

SOUTH AFRICAN

WHEAT CROP

QUALITY REPORT
2012/2013 SEASON



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SOUTH AFRICAN

COMMERCIAL WHEAT QUALITY FOR THE 2012/2013 SEASON

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Summary

The final calculated wheat production figure of 1 870 000 tons for the 2012/2013 season, was 7% lower than the previous season's 2 005 000 tons. The 10 year production average is 1 854 728 tons (2003/2004 to 2012/2013 seasons). A total area of 511 200 hectares was utilized for wheat production. The average yield increased from 3.32 t/ha in the previous season to 3.66 t/ha this season. (Figures obtained from the Crop Estimates Committee).

The whole wheat protein average was 11.4% compared to the 11.8% of the previous season and the ten year average of 12.0%. The average hectolitre mass was 81.3 kg/hl and slightly higher than the 80.7 kg/hl of the 2011/2012 season. The average mixogram peak time of 2.9 minutes compared well with the 3.0 minutes of the previous two seasons.

The percentage of samples in this survey graded as B1, decreased significantly from 41% the previous season to 22% this season, the main contributing factor being the lower protein contents compared to the previous season observed in most of the production regions. The percentage of samples having protein contents higher than 12.0% decreased from 46.2% to 30.5%. The average falling number this season was 360 seconds. Only sixteen of the samples analysed gave falling number values below 250 seconds. Seven of these samples were from the Free State production regions and nine from the Rûens production regions.

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

Introduction

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 337 samples to proportionally represent the production of wheat in all the different production regions.

Cultivar identification was done on these samples and sales figures of seed sold by the commercial grain silo owners were obtained. The samples were fully graded and thousand kernel mass was done. Small samples were milled on the Quadromat mill, followed by a mixograph and RVA analysis.

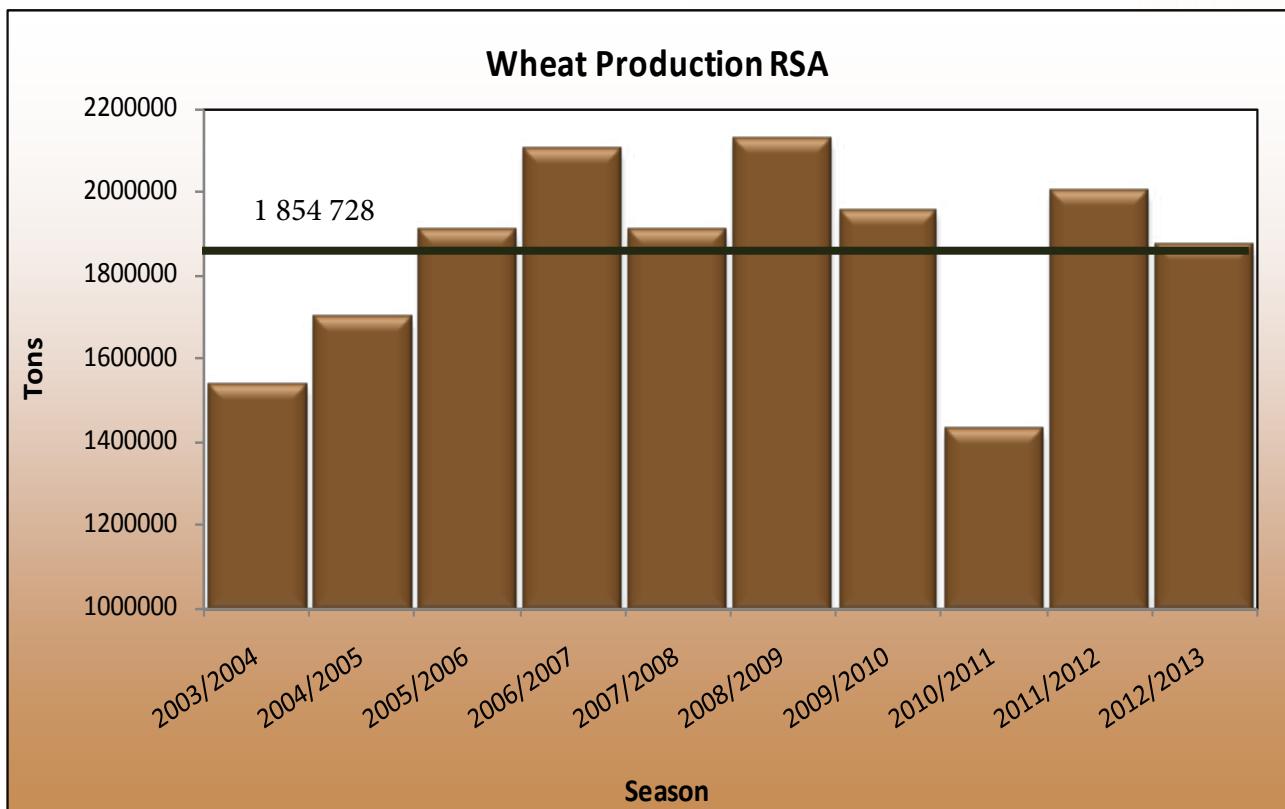
Composite samples were made up per class and grade for each production region and milled on the Bühler mill. Moisture, protein and colour were determined. Rheological tests, namely gluten, mixogram, farinogram, alveogram, extensogram and 100-gram baking tests, were then performed.

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 2010/2011 and 2012/2013 as well as the 2011/2012 and 2012/2013 seasons are provided.

Data on imported wheat are also included in the report.

Graph 1: Wheat production in the RSA over the last 10 seasons



South African Winter Cereal Production

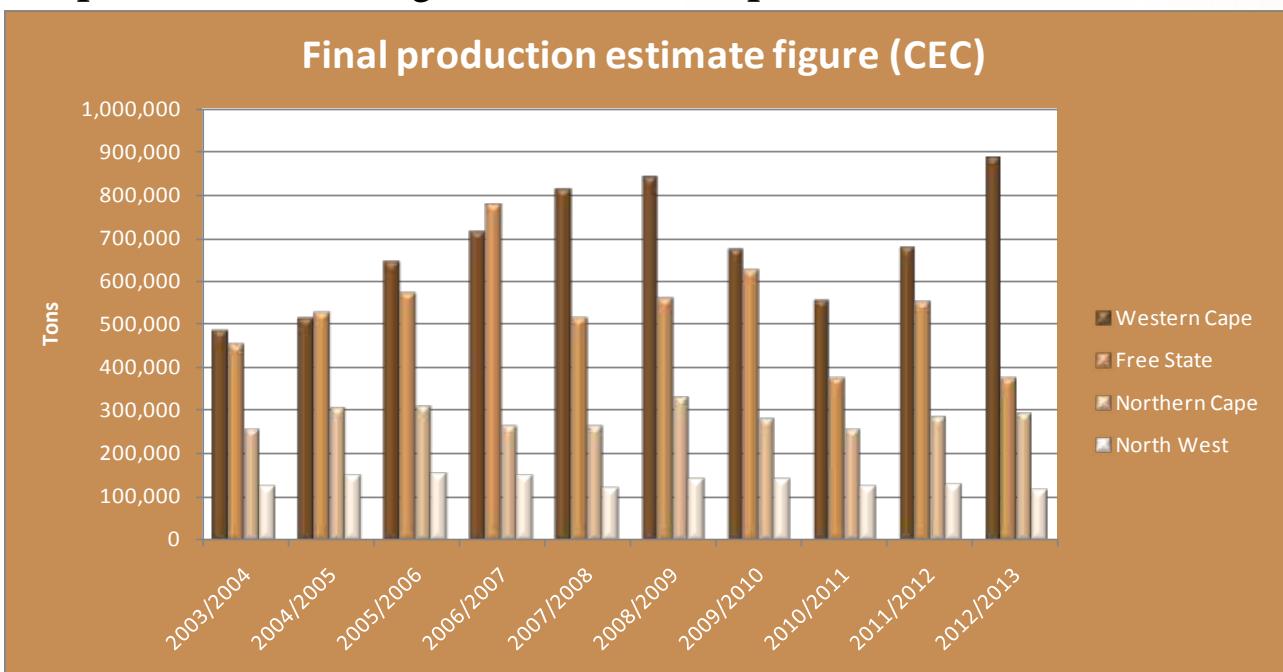
Wheat is by far the biggest winter cereal crop planted in South Africa. Other winter crops produced are barley for malting purposes and canola. Summer field crops are better suited for the South African climatic conditions. Maize has the largest crop size of the different crops, followed by wheat, then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

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 26 to 53 (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). The local production is not sufficient for domestic requirements and South Africa has to import approximately 1.5 million tons of wheat to meet its domestic consumption.

The Western Cape produced 884 000 tons of wheat this season, an increase of almost 210 000 tons compared to the 2011/2012 season, while the production in the Free State decreased with approximately 175 000 tons to 377 000 tons. These two provinces were responsible for ± 66% of the total wheat production. The remainder of the wheat were produced in mainly the Northern Cape (289 800 tons), Limpopo (159 000 tons) and North West (114 000 tons). Figures were obtained from the Final production estimate (26 February 2013) of the Crop Estimates Committee, CEC.

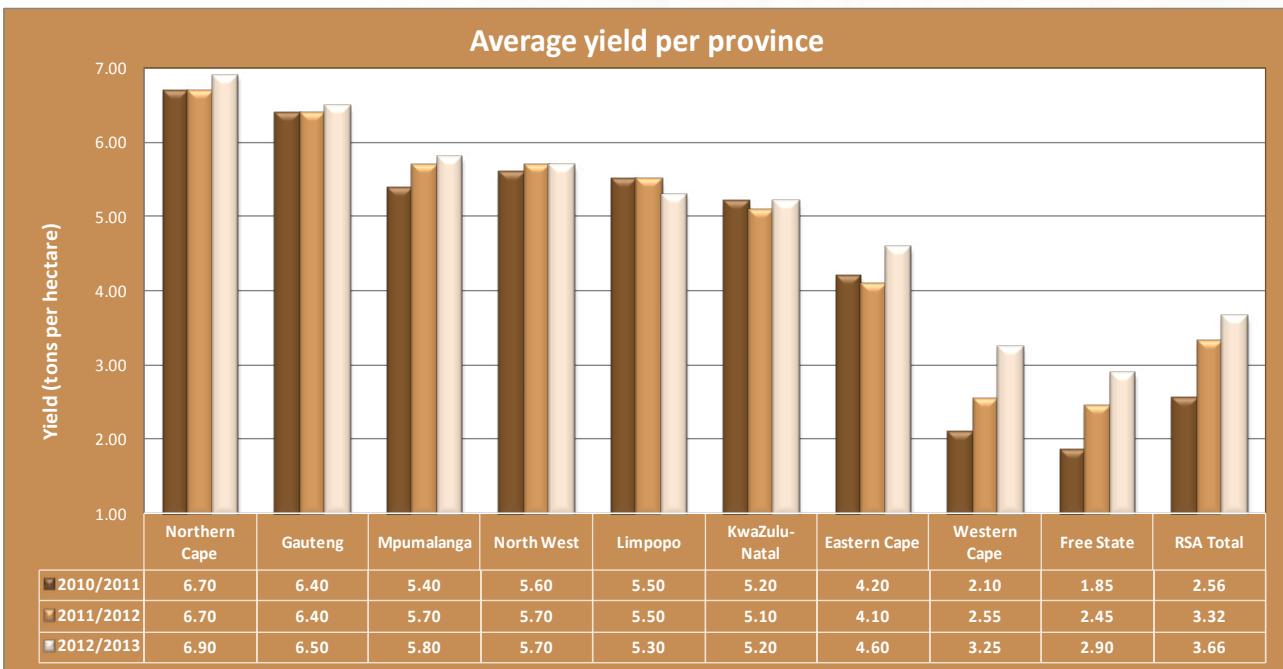
Graph 2: Production figures for the main production areas over seasons



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

The yield in the main production areas ranged from 6.9 tons per hectare (t/ha) in the Northern Cape (irrigation area) to 3.3 t/ha in the Western Cape and 2.9 t/ha in the Free State. Please see graph below.

Graph 3: Average yield per province over seasons



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

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.

RSA wheat production areas



Wheat grades

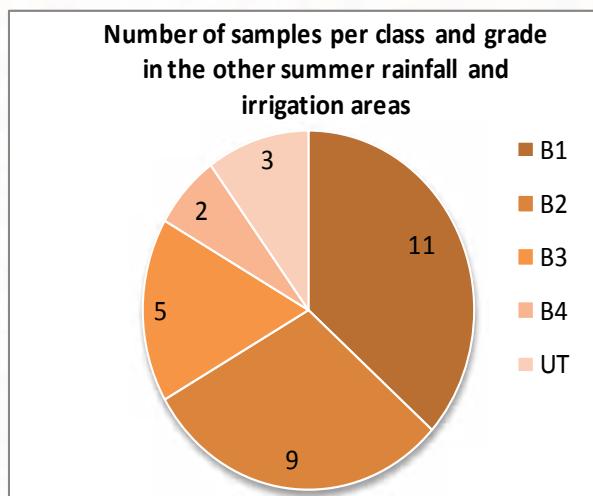
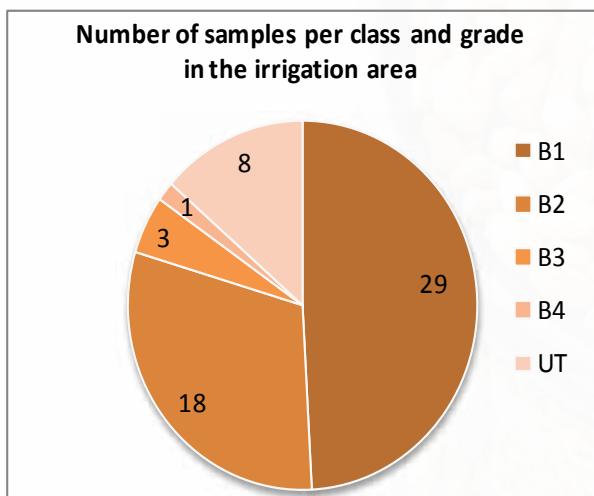
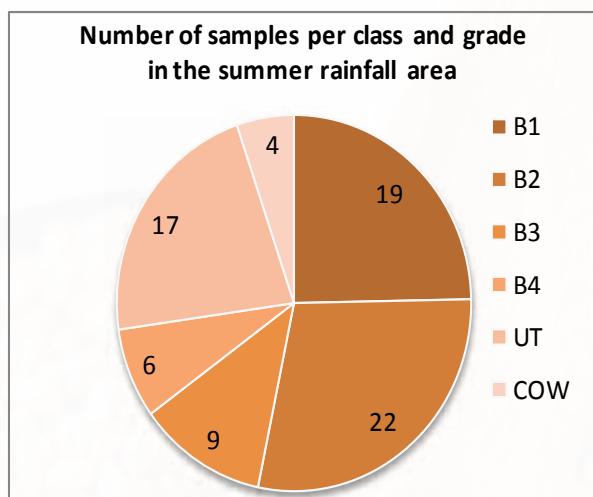
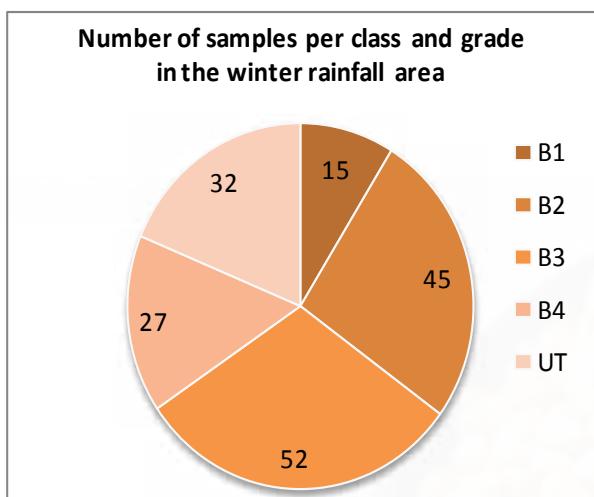
The 337 representative crop samples were graded as follows: 22.0% was graded B1, 27.9% was graded B2, 20.5% was graded B3, 10.7% was graded B4, 17.8% UT (Utility Grade) and 1.1% COW (Class Other Wheat). The majority of the samples downgraded to Utility Grade was as a result of the percentages other grain and unthreshed ears (24 samples) and screenings (15 samples), exceeding the maximum allowable level of grades B1 to B4.

Grade B1 wheat in the Free State province amounted to 25% (45% in the previous season) and grade B1 in Other Summer rainfall and Irrigation areas amounted to 37% (50% in the previous season). In the Irrigation areas 49% (40% in the previous season) of the wheat graded as B1 and in the Western Cape Province 9% graded as B1 (36% in the previous season).

Table 1: Bread Wheat Grading Table 2012/2013

Grade	Minimum			Maximum percentage permissible deviation (m/m)									
				A	B	C	D	E	F	G	H	I	J
Hectolitre mass, kg/hl	Falling number, seconds	Protein content, %	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	4	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	-

Graph 4: Wheat class and grades per production area



Cultivars

In the Western Cape, SST 88 (27.3%), SST 027 (27.0%) and SST 056 (26.7%) dominated the market.

Farmers in the Vaal and Orange River areas preferred SST 835 (28.4%) and SST 843 (24.9%).

The most preferred cultivar in the North West was SST 843 (50.5%) followed by Duzi (23.8%) and SST 835 (17.6%).

In regions 21 to 24 of the Free State SST 835 (40.0%) was the prevalent cultivar by far. Elands dominated regions 25 to 28 (30.2%). SST 356, SST 835 and PAN 3161 were also popular cultivars with 25.7%, 12.8% and 10.1% respectively.

In Mpumalanga, Gauteng, Limpopo and KwaZulu-Natal, Duzi (40.2%) was the dominant cultivar, followed by SST 835 (26.2%) and SST 843 (24.2%).

The above mentioned percentages, are weighted averages based on the top 5 cultivars per region provided on pages 26 to 53. The top 5 cultivars per region were calculated from the cultivar identification done on all 337 crop samples.

WHEAT SEED SOLD BY COMMERCIAL GRAIN SILO OWNERS TO WHEAT PRODUCERS FOR THE 2012 PLANTING SEASON

<u>Cultivar</u>	<u>%</u>	<u>Cultivar</u>	<u>%</u>
SST 056	15.67	PAN 3118	0.28
SST 88	14.21	SST 866	0.27
SST 027	13.40	PAN 3478	0.26
SST 015	8.54	PAN 3368	0.24
Duzi	7.91	SST 347	0.21
SST 875	7.31	CRN 826	0.172
SST 835	7.22	SST 867	0.169
SST 843	4.30	Gariep	0.141
SST 822	3.74	Steenbras	0.140
SST 806	2.95	PAN 3408	0.106
SST 884	2.73	PAN 3379	0.098
SST 047	2.21	PAN 3355	0.094
SST 877	1.56	Buffels	0.086
SST 356	1.25	SST 387	0.077
Krokodil	0.95	SST 374	0.061
Elands	0.93	SST 825	0.034
Kariega	0.84	Baviaans	0.030
PAN 3471	0.44	Olifants	0.014
Matlabas	0.42	PAN 3120	0.008
SST 826	0.32	PAN 3144	0.004
PAN 3161	0.31	SST 895	0.001
SST 876	0.30	SST 334	<u>0.0002</u>
			100

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

Crop quality of the 2012/2013 season

It is a well-known fact that wheat yield and protein content is negatively correlated. This has been clearly demonstrated over the past three seasons where the yield increased from 2.56 ton per hectare in the 2010/2011 season, to 3.32 t/ha in 2011/2012 and 3.66 t/ha in the 2012/2013 season, while the protein content decreased from 12.1% to 11.8 % and 11.4% in the current season.

The highest percentage of samples analysed (33.5%) had protein contents ranging from 11.0 - 11.9%. The second highest percentage of 24.9% was for protein contents 10.0 - 10.9% and thirdly 23.4% for 12.0 - 12.9% protein content. The Winter rainfall areas had the lowest average whole wheat protein content of 10.8%. The Summer rainfall area of the Free State's average protein content was almost one percent higher at 11.7%. The rest of the production areas consisting of regions in Mpumalanga, Gauteng, Limpopo, Griqualand-West, Vaalharts, North-West and KwaZulu-Natal averaged the highest protein content of 12.1%. Although the average whole wheat protein content decreased by 0.4% to 11.4% compared to the previous season, the flour protein content is slightly (0.1%) higher than the previous season. Please see protein detail results in Graphs 5, 6 and 7 on pages 8 and 10.

The average hectolitre mass ranged from 79.9 kg/hl in the Summer rainfall area to 82.1 kg/hl in the Irrigation areas. Only eighteen samples in total reported hectolitre masses below 77 kg/hl (in other words not Grade 1). Eleven of these samples were from the Free State, four from Limpopo, two from the Rûens region and one from the Swartland.

The weighted average thousand kernel mass of 40.2 g was 2.2 g higher than the previous season. The weighted average screenings (1.8 mm sieve) of 1.46% was slightly lower than the 1.56% in the 2011/2012 season.

The weighted average falling number was 360 seconds. Sixteen samples gave falling number values of less than 250 seconds and of these, five had falling number values lower than 220 seconds and another five falling numbers below 200 seconds.

Rapic Visco Analyser (RVA) analyses were performed for the first time this season on the wheat crop quality survey samples. The RVA is a rotational viscometer that is able to continuously record the viscosity of a sample (under controlled temperature conditions) as the starch granules hydrate, swell and disintegrate (gelatinization and pasting), followed by possible realignment of the starch molecules during cooling (retrogradation). The analysis was performed on the Quadromat milled flour.

The average peak viscosity of the 105 samples analysed was 2393 cP, the minimum viscosity 1834 cP and the final viscosity 2775 cP (centipoise). The conditions as set out in the Standard 1 (STD1) profile of the instrument were used. Results are reported on a 14% moisture basis. Please see results on pages 20 to 22.

The weighted mixogram peak time on flour from the Quadromat mill averaged 2.9 minutes, similar to the ten year average and previous season (3.0 minutes). The weighted mixogram peak time of the flour from the Bühler mill was 2.8 minutes.

The weighted average Bühler extraction was 73.2%. The average Kent Jones colour this season was -2.9 KJ and the previous season -2.8 KJ. Dry colour determinations by means of a Konica Minolta CM-5 spectrophotometer were performed for the first time on this seasons' crop samples. The CIE L*a*b* values were reported as follows, with the average and range (in brackets) for each of the colour coordinates: L* 93.85 (93.14 – 94.39), a* 0.41 (0.26 – 0.54) and b* 9.92 (8.65 – 11.35).

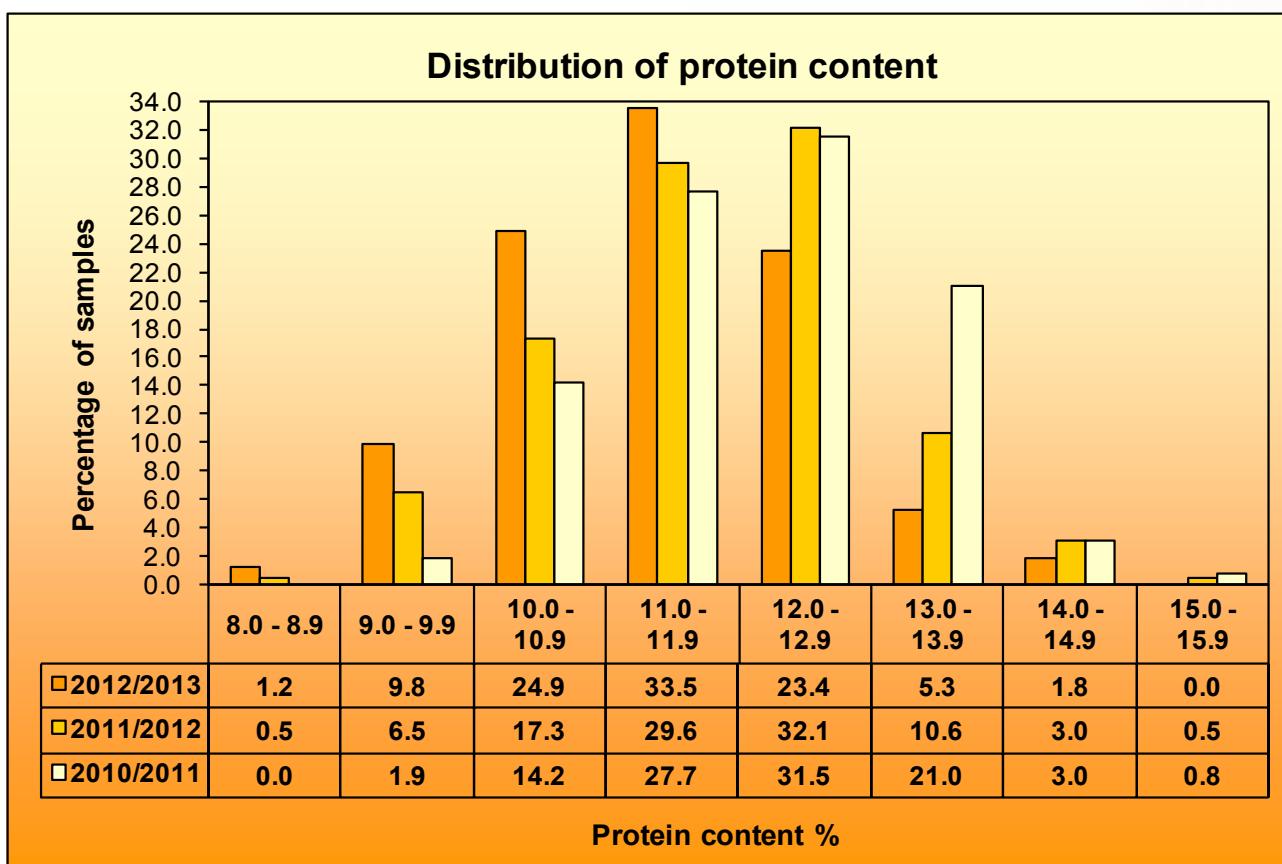
The wet gluten (14% mb) averaged 29.0% and the dry gluten also on a 14% moisture basis, 10.0%. The average gluten index value was 83, ranging from 44 to 97. The difference between the wet and dry gluten contents is an indication of the water-holding capacity of the gluten proteins. High water-holding capacity (a ratio of almost 3:1 in this instance) is considered good quality for bread baking purposes. The gluten index provides an indication of the gluten strength (higher being better) and is not influenced by the protein content.

The farinogram had a weighted average water absorption of 60.8% (61.3% the previous season) and a weighted average development time of 5.1 minutes (4.1 minutes previous season). The weighted average alveogram strength was 36.7 cm² and the weighted average P/L value 0.96 (35.0 cm² and 0.89 the previous season). The weighted average extensogram strength was 84 cm² (90 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, were evaluated and received an "Excellent" score.

Ten of the fourty samples selected to represent different regions as well as classes and grades, tested positive for deoxynivalenol (DON). The average of the positive results was 187 µg/kg.

Graph 5: Differences in the distribution of protein content over the last 3 seasons



Graph 6: Protein distribution graphs per production area

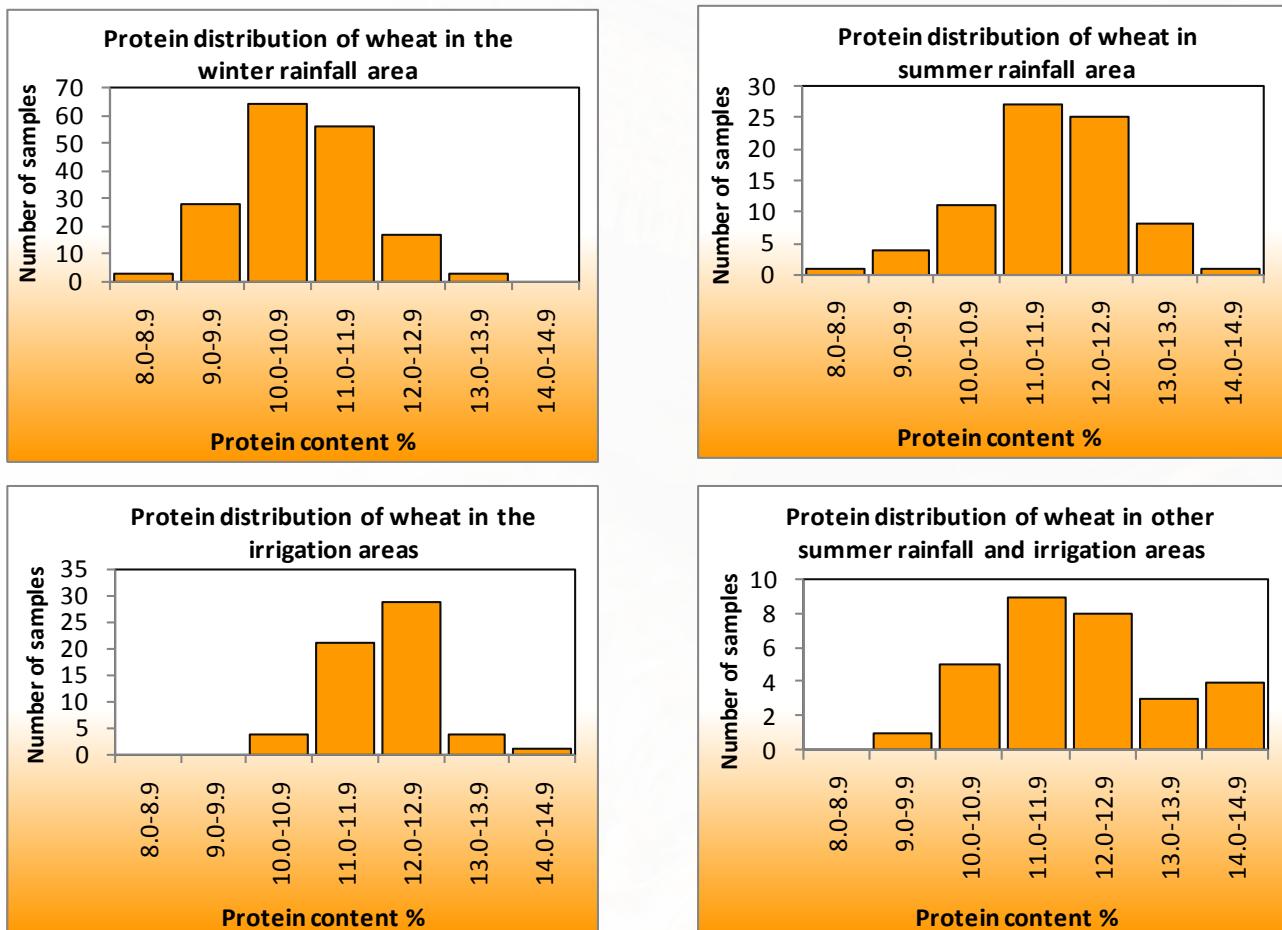
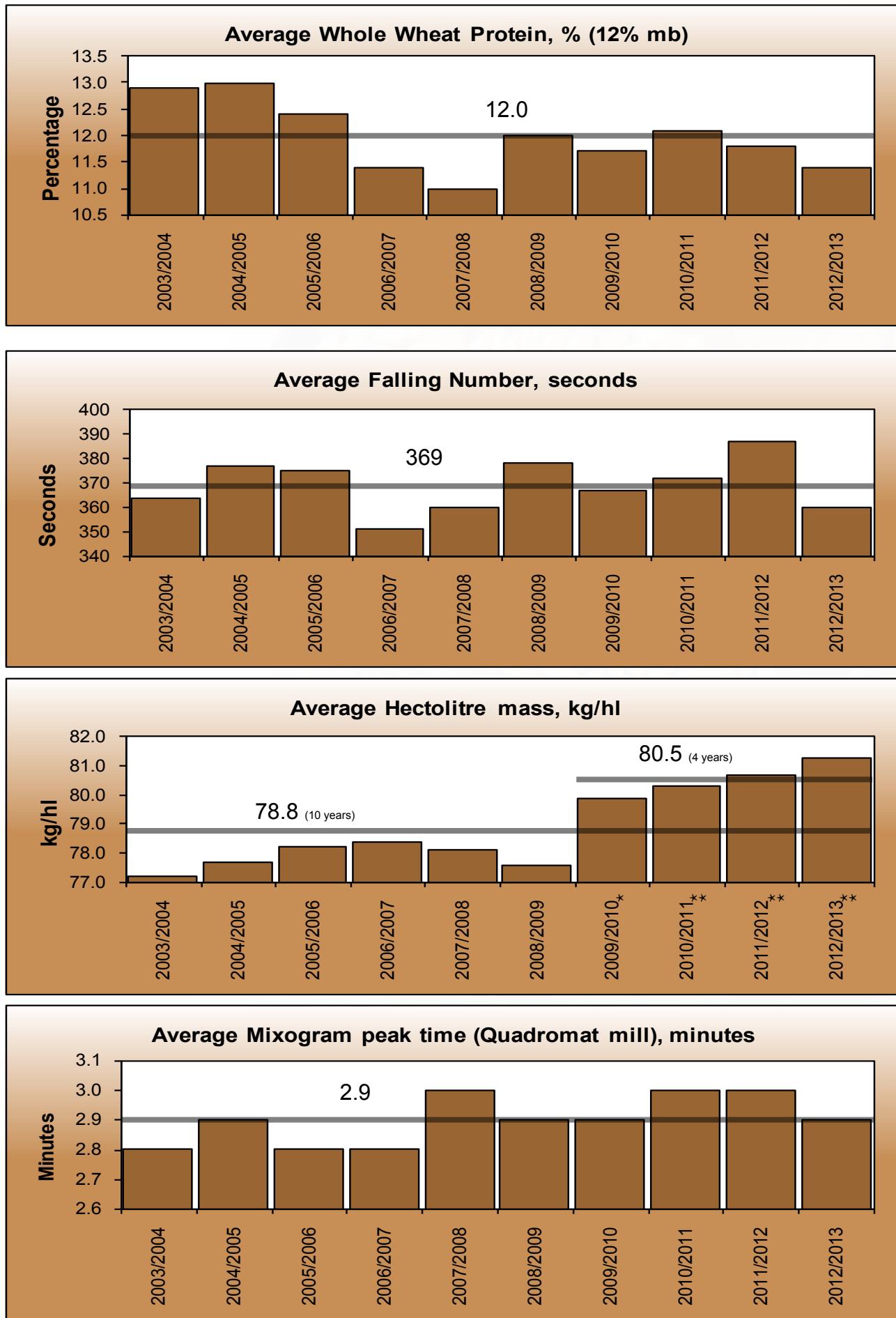


Table 2: Weighted average results for the last three seasons

Region	2012/2013					2011/2012					2010/2011				
	Protein (12% mb), %	FN, sec	Hlm, kg/hl	Mixo PT, min	n	Protein (12% mb), %	FN, sec	Hlm, kg/hl	Mixo PT, min	n	Protein (12% mb), %	FN, sec	Hlm, kg/hl	Mixo PT, min	n
1	-	-	-	-	-	11.9	394	80.4	3.2	3	12.2	393	79.7	2.9	3
2	11.0	396	80.5	3.1	20	12.3	421	77.9	3.0	14	12.3	422	77.7	2.7	12
3	11.0	385	82.4	2.6	69	11.7	412	81.2	3.1	55	11.7	410	79.7	2.7	44
4	10.6	397	83.1	2.6	28	11.4	406	80.8	3.0	37	11.2	387	81.2	2.7	25
5	11.0	341	81.5	2.6	19	11.9	420	82.0	2.9	25	11.8	355	79.6	2.7	20
6	10.6	276	79.8	3.0	35	11.1	413	81.1	2.6	23	12.5	355	80.2	2.6	11
7	-	-	-	-	-	11.1	378	83.3	3.1	5	12.9	401	81.7	2.4	1
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	12.0	378	82.3	2.7	31	11.6	388	82.6	2.7	35	12.4	413	82.4	2.5	32
11	12.0	405	82.4	2.6	16	11.4	375	80.2	2.6	17	11.9	395	80.9	2.7	14
12	12.6	348	81.6	3.1	2	12.6	400	81.6	2.8	6	12.8	405	81.4	3.1	5
13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	12.6	367	80.0	3.8	1	9.8	508	81.3	3.3	1	11.6	415	79.7	2.9	4
15	11.4	376	82.8	2.5	3	10.8	399	81.0	2.6	10	11.9	375	81.2	3.0	9
16	-	-	-	-	-	11.1	411	80.5	3.2	3	11.8	434	78.9	2.6	3
17	12.7	440	83.0	2.8	1	12.2	347	78.9	3.1	4	11.9	416	80.6	2.9	8
18	13.4	387	78.7	4.0	2	12.2	374	80.4	2.5	4	12.7	386	79.6	4.2	2
19	13.1	324	81.3	3.8	2	12.4	401	80.8	3.6	8	11.9	389	81.2	3.4	8
20	-	-	-	-	-	11.8	406	80.9	3.0	8	11.6	411	80.3	3.1	15
21	11.6	336	81.0	2.5	1	12.4	372	81.1	3.1	3	11.8	397	81.7	3.1	5
22	12.4	323	82.1	2.8	4	11.4	345	80.4	3.2	3	11.7	357	81.4	3.4	6
23	12.2	306	78.3	3.0	14	10.9	292	79.0	3.2	30	11.4	362	81.4	3.1	22
24	12.1	298	80.0	3.2	7	11.9	381	81.2	3.1	15	12.0	356	80.1	3.4	16
25	11.4	321	79.2	3.7	18	12.0	339	78.7	3.7	27	13.1	240	78.2	3.8	25
26	12.1	373	80.8	3.5	6	12.6	362	79.0	3.4	16	13.3	305	80.2	3.7	13
27	12.2	378	79.2	3.6	6	12.9	365	80.6	3.4	5	13.6	328	79.1	3.7	8
28	11.3	352	80.9	3.6	21	12.6	343	80.6	3.2	37	13.1	298	78.8	3.4	31
29	13.1	278	83.5	2.4	1	-	-	-	-	-	12.6	421	85.0	2.8	1
30	12.3	393	82.8	3.0	6	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
33	12.1	417	81.6	4.3	2	11.4	468	80.7	3.2	6	-	-	-	-	-
34	11.4	380	80.5	3.0	8	11.7	407	83.8	3.1	5	11.5	436	82.3	2.2	11
35	12.4	378	79.7	3.1	13	11.6	456	81.0	3.1	12	11.9	415	80.6	2.9	8
36	11.4	390	82.3	3.3	1	12.0	473	82.4	2.9	7	12.7	432	82.2	2.9	8
Ave.	11.4	360	81.3	2.9	337	11.8	387	80.7	3.0	433	12.1	372	80.3	3.0	372

Graph 7: Weighted average quality over 10 seasons



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

** Hectolitre mass determined using Kern 222 instrument.

Table 3: Comparison of Flour Quality over the last four seasons

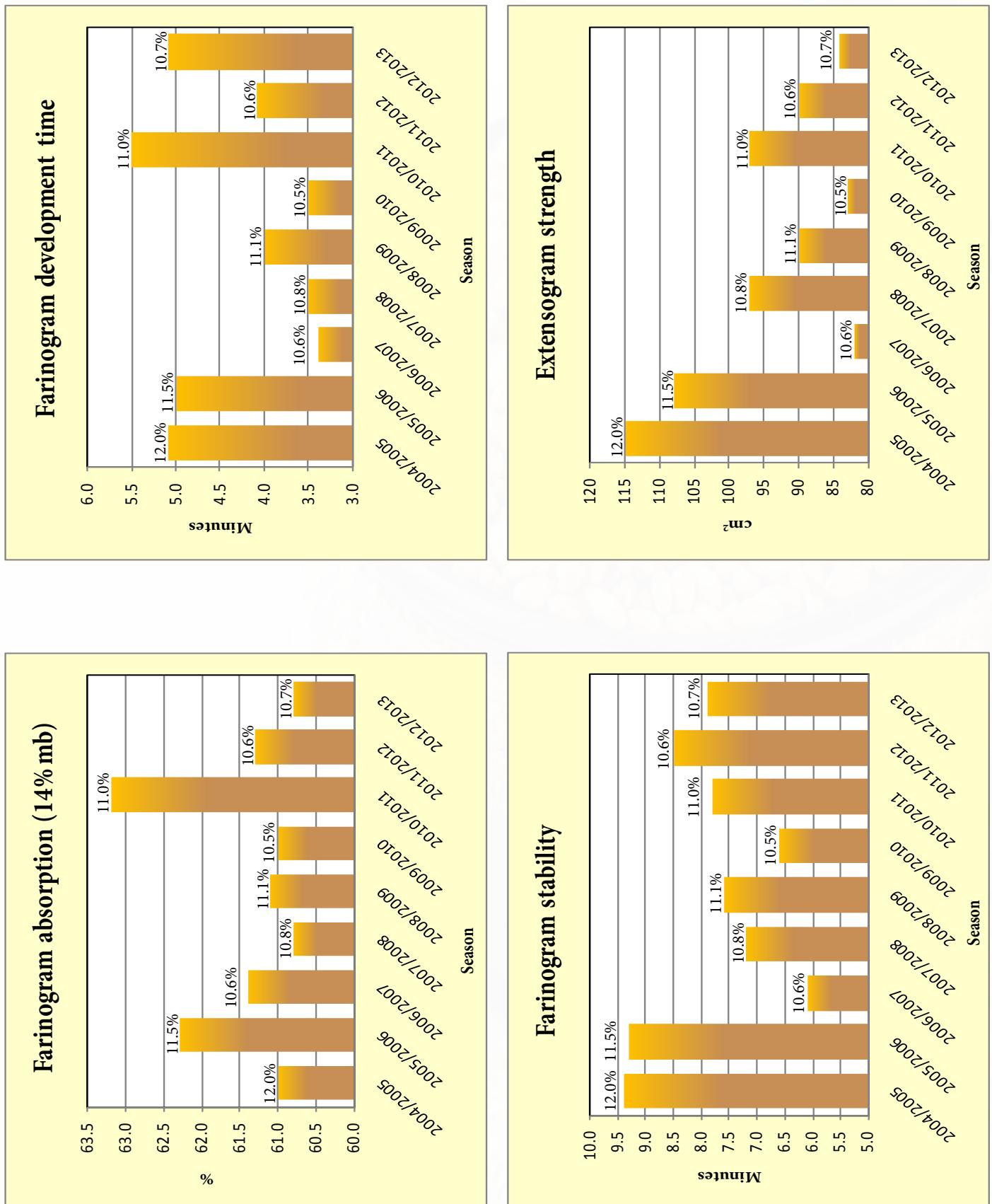
Flour Quality 2012/2013 season			
Flour protein (12% mb) (%)	10.7	Farinogram abs. (14% mb) (%)	60.8
Bread volume 100g (cm ³)	886	Farinogram dev. time (min.)	5.1
Mixogram (Bühler) peak time (min)	2.8	Alveogram strength (cm ²)	36.7
Wet gluten (14% mb) (%)	29.0	Alveogram P/L	0.96
Dry gluten (14% mb) (%)	10.0	Extensogram strength (cm ²)	84

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

Graph 8: Comparison of rheological quality over seasons
 (Flour protein content (12% mb) is indicated above each bar)



Graph 8: Comparison of rheological quality over seasons
 (Flour protein content (12% mb) is indicated above each bar) (continue)

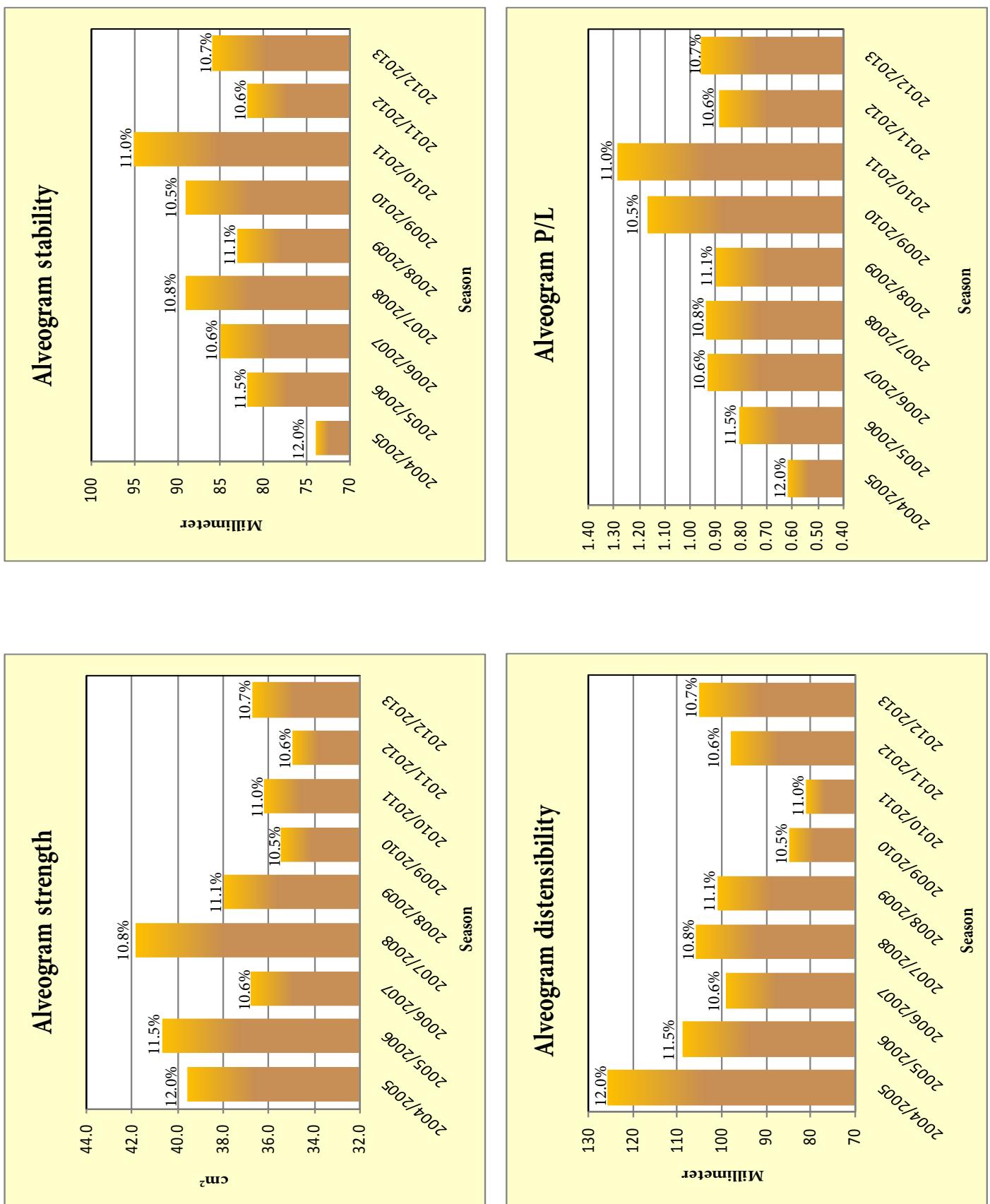


Table 4: Regional quality weighted averages

	<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>		
Number of samples per area	171			77			59			30			337		
Regions	2 - 6			21 - 28			10 - 12, 14 - 20, 36			29 - 35			All		
Hectolitre mass dirty, kg/hl	81.7			79.9			82.1			80.8			81.3		
1000 kernel mass (13% mb), g	42.0			36.2			40.2			40.3			40.2		
Falling number, sec	361			333			384			381			360		
Screenings (1,8 mm), %	1.44			1.28			1.35			1.62			1.46		
Protein (12% mb), % (ww)	10.8			11.7			12.1			12.1			11.4		
Mixogram peak time, min (Quadromat)	2.7			3.4			2.8			3.1			2.9		
Composite samples per class and grade	<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 = 70	3	5	5	7	6	3	7	4	2	5	2	3	22	17	13
	5	2	-	3	2	-	1	2	-	2	1	-	11	7	-
Bühler extraction, %	72.1	71.9	71.9	72.3	73.3	72.4	74.4	75.4	73.7	74.6	74.6	75.5	73.5	73.5	73.1
	72.9	71.6	-	71.5	71.8	-	74.1	74.5	-	73.5	69.3	-	72.7	72.2	-
Flour colour, KJ (wet)	-2.8	-3.0	-2.9	-2.7	-2.7	-2.9	-2.9	-3.0	-3.4	-2.7	-2.6	-3.1	-2.8	-2.8	-3.0
	-2.7	-2.9	-	-2.7	-2.8	-	-3.4	-3.2	-	-2.9	-2.1	-	-2.8	-2.8	-
Colour, Minolta CM5 (dry)															
L*	93.86	94.12	94.13	93.54	93.57	93.79	93.98	93.93	94.25	93.71	93.63	93.90	93.76	93.82	94.02
	93.89	94.11	-	93.68	93.64	-	93.96	94.01	-	93.87	93.62	-	93.84	93.88	-
b*	10.32	10.04	9.98	10.05	9.87	10.15	9.26	9.91	9.77	9.61	9.74	9.98	9.74	9.91	9.99
	9.78	10.32	-	10.77	10.21	-	10.60	9.80	-	10.14	9.32	-	10.19	10.00	-
Flour protein (12% mb), %	11.3	10.4	9.5	11.5	11.1	9.6	12.0	10.6	9.3	11.7	11.0	10.4	11.7	10.8	9.7
	9.3	9.9	-	10.6	10.4	-	9.4	10.9	-	8.7	13.8	-	9.6	10.9	-
Wet gluten (14% mb), %	31.2	28.8	25.6	30.8	29.2	24.5	32.2	30.0	27.2	32.2	30.6	29.1	31.4	29.3	25.9
	24.8	26.8	-	27.9	28.3	-	25.6	30.9	-	23.3	37.9	-	25.5	28.8	-

Table 4: Regional quality weighted averages (continue)

	Winter rainfall area (Western Cape)			Summer rainfall area (Free State)			Irrigation areas			Other Summer rainfall and Irrigation areas			RSA average		
Regions	2 - 6			21 - 28			10 - 12, 14 - 20, 36			29 - 35			All		
<i>Composite samples per class and grade</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>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>
<i>Composite samples, n = 70</i>	3 5	5 2	5 -	7 3	6 2	3 -	7 1	4 2	2 -	5 2	2 1	3 -	22 11	17 7	13 -
Wet gluten (14% mb), %	31.2 24.8	28.8 26.8	25.6 -	30.8 27.9	29.2 28.3	24.5 -	32.5 25.6	29.9 30.9	27.2 -	32.2 23.3	30.6 37.9	29.1 -	31.7 25.4	29.4 30.0	26.4 -
Dry gluten (14% mb), %	10.8 8.5	10.0 8.9	8.9 -	10.5 9.8	10.1 10.0	8.5 -	11.4 9.1	10.2 10.7	9.1 -	11.1 8.0	10.5 13.1	9.9 -	11.0 8.8	10.1 10.3	9.1 -
Gluten Index	74 86	78 87	86 -	85 86	83 81	91 -	86 72	69 73	92 -	86 80	78 86	81 -	84 84	78 81	87 -
Farinogram: Water absorption (14% mb), %	62.0 60.5	61.8 60.3	60.5 -	61.9 62.3	60.6 62.0	61.9 -	60.9 58.3	59.9 60.8	60.7 -	60.1 58.0	59.7 63.0	59.0 -	61.3 60.3	60.7 61.3	60.5 -
Farinogram: Development time, min	5.2 3.4	4.4 3.5	4.0 -	6.4 5.1	5.9 5.5	3.8 -	6.7 4.7	4.5 5.0	4.0 -	6.9 3.5	5.4 6.2	4.7 -	6.4 4.0	5.1 4.9	4.1 -
Alveogram: Strength (S), cm²	38.0 29.5	34.3 32.8	31.4 -	44.9 39.7	39.1 36.7	35.5 -	44.8 26.0	31.5 33.8	28.1 -	41.1 28.7	32.0 48.8	34.5 -	43.1 31.8	35.1 36.5	32.6 -
Alveogram: P/L	0.85 1.13	0.93 0.98	1.09 -	1.00 2.19	0.92 1.22	2.34 -	0.62 0.58	0.64 0.67	0.97 -	0.59 0.95	0.42 0.50	0.54 -	0.77 1.34	0.80 0.89	1.23 -
Extensogram: Strength, cm²	85 60	72 77	67 -	101 83	89 81	74 -	105 66	83 84	65 -	114 70	81 114	85 -	102 70	82 85	72 -
Mixogram peak time, min	2.5 2.8	2.5 2.8	2.9 -	3.0 3.4	2.8 2.9	3.2 -	2.8 2.5	2.5 2.3	2.4 -	3.0 3.2	2.6 2.7	2.8 -	2.9 3.0	2.6 2.7	2.9 -
Relationship between protein and bread volume	EX EX	EX VG	EX -	EX EX	EX EX	EX -	EX EX	EX EX	EX -	EX EX	EX EX	EX -	EX EX	EX EX	EX -

EX = Excellent

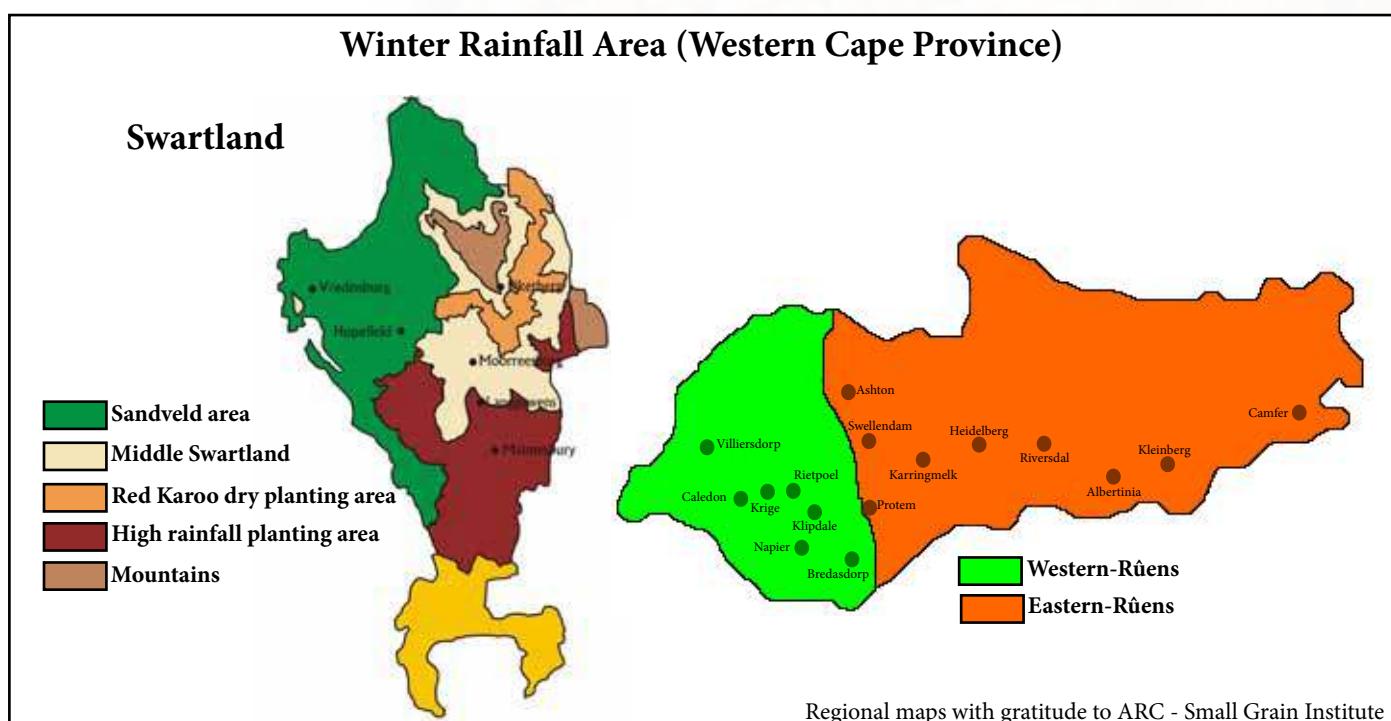
VG = Very Good

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. Wheat is planted from the second half of April until the middle of June and harvested during October to December.

The hectolitre mass averaged 81.7 kg/hl. The thousand kernel mass averaged 42.0 gram, which is almost 4.0 g higher than the previous season. The average falling number was 361 seconds. The average whole wheat protein content of 10.8% (12% mb) was the lowest of the different production areas, confirming a trend observed over previous seasons.



The screenings of 1.44% was lower than the previous season's 1.65%. The Bühler extraction averaged 72.2% (average of wheat grades B1 to B4 and UT). The average dry colour of the flour was -2.9 KJ units and the dry colour L* value (indicating lightness) 94.03. This colour indicates a very white flour that is preferred by millers and bakers.

The lowest average whole wheat and flour protein of the four areas also resulted, as can be expected, in the lowest average wet and dry gluten values namely 27.2% and 9.4% (14% mb). The gluten index was 82.

The mixogram peak time (Quadromat mill) averaged 2.7 minutes. The average farinogram absorption was 61.0%. The average alveogram strength was 32.8 cm², slightly lower, but still comparing well with the previous season. The alveogram P/L value was 1.01 compared to the 0.98 of 2011/2012. The average strength on the extensogram was 71 cm².

The 100-gram baking test showed an excellent relationship between protein content and bread volume.

SUMMER RAINFALL AREA (Free State)

Production regions 21 to 28, which fall within the Free State Province, still made the second highest contribution to the total production figure, although production decreased this season (CEC). Planting of wheat takes place during July and August and harvesting from November to January.

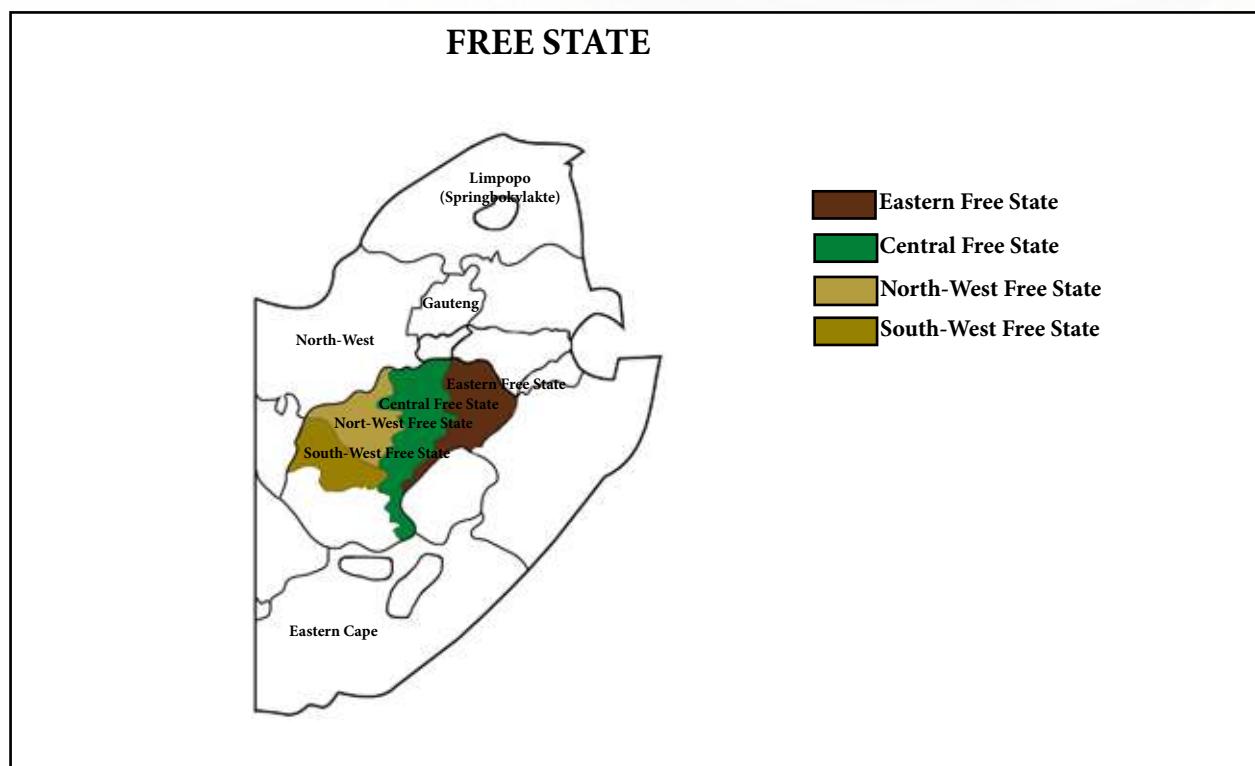
The average hectolitre mass was 79.9 kg/hl. The physical characteristic thousand kernel mass (36.2 g) was higher than the previous season's 35.1 g. The average screenings was 1.28%. The average protein content decreased from 12.0% the previous season to 11.7% (12% mb) this season. Despite the fact that some of 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 333 seconds was still within the ideal range.

The wet gluten content (14% mb) was 28.8% and the dry gluten 10.0%. The gluten index was 85. The mixogram (Quadromat) peak time of 3.4 minutes, gave the Free State the longest average mixogram peak time of the different production areas.

The average Bühler extraction percentage in the Free State was 72.4% (73.3% previous season). The Kent Jones flour colour was -2.7 KJ units (-2.5 KJ units in the previous season) and the L* value 93.61.

The average farinogram water absorption was 61.6%, similar to 2011/2012. The development time averaged 5.6 minutes. The average alveogram strength was 40.4 cm² and extensogram strength 89 cm².

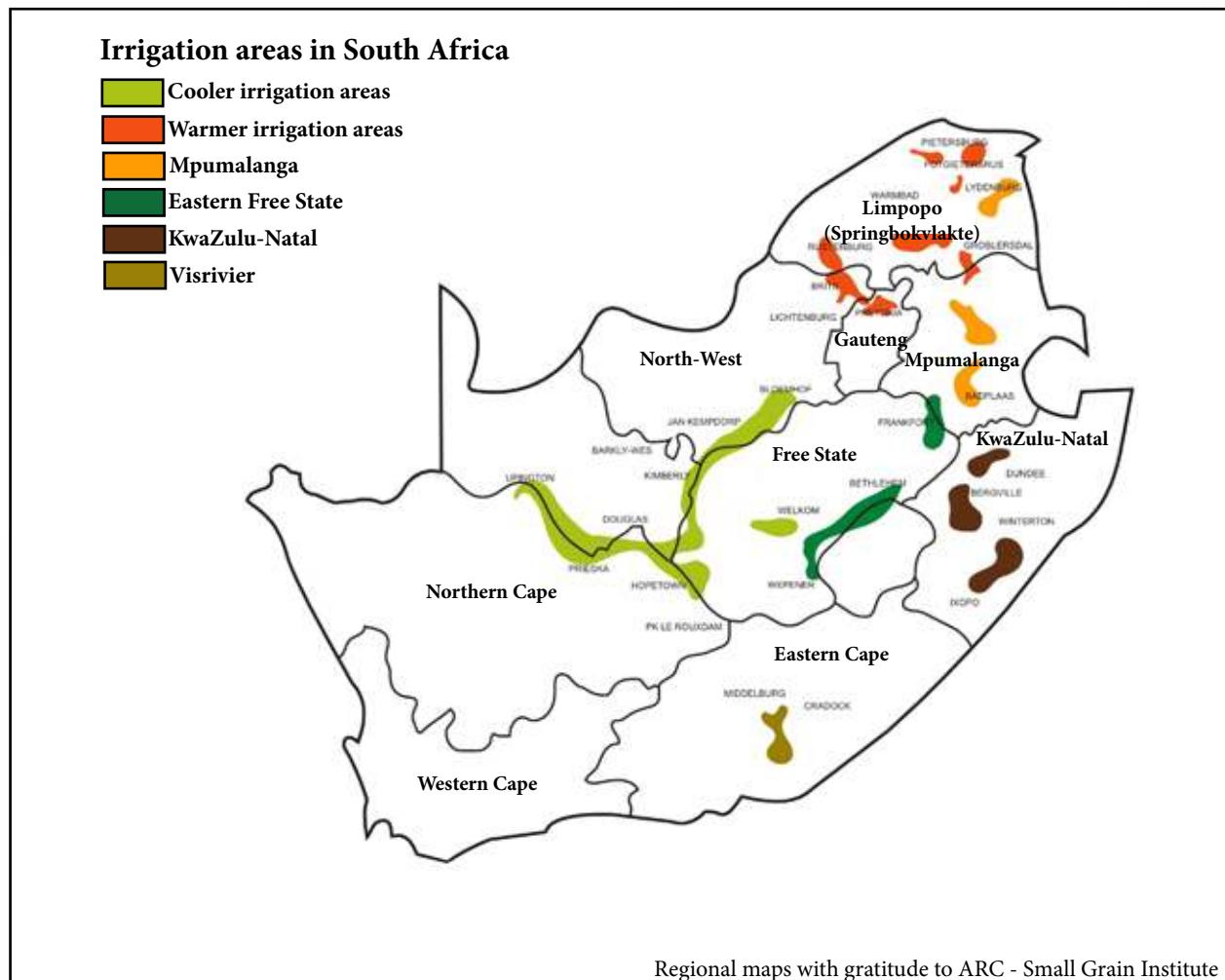
The 100-gram baking test showed that the relationship between protein content and bread volume was excellent between the different grades.



Regional maps with gratitude to ARC - Small Grain Institute

IRRIGATION AREAS

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



Production regions 7, 10 - 12, 14 - 20 and 36 falls within the Irrigation areas.

The highest weighted average hectolitre mass of 82.1 kg/hl was reported here. The thousand kernel mass was 40.2 g (40.7 g the previous season). The average falling number was 384 seconds and the screenings averaged 1.35%.

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

The average Bühler extraction percentage was 74.6 (75.0% during the previous season). The Irrigation areas gave on average 2% higher extraction than the winter and summer rainfall areas.

The Irrigation areas also had the highest average protein content of 12.1% (12% mb), half of a percent increase from the previous season. The wet and dry gluten contents, 30.6% and 10.6% respectively, were the highest of the four areas as well. The gluten index however was the lowest, although very slightly, at 80.

The dry colour L* value was 94.00 and the Kent Jones wet colour value -3.1 KJ units. The average farinogram water absorption was 60.4% (61.7% during previous season), with an average farinogram development time of one minute longer than the 4.4 minutes of 2011/2012.

The average alveogram strength was 36.8 cm² and the average P/L 0.67 (33.6 cm² and 0.84 respectively the previous season). The average extensogram strength was 86 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 29 - 33 (Mpumalanga), 34 (Gauteng) and 35 (Limpopo).

The average hectolitre mass was 80.8 kg/hl, and the thousand kernel mass averaged 40.3 g (39.5 g the previous season).

The average falling number was 381 seconds, with the average percentage screenings 1.62%. The average protein content was 12.1% (12% mb), equal to the previous season.

The average mixogram (Quadromat) peak time was 3.1 minutes, the same as in the 2011/2012 season.

The average Bühler extraction was 74.2%, with an average colour of -2.8 KJ units (75.2% and -2.7 KJ units the previous season). The L* value was 93.76. The farinogram average water absorption was 59.6% (60.9% the previous season) and had an average development time of 5.5 minutes.

The average alveogram strength was 36.9 cm² and the average extensogram strength 94 cm², respectively equal and significantly lower than in 2011/2012. The P/L values over the four production areas ranged from 0.60 locally to 1.36 in the Summer rainfall area. Lower P/L values are indicative of dough being more extensible (having higher L values) than dough with higher P/L values.

The 100-gram baking test showed an excellent relationship between protein content and bread volume.

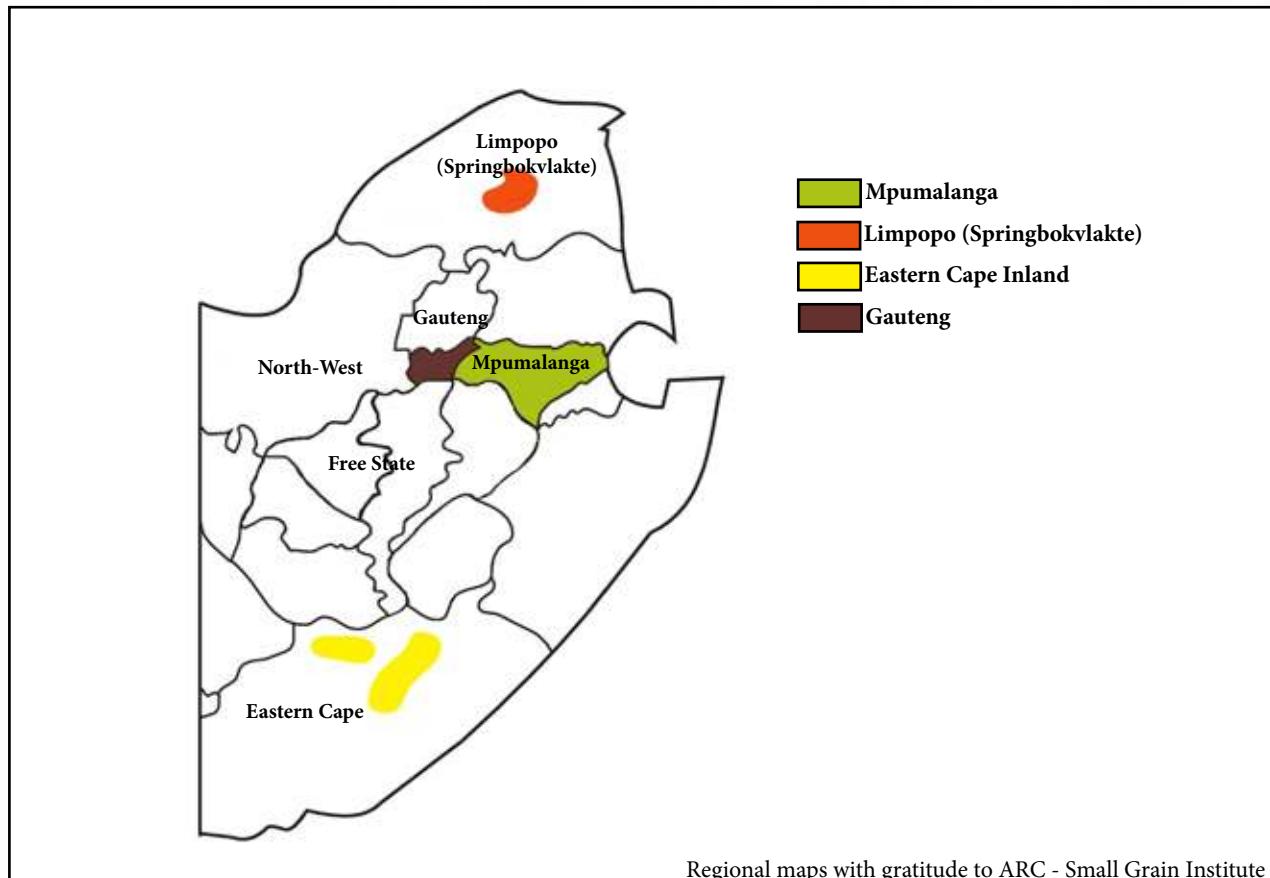


Table 5: Rapid Visco Analyser results

Number of samples	Region	Peak viscosity, cP			Minimum viscosity (Trough), cP			Breakdown, cP			Final viscosity, cP			Peak time, min		
		ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.
GRADE: B1																
6	Region 3	2466	2337	2590	1818	1765	1902	648	570	704	2904	2689	3012	7.00	7.00	7.00
2	Region 5	2094	2066	2121	1614	1549	1679	480	442	517	2560	2518	2602	7.00	7.00	7.00
5	Region 10	2512	2190	2772	1942	1804	2065	570	294	770	2840	2433	3227	6.95	6.80	7.00
3	Region 11	2493	2266	2658	1932	1847	2005	561	419	714	2844	2542	2996	6.98	6.93	7.00
1	Region 14	2623	-	-	2054	-	-	569	-	-	2878	-	-	7.00	-	-
1	Region 15	2482	-	-	2029	-	-	453	-	-	2807	-	-	6.93	-	-
1	Region 17	2858	-	-	2069	-	-	789	-	-	3262	-	-	7.00	-	-
1	Region 19	2847	-	-	2023	-	-	824	-	-	3145	-	-	7.00	-	-
1	Region 20	2189	-	-	1741	-	-	448	-	-	2361	-	-	7.00	-	-
1	Region 23	2819	-	-	2170	-	-	649	-	-	3144	-	-	7.00	-	-
1	Region 27	2791	-	-	1881	-	-	910	-	-	3271	-	-	7.00	-	-
1	Region 28	2268	-	-	1894	-	-	374	-	-	2485	-	-	6.80	-	-
1	Region 29	1661	-	-	1385	-	-	276	-	-	1817	-	-	6.40	-	-
2	Region 30	2665	2639	2690	1960	1955	1965	705	674	735	2935	2934	2935	7.00	7.00	7.00
1	Region 34	2671	-	-	2082	-	-	589	-	-	3018	-	-	7.00	-	-
1	Region 35	2675	-	-	2226	-	-	449	-	-	3122	-	-	6.87	-	-
29	Ave. B1	2491	-	-	1900	-	-	590	-	-	2843	-	-	6.95	-	-
	Min. B1	1661	-	-	1385	-	-	276	-	-	1817	-	-	6.40	-	-
	Max. B1	2858	-	-	2226	-	-	910	-	-	3271	-	-	7.00	-	-
	GRADE: B2															
1	Region 2	2326	-	-	1694	-	-	632	-	-	2814	-	-	7.00	-	-
5	Region 3	2511	2414	2650	1836	1788	1968	674	615	733	2986	2781	3198	7.00	7.00	7.00
1	Region 4	2415	-	-	1787	-	-	628	-	-	2838	-	-	7.00	-	-
1	Region 5	2179	-	-	1731	-	-	448	-	-	2550	-	-	7.00	-	-
3	Region 6	1821	1367	2119	1544	1081	1835	277	261	286	2064	1531	2422	6.49	6.20	6.67

Table 5: Rapid Visco Analyser results (continue)

Number of samples	Region	Peak viscosity, cP			Minimum viscosity (Trough), cP			Breakdown, cP			Final viscosity, cP			Peak time, min		
		ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.
GRADE: B2																
4	Region 10	2562	2489	2660	1945	1863	1980	617	509	688	2911	2801	2983	7.00	7.00	7.00
1	Region 21	2544	-	-	2112	-	-	432	-	-	2850	-	-	6.87	-	-
1	Region 23	2184	-	-	1722	-	-	462	-	-	2442	-	-	7.00	-	-
2	Region 24	2449	2338	2560	1917	1870	1964	532	374	690	2855	2771	2939	6.90	6.80	7.00
1	Region 25	2295	-	-	1789	-	-	506	-	-	2641	-	-	7.00	-	-
1	Region 26	2846	-	-	2058	-	-	788	-	-	3250	-	-	7.00	-	-
1	Region 28	2902	-	-	2165	-	-	737	-	-	3347	-	-	7.00	-	-
1	Region 36	2981	-	-	2259	-	-	722	-	-	3233	-	-	7.00	-	-
23	Ave. B2	2428	-	-	1858	-	-	569	-	-	2802	-	-	6.92	-	-
	Min. B2	1367	-	-	1081	-	-	261	-	-	1531	-	-	6.20	-	-
	Max. B2	2981	-	-	2259	-	-	788	-	-	3347	-	-	7.00	-	-
GRADE: B3																
1	Region 2	2334	-	-	1770	-	-	564	-	-	2868	-	-	7.00	-	-
7	Region 3	2409	2117	2621	1803	1613	2006	606	504	699	2941	2654	3190	7.00	7.00	7.00
5	Region 4	2464	2427	2567	1849	1783	1904	615	549	663	2999	2933	3124	7.00	7.00	7.00
1	Region 6	2251	-	-	1909	-	-	342	-	-	2578	-	-	6.80	-	-
1	Region 10	2606	-	-	1950	-	-	656	-	-	3121	-	-	7.00	-	-
1	Region 25	2219	-	-	1912	-	-	307	-	-	2506	-	-	6.67	-	-
1	Region 26	2789	-	-	2148	-	-	641	-	-	3195	-	-	7.00	-	-
1	Region 27	2882	-	-	2155	-	-	727	-	-	3327	-	-	7.00	-	-
2	Region 28	2559	2166	2951	1968	1765	2171	591	401	780	3002	2619	3385	6.94	6.87	7.00
1	Region 34	2656	-	-	2133	-	-	523	-	-	3126	-	-	7.00	-	-
2	Region 35	2865	2739	2991	2183	2116	2250	682	623	741	3201	3061	3341	7.00	7.00	7.00
23	Ave. B3	2512	-	-	1919	-	-	592	-	-	2987	-	-	6.97	-	-
	Min. B3	2117	-	-	1613	-	-	307	-	-	2506	-	-	6.67	-	-
	Max. B3	2991	-	-	2250	-	-	780	-	-	3385	-	-	7.00	-	-

Table 5: Rapid Visco Analyser results (continue)

Number of samples	Region	Peak viscosity, cP				Minimum viscosity (Trough), cP				Breakdown, cP				Final viscosity, cP				Peak time, min			
		ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.		
GRADE: B4																					
3	Region 4	2492	2474	2526	1849	1766	1902	643	594	710	2966	2886	3044	7.00	7.00	7.00	7.00	7.00	7.00		
2	Region 5	2182	2147	2216	1734	1656	1912	398	304	491	2563	2454	2671	6.90	6.80	7.00	7.00	7.00	7.00		
2	Region 25	2584	2548	2619	2043	2039	2047	541	501	580	2900	2785	3015	6.94	6.87	7.00	7.00	7.00	7.00		
7	Ave. B4	2429			1886			543			2832			6.95							
	Min. B4	2147			1656			304			2454			6.80							
	Max. B4			2619			2047			710			3044			7.00					
GRADE: COW																					
1	Region 12	2446	-	-	1852	-	-	594	-	-	2785	-	-	7.00	-	-	7.00	-	-		
1	Region 23	1624	-	-	1353	-	-	271	-	-	1784	-	-	6.47	-	-	6.47	-	-		
2	Ave. COW	2035			1603			433			2285			6.74							
	Min. COW	1624			1353			271			1784			6.47							
	Max. COW			2446			1852			594			2785			7.00					
GRADE: UT																					
3	Region 2	2569	2435	2794	1811	1759	1878	758	640	916	3033	2925	3225	7.00	7.00	7.00	7.00	7.00	7.00		
4	Region 3	2541	2479	2607	1952	1920	1992	590	517	682	3073	2980	3132	7.00	7.00	7.00	7.00	7.00	7.00		
7	Region 6	1701	1156	2592	1345	819	1836	357	235	756	1927	1289	2958	6.38	5.80	7.00	7.00	7.00	7.00		
1	Region 11	2740	-	-	2184	-	-	556	-	-	2973	-	-	6.93	-	-	6.93	-	-		
1	Region 22	2363	-	-	1858	-	-	505	-	-	2596	-	-	7.00	-	-	7.00	-	-		
1	Region 23	1122	-	-	776	-	-	346	-	-	1205	-	-	5.53	-	-	5.53	-	-		
1	Region 25	1814	-	-	1635	-	-	179	-	-	2267	-	-	6.67	-	-	6.67	-	-		
2	Region 28	2010	1675	2345	1623	1522	1724	387	153	621	2338	2015	2661	6.84	6.67	7.00	6.67	7.00	7.00		
1	Region 33	2525	-	-	1806	-	-	719	-	-	2743	-	-	7.00	-	-	7.00	-	-		
21	Ave. COW	2113			1626			486			2445			6.69							
	Min. COW	1122			776			153			1205			5.53							
	Max. COW			2794			2184			916			3225			7.00					
105	Ave. Wheat	2393			1834			559			2775			6.89							
	Min. Wheat	1122			776			153			1205			5.53							
	Max. Wheat			2991			2259			916			3385			7.00					

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.

Results published in 2011 of a survey conducted on mycotoxin occurrence in 324 grain, feed and feed commodity samples sourced in the Middle East and Africa included the results of 77 samples from SA.⁽¹⁾ Results of the study indicated that the pattern of mycotoxin occurrence depends on where the commodity originated, warmer countries, such as Nigeria, Kenya and Ghana have higher occurrence of aflatoxins, whereas moderate countries, such as SA, exhibit a totally different contamination pattern, with a higher prevalence of B-trichothecenes (including deoxynivalenol, nivalenol and acetyl-deoxynivalenol).

In the results published, the main contaminants in the SA samples were deoxynivalenol (DON), fumonisin (FUM) and zearalenone (ZON) and a wheat sample from South Africa presented the highest contamination level of all the samples analysed for both DON (11 022 µg/kg) and aflatoxin B₁ (7 µg/kg). The level of DON is above the European Commission guidance value.

SAGL implements 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, 15-ADON, HT-2 Toxin, T-2 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.

Ten of the samples tested positive for Deoxynivalenol with levels higher than the limit of quantification (100 µg/kg), averaging 187 µg/kg.

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 cconsumption, ≤ 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.

1. Rodrigues I., Handl J., and Binder E.M., 2011. Mycotoxin occurrence in commodities, feeds and feed ingredients sourced in the Middle East and Africa. *Food Additives and Contaminants: Part B*, Vol 4., 168 -179.

Table 6: Mycotoxin results for the 2012/2013 season

Region	Class and Grade	Aflatoxin µg/kg			Fumonisin µg/kg			Deoxynivalenol µg/kg	15-ADON µg/kg	Ochratoxin A µg/kg	Zearalenone µg/kg	HT-2 Toxin µg/kg	T2 - Toxin µg/kg
		G ₁	B ₁	G ₂	B ₂	B ₁	B ₂						
LOQ													
2	B3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2	B2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3	B1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3	B3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3	B2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4	B4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4	B3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5	B2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5	B3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
6	B4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
6	B2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
10	B2	ND	ND	ND	ND	ND	ND	ND	<100	ND	ND	ND	ND
10	B2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
10	B1	ND	ND	ND	ND	ND	ND	ND	<100	ND	ND	ND	ND
11	B1	ND	ND	ND	ND	ND	ND	ND	132	ND	ND	ND	ND
11	B2	ND	ND	ND	ND	ND	ND	ND	313	<20	ND	ND	ND
12	COW	ND	ND	ND	ND	ND	ND	ND	<100	ND	ND	ND	ND
14	B1	ND	ND	ND	ND	ND	ND	ND	169	ND	ND	ND	ND
15	B2	ND	ND	ND	ND	ND	ND	ND	117	ND	ND	ND	ND
17	B1	ND	ND	ND	ND	ND	ND	ND	<100	ND	ND	ND	ND
19	B1	ND	ND	ND	ND	ND	ND	ND	169	ND	ND	ND	ND
20	B1	ND	ND	ND	ND	ND	ND	ND	<100	ND	ND	ND	ND
21	B2	ND	ND	ND	ND	ND	ND	ND	295	ND	ND	ND	ND
22	B1	ND	ND	ND	ND	ND	ND	ND	113	ND	ND	ND	ND
23	B1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
23	UT	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
24	B2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
25	B4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
25	B2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
26	B1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
27	B1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 6: Mycotoxin results for the 2012/2013 season (continue)

Region	Class and Grade	Aflatoxin µg/kg			Fumonisin µg/kg			Deoxynivalenol µg/kg	15-ADON µg/kg	Ochratoxin A µg/kg	Zearalenone µg/kg	HT-2 Toxin µg/kg	T2 - Toxin µg/kg
		G ₁	B ₁	G ₂	B ₂	B ₁	B ₂						
LOQ													
28	B2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
28	B3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
29	B1	ND	ND	ND	ND	ND	ND	ND	137	ND	ND	ND	ND
30	B1	ND	ND	ND	ND	ND	ND	ND	<100	ND	ND	ND	ND
33	UT	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
34	B2	ND	ND	ND	ND	ND	ND	ND	106	ND	ND	ND	ND
35	B3	ND	ND	ND	ND	ND	ND	ND	108	ND	ND	ND	ND
35	B1	ND	ND	ND	ND	ND	ND	ND	380	ND	ND	ND	ND
36	B2	ND	ND	ND	ND	ND	ND	ND	<100	ND	ND	ND	ND
Total number of samples		40	40	40	40	40	40	40	40	40	40	40	40
Average of total number of samples		0	0	0	0	0	0	0	<LOQ	0	0	0	0
Number of positive results		0	0	0	0	0	0	10	0	0	0	0	0
Average of positive results		-	-	-	-	-	-	187	-	-	-	-	-
Maximum of positive results		-	-	-	-	-	-	380	-	-	-	-	-

Note:
 Limit of quantitation (LOQ) means the lowest concentration level that can be quantified with acceptable precision and accuracy by the spectrometer. A concentration measured below the LOQ is reported as <LOQ.
 Limit of detection (LOD) is the lowest concentration level that can be detected but not quantified and is 50% of the LOQ of each mycotoxin. A concentration measured below the LOD is reported as not detected (ND).

South African Quality data per production region

WINTER RAINFALL WHEAT

Western Cape Province

PRODUCTION REGION	(2) Swartland Western Region				(3) Swartland Central Region							
	Bergvlier	Darling	Koperfontein	Vredenburg	Eendekuil	Klipheuwel	Koringberg	Malmesbury				
Intake silos					Moorreesburg							
					Moravia							
					Piketberg							
					Pools							
					Ruststasie							
WHEAT												
Protein (12% mb), %	ave 11.0	min 9.6	max 12.2	stdev 0.83	ave 11.0	min 9.0	max 13.0	stdev 1.00				
Falling number, sec	396	348	529	46.40	385	325	473	24.69				
1000 Kernel mass (13% mb), g	39.6	36.2	44.5	2.16	41.3	33.5	48.9	3.51				
Hectolitre mass (dirty), kg/hl	80.5	75.6	83.8	1.94	82.4	77.0	84.8	1.40				
Screenings (<1.8mm), %	2.30	0.44	3.82	1.04	1.76	0.10	5.27	1.14				
Total damaged kernels, %	0.93	0.13	2.52	0.70	0.57	0.00	4.32	0.62				
Combined deviations, %	4.52	0.76	8.46	2.17	2.98	0.23	8.47	1.72				
Number of samples	20				69							
CULTIVARS												
cultivars	SST 027	35.5			SST 056	32.3						
with highest % occurrence	SST 88	28.5			SST 027	26.0						
	SST 056	17.8			SST 88	25.5						
	SST 047	10.8			SST 015	10.2						
	SST 015	7.5			SST 047	4.1						
Number of samples	20				69							
MIXOGRAM (Quadromat)												
Peak time, min	ave 3.1	min 2.8	max 3.8	stdev 0.26	ave 2.6	min 2.0	max 3.2	stdev 0.28				
Tail height (6min), mm	49	43	54	2.58	48	41	54	2.56				
Number of samples	20				69							
CLASS AND GRADE	COMPOSITE SAMPLES											
BÜHLER EXTRACTION, %	B1 71.9	B2 71.8	B3 72.3	B4 72.6	UT 70.8	COW -	B1 71.7	B2 70.7	B3 71.3	B4 71.5	UT 72.4	COW -
FLOWER												
Protein (12% mb), %	11.3	10.5	9.5	9.1	10.2	-	11.7	10.5	9.3	8.6	9.6	-
Colour, KJ (wet)	-2.5	-3.1	-2.8	-3.2	-2.9	-	-3.1	-3.2	-3.3	-2.7	-2.9	-
Colour, Minolta CM5 (dry)												
L*	93.72	94.06	93.92	94.14	94.15	-	94.18	94.26	94.22	93.79	94.07	-
a*	0.43	0.43	0.38	0.41	0.37	-	0.41	0.41	0.40	0.36	0.40	-
b*	10.54	10.96	10.88	10.85	10.48	-	10.36	10.19	10.54	9.92	10.15	-
GLUTEN												
Wet gluten (14% mb), %	31.0	27.8	24.9	23.0	27.4	-	32.2	29.3	25.7	22.7	26.2	-
Dry gluten (14% mb), %	10.7	9.4	8.7	8.3	9.2	-	11.1	10.3	9.0	7.8	8.6	-
Gluten Index	78	80	82	85	86	-	71	71	84	93	88	-
FARINOGRAM												
Water absorption (14% mb), %	61.8	60.5	59.4	60.0	60.4	-	62.0	62.5	60.5	59.6	60.1	-
Development time, min	6.5	4.8	5.2	4.0	3.3	-	5.2	4.2	4.4	2.5	3.7	-
Stability, min	9.2	8.5	8.0	7.9	8.5	-	6.5	6.7	6.8	5.8	6.3	-
Mixing tolerance index, BU	31	26	40	32	22	-	38	36	38	36	38	-
EXTENSOGRAM (45 min pull)												
Area, cm ²	99	73	71	57	78	-	88	74	75	63	75	-
Maximum height, BU	391	320	280	300	348	-	308	295	312	306	294	-
Extensibility, mm	189	159	179	134	158	-	203	176	168	146	179	-
ALVEOGRAM												
Strength (S), cm ²	41.1	34.7	32.6	32.3	35.3	-	39.0	37.0	30.1	26.8	30.1	-
Stability (P), mm	95	84	89	98	93	-	84	98	90	86	81	-
Distensibility (L), mm	95	102	83	72	85	-	120	91	77	70	94	-
Configuration ratio (P/L)	1.00	0.82	1.07	1.36	1.09	-	0.70	1.08	1.17	1.23	0.86	-
MIXOGRAM												
Peak time, min	2.7	2.6	3.0	3.6	3.0	-	2.3	2.4	2.5	2.9	2.5	-
100g BAKING TEST												
Loaf volume, cm ³	870	850	825	765	775	-	935	900	805	775	855	-
Evaluation (see page 61)	0	0	0	0	1	-	0	0	0	0	0	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION



South African Quality data per production region

WINTER RAINFALL WHEAT

Western Cape Province

PRODUCTION REGION	(4) Swartland Eastern Region				(5) Rüens Western Region								
	Ceres	Gouda	Halfmanshof	Leliedam	Porterville	Riebeeck-Wes	Bredasdorp	Caledon	Klipdale	Krike	Napier	Protem	Rietpoel
Intake silos													
WHEAT													
Protein (12% mb), %	ave	min	max	stdev	ave	min	max	stdev					
	10.6	9.1	11.8	0.70	11.0	9.7	12.3	0.85					
Falling number, sec	397	323	538	44.51	341	236	416	48.63					
1000 Kernel mass (13% mb), g	40.5	36.3	46.8	2.58	45.0	43.1	46.5	1.11					
Hectolitre mass (dirty), kg/hl	83.1	80.5	85.2	1.07	81.5	76.8	83.7	1.97					
Screenings (<1.8mm), %	0.98	0.10	3.53	1.02	0.65	0.09	1.47	0.48					
Total damaged kernels, %	0.56	0.05	1.53	0.38	0.48	0.12	1.92	0.45					
Combined deviations, %	1.91	0.32	4.60	1.19	1.84	0.34	3.38	0.83					
Number of samples	28				19								
CULTIVARS													
cultivars	SST 056				29.7				SST 88				
with highest % occurrence	SST 027				27.0				SST 027				
	SST 88				17.3				SST 056				
	SST 015				11.8				SST 015				
	SST 047				10.0				SST 047				
Number of samples	28				19								
MIXOGRAM (Quadromat)													
Peak time, min	ave	min	max	stdev	ave	min	max	stdev					
	2.6	2.2	2.9	0.21	2.6	2.3	2.9	0.21					
Tail height (6min), mm	48	43	53	2.45	50	46	54	2.02					
Number of samples	28				19								
	COMPOSITE SAMPLES												
CLASS AND GRADE	B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW	
BÜHLER EXTRACTION, %	-	72.5	72.7	71.8	-	-	72.7	72.8	72.2	76.9	-	-	
FLOUR													
Protein (12% mb), %	-	10.6	9.4	9.3	-	-	11.0	10.1	9.7	10.1	-	-	
Colour, KJ (wet)	-	-3.0	-3.1	-3.3	-	-	-2.8	-2.7	-2.9	-1.8	-	-	
Colour, Minolta CM5 (dry)	-	94.21	94.27	94.09	-	-	93.68	93.88	94.08	93.37	-	-	
L*	-	94.21	94.27	94.09	-	-	93.68	93.88	94.08	93.37	-	-	
a*	-	0.39	0.41	0.41	-	-	0.53	0.43	0.40	0.45	-	-	
b*	-	10.08	10.08	10.05	-	-	10.06	9.35	9.56	9.25	-	-	
GLUTEN													
Wet gluten (14% mb), %	-	30.4	25.6	25.2	-	-	30.5	27.6	26.2	27.5	-	-	
Dry gluten (14% mb), %	-	10.7	8.7	8.7	-	-	10.7	9.5	8.9	9.1	-	-	
Gluten Index	-	75	89	76	-	-	74	86	82	91	-	-	
FARINOGRAM													
Water absorption (14% mb), %	-	62.4	61.5	60.2	-	-	62.3	61.6	60.7	62.7	-	-	
Development time, min	-	5.2	3.2	4.0	-	-	4.0	3.7	4.2	3.2	-	-	
Stability, min	-	8.1	6.0	5.5	-	-	6.0	6.2	7.9	5.3	-	-	
Mixing tolerance index, BU	-	30	37	48	-	-	44	41	31	46	-	-	
EXTENSOGRAM (45 min pull)													
Area, cm ²	-	73	57	63	-	-	67	70	67	-	-	-	
Maximum height, BU	-	284	249	259	-	-	262	264	311	-	-	-	
Extensibility, mm	-	181	158	169	-	-	176	182	152	-	-	-	
ALVEOGRAM													
Strength (S), cm ²	-	35.6	31.7	30.0	-	-	33.8	30.7	31.5	29.8	-	-	
Stability (P), mm	-	93	95	82	-	-	87	85	89	94	-	-	
Distensibility (L), mm	-	94	78	95	-	-	101	91	83	74	-	-	
Configuration ratio (P/L)	-	0.99	1.22	0.86	-	-	0.86	0.93	1.07	1.27	-	-	
MIXOGRAM													
Peak time, min	-	2.2	2.9	2.3	-	-	2.5	2.6	2.7	2.6	-	-	
100g BAKING TEST													
Loaf volume, cm ³	-	885	805	815	-	-	850	835	805	805	-	-	
Evaluation (see page 61)	-	0	0	0	-	-	0	0	0	0	-	-	

RHEOLOGICAL GRAPHS PER PRODUCTION REGION



South African Quality data per production region

WINTER RAINFALL WHEAT

Western Cape Province

PRODUCTION REGION	(6) Rüens Eastern Region				(10) Griqualand-West													
Intake silos	Albertinia	Ashton	Camfer	Heidelberg	Karrigmelksrivier	Kleinberg	Protem	Riversdal	Swellendam	Britstown	Douglas	Havenga Brug	Marydale	Modderrivier	Oranjerivierstasie	Prieska	Rietrivier	Upington
WHEAT																		
Protein (12% mb), %	ave 10.6	min 8.6	max 12.0	stdev 0.86	ave 12.0	min 10.4	max 13.1	stdev 0.65										
Falling number, sec	276	173	434	51.08	378	309	453	35.27										
1000 Kernel mass (13% mb), g	44.5	37.0	48.2	2.26	41.0	33.6	49.0	3.24										
Hectolitre mass (dirty), kg/hl	79.8	76.5	87.7	1.91	82.3	79.5	85.6	1.61										
Screenings (<1.8mm), %	1.12	0.28	2.83	0.66	1.16	0.13	4.10	0.86										
Total damaged kernels, %	0.80	0.06	2.20	0.49	0.90	0.10	3.80	0.85										
Combined deviations, %	2.84	0.78	6.07	1.20	2.44	1.03	6.18	1.16										
Number of samples	35				31													
CULTIVARS																		
cultivars	SST 88 24.5				SST 835 22.5													
with highest % occurrence	SST 027 23.0				Duzi 6.5													
	SST 015 2.8				Baviaans 5.5													
Number of samples	35				31													
MIXOGRAM (Quadromat)																		
Peak time, min	ave 3.0	min 2.4	max 3.5	stdev 0.28	ave 2.7	min 1.9	max 3.5	stdev 0.36										
Tail height (6min), mm	49	43	54	2.30	49	46	54	2.62										
Number of samples	35				31													
CLASS AND GRADE	COMPOSITE SAMPLES																	
BÜHLER EXTRACTION, %	B1 -	B2 71.7	B3 71.0	B4 71.9	UT -	COW -	B1 73.9	B2 74.7	B3 72.1	UT -	COW 74.7							
FLOUR																		
Protein (12% mb), %	-	10.4	9.5	9.4	-	-	11.3	10.8	9.1	-	10.9	-						
Colour, KJ (wet)	-	-3.0	-2.6	-2.6	-	-	-3.2	-3.1	-3.3	-	-3.2	-						
Colour, Minolta CM5 (dry)	-	94.17	94.16	94.08	-	-	93.95	94.12	94.39	-	94.21	-						
L*	-	94.17	94.16	94.08	-	-	93.95	94.12	94.39	-	94.21	-						
a*	-	0.35	0.26	0.30	-	-	0.54	0.50	0.38	-	0.50	-						
b*	-	9.60	8.86	8.85	-	-	9.74	9.68	9.76	-	9.40	-						
GLUTEN																		
Wet gluten (14% mb), %	-	29.0	25.8	25.6	-	-	32.5	30.5	27.0	-	32.1	-						
Dry gluten (14% mb), %	-	10.3	9.0	8.4	-	-	11.1	10.6	9.2	-	10.7	-						
Gluten Index	-	80	92	82	-	-	76	82	96	-	67	-						
FARINOGRAM																		
Water absorption (14% mb), %	-	61.9	60.6	59.8	-	-	60.0	60.1	61.7	-	60.8	-						
Development time, min	-	4.0	3.2	3.5	-	-	6.2	5.0	3.7	-	4.7	-						
Stability, min	-	5.7	6.0	6.1	-	-	7.5	6.3	6.1	-	4.5	-						
Mixing tolerance index, BU	-	54	46	45	-	-	37	42	39	-	56	-						
EXTENSOGRAM (45 min pull)																		
Area, cm ²	-	70	63	58	-	-	96	97	67	-	74	-						
Maximum height, BU	-	266	250	242	-	-	318	339	289	-	281	-						
Extensibility, mm	-	184	174	165	-	-	216	204	160	-	187	-						
ALVEOGRAM																		
Strength (S), cm ²	-	33.6	31.2	28.4	-	-	33.0	34.3	30.3	-	30.7	-						
Stability (P), mm	-	85	86	81	-	-	66	74	95	-	71	-						
Distensibility (L), mm	-	102	93	86	-	-	130	119	71	-	114	-						
Configuration ratio (P/L)	-	0.83	0.92	0.94	-	-	0.51	0.62	1.34	-	0.62	-						
MIXOGRAM																		
Peak time, min	-	2.7	3.4	2.8	-	-	2.5	2.4	2.5	-	2.3	-						
100g BAKING TEST																		
Loaf volume, cm ³	-	880	825	835	-	-	990	975	825	-	1015	-						
Evaluation (see page 61)	-	0	0	0	-	-	0	0	0	-	0	-						

RHEOLOGICAL GRAPHS PER PRODUCTION REGION



South African Quality data per production region

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 Buhrmannsdrif Kameel Kraaipan Madibogo Mafikeng Mareetsane Piet Plessis Springbokpan	Vergeleë Vryburg Vryhof		
WHEAT								
Protein (12% mb), %	ave 12.0	min 10.5	max 12.90	stdev 0.68	ave 12.6	min 11.9	max 13.2	stdev 0.92
Falling number, sec	405	319	581	58.01	348	346	350	2.83
1000 Kernel mass (13% mb), g	38.7	36.4	40.4	1.29	37.9	34.0	41.7	5.44
Hectolitre mass (dirty), kg/hl	82.4	78.9	84.2	1.48	81.6	79.9	83.2	2.33
Screenings (<1.8mm), %	1.94	0.10	3.30	0.92	1.00	0.79	1.21	0.30
Total damaged kernels, %	0.78	0.00	1.90	0.51	2.53	0.13	4.93	3.39
Combined deviations, %	3.58	1.29	5.40	0.98	4.10	2.19	6.00	2.69
Number of samples	16				2			
CULTIVARS								
cultivars with highest % occurrence	SST 877 SST 843 SST 835 Duzi Baviaans		32.1 29.6 18.2 13.8 2.8		SST 843		61.5 24.5 9.0 5.0	
Number of samples	16				2			
MIXOGRAM (Quadromat)								
Peak time, min	ave 2.6	min 2.2	max 2.9	stdev 0.22	ave 3.1	min 2.4	max 3.8	stdev 0.99
Tail height (6min), mm	48	45	50	1.55	51	48	54	4.24
Number of samples	16				2			
	COMPOSITE SAMPLES							
CLASS AND GRADE	B1	B2	B3	B4	UT	COW	B1	B2
BÜHLER EXTRACTION, %	74.7	75.0	-	74.1	74.3	-	73.9	-
FLOUR								
Protein (12% mb), %	11.8	10.7	-	9.4	10.8	-	12.5	-
Colour, KJ (wet)	-3.0	-3.1	-	-3.4	-3.2	-	-3.0	-
Colour, Minolta CM5 (dry)	L* 94.08	94.06	-	93.96	93.80		94.22	-
a*	0.46	0.44	-	0.48	0.49	-	0.38	-
b*	9.79	9.97	-	10.60	10.20	-	8.82	-
GLUTEN								
Wet gluten (14% mb), %	32.9	29.9	-	25.6	29.6	-	32.0	-
Dry gluten (14% mb), %	11.7	10.4	-	9.1	10.6	-	11.2	-
Gluten Index	76	70	-	72	78	-	94	-
FARINOGRAM								
Water absorption (14% mb), %	61.7	60.5	-	58.3	60.7	-	60.9	-
Development time, min	5.3	4.5	-	4.7	5.3	-	8.2	-
Stability, min	6.7	5.2	-	5.7	5.6	-	11.9	-
Mixing tolerance index, BU	39	53	-	52	42	-	29	-
EXTENSOGRAM (45 min pull)								
Area, cm ²	85	84	-	66	93	-	-	-
Maximum height, BU	291	296	-	261	320	-	-	-
Extensibility, mm	206	203	-	177	205	-	-	-
ALVEOGRAM								
Strength (S), cm ²	37.8	30.4	-	26.0	36.9	-	58.6	-
Stability (P), mm	75	72	-	64	81	-	95	-
Distensibility (L), mm	128	103	-	111	113	-	125	-
Configuration ratio (P/L)	0.59	0.70	-	0.58	0.72	-	0.76	-
MIXOGRAM								
Peak time, min	2.3	2.3	-	2.5	2.3	-	3.3	-
100g BAKING TEST								
Loaf volume, cm ³	1005	950	-	805	900	-	950	-
Evaluation (see page 61)	0	0	-	0	0	-	0	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION



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South African Quality data per production region

MAINLY IRRIGATION WHEAT

North-West Province

PRODUCTION REGION	(14) North-West Southern Region				(15) North-West South-Eastern Region								
	Amalia	Barberspan	Schweizer-Reneke	Taalbospan	Bloemhof	Christiana	Hertzogville	Hoopstad					
Intake silos								Kingwood					
WHEAT													
Protein (12% mb), %	ave 12.6	min -	max -	stdev -	ave 11.4	min 10.6	max 12.3	stdev 0.85					
Falling number, sec	367	-	-	-	376	331	415	42.32					
1000 Kernel mass (13% mb), g	38.8	-	-	-	46.6	44.5	49.3	2.46					
Hectolitre mass (dirty), kg/hl	80.0	-	-	-	82.8	81.3	83.8	1.34					
Screenings (<1.8mm), %	0.66	-	-	-	0.49	0.42	0.56	0.07					
Total damaged kernels, %	1.42	-	-	-	0.45	0.12	0.83	0.36					
Combined deviations, %	2.23	-	-	-	0.97	0.70	1.33	0.33					
Number of samples	1				3								
CULTIVARS													
	SST 843	57.0			Duzi	66.0							
cultivars	Baviaans	22.0			SST 835	13.7							
with highest % occurrence	SST 835	21.0			Baviaans	9.3							
					SST 843	6.0							
					Sabie	5.0							
Number of samples	1				3								
MIXOGRAM (Quadromat)													
Peak time, min	ave 3.8	min -	max -	stdev -	ave 2.5	min 2.3	max 2.6	stdev 0.15					
Tail height (6min), mm	57	-	-	-	45	42	49	3.51					
Number of samples	1				3								
COMPOSITE SAMPLES													
CLASS AND GRADE	B1	B2	B3	B4	UT	COW	B1	B2					
BÜHLER EXTRACTION, %	-	-	-	-	-	-	76.2	76.2					
							75.3	-					
							-	-					
							-	-					
FLOUR													
Protein (12% mb), %	-	-	-	-	-	-	11.4	10.2					
Colour, KJ (wet)	-	-	-	-	-	-	-3.0	-3.4					
Colour, Minolta CM5 (dry)							-3.4	-3.4					
L*	-	-	-	-	-	-	93.90	94.04					
a*	-	-	-	-	-	-	94.10	-					
b*	-	-	-	-	-	-	0.43	0.49					
							0.42	-					
							-	-					
							-	-					
GLUTEN													
Wet gluten (14% mb), %	-	-	-	-	-	-	31.9	29.6					
Dry gluten (14% mb), %	-	-	-	-	-	-	10.8	10.1					
Gluten Index	-	-	-	-	-	-	81	44					
							87	-					
							-	-					
							-	-					
FARINOGRAM													
Water absorption (14% mb), %	-	-	-	-	-	-	59.4	60.2					
Development time, min	-	-	-	-	-	-	4.5	3.2					
Stability, min	-	-	-	-	-	-	5.8	4.2					
Mixing tolerance index, BU	-	-	-	-	-	-	52	49					
							-	-					
							-	-					
EXTENOGRAM (45 min pull)													
Area, cm ²	-	-	-	-	-	-	75	54					
Maximum height, BU	-	-	-	-	-	-	260	181					
Extensibility, mm	-	-	-	-	-	-	201	188					
							-	-					
							-	-					
ALVEOGRAM													
Strength (S), cm ²	-	-	-	-	-	-	29.5	23.9					
Stability (P), mm	-	-	-	-	-	-	56	58					
Distensibility (L), mm	-	-	-	-	-	-	149	123					
Configuration ratio (P/L)	-	-	-	-	-	-	0.38	0.47					
							0.59	-					
							-	-					
MIXOGRAM													
Peak time, min	-	-	-	-	-	-	2.3	1.8					
							2.2	-					
							-	-					
100g BAKING TEST													
Loaf volume, cm ³	-	-	-	-	-	-	950	820					
Evaluation (see page 61)	-	-	-	-	-	-	825	-					
							0	0					
							0	-					
							-	-					

RHEOLOGICAL GRAPHS PER PRODUCTION REGION



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South African Quality data per production region

MAINLY IRRIGATION WHEAT

North-West Province

PRODUCTION REGION	(17) North-West Central Northern Region (Ottosdal)				(19) North-West Central Region (Lichtenburg)									
	Bospoort	Lethabong (Hartbeesfontein)	Kleinhardt	Melliadra	Ottosdal	Rostrataville	Vermaas	Werda	Grootpan	Halfpad	Hibernia	Lichtenburg	Lottiehalte	Lusthof
Intake silos														
WHEAT														
Protein (12% mb), %	ave 12.7	min -	max -	stdev -	ave 13.4	min 12.3	max 14.4	stdev 1.48	ave 387	min 319	max 454	stdev 95.46		
Falling number, sec	440	-	-	-	34.4	33.1	35.6	1.77	78.7	78.3	79.1	0.57		
1000 Kernel mass (13% mb), g	39.5	-	-	-	2.00	-	-	-	1.85	0.98	2.71	1.22		
Hectolitre mass (dirty), kg/hl	83.0	-	-	-	0.50	-	-	-	0.98	0.20	1.76	1.10		
Screenings (<1.8mm), %					Combined deviations, %	2.65	-	-	3.48	3.00	3.95	0.67		
Number of samples	1				2									
CULTIVARS														
cultivars	SST 843	56.0					SST 843	75.5						
with highest % occurrence	SST 835	44.0					SST 835	13.0						
									Duzi	5.0				
									Baviaans	4.0				
									Olifants	2.5				
Number of samples	1				2									
MIXOGRAM (Quadromat)														
Peak time, min	ave 2.8	min -	max -	stdev -	ave 4.0	min 3.8	max 4.2	stdev 0.28						
Tail height (6min), mm	50	-	-	-	56	53	59	4.24						
Number of samples	1				2									
COMPOSITE SAMPLES														
CLASS AND GRADE	B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW		
BÜHLER EXTRACTION, %	75.3	-	-	-	-	-	73.0	-	-	-	-	-		
FLOUR														
Protein (12% mb), %	12.4	-	-	-	-	-	12.6	-	-	-	-	-		
Colour, KJ (wet)	-3.0	-	-	-	-	-	-2.7	-	-	-	-	-		
Colour, Minolta CM5 (dry)														
L*	94.05	-	-	-	-	-	93.88	-	-	-	-	-		
a*	0.39	-	-	-	-	-	0.42	-	-	-	-	-		
b*	9.06	-	-	-	-	-	9.13	-	-	-	-	-		
GLUTEN														
Wet gluten (14% mb), %	34.1	-	-	-	-	-	32.3	-	-	-	-	-		
Dry gluten (14% mb), %	11.7	-	-	-	-	-	11.8	-	-	-	-	-		
Gluten Index	90	-	-	-	-	-	95	-	-	-	-	-		
FARINOGRAM														
Water absorption (14% mb), %	-	-	-	-	-	-	60.8	-	-	-	-	-		
Development time, min	-	-	-	-	-	-	8.9	-	-	-	-	-		
Stability, min	-	-	-	-	-	-	15.9	-	-	-	-	-		
Mixing tolerance index, BU	-	-	-	-	-	-	16	-	-	-	-	-		
EXTENSOGRAM (45 min pull)														
Area, cm ²	-	-	-	-	-	-	165	-	-	-	-	-		
Maximum height, BU	-	-	-	-	-	-	492	-	-	-	-	-		
Extensibility, mm	-	-	-	-	-	-	247	-	-	-	-	-		
ALVEOGRAM														
Strength (S), cm ²	47.7	-	-	-	-	-	54.3	-	-	-	-	-		
Stability (P), mm	86	-	-	-	-	-	87	-	-	-	-	-		
Distensibility (L), mm	138	-	-	-	-	-	125	-	-	-	-	-		
Configuration ratio (P/L)	0.62	-	-	-	-	-	0.70	-	-	-	-	-		
MIXOGRAM														
Peak time, min	2.3	-	-	-	-	-	3.5	-	-	-	-	-		
100g BAKING TEST														
Loaf volume, cm ³	945	-	-	-	-	-	1040	-	-	-	-	-		
Evaluation (see page 61)	0	-	-	-	-	-	0	-	-	-	-	-		

RHEOLOGICAL GRAPHS PER PRODUCTION REGION



South African Quality data per production region

MAINLY IRRIGATION WHEAT

North-West Province

PRODUCTION REGION	(20) North-West Eastern Region				SUMMER RAINFALL WHEAT (AND IRRIGATION) Free State Province (Central)															
	Battery	Boons	Brits	Derby	Koster	Rustenburg	Swartruggens	Syferbult	Attie	Groenebloem	Heuningspruit	Koppies	Rooiwal	Vierfontein	Viljoenskroon	Vrededorf	Weiveld			
Intake silos																				
WHEAT																				
Protein (12% mb), %	ave 13.1	min 12.8	max 13.3	stdev 0.35	ave 11.6	min -	max -	stdev -	ave 324	min 290	max 357	stdev 47.38	ave 37.4	min -	max -	stdev -				
Falling number, sec																				
1000 Kernel mass (13% mb), g	39.9	39.9	39.9	0.00	81.0	-	-	-	39.9	39.9	39.9	0.00	81.0	-	-	-	-			
Hectolitre mass (dirty), kg/hl	81.3	80.8	81.7	0.64	81.0	-	-	-	81.3	80.8	81.7	0.64	81.0	-	-	-	-			
Screenings (<1.8mm), %	0.59	0.34	0.84	0.35	1.61	-	-	-	0.59	0.34	0.84	0.35	1.61	-	-	-	-			
Total damaged kernels, %	0.89	0.89	0.89	0.00	1.16	-	-	-	0.89	0.89	0.89	0.00	1.16	-	-	-	-			
Combined deviations, %	1.80	1.80	1.80	0.00	3.08	-	-	-	1.80	1.80	1.80	0.00	3.08	-	-	-	-			
Number of samples	2				1															
CULTIVARS																				
cultivars with highest % occurrence	SST 843				75.5				SST 835				67.0							
	Duzi				18.0				SST 876				19.0							
	SST 835				6.5				PAN 3118				14.0							
Number of samples	2				1															
MIXOGRAM (Quadromat)																				
Peak time, min	ave 3.8	min 3.3	max 4.2	stdev 0.64	ave 2.5	min -	max -	stdev -	ave 58	min 57	max 59	stdev 1.41	ave 47	min -	max -	stdev -	ave -	min -	max -	stdev -
Tail height (6min), mm																				
Number of samples	2				1															
COMPOSITE SAMPLES																				
CLASS AND GRADE		B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW	
BÜHLER EXTRACTION, %		73.7	-	-	-	-	-	-	-	74.9	-	-	-	-	-	-	-	-	-	
FLOUR																				
Protein (12% mb), %	12.2	-	-	-	-	-	-	-	12.3	-	-	-	-	-	-	-	-	-	-	
Colour, KJ (wet)	-2.5	-	-	-	-	-	-	-	-2.7	-	-	-	-	-	-	-	-	-	-	
Colour, Minolta CM5 (dry)																				
L*	93.77	-	-	-	-	-	-	-	93.82	-	-	-	-	-	-	-	-	-	-	
a*	0.43	-	-	-	-	-	-	-	0.42	-	-	-	-	-	-	-	-	-	-	
b*	8.65	-	-	-	-	-	-	-	9.17	-	-	-	-	-	-	-	-	-	-	
GLUTEN																				
Wet gluten (14% mb), %	32.0	-	-	-	-	-	-	-	28.8	-	-	-	-	-	-	-	-	-	-	
Dry gluten (14% mb), %	11.4	-	-	-	-	-	-	-	9.8	-	-	-	-	-	-	-	-	-	-	
Gluten Index	92	-	-	-	-	-	-	-	76	-	-	-	-	-	-	-	-	-	-	
FARINOGRAM																				
Water absorption (14% mb), %	62.4	-	-	-	-	-	-	-	59.8	-	-	-	-	-	-	-	-	-	-	
Development time, min	6.9	-	-	-	-	-	-	-	3.7	-	-	-	-	-	-	-	-	-	-	
Stability, min	10.1	-	-	-	-	-	-	-	4.3	-	-	-	-	-	-	-	-	-	-	
Mixing tolerance index, BU	36	-	-	-	-	-	-	-	63	-	-	-	-	-	-	-	-	-	-	
EXTENSOGRAM (45 min pull)																				
Area, cm ²	-	-	-	-	-	-	-	-	65	-	-	-	-	-	-	-	-	-	-	
Maximum height, BU	-	-	-	-	-	-	-	-	226	-	-	-	-	-	-	-	-	-	-	
Extensibility, mm	-	-	-	-	-	-	-	-	203	-	-	-	-	-	-	-	-	-	-	
ALVEOGRAM																				
Strength (S), cm ²	52.4	-	-	-	-	-	-	-	28.7	-	-	-	-	-	-	-	-	-	-	
Stability (P), mm	93	-	-	-	-	-	-	-	62	-	-	-	-	-	-	-	-	-	-	
Distensibility (L), mm	118	-	-	-	-	-	-	-	136	-	-	-	-	-	-	-	-	-	-	
Configuration ratio (P/L)	0.79	-	-	-	-	-	-	-	0.46	-	-	-	-	-	-	-	-	-	-	
MIXOGRAM																				
Peak time, min	3.6	-	-	-	-	-	-	-	2.4	-	-	-	-	-	-	-	-	-	-	
100g BAKING TEST																				
Loaf volume, cm ³	925	-	-	-	-	-	-	-	960	-	-	-	-	-	-	-	-	-	-	
Evaluation (see page 61)	0	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

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FARINOGRAM

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EXTENSOGRAM

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ALVEOGRAM

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South African Quality data per production region

SUMMER RAINFALL WHEAT (AND IRRIGATION)

Free State Province (Central)

PRODUCTION REGION	(26) Free State South-Eastern Region (Senekal)				(27) Free State Northern Region								
	Arlington	Kaallaagte	Libertas	Marquard	Meets	Monte Video	Senekal	Steynsrus	Gottenburg	Heilbron	Hoogte	Mooigeleë	Petrus Steyn
WHEAT													
Protein (12% mb), %	ave 12.1	min 10.7	max 13.1	stdev 0.83	ave 12.2	min 10.6	max 13.0	stdev 0.85	ave 12.2	min 10.6	max 13.0	stdev 0.85	
Falling number, sec	373	331	435	40.54	378	314	461	54.76	378	314	461	54.76	
1000 Kernel mass (13% mb), g	37.2	31.4	41.0	3.31	34.1	30.8	44.5	5.21	34.1	30.8	44.5	5.21	
Hectolitre mass (dirty), kg/hl	80.8	80.3	81.7	0.55	79.2	76.5	81.9	1.93	79.2	76.5	81.9	1.93	
Screenings (<1.8mm), %	1.46	0.62	2.42	0.63	1.49	0.40	3.31	1.16	1.49	0.40	3.31	1.16	
Total damaged kernels, %	0.36	0.13	0.66	0.21	0.56	0.15	1.13	0.34	0.56	0.15	1.13	0.34	
Combined deviations, %	2.24	1.14	3.35	0.81	2.78	1.52	4.96	1.29	2.78	1.52	4.96	1.29	
Number of samples	6				6				6				
CULTIVARS													
cultivars	SST 356				SST 356				31.2				
with highest % occurrence	SST 835				Elands				20.8				
	SST 843				SST 835				12.7				
	Elands				Matlabas				9.7				
	PAN 3161				PAN 3120				7.3				
Number of samples	6				6				6				
MIXOGRAM (Quadromat)													
Peak time, min	ave 3.5	min 2.8	max 4.0	stdev 0.49	ave 3.6	min 3.0	max 4.2	stdev 0.43	ave 3.6	min 3.0	max 4.2	stdev 0.43	
Tail height (6min), mm	56	50	62	4.59	56	48	62	4.58	56	48	62	4.58	
Number of samples	6				6				6				
COMPOSITE SAMPLES													
CLASS AND GRADE	B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW	
BÜHLER EXTRACTION, %	72.8	73.2	-	-	-	-	71.2	-	72.7	70.8	-	-	
FLOUR													
Protein (12% mb), %	11.7	11.0	-	-	-	-	11.8	-	9.5	12.8	-	-	
Colour, KJ (wet)	-2.4	-2.4	-	-	-	-	-2.7	-	-3.0	-2.7	-	-	
Colour, Minolta CM5 (dry)	L*	93.68	93.34	-	-	-	93.65	-	93.91	93.71	-	-	
a*	0.41	0.33	-	-	-	-	0.38	-	0.35	0.39	-	-	
b*	9.62	9.93	-	-	-	-	10.68	-	9.84	10.82	-	-	
GLUTEN													
Wet gluten (14% mb), %	30.4	27.9	-	-	-	-	31.1	-	24.0	33.9	-	-	
Dry gluten (14% mb), %	10.6	9.9	-	-	-	-	10.2	-	8.5	12.0	-	-	
Gluten Index	90	91	-	-	-	-	84	-	93	70	-	-	
FARINOGRAM													
Water absorption (14% mb), %	62.2	60.3	-	-	-	-	61.4	-	58.4	63.2	-	-	
Development time, min	7.7	8.7	-	-	-	-	8.2	-	4.0	7.7	-	-	
Stability, min	11.7	16.3	-	-	-	-	13.6	-	8.5	9.3	-	-	
Mixing tolerance index, BU	26	17	-	-	-	-	24	-	26	31	-	-	
EXTENSOGRAM (45 min pull)													
Area, cm ²	113	109	-	-	-	-	87	-	82	92	-	-	
Maximum height, BU	438	438	-	-	-	-	447	-	342	364	-	-	
Extensibility, mm	191	180	-	-	-	-	147	-	173	186	-	-	
ALVEOGRAM													
Strength (S), cm ²	49.8	42.4	-	-	-	-	47.2	-	33.0	48.9	-	-	
Stability (P), mm	108	110	-	-	-	-	101	-	83	101	-	-	
Distensibility (L), mm	94	71	-	-	-	-	102	-	88	112	-	-	
Configuration ratio (P/L)	1.15	1.55	-	-	-	-	0.99	-	0.94	0.90	-	-	
MIXOGRAM													
Peak time, min	3.3	3.4	-	-	-	-	2.9	-	3.1	3.0	-	-	
100g BAKING TEST													
Loaf volume, cm ³	895	830	-	-	-	-	930	-	830	985	-	-	
Evaluation (see page 61)	1	1	-	-	-	-	0	-	0	0	-	-	

RHEOLOGICAL GRAPHS PER PRODUCTION REGION



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South African Quality data per production region

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)							
	Allanridge	Bothaville	Mirage	Odendaalsrus	Schoonspruit	Schuttesdraai	Bultfontein	Losdoorns	Protespan	Tierfontein	Wesselsbron	Willemsrust
Intake silos												
WHEAT												
Protein (12% mb), %	ave 12.4	min 11.1	max 13.0	stdev 0.86	ave 12.2	min 10.8	max 14.6	stdev 0.97				
Falling number, sec	323	293	341	21.82	306	164	437	78.11				
1000 Kernel mass (13% mb), g	37.0	35.3	39.6	1.85	38.1	28.6	45.1	3.96				
Hectolitre mass (dirty), kg/hl	82.1	81.1	83.1	0.82	78.3	69.2	87.6	4.99				
Screenings (<1.8mm), %	0.55	0.22	0.85	0.35	2.19	0.17	6.97	1.93				
Total damaged kernels, %	1.95	1.22	2.68	0.71	1.80	0.28	4.57	1.22				
Combined deviations, %	3.02	2.13	3.71	0.72	4.66	0.84	9.81	2.65				
Number of samples	4				14							
CULTIVARS												
	SST 835		24.3			SST 835		51.0				
cultivars	SST 843		19.0			SST 843		12.9				
with highest % occurrence	PAN 3120		18.5			Krokodil		11.4				
	PAN 3118		18.3			PAN 3120		6.6				
	PAN 3434		13.8			Matlabas		5.5				
Number of samples	4				14							
MIXOGRAM (Quadromat)												
Peak time, min	ave 2.8	min 2.7	max 3.0	stdev 0.13	ave 3.0	min 2.2	max 6.8	stdev 1.16				
Tail height (6min), mm	49	46	53	3.30	49	41	59	4.73				
Number of samples	4				14							
COMPOSITE SAMPLES												
CLASS AND GRADE	B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW
BÜHLER EXTRACTION, %	72.3	-	-	-	73.0	-	75.8	73.7	-	-	-	-
FLOUR												
Protein (12% mb), %	10.3	-	-	-	10.7	-	11.8	11.4	-	-	-	-
Colour, KJ (wet)	-2.9	-	-	-	-3.0	-	-3.0	-2.8	-	-	-	-
Colour, Minolta CM5 (dry)												
L*	93.55	-	-	-	93.70	-	93.83	93.60	-	-	-	-
a*	0.38	-	-	-	0.44	-	0.44	0.41	-	-	-	-
b*	9.78	-	-	-	9.94	-	9.58	9.76	-	-	-	-
GLUTEN												
Wet gluten (14% mb), %	28.1	-	-	-	29.4	-	33.2	32.6	-	-	-	-
Dry gluten (14% mb), %	9.6	-	-	-	10.1	-	11.1	11.2	-	-	-	-
Gluten Index	76	-	-	-	77	-	80	77	-	-	-	-
FARINOGRAM												
Water absorption (14% mb), %	64.6	-	-	-	61.9	-	63.0	62.4	-	-	-	-
Development time, min	6.8	-	-	-	6.0	-	5.3	5.2	-	-	-	-
Stability, min	9.4	-	-	-	7.7	-	5.4	5.7	-	-	-	-
Mixing tolerance index, BU	25	-	-	-	36	-	50	52	-	-	-	-
EXTENOGRAM (45 min pull)												
Area, cm ²	82	-	-	-	88	-	92	80	-	-	-	-
Maximum height, BU	329	-	-	-	340	-	269	294	-	-	-	-
Extensibility, mm	182	-	-	-	191	-	242	194	-	-	-	-
ALVEOGRAM												
Strength (S), cm ²	43.1	-	-	-	35.0	-	33.3	36.1	-	-	-	-
Stability (P), mm	117	-	-	-	87	-	68	79	-	-	-	-
Distensibility (L), mm	76	-	-	-	92	-	139	115	-	-	-	-
Configuration ratio (P/L)	1.54	-	-	-	0.95	-	0.49	0.69	-	-	-	-
MIXOGRAM												
Peak time, min	3.0	-	-	-	2.8	-	2.0	2.2	-	-	-	-
100g BAKING TEST												
Loaf volume, cm ³	830	-	-	-	965	-	1015	1000	-	-	-	-
Evaluation (see page 61)	0	-	-	-	0	-	0	0	-	-	-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

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FARINOGRAM

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EXTENSOGRAM

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ALVEOGRAM

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South African Quality data per production region

SUMMER RAINFALL WHEAT (AND IRRIGATION)

Free State Province (Eastern)

PRODUCTION REGION	(25) Free State South-Western Region (Bethlehem)				(28) Free State Eastern Region			
	Bethlehem	Westminster	Clocolan	Zastron	Afrikaskop	Memel	Ascent	Reitz
Intake silos	De Wetsdorp	Ficksburg	Fouriesburg	Marseilles	Daniëlsrus	Villiers	Tweeling	
	Modderpoort				Eeram	Vrede		
	Slabberts				Frankfort	Warden		
	Tweespruit				Harrismith	Windfield		
					Jim Fouche			
					Kransfontein			
WHEAT								
Protein (12% mb), %	ave 11.4	min 9.6	max 13.6	stdev 1.11	ave 11.3	min 8.1	max 13.3	stdev 1.35
Falling number, sec	321	198	476	58.01	352	255	433	40.87
1000 Kernel mass (13% mb), g	35.8	29.0	39.6	3.33	36.5	28.0	43.6	3.87
Hectolitre mass (dirty), kg/hl	79.2	74.5	82.9	2.10	80.9	75.0	84.5	2.41
Screenings (<1.8mm), %	1.87	0.34	5.63	1.49	0.91	0.28	2.52	0.54
Total damaged kernels, %	0.46	0.04	0.92	0.24	0.59	0.00	1.50	0.47
Combined deviations, %	2.90	0.55	7.46	1.81	2.01	0.48	4.22	0.89
Number of samples	18				21			
CULTIVARS								
cultivars	Elands				SST 356			
with highest % occurrence	SST 356				25.8			
	PAN 3161				SST 835			
	Matlabas				19.0			
	PAN 3120				SST 843			
Number of samples	18				21			
MIXOGRAM (Quadromat)								
Peak time, min	ave 3.7	min 2.8	max 4.8	stdev 0.54	ave 3.6	min 2.8	max 4.7	stdev 0.60
Tail height (6min), mm	55	41	60	4.68	51	37	61	4.56
Number of samples	18				21			
	COMPOSITE SAMPLES							
CLASS AND GRADE	B1	B2	B3	B4	UT	COW	B1	B2
BÜHLER EXTRACTION, %	71.3	72.3	72.0	72.1	70.5	-	72.9	74.2
							72.4	71.5
							-	-
FLOUR								
Protein (12% mb), %	11.5	11.2	9.5	10.7	10.1	-	12.4	10.9
Colour, KJ (wet)	-2.6	-2.2	-2.7	-2.6	-2.5	-	-2.7	-2.9
Colour, Minolta CM5 (dry)								
L*	93.30	93.20	93.78	93.41	93.58	-	93.63	93.89
a*	0.39	0.41	0.32	0.32	0.35	-	0.40	0.39
b*	9.78	9.86	9.62	10.13	10.48	-	9.86	9.79
							11.00	11.35
							-	-
GLUTEN								
Wet gluten (14% mb), %	30.6	29.7	24.2	28.1	27.1	-	33.1	29.8
Dry gluten (14% mb), %	10.9	10.6	8.3	10.1	9.8	-	11.5	10.3
Gluten Index	90	89	90	91	85	-	85	82
							89	97
							-	-
FARINOGRAM								
Water absorption (14% mb), %	62.6	60.7	61.4	59.0	62.0	-	60.2	61.2
Development time, min	4.7	6.2	2.2	5.4	5.0	-	6.4	6.0
Stability, min	12.5	11.1	8.1	12.6	9.2	-	9.5	9.4
Mixing tolerance index, BU	14	30	29	20	27	-	32	31
							39	18
							-	-
EXTENSOGRAM (45 min pull)								
Area, cm ²	111	104	80	111	73	-	116	93
Maximum height, BU	414	423	377	444	316	-	418	368
Extensibility, mm	195	185	154	183	167	-	201	182
							144	121
							-	-
ALVEOGRAM								
Strength (S), cm ²	51.7	49.8	37.5	43.0	38.4	-	43.6	42.0
Stability (P), mm	119	102	123	87	107	-	75	98
Distensibility (L), mm	85	99	54	108	72	-	141	92
Configuration ratio (P/L)	1.40	1.03	2.28	0.81	1.49	-	0.53	1.07
							3.80	4.87
							-	-
MIXOGRAM								
Peak time, min	3.6	3.2	3.5	3.6	3.0	-	2.9	3.0
							3.0	3.7
							-	-
100g BAKING TEST								
Loaf volume, cm ³	895	915	755	925	825	-	1015	895
Evaluation (see page 61)	0	0	1	0	0	-	0	0
							0	0
							-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION



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South African Quality data per production region

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

OTHER SUMMER RAINFALL AND

IRRIGATION WHEAT

Mpumalanga

(29)

Mpumalanga
Southern Region

PRODUCTION REGION	(24) Free State Central Region				(29) Mpumalanga Southern Region			
Intake silos	Bloemfontein	Van Tonder	Zastron	Welgeleë	Balfour	Greylingstad	Grootvlei	Harvard
	Brandfort			Winburg	Holmdene	Leeuspruit	Platrand	Standerton
	De Brug				Val			
	Geneva							
	Henneman							
	Koffiefontein							
	Kroonstad							
	Petrusburg							
	Theunissen							
WHEAT								
Protein (12% mb), %	ave 12.1	min 11.0	max 13.5	stdev 0.86	ave 13.1	min -	max -	stdev -
Falling number, sec	298	171	409	93.44	278	-	-	-
1000 Kernel mass (13% mb), g	32.6	27.5	37.1	3.32	39.4	-	-	-
Hectolitre mass (dirty), kg/hl	80.0	74.4	83.2	3.05	83.5	-	-	-
Screenings (<1.8mm), %	1.84	0.85	2.84	0.88	0.59	-	-	-
Total damaged kernels, %	1.48	0.08	5.77	2.13	1.00	-	-	-
Combined deviations, %	4.17	1.06	8.73	2.83	1.79	-	-	-
Number of samples		7				1		
CULTIVARS								
	SST 835	23.1			SST 843	100.0		
cultivars	PAN 3118	21.4						
with highest % occurrence	PAN 3120	16.7						
	SST 843	12.6						
	Matlabas	10.4						
Number of samples		7				1		
MIXOGRAM (Quadromat)								
Peak time, min	ave 3.2	min 2.8	max 4.2	stdev 0.50	ave 2.4	min -	max -	stdev -
Tail height (6min), mm	51	47	55	3.21	49	-	-	-
Number of samples		7				1		
					COMPOSITE SAMPLES			
CLASS AND GRADE	B1	B2	B3	B4	UT	COW	B1	B2
BÜHLER EXTRACTION, %	70.1	71.3	-	-	-	-	75.5	-
								-
								-
FLOUR								
Protein (12% mb), %	11.0	10.0	-	-	-	-	12.0	-
Colour, KJ (wet)	-2.8	-3.0	-	-	-	-	-2.3	-
Colour, Minolta CM5 (dry)								
L*	93.14	93.56	-	-	-	-	93.24	-
a*	0.53	0.45	-	-	-	-	0.43	-
b*	11.02	10.72	-	-	-	-	9.43	-
								-
								-
GLUTEN								
Wet gluten (14% mb), %	29.3	26.4	-	-	-	-	35.5	-
Dry gluten (14% mb), %	9.9	9.0	-	-	-	-	11.6	-
Gluten Index	93	83	-	-	-	-	-	-
								-
FARINOGRAM								
Water absorption (14% mb), %	59.6	58.9	-	-	-	-	-	-
Development time, min	5.7	5.5	-	-	-	-	-	-
Stability, min	10.2	7.8	-	-	-	-	-	-
Mixing tolerance index, BU	27	44	-	-	-	-	-	-
								-
EXTENSOGRAM (45 min pull)								
Area, cm ²	108	85	-	-	-	-	-	-
Maximum height, BU	445	392	-	-	-	-	-	-
Extensibility, mm	181	161	-	-	-	-	-	-
								-
ALVEOGRAM								
Strength (S), cm ²	45.9	35.8	-	-	-	-	29.4	-
Stability (P), mm	94	79	-	-	-	-	73	-
Distensibility (L), mm	107	108	-	-	-	-	103	-
Configuration ratio (P/L)	0.88	0.73	-	-	-	-	0.71	-
								-
MIXOGRAM								
Peak time, min	3.1	2.8	-	-	-	-	2.3	-
								-
100g BAKING TEST								
Loaf volume, cm ³	865	885	-	-	-	-	880	-
Evaluation (see page 61)	0	0	-	-	-	-	1	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION



MIXOGRAM

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FARINOGRAM

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EXTENSOGRAM

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ALVEOGRAM

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South African Quality data per production region

OTHER SUMMER RAINFALL WHEAT AND IRRIGATION

Mpumalanga Province

PRODUCTION REGION	(30) Mpumalanga Eastern Region				(33) Mpumalanga Northern Region							
	Amersfoort	Morgenzon	Overvaal	Panbuilt	Driefontein	Lydenburg	Marble Hall	Middelburg				
Intake silos	Badplaas				Ermelo		Stoffberg					
	Carolina				Estancia		Pan					
	Davel				Lothair		Arnot					
	Maizefield				Mkondo		Wonderfontein					
WHEAT												
Protein (12% mb), %	ave 12.3	min 10.7	max 13.4	stdev 0.93	ave 12.1	min 11.9	max 12.2	stdev 0.21				
Falling number, sec	393	365	437	24.54	417	390	443	37.48				
1000 Kernel mass (13% mb), g	41.8	36.5	44.7	3.14	42.1	38.1	46.1	5.66				
Hectolitre mass (dirty), kg/hl	82.8	81.3	84.4	1.00	81.6	81.4	81.8	0.28				
Screenings (<1.8mm), %	1.94	1.25	2.82	0.58	0.75	0.29	1.20	0.64				
Total damaged kernels, %	0.34	0.00	1.08	0.40	1.75	1.04	2.46	1.00				
Combined deviations, %	2.59	2.05	3.32	0.47	2.66	2.35	2.97	0.44				
Number of samples	6				2							
CULTIVARS												
cultivars	SST 835	49.7			SST 843	64.0						
with highest % occurrence	SST 843	25.7			Duzi	20.5						
	Duzi	18.8			Kariega	9.0						
	Sabie	5.8			SST 835	4.5						
					SST 876	2.0						
Number of samples	6				2							
MIXOGRAM (Quadromat)												
Peak time, min	ave 3.0	min 2.5	max 4.3	stdev 0.73	ave 4.3	min 3.8	max 4.7	stdev 0.64				
Tail height (6min), mm	51	47	57	3.72	57	57	57	0.00				
Number of samples	6				2							
COMPOSITE SAMPLES												
CLASS AND GRADE	B1	B2	B3	B4	UT	COW	B1	B2				
BÜHLER EXTRACTION, %	74.5	-	75.5	-	-	-	73.5	-				
FLOUR												
Protein (12% mb), %	11.8	-	10.4	-	-	-	11.6	-				
Colour, KJ (wet)	-3.2	-	-3.1	-	-	-	-2.7	-				
Colour, Minolta CM5 (dry)												
L*	94.18	-	93.96	-	-	-	93.67	-				
a*	0.43	-	0.40	-	-	-	0.47	-				
b*	9.41	-	9.63	-	-	-	9.24	-				
GLUTEN												
Wet gluten (14% mb), %	31.9	-	30.1	-	-	-	29.6	-				
Dry gluten (14% mb), %	11.1	-	9.9	-	-	-	10.4	-				
Gluten Index	90	-	78	-	-	-	93	-				
FARINOGRAM												
Water absorption (14% mb), %	60.5	-	60.7	-	-	-	60.1	-				
Development time, min	7.2	-	4.2	-	-	-	9.2	-				
Stability, min	9.7	-	5.2	-	-	-	18.2	-				
Mixing tolerance index, BU	39	-	49	-	-	-	15	-				
EXTENSOGRAM (45 min pull)												
Area, cm ²	118	-	82	-	-	-	140	-				
Maximum height, BU	388	-	310	-	-	-	498	-				
Extensibility, mm	227	-	188	-	-	-	211	-				
ALVEOGRAM												
Strength (S), cm ²	47.7	-	34.7	-	-	-	58.3	-				
Stability (P), mm	79	-	78	-	-	-	99	-				
Distensibility (L), mm	138	-	110	-	-	-	114	-				
Configuration ratio (P/L)	0.57	-	0.71	-	-	-	0.87	-				
MIXOGRAM												
Peak time, min	2.8	-	2.5	-	-	-	4.4	-				
100g BAKING TEST												
Loaf volume, cm ³	940	-	865	-	-	-	860	-				
Evaluation (see page 61)	0	-	0	-	-	-	1	-				

RHEOLOGICAL GRAPHS PER PRODUCTION REGION



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South African Quality data per production region

OTHER SUMMER RAINFALL WHEAT AND IRRIGATION

Gauteng and Limpopo Provinces

PRODUCTION REGION	(34) Gauteng				(35) Limpopo									
	Bloekomspruit	Bronkhorstspruit	Glenroy	Goeie Hoek	Alma	Bela-Bela (Warmbad)	Crecy	Pienaarsrivier						
Intake silos								Polokwane (Pietersburg)						
								Roedtan						
								Immerpan						
								Settlers						
								Lehau						
								Tzaneen						
								Modimolle (Nylstroom)						
								Vaalwater						
								Mokopane (Potgietersrus)						
								Naboomspruit						
								Northam						
								Nutfield						
WHEAT														
Protein (12% mb), %	ave 11.4	min 10.5	max 12.0	stdev 0.60	ave 12.4	min 9.6	max 14.6	stdev 1.60						
Falling number, sec	380	298	422	39.46	378	340	431	30.40						
1000 Kernel mass (13% mb), g	40.5	32.8	45.8	4.80	39.3	29.4	48.3	7.21						
Hectolitre mass (dirty), kg/hl	80.5	78.7	82.4	1.32	79.7	75.5	83.6	2.71						
Screenings (<1.8mm), %	1.63	0.83	3.41	0.86	1.69	0.13	6.02	2.00						
Total damaged kernels, %	0.88	0.23	1.64	0.47	1.19	0.57	1.81	0.39						
Combined deviations, %	2.94	2.05	4.51	0.80	3.12	0.76	7.97	2.26						
Number of samples	8				13									
CULTIVARS														
	Duzi	53.4			Duzi	51.1								
cultivars	SST 835	25.6			SST 835	19.1								
with highest % occurrence	SST 843	12.9			SST 843	16.8								
	SST 877	6.1			SST 884	4.0								
	SST 876	2.0			SST 822	3.8								
Number of samples	8				13									
MIXOGRAM (Quadromat)														
Peak time, min	ave 3.0	min 2.5	max 3.3	stdev 0.26	ave 3.1	min 2.7	max 3.8	stdev 0.40						
Tail height (6min), mm	48	43	52	2.73	53	47	63	4.92						
Number of samples	8				13									
COMPOSITE SAMPLES														
CLASS AND GRADE	B1	B2	B3	B4	UT	COW	B1	B2						
BÜHLER EXTRACTION, %	75.6	75.8	76.4	72.5	-	-	73.9	73.4						
							74.5	74.4						
							69.3	-						
FLOUR														
Protein (12% mb), %	11.5	10.4	9.8	9.2	-	-	11.4	11.6						
Colour, KJ (wet)	-2.5	-2.7	-3.2	-2.9	-	-	-3.0	-2.5						
Colour, Minolta CM5 (dry)														
L*	93.55	93.65	93.70	93.99	-	-	93.90	93.61						
a*	0.40	0.43	0.44	0.40	-	-	0.52	0.41						
b*	9.87	10.04	10.49	10.03	-	-	10.10	9.44						
							9.81	10.25						
							9.32	-						
GLUTEN														
Wet gluten (14% mb), %	32.4	28.9	27.6	24.5	-	-	31.6	32.3						
Dry gluten (14% mb), %	11.0	9.9	9.2	8.5	-	-	11.2	11.1						
Gluten Index	83	76	79	81	-	-	79	79						
							87	78						
							86	-						
FARINOGRAM														
Water absorption (14% mb), %	60.1	58.9	57.4	58.6	-	-	59.8	60.4						
Development time, min	5.8	5.5	4.7	2.5	-	-	5.2	5.2						
Stability, min	7.2	6.4	6.5	7.6	-	-	6.5	6.0						
Mixing tolerance index, BU	48	52	45	19	-	-	51	49						
							31	42						
							33	-						
EXTENSOGRAM (45 min pull)														
Area, cm ²	96	80	67	83	-	-	100	81						
Maximum height, BU	304	281	261	371	-	-	305	244						
Extensibility, mm	228	202	184	162	-	-	233	230						
							197	144						
							241	-						
ALVEOGRAM														
Strength (S), cm ²	35.0	30.6	27.2	32.9	-	-	35.2	33.3						
Stability (P), mm	63	63	54	88	-	-	62	59						
Distensibility (L), mm	151	131	143	85	-	-	157	171						
Configuration ratio (P/L)	0.42	0.48	0.38	1.04	-	-	0.39	0.35						
							0.53	0.85						
							0.50	-						
MIXOGRAM														
Peak time, min	2.8	2.8	2.8	3.0	-	-	2.5	2.4						
							3.2	3.4						
							2.7	-						
100g BAKING TEST														
Loaf volume, cm ³	940	865	830	775	-	-	945	950						
Evaluation (see page 61)	0	0	0	0	-	-	0	0						
							0	0						
							0	-						

RHEOLOGICAL GRAPHS PER PRODUCTION REGION



South African Quality data per production region

OTHER SUMMER RAINFALL WHEAT AND IRRIGATION

KwaZulu-Natal Province

PRODUCTION REGION	(36) KwaZulu-Natal			
Intake silos	Bergville Bloedrivier Dannhauser Dundee Mizpah New Amalfi Paulpietersburg Vryheid Winterton			
WHEAT				
Protein (12% mb), %	ave 11.4	min -	max -	stdev -
Falling number, sec	390	-	-	-
1000 Kernel mass (13% mb), g	37.1	-	-	-
Hectolitre mass (dirty), kg/hl	82.3	-	-	-
Screenings (<1.8mm), %	1.37	-	-	-
Total damaged kernels, %	0.32	-	-	-
Combined deviations, %	1.69	-	-	-
Number of samples	1			
CULTIVARS				
cultivars	SST 835	53.0		
with highest % occurrence	SST 843	47.0		
Number of samples	1			
MIXOGRAM (Quadromat)				
Peak time, min	ave 3.3	min -	max -	stdev -
Tail height (6min), mm	51	-	-	-
Number of samples	1			
COMPOSITE SAMPLES				
CLASS AND GRADE	B1	B2	B3	B4
BÜHLER EXTRACTION, %	-	75.8	-	-
FLOUR				
Protein (12% mb), %	-	10.8	-	-
Colour, KJ (wet)	-	-2.5	-	-
Colour, Minolta CM5 (dry)				
L*	-	93.49	-	-
a*	-	0.53	-	-
b*	-	9.69	-	-
GLUTEN				
Wet gluten (14% mb), %	-	29.6	-	-
Dry gluten (14% mb), %	-	9.6	-	-
Gluten Index	-	80	-	-
FARINOGRAM				
Water absorption (14% mb), %	-	58.7	-	-
Development time, min	-	5.2	-	-
Stability, min	-	8.2	-	-
Mixing tolerance index, BU	-	36	-	-
EXTENSOGRAM (45 min pull)				
Area, cm ²	-	97	-	-
Maximum height, BU	-	406	-	-
Extensibility, mm	-	175	-	-
ALVEOGRAM				
Strength (S), cm ²	-	37.2	-	-
Stability (P), mm	-	82	-	-
Distensibility (L), mm	-	108	-	-
Configuration ratio (P/L)	-	0.76	-	-
MIXOGRAM				
Peak time, min	-	3.3	-	-
100g BAKING TEST				
Loaf volume, cm ³	-	900	-	-
Evaluation (see page 61)	-	0	-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION



MIXOGRAM

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FARINOGRAM

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EXTENSOGRAM

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ALVEOGRAM

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RSA WHEAT CROP QUALITY SUMMARY

RSA Crop Quality 2010/2011 and 2012/2013 Seasons

Country of origin		RSA Crop Average 2010/2011							RSA Crop Average 2012/2013						
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	74	95	69	36	59	4	337
WHEAT GRADING															
Protein (12% mb), %		12.91	11.53	10.69	11.20	12.28	13.31	12.14	12.59	11.55	10.50	10.15	11.30	12.23	11.38
Moisture, %		11.8	11.7	11.6	11.6	11.8	12.2	11.8	11.1	11.1	11.0	11.1	11.2	12.1	11.1
Falling number, sec		385	389	371	359	358	180	372	375	371	361	355	333	280	360
1000 Kernel mass (13% mb), g		39.1	40.0	39.9	40.8	38.5	39.3	39.5	39.5	40.4	41.2	41.4	39.2	36.9	40.2
Hlm (dirty), kg/hl		80.9	80.4	80.6	80.8	78.1	76.6	80.3	81.7	81.7	81.9	81.7	79.5	75.1	81.3
Screenings (<1,8mm), %		1.34	1.61	1.51	2.66	3.48	1.49	1.68	1.14	1.25	1.13	1.64	2.32	3.60	1.46
Gravel, stones, turf and glass, %		0.00	0.00	0.00	0.00	0.00	0.07	0.01	0.00	0.01	0.01	0.01	0.00	0.00	0.00
Foreign matter, %		0.07	0.08	0.07	0.10	0.18	0.42	0.10	0.08	0.10	0.13	0.14	0.25	0.25	0.13
Other grain & unthreshed ears, %		0.28	0.34	0.33	0.43	0.85	0.26	0.35	0.37	0.42	0.34	0.40	1.04	0.64	0.50
Heat damaged kernels, %		0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.04	0.02	0.02	0.03	0.02	0.00	0.02
Immature kernels, %		0.06	0.02	0.02	0.02	0.06	0.10	0.04	0.20	0.15	0.11	0.09	0.25	0.12	0.16
Insect damaged kernels, %		0.24	0.28	0.29	0.27	0.35	0.28	0.27	0.24	0.32	0.27	0.31	0.68	0.31	0.36
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	0.32	0.16	0.07	0.09	0.42	1.96	0.24
Total damaged kernels, %		0.34	0.33	0.35	0.35	0.56	1.83	0.42	0.80	0.65	0.47	0.53	1.38	2.39	0.78
Combined deviations, %		2.03	2.36	2.26	3.55	5.07	3.99	2.55	2.38	2.43	2.08	2.72	4.91	6.88	2.86
Field fungi, %		0.18	0.12	0.10	0.14	0.29	1.12	0.20	0.49	0.40	0.35	0.28	0.45	1.69	0.42
Storage fungi, %		0.02	0.01	0.01	0.02	0.03	0.14	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.00
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		No	No	No	No	No	No	No	No	No	No	No	No	No	No
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	22	17	13	11	7	-	70
BÜHLER EXTRACTION, %		75.1	75.1	75.0	74.7	74.4	74.2	74.9	73.5	73.5	73.1	72.7	72.1	-	73.2
FLOUR															
Colour, KJ		-2.0	-2.1	-2.0	-1.9	-1.5	0.4	-1.8	-2.8	-2.8	-3.0	-2.8	-2.8	-	-2.9
Protein (12% mb), %		12.0	10.5	9.7	9.8	11.5	12.1	11.0	11.7	10.8	9.7	9.6	10.9	-	10.7
Wet Gluten (14% mb), %		32.7	28.4	25.7	28.0	31.4	31.1	29.7	31.7	29.4	26.4	25.4	30.0	-	29.0
Dry Gluten (14% mb), %		11.6	9.9	9.0	9.6	11.1	11.1	10.4	11.0	10.2	9.0	8.8	10.3	-	10.0
100g BAKING TEST															
Baking water absorption, %		62.3	60.5	59.6	59.9	61.8	62.4	61.1	61.3	60.4	59.3	59.2	60.4	-	60.3
Loaf volume, cm ³		882	824	766	789	846	853	832	930	900	828	822	916	-	886
Evaluation		2	1	1	1	2	2	1	0	0	0	0	0	-	0
FARINOGRAM															
Water absorption, %		64.2	62.7	61.7	62.3	63.8	64.0	63.2	61.3	60.6	60.5	60.3	61.3	-	60.8
Development time, min		7.0	5.3	5.0	4.0	5.2	4.7	5.5	6.4	5.0	4.1	4.0	4.9	-	5.1
Stability, mm		9.1	7.3	7.5	6.0	8.1	7.6	7.8	9.7	7.4	7.0	7.3	7.3	-	7.9
Mixing tolerance index, BU		33	39	38	43	37	40	37	34	42	38	35	36	-	37

RSA Crop Quality of 2010/2011 and 2012/2013 Seasons

Country of origin		RSA Crop Average 2010/2011							RSA Crop Average 2012/2013						
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	22	17	13	11	7	-	70	
ALVEOGRAM															
Strength (S), cm ²	43.1	32.6	30.5	29.2	39.5	39.4	36.2	43.1	35.1	32.6	31.8	36.5	-	36.7	
Stability (P), mm	98	91	92	91	98	102	95	86	81	90	91	86	-	86	
Distensibility (L), mm	94	78	69	70	87	78	81	120	109	90	84	104	-	105	
P/L	1.08	1.21	1.44	1.55	1.28	1.57	1.29	0.77	0.80	1.23	1.34	0.89	-	0.96	
EXTENSOGRAM															
Strength, cm ²	110	93	85	80	101	109	97	102	82	72	70	85	-	84	
Max. height, BU	376	357	358	323	371	378	362	365	313	299	308	320	-	325	
Extensibility, mm	205	181	166	170	193	203	187	204	189	171	159	190	-	185	
MIXOGRAM															
Peak time, min	2.8	2.6	2.8	2.6	2.8	3.2	2.8	2.9	2.6	2.9	3.0	2.7	-	2.8	
Absorption, %	62.2	60.4	59.6	59.8	61.7	62.3	61.0	61.8	60.7	59.5	59.5	60.9	-	60.6	
MYCOTOXINS	UPLC-MS/MS							UPLC-MS/MS							
Afla G ₁ ($\mu\text{g/kg}$)	ND							ND							
Afla B ₁ ($\mu\text{g/kg}$)	ND							ND							
Afla G ₂ ($\mu\text{g/kg}$)	ND							ND							
Afla B ₂ ($\mu\text{g/kg}$)	ND							ND							
Fum B ₁ ($\mu\text{g/kg}$)	ND							ND							
Fum B ₂ ($\mu\text{g/kg}$)	ND							ND							
Deoxynivalenol ($\mu\text{g/kg}$) [max. value]	ND							<LOQ [380]							
Ochratoxin A ($\mu\text{g/kg}$)	ND							ND							
Zearalenone ($\mu\text{g/kg}$)	ND							ND							
T-2 Toxin ($\mu\text{g/kg}$)	ND							ND							
No. of samples	30							40							

RSA WHEAT CROP QUALITY SUMMARY

RSA Crop Quality 2011/2012 and 2012/2013 Seasons

Country of origin		RSA Crop Average 2011/2012							RSA Crop Average 2012/2013						
Class and Grade bread wheat		B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples		176	120	61	39	25	12	433	74	95	69	36	59	4	337
WHEAT GRADING															
Protein (12% mb), %		12.78	11.52	10.48	10.33	11.72	10.78	11.77	12.59	11.55	10.50	10.15	11.30	12.23	11.38
Moisture, %		11.1	11.0	10.9	10.9	11.0	11.4	11.0	11.1	11.1	11.0	11.1	11.2	12.1	11.1
Falling number, sec		397	393	384	372	376	274	387	375	371	361	355	333	280	360
1000 Kernel mass (13% mb), g		37.7	38.8	38.9	38.2	34.1	36.7	38.0	39.5	40.4	41.2	41.4	39.2	36.9	40.2
Hlm (dirty), kg/hl		81.1	81.0	80.7	79.9	78.8	79.9	80.7	81.7	81.7	81.9	81.7	79.5	75.1	81.3
Screenings (<1.8mm), %		1.32	1.36	1.36	2.21	3.20	2.62	1.56	1.14	1.25	1.13	1.64	2.32	3.60	1.46
Gravel, stones, turf and glass, %		0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00
Foreign matter, %		0.08	0.09	0.10	0.10	0.14	0.13	0.09	0.08	0.10	0.13	0.14	0.25	0.25	0.13
Other grain & unthreshed ears, %		0.24	0.29	0.27	0.30	0.64	0.20	0.28	0.37	0.42	0.34	0.40	1.04	0.64	0.50
Heat damaged kernels, %		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.02	0.02	0.03	0.02	0.00	0.02
Immature kernels, %		0.05	0.04	0.02	0.03	0.03	0.03	0.04	0.20	0.15	0.11	0.09	0.25	0.12	0.16
Insect damaged kernels, %		0.37	0.43	0.43	0.36	0.84	0.24	0.42	0.24	0.32	0.27	0.31	0.68	0.31	0.36
Heavily frost damaged kernels, %		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
Sprouted kernels, %		0.03	0.02	0.04	0.02	0.10	0.42	0.04	0.32	0.16	0.07	0.09	0.42	1.96	0.24
Total damaged kernels, %		0.46	0.48	0.49	0.41	0.96	0.70	0.50	0.80	0.65	0.47	0.53	1.38	2.39	0.78
Combined deviations, %		2.10	2.23	2.23	3.06	4.94	3.65	2.45	2.38	2.43	2.08	2.72	4.91	6.88	2.86
Field fungi, %		0.10	0.11	0.14	0.19	0.06	0.06	0.12	0.49	0.40	0.35	0.28	0.45	1.69	0.42
Storage fungi, %		0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00
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>Agronomus mexicana</i> , etc.)		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Live insects		No	No	No	No	No	Yes	No	No	No	No	No	No	No	No
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		28	23	14	15	8	2	90	22	17	13	11	7	-	70
BÜHLER EXTRACTION, %		74.4	74.2	74.8	73.8	72.8	73.3	74.1	73.5	73.5	73.1	72.7	72.1	-	73.2
FLOUR															
Colour, KJ		-2.7	-2.7	-3.0	-2.8	-2.7	-3.0	-2.8	-2.8	-2.8	-3.0	-2.8	-2.8	-	-2.9
Protein (12% mb), %		11.7	10.5	9.6	9.6	10.6	9.7	10.6	11.7	10.8	9.7	9.6	10.9	-	10.7
Wet Gluten (14% mb), %		32.0	28.4	26.0	26.0	28.5	25.6	28.7	31.7	29.4	26.4	25.4	30.0	-	29.0
Dry Gluten (14% mb), %		11.1	9.8	8.8	8.8	9.7	9.0	9.9	11.0	10.2	9.0	8.8	10.3	-	10.0
100g BAKING TEST															
Baking water absorption, %		61.7	60.3	59.3	59.2	60.6	59.1	60.4	61.3	60.4	59.3	59.2	60.4	-	60.3
Loaf volume, cm ³		916	847	811	802	821	778	852	930	900	828	822	916	-	886
Evaluation		0	0	0	0	1	1	0	0	0	0	0	0	-	0
FARINOGRAM															
Water absorption, %		62.3	61.3	60.9	60.3	60.7	60.1	61.3	61.3	60.6	60.5	60.3	61.3	-	60.8
Development time, min		5.6	3.8	3.2	2.8	4.4	3.1	4.1	6.4	5.0	4.1	4.0	4.9	-	5.1
Stability, mm		10.7	8.1	6.7	6.8	8.9	6.4	8.5	9.7	7.4	7.0	7.3	7.3	-	7.9
Mixing tolerance index, BU		34	39	47	43	37	50	39	34	42	38	35	36	-	37

RSA Crop Quality of 2011/2012 and 2012/2013 Seasons

Country of origin	RSA Crop Average 2011/2012							RSA Crop Average 2012/2013						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	28	23	14	15	8	2	90	22	17	13	11	7	-	70
ALVEOGRAM														
Strength (S), cm ²	41.7	34.6	29.4	29.8	33.7	30.4	35.0	43.1	35.1	32.6	31.8	36.5	-	36.7
Stability (P), mm	85	83	80	79	82	78	82	86	81	90	91	86	-	86
Distensibility (L), mm	112	94	86	89	96	86	98	120	109	90	84	104	-	105
P/L	0.79	0.92	0.97	0.97	0.90	0.90	0.89	0.77	0.80	1.23	1.34	0.89	-	0.96
EXTENSOGRAM														
Strength, cm ²	110	87	72	74	86	82	90	102	82	72	70	85	-	84
Max. height, BU	379	337	294	311	349	315	340	365	313	299	308	320	-	325
Extensibility, mm	211	184	174	170	175	183	188	204	189	171	159	190	-	185
MIXOGRAM														
Peak time, min	2.9	3.0	2.8	3.1	3.3	3.2	3.0	2.9	2.6	2.9	3.0	2.7	-	2.8
Absorption, %	61.9	60.4	59.4	59.4	60.6	59.5	60.5	61.8	60.7	59.5	59.5	60.9	-	60.6
MYCOTOXINS														
Afla G ₁ (µg/kg)	ND							ND						
Afla B ₁ (µg/kg)	ND							ND						
Afla G ₂ (µg/kg)	ND							ND						
Afla B ₂ (µg/kg)	ND							ND						
Fum B ₁ (µg/kg)	ND							ND						
Fum B ₂ (µg/kg)	ND							ND						
Deoxynivalenol (µg/kg) [max. value]	<LOQ [119]							<LOQ [380]						
Ochratoxin A (µg/kg)	ND							ND						
Zearalenone (µg/kg)	ND							ND						
T-2 Toxin (µg/kg)	ND							ND						
No. of samples	40							40						

METHODS

GRADING:

Full grading was done in accordance with the Regulations relating to the grading, packing and marking of bread wheat intended for sale in the Republic of South Africa (No. R. 1186 of 17 December 2010). Please see pages 93-105.

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 93 - 95 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.

Combined deviations means the sum of the percentages screenings, other grain and unthreshed ears, foreign matter and damaged kernels.

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 enzyme activity, mainly the α -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.

RAPID VISCO ANALYSER:

AACCI method 76-21.01, latest edition, is followed to prepare a complete pasting curve

by means of the Rapid Visco Analyser (RVA). The RVA is a rotational viscometer that is able to continuously record the viscosity of a sample (under controlled temperature conditions) as the starch granules hydrate, swell and disintegrate (gelatinization and pasting), followed by possible realignment of the starch molecules during cooling (retrogradation).

Maximum viscosity before the onset of cooling (**peak viscosity**), **time to peak** viscosity, **minimum viscosity** after peak (trough) and **final viscosity** are measured and provide indications of the pasting properties of the samples and therefore its processing value for baking and other applications.

The results are reported in centipoise (cP). Results can also be converted to RVU (rapid visco unit), 1 RVU = 12 cP.

BÜHLER MILLING:

Cleaned wheat samples are damped 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:

Colour is one of the important properties of milled grains and the colour of wheat flour often affects the colour of the finished product. Generally speaking, a bright white colour flour is more desirable for most products.

The **Kent Jones** colour (so called wet 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.

The dry colour of wheat flour can be measured accurately and precisely with the **Minolta CM-5** spectrophotometer. CIE L^{*}a^{*}b^{*} (CIELAB) is a colour model using lightness (L^{*}) and two colour values (a^{*} and b^{*}). The colour coordinates define where a specific colour lies in a Cartesian graph. L^{*} represents lightness (100 being white and 0 being black), a^{*} represents green to red variation and b^{*} represents variation from blue to yellow. The results reported are for the 10° observer and D65 illuminant.

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.

Wet gluten content correlates to loaf volume and dry gluten content to the crude protein content. The difference between the wet and dry gluten contents is an indication of the water-holding capacity of the gluten proteins, which is in turn, related to flour water absorption.

The **gluten index** is the ratio of the wet gluten remaining on the sieve (after centrifugation) to the total wet gluten. The gluten index provides an indication of the gluten strength and is not

influenced by the protein content.

FARINOGRAPH:

AACCI method 54-21.02, 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.

SAGL implements a validated SAGL In-house multi-mycotoxin screening method using UPLC - MS/MS. 40 of the 337 wheat crop samples were tested for Aflatoxin G₁; B₁; G₂; B₂, Fumonisin B₁; B₂; B₃, Deoxynivalenol, 15-ADON, HT2 - Toxin, T-2 Toxin, Zearalenone and Ochratoxin A.

WHEAT IMPORTS PER COUNTRY

2011/12 Season (1 Oct 2011 - 28 Sep 2012)

FROM COUNTRY	FOR RSA TON	FOR AFRICA TON	TOTAL TON
Argentina	652 279	11 351	663 630
Australia	247 675	7 348	255 023
Brazil	276 420	484	276 904
Canada	45 252	-	45 252
Germany	105 964	665	106 629
Lithuania	8 880	-	8 880
Romania	36 071	2 465	38 536
Russia	154 129	20 490	174 619
Ukraine	39 016	-	39 016
Uruguay	45 250	-	45 250
USA	112 915	-	112 915
	1 723 851	42 803	1 766 654

WHEAT EXPORTS PER COUNTRY

2011/12 Season (1 Oct 2011 - 28 Sep 2012)

TO COUNTRY	FROM RSA TO AFRICA TON	FROM OVERSEAS TO AFRICA TON	TOTAL TON
Botswana	107 421	3 078	110 499
Lesotho	70 613	20 441	91 054
Mozambique	2 964	-	2 964
Namibia	21 064	-	21 064
Swaziland	21 109	11 512	32 621
Zambia	19 595	-	19 595
Zimbabwe	26 145	664	26 809
	268 911	35 695	304 606

WHEAT IMPORTS PER COUNTRY

2012/13 Season (29 Sep 2012 - 21 Jun 2013)

FROM COUNTRY	FOR RSA TON	FOR AFRICA TON	TOTAL T ON
Argentina	87 344	0	87 344
Australia	176 211	9 200	185 411
Brazil	233 135	6 000	239 135
Canada	35 181	1 809	36 990
Germany	40 997	3 000	43 997
Lesotho	698	0	698
Lithuania	0	0	0
Romania	0	0	0
Russia	67 608	0	67 608
Swaziland	288	0	288
Ukraine	196 392	4 800	201 192
Uruguay	86 655	0	86 655
USA	19 630	0	19 630
	944 139	24 809	968 948

WHEAT EXPORTS PER COUNTRY

2012/13 Season (29 Sep 2012 - 21 Jun 2013)

TO COUNTRY	FROM RSA TO AFRICA TON	FROM OVERSEAS TO AFRICA TON	TOTAL TON
Botswana	70 986	0	70 986
Lesotho	61 446	22 186	83 632
Mozambique	0	1 809	1 809
Namibia	18 034	0	18 034
Swaziland	13 801	8 013	21 814
Zambia	0	0	0
Zimbabwe	40 986	0	40 986
	205 253	32 008	237 261



SAGIS South African Grain Information Service Suid-Afrikaanse Graan Inligtingsdiens

Association incorporated under section 21 / Vereniging ingeval Kragtien artikel 21 (Reg No. 1997/019186/08)

WHEAT: SUPPLY AND DEMAND TABLE BASED ON SAGIS' INFO

Season (Oct - Sep)											Publication date: 2012-05-23						
											Current Season Oct - May	10 YEAR AVERAGE 2002/3-2011/12					
	97/98	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	
CEC	2,284,000	1,531,000	1,725,000	2,349,000	2,493,000	2,321,000	1,540,000	1,680,000	1,905,000	2,105,000	1,905,000	2,130,000	1,958,000	1,430,000	2,005,000	1,870,000	1,897,500
CEC (Retention)																	36,850
SUPPLY																	
Opening stock (1 Oct)	578,000	1,241,000	771,000	507,000	551,000	580,000	897,000	598,000	574,000	582,000	376,000	509,000	694,000	579,000	478,000	651,180	586,700
Prod deliveries	2,449,000	1,644,000	1,725,000	2,353,000	2,415,000	2,387,000	1,512,000	1,670,000	1,893,000	2,045,000	1,876,000	2,130,000	1,910,000	1,389,000	1,973,000	1,822,794	1,873,500
Imports	469,000	484,000	624,000	308,000	407,000	747,000	1,042,000	1,227,000	1,055,000	777,000	1,396,000	1,192,000	1,285,000	1,649,000	1,724,000	895,49	1,209,400
Surplus	0	0	0	0	0	0	6,000	6,000	9,000	32,000	0	13,000	0	23,000	14,000	1,827	10,300
Total supply	3,496,000	3,639,000	3,120,000	3,168,000	3,373,000	3,714,000	3,457,000	3,501,000	3,531,000	3,456,000	3,648,000	3,844,000	3,889,000	3,640,000	4,189,000	3,371,750	3,684,900
DEMAND																	
Processed	2,181,000	2,400,000	2,371,000	2,427,000	2,541,000	2,577,000	2,653,000	2,736,000	2,793,000	2,820,000	2,845,000	2,857,000	3,017,000	2,945,000	3,202,000	1,985,840	2,844,500
-human	2,138,000	2,348,000	2,345,000	2,424,000	2,519,000	2,575,000	2,652,000	2,734,000	2,781,000	2,818,000	2,844,000	2,849,000	2,991,000	2,944,000	3,066,000	1,959,604	2,825,400
-animal	43,000	52,000	24,000	22,000	20,000	20,000	1,000	2,000	12,000	2,000	1,000	8,000	26,000	1,000	136,000	26,228	19,100
-gristng	0	0	2,000	1,000	0	0	0	0	0	0	0	0	0	0	0	8	0
-bio-fuel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Withdrawn by producers	0	0	43,000	33,000	31,000	24,000	13,000	7,000	10,000	7,000	12,000	12,000	14,000	6,000	4,000	3,263	10,900
Released to end-consumers	2,000	5,000	12,000	4,000	7,000	5,000	2,000	2,000	4,000	4,000	2,000	5,000	3,000	6,000	7,000	7,369	4,000
Seed for planting purposes	0	16,000	26,000	24,000	27,000	20,000	21,000	18,000	26,000	17,000	22,000	26,000	17,000	13,000	18,000	15,018	19,800
Net receipts(-)/disp(+)	-7,000	76,000	37,000	9,000	15,000	11,000	12,000	6,000	5,000	1,000	26,000	19,000	15,000	13,000	19,000	17,194	12,700
Deficit	0	60,000	52,000	17,000	23,000	1,000	0	0	0	0	9,000	0	4,000	0	0	1,400	
Exports	79,000	75,000	72,000	103,000	149,000	179,000	158,000	111,000	211,000	223,000	231,000	240,000	179,000	288,000	200,312	197,800	
Total Demand	2,255,000	2,632,000	2,613,000	2,617,000	2,793,000	2,817,000	2,859,000	2,927,000	2,949,000	3,060,000	3,139,000	3,150,000	3,310,000	3,162,000	3,538,000	2,228,996	3,091,100
STOCK POSITION																	
Ending Stock (30 Sep)	1,241,000	737,000	507,000	551,000	580,000	897,000	598,000	574,000	582,000	376,000	509,000	694,000	579,000	478,000	651,000	1,142,54	593,800
- Processed p/month	181,800	200,000	197,600	202,300	211,800	214,800	221,100	228,000	232,800	235,000	237,100	238,100	251,400	245,400	266,800	248,230	237,050
- months' stock	6.8	3.7	2.6	2.7	4.2	2.7	2.5	2.5	1.6	2.1	2.9	2.3	1.9	2.4	4.6	2.5	
Note: ***Figures for current season up to date																	

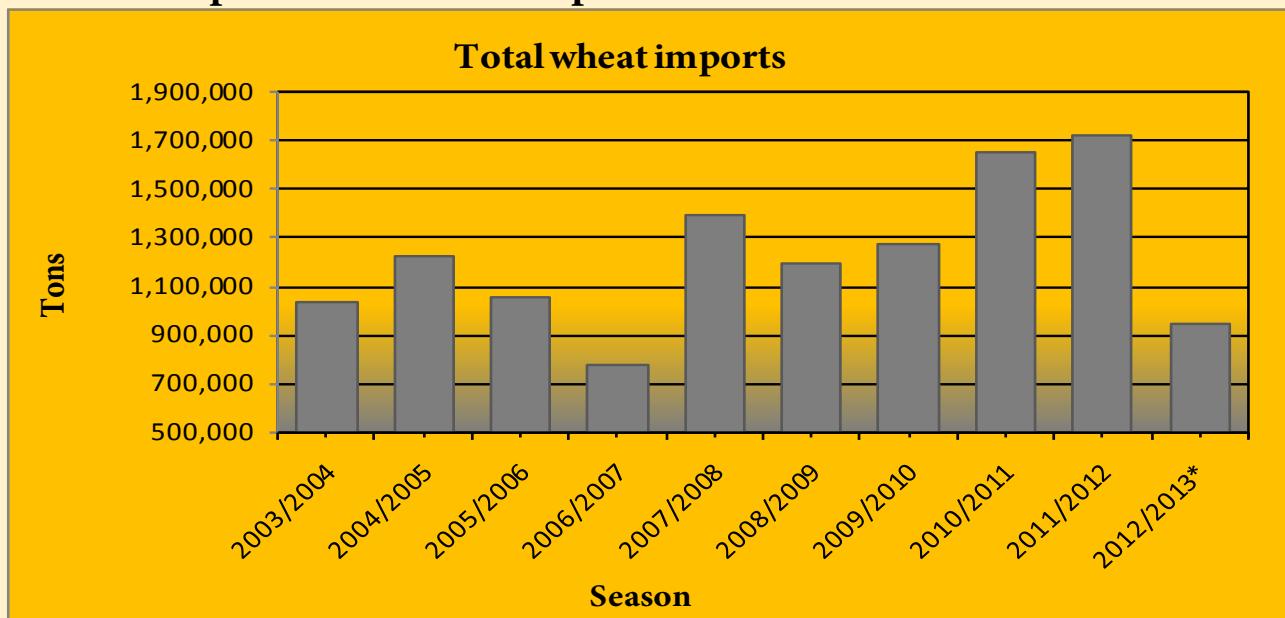
Imported Wheat

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.

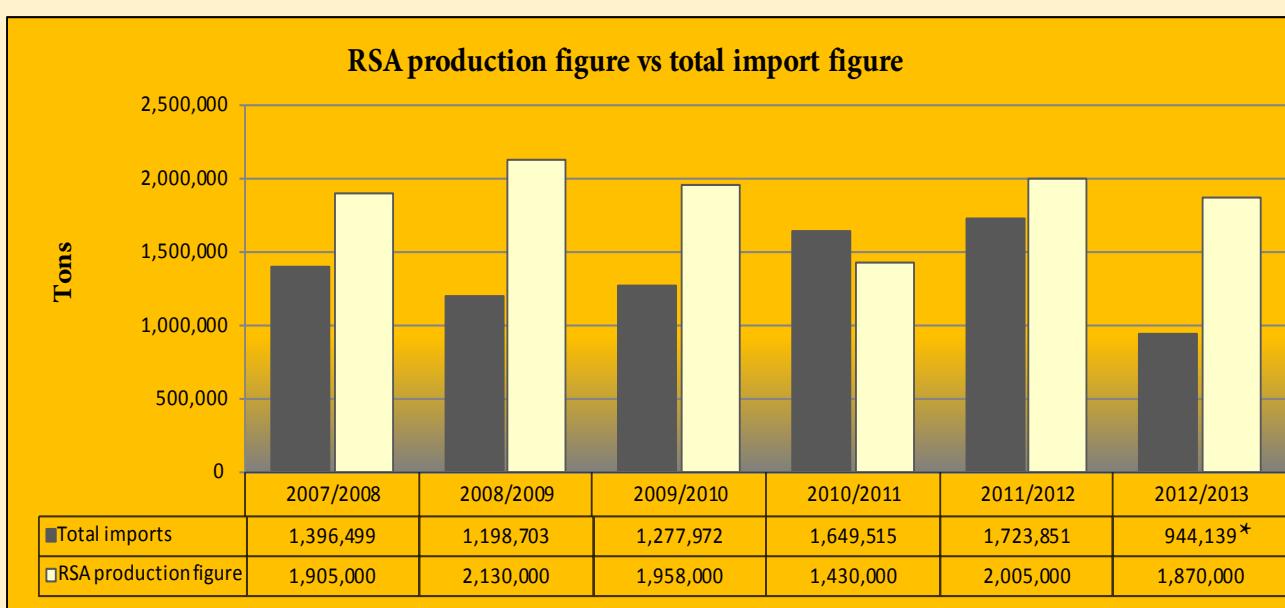
Import figures per season are calculated from 1 October to 30 September of the following year.

Graph 9: Total wheat imports since the 2003/2004 season



*2012/2013 season figure includes imports up to 21/06/2013.

Graph 10: RSA production figure versus the total import figure for the previous five seasons as well as the current season



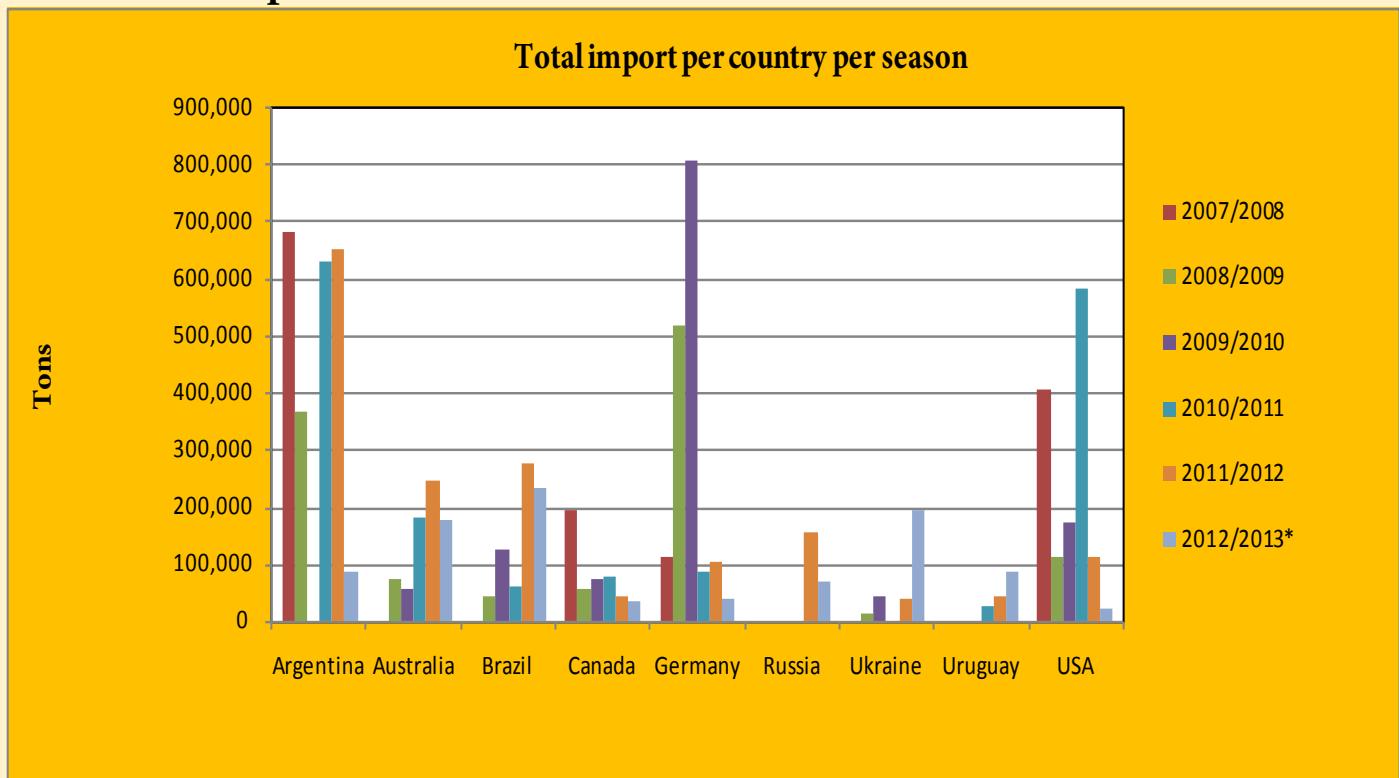
*2012/2013 season figure includes imports up to 21/06/2013.

Table 7: Total wheat imports per country per season since the 2004/2005 season

	Season									Total
	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009	2009/2010	2010/2011	2011/2012	2012/2013*	
Argentina	574,600	392,930	310,524	684,160	368,739	-	629,600	652,279	87,344	3,968,394
Australia	154,112	59,927	-	-	74,714	55,312	181,637	247,675	176,211	1,248,092
Brazil	-	-	-	-	42,449	123,944	58,551	276,420	233,135	734,499
Canada	43,766	62,643	153,694	194,764	54,831	72,911	79,697	45,252	35,181	742,739
France	-	9,920	-	-	-	-	-	-	-	34,936
Germany	115,332	354,718	80,649	111,013	518,002	809,934	88,581	105,964	40,997	2,237,389
Lesotho	-	-	-	-	-	-	-	-	698	698
Lithuania	-	-	-	-	-	1,611	-	8,880	-	10,491
Poland	-	-	-	-	13,013	-	-	-	-	13,013
Romania	-	-	-	-	-	-	-	36,071	-	36,071
Russia	-	-	-	-	-	-	-	154,129	67,608	221,737
Swaziland	-	-	-	-	-	-	-	-	288	288
UK	27,586	-	-	-	-	-	-	-	-	50,006
Ukraine	29,935	85,979	-	-	13,521	41,230	-	39,016	196,392	406,073
Uruguay	-	-	-	-	-	-	25,249	45,250	86,655	157,154
USA	281,165	88,651	232,266	406,562	113,434	173,030	586,200	112,915	19,630	2,427,282
Total	1,226,496	1,054,768	777,133	1,396,499	1,198,703	1,277,972	1,649,515	1,723,851	944,139	12,288,862

*2012/2013 season figures include imports up to 21/06/2013.

Graph 11: Total imports per country per season over the previous five seasons as well as the current season



*2012/2013 season figure includes imports up to 21/06/2013.

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 2011 to 30 September 2012) (Previous season)

The quality of all wheat imported into South Africa is monitored by the SAGL. A subsample of all samples drawn by inspectors of the South African Agricultural Food, Quarantine and Inspection Services (SAAFQIS) of the Department of Agriculture, Forestry and Fisheries (DAFF) is forwarded to the SAGL for analysis. To assist with quality comparisons between local and imported wheat, the same scope of analysis is used for both sets of samples. The import quality results are published only at the end of each production and marketing season.

Please take note that according to the South African grading regulations (please see pages 93 to 105), Regulation 4 Standards for classes, Sub paragraph (2) A consignment shall be classified as Bread Wheat if -- (a) “the wheat in the consignment consists of at least 95 per cent (m/m) of one or more of the bread wheat cultivars specified in the cultivar list;” all imported wheat should be graded as Class Other Wheat. However, for comparison purposes, the wheat is graded by SAGL as if of local origin. For grading as well as dough and baking quality result of the imported wheat per country, please refer to pages 70 to 89. This imported wheat quality is compared to a summary of the local crop quality of the same (2011/2012) season.

To simplify the comparison between the quality of the different countries of import and South African wheat, the average quality per country was summarised in Table 7 on page 69. Please also take note of the number of samples analysed when comparing results, the higher the number of samples, the more reliable the average result will be.

Australian and Canadian wheat had the highest hectolitre mass results, indicating a potential for good (high) flour extraction. Screenings represent all material that passes through a standard sieve, 1.8 mm in this instance, with 3% the maximum allowed for grades 1 to 3 according to RSA grading regulations. Higher percentages screenings result in higher losses due to the removal of unmillable material. Romania and Russia had the highest levels of screenings.

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. The Canadian wheat had the highest protein content resulting in the highest gluten content. South African, Romanian and Australian wheat also showed good wet gluten contents. However, when evaluating gluten content, the protein content should also be taken into account. It then becomes evident that the South African wheat gluten/protein quality is better than that of Romania, also seen when comparing the farinogram, alveogram and extensogram results.

The difference between the wet and dry gluten contents is an indication of the water-holding capacity of the gluten proteins. High water-holding capacity is considered good quality for bread baking purposes. Canadian wheat has the highest capacity, followed by South Africa and Romania, with Ukrainian and Uruguayan wheat having the poorest gluten quality, closely followed by Germany, USA and Russia.

In general bakers prefer flour with higher water absorption, on average 61.0 to 63.0% for white bread flour, as this result in higher dough yields. The farinogram development times of the imported wheat (Australia, Canada and Romania excluded) were much shorter than the South African wheat. Russia, Ukraine and Uruguay showed extremely poor quality on the Farinogram, followed by Germany, Brazil, USA and Argentina.

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, Australian and South African wheat had the highest strength values followed by Argentina. The imported wheat samples tended to have short distensibility values on the alveogram which can result in lower loaf volumes. The short distensibility values also resulted in high P/L values of more than 1.50. The P/L ratio is obtained by dividing the stability value (P) with the distensibility value (L).

The imported wheat samples, except for Canada, again showed a tendency towards longer mixogram mixing times. Australian and Romanian wheat lies on the upper limit of what is considered acceptable mixing times (2.8 to 3.5 minutes) in South Africa. The mixing time is an indication of the amount of time needed to mix the dough to optimum development. The longer the mixing time, the larger the risk that the dough will not be mixed to optimum development, which will negatively influence the bread quality and cause lower loaf volumes. Longer mixing times can also have cost implications due to higher energy inputs required. Shorter mixing times pose the risk of over mixing and dough becoming sticky.

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

A multi-mycotoxin analysis is performed on composite samples of the holds per shipment. None of the samples analysed raised any concerns.



Table 8: Average quality data of imported wheat during the 2011/2012 season (previous season)

	Argentina	Australia	Brazil	Canada	Germany	Russia	Ukraine	Uruguay	USA	RSA
WWF Protein, % (12% mb)	11.3	11.4	11.2	13.3	11.1	12.3	11.1	10.7	10.2	11.2
Hlm, kg/hl	80.6	82.6	80.5	82.7	75.5	77.8	80.3	80.4	81.0	79.1
Screenings, %	2.52	1.98	2.75	2.36	1.27	3.36	4.40	1.90	1.75	2.90
Number of samples	89	31	22	3	1	4	8	5	4	9
Flour colour, KJ	-2.0	-2.9	-1.9	-2.8	-2.2	-1.5	-1.9	-2.2	-2.5	-1.9
Wet gluten, % (14% mb)	25.2	27.5	25.2	36.7	25.7	28.8	24.6	22.9	22.6	24.5
Dry gluten, % (14% mb)	8.9	9.7	8.7	12.6	9.0	10.0	8.9	8.2	8.1	8.5
<i>Farinogram</i>										
Water absorption % (14% mb)	59.2	61.0	60.1	67.4	50.1	60.0	57.7	58.4	58.3	54.3
Development time, min	2.2	3.9	1.8	5.0	1.7	3.5	1.9	1.7	1.7	4.1
Stability, min	7.1	10.5	3.6	8.9	4.7	8.6	2.7	2.7	1.9	6.9
<i>Alveogram</i>										
Strength, cm ²	33.8	37.6	31.3	43.9	14.8	30.5	28.1	29.2	26.7	23.4
Stability, mm	97	106	99	111	34	96	89	89	100	59
Distensibility, mm	62	67	57	84	105	60	48	59	44	79
P/L	1.63	1.66	1.88	1.32	0.32	1.61	2.04	1.54	2.27	0.78
<i>Extensogram</i>										
Strength, cm ²	93	103	80	87	74	72	96	79	75	81
Maximum height, BU	434	446	384	292	390	331	460	369	391	376
Extensibility, mm	155	166	151	212	131	154	142	157	139	145
<i>Mixogram</i>										
Peak time, min	4.4	3.5	4.0	2.4	3.8	3.5	5.2	4.2	4.0	4.1
<i>100 g Baking test</i>										
Volume, cm ³	704	805	698	907	740	716	798	755	740	747
Evaluation (see page 61)	4	1	4	2	1	5	0	1	0	1
Number of samples	89	31	22	3	1	4	8	5	4	9
										90

2011/2012 IMPORTED WHEAT QUALITY - ARGENTINA (1 Oct 2011 to 30 Sep 2012)

2011/2012 Imported Wheat Quality Versus 2011/2012 RSA Wheat Quality

Country of origin		Argentina Average							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		7	35	20	14	2	11	89	176	120	61	39	25	12	433
WHEAT GRADING															
Protein (12% mb), %	12.16	11.51	10.74	11.61	10.62	10.86	11.30	12.78	11.52	10.48	10.33	11.72	10.78	11.77	
Moisture, %	11.3	11.5	11.6	11.6	11.1	11.4	11.5	11.1	11.0	10.9	10.9	11.0	11.4	11.0	
Falling number, sec	478	445	436	437	451	448	445	397	393	384	372	376	274	387	
1000 Kernel mass (13% mb), g	34.4	33.2	34.8	33.0	34.3	35.7	33.9	37.7	38.8	38.9	38.2	34.1	36.7	38.0	
Hlm (dirty), kg/hl	81.4	80.8	80.6	79.7	81.2	81.1	80.6	81.1	81.0	80.7	79.9	78.8	79.9	80.7	
Screenings (<1,8mm), %	2.17	2.20	1.93	3.45	6.68	2.85	2.52	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	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	
Foreign matter, %	0.09	0.09	0.15	0.11	0.11	0.19	0.12	0.08	0.09	0.10	0.10	0.14	0.13	0.09	
Other grain & unthreshed ears, %	0.15	0.15	0.17	0.17	0.16	0.15	0.16	0.24	0.29	0.27	0.30	0.64	0.20	0.28	
Heat damaged kernels, %	0.00	0.03	0.05	0.00	0.04	0.15	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Immature kernels, %	0.12	0.11	0.03	0.07	0.12	0.01	0.07	0.05	0.04	0.02	0.03	0.03	0.03	0.04	
Insect damaged kernels, %	0.27	0.29	0.60	0.26	0.10	1.00	0.44	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Sprouted kernels, %	0.05	0.03	0.01	0.02	0.00	0.00	0.02	0.03	0.02	0.04	0.02	0.10	0.42	0.04	
Total damaged kernels, %	0.44	0.45	0.68	0.35	0.26	1.15	0.57	0.46	0.48	0.49	0.41	0.96	0.70	0.50	
Combined deviations, %	2.84	2.89	2.92	4.09	7.21	4.12	3.33	2.10	2.23	2.23	3.06	4.94	3.65	2.45	
Field fungi, %	0.21	0.26	0.47	0.18	0.28	0.66	0.34	0.10	0.11	0.14	0.19	0.06	0.06	0.12	
Storage fungi, %	0.00	0.03	0.17	0.03	0.04	0.55	0.12	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	No	No	No	No	No	No	No	No	No	No	No	No	Yes	No	
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		7	35	20	14	2	11	89	28	23	14	15	8	2	90
BÜHLER EXTRACTION, %		73.8	74.0	73.8	73.0	73.4	74.1	73.8	74.4	74.2	74.8	73.8	72.8	73.3	74.1
FLOUR															
Colour, KJ	-2.1	-2.0	-2.0	-1.8	-2.3	-2.2	-2.0	-2.7	-2.7	-3.0	-2.8	-2.7	-3.0	-2.8	
Protein (12% mb), %	10.8	10.4	9.5	10.4	9.4	9.6	10.1	11.7	10.5	9.6	9.6	10.6	9.7	10.6	
Wet Gluten (14% mb), %	27.2	26.1	23.2	25.7	24.4	24.2	25.2	32.0	28.4	26.0	26.0	28.5	25.6	28.7	
Dry Gluten (14% mb), %	9.5	9.2	8.2	9.3	8.5	8.3	8.9	11.1	9.8	8.8	8.8	9.7	9.0	9.9	
100g BAKING TEST															
Baking water absorption, %	60.2	60.0	59.1	60.2	59.0	59.4	59.8	61.7	60.3	59.3	59.2	60.6	59.1	60.4	
Loaf volume, cm ³	708	712	650	733	723	735	704	916	847	811	802	821	778	852	
Evaluation	5	4	4	3	2	2	4	0	0	0	0	1	1	0	
FARINOGRAM															
Water absorption, %	59.7	59.4	58.6	59.7	58.4	58.4	59.2	62.3	61.3	60.9	60.3	60.7	60.1	61.3	
Development time, min	4.8	2.2	1.7	2.0	1.7	1.9	2.2	5.6	3.8	3.2	2.8	4.4	3.1	4.1	
Stability, mm	13.8	8.7	2.7	7.5	4.0	5.5	7.1	10.7	8.1	6.7	6.8	8.9	6.4	8.5	
Mixing tolerance index, BU	27	40	60	46	53	45	45	34	39	47	43	37	50	39	

2011/2012 Imported Wheat Quality Versus 2011/2012 RSA Wheat Quality

Country of origin		Argentina Average							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		7	35	20	14	2	11	89	28	23	14	15	8	2	90
ALVEOGRAM															
Strength (S), cm ²	40.5	34.8	30.9	34.9	31.7	30.6	33.8	41.7	34.6	29.4	29.8	33.7	30.4	35.0	
Stability (P), mm	98	97	97	100	91	96	97	85	83	80	79	82	78	82	
Distensibility (L), mm	76	64	55	62	65	56	62	112	94	86	89	96	86	98	
P/L	1.31	1.56	1.79	1.63	1.46	1.75	1.63	0.79	0.92	0.97	0.97	0.90	0.90	0.89	
EXTENSOGRAM															
Strength, cm ²	107	98	85	92	89	88	93	110	87	72	74	86	82	90	
Max. height, BU	459	448	421	408	411	432	434	379	337	294	311	349	315	340	
Extensibility, mm	174	158	147	154	152	150	155	211	184	174	170	175	183	188	
MIXOGRAM															
Peak time, min	4.1	4.3	4.6	4.5	4.4	4.1	4.4	2.9	3.0	2.8	3.1	3.3	3.2	3.0	
Absorption, %	60.7	60.2	59.3	60.3	59.3	59.4	59.9	61.9	60.4	59.4	59.4	60.6	59.5	60.5	
MYCOTOXINS															
Afla G ₁ (µg/kg)	ND							ND							
Afla B ₁ (µg/kg)	ND							ND							
Afla G ₂ (µg/kg)	ND							ND							
Afla B ₂ (µg/kg)	ND							ND							
Fum B ₁ (µg/kg)	ND							ND							
Fum B ₂ (µg/kg)	ND							ND							
Fum B ₃ (µg/kg)	ND							ND							
Deoxynivalenol (µg/kg) [max. value]	<LOQ [125]							<LOQ [119]							
15-ADON (µg/kg)	ND							ND							
Ochratoxin A (µg/kg)	ND							ND							
Zearalenone (µg/kg)	ND							ND							
HT-2 (µg/kg)	ND							ND							
T-2 Toxin (µg/kg)	ND							ND							
No. of samples	38							40							

2011/2012 IMPORTED WHEAT QUALITY - AUSTRALIA (1 Oct 2011 to 30 Sep 2012)

2011/2012 Imported Wheat Quality Versus 2011/2012 RSA Wheat Quality

Country of origin		Australia Average						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		9	6	14	-	-	2	31	176	120	61	39	25	12	433
WHEAT GRADING															
Protein (12% mb), %	12.53	11.61	10.64	-	-	10.78	11.39	12.78	11.52	10.48	10.33	11.72	10.78	11.77	
Moisture, %	10.6	10.6	10.4	-	-	11.7	10.6	11.1	11.0	10.9	10.9	11.0	11.4	11.0	
Falling number, sec	529	481	558	-	-	390	524	397	393	384	372	376	274	387	
1000 Kernel mass (13% mb), g	36.0	37.4	36.2	-	-	31.7	36.1	37.7	38.8	38.9	38.2	34.1	36.7	38.0	
Hlm (dirty), kg/hl	82.3	82.5	83.1	-	-	81.7	82.6	81.1	81.0	80.7	79.9	78.8	79.9	80.7	
Screenings (<1,8mm), %	2.03	2.02	1.94	-	-	1.90	1.98	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	0.01	0.01	0.00	0.00	0.00	0.00	0.00	
Foreign matter, %	0.13	0.14	0.11	-	-	0.25	0.13	0.08	0.09	0.10	0.10	0.14	0.13	0.09	
Other grain & unthreshed ears, %	0.23	0.09	0.14	-	-	0.05	0.15	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Immature kernels, %	0.03	0.04	0.03	-	-	0.00	0.03	0.05	0.04	0.02	0.03	0.03	0.03	0.04	
Insect damaged kernels, %	0.02	0.04	0.03	-	-	0.90	0.09	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Sprouted kernels, %	0.02	0.09	0.05	-	-	0.00	0.05	0.03	0.02	0.04	0.02	0.10	0.42	0.04	
Total damaged kernels, %	0.07	0.17	0.11	-	-	0.90	0.16	0.46	0.48	0.49	0.41	0.96	0.70	0.50	
Combined deviations, %	2.46	2.43	2.31	-	-	3.10	2.43	2.10	2.23	2.23	3.06	4.94	3.65	2.45	
Field fungi, %	0.12	0.20	0.50	-	-	0.90	0.36	0.10	0.11	0.14	0.19	0.06	0.06	0.12	
Storage fungi, %	0.04	0.03	0.04	-	-	0.50	0.07	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	
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	No	No	No	-	-	Yes	No	No	No	No	No	Yes	No		
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	9	6	14	-	-	2	31	28	23	14	15	8	2	90	
BÜHLER EXTRACTION, %	74.9	74.7	73.1	-	-	71.5	73.8	74.4	74.2	74.8	73.8	72.8	73.3	74.1	
FLOUR															
Colour, KJ	-2.9	-2.8	-3.1	-	-	-2.3	-2.9	-2.7	-2.7	-3.0	-2.8	-2.7	-3.0	-2.8	
Protein (12% mb), %	11.5	10.7	9.6	-	-	9.2	10.3	11.7	10.5	9.6	9.6	10.6	9.7	10.6	
Wet Gluten (14% mb), %	31.1	28.5	25.2	-	-	23.6	27.5	32.0	28.4	26.0	26.0	28.5	25.6	28.7	
Dry Gluten (14% mb), %	11.0	10.4	8.8	-	-	8.3	9.7	11.1	9.8	8.8	8.8	9.7	9.0	9.9	
100g BAKING TEST															
Baking water absorption, %	61.7	60.4	59.4	-	-	59.0	60.2	61.7	60.3	59.3	59.2	60.6	59.1	60.4	
Loaf volume, cm ³	857	808	786	-	-	688	805	916	847	811	802	821	778	852	
Evaluation	1	1	0	-	-	3	1	0	0	0	0	1	1	0	
FARINOGRAM															
Water absorption, %	62.4	61.8	60.3	-	-	58.1	61.0	62.3	61.3	60.9	60.3	60.7	60.1	61.3	
Development time, min	6.1	4.9	2.6	-	-	1.6	3.9	5.6	3.8	3.2	2.8	4.4	3.1	4.1	
Stability, mm	12.1	12.1	10.2	-	-	1.7	10.5	10.7	8.1	6.7	6.8	8.9	6.4	8.5	
Mixing tolerance index, BU	31	23	22	-	-	65	27	34	39	47	43	37	50	39	

2011/2012 Imported Wheat Quality Versus 2011/2012 RSA Wheat Quality

Country of origin		Australia Average							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		9	6	14	-	-	2	31	28	23	14	15	8	2	90
ALVEOGRAM															
Strength (S), cm ²	43.8	41.4	33.6	-	-	26.4	37.6	41.7	34.6	29.4	29.8	33.7	30.4	35.0	
Stability (P), mm	111	110	104	-	-	91	106	85	83	80	79	82	78	82	
Distensibility (L), mm	77	72	61	-	-	51	67	112	94	86	89	96	86	98	
P/L	1.52	1.62	1.76	-	-	1.81	1.66	0.79	0.92	0.97	0.97	0.90	0.90	0.89	
EXTENSOGRAM															
Strength, cm ²	115	113	97	-	-	76	103	110	87	72	74	86	82	90	
Max. height, BU	442	460	447	-	-	410	446	379	337	294	311	349	315	340	
Extensibility, mm	188	176	154	-	-	137	166	211	184	174	170	175	183	188	
MIXOGRAM															
Peak time, min	3.3	3.6	3.5	-	-	4.6	3.5	2.9	3.0	2.8	3.1	3.3	3.2	3.0	
Absorption, %	61.5	60.6	59.4	-	-	59.0	60.2	61.9	60.4	59.4	59.4	60.6	59.5	60.5	
MYCOTOXINS															
Afla G ₁ (µg/kg)	ND							ND							
Afla B ₁ (µg/kg)	ND							ND							
Afla G ₂ (µg/kg)	ND							ND							
Afla B ₂ (µg/kg)	ND							ND							
Fum B ₁ (µg/kg)	ND							ND							
Fum B ₂ (µg/kg)	ND							ND							
Fum B ₃ (µg/kg)	ND							ND							
Deoxynivalenol (µg/kg) [max. value]	ND							<LOQ [119]							
15-ADON (µg/kg)	ND							ND							
Ochratoxin A (µg/kg)	ND							ND							
Zearalenone (µg/kg) [max. value]	ND							ND							
HT-2 (µg/kg)	ND							ND							
T-2 Toxin (µg/kg)	ND							ND							
No. of samples	12							40							

2011/2012 IMPORTED WHEAT QUALITY - BRAZIL (1 Oct 2011 to 30 Sep 2012)

2011/2012 Imported Wheat Quality Versus 2011/2012 RSA Wheat Quality

Country of origin		Brazil Average							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	7	6	3	3	1	22	176	120	61	39	25	12	433
WHEAT GRADING															
Protein (12% mb), %	12.73	11.15	10.60	11.07	11.13	12.69	11.20	12.78	11.52	10.48	10.33	11.72	10.78	11.77	
Moisture, %	11.5	11.9	11.7	12.0	12.0	12.0	11.8	11.1	11.0	10.9	10.9	11.0	11.4	11.0	
Falling number, sec	263	422	412	331	386	254	380	397	393	384	372	376	274	387	
1000 Kernel mass (13% mb), g	32.9	31.4	32.3	33.3	32.8	31.4	32.2	37.7	38.8	38.9	38.2	34.1	36.7	38.0	
Hlm (dirty), kg/hl	79.7	80.3	81.5	80.6	80.6	77.9	80.5	81.1	81.0	80.7	79.9	78.8	79.9	80.7	
Screenings (<1.8mm), %	2.63	2.52	2.08	2.95	4.29	3.34	2.75	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	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	
Foreign matter, %	0.11	0.08	0.12	0.17	0.23	0.30	0.14	0.08	0.09	0.10	0.10	0.14	0.13	0.09	
Other grain & unthreshed ears, %	0.16	0.09	0.11	0.11	0.03	0.16	0.10	0.24	0.29	0.27	0.30	0.64	0.20	0.28	
Heat damaged kernels, %	0.00	0.01	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Immature kernels, %	0.43	0.21	0.01	0.04	0.03	0.24	0.13	0.05	0.04	0.02	0.03	0.03	0.03	0.04	
Insect damaged kernels, %	0.12	0.31	0.20	0.19	0.20	0.24	0.23	0.37	0.43	0.43	0.36	0.84	0.24	0.42	
Heavily frost damaged kernels, %	0.00	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	
Sprouted kernels, %	0.28	0.23	0.05	0.19	0.00	0.80	0.17	0.03	0.02	0.04	0.02	0.10	0.42	0.04	
Total damaged kernels, %	0.83	0.91	0.27	0.42	0.23	1.28	0.58	0.46	0.48	0.49	0.41	0.96	0.70	0.50	
Combined deviations, %	3.73	2.70	2.58	3.64	4.77	5.08	3.28	2.10	2.23	2.23	3.06	4.94	3.65	2.45	
Field fungi, %	1.37	0.36	0.40	0.57	0.68	0.70	0.55	0.10	0.11	0.14	0.19	0.06	0.06	0.12	
Storage fungi, %	0.12	0.00	0.04	0.03	0.03	0.00	0.03	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	No	No	No	No	No	Yes	No	No	No	No	No	No	Yes	No	
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		2	7	6	3	3	1	22	28	23	14	15	8	2	90
BÜHLER EXTRACTION, %		72.4	71.5	72.3	72.1	72.3	70.1	71.9	74.4	74.2	74.8	73.8	72.8	73.3	74.1
FLOUR															
Colour, KJ	-1.6	-1.9	-2.4	-1.4	-1.8	-0.3	-1.9	-2.7	-2.7	-3.0	-2.8	-2.7	-3.0	-2.8	
Protein (12% mb), %	11.5	9.7	9.3	9.7	9.8	11.4	9.8	11.7	10.5	9.6	9.6	10.6	9.7	10.6	
Wet Gluten (14% mb), %	31.4	24.6	23.4	25.1	24.8	28.7	25.2	32.0	28.4	26.0	26.0	28.5	25.6	28.7	
Dry Gluten (14% mb), %	10.4	8.6	7.9	8.7	9.0	10.4	8.7	11.1	9.8	8.8	8.8	9.7	9.0	9.9	
100g BAKING TEST															
Baking water absorption, %	61.6	59.2	58.9	59.7	59.5	61.4	59.6	61.7	60.3	59.3	59.2	60.6	59.1	60.4	
Loaf volume, cm ³	773	687	640	743	715	735	698	916	847	811	802	821	778	852	
Evaluation	4	4	4	3	3	5	4	0	0	0	0	1	1	0	
FARINOGRAM															
Water absorption, %	64.2	59.4	58.7	60.3	60.3	63.6	60.1	62.3	61.3	60.9	60.3	60.7	60.1	61.3	
Development time, min	2.5	1.7	1.7	1.7	1.6	2.2	1.8	5.6	3.8	3.2	2.8	4.4	3.1	4.1	
Stability, mm	6.7	3.4	2.4	4.2	2.9	7.3	3.6	10.7	8.1	6.7	6.8	8.9	6.4	8.5	
Mixing tolerance index, BU	38	65	59	60	67	54	60	34	39	47	43	37	50	39	

2011/2012 Imported Wheat Quality Versus 2011/2012 RSA Wheat Quality

Country of origin	Brazil Average							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	7	6	3	3	1	22	28	23	14	15	8	2	90
ALVEOGRAM														
Strength (S), cm ²	38.3	30.2	27.6	33.1	32.2	39.0	31.3	41.7	34.6	29.4	29.8	33.7	30.4	35.0
Stability (P), mm	107	94	96	103	103	116	99	85	83	80	79	82	78	82
Distensibility (L), mm	71	57	53	57	53	60	57	112	94	86	89	96	86	98
P/L	1.53	1.70	2.20	1.79	1.95	1.93	1.88	0.79	0.92	0.97	0.97	0.90	0.90	0.89
EXTENSOGRAM														
Strength, cm ²	75	78	80	82	77	103	80	110	87	72	74	86	82	90
Max. height, BU	338	375	394	404	376	437	384	379	337	294	311	349	315	340
Extensibility, mm	158	152	147	148	147	176	151	211	184	174	170	175	183	188
MIXOGRAM														
Peak time, min	3.3	4.2	4.0	4.0	3.9	4.3	4.0	2.9	3.0	2.8	3.1	3.3	3.2	3.0
Absorption, %	61.6	59.5	59.1	59.7	59.5	61.4	59.7	61.9	60.4	59.4	59.4	60.6	59.5	60.5
MYCOTOXINS														
Afla G ₁ (µg/kg)	ND							ND						
Afla B ₁ (µg/kg)	ND							ND						
Afla G ₂ (µg/kg)	ND							ND						
Afla B ₂ (µg/kg)	ND							ND						
Fum B ₁ (µg/kg)	ND							ND						
Fum B ₂ (µg/kg)	ND							ND						
Fum B ₃ (µg/kg)	ND							ND						
Deoxynivalenol (µg/kg) [max. value]	106 [201]							<LOQ [119]						
15-ADON (µg/kg)	ND							ND						
Ochratoxin A (µg/kg)	ND							ND						
Zearalenone (µg/kg) [max. value]	ND							ND						
HT-2 (µg/kg)	ND							ND						
T-2 Toxin (µg/kg)	ND							ND						
No. of samples	11							40						

2011/2012 IMPORTED WHEAT QUALITY - CANADA (1 Oct 2011 to 30 Sep 2012)

2011/2012 Imported Wheat Quality Versus 2011/2012 RSA Season

Country of origin		Canada Average						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		3	-	-	-	-	-	3	176	120	61	39	25	12	433
WHEAT GRADING															
Protein (12% mb), %	13.25	-	-	-	-	-	-	13.25	12.78	11.52	10.48	10.33	11.72	10.78	11.77
Moisture, %	12.4	-	-	-	-	-	-	12.4	11.1	11.0	10.9	10.9	11.0	11.4	11.0
Falling number, sec	420	-	-	-	-	-	-	420	397	393	384	372	376	274	387
1000 Kernel mass (13% mb), g	35.6	-	-	-	-	-	-	35.6	37.7	38.8	38.9	38.2	34.1	36.7	38.0
Hlm (dirty), kg/hl	82.7	-	-	-	-	-	-	82.7	81.1	81.0	80.7	79.9	78.8	79.9	80.7
Screenings (<1,8mm), %	2.36	-	-	-	-	-	-	2.36	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	0.01	0.00	0.00	0.00	0.00	0.00
Foreign matter, %	0.05	-	-	-	-	-	-	0.05	0.08	0.09	0.10	0.10	0.14	0.13	0.09
Other grain & unthreshed ears, %	0.08	-	-	-	-	-	-	0.08	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	0.00	0.00	0.00	0.00
Immature kernels, %	0.07	-	-	-	-	-	-	0.07	0.05	0.04	0.02	0.03	0.03	0.03	0.04
Insect damaged kernels, %	0.00	-	-	-	-	-	-	0.00	0.37	0.43	0.43	0.36	0.84	0.24	0.42
Heavily frost damaged kernels, %	0.11	-	-	-	-	-	-	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sprouted kernels, %	0.00	-	-	-	-	-	-	0.00	0.03	0.02	0.04	0.02	0.10	0.42	0.04
Total damaged kernels, %	0.07	-	-	-	-	-	-	0.07	0.46	0.48	0.49	0.41	0.96	0.70	0.50
Combined deviations, %	2.57	-	-	-	-	-	-	2.57	2.10	2.23	2.23	3.06	4.94	3.65	2.45
Field fungi, %	0.32	-	-	-	-	-	-	0.32	0.10	0.11	0.14	0.19	0.06	0.06	0.12
Storage fungi, %	0.08	-	-	-	-	-	-	0.08	0.01	0.01	0.02	0.02	0.01	0.01	0.01
Ergot, %	0.02	-	-	-	-	-	-	0.02	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>Agronome mexicana</i> , etc.)	0	-	-	-	-	-	-	0	0	0	0	0	0	0	0
Live insects	No	-	-	-	-	-	-	No	No	No	No	No	Yes	No	
Undesirable odour	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		3	-	-	-	-	-	3	28	23	15	14	8	2	90
BÜHLER EXTRACTION, %		74.2	-	-	-	-	-	74.2	74.4	74.2	74.8	73.8	72.8	73.3	74.1
FLOUR															
Colour, KJ	-2.8	-	-	-	-	-	-	-2.8	-2.7	-2.7	-3.0	-2.8	-2.7	-3.0	-2.8
Protein (12% mb), %	12.7	-	-	-	-	-	-	12.7	11.7	10.5	9.6	9.6	10.6	9.7	10.6
Wet Gluten (14% mb), %	36.7	-	-	-	-	-	-	36.7	32.0	28.4	26.0	26.0	28.5	25.6	28.7
Dry Gluten (14% mb), %	12.6	-	-	-	-	-	-	12.6	11.1	9.8	8.8	8.8	9.7	9.0	9.9
100g BAKING TEST															
Baking water absorption, %	63.1	-	-	-	-	-	-	63.1	61.7	60.3	59.3	59.2	60.6	59.1	60.4
Loaf volume, cm ³	907	-	-	-	-	-	-	907	916	847	811	802	821	778	852
Evaluation	2	-	-	-	-	-	-	2	0	0	0	0	1	1	0
FARINOGRAM															
Water absorption, %	67.4	-	-	-	-	-	-	67.4	62.3	61.3	60.9	60.3	60.7	60.1	61.3
Development time, min	5.0	-	-	-	-	-	-	5.0	5.6	3.8	3.2	2.8	4.4	3.1	4.1
Stability, mm	8.9	-	-	-	-	-	-	8.9	10.7	8.1	6.7	6.8	8.9	6.4	8.5
Mixing tolerance index, BU	36	-	-	-	-	-	-	36	34	39	47	43	37	50	39

2011/2012 Imported Wheat Quality Versus 2011/2012 RSA Wheat Quality

Country of origin	Canada Average							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	3	-	-	-	-	-	3	28	23	14	15	8	2	90
ALVEOGRAM														
Strength (S), cm ²	43.9	-	-	-	-	-	43.9	41.7	34.6	29.4	29.8	33.7	30.4	35.0
Stability (P), mm	111	-	-	-	-	-	111	85	83	80	79	82	78	82
Distensibility (L), mm	84	-	-	-	-	-	84	112	94	86	89	96	86	98
P/L	1.32	-	-	-	-	-	1.32	0.79	0.92	0.97	0.97	0.90	0.90	0.89
EXTENSOGRAM														
Strength, cm ²	87	-	-	-	-	-	87	110	87	72	74	86	82	90
Max. height, BU	292	-	-	-	-	-	292	379	337	294	311	349	315	340
Extensibility, mm	212	-	-	-	-	-	212	211	184	174	170	175	183	188
MIXOGRAM														
Peak time, min	2.4	-	-	-	-	-	2.4	2.9	3.0	2.8	3.1	3.3	3.2	3.0
Absorption, %	63.1	-	-	-	-	-	63.1	61.9	60.4	59.4	59.4	60.6	59.5	60.5
MYCOTOXINS														
Afla G ₁ (µg/kg)	ND							ND						
Afla B ₁ (µg/kg)	ND							ND						
Afla G ₂ (µg/kg)	ND							ND						
Afla B ₂ (µg/kg)	ND							ND						
Fum B ₁ (µg/kg)	ND							ND						
Fum B ₂ (µg/kg)	ND							ND						
Fum B ₃ (µg/kg)	ND							ND						
Deoxynivalenol (µg/kg) [max. value]	ND							<LOQ [119]						
15-ADON (µg/kg)	-							ND						
Ochratoxin A (µg/kg)	ND							ND						
Zearalenone (µg/kg) [max. value]	ND							ND						
HT-2 (µg/kg)	-							ND						
T-2 Toxin (µg/kg)	ND							ND						
No. of samples	1							40						

2011/2012 IMPORTED WHEAT QUALITY - GERMANY (1 Oct 2011 to 30 Sep 2012)

2011/2012 Imported Wheat Quality Versus 2011/2012 RSA Season

Country of origin		Germany Average						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	-	-	-	1	176	120	61	39	25	12	433
WHEAT GRADING															
Protein (12% mb), %	-	-	11.11	-	-	-	11.11	12.78	11.52	10.48	10.33	11.72	10.78	11.77	
Moisture, %	-	-	12.5	-	-	-	12.5	11.1	11.0	10.9	10.9	11.0	11.0	11.0	
Falling number, sec	-	-	378	-	-	-	378	397	393	384	372	376	274	387	
1000 Kernel mass (13% mb), g	-	-	40.4	-	-	-	40.4	37.7	38.8	38.9	38.2	34.1	36.7	38.0	
Hlm (dirty), kg/hl	-	-	75.5	-	-	-	75.5	81.1	81.0	80.7	79.9	78.8	79.9	80.7	
Screenings (<1,8mm), %	-	-	1.27	-	-	-	1.27	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	0.01	0.00	0.00	0.00	0.00	0.00	
Foreign matter, %	-	-	0.00	-	-	-	0.00	0.08	0.09	0.10	0.10	0.14	0.13	0.09	
Other grain & unthreshed ears, %	-	-	0.08	-	-	-	0.08	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	0.00	0.00	0.00	0.00	
Immature kernels, %	-	-	0.00	-	-	-	0.00	0.05	0.04	0.02	0.03	0.03	0.03	0.04	
Insect damaged kernels, %	-	-	0.00	-	-	-	0.00	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	0.00	0.00	0.00	0.00	
Sprouted kernels, %	-	-	0.00	-	-	-	0.00	0.03	0.02	0.04	0.02	0.10	0.42	0.04	
Total damaged kernels, %	-	-	0.00	-	-	-	0.00	0.46	0.48	0.49	0.41	0.96	0.70	0.50	
Combined deviations, %	-	-	1.35	-	-	-	1.35	2.10	2.23	2.23	3.06	4.94	3.65	2.45	
Field fungi, %	-	-	0.00	-	-	-	0.00	0.10	0.11	0.14	0.19	0.06	0.06	0.12	
Storage fungi, %	-	-	0.00	-	-	-	0.00	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	
Noxious seeds (<i>Crotalaria spp.</i> , etc.)	-	-	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	
Live insects	-	-	No	-	-	-	No	No	No	No	No	Yes	No		
Undesirable odour	-	-	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	-	-	1	-	-	-	1	28	23	14	15	8	2	90	
BÜHLER EXTRACTION, %	-	-	73.0	-	-	-	73.0	74.4	74.2	74.8	73.8	72.8	73.3	74.1	
FLOUR															
Colour, KJ	-	-	-2.2	-	-	-	-2.2	-2.7	-2.7	-3.0	-2.8	-2.7	-3.0	-2.8	
Protein (12% mb), %	-	-	9.5	-	-	-	9.5	11.7	10.5	9.6	9.6	10.6	9.7	10.6	
Wet Gluten (14% mb), %	-	-	25.7	-	-	-	25.7	32.0	28.4	26.0	26.0	28.5	25.6	28.7	
Dry Gluten (14% mb), %	-	-	9.0	-	-	-	9.0	11.1	9.8	8.8	8.8	9.7	9.0	9.9	
100g BAKING TEST															
Baking water absorption, %	-	-	51.3	-	-	-	51.3	61.7	60.3	59.3	59.2	60.6	59.1	60.4	
Loaf volume, cm ³	-	-	740	-	-	-	740	916	847	811	802	821	778	852	
Evaluation	-	-	1	-	-	-	1	0	0	0	0	1	1	0	
FARINOGRAM															
Water absorption, %	-	-	50.1	-	-	-	50.1	62.3	61.3	60.9	60.3	60.7	60.1	61.3	
Development time, min	-	-	1.7	-	-	-	1.7	5.6	3.8	3.2	2.8	4.4	3.1	4.1	
Stability, mm	-	-	4.7	-	-	-	4.7	10.7	8.1	6.7	6.8	8.9	6.4	8.5	
Mixing tolerance index, BU	-	-	51	-	-	-	51	34	39	47	43	37	50	39	

2011/2012 Imported Wheat Quality Versus 2011/2012 RSA Wheat Quality

Country of origin	Germany Average							RSA Crop Average						
	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	-	-	1	-	-	-	1	28	23	14	15	8	2	90
ALVEOGRAM														
Strength (S), cm ²	-	-	14.8	-	-	-	14.8	41.7	34.6	29.4	29.8	33.7	30.4	35.0
Stability (P), mm	-	-	34	-	-	-	34	85	83	80	79	82	78	82
Distensibility (L), mm	-	-	105	-	-	-	105	112	94	86	89	96	86	98
P/L	-	-	0.32	-	-	-	0.32	0.79	0.92	0.97	0.97	0.90	0.90	0.89
EXTENSOGRAM														
Strength, cm ²	-	-	74	-	-	-	74	110	87	72	74	86	82	90
Max. height, BU	-	-	390	-	-	-	390	379	337	294	311	349	315	340
Extensibility, mm	-	-	131	-	-	-	131	211	184	174	170	175	183	188
MIXOGRAM														
Peak time, min	-	-	3.8	-	-	-	3.8	2.9	3.0	2.8	3.1	3.3	3.2	3.0
Absorption, %	-	-	59.3	-	-	-	59.3	61.9	60.4	59.4	59.4	60.6	59.5	60.5
MYCOTOXINS														
Afla G ₁ (µg/kg)	ND							ND						
Afla B ₁ (µg/kg)	ND							ND						
Afla G ₂ (µg/kg)	ND							ND						
Afla B ₂ (µg/kg)	ND							ND						
Fum B ₁ (µg/kg)	ND							ND						
Fum B ₂ (µg/kg)	ND							ND						
Fum B ₃ (µg/kg)	-							ND						
Deoxynivalenol (µg/kg) [max. value]	ND							<LOQ [119]						
15-ADON (µg/kg)	-							ND						
Ochratoxin A (µg/kg)	ND							ND						
Zearalenone (µg/kg) [max. value]	ND							ND						
HT-2 (µg/kg)	-							ND						
T-2 Toxin (µg/kg)	-							ND						
No. of samples	1							40						

2011/2012 IMPORTED WHEAT QUALITY - ROMANIA (1 Oct 2011 to 30 Sep 2012)

2011/2012 Imported Wheat Quality Versus 2011/2012 RSA Season

Country of origin		Romania Average						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	-	-	4	176	120	61	39	25	12	433
WHEAT GRADING															
Protein (12% mb), %	-	-	-	12.27	-	-	12.27	12.78	11.52	10.48	10.33	11.72	10.78	11.77	
Moisture, %	-	-	-	11.7	-	-	11.7	11.1	11.0	10.9	10.9	11.0	11.4	11.0	
Falling number, sec	-	-	-	497	-	-	497	397	393	384	372	376	274	387	
1000 Kernel mass (13% mb), g	-	-	-	35.7	-	-	35.7	37.7	38.8	38.9	38.2	34.1	36.7	38.0	
Hlm (dirty), kg/hl	-	-	-	77.8	-	-	77.8	81.1	81.0	80.7	79.9	78.8	79.9	80.7	
Screenings (<1,8mm), %	-	-	-	3.36	-	-	3.36	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	0.01	0.00	0.00	0.00	0.00	0.00	
Foreign matter, %	-	-	-	0.19	-	-	0.19	0.08	0.09	0.10	0.10	0.14	0.13	0.09	
Other grain & unthreshed ears, %	-	-	-	0.29	-	-	0.29	0.24	0.29	0.27	0.30	0.64	0.20	0.28	
Heat damaged kernels, %	-	-	-	0.02	-	-	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Immature kernels, %	-	-	-	0.16	-	-	0.16	0.05	0.04	0.02	0.03	0.03	0.03	0.04	
Insect damaged kernels, %	-	-	-	0.00	-	-	0.00	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	0.00	0.00	0.00	0.00	
Sprouted kernels, %	-	-	-	0.00	-	-	0.00	0.03	0.02	0.04	0.02	0.10	0.42	0.04	
Total damaged kernels, %	-	-	-	0.18	-	-	0.18	0.46	0.48	0.49	0.41	0.96	0.70	0.50	
Combined deviations, %	-	-	-	4.01	-	-	4.01	2.10	2.23	2.23	3.06	4.94	3.65	2.45	
Field fungi, %	-	-	-	0.07	-	-	0.07	0.10	0.11	0.14	0.19	0.06	0.06	0.12	
Storage fungi, %	-	-	-	0.04	-	-	0.04	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	
Noxious seeds (<i>Crotalaria spp.</i> , etc.)	-	-	-	0	-	-	0	0	0	0	0	0	0	0	
Noxious seeds (<i>Agronome mexicana</i> , etc.)	-	-	-	1	-	-	1	0	0	0	0	0	0	0	
Live insects	-	-	-	No	-	-	No	No	No	No	No	Yes	No		
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	-	-	-	4	-	-	4	28	23	14	15	8	2	90	
BÜHLER EXTRACTION, %	-	-	-	73.6	-	-	73.6	74.4	74.2	74.8	73.8	72.8	73.3	74.1	
FLOUR															
Colour, KJ	-	-	-	-1.5	-	-	-1.5	-2.7	-2.7	-3.0	-2.8	-2.7	-3.0	-2.8	
Protein (12% mb), %	-	-	-	10.9	-	-	10.9	11.7	10.5	9.6	9.6	10.6	9.7	10.6	
Wet Gluten (14% mb), %	-	-	-	28.8	-	-	28.8	32.0	28.4	26.0	26.0	28.5	25.6	28.7	
Dry Gluten (14% mb), %	-	-	-	10.0	-	-	10.0	11.1	9.8	8.8	8.8	9.7	9.0	9.9	
100g BAKING TEST															
Baking water absorption, %	-	-	-	60.8	-	-	60.8	61.7	60.3	59.3	59.2	60.6	59.1	60.4	
Loaf volume, cm ³	-	-	-	716	-	-	716	916	847	811	802	821	778	852	
Evaluation	-	-	-	5	-	-	5	0	0	0	0	1	1	0	
FARINOGRAM															
Water absorption, %	-	-	-	60.0	-	-	60.0	62.3	61.3	60.9	60.3	60.7	60.1	61.3	
Development time, min	-	-	-	3.5	-	-	3.5	5.6	3.8	3.2	2.8	4.4	3.1	4.1	
Stability, mm	-	-	-	8.6	-	-	8.6	10.7	8.1	6.7	6.8	8.9	6.4	8.5	
Mixing tolerance index, BU	-	-	-	18	-	-	18	34	39	47	43	37	50	39	

2011/2012 Imported Wheat Quality Versus 2011/2012 RSA Wheat Quality

Country of origin		Romania Average							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	-	-	4	28	23	14	15	8	2	90
ALVEOGRAM															
Strength (S), cm ²	-	-	-	30.5	-	-	30.5	41.7	34.6	29.4	29.8	33.7	30.4	35.0	
Stability (P), mm	-	-	-	96	-	-	96	85	83	80	79	82	78	82	
Distensibility (L), mm	-	-	-	60	-	-	60	112	94	86	89	96	86	98	
P/L	-	-	-	1.61	-	-	1.61	0.79	0.92	0.97	0.97	0.90	0.90	0.89	
EXTENSOGRAM															
Strength, cm ²	-	-	-	72	-	-	72	110	87	72	74	86	82	90	
Max. height, BU	-	-	-	331	-	-	331	379	337	294	311	349	315	340	
Extensibility, mm	-	-	-	154	-	-	154	211	184	174	170	175	183	188	
MIXOGRAM															
Peak time, min	-	-	-	3.5	-	-	3.5	2.9	3.0	2.8	3.1	3.3	3.2	3.0	
Absorption, %	-	-	-	60.8	-	-	60.8	61.9	60.4	59.4	59.4	60.6	59.5	60.5	
MYCOTOXINS															
Afla G ₁ (µg/kg)	ND							ND							
Afla B ₁ (µg/kg)	ND							ND							
Afla G ₂ (µg/kg)	ND							ND							
Afla B ₂ (µg/kg)	ND							ND							
Fum B ₁ (µg/kg)	ND							ND							
Fum B ₂ (µg/kg)	ND							ND							
Fum B ₃ (µg/kg)	ND							ND							
Deoxynivalenol (µg/kg) [max. value]	175 [175]							<LOQ [119]							
15-ADON (µg/kg)	ND							ND							
Ochratoxin A (µg/kg)	ND							ND							
Zearalenone (µg/kg) [max. value]	ND							ND							
HT-2 (µg/kg)	ND							ND							
T-2 Toxin (µg/kg)	ND							ND							
No. of samples	1							40							

2011/2012 IMPORTED WHEAT QUALITY - RUSSIA (1 Oct 2011 to 30 Sep 2012)

2011/2012 Imported Wheat Quality Versus 2011/2012 RSA Season

Country of origin		Russia Average							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	-	1	3	3	8	176	120	61	39	25	12	433
WHEAT GRADING															
Protein (12% mb), %	-	10.98	-	11.13	11.22	11.11	11.14	12.78	11.52	10.48	10.33	11.72	10.78	11.77	
Moisture, %	-	10.6	-	10.9	10.5	10.8	10.7	11.1	11.0	10.9	10.9	11.0	11.0	11.4	11.0
Falling number, sec	-	412	-	324	387	365	374	397	393	384	372	376	274	387	
1000 Kernel mass (13% mb), g	-	34.9	-	32.0	32.4	32.7	32.8	37.7	38.8	38.9	38.2	34.1	36.7	38.0	
Hlm (dirty), kg/hl	-	82.0	-	80.6	79.3	80.6	80.3	81.1	81.0	80.7	79.9	78.8	79.9	80.7	
Screenings (<1,8mm), %	-	2.65	-	3.91	4.61	4.93	4.40	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	0.01	0.01	0.00	0.00	0.00	0.00	0.00	
Foreign matter, %	-	0.04	-	0.06	0.11	0.11	0.09	0.08	0.09	0.10	0.10	0.14	0.13	0.09	
Other grain & unthreshed ears, %	-	0.40	-	0.32	0.24	0.19	0.25	0.24	0.29	0.27	0.30	0.64	0.20	0.28	
Heat damaged kernels, %	-	0.00	-	0.00	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Immature kernels, %	-	0.00	-	0.00	0.06	0.00	0.02	0.05	0.04	0.02	0.03	0.03	0.03	0.04	
Insect damaged kernels, %	-	0.00	-	0.00	0.13	0.13	0.10	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Sprouted kernels, %	-	0.00	-	0.00	0.03	0.00	0.01	0.03	0.02	0.04	0.02	0.10	0.42	0.04	
Total damaged kernels, %	-	0.00	-	0.00	0.21	0.16	0.14	0.46	0.48	0.49	0.41	0.96	0.70	0.50	
Combined deviations, %	-	3.09	-	4.29	5.17	5.38	4.88	2.10	2.23	2.23	3.06	4.94	3.65	2.45	
Field fungi, %	-	0.00	-	0.00	0.05	0.08	0.05	0.10	0.11	0.14	0.19	0.06	0.06	0.12	
Storage fungi, %	-	0.00	-	0.00	0.00	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	
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	-	5	2	13	6	0	0	0	0	0	0	0	
Live insects	-	No	-	No	No	No	No	No	No	No	No	No	Yes	No	
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	-	1	3	3	8	28	23	14	15	8	2	90	
BÜHLER EXTRACTION, %	-	73.3	-	71.3	72.7	71.9	72.3	74.4	74.2	74.8	73.8	72.8	73.3	74.1	
FLOUR															
Colour, KJ	-	-2.0	-	-1.9	-1.7	-1.9	-1.9	-2.7	-2.7	-3.0	-2.8	-2.7	-3.0	-2.8	
Protein (12% mb), %	-	9.8	-	9.8	10.1	9.8	9.9	11.7	10.5	9.6	9.6	10.6	9.7	10.6	
Wet Gluten (14% mb), %	-	24.8	-	23.8	24.9	24.4	24.6	32.0	28.4	26.0	26.0	28.5	25.6	28.7	
Dry Gluten (14% mb), %	-	9.0	-	8.5	9.1	8.8	8.9	11.1	9.8	8.8	8.8	9.7	9.0	9.9	
100g BAKING TEST															
Baking water absorption, %	-	59.6	-	58.6	58.9	59.1	59.0	61.7	60.3	59.3	59.2	60.6	59.1	60.4	
Loaf volume, cm ³	-	795	-	805	795	798	798	916	847	811	802	821	778	852	
Evaluation	-	0	-	0	1	0	0	0	0	0	0	1	1	0	
FARINOGRAM															
Water absorption, %	-	58.1	-	57.6	57.1	58.2	57.7	62.3	61.3	60.9	60.3	60.7	60.1	61.3	
Development time, min	-	2.0	-	1.7	1.9	1.8	1.9	5.6	3.8	3.2	2.8	4.4	3.1	4.1	
Stability, mm	-	2.3	-	1.8	3.6	2.3	2.7	10.7	8.1	6.7	6.8	8.9	6.4	8.5	
Mixing tolerance index, BU	-	60	-	81	53	63	61	34	39	47	43	37	50	39	

2011/2012 Imported Wheat Quality Versus 2011/2012 RSA Wheat Quality

Country of origin		Russia Average							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	-	1	3	3	8	28	23	14	15	8	2	90
ALVEOGRAM															
Strength (S), cm ²	-	29.1	-	25.8	30.1	26.6	28.1	41.7	34.6	29.4	29.8	33.7	30.4	35.0	
Stability (P), mm	-	93	-	93	98	95	96	85	83	80	79	82	78	82	
Distensibility (L), mm	-	52	-	45	49	45	48	112	94	86	89	96	86	98	
P/L	-	1.79	-	2.07	1.98	2.18	2.04	0.79	0.92	0.97	0.97	0.90	0.90	0.89	
EXTENSOGRAM															
Strength, cm ²	-	86	-	99	90	102	96	110	87	72	74	86	82	90	
Max. height, BU	-	415	-	465	445	483	460	379	337	294	311	349	315	340	
Extensibility, mm	-	143	-	145	140	143	142	211	184	174	170	175	183	188	
MIXOGRAM															
Peak time, min	-	5.0	-	6.0	5.1	5.2	5.2	2.9	3.0	2.8	3.1	3.3	3.2	3.0	
Absorption, %	-	59.6	-	59.6	59.9	59.6	59.7	61.9	60.4	59.4	59.4	60.6	59.5	60.5	
MYCOTOXINS															
Afla G ₁ ($\mu\text{g/kg}$)		ND							ND						
Afla B ₁ ($\mu\text{g/kg}$)		ND							ND						
Afla G ₂ ($\mu\text{g/kg}$)		ND							ND						
Afla B ₂ ($\mu\text{g/kg}$)		ND							ND						
Fum B ₁ ($\mu\text{g/kg}$)		ND							ND						
Fum B ₂ ($\mu\text{g/kg}$)		ND							ND						
Fum B ₃ ($\mu\text{g/kg}$)		-							ND						
Deoxynivalenol ($\mu\text{g/kg}$) [max. value]		ND							<LOQ [119]						
15-ADON ($\mu\text{g/kg}$)		-							ND						
Ochratoxin A ($\mu\text{g/kg}$)		ND							ND						
Zearalenone ($\mu\text{g/kg}$) [max. value]		ND							ND						
HT-2 ($\mu\text{g/kg}$)		-							ND						
T-2 Toxin ($\mu\text{g/kg}$)		ND							ND						
No. of samples		3							40						

2011/2012 IMPORTED WHEAT QUALITY - UKRAINE (1 Oct 2011 to 30 Sep 2012)

2011/2012 Imported Wheat Quality Versus 2011/2012 RSA Season

Country of origin		Ukraine Average						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	-	-	1	5	176	120	61	39	25	12	433
WHEAT GRADING															
Protein (12% mb), %	-	-	10.68	-	-	10.81	10.70	12.78	11.52	10.48	10.33	11.72	10.78	11.77	
Moisture, %	-	-	11.8	-	-	11.7	11.8	11.1	11.0	10.9	10.9	11.0	11.4	11.0	
Falling number, sec	-	-	299	-	-	316	302	397	393	384	372	376	274	387	
1000 Kernel mass (13% mb), g	-	-	36.4	-	-	35.7	36.3	37.7	38.8	38.9	38.2	34.1	36.7	38.0	
Hlm (dirty), kg/hl	-	-	80.4	-	-	80.5	80.4	81.1	81.0	80.7	79.9	78.8	79.9	80.7	
Screenings (<1,8mm), %	-	-	1.87	-	-	2.00	1.90	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	0.01	0.01	0.00	0.00	0.00	0.00	0.00	
Foreign matter, %	-	-	0.08	-	-	0.00	0.06	0.08	0.09	0.10	0.10	0.14	0.13	0.09	
Other grain & unthreshed ears, %	-	-	0.35	-	-	0.20	0.32	0.24	0.29	0.27	0.30	0.64	0.20	0.28	
Heat damaged kernels, %	-	-	0.03	-	-	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Immature kernels, %	-	-	0.00	-	-	0.00	0.00	0.05	0.04	0.02	0.03	0.03	0.03	0.04	
Insect damaged kernels, %	-	-	1.00	-	-	0.80	0.96	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	0.00	0.00	0.00	0.00	0.00	
Sprouted kernels, %	-	-	0.00	-	-	0.00	0.00	0.03	0.02	0.04	0.02	0.10	0.42	0.04	
Total damaged kernels, %	-	-	1.03	-	-	0.80	0.98	0.46	0.48	0.49	0.41	0.96	0.70	0.50	
Combined deviations, %	-	-	3.28	-	-	2.80	3.18	2.10	2.23	2.23	3.06	4.94	3.65	2.45	
Field fungi, %	-	-	0.35	-	-	0.30	0.34	0.10	0.11	0.14	0.19	0.06	0.06	0.12	
Storage fungi, %	-	-	0.10	-	-	0.10	0.10	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	
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	-	-	No	-	-	Yes	No	No	No	No	No	Yes	No		
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	-	-	4	-	-	1	5	28	23	14	15	8	2	90	
BÜHLER EXTRACTION, %	-	-	73.0	-	-	73.0	73.0	74.4	74.2	74.8	73.8	72.8	73.3	74.1	
FLOUR															
Colour, KJ	-	-	-2.2	-	-	-2.1	-2.2	-2.7	-2.7	-3.0	-2.8	-2.7	-3.0	-2.8	
Protein (12% mb), %	-	-	9.5	-	-	9.5	9.5	11.7	10.5	9.6	9.6	10.6	9.7	10.6	
Wet Gluten (14% mb), %	-	-	22.8	-	-	23.2	22.9	32.0	28.4	26.0	26.0	28.5	25.6	28.7	
Dry Gluten (14% mb), %	-	-	8.2	-	-	8.2	8.2	11.1	9.8	8.8	8.8	9.7	9.0	9.9	
100g BAKING TEST															
Baking water absorption, %	-	-	59.3	-	-	59.3	59.3	61.7	60.3	59.3	59.2	60.6	59.1	60.4	
Loaf volume, cm ³	-	-	754	-	-	760	755	916	847	811	802	821	778	852	
Evaluation	-	-	1	-	-	0	1	0	0	0	0	1	1	0	
FARINOGRAM															
Water absorption, %	-	-	58.4	-	-	58.5	58.4	62.3	61.3	60.9	60.3	60.7	60.1	61.3	
Development time, min	-	-	1.7	-	-	1.5	1.7	5.6	3.8	3.2	2.8	4.4	3.1	4.1	
Stability, mm	-	-	2.6	-	-	3.1	2.7	10.7	8.1	6.7	6.8	8.9	6.4	8.5	
Mixing tolerance index, BU	-	-	53	-	-	43	51	34	39	47	43	37	50	39	

2011/2012 Imported Wheat Quality Versus 2011/2012 RSA Wheat Quality

Country of origin	Ukraine							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	-	-	1	5	28	23	14	15	8	2	90
ALVEOGRAM														
Strength (S), cm ²	-	-	29.9	-	-	26.6	29.2	41.7	34.6	29.4	29.8	33.7	30.4	35.0
Stability (P), mm	-	-	88	-	-	93	89	85	83	80	79	82	78	82
Distensibility (L), mm	-	-	61	-	-	49	59	112	94	86	89	96	86	98
P/L	-	-	1.45	-	-	1.90	1.54	0.79	0.92	0.97	0.97	0.90	0.90	0.89
EXTENSOGRAM														
Strength, cm ²	-	-	81	-	-	75	79	110	87	72	74	86	82	90
Max. height, BU	-	-	370	-	-	366	369	379	337	294	311	349	315	340
Extensibility, mm	-	-	159	-	-	152	157	211	184	174	170	175	183	188
MIXOGRAM														
Peak time, min	-	-	4.2	-	-	4.1	4.2	2.9	3.0	2.8	3.1	3.3	3.2	3.0
Absorption, %	-	-	59.3	-	-	59.3	59.3	61.9	60.4	59.4	59.4	60.6	59.5	60.5
MYCOTOXINS														
Afla G ₁ (µg/kg)	ND							ND						
Afla B ₁ (µg/kg)	ND							ND						
Afla G ₂ (µg/kg)	ND							ND						
Afla B ₂ (µg/kg)	ND							ND						
Fum B ₁ (µg/kg)	ND							ND						
Fum B ₂ (µg/kg)	ND							ND						
Fum B ₃ (µg/kg)	ND							ND						
Deoxynivalenol (µg/kg) [max. value]	ND							<LOQ [119]						
15-ADON (µg/kg)	ND							ND						
Ochratoxin A (µg/kg)	ND							ND						
Zearalenone (µg/kg) [max. value]	ND							ND						
HT-2 (µg/kg)	ND							ND						
T-2 Toxin (µg/kg)	ND							ND						
No. of samples	1							40						

2011/2012 IMPORTED WHEAT QUALITY - URUGUAY (1 Oct 2011 to 30 Sep 2012)

2011/2012 Imported Wheat Quality Versus 2011/2012 RSA Season

Country of origin		Uruguay Average						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	-	-	-	4	176	120	61	39	25	12	433
WHEAT GRADING															
Protein (12% mb), %	-	-	10.20	-	-	-	10.20	12.78	11.52	10.48	10.33	11.72	10.78	11.77	
Moisture, %	-	-	11.7	-	-	-	11.7	11.1	11.0	10.9	10.9	11.0	11.4	11.0	
Falling number, sec	-	-	364	-	-	-	364	397	393	384	372	376	274	387	
1000 Kernel mass (13% mb), g	-	-	34.0	-	-	-	34.0	37.7	38.8	38.9	38.2	34.1	36.7	38.0	
Hlm (dirty), kg/hl	-	-	81.0	-	-	-	81.0	81.1	81.0	80.7	79.9	78.8	79.9	80.7	
Screenings (<1,8mm), %	-	-	1.75	-	-	-	1.75	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	0.01	0.00	0.00	0.00	0.00	0.00	
Foreign matter, %	-	-	0.15	-	-	-	0.15	0.08	0.09	0.10	0.10	0.14	0.13	0.09	
Other grain & unthreshed ears, %	-	-	0.13	-	-	-	0.13	0.24	0.29	0.27	0.30	0.64	0.20	0.28	
Heat damaged kernels, %	-	-	0.10	-	-	-	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Immature kernels, %	-	-	0.00	-	-	-	0.00	0.05	0.04	0.02	0.03	0.03	0.03	0.04	
Insect damaged kernels, %	-	-	0.93	-	-	-	0.93	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	0.00	0.00	0.00	0.00	
Sprouted kernels, %	-	-	0.00	-	-	-	0.00	0.03	0.02	0.04	0.02	0.10	0.42	0.04	
Total damaged kernels, %	-	-	1.03	-	-	-	1.03	0.46	0.48	0.49	0.41	0.96	0.70	0.50	
Combined deviations, %	-	-	3.05	-	-	-	3.05	2.10	2.23	2.23	3.06	4.94	3.65	2.45	
Field fungi, %	-	-	1.38	-	-	-	1.38	0.10	0.11	0.14	0.19	0.06	0.06	0.12	
Storage fungi, %	-	-	0.35	-	-	-	0.35	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	
Noxious seeds (<i>Crotalaria spp.</i> , etc.)	-	-	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	
Live insects	-	-	No	-	-	-	No	No	No	No	No	Yes	No		
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	-	-	4	-	-	-	4	28	23	14	15	8	2	90	
BÜHLER EXTRACTION, %	-	-	74.7	-	-	-	74.7	74.4	74.2	74.8	73.8	72.8	73.3	74.1	
FLOUR															
Colour, KJ	-	-	-2.5	-	-	-	-2.5	-2.7	-2.7	-3.0	-2.8	-2.7	-3.0	-2.8	
Protein (12% mb), %	-	-	9.1	-	-	-	9.1	11.7	10.5	9.6	9.6	10.6	9.7	10.6	
Wet Gluten (14% mb), %	-	-	22.6	-	-	-	22.6	32.0	28.4	26.0	26.0	28.5	25.6	28.7	
Dry Gluten (14% mb), %	-	-	8.1	-	-	-	8.1	11.1	9.8	8.8	8.8	9.7	9.0	9.9	
100g BAKING TEST															
Baking water absorption, %	-	-	59.0	-	-	-	59.0	61.7	60.3	59.3	59.2	60.6	59.1	60.4	
Loaf volume, cm ³	-	-	740	-	-	-	740	916	847	811	802	821	778	852	
Evaluation	-	-	0	-	-	-	0	0	0	0	0	1	1	0	
FARINOGRAM															
Water absorption, %	-	-	58.3	-	-	-	58.3	62.3	61.3	60.9	60.3	60.7	60.1	61.3	
Development time, min	-	-	1.7	-	-	-	1.7	5.6	3.8	3.2	2.8	4.4	3.1	4.1	
Stability, mm	-	-	1.9	-	-	-	1.9	10.7	8.1	6.7	6.8	8.9	6.4	8.5	
Mixing tolerance index, BU	-	-	58	-	-	-	58	34	39	47	43	37	50	39	

2011/2012 Imported Wheat Quality Versus 2011/2012 RSA Wheat Quality

Country of origin	Uruguay Average							RSA Crop Average						
	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
Class and Grade bread wheat														
No. of samples	-	-	4	-	-	-	4	28	23	14	15	8	2	90
ALVEOGRAM														
Strength (S), cm ²	-	-	26.7	-	-	-	26.7	41.7	34.6	29.4	29.8	33.7	30.4	35.0
Stability (P), mm	-	-	100	-	-	-	100	85	83	80	79	82	78	82
Distensibility (L), mm	-	-	44	-	-	-	44	112	94	86	89	96	86	98
P/L	-	-	2.27	-	-	-	2.27	0.79	0.92	0.97	0.97	0.90	0.90	0.89
EXTENSOGRAM														
Strength, cm ²	-	-	75	-	-	-	75	110	87	72	74	86	82	90
Max. height, BU	-	-	391	-	-	-	391	379	337	294	311	349	315	340
Extensibility, mm	-	-	139	-	-	-	139	211	184	174	170	175	183	188
MIXOGRAM														
Peak time, min	-	-	4.0	-	-	-	4.0	2.9	3.0	2.8	3.1	3.3	3.2	3.0
Absorption, %	-	-	59.0	-	-	-	59.0	61.9	60.4	59.4	59.4	60.6	59.5	60.5
MYCOTOXINS														
Afla G ₁ (µg/kg)	ND							ND						
Afla B ₁ (µg/kg)	ND							ND						
Afla G ₂ (µg/kg)	ND							ND						
Afla B ₂ (µg/kg)	ND							ND						
Fum B ₁ (µg/kg)	ND							ND						
Fum B ₂ (µg/kg)	ND							ND						
Fum B ₃ (µg/kg)	ND							ND						
Deoxynivalenol (µg/kg) [max. value]	143 [170]							<LOQ [119]						
15-ADON (µg/kg)	ND							ND						
Ochratoxin A (µg/kg)	ND							ND						
Zearalenone (µg/kg) [max. value]	ND							ND						
HT-2 (µg/kg)	ND							ND						
T-2 Toxin (µg/kg)	ND							ND						
No. of samples	2							40						

2011/2012 IMPORTED WHEAT QUALITY - USA (1 Oct 2011 to 30 Sep 2012)

2011/2012 Imported Wheat Quality Versus 2011/2012 RSA Season

Country of origin		USA Average						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	2	-	9	176	120	61	39	25	12	433
WHEAT GRADING															
Protein (12% mb), %	-	-	10.49	12.12	12.14	-	11.22	12.78	11.52	10.48	10.33	11.72	10.78	11.77	
Moisture, %	-	-	12.3	11.0	11.0	-	11.7	11.1	11.0	10.9	10.9	11.0	11.4	11.0	
Falling number, sec	-	-	377	475	497	-	426	397	393	384	372	376	274	387	
1000 Kernel mass (13% mb), g	-	-	31.8	30.1	28.8	-	30.8	37.7	38.8	38.9	38.2	34.1	36.7	38.0	
Hlm (dirty), kg/hl	-	-	78.6	79.7	79.6	-	79.1	81.1	81.0	80.7	79.9	78.8	79.9	80.7	
Screenings (<1,8mm), %	-	-	2.01	3.83	4.22	-	2.90	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	0.01	0.01	0.00	0.00	0.00	0.00	0.00	
Foreign matter, %	-	-	0.22	0.07	0.08	-	0.16	0.08	0.09	0.10	0.10	0.14	0.13	0.09	
Other grain & unthreshed ears, %	-	-	0.25	0.23	0.17	-	0.23	0.24	0.29	0.27	0.30	0.64	0.20	0.28	
Heat damaged kernels, %	-	-	0.00	0.03	0.10	-	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Immature kernels, %	-	-	0.00	0.00	0.00	-	0.00	0.05	0.04	0.02	0.03	0.03	0.03	0.04	
Insect damaged kernels, %	-	-	0.06	0.19	0.16	-	0.11	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	0.00	0.00	0.00	0.00	0.00	0.00	
Sprouted kernels, %	-	-	0.06	0.16	0.12	-	0.10	0.03	0.02	0.04	0.02	0.10	0.42	0.04	
Total damaged kernels, %	-	-	0.12	0.38	0.38	-	0.24	0.46	0.48	0.49	0.41	0.96	0.70	0.50	
Combined deviations, %	-	-	2.61	4.51	4.85	-	3.53	2.10	2.23	2.23	3.06	4.94	3.65	2.45	
Field fungi, %	-	-	0.41	0.20	0.16	-	0.31	0.10	0.11	0.14	0.19	0.06	0.06	0.12	
Storage fungi, %	-	-	0.05	0.00	0.00	-	0.03	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	
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	-	-	No	No	No	-	No	No	No	No	No	Yes	No		
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	2	-	9	28	23	14	15	8	2	90
BÜHLER EXTRACTION, %		-	-	71.5	72.1	72.0	-	71.7	74.4	74.2	74.8	73.8	72.8	73.3	74.1
FLOUR															
Colour, KJ	-	-	-1.8	-2.1	-2.1	-	-1.9	-2.7	-2.7	-3.0	-2.8	-2.7	-3.0	-2.8	
Protein (12% mb), %	-	-	8.6	10.8	10.9	-	9.6	11.7	10.5	9.6	9.6	10.6	9.7	10.6	
Wet Gluten (14% mb), %	-	-	22.3	27.4	27.3	-	24.5	32.0	28.4	26.0	26.0	28.5	25.6	28.7	
Dry Gluten (14% mb), %	-	-	7.2	10.1	10.3	-	8.5	11.1	9.8	8.8	8.8	9.7	9.0	9.9	
100g BAKING TEST															
Baking water absorption, %	-	-	53.8	59.3	60.3	-	56.4	61.7	60.3	59.3	59.2	60.6	59.1	60.4	
Loaf volume, cm ³	-	-	657	868	850	-	747	916	847	811	802	821	778	852	
Evaluation	-	-	2	0	1	-	1	0	0	0	0	1	1	0	
FARINOGRAM															
Water absorption, %	-	-	52.6	56.2	56.5	-	54.3	62.3	61.3	60.9	60.3	60.7	60.1	61.3	
Development time, min	-	-	1.5	2.2	2.3	-	1.8	5.6	3.8	3.2	2.8	4.4	3.1	4.1	
Stability, mm	-	-	3.1	11.8	11.8	-	6.9	10.7	8.1	6.7	6.8	8.9	6.4	8.5	
Mixing tolerance index, BU	-	-	76	28	28	-	54	34	39	47	43	37	50	39	

2011/2012 Imported Wheat Quality Versus 2011/2012 RSA Wheat Quality

Country of origin	USA Average							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	2	-	9	28	23	14	15	8	2	90
ALVEOGRAM														
Strength (S), cm ²	-	-	16.3	32.3	32.3	-	23.4	41.7	34.6	29.4	29.8	33.7	30.4	35.0
Stability (P), mm	-	-	43	81	79	-	59	85	83	80	79	82	78	82
Distensibility (L), mm	-	-	84	73	74	-	79	112	94	86	89	96	86	98
P/L	-	-	0.51	1.17	1.07	-	0.78	0.79	0.92	0.97	0.97	0.90	0.90	0.89
EXTENSOGRAM														
Strength, cm ²	-	-	53	117	116	-	81	110	87	72	74	86	82	90
Max. height, BU	-	-	285	470	510	-	376	379	337	294	311	349	315	340
Extensibility, mm	-	-	130	167	160	-	145	211	184	174	170	175	183	188
MIXOGRAM														
Peak time, min	-	-	3.8	4.7	4.5	-	4.1	2.9	3.0	2.8	3.1	3.3	3.2	3.0
Absorption, %	-	-	58.6	60.8	60.8	-	59.5	61.9	60.4	59.4	59.4	60.6	59.5	60.5
MYCOTOXINS														
Afla G ₁ (µg/kg)	ND							ND						
Afla B ₁ (µg/kg)	ND							ND						
Afla G ₂ (µg/kg)	ND							ND						
Afla B ₂ (µg/kg)	ND							ND						
Fum B ₁ (µg/kg)	ND							ND						
Fum B ₂ (µg/kg)	ND							ND						
Fum B ₃ (µg/kg)	ND							ND						
Deoxynivalenol (µg/kg) [max. value]	167 [359]							<LOQ [119]						
15-ADON (µg/kg)	ND							ND						
Ochratoxin A (µg/kg)	ND							ND						
Zearalenone (µg/kg) [max. value]	<LOQ [20]							ND						
HT-2 (µg/kg)	ND							ND						
T-2 Toxin (µg/kg)	ND							ND						
No. of samples	4							40						



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/I EC 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




Mr R Josias
Chief Executive Officer

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

CERTIFICATE SERTIFIKAAT

IT IS HEREBY CERTIFIED THAT
HIERMEE WORD GESERTIFISEER DAT

Southern African Grain Laboratory

Pretoria

Feed / Voer

FOR THE PERIOD OF
VIR DIE TYDPERK VAN

1 January 2012

TO
TOT

31 December 2012

PARTICIPATED IN THE QUALITY ASSURANCE SCHEME AND CONFORMED TO THE REQUIREMENTS
IN RESPECT OF THE FOLLOWING DETERMINATIONS:

AAN DIE GEHALTEVERSEKERINGSKEMA DEELGENEEM HET EN AAN DIE VEREISTES MET BETREKKING
TOT DIE VOLGENDE BEPALINGS VOLDOEN HEI:

Ash Crude Fibre** Dietary Fibre***

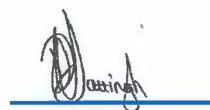
Fat Protein Calc** Starch****

PERFORMANCE CRITERIA

* MEAN ABSOLUTE Z-VALUE ≥ 1.2 AND PARTICIPATION >75%
GEM. ABSOLUTE Z-WAARDE ≥ 1.2 EN DEELNAME >75%

** MEAN ABSOLUTE Z-VALUE ≤ 1 AND PARTICIPATION >90%
GEM. ABSOLUTE Z-WAARDE ≤ 1 EN DEELNAME >90%

NOTE: DUE TO POSTAL STRIKES DURING 2012, THE PARTICIPATION AND RESULTING PERFORMANCE OF CERTAIN LABS COULD HAVE BEEN
INFLUENCED NEGATIVELY



PRESIDENT
PRESIDENT



CONTROL SCHEMES CC
KONTROLESKEMAS BK



CERTIFICATE OF PARTICIPATION

This certificate is awarded to:

SOUTHERN AFRICAN GRAIN LABORATORY (SAGL)

THE WILLOWS - PRETORIA - SOUTH AFRICA

for its participation in BIPEA interlaboratory comparisons for the
annual series 2012-2013.

May 10, 2013 - Gennevilliers France

BIPEA Member

BIPEA Director



Certificate n° 12-13 / 11119



ACCURACY AWARD

Operation of the Mixograph

Southern African Grain Laboratory

Is awarded this certificate for achieving the most accurate and precise results among Series J Check Sample subscribers for 2012

**Moisture, Peak Height, Peak Time
8-Minute Height, Descending Slope**

Steven C. Nelson
Executive Vice President

August 5, 2013

David A. Schenck
President



RECOGNITION OF ANALYTICAL PERFORMANCE

Analysis of Feed

Southern African Grain Laboratory
Pretoria, SOUTH AFRICA

Achieved Outstanding Accuracy and Precision for the year 2012
in check samples including the following analyses:

Moisture, Protein, Ash, Crude Fiber, Crude Fat EE

Steven C. Nelson
Executive Vice President

David A. Schenck
President



RECOGNITION OF ANALYTICAL PERFORMANCE

Analysis of Hard Wheat Flour

Southern African Grain Laboratory
Pretoria, SOUTH AFRICA

Achieved Outstanding Accuracy and Precision for the year 2012
in check samples including the following analyses:

Moisture, Protein, Ash

Steven C. Nelson
Executive Vice President

David A. Schenck
President

No. R. 1186

17 December 2010

