (µg/kg) [max. value]	0 [0]							0 [0]						
Fum B ₂ (µg/kg) [max. value]	-							0 [0]						
Deoxynivalenol (µg/kg) [max. value]	0 [0]							0 [0]						
Ochratoxin A (µg/kg) [max. value]	0 [0]							0 [0]						
Zearalenone (µg/kg) [max. value]	0 [<20]							0 [0]						
T-2 Toxin (µg/kg) [max. value]	0 [0]							0 [0]						
No. of samples	2							30						

2010/2011 IMPORTED WHEAT QUALITY - CANADA (1 Oct 2010 to 30 Sep 2011)

2010/2011 Imported Wheat Quality Versus 2010/2011 RSA Season

Country of origin	Canada							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	4	3	-	2	-	-	9	164	93	48	23	28	16	372
WHEAT GRADING														
Protein (12% mb), %	13.64	11.59	-	11.55	-	-	12.49	12.91	11.53	10.69	11.20	12.28	13.31	12.14
Moisture, %	13.3	10.9	-	10.9	-	-	12.0	11.8	11.7	11.6	11.6	11.8	12.2	11.8
Falling number, sec	383	464	-	429	-	-	420	385	389	371	359	358	180	372
1000 Kernel mass (13% mb), g	33.0	29.1	-	28.7	-	-	30.7	39.1	40.0	39.9	40.8	38.5	39.3	39.5
Hlm (dirty), kg/hl	80.7	82.0	-	81.9	-	-	81.4	80.9	80.4	80.6	80.8	78.1	76.6	80.3
Screenings (<1,8mm), %	2.75	2.89	-	3.13	-	-	2.88	1.34	1.61	1.51	2.66	3.48	1.49	1.68
Gravel, stones, turf and glass, %	0.00	0.00	-	0.00	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.01
Foreign matter, %	0.06	0.07	-	0.12	-	-	0.08	0.07	0.08	0.07	0.10	0.18	0.42	0.10
Other grain & unthreshed ears, %	0.28	0.29	-	0.35	-	-	0.30	0.28	0.34	0.33	0.43	0.85	0.26	0.35
Heat damaged kernels, %	0.00	0.18	-	0.14	-	-	0.09	0.00	0.00	0.00	0.00	0.00	0.02	0.00
Immature kernels, %	0.08	0.00	-	0.00	-	-	0.03	0.06	0.02	0.02	0.02	0.06	0.10	0.04
Insect damaged kernels, %	0.02	0.19	-	0.14	-	-	0.10	0.24	0.28	0.29	0.27	0.35	0.28	0.27
Heavily frost damaged kernels, %	0.04	0.00	-	0.00	-	-	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.01
Sprouted kernels, %	0.16	0.00	-	0.00	-	-	0.07	0.04	0.03	0.03	0.06	0.15	1.43	0.11
Total damaged kernels, %	0.25	0.37	-	0.28	-	-	0.30	0.34	0.33	0.35	0.35	0.56	1.83	0.42
Combined deviations, %	3.34	3.62	-	3.88	-	-	3.55	2.03	2.36	2.26	3.55	5.07	3.99	2.55
Field fungi, %	0.21	0.08	-	0.16	-	-	0.15	0.18	0.12	0.10	0.14	0.29	1.12	0.20
Storage fungi, %	0.04	0.03	-	0.04	-	-	0.04	0.02	0.01	0.01	0.02	0.03	0.14	0.02
Ergot, %	0.02	0.00	-	0.00	-	-	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Noxious seeds (<i>Crotalaria spp., etc.</i>)	0	0	-	0	-	-	0	0	0	0	0	0	0	0
Noxious seeds (<i>Agronome mexicana, etc.</i>)	0	0	-	0	-	-	0	0	0	0	0	0	0	0
Live insects	0	0	-	0	-	-	0	0	0	0	0	0	0	0
Undesirable odour	No	No	-	No	-	-	No	No	No	No	No	No	No	No
	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	4	3	-	2	-	-	9	29	24	17	11	10	8	99
BÜHLER EXTRACTION, %	73.3	72.1	-	72.3	-	-	72.7	75.1	75.1	75.0	74.7	74.4	74.2	74.9
FLOUR														
Colour, KJ	-2.2	-1.9	-	-1.9	-	-	-2.0	-2.0	-2.1	-2.0	-1.9	-1.5	0.4	-1.8
Protein (12% mb), %	12.7	10.3	-	10.3	-	-	11.4	12.0	10.5	9.7	9.8	11.5	12.1	11.0
Wet Gluten (14% mb), %	35.1	25.9	-	26.0	-	-	30.0	32.7	28.4	25.7	28.0	31.4	31.1	29.7
Dry Gluten (14% mb), %	13.3	9.4	-	9.2	-	-	11.1	11.6	9.9	9.0	9.6	11.1	11.1	10.4
100g BAKING TEST														
Baking water absorption, %	63.1	60.1	-	60.2	-	-	61.4	62.3	60.5	59.6	59.9	61.8	62.4	61.1
Loaf volume, cm ³	924	832	-	850	-	-	877	882	824	766	789	846	853	832
Evaluation	1	0	-	0	-	-	0	2	1	1	1	2	2	1
FARINOGRAM														
Water absorption, %	64.0	56.7	-	56.8	-	-	60.0	64.2	62.7	61.7	62.3	63.8	64.0	63.2
Development time, min	5.9	2.0	-	2.0	-	-	3.7	7.0	5.3	5.0	4.0	5.2	4.7	5.5
Stability, mm	11.5	10.2	-	9.2	-	-	10.5	9.1	7.3	7.5	6.0	8.1	7.6	7.8
Mixing tolerance index, BU	23	29	-	37	-	-	28	33	39	38	43	37	40	37

2010/2011 Imported Wheat Quality Versus 2010/2011 RSA Wheat Quality

Country of origin	Canada							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	4	3	-	2	-	-	9	29	24	17	11	10	8	99
ALVEOGRAM														
Strength (S) , cm ²	48.2	30.9	-	29.0	-	-	38.2	43.1	32.6	30.5	29.2	39.5	39.4	36.2
Stability (P), mm	102	78	-	79	-	-	89	98	91	92	91	98	102	95
Distensibility (L), mm	94	74	-	68	-	-	81	94	78	69	70	87	78	81
P/L	1.09	1.05	-	1.19	-	-	1.10	1.08	1.21	1.44	1.55	1.28	1.57	1.29
EXTENSOGRAM														
Strength, cm ²	123	108	-	106	-	-	114	110	93	85	80	101	109	97
Max. height, BU	415	515	-	493	-	-	466	376	357	358	323	371	378	362
Extensibility, mm	212	149	-	150	-	-	177	205	181	166	170	193	203	187
MIXOGRAM														
Peak time, min	3.0	4.1	-	4.1	-	-	3.6	2.8	2.6	2.8	2.6	2.8	3.2	2.8
Absorption, %	63.1	60.1	-	60.2	-	-	61.4	62.2	60.4	59.6	59.8	61.7	62.3	61.0
MYCOTOXINS														
Afla G ₁ (µg/kg) [max. value]	0 [0]							0 [0]						
Afla B ₁ (µg/kg) [max. value]	0 [0]							0 [0]						
Afla G ₂ (µg/kg) [max. value]	0 [0]							0 [0]						
Afla B ₂ (µg/kg) [max. value]	0 [0]							0 [0]						
Fum B ₁ (µg/kg) [max. value]	0 [0]							0 [0]						
Fum B ₂ (µg/kg) [max. value]	-							0 [0]						
Deoxynivalenol (µg/kg) [max. value]	4 [11]							0 [0]						
Ochratoxin A (µg/kg) [max. value]	0 [0]							0 [0]						
Zearalenone (µg/kg) [max. value]	0 [0]							0 [0]						
T-2 Toxin (µg/kg) [max. value]	15 [46]							0 [0]						
No. of samples	3							30						

2010/2011 IMPORTED WHEAT QUALITY - GERMANY (1 Oct 2010 to 30 Sep 2011)

2010/2011 Imported Wheat Quality Versus 2010/2011 RSA Season

Country of origin	Germany							RSA Crop Average						
	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	-	6	1	3	2	-	12	164	93	48	23	28	16	372
WHEAT GRADING														
Protein (12% mb), %	-	11.36	10.95	10.70	11.50	-	11.18	12.91	11.53	10.69	11.20	12.28	13.31	12.14
Moisture, %	-	12.9	12.8	12.4	12.9	-	12.8	11.8	11.7	11.6	11.6	11.8	12.2	11.8
Falling number, sec	-	297	504	333	272	-	319	385	389	371	359	358	180	372
1000 Kernel mass (13% mb), g	-	38.8	33.0	36.6	41.7	-	38.3	39.1	40.0	39.9	40.8	38.5	39.3	39.5
Hlm (dirty), kg/hl	-	78.1	81.2	80.5	78.6	-	79.1	80.9	80.4	80.6	80.8	78.1	76.6	80.3
Screenings (<1,8mm), %	-	2.29	2.75	3.02	2.82	-	2.60	1.34	1.61	1.51	2.66	3.48	1.49	1.68
Gravel, stones, turf and glass, %	-	0.02	0.00	0.00	0.16	-	0.04	0.00	0.00	0.00	0.00	0.00	0.07	0.01
Foreign matter, %	-	0.11	0.10	0.13	0.25	-	0.14	0.07	0.08	0.07	0.10	0.18	0.42	0.10
Other grain & unthreshed ears, %	-	0.31	0.28	0.13	0.65	-	0.32	0.28	0.34	0.33	0.43	0.85	0.26	0.35
Heat damaged kernels, %	-	0.01	0.00	0.03	0.00	-	0.01	0.00	0.00	0.00	0.00	0.00	0.02	0.00
Immature kernels, %	-	0.00	0.00	0.03	0.00	-	0.01	0.06	0.02	0.02	0.02	0.06	0.10	0.04
Insect damaged kernels, %	-	0.09	0.12	0.11	0.04	-	0.09	0.24	0.28	0.29	0.27	0.35	0.28	0.27
Heavily frost damaged kernels, %	-	0.00	0.00	0.11	0.08	-	0.04	0.02	0.00	0.00	0.00	0.00	0.00	0.01
Sprouted kernels, %	-	0.19	0.08	0.08	0.24	-	0.16	0.04	0.03	0.03	0.06	0.15	1.43	0.11
Total damaged kernels, %	-	0.29	0.20	0.24	0.28	-	0.27	0.34	0.33	0.35	0.35	0.56	1.83	0.42
Combined deviations, %	-	3.01	3.33	3.52	4.00	-	3.33	2.03	2.36	2.26	3.55	5.07	3.99	2.55
Field fungi, %	-	0.57	0.48	0.52	0.62	-	0.56	0.18	0.12	0.10	0.14	0.29	1.12	0.20
Storage fungi, %	-	0.07	0.16	0.05	0.08	-	0.07	0.02	0.01	0.01	0.02	0.03	0.14	0.02
Ergot, %	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Noxious seeds (<i>Crotalaria spp., etc.</i>)	-	0	0	0	0	-	0	0	0	0	0	0	0	0
Noxious seeds (<i>Agronome mexicana, etc.</i>)	-	0	0	0	0	-	0	0	0	0	0	0	0	0
Live insects	-	0	0	0	0	-	0	0	0	0	0	0	0	0
Undesirable odour	-	No	No	No	No	-	No	No	No	No	No	No	No	No
	B1	B2	B3	B1	UT	B1	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	-	6	1	3	2	-	12	29	24	17	11	10	8	99
BÜHLER EXTRACTION, %	-	74.6	72.7	72.5	75.6	-	74.1	75.1	75.1	75.0	74.7	74.4	74.2	74.9
FLOUR														
Colour, KJ	-	-0.3	-1.5	-1.6	0.0	-	-0.7	-2.0	-2.1	-2.0	-1.9	-1.5	0.4	-1.8
Protein (12% mb), %	-	10.1	9.9	9.4	10.2	-	9.9	12.0	10.5	9.7	9.8	11.5	12.1	11.0
Wet Gluten (14% mb), %	-	25.9	22.8	23.0	26.7	-	25.0	32.7	28.4	25.7	28.0	31.4	31.1	29.7
Dry Gluten (14% mb), %	-	9.0	8.5	8.1	9.9	-	8.9	11.6	9.9	9.0	9.6	11.1	11.1	10.4
100g BAKING TEST														
Baking water absorption, %	-	59.9	59.7	59.2	60.0	-	59.7	62.3	60.5	59.6	59.9	61.8	62.4	61.1
Loaf volume, cm³	-	762	705	672	715	-	727	882	824	766	789	846	853	832
Evaluation	-	1	3	3	3	-	3	2	1	1	1	2	2	1
FARINOGRAM														
Water absorption, %	-	58.1	59.0	58.5	58.2	-	58.3	64.2	62.7	61.7	62.3	63.8	64.0	63.2
Development time, min	-	1.9	1.7	1.7	2.1	-	1.9	7.0	5.3	5.0	4.0	5.2	4.7	5.5
Stability, mm	-	3.8	2.5	2.1	3.9	-	3.3	9.1	7.3	7.5	6.0	8.1	7.6	7.8
Mixing tolerance index, BU	-	45	71	72	54	-	55	33	39	38	43	37	40	37

2010/2011 Imported Wheat Quality Versus 2010/2011 RSA Wheat Quality

Country of origin	Germany							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	-	6	1	3	2	-	12	29	24	17	11	10	8	99
ALVEOGRAM														
Strength (S) , cm ²	-	29.5	35.2	27.3	32.6	-	29.9	43.1	32.6	30.5	29.2	39.5	39.4	36.2
Stability (P), mm	-	87	107	95	89	-	91	98	91	92	91	98	102	95
Distensibility (L), mm	-	64	53	49	72	-	61	94	78	69	70	87	78	81
P/L	-	1.42	2.02	2.02	1.27	-	1.59	1.08	1.21	1.44	1.55	1.28	1.57	1.29
EXTENSOGRAM														
Strength, cm ²	-	88	84	79	91	-	86	110	93	85	80	101	109	97
Max. height, BU	-	388	370	398	410	-	393	376	357	358	323	371	378	362
Extensibility, mm	-	159	156	141	153	-	153	205	181	166	170	193	203	187
MIXOGRAM														
Peak time, min	-	4.4	5.8	4.6	3.7	-	4.4	2.8	2.6	2.8	2.6	2.8	3.2	2.8
Absorption, %	-	59.9	59.7	59.2	60.0	-	59.7	62.2	60.4	59.6	59.8	61.7	62.3	61.0
MYCOTOXINS														
Afla G ₁ (µg/kg) [max. value]	0 [0]							0 [0]						
Afla B ₁ (µg/kg) [max. value]	0 [0]							0 [0]						
Afla G ₂ (µg/kg) [max. value]	0 [0]							0 [0]						
Afla B ₂ (µg/kg) [max. value]	0 [0]							0 [0]						
Fum B ₁ (µg/kg) [max. value]	0 [0]							0 [0]						
Fum B ₂ (µg/kg) [max. value]	-							0 [0]						
Deoxynivalenol (µg/kg) [max. value]	29 [117]							0 [0]						
Ochratoxin A (µg/kg) [max. value]	0 [0]							0 [0]						
Zearalenone (µg/kg) [max. value]	0 [0]							0 [0]						
T-2 Toxin (µg/kg) [max. value]	0 [0]							0 [0]						
No. of samples	4							30						

2010/2011 IMPORTED WHEAT QUALITY - URUGUAY (1 Oct 2010 to 30 Sep 2011)

2010/2011 Imported Wheat Quality Versus 2010/2011 RSA Season

Country of origin	Uruguay							RSA Crop Average						
	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
Class and Grade bread wheat	-	-	-	2	-	-	2	164	93	48	23	28	16	372
No. of samples	-	-	-	2	-	-	2	164	93	48	23	28	16	372
WHEAT GRADING														
Protein (12% mb), %	-	-	-	11.21	-	-	11.21	12.91	11.53	10.69	11.20	12.28	13.31	12.14
Moisture, %	-	-	-	13.0	-	-	13.0	11.8	11.7	11.6	11.6	11.8	12.2	11.8
Falling number, sec	-	-	-	308	-	-	308	385	389	371	359	358	180	372
1000 Kernel mass (13% mb), g	-	-	-	34.6	-	-	34.6	39.1	40.0	39.9	40.8	38.5	39.3	39.5
Hlm (dirty), kg/hl	-	-	-	77.5	-	-	77.5	80.9	80.4	80.6	80.8	78.1	76.6	80.3
Screenings (<1,8mm), %	-	-	-	3.55	-	-	3.55	1.34	1.61	1.51	2.66	3.48	1.49	1.68
Gravel, stones, turf and glass, %	-	-	-	0.00	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.01
Foreign matter, %	-	-	-	0.05	-	-	0.05	0.07	0.08	0.07	0.10	0.18	0.42	0.10
Other grain & unthreshed ears, %	-	-	-	0.16	-	-	0.16	0.28	0.34	0.33	0.43	0.85	0.26	0.35
Heat damaged kernels, %	-	-	-	0.16	-	-	0.16	0.00	0.00	0.00	0.00	0.00	0.02	0.00
Immature kernels, %	-	-	-	0.00	-	-	0.00	0.06	0.02	0.02	0.02	0.06	0.10	0.04
Insect damaged kernels, %	-	-	-	0.07	-	-	0.07	0.24	0.28	0.29	0.27	0.35	0.28	0.27
Heavily frost damaged kernels, %	-	-	-	0.00	-	-	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.01
Sprouted kernels, %	-	-	-	0.24	-	-	0.24	0.04	0.03	0.03	0.06	0.15	1.43	0.11
Total damaged kernels, %	-	-	-	0.47	-	-	0.47	0.34	0.33	0.35	0.35	0.56	1.83	0.42
Combined deviations, %	-	-	-	4.23	-	-	4.23	2.03	2.36	2.26	3.55	5.07	3.99	2.55
Field fungi, %	-	-	-	0.71	-	-	0.71	0.18	0.12	0.10	0.14	0.29	1.12	0.20
Storage fungi, %	-	-	-	0.12	-	-	0.12	0.02	0.01	0.01	0.02	0.03	0.14	0.02
Ergot, %	-	-	-	0.00	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Noxious seeds (<i>Crotalaria spp.</i> , etc.)	-	-	-	0	-	-	0	0	0	0	0	0	0	0
Noxious seeds (<i>Agronomexicana</i> , etc.)	-	-	-	0	-	-	0	0	0	0	0	0	0	0
Live insects	-	-	-	0	-	-	0	0	0	0	0	0	0	0
Undesirable odour	-	-	-	No	-	-	No	No	No	No	No	No	No	No
	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	-	-	-	2	-	-	2	29	24	17	11	10	8	99
BÜHLER EXTRACTION, %	-	-	-	70.2	-	-	70.2	75.1	75.1	75.0	74.7	74.4	74.2	74.9
FLOUR														
Colour, KJ	-	-	-	-1.6	-	-	-1.6	-2.0	-2.1	-2.0	-1.9	-1.5	0.4	-1.8
Protein (12% mb), %	-	-	-	9.7	-	-	9.7	12.0	10.5	9.7	9.8	11.5	12.1	11.0
Wet Gluten (14% mb), %	-	-	-	24.5	-	-	24.5	32.7	28.4	25.7	28.0	31.4	31.1	29.7
Dry Gluten (14% mb), %	-	-	-	8.4	-	-	8.4	11.6	9.9	9.0	9.6	11.1	11.1	10.4
100g BAKING TEST														
Baking water absorption, %	-	-	-	59.5	-	-	59.5	62.3	60.5	59.6	59.9	61.8	62.4	61.1
Loaf volume, cm ³	-	-	-	760	-	-	760	882	824	766	789	846	853	832
Evaluation	-	-	-	1	-	-	1	2	1	1	1	2	2	1
FARINOGRAM														
Water absorption, %	-	-	-	58.9	-	-	58.9	64.2	62.7	61.7	62.3	63.8	64.0	63.2
Development time, min	-	-	-	1.9	-	-	1.9	7.0	5.3	5.0	4.0	5.2	4.7	5.5
Stability, mm	-	-	-	2.5	-	-	2.5	9.1	7.3	7.5	6.0	8.1	7.6	7.8
Mixing tolerance index, BU	-	-	-	50	-	-	50	33	39	38	43	37	40	37

2010/2011 Imported Wheat Quality Versus 2010/2011 RSA Wheat Quality

Country of origin	Uruguay							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	-	-	-	2	-	-	2	29	24	17	11	10	8	99
ALVEOGRAM														
Strength (S) , cm ²	-	-	-	29.8	-	-	29.8	43.1	32.6	30.5	29.2	39.5	39.4	36.2
Stability (P), mm	-	-	-	94	-	-	94	98	91	92	91	98	102	95
Distensibility (L), mm	-	-	-	54	-	-	54	94	78	69	70	87	78	81
P/L	-	-	-	1.77	-	-	1.77	1.08	1.21	1.44	1.55	1.28	1.57	1.29
EXTENSOGRAM														
Strength, cm ²	-	-	-	78	-	-	78	110	93	85	80	101	109	97
Max. height, BU	-	-	-	358	-	-	358	376	357	358	323	371	378	362
Extensibility, mm	-	-	-	158	-	-	158	205	181	166	170	193	203	187
MIXOGRAM														
Peak time, min	-	-	-	4.4	-	-	4.4	2.8	2.6	2.8	2.6	2.8	3.2	2.8
Absorption, %	-	-	-	59.5	-	-	59.5	62.2	60.4	59.6	59.8	61.7	62.3	61.0
MYCOTOXINS														
Afla G ₁ (µg/kg) [max. value]	0 [0]							0 [0]						
Afla B ₁ (µg/kg) [max. value]	0 [0]							0 [0]						
Afla G ₂ (µg/kg) [max. value]	0 [0]							0 [0]						
Afla B ₂ (µg/kg) [max. value]	0 [0]							0 [0]						
Fum B ₁ (µg/kg) [max. value]	0 [0]							0 [0]						
Fum B ₂ (µg/kg) [max. value]	-							0 [0]						
Deoxynivalenol (µg/kg) [max. value]	140 [140]							0 [0]						
Ochratoxin A (µg/kg) [max. value]	0 [0]							0 [0]						
Zearalenone (µg/kg) [max. value]	0 [0]							0 [0]						
T-2 Toxin (µg/kg) [max. value]	0 [0]							0 [0]						
No. of samples	1							30						

2010/2011 IMPORTED WHEAT QUALITY - USA (1 Oct 2010 to 30 Sep 2011)

2010/2011 Imported Wheat Quality Versus 2010/2011 RSA Season

Country of origin	USA							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	2	5	4	18	17	-	46	164	93	48	23	28	16	372
WHEAT GRADING														
Protein (12% mb), %	12.98	11.70	10.66	11.46	11.57	-	11.52	12.91	11.53	10.69	11.20	12.28	13.31	12.14
Moisture, %	12.7	11.3	11.7	11.0	11.2	-	11.2	11.8	11.7	11.6	11.6	11.8	12.2	11.8
Falling number, sec	408	455	450	485	486	-	476	385	389	371	359	358	180	372
1000 Kernel mass (13% mb), g	37.2	28.6	32.3	29.9	28.1	-	29.6	39.1	40.0	39.9	40.8	38.5	39.3	39.5
Hlm (dirty), kg/hl	80.5	80.3	81.5	80.7	79.6	-	80.3	80.9	80.4	80.6	80.8	78.1	76.6	80.3
Screenings (<1,8mm), %	2.17	2.57	3.43	3.55	4.84	-	3.85	1.34	1.61	1.51	2.66	3.48	1.49	1.68
Gravel, stones, turf and glass, %	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.01
Foreign matter, %	0.12	0.08	0.12	0.09	0.10	-	0.09	0.07	0.08	0.07	0.10	0.18	0.42	0.10
Other grain & unthreshed ears, %	0.40	0.38	0.20	0.30	0.35	-	0.32	0.28	0.34	0.33	0.43	0.85	0.26	0.35
Heat damaged kernels, %	0.00	0.16	0.17	0.11	0.17	-	0.14	0.00	0.00	0.00	0.00	0.00	0.02	0.00
Immature kernels, %	0.00	0.00	0.00	0.00	0.00	-	0.00	0.06	0.02	0.02	0.02	0.06	0.10	0.04
Insect damaged kernels, %	0.28	0.08	0.13	0.14	0.21	-	0.16	0.24	0.28	0.29	0.27	0.35	0.28	0.27
Heavily frost damaged kernels, %	0.00	0.00	0.00	0.01	0.03	-	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.01
Sprouted kernels, %	0.00	0.02	0.04	0.01	0.05	-	0.03	0.04	0.03	0.03	0.06	0.15	1.43	0.11
Total damaged kernels, %	0.28	0.26	0.34	0.27	0.43	-	0.33	0.34	0.33	0.35	0.35	0.56	1.83	0.42
Combined deviations, %	2.97	3.28	4.08	4.20	5.72	-	4.60	2.03	2.36	2.26	3.55	5.07	3.99	2.55
Field fungi, %	0.36	0.22	0.52	0.30	0.59	-	0.42	0.18	0.12	0.10	0.14	0.29	1.12	0.20
Storage fungi, %	0.00	0.02	0.04	0.01	0.03	-	0.02	0.02	0.01	0.01	0.02	0.03	0.14	0.02
Ergot, %	0.01	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Noxious seeds (<i>Crotalaria spp., etc.</i>)	0	0	0	0	0	-	0	0	0	0	0	0	0	0
Noxious seeds (<i>Agronome mexicana, etc.</i>)	0	0	0	0	0	-	0	0	0	0	0	0	0	0
Live insects	0	0	0	0	0	-	0	0	0	0	0	0	0	0
Undesirable odour	No	No	No	No	No	-	No	No	No	No	No	No	No	No
	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	2	5	4	18	17	-	46	29	24	17	11	10	8	99
BÜHLER EXTRACTION, %	73.2	71.5	74.1	72.3	72.7	-	72.5	75.1	75.1	75.0	74.7	74.4	74.2	74.9
FLOUR														
Colour, KJ	-2.4	-1.7	-1.0	-1.6	-0.5	-	-1.2	-2.0	-2.1	-2.0	-1.9	-1.5	0.4	-1.8
Protein (12% mb), %	11.9	10.5	10.2	10.3	10.3	-	10.4	12.0	10.5	9.7	9.8	11.5	12.1	11.0
Wet Gluten (14% mb), %	32.2	26.0	26.1	25.5	25.6	-	25.9	32.7	28.4	25.7	28.0	31.4	31.1	29.7
Dry Gluten (14% mb), %	11.9	9.3	9.4	9.0	9.0	-	9.2	11.6	9.9	9.0	9.6	11.1	11.1	10.4
100g BAKING TEST														
Baking water absorption, %	62.1	59.3	59.6	59.8	59.8	-	59.8	62.3	60.5	59.6	59.9	61.8	62.4	61.1
Loaf volume, cm³	883	779	810	796	801	-	801	882	824	766	789	846	853	832
Evaluation	1	2	0	1	1	-	1	2	1	1	1	2	2	1
FARINOGRAM														
Water absorption, %	61.4	56.5	58.3	57.0	56.8	-	57.2	64.2	62.7	61.7	62.3	63.8	64.0	63.2
Development time, min	5.5	2.0	2.1	2.0	2.0	-	2.2	7.0	5.3	5.0	4.0	5.2	4.7	5.5
Stability, mm	14.7	9.6	8.8	7.4	7.1	-	8.0	9.1	7.3	7.5	6.0	8.1	7.6	7.8
Mixing tolerance index, BU	12	36	37	39	40	-	38	33	39	38	43	37	40	37

2010/2011 Imported Wheat Quality Versus 2010/2011 RSA Wheat Quality

Country of origin	USA							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	2	5	4	18	17	-	46	29	24	17	11	10	8	99
ALVEOGRAM														
Strength (S) , cm ²	49.8	30.6	33.0	31.5	29.9	-	31.7	43.1	32.6	30.5	29.2	39.5	39.4	36.2
Stability (P), mm	95	78	86	84	81	-	83	98	91	92	91	98	102	95
Distensibility (L), mm	98	71	73	67	67	-	69	94	78	69	70	87	78	81
P/L	0.97	1.14	1.23	1.29	1.24	-	1.24	1.08	1.21	1.44	1.55	1.28	1.57	1.29
EXTENSOGRAM														
Strength, cm ²	128	109	99	109	104	-	107	110	93	85	80	101	109	97
Max. height, BU	450	476	444	505	482	-	486	376	357	358	323	371	378	362
Extensibility, mm	204	155	154	150	166	-	159	205	181	166	170	193	203	187
MIXOGRAM														
Peak time, min	3.8	4.7	4.4	4.6	4.5	-	4.5	2.8	2.6	2.8	2.6	2.8	3.2	2.8
Absorption, %	62.1	60.3	60.1	60.1	60.1	-	60.2	62.2	60.4	59.6	59.8	61.7	62.3	61.0
MYCOTOXINS														
Afla G ₁ (µg/kg) [max. value]	0 [0]							0 [0]						
Afla B ₁ (µg/kg) [max. value]	0 [0]							0 [0]						
Afla G ₂ (µg/kg) [max. value]	0 [0]							0 [0]						
Afla B ₂ (µg/kg) [max. value]	0 [0]							0 [0]						
Fum B ₁ (µg/kg) [max. value]	0 [0]							0 [0]						
Fum B ₂ (µg/kg) [max. value]	-							0 [0]						
Deoxynivalenol (µg/kg) [max. value]	101 [626]							0 [0]						
Ochratoxin A (µg/kg) [max. value]	0 [0]							0 [0]						
Zearalenone (µg/kg) [max. value]	2 [44]							0 [0]						
T-2 Toxin (µg/kg) [max. value]	6 [43]							0 [0]						
No. of samples	18							30						

Accuracy Award

SAGL participates in several international proficiency schemes including AACC International, BIPEA and FAPAS, as part of our quality assurance procedures to demonstrate technical competency. SAGL has received the 2010 AACC International Accuracy Award for the Mixograph analysis (also received in 2006, 2007, 2008 and 2009). SAGL received the Accuracy Award for Feed analysis (moisture, crude protein, crude fibre and ash) in 2004 and 2009.





CERTIFICATE OF ACCREDITATION

In terms of section 22(2)(b) of the Accreditation for Conformity Assessment, Calibration and Good Laboratory Practice Act, 2006 (Act 19 of 2006), read with sections 23(1), (2) and (3) of the said Act, I hereby certify that:-

SOUTHERN AFRICAN GRAIN LABORATORY
Co. reg no: 1997/018518/08

Facility Accreditation Number: **T0116**

is a South African National Accreditation System accredited Testing laboratory
provided that all SANAS conditions and requirements are complied with

This certificate is valid as per the scope as stated in the accompanying schedule of accreditation,
Annexure "A", bearing the above accreditation number for

CHEMICAL & PHYSICAL ANALYSIS

The facility is accredited in accordance with the recognised International Standard

ISO/IEC 17025:2005

*The accreditation demonstrates technical competency for a defined scope and the operation of a
laboratory quality management system*

While this certificate remains valid, the Accredited Facility named above is authorised to
use the relevant SANAS accreditation symbol to issue facility reports and/or certificates



M F R Josias
Chief Executive Officer

Effective Date: 01 November 2009
Certificate Expires: 31 October 2014

ANNEXURE A

SCHEDULE OF ACCREDITATION

Testing Laboratory Number: T0116

<p>Permanent Address of Laboratory: Southern African Grain Laboratory Grain Building 477 Witherite Road The Willows 0040</p> <p>Postal Address: PostNet Suite # 391 Private Bag X 1 The Willows 0041</p> <p>Tel : (012) 807-4019 Fax : (012) 807-4160 E-mail : info@sagl.co.za</p>	<p>Technical Signatories</p> <ul style="list-style-type: none"> : Ms J Nortjé (All) : Ms M Hammes (Chemical) : Ms M E Vorster (Physical) : Mr B van der Linde (Grading) : Ms A de Jager (Nutrients & Contaminants) : Mrs M Henning (Chemical) : Ms H Schoeman (In House Method 24 & Grading) : Ms D Moleke (Physical) : Ms I Delpont (Physical) : Mrs W Louw (In House Methods 1, 2, 3, 10 & 26) : Ms J Kruger (Chemical excluding In-House Method 12) <p>Nominated Representative : Mrs S du Preez</p> <p>Management Representative : Mrs W Louw</p> <p>Issue No. : 18 Date of issue : 22 November 2011 Expiry date : 31 October 2014</p>	
Materials/Products Tested	Types of Tests/Properties Measured, Range of Measurement	Standard Specifications, Equipment/ Techniques Used
CHEMICAL		
<p>Ground barley</p> <p>Ground grains, semolina and flour, milled-wheat, bran, rice (hulled, paddy), millet, rye & oats as grains, milled pasta, brown bread flour.</p> <p>Whole and milled maize and soya beans, milled maize products</p> <p>All flours, cereal grains, oil seeds and animal feeds</p> <p>Food stuffs</p> <p>Food Stuff and Feeds</p> <p>Food Stuffs and Feeds, Semolina and Milled Pasta</p> <p>Wheat Kernels</p>	<p>Moisture (Oven method)</p> <p>Moisture (Oven method)</p> <p>Moisture (Oven method)</p> <p>Nitrogen and protein (Combustion method)</p> <p>Dietary fibre (total)</p> <p>Carbohydrates (by difference) (calculation) Energy Value (calculation) Total Digestible Nutritional Value (calculation)</p> <p>Determination of Ash</p> <p>Moisture (oven method)</p>	<p>Analytical EBC 3.2, Latest Edition</p> <p>ICC No 110/1, Latest Edition</p> <p>AACC 44-15.02, Latest Edition</p> <p>AACC 46-30.01, Latest Edition</p> <p>In-House Method 12</p> <p>SOP MC 23</p> <p>In-House Method 11</p> <p>Government Gazette Wheat Grading Regulation , Latest Edition</p>

Original date of accreditation: 01 November 1999

Page 1 of 2


Field Manager

ANNEXURE A

Laboratory No: T0116
Date of issue: 22 November 2011
Expiry date: 31 October 2014

Materials/Products Tested	Types of Tests/Properties Measured, Range of Measurement	Standard Specifications, Equipment/ Techniques Used
CHEMICAL Continued...		
Flours of grains, e.g. barley, triticale, maize, rye, sorghum and wheat, oilseeds, feeds, mixed feeds and foodstuffs	Crude fat (Ether extraction by Soxhlet)	In-House Method 24
Meal and flour of wheat, rye, barley, other grains, starch containing and malted products	Falling Number	ICC No 107/1, Latest Edition
NUTRIENTS & CONTAMINANTS		
Grain based fortified food and feed products and fortification mixes	Vitamin A as all trans Retinol (Saponification) (HPLC)	In-House Method 1
	Thiamine Mononitrate (HPLC)	In-House Method 2
	Riboflavin (HPLC)	In-House Method 2
	Nicotinamide (HPLC)	In-House Method 2
	Pyridoxine Hydrochloride (HPLC)	In-House Method 2
Grain based fortified food and feed products and fortification mixes	Folic Acid (HPLC)	In-House Method 3
Grain based fortified food and feed products and fortification mixes	Total Iron and Total Zinc (AA)	In-House Method 10
Food and Feed	Mycotoxins - Aflatoxins - Deoxynivalenol (DON) - Fumonisin - Ochratoxin A - T2 - Zearalenone	In-House Method 26 UPLC-MS/MS
GRADING		
Maize	Defective Kernels (white maize/ yellow maize)	Government Gazette Maize Grading Regulation, Latest Edition
Cereals as grain (Wheat, barley, rye and oats)	Hectolitre mass (Kern 222)	ISO 7971-3, Latest Edition
Wheat	Screenings	Government Gazette Wheat Grading Regulation, Latest Edition
PHYSICAL		
Wheat flour	Alveograph (Rheological properties)	ICC No 121, Latest Edition
Wheat Flour and brown bread flour	Farinograph (Rheological properties)	AACC 54-21.01, Latest Edition Constant Flour Weight Procedure
Wheat flour and whole wheat flour of hard/soft wheat	Mixograph (Rheological properties)	Industry Accepted Method 020 (Based on AACC 54-40.02, Latest Edition.)

Original date of accreditation: 01 November 1999

Page 2 of 2

ISSUED BY THE SOUTH AFRICAN NATIONAL ACCREDITATION SYSTEM


Field Manager

No. R. 1186

17 December 2010

