South African Wheat Crop

QUALITY REPORT
2013/2014 SEASON

Index

	Page
Summary & Introduction	1
Production, Supply and Demand	2
RSA wheat production over ten seasons (Graph 1)	2
Production figures for production areas over seasons (Graph 2)	2
Average yield per production areas over seasons (Graph 3)	3
Wheat production of the 2013/2014 season (Table 1)	3
RSA production figure vs total import figure over six seasons (Graph 4)	4
Wheat supply and demand overview 2013/2014 season (Graph 5)	4
SAGIS Wheat Supply and Demand Table	5
Wheat: Supply and demand graphs over 10 seasons (Graphs 6 – 9)	6
Assuring the quality of South African wheat	7
Wheat grades	7
Bread Wheat Grading Table (Table 2)	7
Wheat seed figures	8
Cultivars	8
Crop quality of the 2013/2014 season	9 - 10
Protein distribution over the last 3 seasons (Graph 10)	10
Protein distribution between production areas (Graph 11)	10
Weighted average protein, falling number, hectolitre mass and mixogram peak times per region compared over the last three seasons (Table 3)	11
Protein, falling number, hectolitre mass and mixogram peak time over ten seasons (Graph 12)	12
Comparison of Flour Quality over last four seasons (Table 4)	13
Comparison of Rheological Quality over seasons (Graph 13)	14 - 15
Regional quality weighted averages (Table 5)	16 - 17
Regional quality summary	18 - 19
RSA Crop Production Regions (Map)	20
Quality data plus rheological graphs per production region	21 - 48
Mycotoxins	49 - 50

	Page
Mycotoxin results (Table 6)	51 - 52
Summary of RSA wheat quality of 2011/2012 and 2013/2014	53 - 54
Summary of RSA wheat quality of 2012/2013 and 2013/2014	55 - 56
Methods	57 - 60
SAGIS Wheat Exports and Imports per country 2012/2013 Season	61
SAGIS Wheat Exports and Imports per country 2013/2014 Season	62
Quantity of wheat imported to the RSA (Graph 14)	63
Wheat imports per origin for domestic use (Graphs 15 – 16)	63
Total wheat imports per country per season for use in RSA (Table 7)	64
Quality of imported wheat 2012/2013 season	64 - 65
Average quality data of imported wheat during the 2012/2013 season (Table 8)	66
Imported wheat quality per country compared to RSA crop quality during the 2012/2013 production season	67 - 84
SANAS Certificate and Schedule	85 - 88
International and national proficiency testing certificates	89 - 90
Grading Regulations for Bread Wheat, Government Notice No. R. 1186 of 17 December 2010	91 - 103

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SOUTH AFRICAN
COMMERCIAL WHEAT QUALITY FOR THE 2013/2014 SEASON

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- *The Grain Silo Industry and its members for their cooperation in providing the samples to make this survey possible.*
- *Milling companies for providing samples of wheat delivered directly to the mills.*

Summary

The commercial wheat crop for the 2013/2014 season was set at 1.870 million tons which is equal to the previous season's crop. A total area of 505,500 hectares was utilized for wheat production and the average yield was 3.70 tons per hectare (Figures obtained from the Crop Estimates Committee).

The whole wheat protein average was 11.6% compared to the 11.4% of the previous season and the ten year average of 11.9%. The percentage of samples having protein contents higher than 12.0% increased from 30.5% to 39.5%. The average hectolitre mass was 79.5 kg/hl, lower than the 81.3 kg/hl of the 2012/2013 season. The average mixogram peak time of 3.0 minutes compared well with the previous two seasons.

The average falling number this season was 337 seconds. Twenty of the samples analysed gave falling number values below 220 seconds and of these seventeen were below 200 seconds. Three of the twenty samples were from the Rûens production regions, another three from the North West, ten from the Free State and four from Mpumalanga. Sprouted kernels were not visually present in all of these samples which may indicate the presence of late maturity alpha amylase.

The overall flour and dough quality were good and compared well with the previous three seasons. The water absorption according to the Farinograph was slightly lower and the distensibility of the dough as measured with the Alveograph increased on average compared to the 2012/2013 season.

Introduction

During the harvesting season (October to December for the southern production regions and November to January for the Northern production regions), 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 340 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 the thousand kernel mass determined. Sub-samples were milled on the Quadromat mill for a mixograph 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 and a RVA analysis conducted. 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. Hard copy of the report are distributed to all interested parties and the report is also available in a PDF format on the website.

Summaries comparing the quality of the local wheat for the last three seasons are provided.

Data on imported wheat is also included in the report.

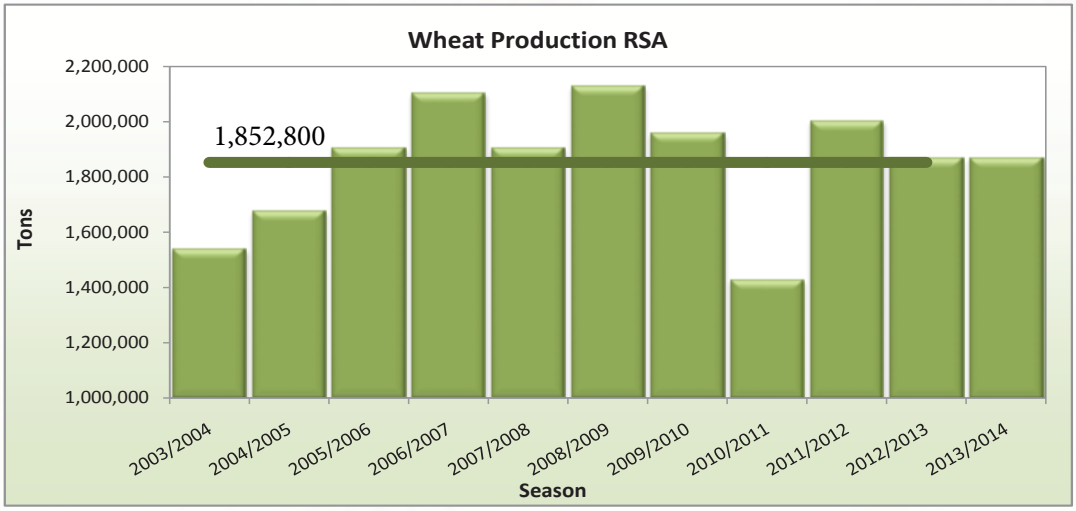
Production, Supply and Demand

Wheat is by far the biggest winter cereal crop planted in South Africa. Other winter crops produced are barley for malting purposes and canola.

South Africa (made up of nine provinces) is divided into 36 crop production regions with wheat planted in about 32 of these regions. Please see RSA Crop Production Regions map on page 20. These regions are also described on pages 21 to 47 (in the header of the left page) with the specific intake silo names for each region.

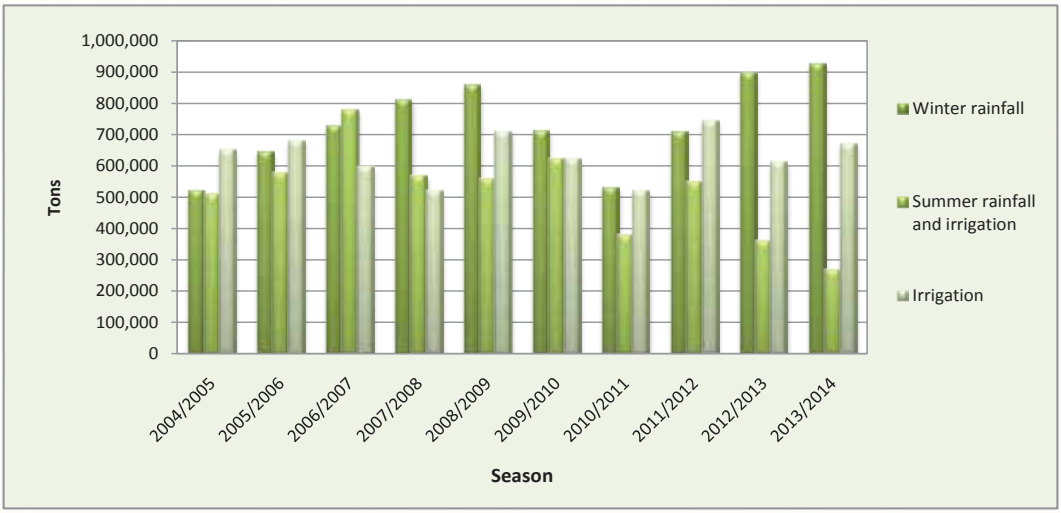
The national Crop Estimates Committee's (CEC) estimated total production figures were revised, using the South African Grain Information Services (SAGIS) published figures of actual deliveries as basis for the calculations. Figures to determine on-farm usage and retentions obtained from a wheat utilization survey conducted by the Department of Agriculture, Forestry and Fisheries (DAFF), were added to the SAGIS delivery figures to calculate the final crop production figures.

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



The final figure of 1,870,000 tons is just slightly higher than the 10 year production average of 1,852,800 tons (2003/2004 to 2012/2013 seasons). The Western Cape produced 928,000 tons of wheat this season, contributing 50% of the total crop. The Free State's production continued the decreasing trend of the previous two seasons to 270,000 tons, 90,000 tons less than in the 2012/2013 season. The Northern Cape's irrigation areas are now the second largest producer of wheat with 320,000 tons produced. The remainder of the wheat was produced mainly in Limpopo (146,000 tons) and North West (110,000 tons).

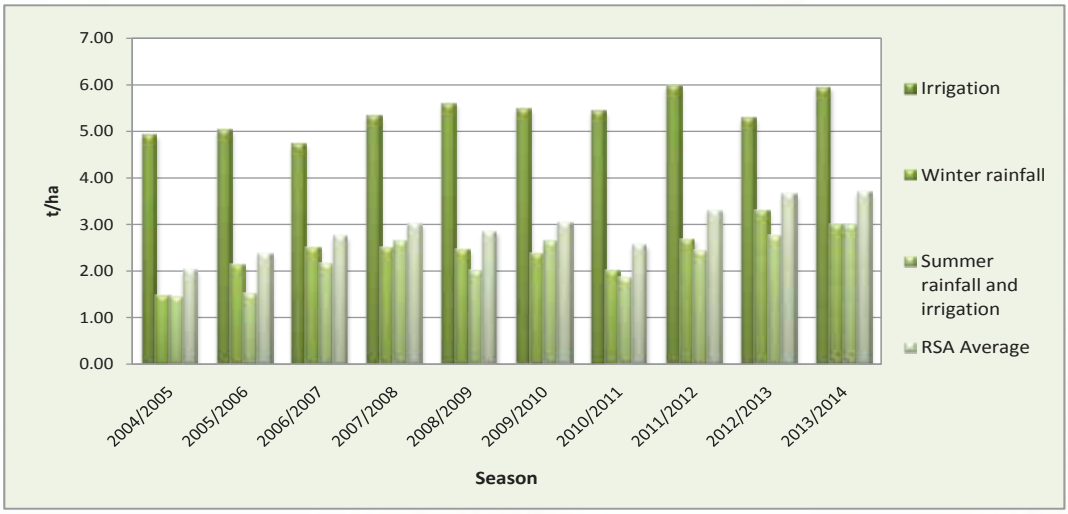
Graph 2: Production figures for the production areas over seasons



Figures obtained from the CEC.

The yield in the main production areas ranged from 1.30 tons per hectare (t/ha) to 2.93 t/ha for wheat produced under dryland conditions and 5.94 t/ha to 7.73 t/ha for irrigation wheat. Please see graph below.

Graph 3: Average yield per production area over seasons



Figures obtained from the CEC.

Please see Table 1 for an overview of the wheat production in the 2013/2014 season.

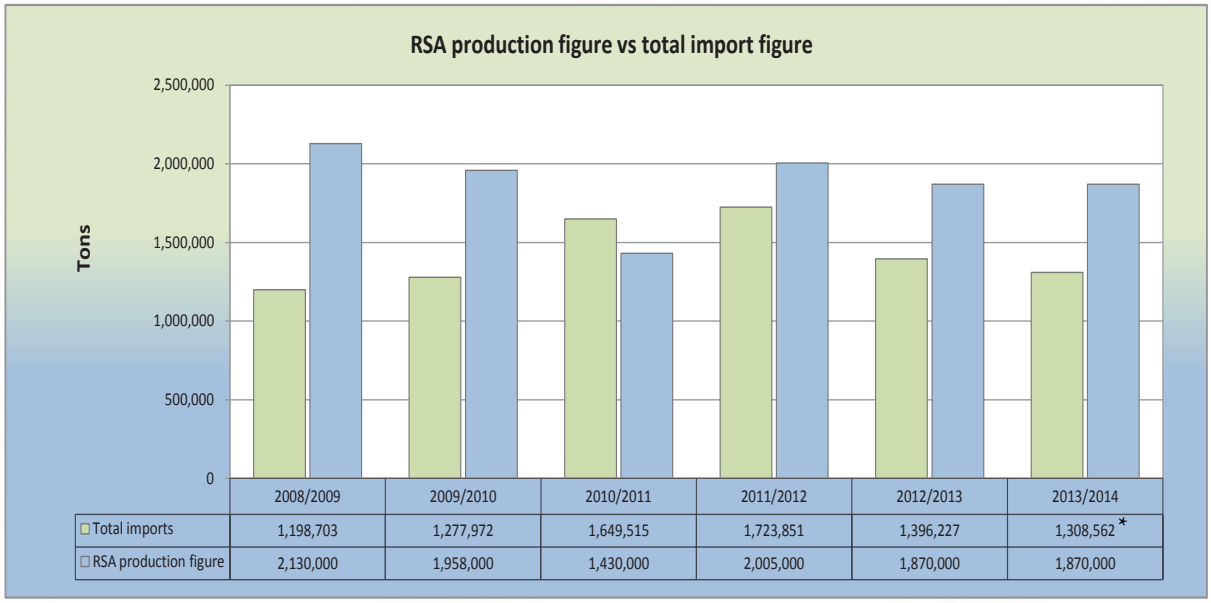
Table1: Wheat production of the 2013/2014 season

Province	Type of production	Hectares planted, ha	Crop, tons	Yield, t/ha
Western Cape	Dryland	306 000	898 000	2.93
	Irrigation	4 000	30 000	7.50
	Total	310 000	928 000	2.99
Northern Cape	Dryland	1 000	2 900	2.90
	Irrigation	41 000	317 100	7.73
	Total	42 000	320 000	7.62
Free State	Dryland	57 000	74 000	1.30
	Irrigation	33 000	196 000	5.94
	Total	90 000	270 000	3.00
Eastern Cape	Dryland	1 500	2 600	1.73
	Irrigation	3 000	17 200	5.73
	Total	4 500	19 800	4.40
KwaZulu-Natal	Dryland			
	Irrigation	7 000	42 000	6.00
	Total	7 000	42 000	6.00
Mpumalanga	Dryland			
	Irrigation	4 500	28 000	6.22
	Total	4 500	28 000	6.22
Limpopo	Dryland	1 500	750	0.50
	Irrigation	26 500	145 250	5.48
	Total	28 000	146 000	5.21
Gauteng	Dryland	150	255	1.70
	Irrigation	850	5 945	6.99
	Total	1 000	6 200	6.20
North West	Dryland	200	340	1.70
	Irrigation	18 300	109 660	5.99
	Total	18 500	110 000	5.95
RSA	Dryland	367 350	978 845	2.66
	Irrigation	138 150	891 155	6.45
	Total	505 500	1 870 000	3.70

Figures obtained from the CEC.

The local wheat production is not sufficient for domestic requirements and South Africa has to import approximately half of the wheat required for its domestic consumption needs. During the 2012/2013 season 1.396 million tons of wheat were imported for domestic consumption and so far 1.308 million tons of wheat have been imported for the current season. See pages 67 to 84 for the quality of the wheat imported during 2012/2013.

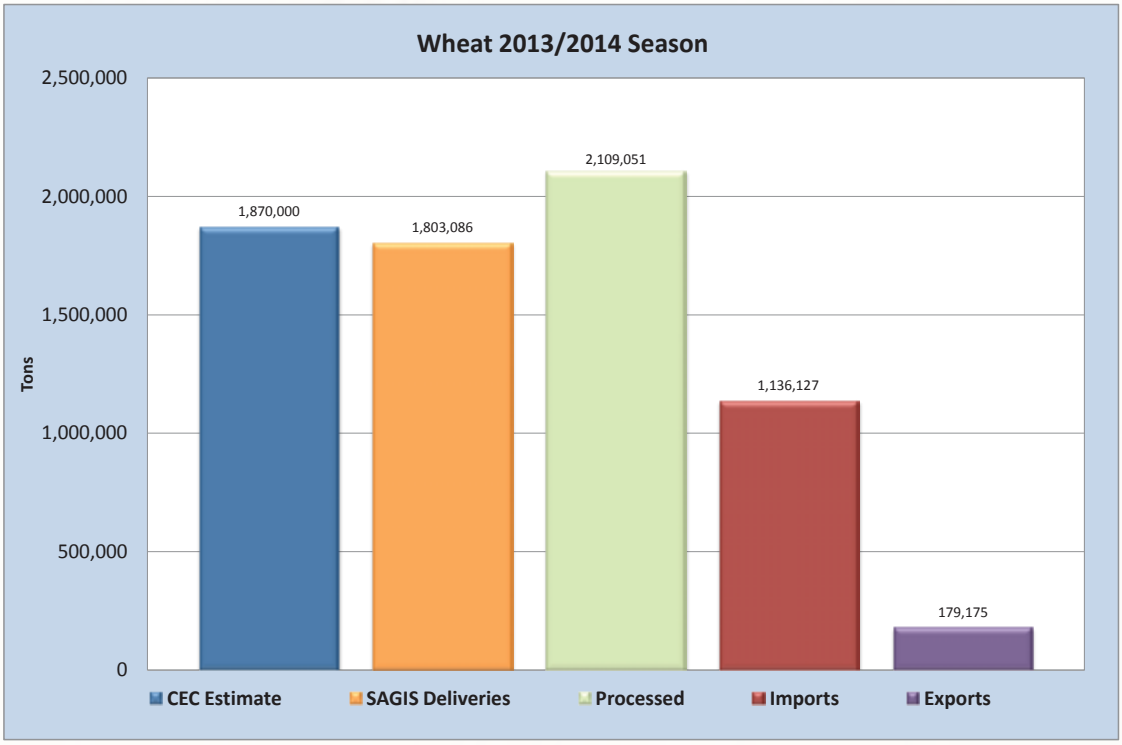
Graph 4: RSA production figure versus the total import figure for the previous five seasons as well as the current season



	2008/2009	2009/2010	2010/2011	2011/2012	2012/2013	2013/2014
Total imports	1,198,703	1,277,972	1,649,515	1,723,851	1,396,227	1,308,562 *
RSA production figure	2,130,000	1,958,000	1,430,000	2,005,000	1,870,000	1,870,000

*2013/2014 season figure includes imports up to 4 July 2014.

Graph 5: Wheat supply and demand overview 2013/2014 season (Oct - May)

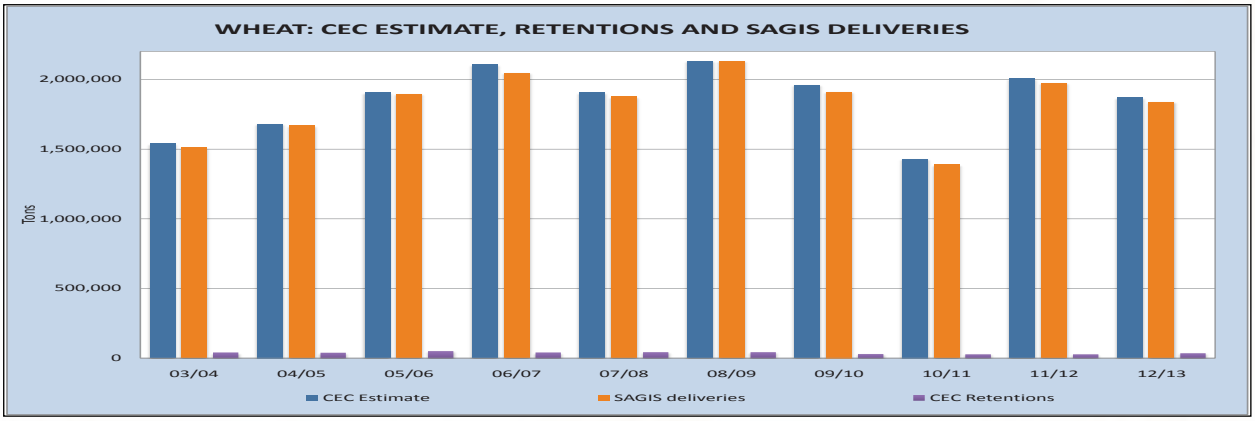


Figures obtained from SAGIS.

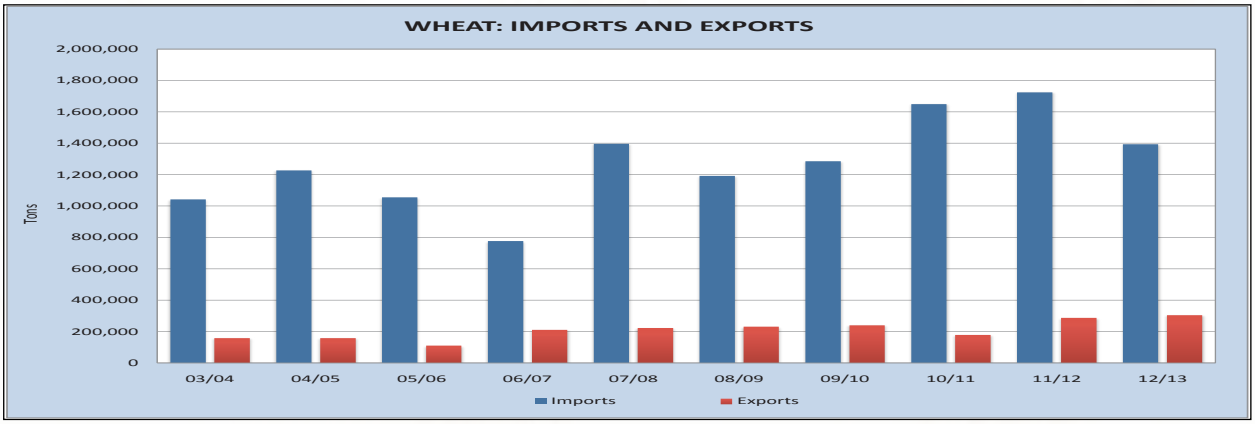
South African Grain Information Services NPC
Suid-Afrikaanse Graaninligtingsdiens NWM
Reg no. 1997/019186/08

WHEAT: SUPPLY AND DEMAND TABLE BASED ON SAGIS' INFO														Publication date: 2014-06-25				
	Season (Oct - Sep)																Current Season Oct - May	10 YEAR AVERAGE 2003/4-2012/13
	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	13/14	
																	8	
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	1,870,000	1,852,800
CEC (Retention)						33,000	40,000	38,000	50,000	40,000	42,000	43,000	29,000	27,000	26,500	35,000	30,000	37,050
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	489,253	593,818
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	1,837,137	1,803,086	1,823,514
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	1,393,215	1,136,127	1,274,022
Surplus	0	0	0	0	0	0	6,000	6,000	9,000	32,000	0	13,000	0	23,000	14,000	0	9,624	10,300
Total supply	3,496,000	3,369,000	3,120,000	3,168,000	3,373,000	3,714,000	3,457,000	3,501,000	3,531,000	3,436,000	3,648,000	3,844,000	3,889,000	3,640,000	4,189,000	3,881,532	3,438,090	3,701,653
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	3,040,086	2,109,051	2,890,809
-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	3,008,378	2,058,939	2,868,738
-animal	43,000	52,000	24,000	2,000	22,000	2,000	1,000	2,000	12,000	2,000	1,000	8,000	26,000	1,000	136,000	31,694	50,107	22,069
-gristing	0	0	2,000	1,000	0	0	0	0	0	0	0	0	0	0	0	14	5	1
-bio-fuel	0	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	3,934	3,978	8,893
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	7,322	4,678	4,232
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	15,998	17,308	19,400
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	19,990	8,578	13,599
Deficit	0	60,000	52,000	17,000	23,000	1,000	0	0	0	0	9,000	0	4,000	0	0	713	0	1,371
Exports	79,000	75,000	72,000	103,000	149,000	179,000	158,000	158,000	111,000	211,000	223,000	231,000	240,000	179,000	288,000	304,236	179,175	210,324
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	3,392,279	2,322,768	3,148,628
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	489,253	1,115,322	553,025
- 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	253,341	263,631	240,904.1
- months' stock	6.8	3.7	2.6	2.7	2.7	4.2	2.7	2.5	2.5	1.6	2.1	2.9	2.3	1.9	2.4	1.9	4.2	2.3
Note: ***Figures for current season up to date																		

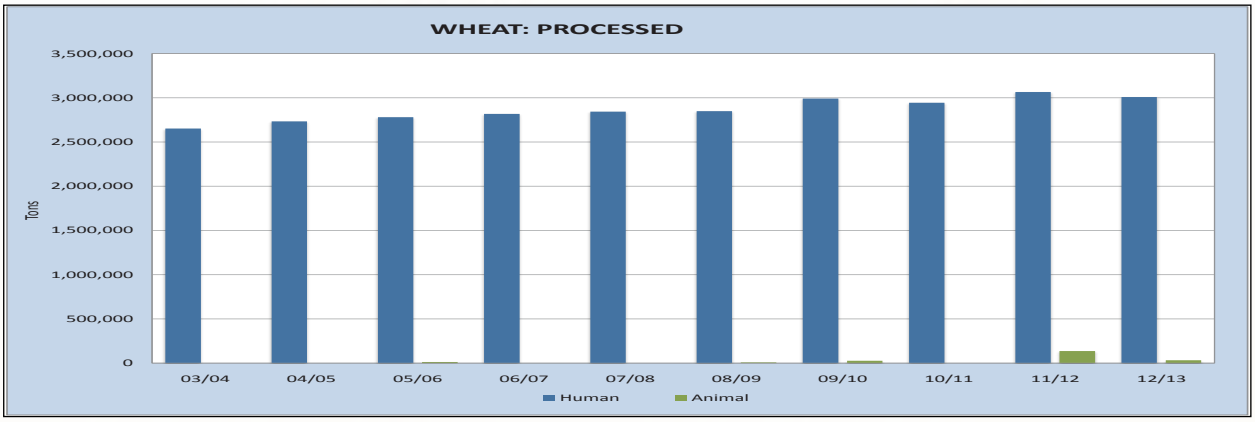
Graph 6: Wheat: CEC Estimate, Retentions and SAGIS deliveries over 10 seasons



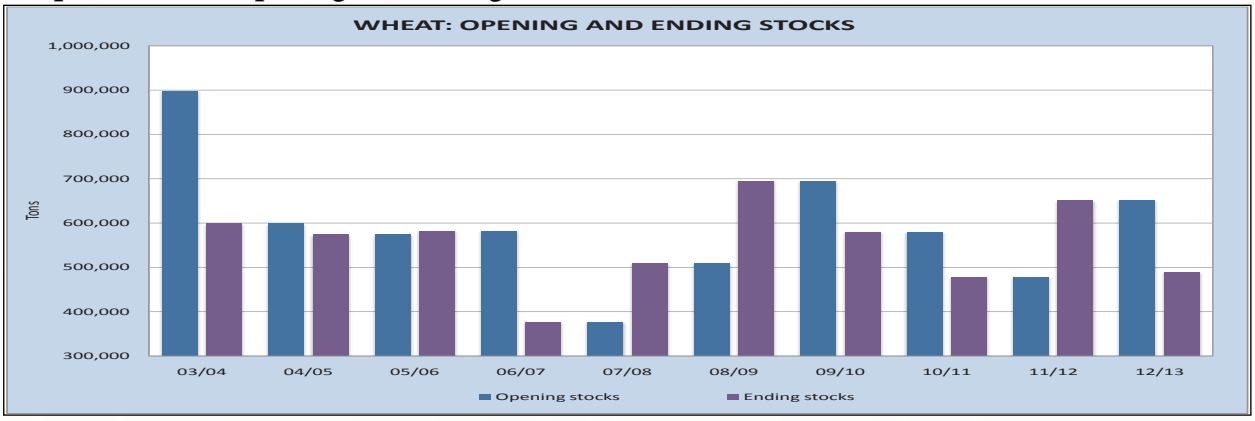
Graph 7: Wheat: Imports and exports over 10 seasons



Graph 8: Wheat: RSA consumption over 10 seasons



Graph 9: Wheat: Opening and ending stocks over 10 seasons



Figures provided by SAGIS.

Assuring the quality of South African wheat

South Africa has three major wheat-breeding programs. New or introduction cultivars can only be released for planting if it has better agronomical as well as better flour quality characteristics than the cultivars planted commercially in a specific area.

The classification of wheat cultivars is an attempt to provide the wheat industry with new cultivars that perform well agronomically and possess suitable milling, rheological and baking characteristics. Analytical procedures and classification norms are compiled in conjunction with wheat breeders, millers and bakers to ensure market-directed and quality-driven wheat production in the interest of wheat producers and processors.

Classification norms use cultivars as biological quality standards as a frame of reference against which new breeding lines are evaluated. Only cultivars that are successfully grown commercially and possess acceptable agronomical and quality characteristics may be considered as biological quality standards.

As the breeding of wheat with the suitable quality characteristics is a long-term project, classification norms and quality standards are provided to breeders in an attempt to give them guidelines that should stand the test of time. Changing the classification norms and establishing new quality standards are for this reason thoroughly investigated and carefully considered to ensure that the long-term goals of breeding programs are achieved.

The effect of the climate, rainfall, environmental interaction, cultivation practices and other factors on wheat quality makes the use of fixed criteria or norms for classification purposes impractical. For this reason cultivars are used as biological quality standards, and acceptable deviations from the standard are established as classification norms.

Producers continuously strive to improve the wheat yield and quality by selecting the cultivars best suited for commercial production in a specific area. Grading standards are also set high to ensure adequate quality control.

Wheat grades

The 340 representative crop samples were graded as follows: 27% was graded B1, 22% was graded B2, 21% was graded B3, 14% was graded B4, 13% UT (Utility Grade) and 3% 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 (15 samples) and screenings (12 samples), exceeding the maximum allowable level of grades B1 to B4. Low protein levels and falling numbers were also contributing factors.

Grade B1 wheat in the Free State province amounted to 38% (25% in the previous season). In the Irrigation areas 39% (49% in the previous season) of the wheat graded as B1 and in the Western Cape Province 12% graded as B1 (9% in the previous season).

Table 2: Bread Wheat Grading Table

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	-

Government Notice No. R. 1186 of 17 December 2010

WHEAT SEED SOLD BY COMMERCIAL GRAIN SILO OWNERS TO WHEAT PRODUCERS FOR THE 2013 PLANTING SEASON

Cultivar	%	Cultivar	%
SST 056	21.67	Krokodil	0.30
SST 88	16.79	SST 876	0.297
SST 027	13.93	Matlabas	0.297
SST 015	9.45	Elands	0.296
SST 884	5.60	SST 347	0.285
SST 835	5.53	SST 866	0.280
SST 875	4.65	PAN 3161	0.224
Duzi	4.18	PAN 3368	0.147
SST 806	3.36	SST 374	0.129
SST 843	2.36	Kwartel	0.086
SST 047	1.67	CRN 826	0.084
SST 822	1.42	SST 316	0.084
SST 877	1.29	Steenbras	0.084
Kariega	0.92	SST 317	0.066
PAN 3408	0.88	PAN 3120	0.058
SST 356	0.63	Buffels	0.056
SST 087	0.61	PAN 3118	0.052
SST 867	0.58	Gariep	0.031
SST 387	0.46	Tankwa	0.024
PAN 3471	0.43	Olifants	0.003
Ratel	0.39	PAN 3379	0.001
SST 895	0.33		
			100

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

Cultivars

In the Western Cape, SST 015 (31.0%), SST 027 (27.3%) and SST 88 (23.2%) dominated the market.

Farmers in the Vaal and Orange River areas preferred SST 835 (27.8%) and SST 843 (22.1%). Duzi (15.1%) was also a popular cultivar.

The most preferred cultivar in the North West was SST 843 (36.2%) followed by SST 835 (28.5%) and Duzi (10.2%).

In regions 21 to 24 of the Free State SST 835 (28.3%) was the prevalent cultivar, followed by PAN 3120 (15.5%) and PAN 3471 (13.7%). SST 835 was also the most planted cultivar in regions 25 to 28 with 19.3%. SST 356, Elands and PAN 3161 were also popular cultivars with 17.2%, 15.5% and 13.3% respectively.

In Mpumalanga, Gauteng, Limpopo and KwaZulu-Natal, SST 835 (24.5%) and SST 843 (24.2%) were the dominant cultivars, followed by Duzi (17.3%).

The above mentioned percentages, are weighted averages based on the top 5 cultivars per region provided on pages 21 to 47. The top 5 cultivars per region were calculated from the cultivar identification done on all 340 crop samples.

Crop quality of the 2013/2014 season

The percentages of samples having protein contents in the intervals 10.0 – 10.9%, 11.0 - 11.9% and 12.0 - 12.9% were very similar, resulting in a flattened normal curve compared to previous seasons. The Winter rainfall areas again reported the lowest average whole wheat protein, namely 10.7%. The Free State areas reported the highest average protein content (12.7%) followed by the 12.0% of the Irrigation areas. The protein content is reported on a 12% moisture basis. Whole wheat protein content is on average 0.5 to 1.2% higher than that of flour. The protein loss can be attributed to the removal of the bran and aleuron layer as well as the germ during milling. Please refer to Graphs 10 and 11 on the next page for the protein content distribution over seasons and between production areas.

The average hectolitre mass of 79.5 kg/hl, although 1.8 kg/hl lower than the previous season was still well above the minimum of 77 kg/hl required for Grade 1 wheat. In total 41 samples reported values below 77 kg/hl, of these 56% was from the Western Cape (Winter rainfall area) and 32% from the Free State. The regional averages ranged from 78.6 kg/hl in the Winter rainfall area to 80.9 kg/hl in the Irrigation areas.

The weighted average thousand kernel mass decreased with almost 1 g from the previous season to 39.3 g. The weighted average screenings (1.8 mm sieve) of 1.58% was similar to previous seasons.

The weighted average falling number was 337 seconds, the lowest the past eleven seasons. 6% of the samples reported falling number values lower than the 220 seconds minimum for Grades 1 to 3.

The weighted mixogram peak time on flour from the Quadromat mill averaged 3.0 minutes, comparing very well with the ten year average (2.9 minutes) as well as previous seasons. The weighted mixogram peak time of the flour from the Bühler mill was 2.8 minutes, equal to the mixing time last season.

Extraction rate is an indication of the flour yield that can be obtained from a given amount of wheat. The extraction rate achievable on industrial scale mills is a number of percentage points higher than on laboratory scale mills due to an increase in roller surface area. For the purpose of this survey composite samples per class and grade per production region are milled and then further analysed for quality. The weighted average Bühler MLU 202 laboratory mill extraction for the 70 composite samples was 73.2%.

The average Kent Jones colour this season was -2.9 KJ equal to that of the previous season. The 2013/2014 survey is the second survey that includes dry colour determinations by means of a Konica Minolta CM-5 spectrophotometer. The CIE L*a*b* values were reported as follows, with the average and range (in brackets) for each of the colour coordinates: L* 93.99 (93.11 – 94.59), a* 0.40 (0.29 – 0.57) and b* 9.50 (8.49 – 10.63). The colour values did not differ significantly from those obtained last season (L* 93.85 (93.14 – 94.39), a* 0.41 (0.26 – 0.54) and b* 9.92 (8.65 – 11.35)). L* represents lightness (100 being white and 0 being black), a* represents green to red variation and b* represents variation from blue to yellow.

Rapid Visco Analyser (RVA) analyses were performed for the first time this season on the composite samples. The average peak viscosity of the samples analysed was 2170 cP (centipoise), the minimum viscosity 1750 cP and the final viscosity 2432 cP (centipoise). The analysis conditions were kept constant during all of the analyses.

The wet gluten (14% mb) averaged 29.5% and the dry gluten also on a 14% moisture basis, 10.4%. These values indicated a good quality gluten if the flour protein content of 10.7% is considered. The average gluten index value was 86, ranging between 50 and 97. The gluten index provides an indication of the gluten strength (higher being better) and is not influenced by the protein content. The average gluten index value last season was 83.

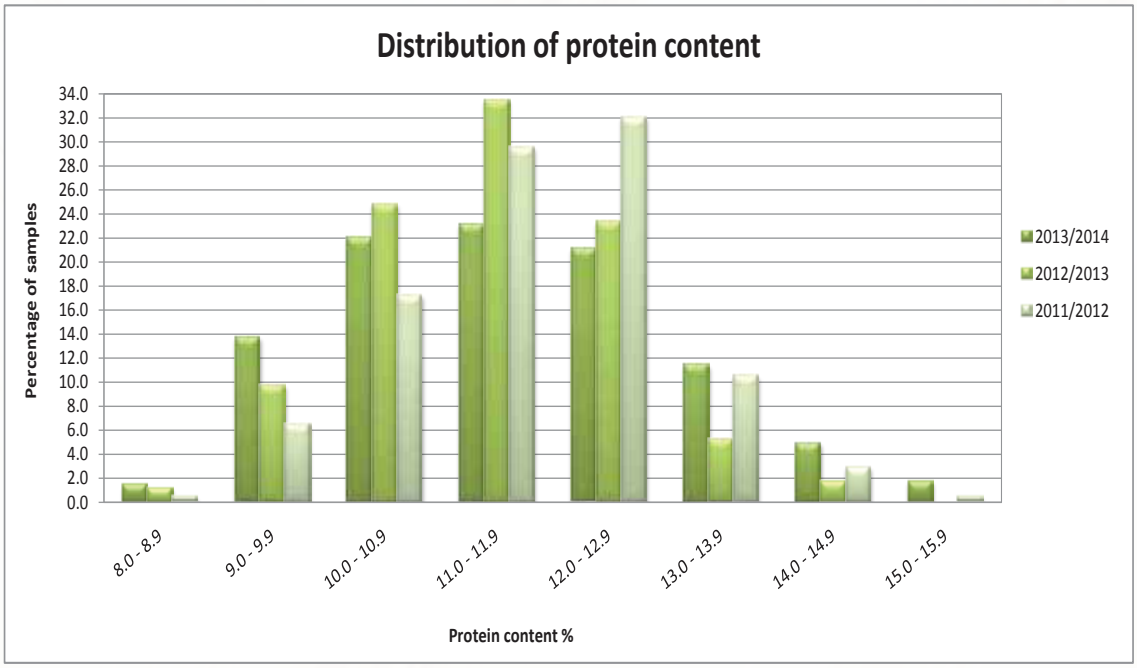
The farinogram had a weighted average water absorption of 60.1% (60.8% the previous season) and a weighted average development time of 5.2 minutes (5.1 minutes previous season). The stability values of 8.0 and 7.9 minutes compared equally well. The weighted average alveogram strength was 37.6 cm^2 and the weighted average P/L value 0.74 (36.7 cm^2 and 0.96 the previous season). The distensibility of the dough reported on the Alveograph was slightly longer during 2013/2014. A combination of this and also a slightly lower stability

value resulted in the observed decrease in P/L value. The weighted average extensogram strength was 92 cm² (84 cm² previous season).

The 100 g loaves baked using the straight-dough optimized bread making method, received an evaluation rated as "Excellent". The basis for this evaluation refers to the relationship between the protein content and the bread volume.

Only one of the forty samples selected to represent different regions as well as classes and grades, tested positive for mycotoxin residues, deoxynivalenol (DON) to be specific with a level of 151 µg/kg.

Graph 10: Differences in the distribution of protein content over the last 3 seasons



Graph 11: Differences in the distribution of protein content between the 3 production areas

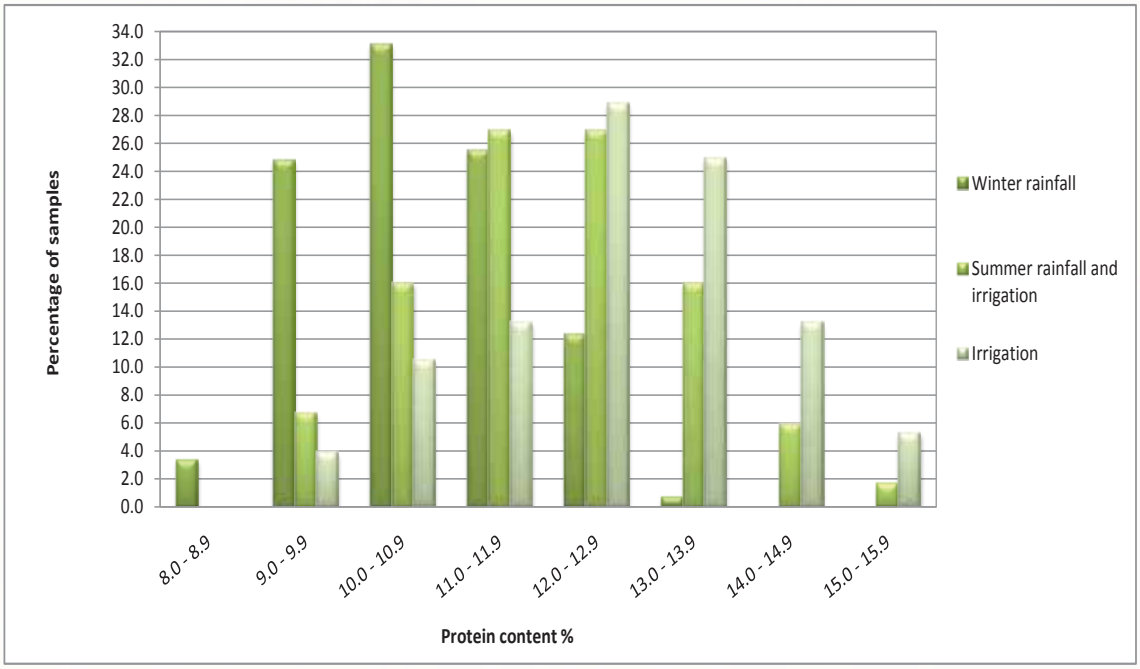
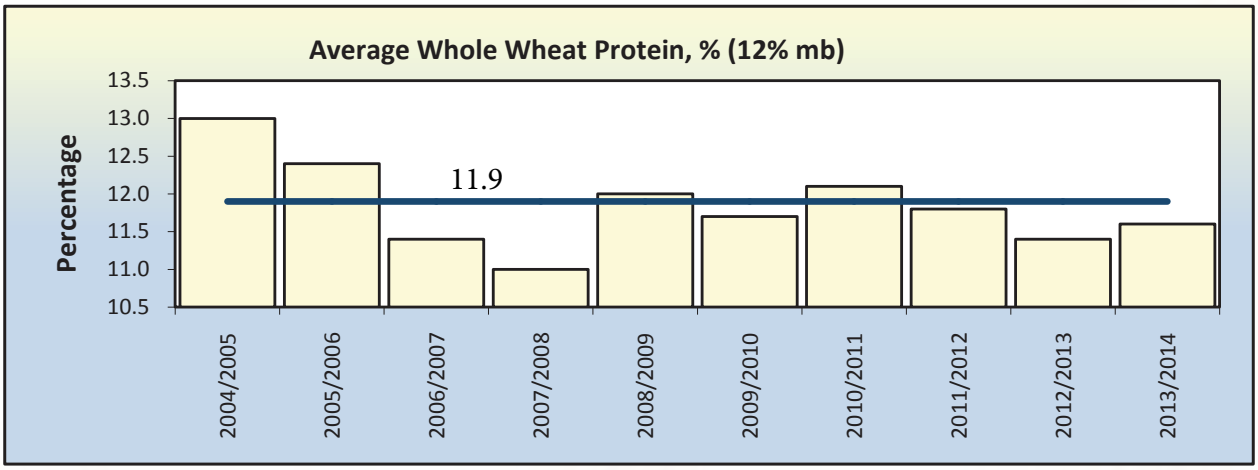
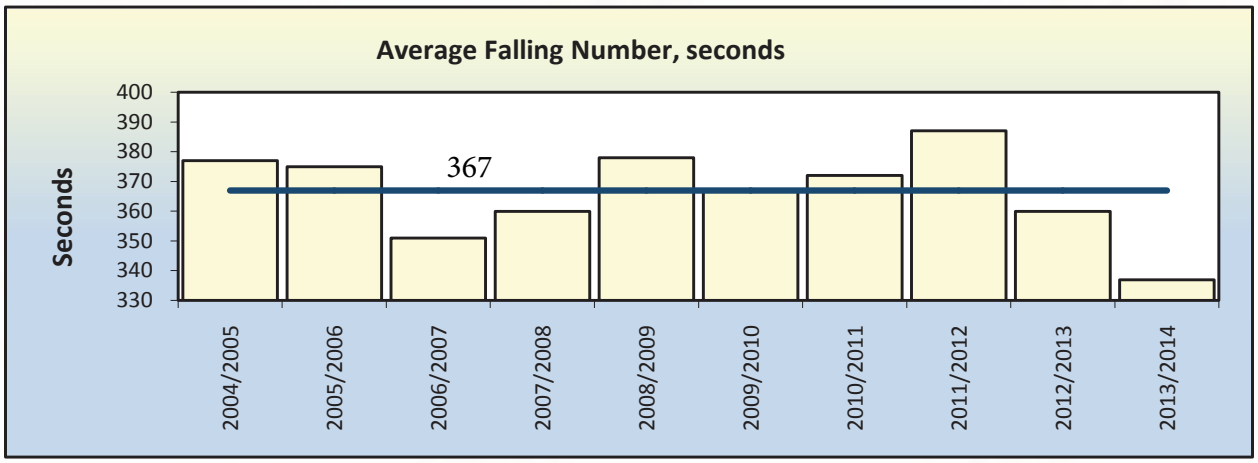


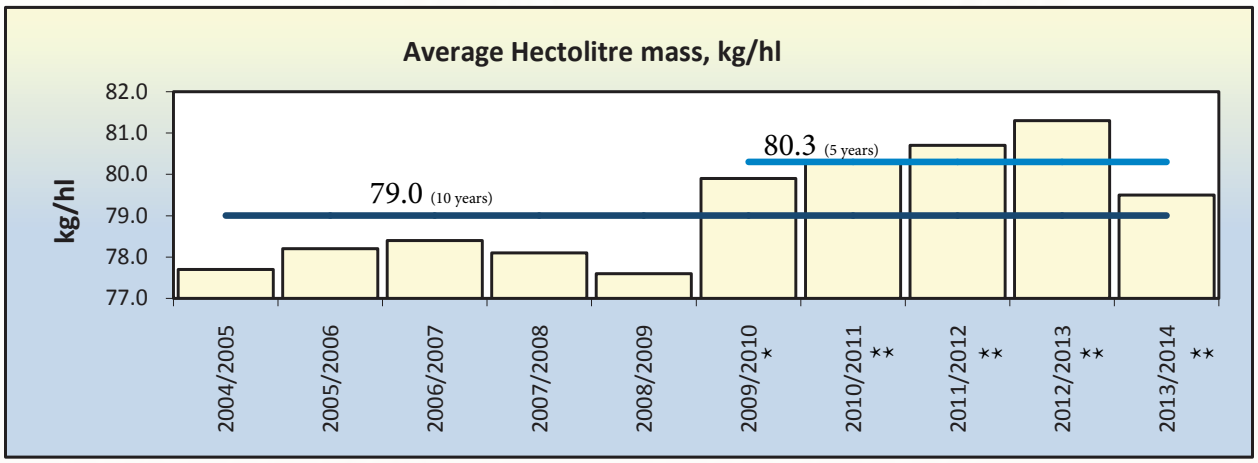
Table 3: Weighted average results for the last three seasons

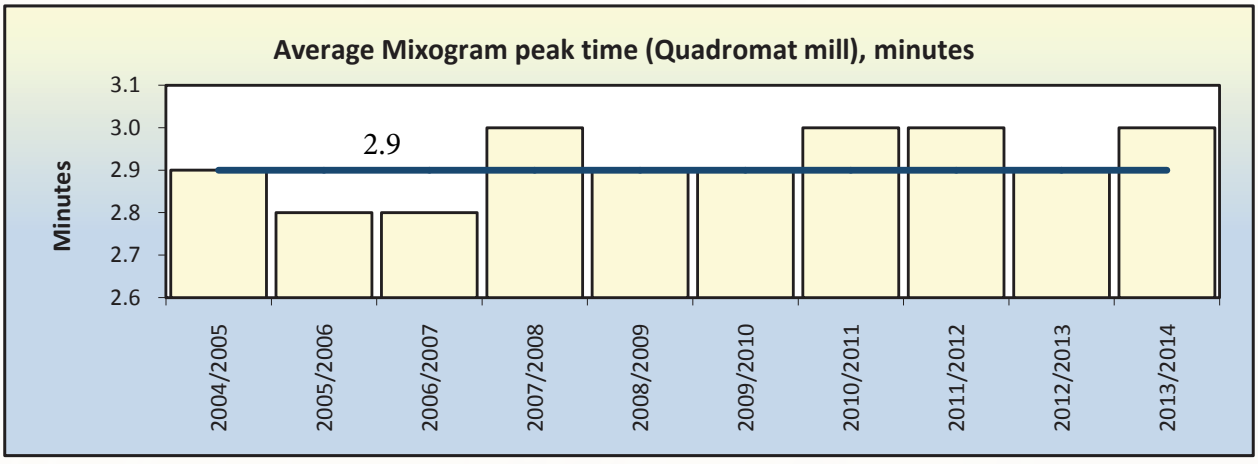
	2013/2014					2012/2013					2011/2012				
Region	**Protein (12% mb), %**	**FN, sec**	**Hlm, kg/hl**	**Mixo PT, min**	***n***	**Protein (12% mb), %**	**FN, sec**	**Hlm, kg/hl**	**Mixo PT, min**	***n***	**Protein (12% mb), %**	**FN, sec**	**Hlm, kg/hl**	**Mixo PT, min**	***n***
1	10.9	369	78.8	2.9	*4*	-	-	-	-	-	11.9	394	80.4	3.2	*3*
2	10.5	355	78.5	3.2	*20*	11.0	396	80.5	3.1	*20*	12.3	421	77.9	3.0	*14*
3	10.5	361	78.6	2.9	*55*	11.0	385	82.4	2.6	*69*	11.7	412	81.2	3.1	*55*
4	10.6	331	77.8	3.0	*31*	10.6	397	83.1	2.6	*28*	11.4	406	80.8	3.0	*37*
5	10.9	300	79.2	2.6	*23*	11.0	341	81.5	2.6	*19*	11.9	420	82.0	2.9	*25*
6	11.2	325	79.4	2.5	*12*	10.6	276	79.8	3.0	*35*	11.1	413	81.1	2.6	*23*
7	-	-	-	-	-	-	-	-	-	-	11.1	378	83.3	3.1	*5*
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	11.5	382	81.8	2.8	*19*	12.0	378	82.3	2.7	*31*	11.6	388	82.6	2.7	*35*
11	12.4	375	81.0	2.5	*14*	12.0	405	82.4	2.6	*16*	11.4	375	80.2	2.6	*17*
12	12.2	357	80.8	3.1	*6*	12.6	348	81.6	3.1	*2*	12.6	400	81.6	2.8	*6*
13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	12.0	368	82.2	3.2	*2*	12.6	367	80.0	3.8	*1*	9.8	508	81.3	3.3	*1*
15	-	-	-	-	-	11.4	376	82.8	2.5	*3*	10.8	399	81.0	2.6	*10*
16	-	-	-	-	-	-	-	-	-	-	11.1	411	80.5	3.2	*3*
17	12.1	257	78.3	3.0	*8*	12.7	440	83.0	2.8	*1*	12.2	347	78.9	3.1	*4*
18	11.8	340	79.0	3.1	*2*	13.4	387	78.7	4.0	*2*	12.2	374	80.4	2.5	*4*
19	12.3	319	79.1	3.4	*11*	13.1	324	81.3	3.8	*2*	12.4	401	80.8	3.6	*8*
20	11.4	379	81.8	3.2	*7*	-	-	-	-	-	11.8	406	80.9	3.0	*8*
21	-	-	-	-	-	11.6	336	81.0	2.5	*1*	12.4	372	81.1	3.1	*3*
22	11.8	377	79.7	3.5	*3*	12.4	323	82.1	2.8	*4*	11.4	345	80.4	3.2	*3*
23	14.0	295	77.1	3.2	*13*	12.2	306	78.3	3.0	*14*	10.9	292	79.0	3.2	*30*
24	12.7	373	80.3	2.9	*13*	12.1	298	80.0	3.2	*7*	11.9	381	81.2	3.1	*15*
25	12.9	309	79.9	3.3	*12*	11.4	321	79.2	3.7	*18*	12.0	339	78.7	3.7	*27*
26	11.9	304	79.7	3.2	*7*	12.1	373	80.8	3.5	*6*	12.6	362	79.0	3.4	*16*
27	12.4	282	78.8	3.5	*2*	12.2	378	79.2	3.6	*6*	12.9	365	80.6	3.4	*5*
28	12.2	278	79.3	3.4	*26*	11.3	352	80.9	3.6	*21*	12.6	343	80.6	3.2	*37*
29	12.7	275	80.8	3.0	*1*	13.1	278	83.5	2.4	*1*	-	-	-	-	-
30	11.4	345	82.4	3.0	*2*	12.3	393	82.8	3.0	*6*	13.9	432	82.4	3.1	*6*
31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32	12.8	307	80.5	2.7	*9*	-	-	-	-	-	12.1	415	82.1	3.1	*3*
33	12.5	278	80.3	3.0	*8*	12.1	417	81.6	4.3	*2*	11.4	468	80.7	3.2	*6*
34	11.5	353	81.4	2.8	*8*	11.4	380	80.5	3.0	*8*	11.7	407	83.8	3.1	*5*
35	12.0	384	81.7	3.4	*18*	12.4	378	79.7	3.1	*13*	11.6	456	81.0	3.1	*12*
36	12.0	391	83.3	2.6	4	11.4	390	82.3	3.3	*1*	12.0	473	82.4	2.9	*7*
Ave.	**11.6**	**337**	**79.5**	**3.0**	**340**	**11.4**	**360**	**81.3**	**2.9**	***337***	**11.8**	**387**	**80.7**	**3.0**	***433***

Graph 12: 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 4: Comparison of Flour Quality over the last four seasons

Flour Quality 2013/2014 season			
Flour protein (12% mb) (%)	10.7	Farinogram abs. (14% mb) (%)	60.1
Bread volume 100g (cm^3)	868	Farinogram dev. time (min.)	5.2
Mixogram (Bühler) peak time (min)	2.8	Alveogram strength (cm^2)	37.6
Wet gluten (14% mb) (%)	29.5	Alveogram P/L	0.74
Dry gluten (14% mb) (%)	10.4	Extensogram strength (cm^2)	92

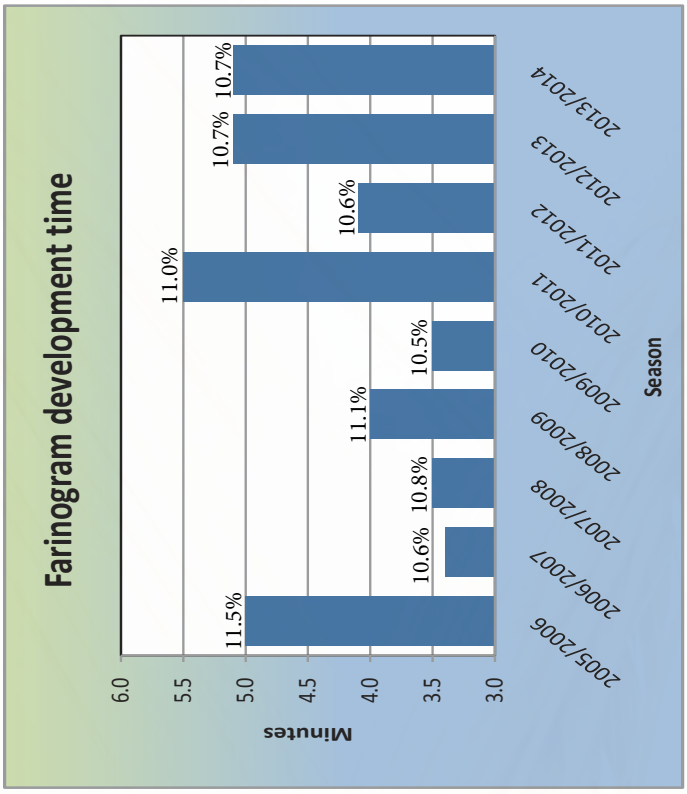
Flour Quality 2012/2013 season			
Flour protein (12% mb) (%)	10.7	Farinogram abs. (14% mb) (%)	60.8
Bread volume 100g (cm^3)	886	Farinogram dev. time (min.)	5.1
Mixogram (Bühler) peak time (min)	2.8	Alveogram strength (cm^2)	36.7
Wet gluten (14% mb) (%)	29.0	Alveogram P/L	0.96
Dry gluten (14% mb) (%)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

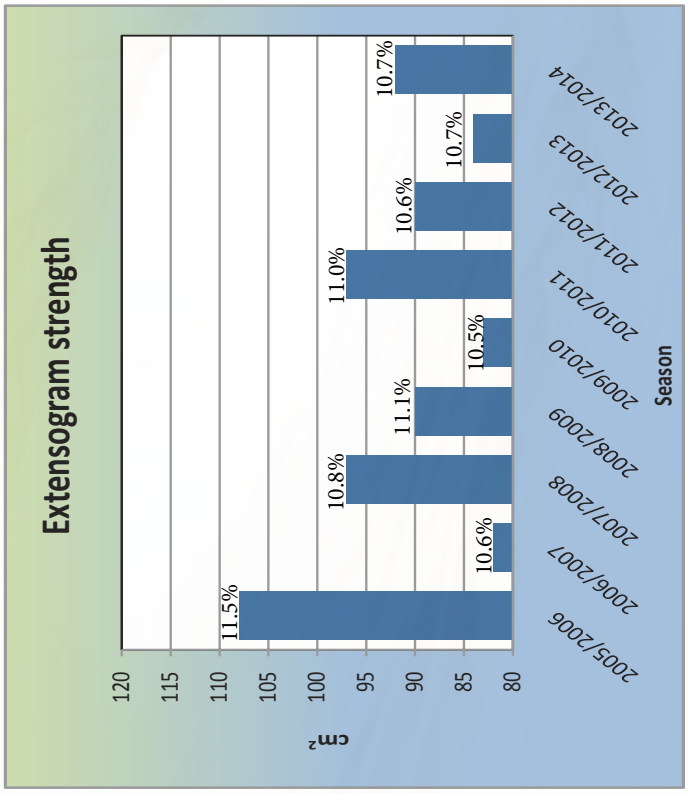
Flour Quality 2011/2012 season			
Flour protein (12% mb) (%)	10.6	Farinogram abs. (14% mb) (%)	61.3
Bread volume 100g (cm^3)	852	Farinogram dev. time (min.)	4.1
Mixogram (Bühler) peak time (min)	3.0	Alveogram strength (cm^2)	35.0
Wet gluten (14% mb) (%)	28.7	Alveogram P/L	0.89
Dry gluten (14% mb) (%)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

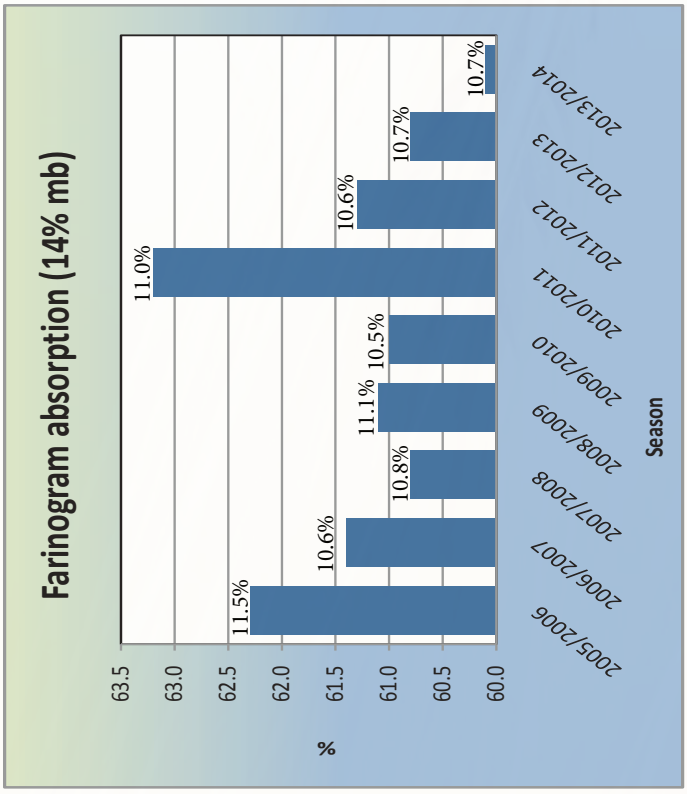
Flour Quality 2010/2011 season			
Flour protein (12% mb) (%)	11.0	Farinogram abs. (14% mb) (%)	63.2
Bread volume 100g (cm^3)	832	Farinogram dev. time (min.)	5.5
Mixogram (Bühler) peak time (min)	2.8	Alveogram strength (cm^2)	36.2
Wet gluten (14% mb) (%)	29.7	Alveogram P/L	1.29
Dry gluten (14% mb) (%)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

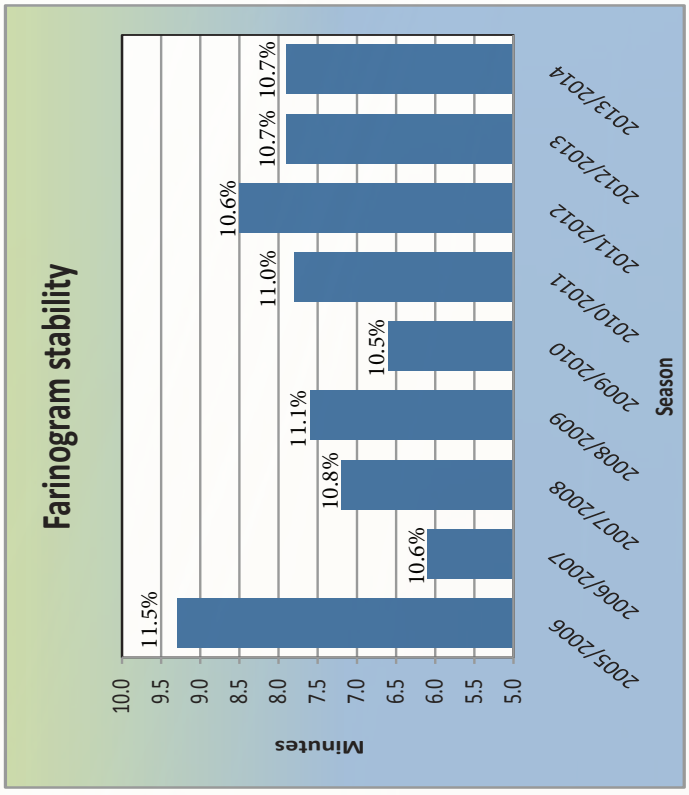
Graph 13: Comparison of rheological quality over seasons

(Flour protein content (12% mb) is indicated above each bar)



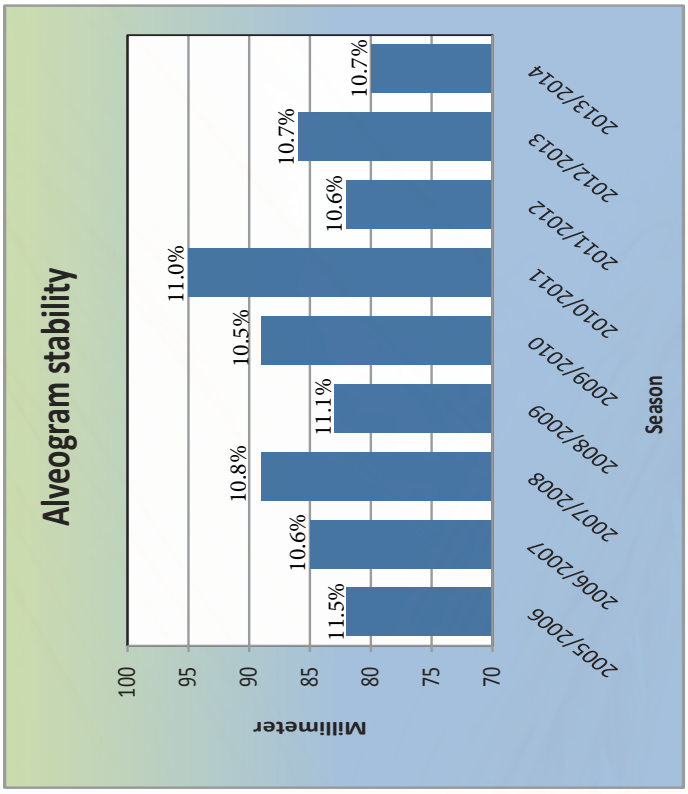


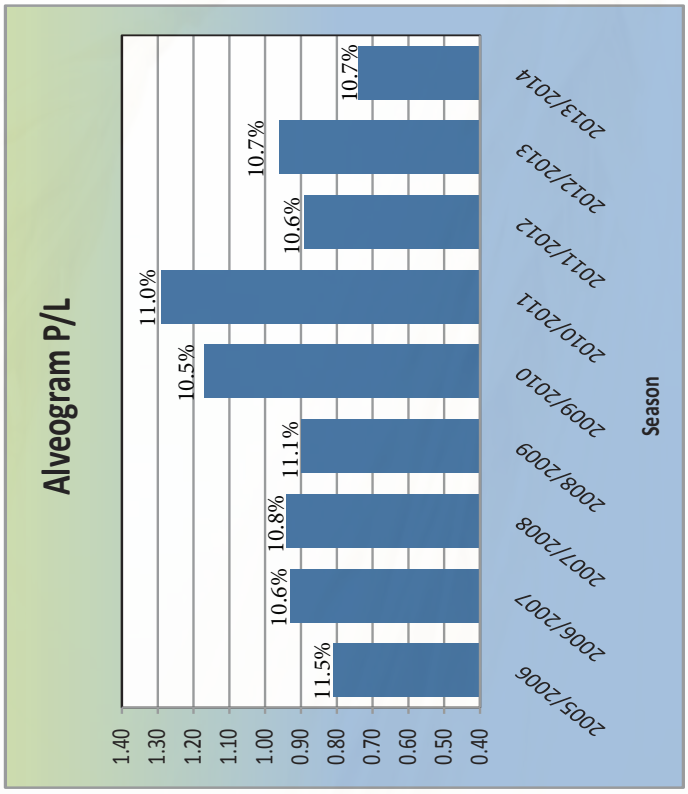


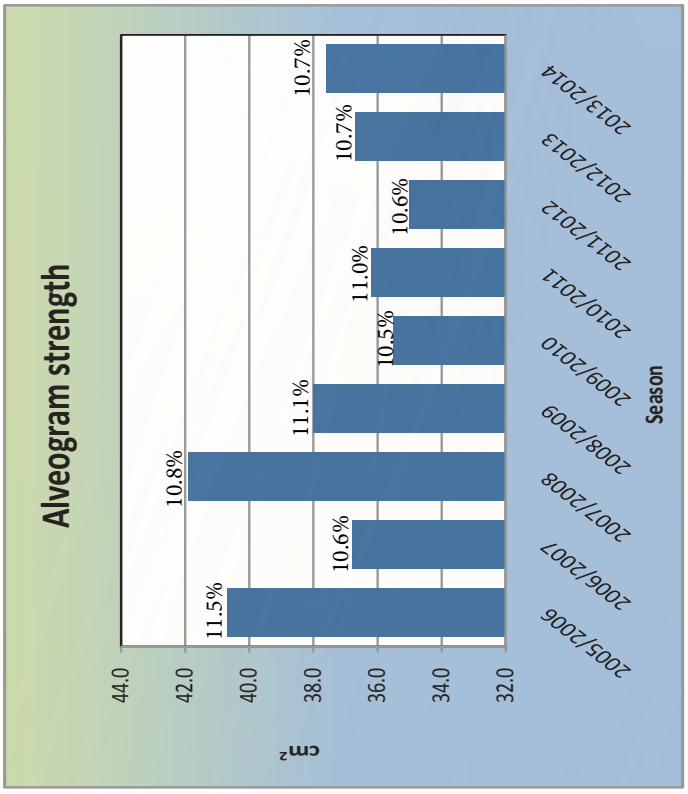


Graph 13: Comparison of rheological quality over seasons

(Flour protein content (12% mb) is indicated above each bar) (continue)







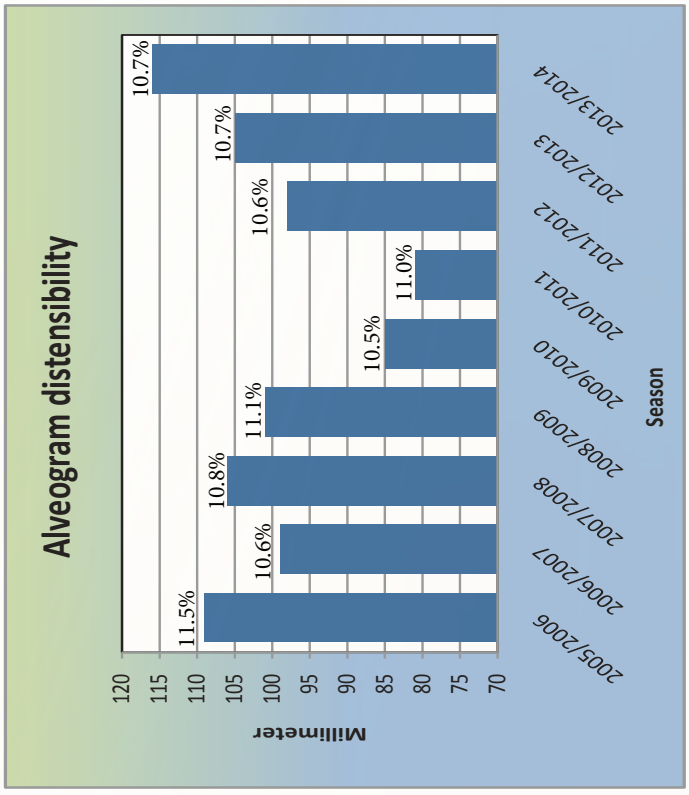


Table 5: Regional quality weighted averages

	Winter rainfall area (Western Cape)			*Summer rainfall and Irrigation area (Free State)*			*Irrigation areas*			*RSA average*		
Number of samples per area	*145*			*76*			*119*			*340*		
Regions	1 - 6			21 - 28			10 - 11, 12 - 20, 29 - 33, 34, 35, 36			All		
Hectolitre mass dirty, kg/hl	78.6			79.2			80.9			79.5		
1000 kernel mass (13% mb), g	40.8			37.0			39.0			39.3		
Falling number, sec	341			308			349			337		
Screenings (1,8 mm), %	1.67			1.35			1.36			1.58		
Protein (12% mb), % (ww)	10.7			12.7			12.0			11.6		
Mixogram peak time, min (Quadromat)	2.9			3.3			3.0			3.0		
Composite samples per class and grade	***B1***	***B2***	***B3***	***B1***	***B2***	***B3***	***B1***	***B2***	***B3***	***B1***	***B2***	***B3***
	B4	***UT***	***COW***	***B4***	***UT***	***COW***	***B4***	***UT***	***COW***	***B4***	***UT***	***COW***
Composite samples, n = 70	***5***	***6***	***5***	***6***	***5***	***1***	***12***	***7***	***5***	***23***	***18***	***11***
	4	***3***	-	***1***	***3***	***1***	***3***	***2***	***1***	***8***	***8***	***2***
Bühler extraction, %	72.0	72.5	72.7	72.9	73.3	72.6	73.5	74.5	75.0	73.0	73.5	73.7
	72.6	72.4	-	72.9	72.6	69.9	73.8	73.6	71.8	73.1	72.8	70.9
Flour colour, KJ (wet)	-2.6	-2.9	-3.1	-2.5	-2.7	-2.5	-3.0	-3.0	-3.3	-2.8	-2.9	-3.1
	-3.1	-3.2	-	-2.4	-2.5	-1.8	-3.3	-2.7	-2.7	-3.1	-2.8	-2.3
Colour, Minolta CM5 (dry)												
L*	93.95	94.15	94.18	93.67	93.89	94.00	93.96	93.98	94.18	93.88	94.01	94.16
	94.22	94.28	-	93.88	93.69	93.11	94.02	93.91	94.12	94.10	93.97	93.62
b*	9.19	9.14	9.67	9.66	9.52	9.79	9.37	9.47	9.35	9.41	9.37	9.54
	10.02	10.07	-	9.92	9.36	10.21	9.78	9.23	9.08	9.92	9.59	9.65
Flour protein (12% mb), %	11.3	10.5	9.6	11.9	10.5	9.7	11.9	10.5	9.7	11.8	10.5	9.7
	8.8	8.9	-	9.0	12.5	13.7	9.1	11.3	12.1	8.9	10.9	12.9

Table 5: Regional quality weighted averages (continue)

	Winter rainfall area (Western Cape)			*Summer rainfall and Irrigation area (Free State)*			*Irrigation areas*			*RSA average*		
Regions	1 - 6			21 - 28			10 - 11, 12 - 20, 29 - 33, 34, 35, 36			All		
Composite samples per class and grade	***B1***	***B2***	***B3***	***B1***	***B2***	***B3***	***B1***	***B2***	***B3***	***B1***	***B2***	***B3***
	B4	***UT***	***COW***	***B4***	***UT***	***COW***	***B4***	***UT***	***COW***	***B4***	***UT***	***COW***
Composite samples, n = 70	***5***	***6***	***5***	***6***	***5***	***1***	***12***	***7***	***5***	***23***	***18***	***11***
	4	***3***	***-***	***1***	***3***	***1***	***3***	***2***	***1***	***8***	***8***	***2***
Wet gluten (14% mb), %	33.0	30.0	28.6	32.1	28.5	25.8	32.6	28.9	27.0	34.1	29.2	27.6
	22.8	24.9	-	21.8	33.4	36.8	24.1	29.9	36.3	23.2	29.3	36.6
Dry gluten (14% mb), %	11.7	10.2	10.6	11.6	10.1	9.2	11.4	10.1	9.3	12.1	10.1	9.9
	8.1	8.9	-	7.6	11.6	12.8	8.3	10.5	12.9	8.1	10.3	12.9
Gluten Index	80	84	83	89	88	93	88	87	81	91	86	83
	78	94	-	96	90	88	85	85	97	83	90	93
Farinogram: Water absorption (14% mb), %	61.9	61.2	59.3	62.0	59.8	59.0	61.3	59.7	58.3	61.6	60.2	58.8
	57.5	57.3	-	60.7	61.5	60.9	56.6	61.0	59.9	57.6	59.8	60.4
Farinogram: Development time, min	4.6	4.3	4.0	7.0	5.2	4.7	7.0	5.6	4.2	6.5	5.1	4.2
	2.2	2.3	-	1.5	7.7	6.2	4.3	5.3	5.2	2.9	5.1	5.7
Alveogram: Strength (S), cm²	39.3	34.2	29.5	47.6	38.2	35.9	45.6	35.4	29.5	44.8	35.8	30.1
	26.8	27.7	-	33.9	53.7	51.1	26.2	37.1	40.2	27.5	39.8	45.7
Alveogram: P/L	0.85	0.79	0.79	0.90	0.80	0.84	0.63	0.66	0.55	0.75	0.74	0.69
	0.84	0.78	-	2.13	0.71	0.59	0.61	0.53	0.35	0.92	0.69	0.47
Extensogram: Strength, cm²	88	74	66	120	92	78	114	89	74	110	85	71
	64	69	-	88	137	139	76	88	118	72	99	129
Mixogram peak time, min	2.6	2.5	2.5	2.9	3.0	3.3	2.9	2.8	2.7	2.8	2.8	2.7
	2.7	3.1	-	3.8	3.1	3.3	3.1	2.5	2.5	3.0	3.0	2.9
Relationship between protein and bread volume	VG	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX
	EX	EX	-	VG	VG	EX	EX	EX	EX	EX	EX	EX

EX = Excellent VG = Very Good

REGIONAL QUALITY SUMMARY

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 78.6 kg/hl compared to the previous season's 81.7 kg/hl. The thousand kernel mass averaged 40.8 gram, 1.2 g lower than the previous season. The average falling number was 341 seconds. Three samples of the western Rûens region had falling number values below 220 seconds. The average whole wheat protein content of 10.7% (12% mb) (10.8% in 2012/2013) was the lowest of the different production areas, confirming a trend observed over previous seasons.

The screenings of 1.67% was little higher than the previous season's 1.44%. The Bühler extraction averaged 72.4% (average of wheat grades B1 to B4 and UT), similar to 2012/2013. The average wet colour of the flour was -2.9 KJ units and the dry colour L* value (indicating lightness) 94.14. This colour indicates a very white flour that is preferred by millers and bakers. Both the wet and dry colour compares very well with the previous season.

The average wet and dry gluten values namely 28.1% and 10.0% (14% mb) respectively correlated well with the flour protein content of 10.0% (12% mb). The gluten index was 83. The average farinogram absorption was 59.8% and the development time 3.7 minutes, the shortest of the three regions. The average alveogram strength was 32.2 cm^2, slightly lower, but still comparing well with the previous season. The alveogram P/L value was 0.81 compared to the 1.01 of 2012/2013. The average strength on the extensogram was 73 cm^2. The mixogram peak time (Bühler mill) averaged 2.6 minutes. The 100-gram baking test showed an excellent relationship between protein content and bread volume.

SUMMER RAINFALL AND IRRIGATION AREA
(Free State)

The number of tons produced in production regions 21 to 28, which fall within the Free State Province, continue to decrease. The drought conditions experienced in the Western as well as Southwestern parts attributed to the decline. Early planting commences in June and continues until August. Harvesting takes place from November to January.

The average hectolitre mass was 79.2 kg/hl. The physical characteristic thousand kernel mass (37.0 g) was slightly higher than the previous season's 36.2 g. The average screenings was 1.35%. The average whole wheat protein content increased from 11.7% the previous season to 12.7% (12% mb) this season. Despite the fact that 50% 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 308 seconds was still within the ideal range.

The wet gluten content (14% mb) was 30.6% and the dry gluten 10.8%. The gluten index was 89. The average Bühler extraction percentage in the Free State was 72.2% (72.4% previous season). The Kent Jones flour colour was -2.5 KJ units (-2.7 KJ units in the previous season) and the L* value 93.74 (previously 93.61).

The average farinogram water absorption was 60.9%, slightly lower than in 2012/2013. The development time averaged 6.1, the longest of the three areas. The average alveogram strength of 44.6 cm^2 and extensogram strength of 111 cm^2 was the highest of the three regions, as can be expected as this region also had the highest protein content. These results, including the gluten, indicate that the Free State regions produced wheat with the strongest rheological (dough) quality.

The mixogram (Bühler) peak time of 3.1 minutes, gave the Free State the longest average mixogram peak time of the different production areas. The 100-gram baking test showed that the relationship between protein content and bread volume was excellent between the different grades.

IRRIGATION AREAS
(Northern Cape, North West, Mpumalanga, Gauteng, Limpopo and KwaZulu-Natal)

Production regions 10 - 11, 12 – 20, 29 – 33, 34, 35 and 36 falls within the Irrigation areas. The irrigation areas are divided into the cooler central areas and the warmer northern areas.

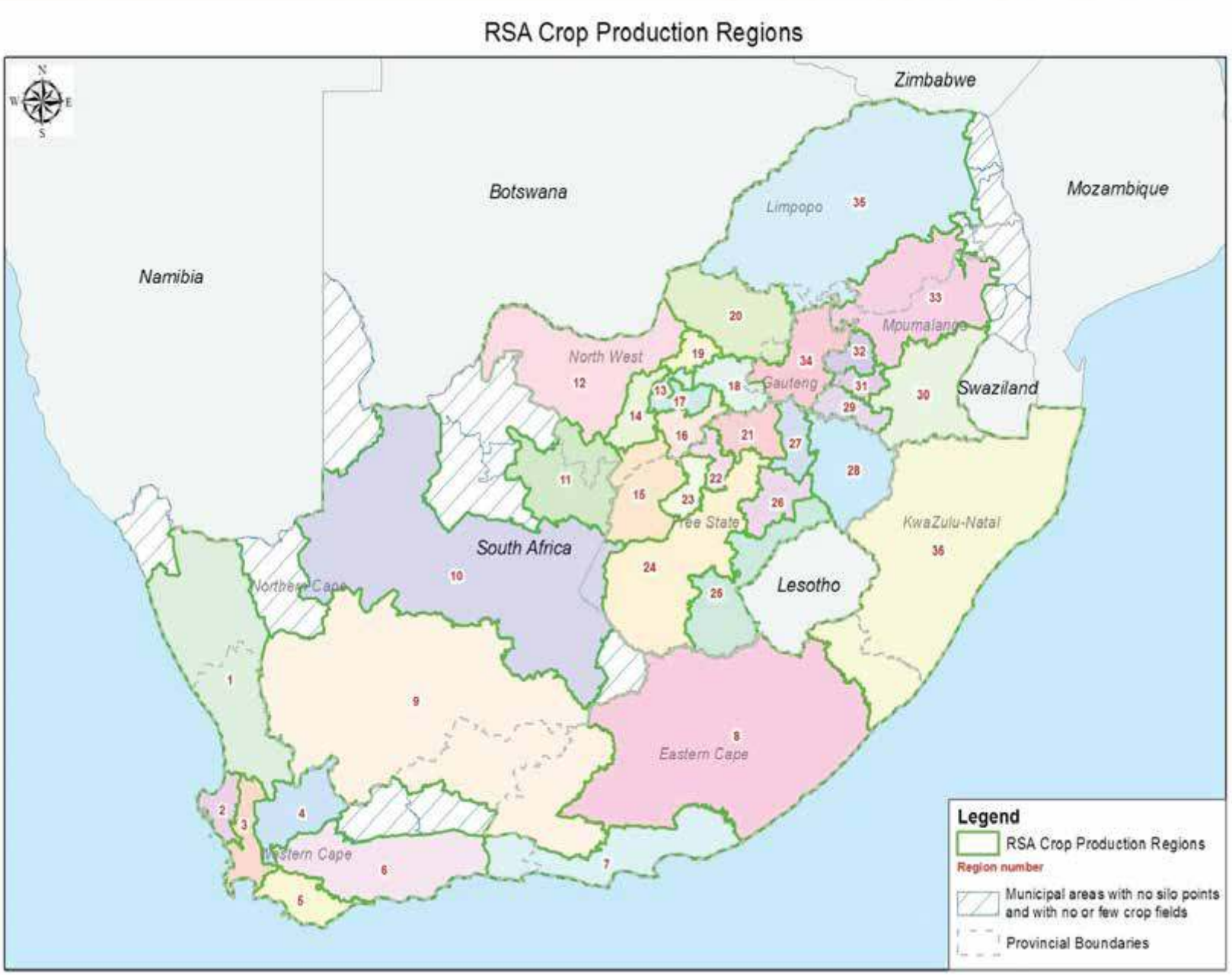
The irrigation wheat had the highest weighted average hectolitre mass of 80.9 kg/hl. The thousand kernel mass was 39.0 g. The average falling number was 349 seconds and the screenings averaged 1.36%. Four samples from Mpumalanga had falling numbers below 220 seconds. Whole wheat protein content averaged 12.0% equal to 2012/2013.

The average Bühler extraction percentage was 74.0. The Irrigation areas gave on average almost 2% higher extraction than the winter and summer rainfall areas.

The dry colour L* value 94.01 and the Kent Jones wet colour value -3.1 KJ units equaled the previous season. The wet and dry gluten contents were 29.9% and 10.4% respectively and the gluten index 86. The average farinogram water absorption was 59.9% (60.4% during previous season), with an average farinogram development time half a minute longer than in 2012/2013.

The average alveogram strength was 37.8 cm^2 and the average P/L 0.61 (36.8 cm^2 and 0.67 respectively the previous season). Lower P/L values are indicative of dough being more extensible (having higher L values) than dough with higher P/L values. The average extensogram strength was 96 cm^2. The average mixogram (Bühler) peak time was 2.8 minutes which was slightly longer than the previous two seasons. The relationship between protein content and 100 g bread volume was also shown to be excellent.

Please see the RSA Crop Production map on the next page as well as the regional results provided on pages 21 to 48.



Regional map with gratitude to the Grain Silo Industry and SiQ.

South African Quality data per production region

WINTER RAINFALL WHEAT

PRODUCTION REGION	(1) Namaqualand	(2) Swartland Western Region
Intake silos	Bitterfontein Graafwater Landplaas Vanrhynsdorp Vredendal	Bergrivier Darling Koperfontein Vredenburg

WHEAT	ave	min	max	stdev	ave	min	max	stdev
Protein (12% mb), %	10.9	9.3	13.0	1.63	10.5	8.9	13.0	1.02
Falling number, sec	369	323	388	30.80	355	256	388	27.84
1000 Kernel mass (13% mb), g	39.0	36.3	40.4	1.85	36.8	29.5	47.1	3.79
Hectolitre mass (dirty), kg/hl	78.8	78.3	79.3	0.41	78.5	75.6	82.3	1.76
Screenings (<1.8mm), %	2.43	1.99	2.84	0.35	1.31	0.23	5.35	1.10
Total damaged kernels, %	0.55	0.12	1.28	0.54	0.07	0.00	0.40	0.10
Combined deviations, %	3.64	3.09	4.67	0.71	1.73	0.30	5.47	1.08
Number of samples	***4***				***20***			

CULTIVARS					
	SST 015	33.8		SST 88	41.4
cultivars	SST 027	17.5		SST 027	27.3
with highest %	SST 88	14.0		SST 015	19.5
occurrence	SST 047	10.8		SST 047	4.2
	SST 056	8.5		SST 056	3.8
Number of samples	***4***			***20***	

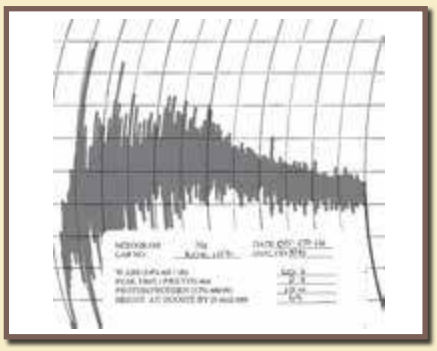
MIXOGRAM (Quadromat)	ave	min	max	stdev	ave	min	max	stdev
Peak time, min	2.9	2.3	3.8	0.63	3.2	2.5	3.8	0.40
Tail height (6min), mm	48	44	49	2.38	48	43	58	3.72
Number of samples	***4***				***20***			

	COMPOSITE SAMPLES											
CLASS AND GRADE	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**
BÜHLER EXTRACTION, %	71.5	71.7	-	-	-	-	72.2	72.6	72.9	72.5	72.4	-
FLOUR												
Protein (12% mb), %	12.2	10.4	-	-	-	-	10.4	10.4	9.9	8.7	9.1	-
Colour, KJ (wet)	-2.7	-2.9	-	-	-	-	-2.1	-2.7	-3.2	-3.3	-3.2	-
Colour, Minolta CM5 (dry)												
L*	94.04	94.12	-	-	-	-	93.50	94.02	94.33	94.40	94.32	-
a*	0.36	0.35	-	-	-	-	0.46	0.36	0.34	0.29	0.32	-
b*	8.70	9.13	-	-	-	-	10.54	9.41	10.51	10.47	10.63	-
RVA												
Peak Viscosity, cP	2057	2133	-	-	-	-	2458	1994	2410	2328	2351	-
Minimum viscosity (Through), cP	1488	1583	-	-	-	-	2117	1733	1980	1807	1746	-
Final Viscosity, cP	2246	2384	-	-	-	-	2703	2217	2802	2793	2788	-
Peak Time, min	7.00	7.00	-	-	-	-	7.00	6.87	7.00	7.00	7.00	-
GLUTEN												
Wet gluten (14% mb), %	38.4	29.3	-	-	-	-	26.7	28.1	26.3	21.4	23.4	-
Dry gluten (14% mb), %	13.7	10.2	-	-	-	-	9.3	10.3	9.9	7.8	8.1	-
Gluten Index	90	75	-	-	-	-	94	93	89	93	94	-
FARINOGRAM												
Water absorption (14% mb), %	63.9	61.1	-	-	-	-	57.3	60.8	57.9	56.5	57.3	-
Development time, min	4.9	4.2	-	-	-	-	2.5	4.0	5.8	2.3	2.2	-
Stability, min	7.3	7.4	-	-	-	-	11.7	6.2	8.1	6.6	6.7	-
Mixing tolerance index, BU	32	34	-	-	-	-	22	39	37	33	27	-
EXTENSOGRAM (45 min pull)												
Area, cm^2	91	74	-	-	-	-	105	62	71	72	72	-
Maximum height, BU	326	304	-	-	-	-	486	254	314	336	337	-
Extensibility, mm	201	172	-	-	-	-	160	173	161	153	152	-
ALVEOGRAM												
Strength (S), cm^2	43.9	34.1	-	-	-	-	40.2	31.8	33.0	30.9	30.0	-
Stability (P), mm	96	88	-	-	-	-	97	82	77	76	77	-
Distensibility (L), mm	114	95	-	-	-	-	76	99	101	100	94	-
Configuration ratio (P/L)	0.84	0.93	-	-	-	-	1.28	0.83	0.76	0.76	0.82	-
MIXOGRAM												
Peak time, min	2.3	2.8	-	-	-	-	3.7	2.5	2.8	2.8	3.3	-
100g BAKING TEST												
Loaf volume, cm^3	912	823	-	-	-	-	795	773	803	767	792	-
Evaluation (see page 60)	1	0	-	-	-	-	1	2	0	0	0	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

1



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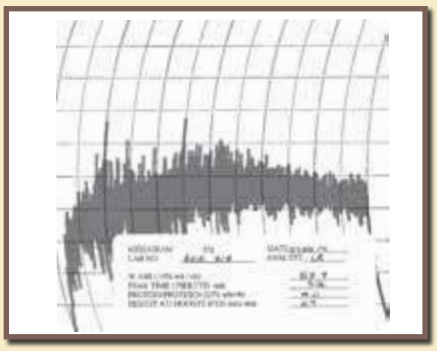
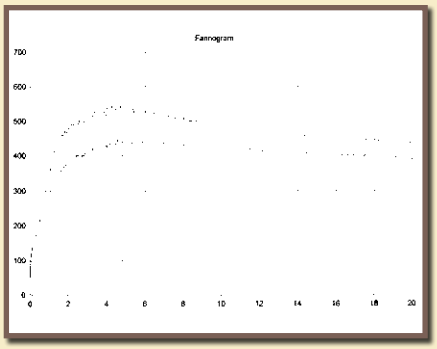


FARINOGRAM

1



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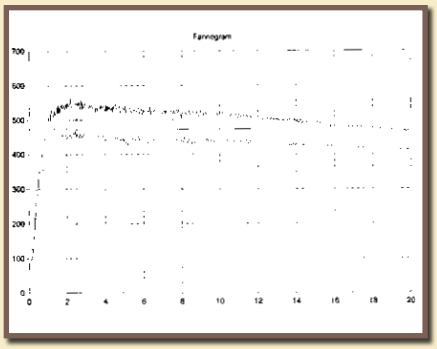
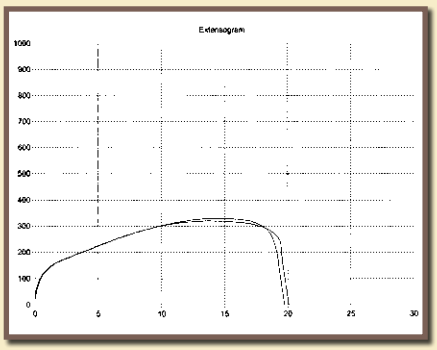


EXTENSOGRAM

1



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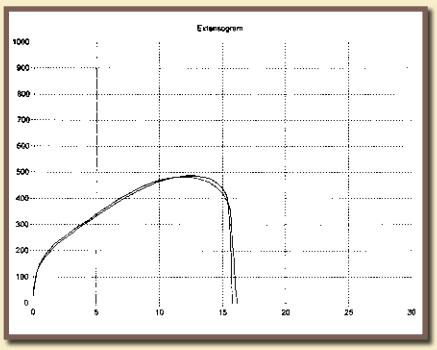
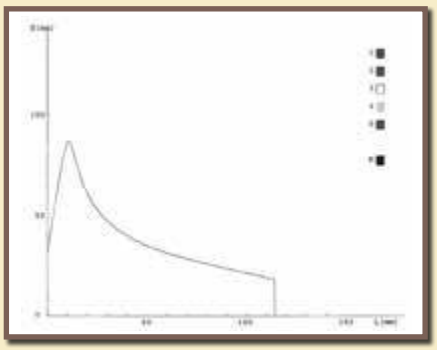


ALVEOGRAM

1



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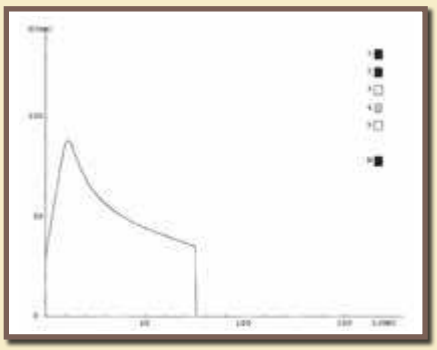


South African Quality data per production region

WINTER RAINFALL WHEAT

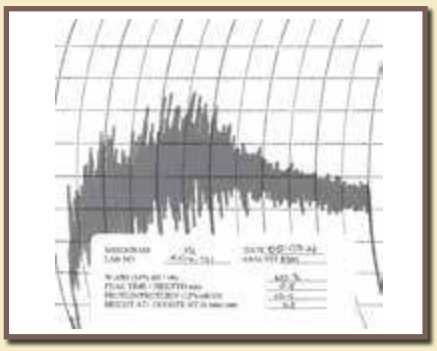
	(3)				(4)			
PRODUCTION REGION	**Swartland Central Region**				**Swartland Eastern Region**			
Intake silos	Eendekuil Klipheuwel Koringberg Malmesbury Moorreesburg Moravia Piketberg Pools Ruststasie				Ceres Gouda Halfmanshof Leliedam Porterville Riebeeck-Wes			
WHEAT	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Protein (12% mb), %	10.5	8.4	12.4	1.04	10.6	8.9	12.4	0.93
Falling number, sec	361	302	411	25.17	331	256	505	45.25
1000 Kernel mass (13% mb), g	40.5	35.2	48.5	2.74	39.5	35.5	48.6	3.43
Hectolitre mass (dirty), kg/hl	78.6	75.4	82.4	1.64	77.8	72.5	82.7	1.99
Screenings (<1.8mm), %	1.95	0.11	3.85	1.00	1.71	0.26	3.73	1.11
Total damaged kernels, %	0.13	0.00	1.87	0.29	0.17	0.00	0.84	0.21
Combined deviations, %	2.79	0.53	4.63	1.12	2.66	0.64	5.12	1.41
Number of samples	***55***				***31***			
CULTIVARS								
cultivars with highest % occurrence	SST 015	35.5			SST 015	30.7		
	SST 027	23.5			SST 027	26.3		
	SST 88	18.8			SST 88	18.6		
	SST 056	14.2			SST 056	14.7		
	SST 047	3.3			SST 047	4.4		
Number of samples	***55***				***31***			
MIXOGRAM (Quadromat)	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Peak time, min	2.9	2.3	3.8	0.40	3.0	2.3	4.0	0.46
Tail height (6min), mm	48	40	54	3.21	47	39	53	2.95
Number of samples	***55***				***31***			

	COMPOSITE SAMPLES											
CLASS AND GRADE	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**
BÜHLER EXTRACTION, %	72.5	72.4	72.8	73.1	72.4	-	-	73.2	73.3	73.3	72.5	-
FLOUR												
Protein (12% mb), %	11.2	10.5	9.7	9.0	8.0	-	-	10.8	9.6	8.7	9.6	-
Colour, KJ (wet)	-3.3	-3.3	-3.1	-3.1	-3.4	-	-	-2.9	-3.0	-3.2	-2.9	-
Colour, Minolta CM5 (dry)												
L*	94.44	94.59	94.24	94.14	94.43	-	-	94.04	93.96	94.34	94.10	-
a*	0.34	0.37	0.33	0.33	0.34	-	-	0.41	0.30	0.30	0.33	-
b*	9.30	9.41	9.67	9.99	9.85	-	-	9.35	9.68	9.94	9.74	-
RVA												
Peak Viscosity, cP	2412	2280	2307	2384	2511	-	-	1911	2166	2318	2235	-
Minimum viscosity (Through), cP	1885	1654	1740	1795	1866	-	-	1532	1726	1849	1958	-
Final Viscosity, cP	2770	2640	2717	2840	3057	-	-	2088	2455	2702	2500	-
Peak Time, min	7.00	7.00	7.00	7.00	7.00	-	-	7.00	7.00	7.00	6.73	-
GLUTEN												
Wet gluten (14% mb), %	33.8	28.2	25.8	23.0	-	-	-	30.0	25.3	21.7	26.3	-
Dry gluten (14% mb), %	12.2	10.4	9.2	8.0	-	-	-	10.2	9.0	7.5	9.6	-
Gluten Index	70	93	85	86	-	-	-	94	82	81	94	-
FARINOGRAM												
Water absorption (14% mb), %	61.7	60.0	58.6	57.3	56.4	-	-	59.7	57.9	56.0	58.1	-
Development time, min	5.5	4.2	4.7	3.4	1.4	-	-	4.8	3.5	2.0	3.2	-
Stability, min	7.1	7.7	6.5	7.0	5.3	-	-	5.8	6.2	5.6	5.3	-
Mixing tolerance index, BU	36	30	42	34	39	-	-	41	43	37	44	-
EXTENSOGRAM (45 min pull)												
Area, cm^2	90	82	74	68	64	-	-	82	66	63	70	-
Maximum height, BU	314	318	292	302	316	-	-	285	268	280	300	-
Extensibility, mm	206	185	177	160	141	-	-	202	174	159	167	-
ALVEOGRAM												
Strength (S), cm^2	41.9	37.8	28.9	26.8	24.3	-	-	31.5	26.8	25.1	28.9	-
Stability (P), mm	83	80	69	71	71	-	-	68	63	59	68	-
Distensibility (L), mm	134	124	114	95	79	-	-	131	117	113	109	-
Configuration ratio (P/L)	0.62	0.65	0.61	0.75	0.90	-	-	0.52	0.54	0.52	0.62	-
MIXOGRAM												
Peak time, min	2.2	2.5	2.5	2.8	3.3	-	-	2.4	2.7	2.7	2.8	-
100g BAKING TEST												
Loaf volume, cm^3	876	839	840	785	715	-	-	890	812	743	862	-
Evaluation (see page 60)	0	0	0	0	0	-	-	0	0	0	0	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

3



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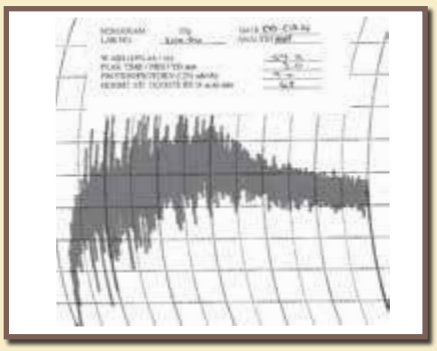
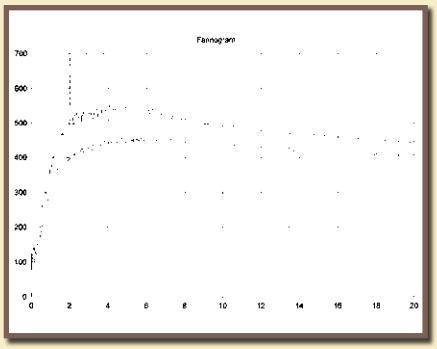


FARINOGRAM

3



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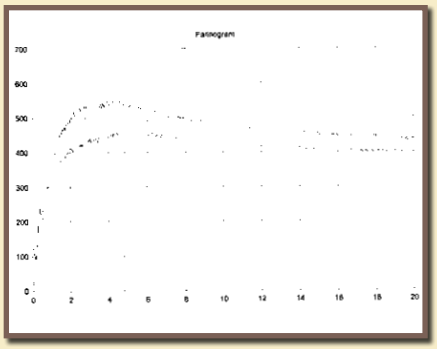
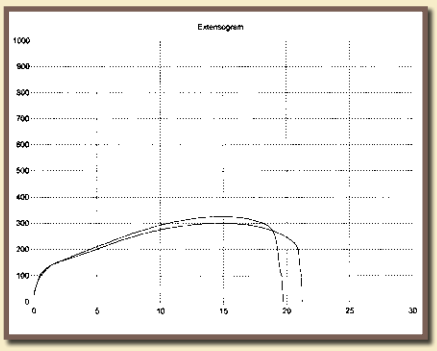


EXTENSOGRAM

3



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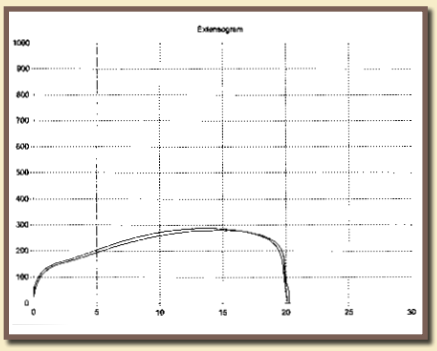
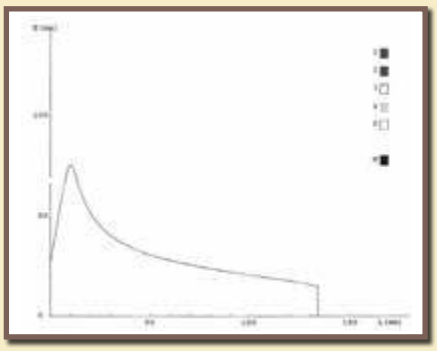


ALVEOGRAM

3



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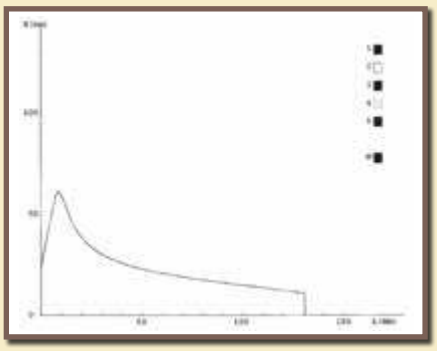


South African Quality data per production region

WINTER RAINFALL WHEAT

PRODUCTION REGION	(5) Rûens Western Region	(6) Rûens Eastern Region
Intake silos	Bredasdorp Caledon Klipdale Krige Napier Protem Rietpoel Villiersdorp	Albertinia Ashton Camfer Heidelberg Karringmelksrivier Kleinberg Protem Riversdal Swellendam

WHEAT	(5) ave	(5) min	(5) max	(5) stdev	(6) ave	(6) min	(6) max	(6) stdev
Protein (12% mb), %	10.9	9.0	12.6	0.95	11.2	9.7	12.6	0.94
Falling number, sec	300	130	375	71.42	325	248	392	37.63
1000 Kernel mass (13% mb), g	44.7	40.8	48.1	2.13	45.1	38.8	47.7	2.33
Hectolitre mass (dirty), kg/hl	79.2	74.5	82.9	2.17	79.4	78.8	80.3	0.53
Screenings (<1.8mm), %	1.39	0.25	2.93	0.77	1.11	0.53	4.43	1.10
Total damaged kernels, %	0.54	0.00	3.12	0.76	0.21	0.00	1.04	0.33
Combined deviations, %	2.57	0.75	5.88	1.44	1.80	0.99	5.86	1.33
Number of samples	***23***				***12***			

CULTIVARS	(5)		(6)	
	SST 027	37.1	SST 015	41.2
cultivars	SST 88	30.1	SST 027	31.8
with highest %	SST 015	25.1	SST 88	14.9
occurrence	SST 047	4.7	SST 056	11.6
	SST 056	3.0	SST 57	0.5
Number of samples	***23***		***12***	

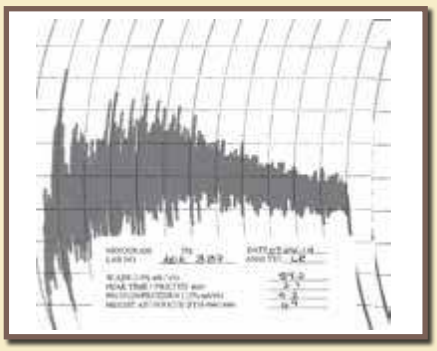
MIXOGRAM (Quadromat)	(5) ave	(5) min	(5) max	(5) stdev	(6) ave	(6) min	(6) max	(6) stdev
Peak time, min	2.6	2.0	2.8	0.24	2.5	2.3	2.7	0.15
Tail height (6min), mm	49	44	54	2.60	51	47	55	2.55
Number of samples	***23***				***12***			

	COMPOSITE SAMPLES											
CLASS AND GRADE	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**
BÜHLER EXTRACTION, %	71.3	72.4	72.1	71.3	-	-	72.4	72.6	72.5	-	-	-
FLOUR												
Protein (12% mb), %	11.4	10.7	9.4	8.8	-	-	11.3	10.5	9.6	-	-	-
Colour, KJ (wet)	-2.1	-2.7	-2.9	-2.6	-	-	-2.8	-3.0	-3.1	-	-	-
Colour, Minolta CM5 (dry)												
L*	93.55	93.93	94.09	94.00	-	-	94.20	94.21	94.28	-	-	-
a*	0.57	0.44	0.34	0.38	-	-	0.36	0.34	0.33	-	-	-
b*	8.83	8.89	9.57	9.67	-	-	8.59	8.65	8.91	-	-	-
RVA												
Peak Viscosity, cP	1825	2177	2107	1611	-	-	2121	2076	2290	-	-	-
Minimum viscosity (Through), cP	1453	1807	1673	1402	-	-	1780	1878	1969	-	-	-
Final Viscosity, cP	2017	2413	2395	1834	-	-	2472	2348	2807	-	-	-
Peak Time, min	6.93	7.00	7.00	6.80	-	-	6.20	6.73	6.20	-	-	-
GLUTEN												
Wet gluten (14% mb), %	-	30.2	30.4	24.9	-	-	-	34.2	35.1	-	-	-
Dry gluten (14% mb), %	-	7.8	11.3	9.2	-	-	-	12.5	13.5	-	-	-
Gluten Index	-	79	93	50	-	-	67	70	65	-	-	-
FARINOGRAM												
Water absorption (14% mb), %	63.0	62.4	60.2	60.1	-	-	63.7	63.0	62.1	-	-	-
Development time, min	5.3	4.5	3.0	2.2	-	-	4.8	4.3	3.2	-	-	-
Stability, min	7.0	6.9	6.0	5.1	-	-	5.9	5.7	5.9	-	-	-
Mixing tolerance index, BU	43	36	33	43	-	-	53	45	36	-	-	-
EXTENSOGRAM (45 min pull)												
Area, cm^2	77	73	61	54	-	-	79	68	56	-	-	-
Maximum height, BU	256	269	249	234	-	-	262	238	220	-	-	-
Extensibility, mm	202	190	170	159	-	-	209	198	172	-	-	-
ALVEOGRAM												
Strength (S), cm^2	33.8	35.8	28.1	24.3	-	-	36.7	34.1	30.9	-	-	-
Stability (P), mm	84	89	83	85	-	-	85	90	90	-	-	-
Distensibility (L), mm	104	101	82	65	-	-	125	100	87	-	-	-
Configuration ratio (P/L)	0.81	0.88	1.01	1.31	-	-	0.68	0.90	1.03	-	-	-
MIXOGRAM												
Peak time, min	2.3	2.3	2.3	2.5	-	-	2.3	2.3	2.3	-	-	-
100g BAKING TEST												
Loaf volume, cm^3	850	829	762	716	-	-	862	860	767	-	-	-
Evaluation (see page 60)	1	0	0	0	-	-	1	0	0	-	-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

5



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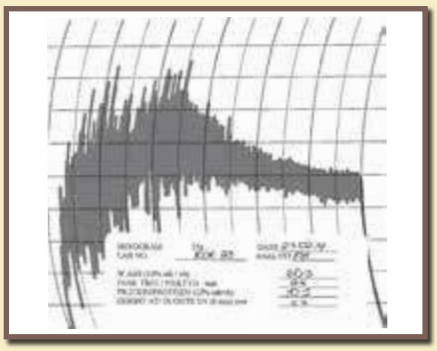
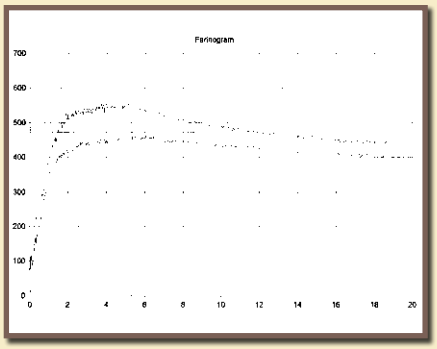


FARINOGRAM

5



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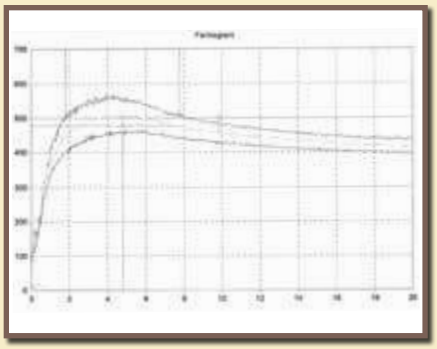
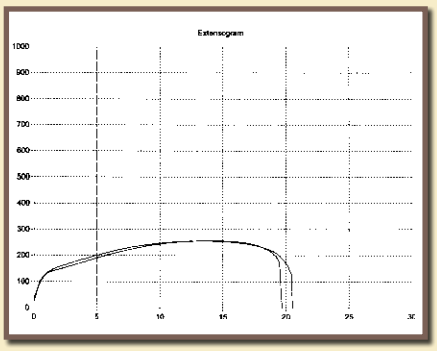


EXTENSOGRAM

5



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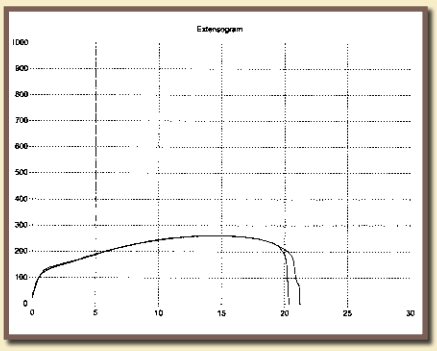
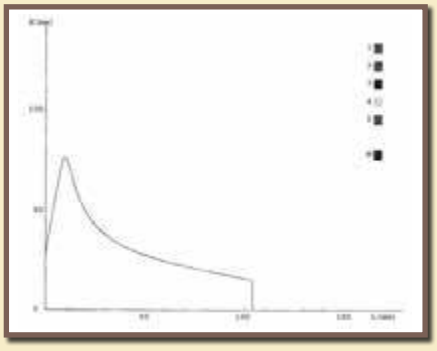


ALVEOGRAM

5



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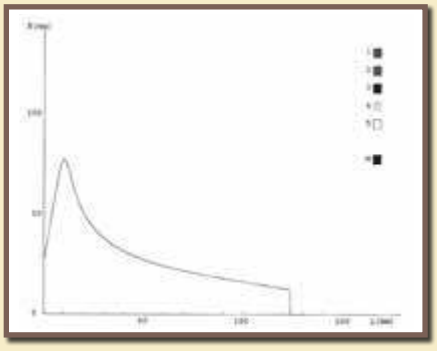


South African Quality data per production region

IRRIGATION WHEAT

	(10)	(11)
PRODUCTION REGION	**Griqualand-West**	**Vaalharts**
Intake silos	Britstown Douglas Havenga Brug Marydale Modderrivier Oranjerivierstasie Prieska Rietrivier Upington	Barkly-West Hartswater Jan Kemp Magogong Taung

WHEAT	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Protein (12% mb), %	11.5	10.0	13.4	0.98	12.4	10.8	14.9	1.10
Falling number, sec	382	355	405	14.26	375	323	554	56.54
1000 Kernel mass (13% mb), g	38.8	36.7	42.5	1.77	38.2	37.0	39.9	0.78
Hectolitre mass (dirty), kg/hl	81.8	79.8	84.7	1.31	81.0	79.2	83.3	1.40
Screenings (<1.8mm), %	1.30	0.26	5.20	1.22	1.51	0.16	2.65	0.79
Total damaged kernels, %	0.28	0.00	1.40	0.37	0.37	0.04	0.88	0.23
Combined deviations, %	2.14	0.55	5.61	1.21	3.13	0.94	8.32	1.83
Number of samples	***19***				***14***			

CULTIVARS					
	SST 835	34.3		SST 843	22.6
cultivars	SST 843	21.8		SST 877	21.0
with highest %	Duzi	14.1		SST 835	18.9
occurrence	PAN 3471	9.7		Duzi	16.4
	Baviaans	7.0		PAN 3471	12.1
Number of samples	***19***			***14***	

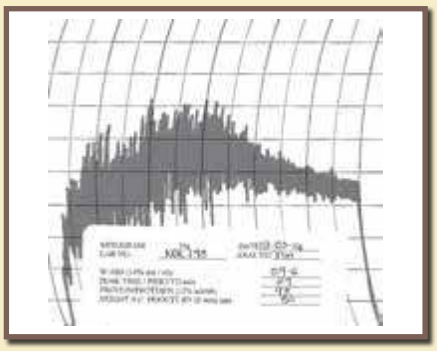
MIXOGRAM (Quadromat)	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Peak time, min	2.8	2.4	3.4	0.27	2.5	2.3	2.8	0.17
Tail height (6min), mm	49	45	54	2.84	49	44	51	1.99
Number of samples	***19***				***14***			

	COMPOSITE SAMPLES											
CLASS AND GRADE	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**
BÜHLER EXTRACTION, %	74.1	74.6	74.7	74.3	-	-	74.3	75.0	74.5	-	73.7	-
FLOUR												
Protein (12% mb), %	11.6	10.5	9.8	10.3	-	-	11.6	10.6	9.9	-	11.8	-
Colour, KJ (wet)	-3.2	-3.4	-3.5	-3.2	-	-	-3.2	-3.4	-3.4	-	-3.1	-
Colour, Minolta CM5 (dry)												
L*	94.03	94.10	94.38	93.97	-	-	93.89	94.13	94.26	-	93.95	-
a*	0.50	0.47	0.43	0.47	-	-	0.49	0.48	0.41	-	0.45	-
b*	9.54	9.55	9.37	9.82	-	-	9.98	9.68	9.60	-	9.96	-
RVA												
Peak Viscosity, cP	2571	2565	2556	2452	-	-	2189	2495	2524	-	2483	-
Minimum viscosity (Through), cP	2135	1919	1968	1857	-	-	1626	2012	2193	-	1905	-
Final Viscosity, cP	2774	2935	2921	2780	-	-	2511	2836	2837	-	2736	-
Peak Time, min	7.00	7.00	7.00	7.00	-	-	7.00	7.00	7.00	-	7.00	-
GLUTEN												
Wet gluten (14% mb), %	31.8	28.6	27.4	28.6	-	-	33.3	29.8	27.0	-	30.6	-
Dry gluten (14% mb), %	10.8	10.0	9.5	10.0	-	-	11.3	11.0	9.0	-	11.3	-
Gluten Index	88	88	85	83	-	-	76	85	81	-	81	-
FARINOGRAM												
Water absorption (14% mb), %	59.7	58.4	57.2	58.3	-	-	60.7	59.7	57.8	-	61.5	-
Development time, min	6.0	5.0	5.2	4.7	-	-	5.4	4.7	4.3	-	5.2	-
Stability, min	7.6	6.9	6.5	6.6	-	-	6.5	5.7	5.5	-	5.6	-
Mixing tolerance index, BU	39	45	49	44	-	-	41	48	51	-	47	-
EXTENSOGRAM (45 min pull)												
Area, cm^2	107	93	83	88	-	-	84	76	77	-	91	-
Maximum height, BU	362	368	334	326	-	-	292	286	292	-	326	-
Extensibility, mm	217	184	180	199	-	-	205	189	187	-	201	-
ALVEOGRAM												
Strength (S), cm^2	38.7	33.0	29.2	30.3	-	-	34.1	32.7	29.8	-	39.3	-
Stability (P), mm	66	63	60	61	-	-	70	72	60	-	76	-
Distensibility (L), mm	155	134	127	132	-	-	131	120	145	-	134	-
Configuration ratio (P/L)	0.43	0.47	0.47	0.46	-	-	0.53	0.60	0.41	-	0.57	-
MIXOGRAM												
Peak time, min	2.8	3.2	2.9	3.2	-	-	2.3	2.3	2.5	-	2.3	-
100g BAKING TEST												
Loaf volume, cm^3	952	836	838	886	-	-	946	842	863	-	967	-
Evaluation (see page 60)	0	0	0	0	-	-	0	0	0	-	0	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

10



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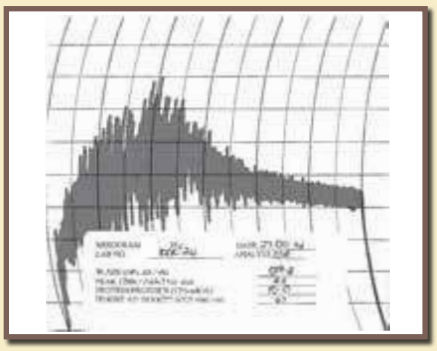
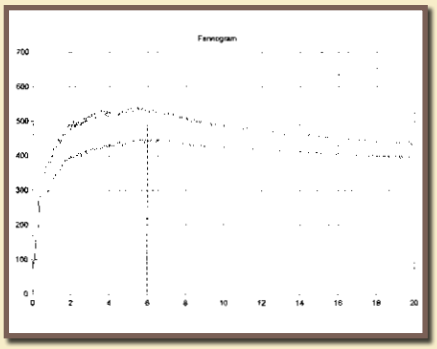


FARINOGRAM

10



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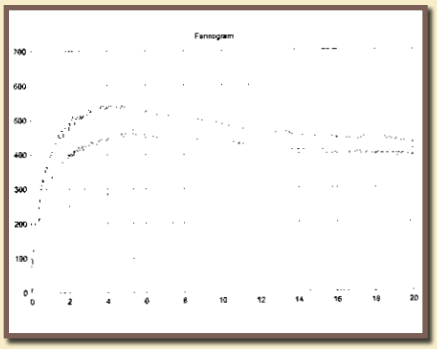
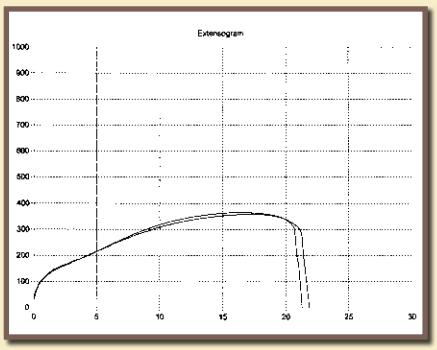


EXTENSOGRAM

10



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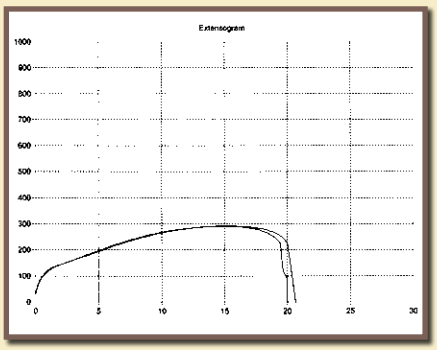
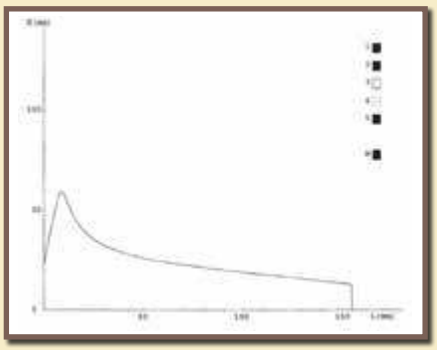


ALVEOGRAM

10



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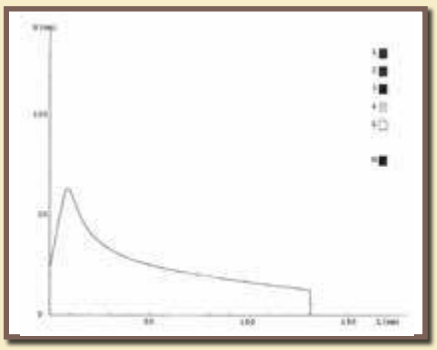


South African Quality data per production region

IRRIGATION WHEAT

PRODUCTION REGION	(12) North-West Western Region		(14) North-West Southern Region	
Intake silos	Bloubank	Vryburg	Amalia	
	Buhrmannsdrif	Vryhof	Barberspan	
	Kameel		Delareyville	
	Kraaipan		Excelsior	
	Madibogo		Geysdorp	
	Mafikeng		Hallat's Hope	
	Mareetsane		Migdol	
	Piet Plessis		Nooitgedacht	
	Springbokpan		Schweizer-Reneke	
	Vergeleë		Taaibospan	

WHEAT								
	ave	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Protein (12% mb), %	12.2	10.7	14.0	1.19	12.0	10.9	13.0	1.53
Falling number, sec	357	234	405	63.31	368	344	391	33.23
1000 Kernel mass (13% mb), g	38.2	35.0	41.1	2.30	38.2	37.1	39.3	1.56
Hectolitre mass (dirty), kg/hl	80.8	77.9	83.1	1.86	82.2	81.4	83.0	1.13
Screenings (<1.8mm), %	1.33	0.97	1.61	0.28	1.35	1.20	1.49	0.21
Total damaged kernels, %	0.54	0.12	1.20	0.41	0.22	0.08	0.36	0.20
Combined deviations, %	2.22	1.57	2.89	0.53	2.02	1.97	2.06	0.06
Number of samples	***6***				***2***			

CULTIVARS				
	SST 835	39.7	SST 843	53.0
cultivars	SST 843	36.8	SST 835	21.0
with highest %	Duzi	9.7	Duzi	9.5
occurrence	Baviaans	7.8	PAN 3471	9.0
	PAN 3471	4.7	SST 875	7.5
Number of samples	***6***		***2***	

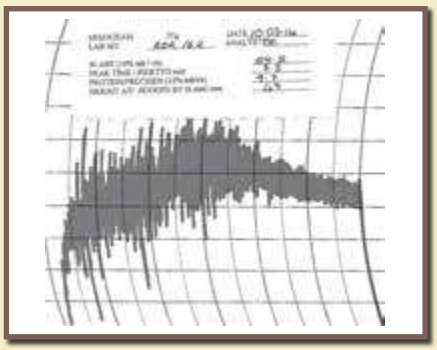
MIXOGRAM (Quadromat)								
	ave	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Peak time, min	3.1	2.5	3.8	0.52	3.2	2.8	3.5	0.49
Tail height (6min), mm	49	47	52	2.32	52	47	56	6.36
Number of samples	***6***				***2***			

	COMPOSITE SAMPLES											
CLASS AND GRADE	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**
BÜHLER EXTRACTION, %	73.2	-	-	-	-	-	73.7	-	-	-	-	-
FLOUR												
Protein (12% mb), %	12.1	-	-	-	-	-	12.1	-	-	-	-	-
Colour, KJ (wet)	-3.1	-	-	-	-	-	-3.2	-	-	-	-	-
Colour, Minolta CM5 (dry)												
L*	94.23	-	-	-	-	-	94.11	-	-	-	-	-
a*	0.41	-	-	-	-	-	0.42	-	-	-	-	-
b*	9.21	-	-	-	-	-	9.14	-	-	-	-	-
RVA												
Peak Viscosity, cP	1922	-	-	-	-	-	2322	-	-	-	-	-
Minimum viscosity (Through), cP	1584	-	-	-	-	-	1793	-	-	-	-	-
Final Viscosity, cP	2093	-	-	-	-	-	2576	-	-	-	-	-
Peak Time, min	7.00	-	-	-	-	-	7.00	-	-	-	-	-
GLUTEN												
Wet gluten (14% mb), %	32.6	-	-	-	-	-	31.1	-	-	-	-	-
Dry gluten (14% mb), %	11.2	-	-	-	-	-	12.0	-	-	-	-	-
Gluten Index	88	-	-	-	-	-	94	-	-	-	-	-
FARINOGRAM												
Water absorption (14% mb), %	60.5	-	-	-	-	-	61.9	-	-	-	-	-
Development time, min	7.2	-	-	-	-	-	8.2	-	-	-	-	-
Stability, min	9.0	-	-	-	-	-	12.2	-	-	-	-	-
Mixing tolerance index, BU	33	-	-	-	-	-	28	-	-	-	-	-
EXTENSOGRAM (45 min pull)												
Area, cm^2	117	-	-	-	-	-	128	-	-	-	-	-
Maximum height, BU	380	-	-	-	-	-	436	-	-	-	-	-
Extensibility, mm	226	-	-	-	-	-	218	-	-	-	-	-
ALVEOGRAM												
Strength (S), cm^2	43.1	-	-	-	-	-	54.3	-	-	-	-	-
Stability (P), mm	74	-	-	-	-	-	92	-	-	-	-	-
Distensibility (L), mm	139	-	-	-	-	-	121	-	-	-	-	-
Configuration ratio (P/L)	0.53	-	-	-	-	-	0.76	-	-	-	-	-
MIXOGRAM												
Peak time, min	2.8	-	-	-	-	-	3.3	-	-	-	-	-
100g BAKING TEST												
Loaf volume, cm^3	956	-	-	-	-	-	948	-	-	-	-	-
Evaluation (see page 60)	0	-	-	-	-	-	0	-	-	-	-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

12



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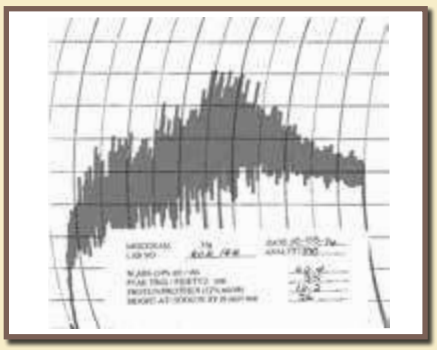
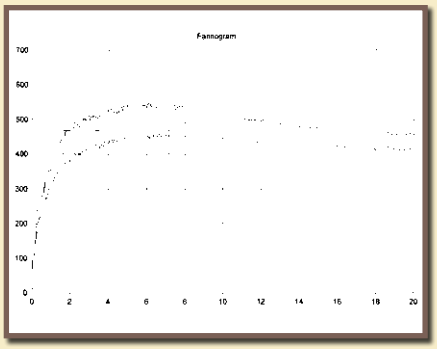


FARINOGRAM

12



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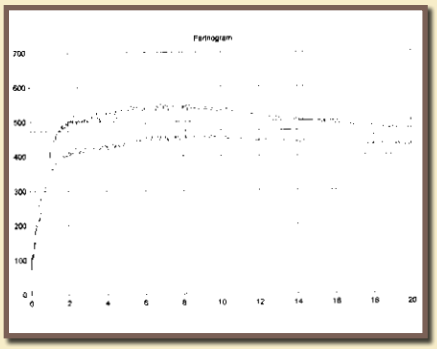
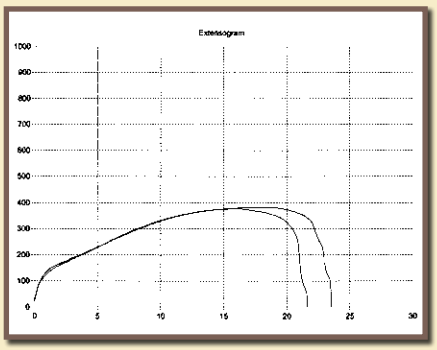


EXTENSOGRAM

12



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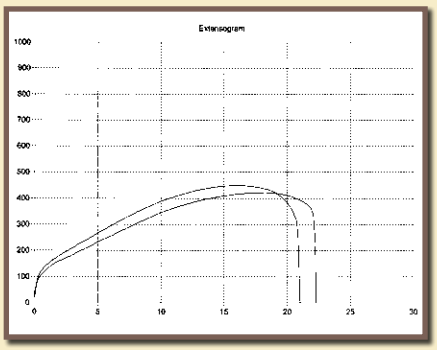
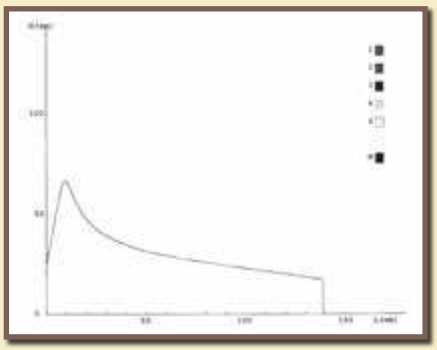


ALVEOGRAM

12



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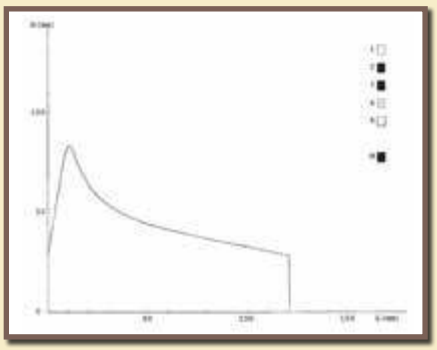


South African Quality data per production region

IRRIGATION WHEAT

PRODUCTION REGION	(17) North-West Central Northern Region (Ottosdal)	(18) North-West Central Region (Ventersdorp)
Intake silos	Bospoort Lethabong (Hartbeesfontein) Kleinharts Melliodora Ottosdal Rostrataville Vermaas Werda	Bodenstein Buckingham Coligny Enselspruit Makokskraal Potchefstroom Ventersdorp

WHEAT	ave	min	max	stdev	ave	min	max	stdev
Protein (12% mb), %	12.1	9.9	14.0	1.32	11.8	10.7	12.9	1.53
Falling number, sec	257	61	393	126.36	340	328	351	16.26
1000 Kernel mass (13% mb), g	36.0	30.2	42.2	4.41	38.8	38.2	39.3	0.78
Hectolitre mass (dirty), kg/hl	78.3	74.2	83.5	3.18	79.0	78.6	79.4	0.57
Screenings (<1.8mm), %	2.23	0.75	4.93	1.34	0.98	0.47	1.48	0.71
Total damaged kernels, %	1.23	0.04	3.88	1.65	0.86	0.12	1.60	1.05
Combined deviations, %	4.74	1.31	9.87	2.84	1.84	0.59	3.08	1.76
Number of samples	***8***				***2***			

CULTIVARS					
cultivars with highest % occurrence	SST 835	37.6	SST 843	44.5
	SST 843	35.1	SST 835	18.0
	PAN 3471	5.6	SST 884	17.0
	SST 88	3.4	PAN 3471	12.0
	SST 027	3.3	Duzi	8.5
Number of samples	***8***		***2***	

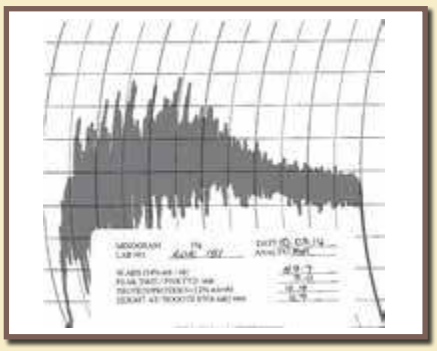
MIXOGRAM (Quadromat)	ave	min	max	stdev	ave	min	max	stdev
Peak time, min	3.0	2.5	3.5	0.36	3.1	2.8	3.4	0.42
Tail height (6min), mm	48	40	52	3.92	50	46	53	4.95
Number of samples	***8***				***2***			

	COMPOSITE SAMPLES											
CLASS AND GRADE	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**
BÜHLER EXTRACTION, %	73.0	-	-	-	-	71.8	-	-	75.6	-	-	-
FLOUR												
Protein (12% mb), %	11.8	-	-	-	-	12.1	-	-	9.8	-	-	-
Colour, KJ (wet)	-3.3	-	-	-	-	-2.7	-	-	-3.1	-	-	-
Colour, Minolta CM5 (dry)												
L*	94.22	-	-	-	-	94.12	-	-	94.11	-	-	-
a*	0.43	-	-	-	-	0.33	-	-	0.36	-	-	-
b*	9.01	-	-	-	-	9.08	-	-	8.56	-	-	-
RVA												
Peak Viscosity, cP	1796	-	-	-	-	564	-	-	2230	-	-	-
Minimum viscosity (Through), cP	1531	-	-	-	-	285	-	-	1943	-	-	-
Final Viscosity, cP	1963	-	-	-	-	516	-	-	2452	-	-	-
Peak Time, min	6.73	-	-	-	-	4.93	-	-	6.73	-	-	-
GLUTEN												
Wet gluten (14% mb), %	32.2	-	-	-	-	36.3	-	-	26.5	-	-	-
Dry gluten (14% mb), %	11.0	-	-	-	-	12.9	-	-	9.7	-	-	-
Gluten Index	87	-	-	-	-	97	-	-	96	-	-	-
FARINOGRAM												
Water absorption (14% mb), %	60.5	-	-	-	-	59.9	-	-	59.2	-	-	-
Development time, min	6.0	-	-	-	-	5.2	-	-	4.3	-	-	-
Stability, min	7.6	-	-	-	-	6.0	-	-	4.7	-	-	-
Mixing tolerance index, BU	39	-	-	-	-	51	-	-	61	-	-	-
EXTENSOGRAM (45 min pull)												
Area, cm^2	112	-	-	-	-	118	-	-	79	-	-	-
Maximum height, BU	384	-	-	-	-	383	-	-	302	-	-	-
Extensibility, mm	215	-	-	-	-	226	-	-	191	-	-	-
ALVEOGRAM												
Strength (S), cm^2	40.7	-	-	-	-	40.2	-	-	33.0	-	-	-
Stability (P), mm	74	-	-	-	-	62	-	-	67	-	-	-
Distensibility (L), mm	131	-	-	-	-	176	-	-	129	-	-	-
Configuration ratio (P/L)	0.56	-	-	-	-	0.35	-	-	0.52	-	-	-
MIXOGRAM												
Peak time, min	2.8	-	-	-	-	2.5	-	-	2.5	-	-	-
100g BAKING TEST												
Loaf volume, cm^3	966	-	-	-	-	1006	-	-	915	-	-	-
Evaluation (see page 60)	0	-	-	-	-	0	-	-	0	-	-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

17



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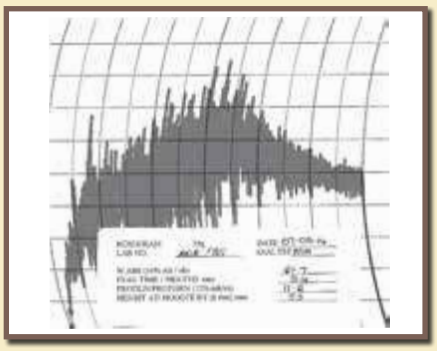
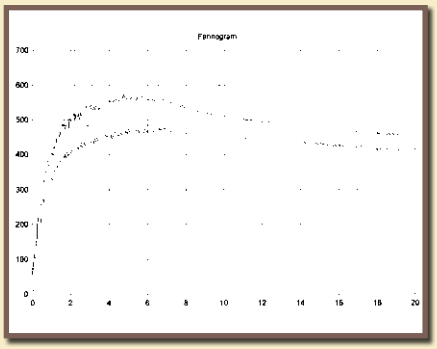


FARINOGRAM

17



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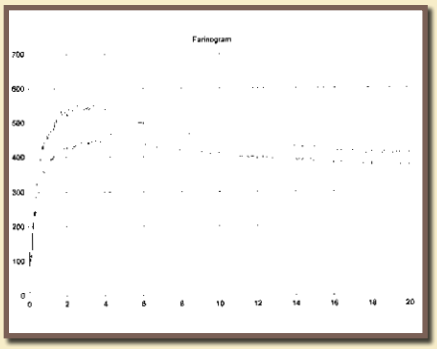
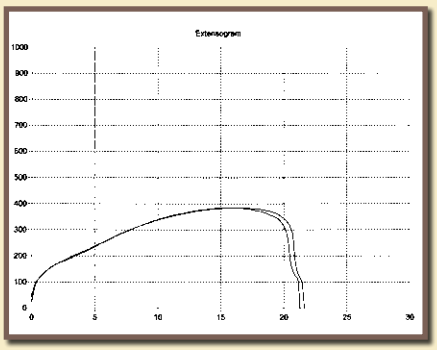


EXTENSOGRAM

17



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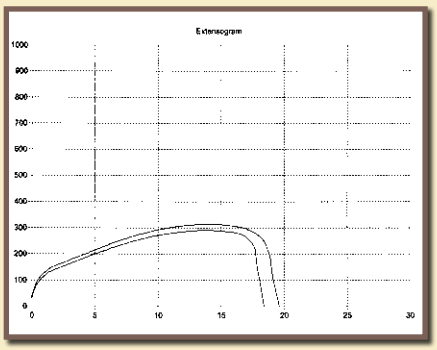
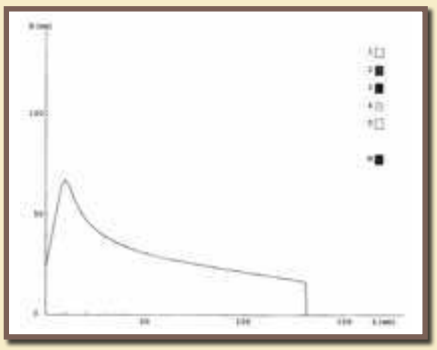


ALVEOGRAM

17



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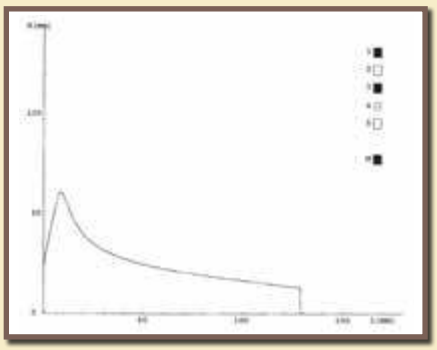


South African Quality data per production region

IRRIGATION WHEAT

PRODUCTION REGION	(19) North-West Central Region (Lichtenburg)	(20) North-West Eastern Region
Intake silos	Grootpan Halfpad Hibernia Lichtenburg Lottiehalte Lusthof	Battery Boons Brits Derby Koster Swartruggens Syferbult Ruststasie

WHEAT	ave	min	max	stdev	ave	min	max	stdev
Protein (12% mb), %	12.3	9.6	14.9	1.49	11.4	9.2	13.8	1.80
Falling number, sec	319	166	410	74.33	379	348	413	24.82
1000 Kernel mass (13% mb), g	36.8	33.1	41.1	2.78	40.1	36.4	45.6	3.18
Hectolitre mass (dirty), kg/hl	79.1	77.1	80.6	1.14	81.8	80.9	82.8	0.62
Screenings (<1.8mm), %	1.81	0.35	2.62	0.83	1.50	0.34	3.50	0.98
Total damaged kernels, %	0.53	0.00	1.72	0.57	0.24	0.08	0.54	0.19
Combined deviations, %	2.99	0.74	5.40	1.29	2.20	1.19	4.21	0.98
Number of samples	***11***				***7***			

CULTIVARS								
	SST 843	35.3			Duzi	38.9		
cultivars	SST 835	27.5			SST 843	31.4		
with highest %	SST 027	9.9			SST 835	15.4		
occurrence	SST 056	6.4			SST 015	5.7		
	SST 88	6.4			SST 027	4.4		
Number of samples	***11***				***7***			

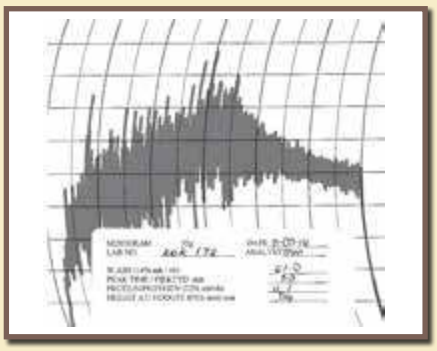
MIXOGRAM (Quadromat)	ave	min	max	stdev	ave	min	max	stdev
Peak time, min	3.4	2.8	4.3	0.52	3.2	2.3	4.2	0.60
Tail height (6min), mm	54	47	64	6.50	49	42	60	6.58
Number of samples	***11***				***7***			

	COMPOSITE SAMPLES											
CLASS AND GRADE	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**
BÜHLER EXTRACTION, %	72.8	-	-	-	-	-	73.4	74.1	-	73.9	-	-
FLOUR												
Protein (12% mb), %	12.2	-	-	-	-	-	12.7	10.8	-	8.4	-	-
Colour, KJ (wet)	-3.3	-	-	-	-	-	-3.1	-3.2	-	-3.3	-	-
Colour, Minolta CM5 (dry)												
L*	93.96	-	-	-	-	-	94.02	94.36	-	93.88	-	-
a*	0.41	-	-	-	-	-	0.43	0.42	-	0.43	-	-
b*	8.83	-	-	-	-	-	9.54	8.95	-	10.48	-	-
RVA												
Peak Viscosity, cP	2249	-	-	-	-	-	2252	2358	-	2430	-	-
Minimum viscosity (Through), cP	1837	-	-	-	-	-	1654	2093	-	2029	-	-
Final Viscosity, cP	2404	-	-	-	-	-	2548	2628	-	2821	-	-
Peak Time, min	7.00	-	-	-	-	-	7.00	6.73	-	7.00	-	-
GLUTEN												
Wet gluten (14% mb), %	31.5	-	-	-	-	-	33.3	29.3	-	21.5	-	-
Dry gluten (14% mb), %	11.4	-	-	-	-	-	11.8	10.4	-	7.3	-	-
Gluten Index	97	-	-	-	-	-	89	95	-	88	-	-
FARINOGRAM												
Water absorption (14% mb), %	60.5	-	-	-	-	-	61.9	60.6	-	55.0	-	-
Development time, min	8.8	-	-	-	-	-	9.2	6.0	-	2.9	-	-
Stability, min	15.7	-	-	-	-	-	14.1	8.4	-	5.5	-	-
Mixing tolerance index, BU	19	-	-	-	-	-	25	39	-	49	-	-
EXTENSOGRAM (45 min pull)												
Area, cm^2	154	-	-	-	-	-	145	89	-	61	-	-
Maximum height, BU	473	-	-	-	-	-	413	346	-	273	-	-
Extensibility, mm	244	-	-	-	-	-	256	188	-	157	-	-
ALVEOGRAM												
Strength (S), cm^2	56.9	-	-	-	-	-	60.9	37.2	-	21.9	-	-
Stability (P), mm	90	-	-	-	-	-	93	80	-	52	-	-
Distensibility (L), mm	132	-	-	-	-	-	139	111	-	116	-	-
Configuration ratio (P/L)	0.68	-	-	-	-	-	0.67	0.72	-	0.45	-	-
MIXOGRAM												
Peak time, min	3.4	-	-	-	-	-	3.5	3.0	-	3.0	-	-
100g BAKING TEST												
Loaf volume, cm^3	944	-	-	-	-	-	981	858	-	771	-	-
Evaluation (see page 60)	0	-	-	-	-	-	0	0	-	0	-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

19



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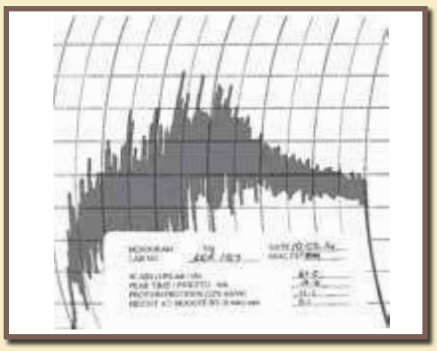
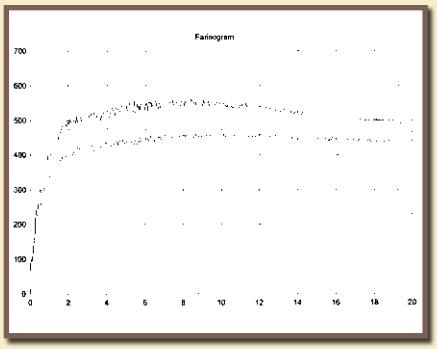


FARINOGRAM

19



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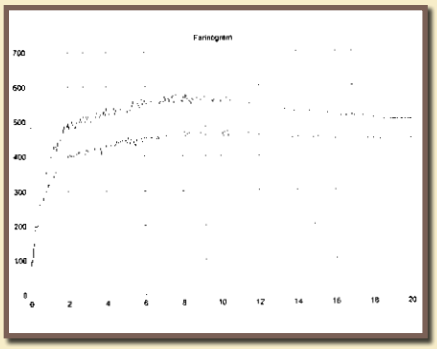
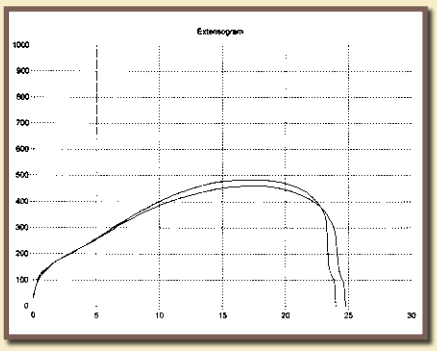


EXTENSOGRAM

19



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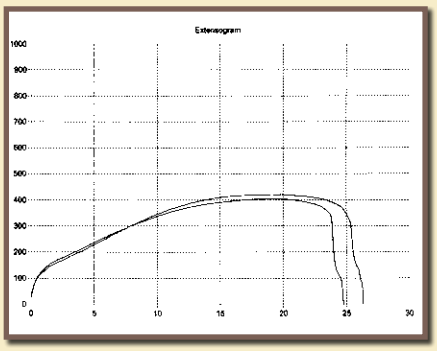
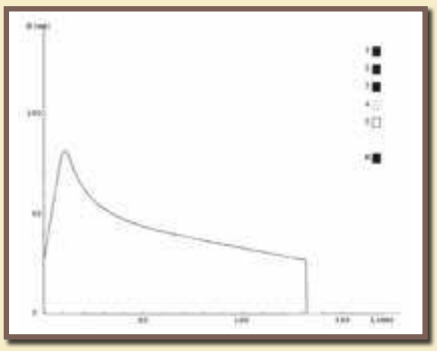


ALVEOGRAM

19



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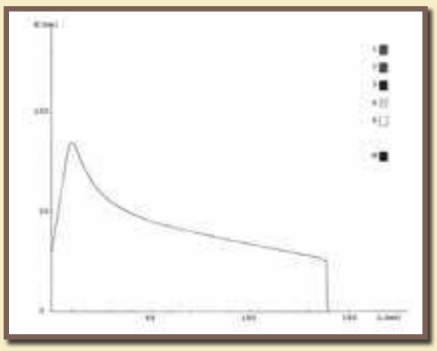


South African Quality data per production region

SUMMER RAINFALL AND IRRIGATION WHEAT

PRODUCTION REGION	(22) Free-State North-Western Region (Bothaville)	(23) Free-State North-Western Region (Bultfontein)
Intake silos	Allanridge Bothaville Mirage Odendaalsrus Schoonspruit Schuttesdraai	Bultfontein Losdoorns Protespan Tierfontein Wesselsbron Willemsrust

WHEAT	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Protein (12% mb), %	11.8	11.2	12.4	0.60	14.0	12.5	15.8	1.04
Falling number, sec	377	354	404	25.24	295	79	384	94.83
1000 Kernel mass (13% mb), g	33.7	33.3	34.0	0.38	33.6	29.1	41.2	3.30
Hectolitre mass (dirty), kg/hl	79.7	78.9	80.8	1.00	77.1	71.3	85.1	3.78
Screenings (<1.8mm), %	1.37	1.05	1.62	0.29	3.01	0.42	8.94	2.50
Total damaged kernels, %	0.31	0.00	0.80	0.43	0.65	0.12	3.69	0.94
Combined deviations, %	1.88	1.78	2.07	0.16	4.31	0.68	10.21	3.00
Number of samples	***3***				***13***			

CULTIVARS				
cultivars with highest % occurrence	PAN 3471	26.7	PAN 3120	27.0
	SST 835	20.0	SST 835	21.2
	PAN 3161	17.0	SST 387	11.8
	SST 843	14.7	PAN 3471	9.6
	SST 875	13.3	PAN 3118	7.9
Number of samples	***3***		***13***	

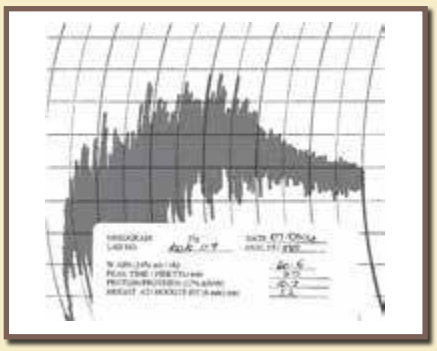
MIXOGRAM (Quadromat)	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Peak time, min	3.5	3.3	3.7	0.20	3.2	2.8	4.2	0.39
Tail height (6min), mm	52	50	53	1.53	54	51	56	1.65
Number of samples	***3***				***13***			

	COMPOSITE SAMPLES											
CLASS AND GRADE	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**
BÜHLER EXTRACTION, %	-	73.1	-	-	-	-	72.5	-	-	-	72.7	69.9
FLOUR												
Protein (12% mb), %	-	10.6	-	-	-	-	12.4	-	-	-	12.8	13.7
Colour, KJ (wet)	-	-3.0	-	-	-	-	-2.9	-	-	-	-2.6	-1.8
Colour, Minolta CM5 (dry)												
L*	-	94.13	-	-	-	-	93.92	-	-	-	93.64	93.11
a*	-	0.43	-	-	-	-	0.44	-	-	-	0.40	0.34
b*	-	9.28	-	-	-	-	9.41	-	-	-	9.56	10.21
RVA												
Peak Viscosity, cP	-	2479	-	-	-	-	2081	-	-	-	2176	726
Minimum viscosity (Through), cP	-	2051	-	-	-	-	1609	-	-	-	1748	342
Final Viscosity, cP	-	2723	-	-	-	-	2285	-	-	-	2332	647
Peak Time, min	-	7.00	-	-	-	-	7.00	-	-	-	7.00	5.00
GLUTEN												
Wet gluten (14% mb), %	-	27.3	-	-	-	-	34.2	-	-	-	33.8	36.8
Dry gluten (14% mb), %	-	9.6	-	-	-	-	12.6	-	-	-	11.8	12.8
Gluten Index	-	93	-	-	-	-	80	-	-	-	86	88
FARINOGRAM												
Water absorption (14% mb), %	-	58.7	-	-	-	-	62.6	-	-	-	60.9	60.9
Development time, min	-	5.7	-	-	-	-	6.9	-	-	-	5.7	6.2
Stability, min	-	9.0	-	-	-	-	9.3	-	-	-	8.6	11.6
Mixing tolerance index, BU	-	32	-	-	-	-	30	-	-	-	31	22
EXTENSOGRAM (45 min pull)												
Area, cm^2	-	104	-	-	-	-	112	-	-	-	122	139
Maximum height, BU	-	409	-	-	-	-	363	-	-	-	380	466
Extensibility, mm	-	193	-	-	-	-	224	-	-	-	236	223
ALVEOGRAM												
Strength (S), cm^2	-	40.5	-	-	-	-	41.7	-	-	-	46.3	51.1
Stability (P), mm	-	73	-	-	-	-	86	-	-	-	71	79
Distensibility (L), mm	-	139	-	-	-	-	109	-	-	-	170	135
Configuration ratio (P/L)	-	0.53	-	-	-	-	0.79	-	-	-	0.42	0.59
MIXOGRAM												
Peak time, min	-	2.9	-	-	-	-	2.6	-	-	-	2.8	3.3
100g BAKING TEST												
Loaf volume, cm^3	-	944	-	-	-	-	963	-	-	-	976	1061
Evaluation (see page 60)	-	0	-	-	-	-	0	-	-	-	0	0

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

22



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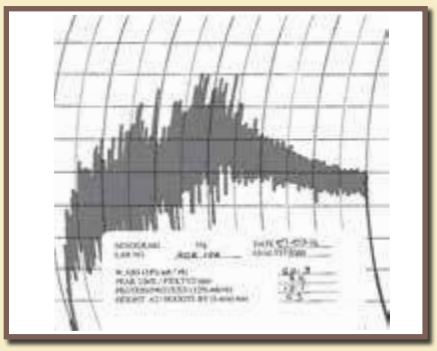
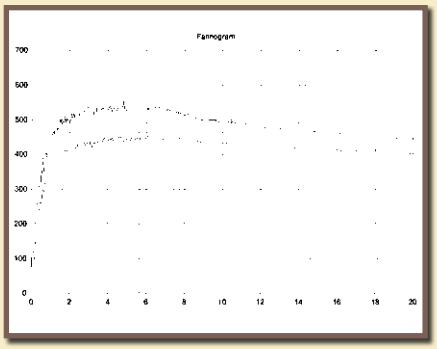


FARINOGRAM

22



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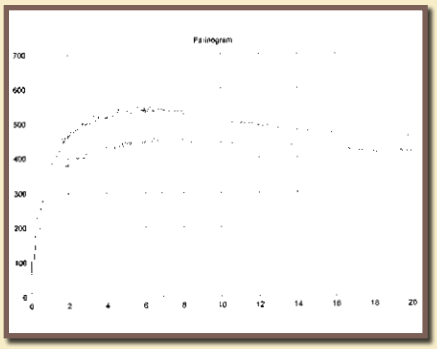
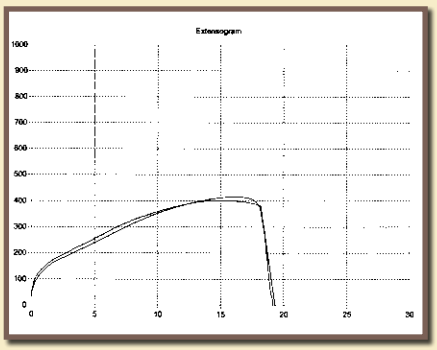


EXTENSOGRAM

22



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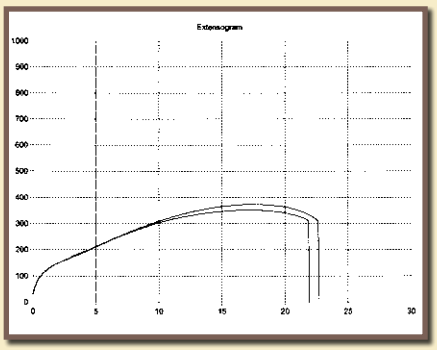
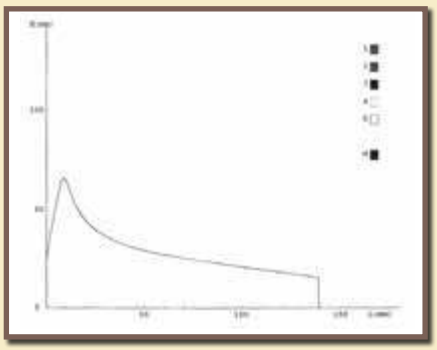


ALVEOGRAM

22



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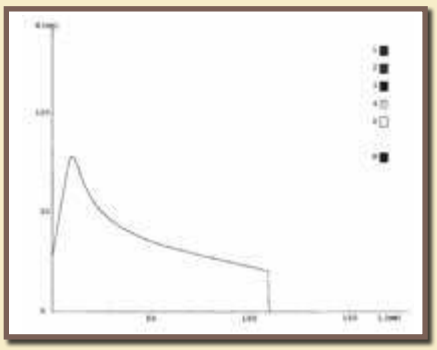


South African Quality data per production region

SUMMER RAINFALL AND IRRIGATION WHEAT

	(24)		(25)	
PRODUCTION REGION	**Free State Central Region**		**Free State South-Western Region**	
Intake silos	Bloemfontein	Welgeleë	Bethlehem	
	Brandfort	Winburg	Clocolan	
	De Brug		De Wetsdorp	
	Geneva		Ficksburg	
	Hennenman		Fouriesburg	
	Koffiefontein		Marseilles	
	Kroonstad		Modderpoort	
	Petrusburg		Slabberts	
	Theunissen		Tweespruit	
	Van Tonder		Westminster	

WHEAT	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Protein (12% mb), %	12.7	10.5	13.9	1.09	12.9	10.7	15.5	1.50
Falling number, sec	373	268	420	38.03	309	109	396	74.30
1000 Kernel mass (13% mb), g	36.2	30.4	41.9	3.72	41.0	37.6	46.2	2.82
Hectolitre mass (dirty), kg/hl	80.3	74.7	82.8	2.87	79.9	75.7	81.8	1.96
Screenings (<1.8mm), %	2.90	0.73	6.47	1.59	1.16	0.27	2.78	0.75
Total damaged kernels, %	0.33	0.00	0.88	0.25	0.77	0.00	2.44	0.67
Combined deviations, %	3.69	1.12	7.77	1.88	2.80	0.87	4.84	1.20
Number of samples	***13***				***12***			

CULTIVARS				
	SST 835	37.3	Elands	31.7
cultivars	PAN 3471	14.9	SST 835	17.0
with highest %	PAN 3120	7.5	Matlabas	15.8
occurrence	SST 877	7.3	PAN 3161	11.8
	SST 843	6.6	SST 356	8.4
Number of samples	***13***		***12***	

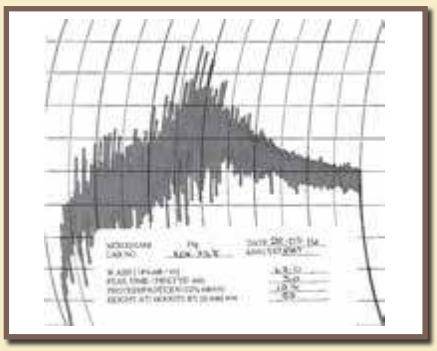
MIXOGRAM (Quadromat)	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Peak time, min	2.9	2.5	3.6	0.31	3.3	2.1	4.4	0.60
Tail height (6min), mm	51	46	57	3.19	55	46	68	5.76
Number of samples	***13***				***12***			

	COMPOSITE SAMPLES											
CLASS AND GRADE	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**
BÜHLER EXTRACTION, %	73.9	74.8	-	-	73.0	-	72.1	71.9	-	-	72.0	-
FLOUR												
Protein (12% mb), %	12.3	10.0	-	-	12.4	-	11.8	10.3	-	-	12.4	-
Colour, KJ (wet)	-3.2	-3.5	-	-	-2.5	-	-2.4	-2.6	-	-	-2.3	-
Colour, Minolta CM5 (dry)												
L*	94.13	94.52	-	-	93.89	-	93.62	93.66	-	-	93.55	-
a*	0.47	0.44	-	-	0.38	-	0.37	0.40	-	-	0.43	-
b*	9.36	9.07	-	-	9.15	-	9.69	10.00	-	-	9.38	-
RVA												
Peak Viscosity, cP	2212	2418	-	-	2221	-	1990	1852	-	-	2036	-
Minimum viscosity (Through), cP	1732	1926	-	-	1768	-	1650	1528	-	-	1606	-
Final Viscosity, cP	2406	2657	-	-	2363	-	2197	2069	-	-	2203	-
Peak Time, min	7.00	7.00	-	-	7.00	-	6.93	6.87	-	-	7.00	-
GLUTEN												
Wet gluten (14% mb), %	34.2	28.3	-	-	32.9	-	32.0	28.3	-	-	33.5	-
Dry gluten (14% mb), %	12.3	9.7	-	-	11.0	-	11.6	10.1	-	-	12.0	-
Gluten Index	90	80	-	-	91	-	95	83	-	-	93	-
FARINOGRAM												
Water absorption (14% mb), %	60.7	57.4	-	-	59.7	-	62.8	60.9	-	-	63.8	-
Development time, min	5.9	4.2	-	-	6.9	-	8.4	4.9	-	-	10.5	-
Stability, min	7.9	5.1	-	-	10.2	-	17.9	6.8	-	-	16.5	-
Mixing tolerance index, BU	41	53	-	-	33	-	11	40	-	-	23	-
EXTENSOGRAM (45 min pull)												
Area, cm^2	129	77	-	-	132	-	122	74	-	-	156	-
Maximum height, BU	401	314	-	-	432	-	415	313	-	-	516	-
Extensibility, mm	238	176	-	-	227	-	215	168	-	-	225	-
ALVEOGRAM												
Strength (S), cm^2	42.2	29.1	-	-	49.4	-	52.9	33.2	-	-	65.4	-
Stability (P), mm	73	59	-	-	71	-	111	92	-	-	129	-
Distensibility (L), mm	145	141	-	-	177	-	96	79	-	-	99	-
Configuration ratio (P/L)	0.50	0.42	-	-	0.40	-	1.16	1.16	-	-	1.30	-
MIXOGRAM												
Peak time, min	2.3	2.7	-	-	3.0	-	3.3	2.8	-	-	3.5	-
100g BAKING TEST												
Loaf volume, cm^3	981	888	-	-	969	-	880	810	-	-	868	-
Evaluation (see page 60)	0	0	-	-	0	-	1	0	-	-	2	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

24



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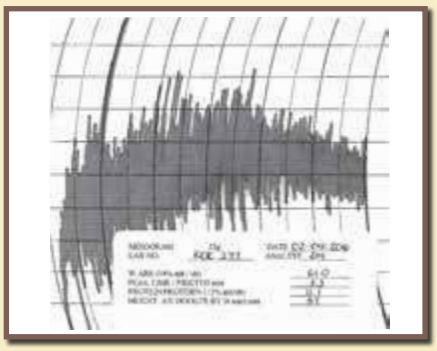
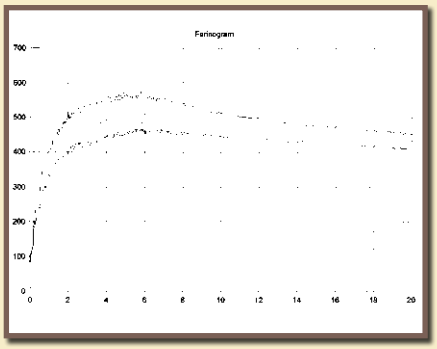


FARINOGRAM

24



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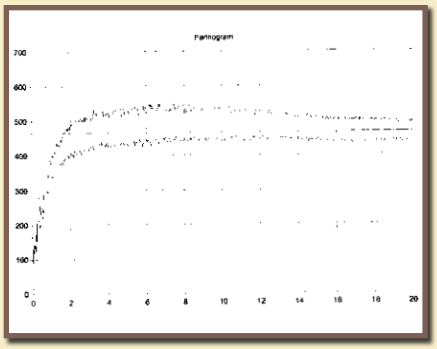
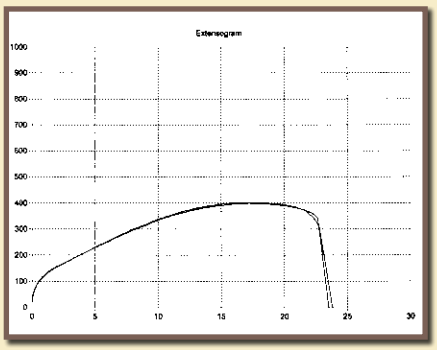


EXTENSOGRAM

24



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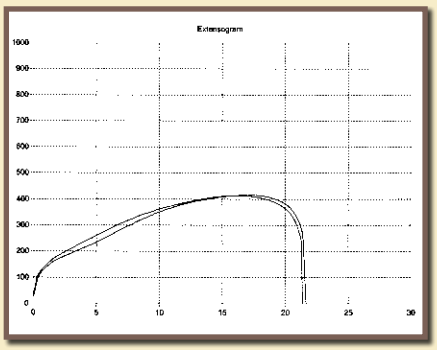
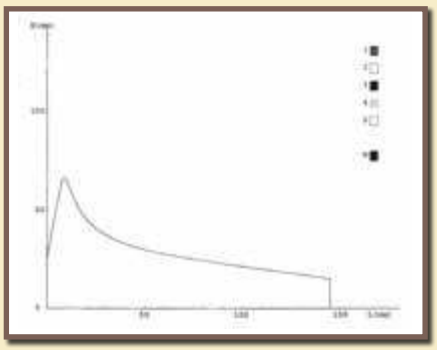


ALVEOGRAM

24



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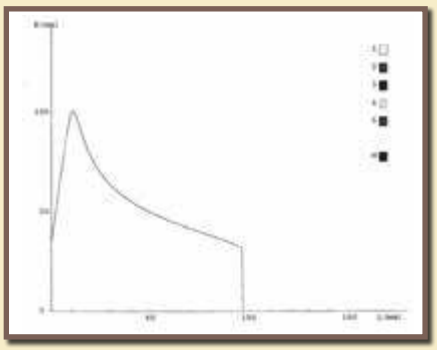


South African Quality data per production region

SUMMER RAINFALL AND IRRIGATION WHEAT

	(26)	(27)
PRODUCTION REGION	**Free State South-Eastern Region**	**Free State Northern Region**
Intake silos	Arlington Kaallaagte Libertas Marquard Meets Monte Video Senekal Steynsrus	Gottenburg Heilbron Hoogte Mooigeleë Petrus Steyn Wolwehoek

WHEAT								
	ave	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Protein (12% mb), %	11.9	9.5	15.2	1.85	12.4	11.8	13.1	0.93
Falling number, sec	304	179	365	62.53	282	274	289	10.61
1000 Kernel mass (13% mb), g	36.6	34.7	38.5	1.57	39.2	34.8	43.5	6.15
Hectolitre mass (dirty), kg/hl	79.7	79.2	80.7	0.52	78.8	78.1	79.5	0.99
Screenings (<1.8mm), %	0.78	0.42	1.28	0.32	1.02	1.00	1.04	0.03
Total damaged kernels, %	0.29	0.00	0.80	0.27	0.40	0.36	0.44	0.06
Combined deviations, %	1.40	0.62	2.06	0.54	1.77	1.48	2.06	0.41
Number of samples	***7***				***2***			

CULTIVARS				
	SST 835	27.3	PAN 3161	50.0
cultivars	SST 843	14.1	SST 843	23.0
with highest %	PAN 3120	13.4	PAN 3471	17.5
occurrence	SST 356	12.7	SST 835	9.5
	PAN 3471	8.9		
Number of samples	***7***		***2***	

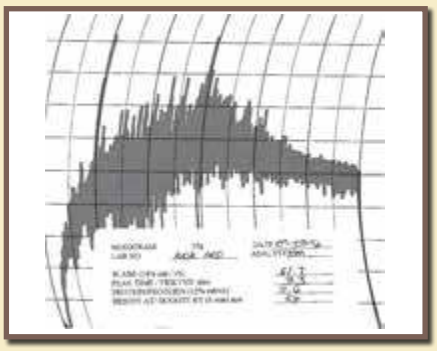
MIXOGRAM (Quadromat)								
	ave	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Peak time, min	3.2	2.8	3.7	0.31	3.5	3.3	3.7	0.28
Tail height (6min), mm	54	48	60	5.55	57	56	58	1.41
Number of samples	***7***				***2***			

	COMPOSITE SAMPLES											
CLASS AND GRADE	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**
BÜHLER EXTRACTION, %	73.4	74.1	-	-	-	-	73.7	-	-	-	-	-
FLOUR												
Protein (12% mb), %	11.4	10.7	-	-	-	-	11.8	-	-	-	-	-
Colour, KJ (wet)	-2.5	-2.7	-	-	-	-	-1.9	-	-	-	-	-
Colour, Minolta CM5 (dry)												
L*	93.64	93.83	-	-	-	-	93.42	-	-	-	-	-
a*	0.37	0.34	-	-	-	-	0.32	-	-	-	-	-
b*	9.47	9.26	-	-	-	-	9.82	-	-	-	-	-
RVA												
Peak Viscosity, cP	1891	2121	-	-	-	-	2036	-	-	-	-	-
Minimum viscosity (Through), cP	1644	1752	-	-	-	-	1722	-	-	-	-	-
Final Viscosity, cP	2053	2291	-	-	-	-	2226	-	-	-	-	-
Peak Time, min	6.73	7.00	-	-	-	-	6.93	-	-	-	-	-
GLUTEN												
Wet gluten (14% mb), %	30.9	29.4	-	-	-	-	30.3	-	-	-	-	-
Dry gluten (14% mb), %	11.1	10.4	-	-	-	-	11.4	-	-	-	-	-
Gluten Index	89	93	-	-	-	-	92	-	-	-	-	-
FARINOGRAM												
Water absorption (14% mb), %	60.7	59.8	-	-	-	-	62.8	-	-	-	-	-
Development time, min	6.2	5.0	-	-	-	-	8.9	-	-	-	-	-
Stability, min	9.8	8.8	-	-	-	-	13.8	-	-	-	-	-
Mixing tolerance index, BU	34	32	-	-	-	-	24	-	-	-	-	-
EXTENSOGRAM (45 min pull)												
Area, cm^2	125	98	-	-	-	-	140	-	-	-	-	-
Maximum height, BU	414	369	-	-	-	-	476	-	-	-	-	-
Extensibility, mm	227	197	-	-	-	-	216	-	-	-	-	-
ALVEOGRAM												
Strength (S), cm^2	47.9	38.2	-	-	-	-	55.0	-	-	-	-	-
Stability (P), mm	83	78	-	-	-	-	118	-	-	-	-	-
Distensibility (L), mm	135	111	-	-	-	-	91	-	-	-	-	-
Configuration ratio (P/L)	0.61	0.70	-	-	-	-	1.30	-	-	-	-	-
MIXOGRAM												
Peak time, min	3.0	3.1	-	-	-	-	3.3	-	-	-	-	-
100g BAKING TEST												
Loaf volume, cm^3	884	854	-	-	-	-	899	-	-	-	-	-
Evaluation (see page 60)	0	0	-	-	-	-	0	-	-	-	-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

26



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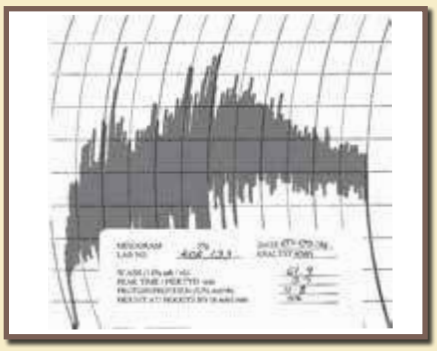
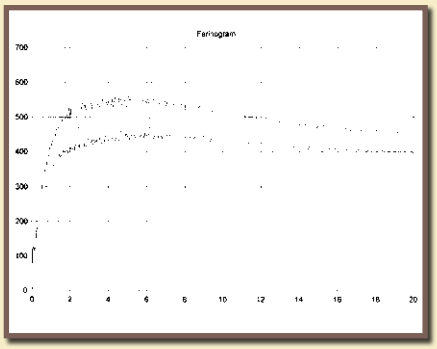


FARINOGRAM

26



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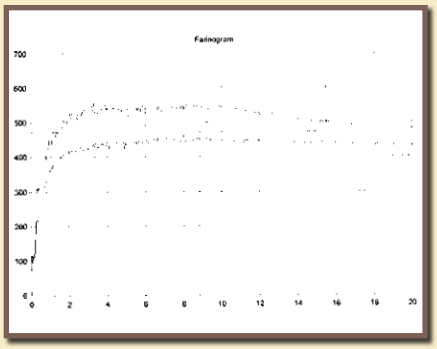
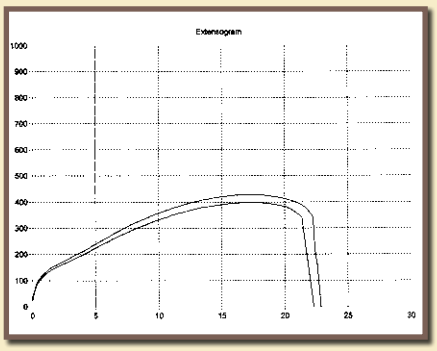


EXTENSOGRAM

26



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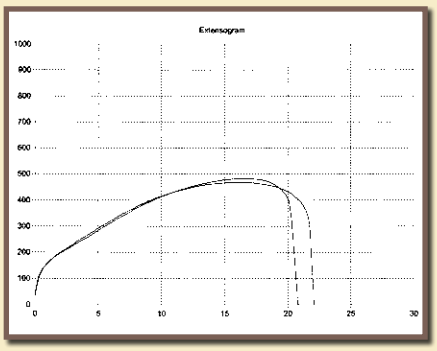
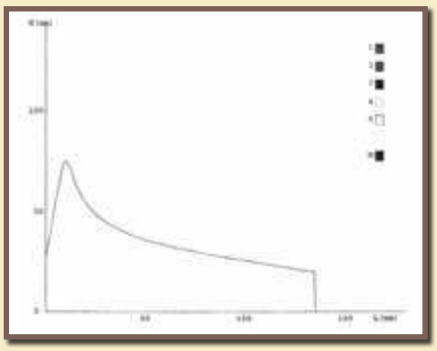


ALVEOGRAM

26



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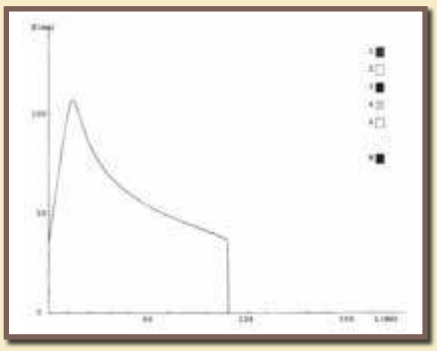


South African Quality data per production region

SUMMER RAINFALL AND IRRIGATION WHEAT

IRRIGATION WHEAT

	(28)		(29)
PRODUCTION REGION	**Free State**		**Mpumalanga**
	Eastern Region		**Southern Region**
Intake silos	Afrikaskop	Reitz	Balfour
	Ascent	Tweeling	Greylingstad
	Cornelia	Villiers	Grootvlei
	Daniëlsrus	Vrede	Harvard
	Eeram	Warden	Holmdene
	Frankfort	Windfield	Leeuspruit
	Harrismith		Platrand
	Jim Fouché		Standerton
	Kransfontein		Val
	Memel		

WHEAT								
	ave	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Protein (12% mb), %	12.2	9.6	14.8	1.39	12.7	-	-	-
Falling number, sec	278	139	373	72.38	275	-	-	-
1000 Kernel mass (13% mb), g	37.6	31.4	48.9	4.21	38.3	-	-	-
Hectolitre mass (dirty), kg/hl	79.3	75.2	82.2	1.89	80.8	-	-	-
Screenings (<1.8mm), %	1.21	0.11	4.03	0.89	0.99	-	-	-
Total damaged kernels, %	0.66	0.12	2.37	0.59	1.08	-	-	-
Combined deviations, %	2.26	0.40	5.59	1.25	2.07	-	-	-
Number of samples	***26***				***1***			

CULTIVARS				
	SST 356	23.8	SST 843	100.0
cultivars	SST 835	19.0	-	-
with highest %	PAN 3161	14.8	-	-
occurrence	Elands	13.4	-	-
	Matlabas	7.2	-	-
Number of samples	***26***		***1***	

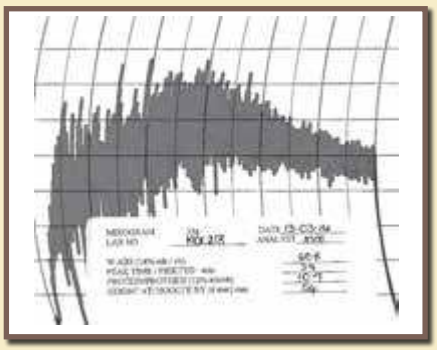
MIXOGRAM (Quadromat)								
	ave	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Peak time, min	3.4	2.8	4.7	0.44	3.0	-	-	-
Tail height (6min), mm	54	45	66	5.16	54	-	-	-
Number of samples	***26***				***1***			

	COMPOSITE SAMPLES											
CLASS AND GRADE	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**
BÜHLER EXTRACTION, %	71.6	72.5	72.6	72.9	-	-	-	-	-	-	-	-
FLOUR												
Protein (12% mb), %	11.5	11.0	9.7	9.0	-	-	-	-	-	-	-	-
Colour, KJ (wet)	-2.0	-1.9	-2.5	-2.4	-	-	-	-	-	-	-	-
Colour, Minolta CM5 (dry)												
L*	93.27	93.32	94.00	93.88	-	-	-	-	-	-	-	-
a*	0.42	0.41	0.36	0.31	-	-	-	-	-	-	-	-
b*	10.22	10.00	9.79	9.92	-	-	-	-	-	-	-	-
RVA												
Peak Viscosity, cP	1846	2192	2426	2113	-	-	-	-	-	-	-	-
Minimum viscosity (Through), cP	1584	1795	1855	1793	-	-	-	-	-	-	-	-
Final Viscosity, cP	2039	2446	2778	2357	-	-	-	-	-	-	-	-
Peak Time, min	6.80	6.93	7.00	7.00	-	-	-	-	-	-	-	-
GLUTEN												
Wet gluten (14% mb), %	30.9	29.1	25.8	21.8	-	-	-	-	-	-	-	-
Dry gluten (14% mb), %	10.4	10.5	9.2	7.6	-	-	-	-	-	-	-	-
Gluten Index	87	91	93	96	-	-	-	-	-	-	-	-
FARINOGRAM												
Water absorption (14% mb), %	62.6	62.1	59.0	60.7	-	-	-	-	-	-	-	-
Development time, min	6.7	6.0	4.7	1.5	-	-	-	-	-	-	-	-
Stability, min	10.2	12.3	9.1	4.7	-	-	-	-	-	-	-	-
Mixing tolerance index, BU	29	20	29	44	-	-	-	-	-	-	-	-
EXTENSOGRAM (45 min pull)												
Area, cm^2	93	105	78	88	-	-	-	-	-	-	-	-
Maximum height, BU	339	384	306	399	-	-	-	-	-	-	-	-
Extensibility, mm	197	200	177	162	-	-	-	-	-	-	-	-
ALVEOGRAM												
Strength (S), cm^2	45.6	50.0	35.9	33.9	-	-	-	-	-	-	-	-
Stability (P), mm	100	110	85	113	-	-	-	-	-	-	-	-
Distensibility (L), mm	99	93	101	53	-	-	-	-	-	-	-	-
Configuration ratio (P/L)	1.01	1.18	0.84	2.13	-	-	-	-	-	-	-	-
MIXOGRAM												
Peak time, min	2.9	3.3	3.3	3.8	-	-	-	-	-	-	-	-
100g BAKING TEST												
Loaf volume, cm^3	888	867	810	721	-	-	-	-	-	-	-	-
Evaluation (see page 60)	0	0	0	1	-	-	-	-	-	-	-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

28



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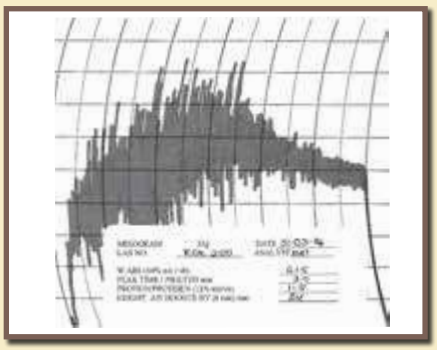
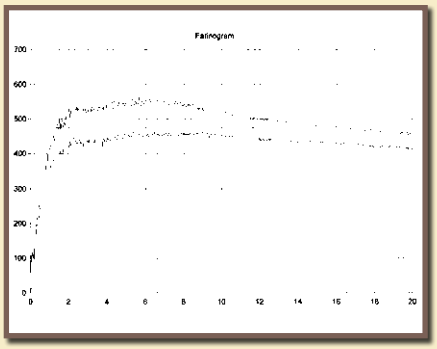


FARINOGRAM

28



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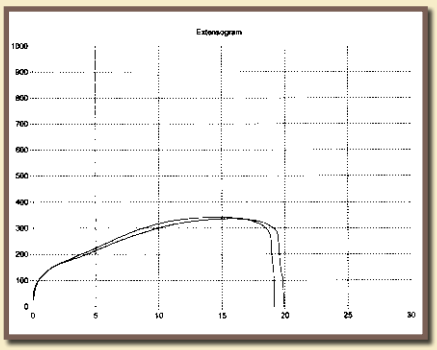
EXTENSOGRAM

28



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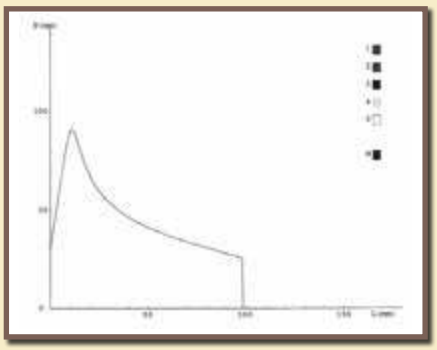
ALVEOGRAM

28



29

South African Quality data per production region

IRRIGATION WHEAT

PRODUCTION REGION	(30) Mpumalanga Eastern Region	(32) Mpumalanga Western Region
Intake silos	Amersfoort Carolina Davel Ermelo Estancia Lothair Maizefield Mkondo Morgenzon Overvaal Panbult	Argent Dryden Endicott Elof Hawerklip Kendal Ogies

WHEAT	ave	min	max	stdev	ave	min	max	stdev
Protein (12% mb), %	11.4	11.4	11.4	0.02	12.8	10.6	14.1	1.17
Falling number, sec	345	269	420	106.77	307	161	419	95.01
1000 Kernel mass (13% mb), g	40.5	40.2	40.7	0.35	37.8	32.5	42.6	3.52
Hectolitre mass (dirty), kg/hl	82.4	82.3	82.5	0.14	80.5	77.5	82.6	1.71
Screenings (<1.8mm), %	1.47	1.44	1.50	0.04	1.45	0.31	2.83	0.96
Total damaged kernels, %	0.04	0.00	0.08	0.06	1.04	0.04	4.40	1.40
Combined deviations, %	1.77	1.59	1.94	0.25	3.17	0.71	7.95	2.09
Number of samples	***2***				***9***			

CULTIVARS								
	SST 843	39.5			SST 835	49.4		
cultivars	SST 876	39.5			SST 843	25.7		
with highest %	SST 835	21.0			SST 875	10.9		
occurrence	-	-			SST 876	7.0		
	-	-			Olifants	2.8		
Number of samples	***2***				***9***			

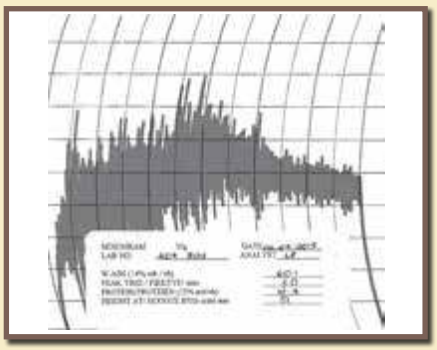
MIXOGRAM (Quadromat)	ave	min	max	stdev	ave	min	max	stdev
Peak time, min	3.0	3.0	3.0	0.00	2.7	2.0	3.2	0.47
Tail height (6min), mm	51	51	51	0.00	52	50	55	1.80
Number of samples	***2***				***9***			

	COMPOSITE SAMPLES											
CLASS AND GRADE	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**
BÜHLER EXTRACTION, %	-	-	-	-	-	-	73.3	-	-	-	73.5	-
FLOUR												
Protein (12% mb), %	-	-	-	-	-	-	12.2	-	-	-	10.8	-
Colour, KJ (wet)	-	-	-	-	-	-	-2.7	-	-	-	-2.3	-
Colour, Minolta CM5 (dry)												
L*	-	-	-	-	-	-	93.90	-	-	-	93.86	-
a*	-	-	-	-	-	-	0.42	-	-	-	0.36	-
b*	-	-	-	-	-	-	9.23	-	-	-	8.49	-
RVA												
Peak Viscosity, cP	-	-	-	-	-	-	2316	-	-	-	1371	-
Minimum viscosity (Through), cP	-	-	-	-	-	-	1862	-	-	-	1069	-
Final Viscosity, cP	-	-	-	-	-	-	2501	-	-	-	1486	-
Peak Time, min	-	-	-	-	-	-	7.00	-	-	-	6.07	-
GLUTEN												
Wet gluten (14% mb), %	-	-	-	-	-	-	34.5	-	-	-	29.1	-
Dry gluten (14% mb), %	-	-	-	-	-	-	11.9	-	-	-	9.7	-
Gluten Index	-	-	-	-	-	-	78	-	-	-	88	-
FARINOGRAM												
Water absorption (14% mb), %	-	-	-	-	-	-	61.9	-	-	-	60.4	-
Development time, min	-	-	-	-	-	-	5.5	-	-	-	5.3	-
Stability, min	-	-	-	-	-	-	6.6	-	-	-	6.5	-
Mixing tolerance index, BU	-	-	-	-	-	-	49	-	-	-	54	-
EXTENSOGRAM (45 min pull)												
Area, cm^2	-	-	-	-	-	-	112	-	-	-	84	-
Maximum height, BU	-	-	-	-	-	-	342	-	-	-	302	-
Extensibility, mm	-	-	-	-	-	-	235	-	-	-	201	-
ALVEOGRAM												
Strength (S), cm^2	-	-	-	-	-	-	41.0	-	-	-	34.9	-
Stability (P), mm	-	-	-	-	-	-	74	-	-	-	68	-
Distensibility (L), mm	-	-	-	-	-	-	152	-	-	-	139	-
Configuration ratio (P/L)	-	-	-	-	-	-	0.49	-	-	-	0.49	-
MIXOGRAM												
Peak time, min	-	-	-	-	-	-	2.5	-	-	-	2.7	-
100g BAKING TEST												
Loaf volume, cm^3	-	-	-	-	-	-	970	-	-	-	935	-
Evaluation (see page 60)	-	-	-	-	-	-	0	-	-	-	0	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

30



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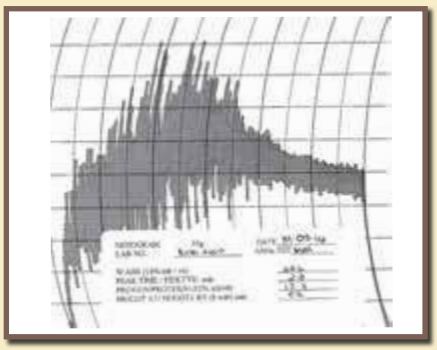
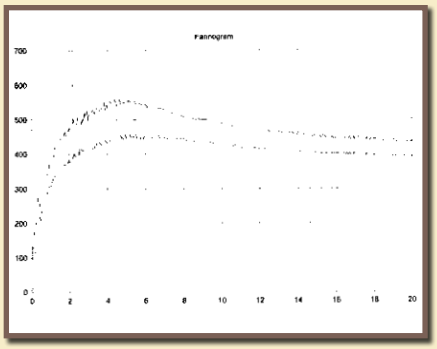


FARINOGRAM

30

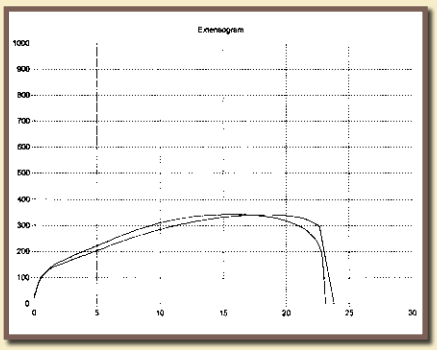
32



EXTENSOGRAM

30

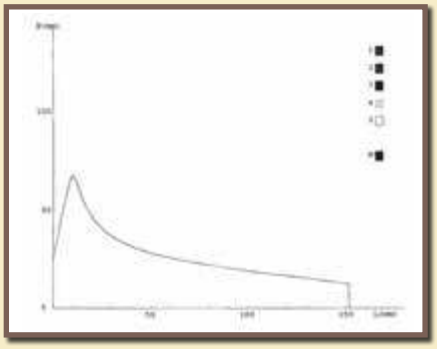
32



ALVEOGRAM

30

32



South African Quality data per production region

IRRIGATION WHEAT

PRODUCTION REGION	(33) Mpumalanga Northern Region	(34) Gauteng
Intake silos	Driefontein Lydenburg Marble Hall Middelburg Stoffberg Pan Arnot Wonderfontein	Bloekomspruit Bronkhorstspruit Glenroy Goeie Hoek Kaalfontein Middelvlei Nigel Oberholzer Raathsvlei Ruststasie

WHEAT	ave	min	max	stdev	ave	min	max	stdev
Protein (12% mb), %	12.5	10.3	14.2	1.20	11.5	10.1	13.0	1.04
Falling number, sec	278	47	424	111.79	353	286	454	60.31
1000 Kernel mass (13% mb), g	41.6	36.2	46.4	3.69	41.1	35.9	46.6	3.44
Hectolitre mass (dirty), kg/hl	80.3	75.2	83.3	2.67	81.4	79.4	84.0	1.37
Screenings (<1.8mm), %	0.81	0.22	1.80	0.62	0.86	0.36	1.58	0.37
Total damaged kernels, %	1.88	0.40	8.60	2.75	0.72	0.08	1.88	0.66
Combined deviations, %	2.91	0.64	9.91	3.02	1.86	0.63	2.82	0.79
Number of samples			***8***				***8***	

CULTIVARS								
	SST 843	36.9			Duzi	37.8		
cultivars	SST 835	22.3			Olifants	21.1		
with highest %	SST 876	16.1			SST 877	8.5		
occurrence	Duzi	13.9			PAN 3471	8.3		
	SST 875	4.3			SST 835	7.6		
Number of samples			***8***				***8***	

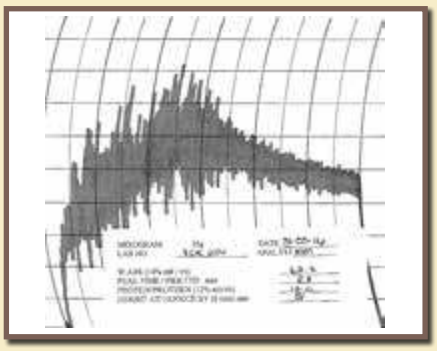
MIXOGRAM (Quadromat)	ave	min	max	stdev	ave	min	max	stdev
Peak time, min	3.0	2.3	3.8	0.65	2.8	2.5	3.2	0.25
Tail height (6min), mm	51	44	57	4.22	49	45	55	3.16
Number of samples			***8***				***8***	

	COMPOSITE SAMPLES											
CLASS AND GRADE	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**
BÜHLER EXTRACTION, %	74.2	73.8	-	-	-	-	73.3	75.1	74.3	-	-	-
FLOUR												
Protein (12% mb), %	11.7	10.9	-	-	-	-	11.6	10.1	9.8	-	-	-
Colour, KJ (wet)	-2.8	-2.2	-	-	-	-	-2.8	-2.9	-3.3	-	-	-
Colour, Minolta CM5 (dry)												
L*	93.88	93.63	-	-	-	-	93.84	93.96	94.24	-	-	-
a*	0.45	0.47	-	-	-	-	0.41	0.35	0.36	-	-	-
b*	9.36	9.15	-	-	-	-	9.25	9.72	9.42	-	-	-
RVA												
Peak Viscosity, cP	2003	1926	-	-	-	-	2051	2438	2310	-	-	-
Minimum viscosity (Through), cP	1699	1623	-	-	-	-	1673	2118	2016	-	-	-
Final Viscosity, cP	2156	2055	-	-	-	-	2270	2743	2551	-	-	-
Peak Time, min	6.47	6.33	-	-	-	-	6.93	6.53	6.93	-	-	-
GLUTEN												
Wet gluten (14% mb), %	32.4	29.5	-	-	-	-	32.7	27.4	28.0	-	-	-
Dry gluten (14% mb), %	10.9	10.4	-	-	-	-	11.4	9.3	9.4	-	-	-
Gluten Index	85	87	-	-	-	-	89	77	67	-	-	-
FARINOGRAM												
Water absorption (14% mb), %	60.6	59.9	-	-	-	-	61.8	58.6	59.8	-	-	-
Development time, min	6.4	7.2	-	-	-	-	6.4	4.7	2.5	-	-	-
Stability, min	8.3	10.6	-	-	-	-	7.9	6.0	5.0	-	-	-
Mixing tolerance index, BU	39	30	-	-	-	-	40	47	42	-	-	-
EXTENSOGRAM (45 min pull)												
Area, cm^2	100	109	-	-	-	-	96	71	60	-	-	-
Maximum height, BU	369	439	-	-	-	-	342	274	256	-	-	-
Extensibility, mm	202	186	-	-	-	-	204	186	164	-	-	-
ALVEOGRAM												
Strength (S), cm^2	40.1	40.2	-	-	-	-	41.9	30.4	28.1	-	-	-
Stability (P), mm	77	92	-	-	-	-	87	66	74	-	-	-
Distensibility (L), mm	125	94	-	-	-	-	117	126	96	-	-	-
Configuration ratio (P/L)	0.62	0.98	-	-	-	-	0.74	0.52	0.77	-	-	-
MIXOGRAM												
Peak time, min	3.0	3.4	-	-	-	-	2.7	2.5	2.7	-	-	-
100g BAKING TEST												
Loaf volume, cm^3	904	841	-	-	-	-	900	865	810	-	-	-
Evaluation (see page 60)	0	1	-	-	-	-	0	0	0	-	-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

33



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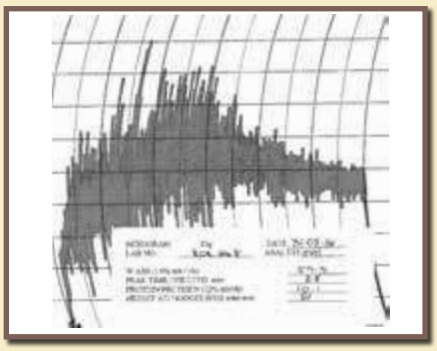
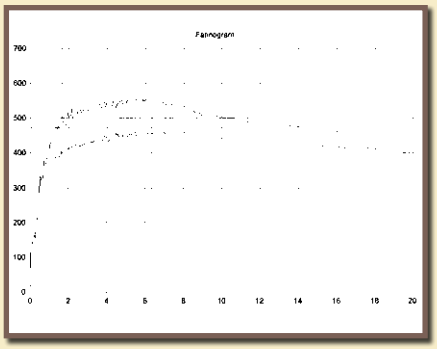


FARINOGRAM

33



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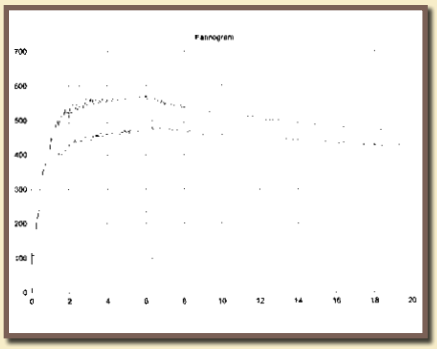
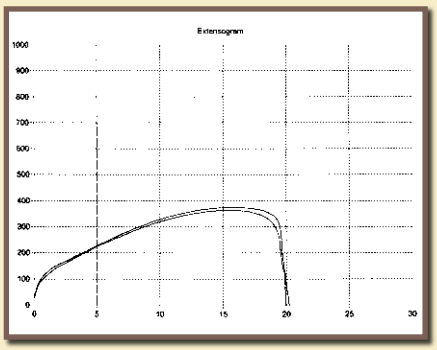


EXTENSOGRAM

33



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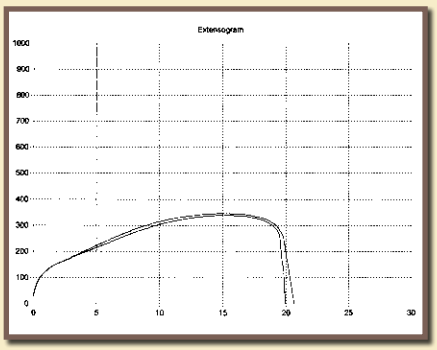
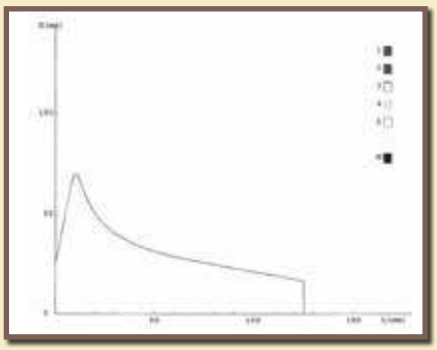


ALVEOGRAM

33



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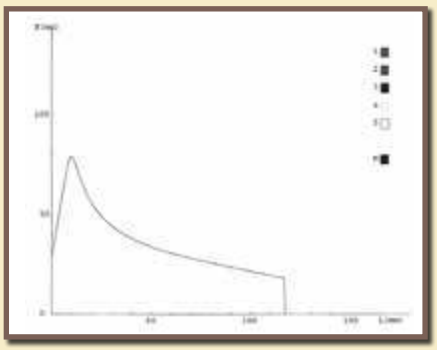


South African Quality data per production region

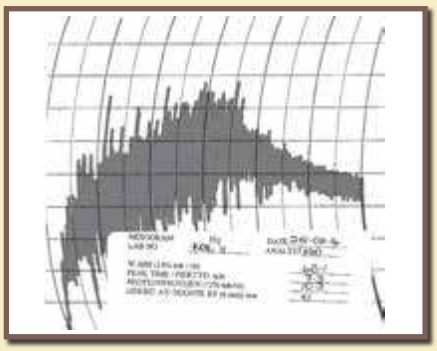
IRRIGATION WHEAT

	(35)						(36)					
PRODUCTION REGION	**Limpopo**						**KwaZulu-Natal**					
Intake silos	Alma Lehau Naboomspruit (Mookgophong) Northam Nutfield Nylstroom (Modimolle) Pienaarsrivier Potgietersus (Mokopane) Roedtan Settlers Warmbad (Bela-Bela)						Bergville Bloedrivier Dannhauser Dundee Mizpah New Amalfi Paulpietersburg Vryheid Winterton					
WHEAT												
	ave	**min**	**max**	**stdev**			**ave**	**min**	**max**	**stdev**		
Protein (12% mb), %	12.0	9.4	15.8	1.86			12.0	11.4	12.5	0.44		
Falling number, sec	384	322	481	41.24			391	349	470	54.33		
1000 Kernel mass (13% mb), g	40.6	27.7	48.3	5.01			38.7	37.2	40.7	1.46		
Hectolitre mass (dirty), kg/hl	81.7	72.9	84.7	2.55			83.3	80.4	85.7	2.19		
Screenings (<1.8mm), %	1.09	0.10	4.77	1.06			1.32	0.41	2.41	1.05		
Total damaged kernels, %	0.58	0.08	1.76	0.46			0.11	0.00	0.28	0.12		
Combined deviations, %	2.00	0.50	6.85	1.40			1.69	0.41	2.95	1.41		
Number of samples	***18***						***4***					
CULTIVARS												
	SST 843	26.3					SST 835	39.0				
cultivars	Duzi	25.2					SST 875	32.8				
with highest %	SST 835	19.1					PAN 3471	11.5				
occurrence	SST 875	9.6					SST 877	8.5				
	SST 876	7.5					SST 843	8.3				
Number of samples	***18***						***4***					
MIXOGRAM (Quadromat)												
	ave	**min**	**max**	**stdev**			**ave**	**min**	**max**	**stdev**		
Peak time, min	3.4	2.4	5.8	0.82			2.6	2.2	3.1	0.38		
Tail height (6min), mm	51	41	70	7.37			52	49	53	1.73		
Number of samples	***18***						***4***					
	COMPOSITE SAMPLES											
CLASS AND GRADE	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**
BÜHLER EXTRACTION, %	72.0	74.5	76.1	73.2	-	-	74.7	74.2	-	-	-	-
FLOUR												
Protein (12% mb), %	12.3	10.3	9.5	8.5	-	-	11.3	10.6	-	-	-	-
Colour, KJ (wet)	-2.8	-3.1	-3.2	-3.4	-	-	-3.0	-2.9	-	-	-	-
Colour, Minolta CM5 (dry)												
L*	93.64	93.93	93.89	94.22	-	-	93.75	93.74	-	-	-	-
a*	0.44	0.44	0.45	0.41	-	-	0.48	0.40	-	-	-	-
b*	9.92	9.53	9.82	9.04	-	-	9.37	9.72	-	-	-	-
RVA												
Peak Viscosity, cP	2278	2407	2474	2413	-	-	2406	2288	-	-	-	-
Minimum viscosity (Through), cP	1825	2126	1966	1801	-	-	1921	1877	-	-	-	-
Final Viscosity, cP	2496	2678	2824	2795	-	-	2698	2597	-	-	-	-
Peak Time, min	7.00	6.80	7.00	7.00	-	-	7.00	6.93	-	-	-	-
GLUTEN												
Wet gluten (14% mb), %	33.0	28.5	25.9	22.1	-	-	32.2	29.2	-	-	-	-
Dry gluten (14% mb), %	12.1	9.3	8.7	7.5	-	-	11.5	10.3	-	-	-	-
Gluten Index	92	90	77	85	-	-	92	86	-	-	-	-
FARINOGRAM												
Water absorption (14% mb), %	62.8	59.5	57.7	56.6	-	-	62.3	60.9	-	-	-	-
Development time, min	8.4	5.7	4.7	5.2	-	-	6.5	6.2	-	-	-	-
Stability, min	11.6	7.2	6.0	7.4	-	-	7.3	7.5	-	-	-	-
Mixing tolerance index, BU	27	42	49	44	-	-	44	44	-	-	-	-
EXTENSOGRAM (45 min pull)												
Area, cm^2	125	95	71	78	-	-	93	93	-	-	-	-
Maximum height, BU	423	342	292	384	-	-	328	342	-	-	-	-
Extensibility, mm	223	205	176	148	-	-	203	198	-	-	-	-
ALVEOGRAM												
Strength (S), cm^2	53.4	35.3	27.4	26.3	-	-	41.9	39.1	-	-	-	-
Stability (P), mm	93	73	64	74	-	-	90	84	-	-	-	-
Distensibility (L), mm	128	118	108	80	-	-	113	119	-	-	-	-
Configuration ratio (P/L)	0.73	0.62	0.59	0.93	-	-	0.80	0.71	-	-	-	-
MIXOGRAM												
Peak time, min	3.1	2.6	2.8	3.0	-	-	2.7	2.7	-	-	-	-
100g BAKING TEST												
Loaf volume, cm^3	915	853	797	723	-	-	927	901	-	-	-	-
Evaluation (see page 60)	1	0	0	0	-	-	0	0	-	-	-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

35



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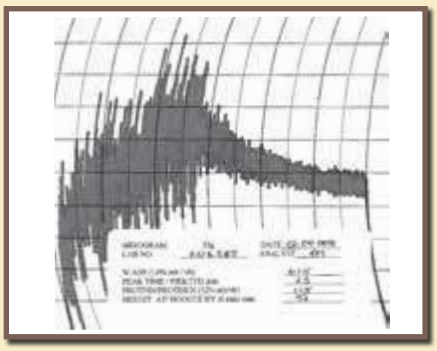
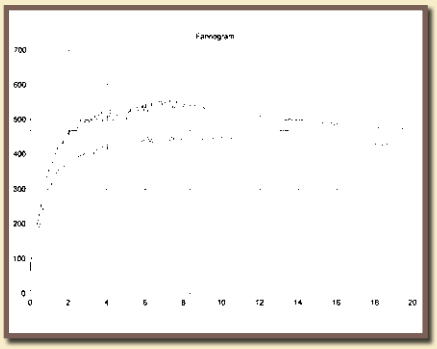


FARINOGRAM

35



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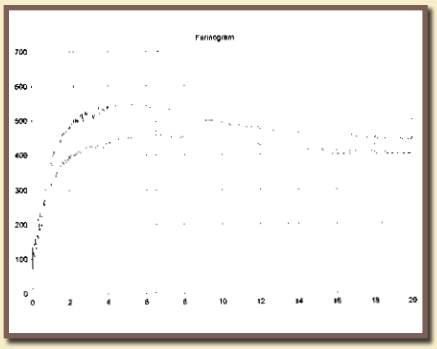
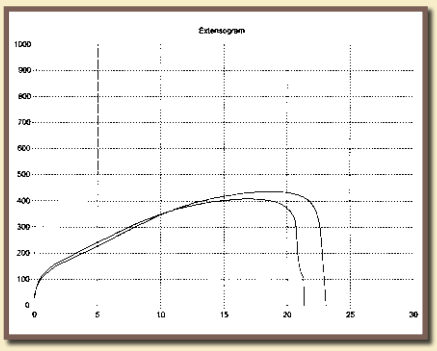


EXTENSOGRAM

35



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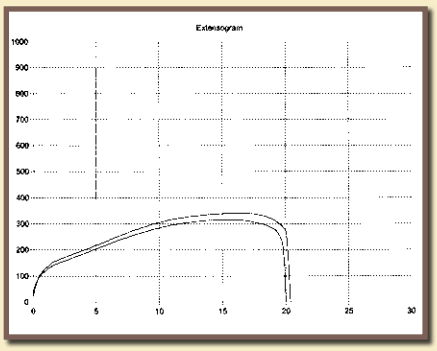
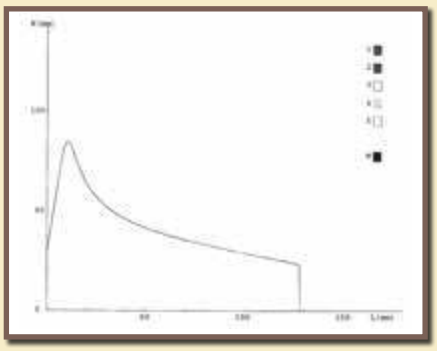


ALVEOGRAM

35



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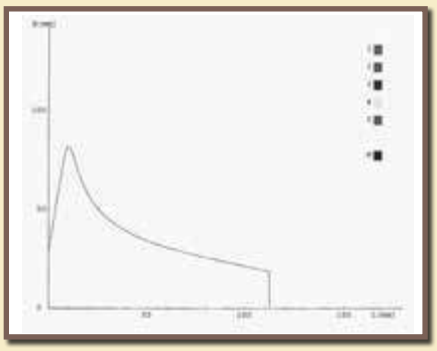


Mycotoxins

Mycotoxins can occur in both tropical areas and temperate regions of the world. Major food commodities affected include cereals, nuts, oil seeds and fruit. Mycotoxin production is foremost a food safety issue, although the occurrence of moulds can also lead to damage ranging from rancidity, odour, flavour changes, loss of nutrients and germ layer destruction resulting in quality reduction of commodities.

Mycotoxins are produced by one or more very specific fungal or mould species. In some cases one species can form more than one mycotoxin. It is important to remember that the presence of a toxin-producing mould does not automatically imply the presence of the associated toxin as many factors influence the production of mycotoxins. Mycotoxins are often produced when the mould is under stress, for example, when the temperature, water activity or amount of oxygen becomes less favourable. In general, the minimum water activity for growth is lower than the minimum for mycotoxin production. Conversely, the absence of any visible mould does not guarantee that no toxins are present as the mould may have already died out while leaving the toxin intact.

Mycotoxin-producing moulds are generally divided into field and storage moulds. Field mould primarily occur pre-harvest in the field and storage mould post-harvest during storage. Any crop that is stored for more than a few days is a target for mould growth and mycotoxin formation.

Moulds tend to develop in isolated pockets in stored commodities. This results in a very uneven distribution of the mould and any associated mycotoxin within a consignment. Correct sampling procedures to ensure a truly representative sample of the whole consignment is therefore vital. Most mycotoxins are toxic in very low concentrations, requiring sensitive and reliable methods for their detection. Failure to achieve satisfactory sampling and analysis performance can lead to unacceptable consignments being accepted or satisfactory loads being unnecessarily rejected.

Most mycotoxins are chemically stable and tend to survive storage and processing even when cooked to quite high temperatures as reached during baking bread or producing breakfast cereals. The difficulty of removing a mycotoxin once produced means that the best method of control is prevention.

Mould growth in the field can be limited by amongst other planting resistant cultivars, correct planting density, weed control and control of insect and pest damage. Other control methods include harvesting at the correct time, rapid drying of the grain, avoiding rewetting and controlling insects during storage to reduce the risk of mould growth. Milling will also reduce the level of contamination by removal of the outer layers of affected kernels. This milling fraction will by comparison contain much higher levels of contamination and most probably cannot be used for animal feed. [(1)]

In a BIOMIN survey conducted from January to December 2013, 4 218 samples different grain and grain products were collected worldwide and analysed for the presence of mycotoxins. Aflatoxin (Afla) was present in 30%, Zearalenone (ZEN) in 37%, Deoxynivalenol (DON) in 59%, Fumonisin (FUM) in 55% and Ochratoxin A (OTA) in 23% of these samples. Of the samples from South Africa, 10% tested positive for DON, 92% for FUM and 3% for OTA. No samples tested positive for Afla or ZEN. The most frequent occurring mycotoxins were the field mould produced mycotoxins such as DON, FUM and ZEN. Other findings included the observations that more than half of all the worldwide samples analysed for the survey contained DON and FUM and that more than one myctoxin was detected in half of the samples.

Constant monitoring and continued research on the preventation and mitigation of mycotoxin contamination are necessary. Application of good agricultural practices and storage conditions as well as effective mycotoxin risk management programs are essential elements in preventing the negative effects of mycotoxins. [(2)]

SAGL implements a multi-mycotoxin screening method using UPLC-MS/MS. With this technique simultaneous quantification and confirmation of Aflatoxin G_1; B_1; G_2; B_2, Fumonisin B_1; B_2; B_3, Deoxynivalenol, 15-ADON, HT-2 Toxin, T-2 Toxin, Zearalenone and Ochratoxin A are possible in one run.

Forty samples (representing different regions as well as different classes and grades) were randomly selected for mycotoxin analyses. Only one of these forty samples selected, tested positive for mycotoxin residues, deoxynivalenol (DON) to be specific with a level of 151 µg/kg.

This level is well below the maximum level prescribed internationally.

The **European Union** specifies the following maximum levels for mycotoxins on cereals and specifically wheat:

Aflatoxins
- All cereals and all produts 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, $B_1 \leq 2.0$ 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 $B_1 + B_2 + G_1 + G_2 \leq 4.0$ µg/kg.

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

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

Zearalenone
- Unprocessed cereals other than maize ≤ 100 µg/kg.
- Cereals intended for direct human consumption, cereal flour, bran and germ as end product marketed for direct human consumption and the germ with the certain exceptions (see full regulation) ≤ 75 µg/kg.
- Bread (including small bakery wares), pastries, biscuits, cereal snacks and breakfast cereals, excluding maize-snacks and maize-based breakfast cereals, ≤ 50 µg/kg. [3]

T-2 and HT-2 toxin
- Unprocessed cereal – wheat, rye and other cereal, indicative level 100 µg/kg.
- Cereal grains for direct human consumption – cereals other than oats and maize, indicative level 50 µg/kg.
- Cereal products for human consumption – cereal milling products other than oat and maiz, indicative level 50 µg/kg.
- Cereal products for human consumption – breakfast cereals including formed cereal flakes, indicative level 75 µg/kg.
- Cereal products for human consumption – bread (including small bakery wares), pastries, biscuits, cereal snacks, pasta, indicative level 25 µg/kg.
- Cereal products for human consumption – cereal-based foods for infants and young children, indicative level 15 µg/kg. [4]

In the **USA**, the Food and Drug Administration (FDA) actions levels for **Aflatoxin** for all commodities intended for human consumption is 20 µg/kg (excluding Aflatoxin M1 in milk where the maximum level is 0.5 µg/kg). Advisory maximum levels for **DON** in finished wheat products intended for human consumption is 1 000 µg/kg. [5]

References:
1) Fact sheets available from the European Mycotoxin Awareness Network website. www.mycotoxins.org.
2) BIOMIN Mycotoxin Survey 2013. www.biomin.net.
3) COMMISSION REGULATION (EC) No 1881/226 of 19 December 2006 setting maximum levels for certain contaminants in foodstuffs.
4) COMMISSION RECOMMENDATION of 27 March 2013 on the presence of T-2 and HT-2 toxin in cereals and cereal products.
5) FDA Mycotoxin Regulatory Guidance, A Guide for Grain Elevators, Feed Manufacturers, Grain Processors and Exporters, August 2011.

Table 6: Mycotoxin results for the 2013/2014 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	B_3						
		LOQ												
		5 µg/kg	5 µg/kg	5 µg/kg	5 µg/kg	20 µg/kg	20 µg/kg	20 µg/kg	100 µg/kg	50 µg/kg	5 µg/kg	20 µg/kg	20 µg/kg	20 µg/kg
1	B3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2	B3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2	B4	ND	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	ND
3	B2	ND	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	ND
3	B4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4	B2	ND	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	ND
4	B4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4	UT	ND	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	ND
5	B3	ND	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	ND
10	B1	ND	ND	ND	ND	ND	ND	ND	<100	ND	ND	ND	ND	ND
10	B2	ND	ND	ND	ND	ND	ND	ND	<100	ND	ND	ND	ND	ND
11	B1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
12	B3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
14	B3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
17	B1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
18	B1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
19	B1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
20	B2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
22	B2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
23	B1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
24	B1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
25	B1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
26	B4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
27	B2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
28	B1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
28	B2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<20	ND	ND

Table 6: Mycotoxin results for the 2013/2014 season (continue)

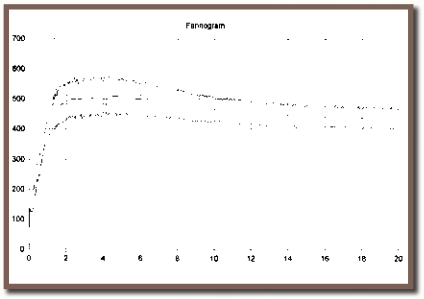
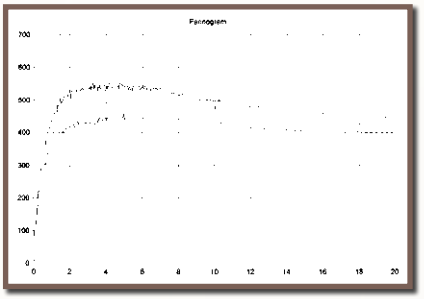
Region	Class and Grade	Aflatoxin µg/kg				Fumonisin µg/kg			Deoxynivalenol µg/kg	15-ADON µg/kg	Ochratoxin A µg/kg	Zearalenone µg/kg	HT-2 Toxin µg/kg	T2 - Toxin µg/kg
		G_1	B_1	G_2	B_2	B_1	B_2	B_3						
		LOQ												
		5 µg/kg	5 µg/kg	5 µg/kg	5 µg/kg	20 µg/kg	20 µg/kg	20 µg/kg	100 µg/kg	50 µg/kg	5 µg/kg	20 µg/kg	20 µg/kg	20 µg/kg
28	B3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
29	B1	ND	ND	ND	ND	ND	ND	ND	<100	ND	ND	ND	ND	ND
30	B2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
32	B1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
33	B1	ND	ND	ND	ND	ND	ND	ND	151	ND	ND	<20	ND	ND
34	B2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
35	B1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
35	B2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
36	B2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total number of samples		40	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	4	0	0	0	0	0
Number of positive results		0	0	0	0	0	0	0	1	0	0	0	0	0
Average of positive results		-	-	-	-	-	-	-	151	-	-	-	-	-
Maximum of positive results		-	-	-	-	-	-	-	151	-	-	-	-	-

Note:

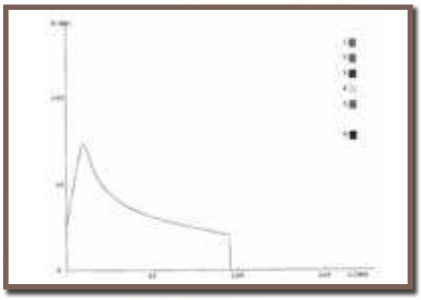
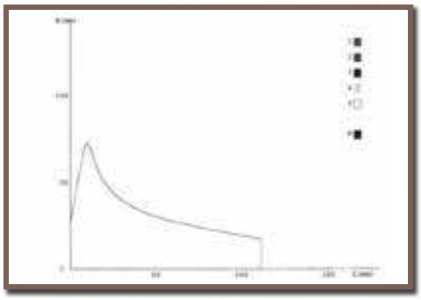
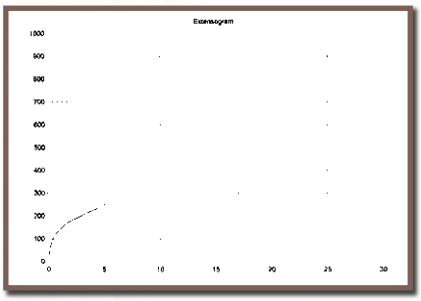
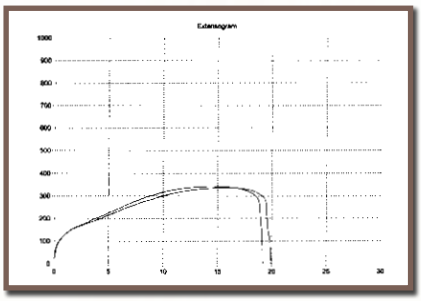
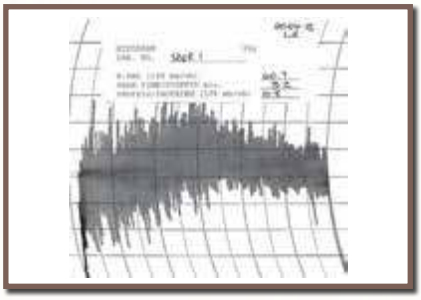
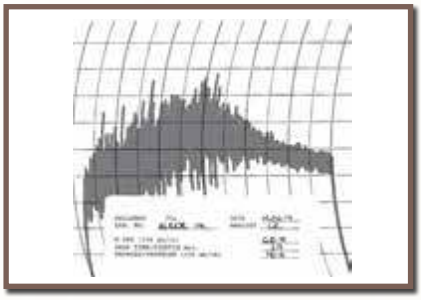
- Limit of quantitation (LOQ) means the lowest concentration level that can be quantified with acceptable presicion and accuracy by the spectrometer. A concentration measured below the LOQ is reported as <LOQ.
- Limit of detection (LOD) is the lowest concentration level that can be detected but not quantified and is 50% of the LOQ of each mycotoxin. A concentration measured below the LOD is reported as not detected (ND).
- Mycotoxin levels lower than the LOQ were seen as tested negative for calculation purposes.
- µg/kg = ppb (parts per billion)

RSA WHEAT CROP QUALITY SUMMARY

RSA Crop Quality 2011/2012 and 2013/2014 Seasons

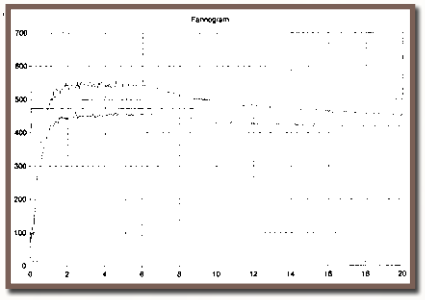
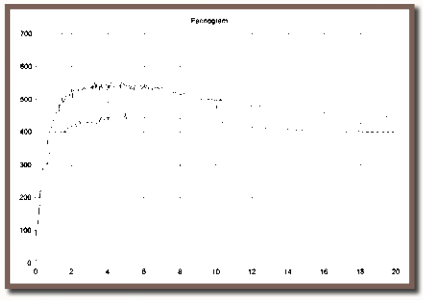
Country of origin	RSA Crop Average 2011/2012							RSA Crop Average 2013/2014						
Class and Grade bread wheat	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	**176**	**120**	**61**	**39**	**25**	**12**	**433**	**93**	**74**	**70**	**47**	**43**	**13**	**340**
WHEAT **GRADING**														
Protein (12% mb), %	12.78	11.52	10.48	10.33	11.72	10.78	11.77	12.90	11.49	10.62	9.77	12.06	12.80	11.58
Moisture, %	11.1	11.0	10.9	10.9	11.0	11.4	11.0	11.5	11.4	11.3	11.3	11.6	11.6	11.4
Falling number, sec	397	393	384	372	376	274	387	344	350	349	344	322	163	337
1000 Kernel mass (13% mb), g	37.7	38.8	38.9	38.2	34.1	36.7	38.0	38.3	40.6	40.3	39.7	37.3	38.4	39.3
Hlm (dirty), kg/hl	81.1	81.0	80.7	79.9	78.8	79.9	80.7	80.4	80.4	79.4	78.7	78.5	76.4	79.5
Screenings (<1,8mm), %	1.32	1.36	1.36	2.21	3.20	2.62	1.56	1.25	1.19	1.43	1.88	2.56	2.58	1.58
Gravel, stones, turf and glass, %	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.07	0.01
Foreign matter, %	0.08	0.09	0.10	0.10	0.14	0.13	0.09	0.14	0.16	0.22	0.18	0.37	0.38	0.20
Other grain & unthreshed ears, %	0.24	0.29	0.27	0.30	0.64	0.20	0.28	0.30	0.35	0.47	0.40	0.77	0.67	0.43
Heat damaged kernels, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.00
Immature kernels, %	0.05	0.04	0.02	0.03	0.03	0.03	0.04	0.11	0.05	0.03	0.02	0.19	0.12	0.08
Insect damaged kernels, %	0.37	0.43	0.43	0.36	0.84	0.24	0.42	0.18	0.18	0.13	0.10	0.20	0.16	0.16
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	0.14	0.08	0.09	0.04	0.31	2.02	0.20
Total damaged kernels, %	0.46	0.48	0.49	0.41	0.96	0.70	0.50	0.43	0.31	0.26	0.17	0.71	2.32	0.44
Combined deviations, %	2.10	2.23	2.23	3.06	4.94	3.65	2.45	2.12	2.00	2.28	2.59	4.29	5.95	2.61
Field fungi, %	0.10	0.11	0.14	0.19	0.06	0.06	0.12	0.10	0.07	0.06	0.05	0.12	0.07	0.08
Storage fungi, %	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.03	0.02	0.01	0.01	0.02	0.10	0.02
Ergot, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Noxious seeds (*Crotalaria spp., etc.*)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Noxious seeds (*Argemone mexicana, 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***	***23***	***18***	***11***	***8***	***8***	***2***	***70***
BÜHLER EXTRACTION, %	74.4	74.2	74.8	73.8	72.8	73.3	74.1	73.0	73.5	73.8	73.1	72.8	70.9	73.2
FLOUR														
Colour, KJ	-2.7	-2.7	-3.0	-2.8	-2.7	-3.0	-2.8	-2.8	-2.9	-3.1	-3.1	-2.8	-2.3	-2.9
Protein (12% mb), %	11.7	10.5	9.6	9.6	10.6	9.7	10.6	11.8	10.5	9.7	8.9	10.9	12.9	10.7
Wet Gluten (14% mb), %	32.0	28.4	26.0	26.0	28.5	25.6	28.7	32.5	29.2	27.6	23.1	29.9	36.6	29.5
Dry Gluten (14% mb), %	11.1	9.8	8.8	8.8	9.7	9.0	9.9	11.5	10.1	9.9	8.1	10.5	12.9	10.4
100g BAKING TEST														
Baking water absorption, %	61.7	60.3	59.3	59.2	60.6	59.1	60.4	61.6	60.2	59.3	58.7	60.8	62.7	60.5
Loaf volume, cm^3	916	847	811	802	821	778	852	917	854	820	764	886	1034	868
Evaluation	0	0	0	0	1	1	0	0	0	0	0	0	0	0
FARINOGRAM														
Water absorption, %	62.3	61.3	60.9	60.3	60.7	60.1	61.3	61.6	60.2	58.9	57.6	59.8	60.4	60.1
Development time, min	5.6	3.8	3.2	2.8	4.4	3.1	4.1	6.5	5.1	4.2	3.0	5.1	5.7	5.2
Stability, mm	10.7	8.1	6.7	6.8	8.9	6.4	8.5	9.7	7.4	6.3	6.1	8.1	8.8	8.0
Mixing tolerance index, BU	34	39	47	43	37	50	39	34	39	43	41	37	37	38
														

RSA Crop Quality of 2011/2012 and 2013/2014 Seasons

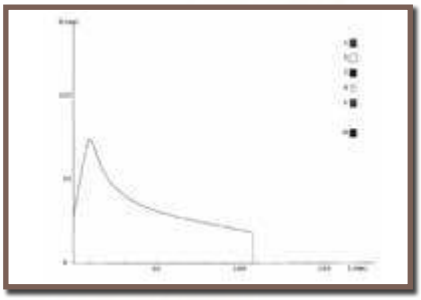
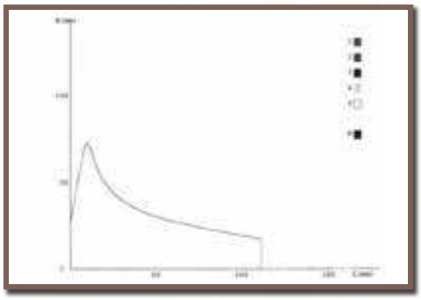
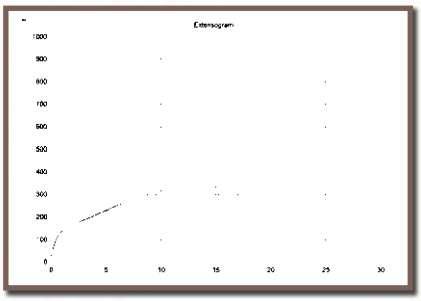
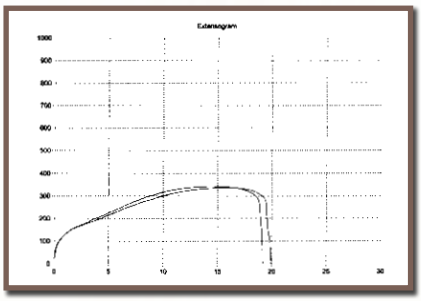
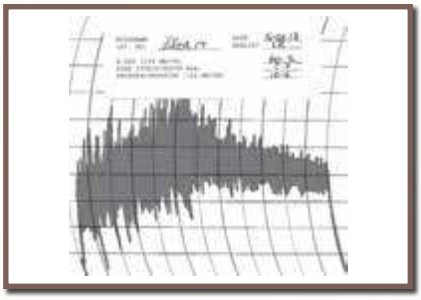
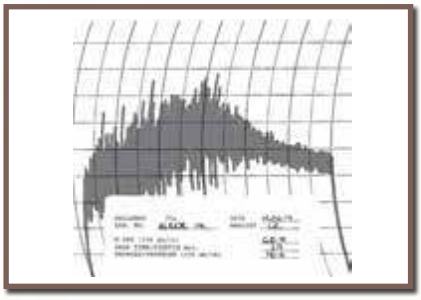
Country of origin	RSA Crop Average 2011/2012							RSA Crop Average 2013/2014						
Class and Grade bread wheat	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	**28**	**23**	**14**	**15**	**8**	**2**	**90**	**23**	**18**	**11**	**8**	**8**	**2**	**70**
ALVEOGRAM														
Strength (S), cm²	41.7	34.6	29.4	29.8	33.7	30.4	35.0	44.7	35.8	30.1	27.4	39.8	45.7	37.6
Stability (P), mm	85	83	80	79	82	78	82	87	80	72	74	79	71	80
Distensibility (L), mm	112	94	86	89	96	86	98	122	113	110	94	125	156	116
P/L	0.79	0.92	0.97	0.97	0.90	0.90	0.89	0.75	0.74	0.69	0.91	0.69	0.47	0.74
														
EXTENSOGRAM														
Strength, cm²	110	87	72	74	86	82	90	110	85	71	72	99	129	92
Max. height, BU	379	337	294	311	349	315	340	374	325	284	317	364	425	341
Extensibility, mm	211	184	174	170	175	183	188	215	188	175	162	194	225	194
														
MIXOGRAM														
Peak time, min	2.9	3.0	2.8	3.1	3.3	3.2	3.0	2.8	2.7	2.7	3.0	3.0	2.9	2.8
Absorption, %	61.9	60.4	59.4	59.4	60.6	59.5	60.5	61.9	60.4	59.5	58.8	61.0	63.4	60.7
														
MYCOTOXINS	**UPLC - MS/MS**							**UPLC - MS/MS**						
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 [119]							ND [151]						
Ochratoxin A (µg/kg)	ND							ND						
Zearalenone (µg/kg)	ND							ND						
T-2 Toxin (µg/kg)	ND							ND						
No. of samples	***40***							***40***						

RSA WHEAT CROP QUALITY SUMMARY

RSA Crop Quality 2012/2013 and 2013/2014 Seasons

Country of origin	RSA Crop Average 2012/2013							RSA Crop Average 2013/2014						
Class and Grade bread wheat	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	**74**	**95**	**69**	**36**	**59**	**4**	**337**	**93**	**74**	**70**	**47**	**43**	**13**	**340**
WHEAT														
GRADING														
Protein (12% mb), %	12.59	11.55	10.50	10.15	11.30	12.23	11.38	12.90	11.49	10.62	9.77	12.06	12.80	11.58
Moisture, %	11.1	11.1	11.0	11.1	11.2	12.1	11.1	11.5	11.4	11.3	11.3	11.6	11.6	11.4
Falling number, sec	375	371	361	355	333	280	360	344	350	349	344	322	163	337
1000 Kernel mass (13% mb), g	39.5	40.4	41.2	41.4	39.2	36.9	40.2	38.3	40.6	40.3	39.7	37.3	38.4	39.3
Hlm (dirty), kg/hl	81.7	81.7	81.9	81.7	79.5	75.1	81.3	80.4	80.4	79.4	78.7	78.5	76.4	79.5
Screenings (<1,8mm), %	1.14	1.25	1.13	1.64	2.32	3.60	1.46	1.25	1.19	1.43	1.88	2.56	2.58	1.58
Gravel, stones, turf and glass, %	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.07	0.01
Foreign matter, %	0.08	0.10	0.13	0.14	0.25	0.25	0.13	0.14	0.16	0.22	0.18	0.37	0.38	0.20
Other grain & unthreshed ears, %	0.37	0.42	0.34	0.40	1.04	0.64	0.50	0.30	0.35	0.47	0.40	0.77	0.67	0.43
Heat damaged kernels, %	0.04	0.02	0.02	0.03	0.02	0.00	0.02	0.00	0.00	0.01	0.00	0.01	0.01	0.00
Immature kernels, %	0.20	0.15	0.11	0.09	0.25	0.12	0.16	0.11	0.05	0.03	0.02	0.19	0.12	0.08
Insect damaged kernels, %	0.24	0.32	0.27	0.31	0.68	0.31	0.36	0.18	0.18	0.13	0.10	0.20	0.16	0.16
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, %	0.32	0.16	0.07	0.09	0.42	1.96	0.24	0.14	0.08	0.09	0.04	0.31	2.02	0.20
Total damaged kernels, %	0.80	0.65	0.47	0.53	1.38	2.39	0.78	0.43	0.31	0.26	0.17	0.71	2.32	0.44
Combined deviations, %	2.38	2.43	2.08	2.72	4.91	6.88	2.86	2.12	2.00	2.28	2.59	4.29	5.95	2.61
Field fungi, %	0.49	0.40	0.35	0.28	0.45	1.69	0.42	0.10	0.07	0.06	0.05	0.12	0.07	0.08
Storage fungi, %	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.03	0.02	0.01	0.01	0.02	0.10	0.02
Ergot, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Noxious seeds (*Crotalaria spp., etc.*)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Noxious seeds (*Argemone mexicana, 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	***22***	***17***	***13***	***11***	***7***	***-***	***70***	***23***	***18***	***11***	***8***	***8***	***2***	***70***
BÜHLER EXTRACTION, %	73.5	73.5	73.1	72.7	72.1	-	73.2	73.0	73.5	73.8	73.1	72.8	70.9	73.2
FLOUR														
Colour, KJ (wet)	-2.8	-2.8	-3.0	-2.8	-2.8	-	-2.9	-2.8	-2.9	-3.1	-3.1	-2.8	-2.3	-2.9
Colour, Minolta CM5 (dry)														
L*	93.76	93.82	94.02	83.84	93.88	-	93.85	93.88	94.01	94.16	94.10	93.97	93.62	93.99
a*	0.44	0.42	0.38	0.38	0.43	-	0.41	0.42	0.41	0.36	0.37	0.38	0.34	0.40
b*	9.73	9.91	9.99	10.19	10.00	-	9.92	9.40	9.38	9.54	9.92	9.60	9.65	9.50
Protein (12% mb), %	11.7	10.8	9.7	9.6	10.9	-	10.7	11.8	10.5	9.7	8.9	10.9	12.9	10.7
Wet Gluten (14% mb), %	31.7	29.4	26.4	25.4	30.0	-	29.0	32.5	29.2	27.6	23.1	29.9	36.6	29.5
Dry Gluten (14% mb), %	11.0	10.2	9.0	8.8	10.3	-	10.0	11.5	10.1	9.9	8.1	10.5	12.9	10.4
Gluten Index	84	78	87	83	81	-	83	87	86	83	83	90	93	86
100g BAKING TEST														
Baking water absorption, %	61.3	60.4	59.3	59.2	60.4	-	60.3	61.6	60.2	59.3	58.7	60.8	62.7	60.5
Loaf volume, cm^3	930	900	828	822	916	-	886	917	854	820	764	886	1034	868
Evaluation	0	0	0	0	0	-	0	0	0	0	0	0	0	0
FARINOGRAM														
Water absorption, %	61.3	60.6	60.5	60.3	61.3	-	60.8	61.6	60.2	58.9	57.6	59.8	60.4	60.1
Development time, min	6.4	5.0	4.1	4.0	4.9	-	5.1	6.5	5.1	4.2	3.0	5.1	5.7	5.2
Stability, mm	9.7	7.4	7.0	7.3	7.3	-	7.9	9.7	7.4	6.3	6.1	8.1	8.8	8.0
Mixing tolerance index, BU	34	42	38	35	36	-	37	34	39	43	41	37	37	38
														

RSA Crop Quality of 2012/2013 and 2013/2014 Seasons

Country of origin	RSA Crop Average 2012/2013							RSA Crop Average 2013/2014						
Class and Grade bread wheat	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	**22**	**17**	**13**	**11**	**7**	**-**	**70**	**23**	**18**	**11**	**8**	**8**	**2**	**70**
ALVEOGRAM														
Strength (S), cm²	43.1	35.1	32.6	31.8	36.5	-	36.7	44.7	35.8	30.1	27.4	39.8	45.7	37.6
Stability (P), mm	86	81	90	91	86	-	86	87	80	72	74	79	71	80
Distensibility (L), mm	120	109	90	84	104	-	105	122	113	110	94	125	156	116
P/L	0.77	0.80	1.23	1.34	0.89	-	0.96	0.75	0.74	0.69	0.91	0.69	0.47	0.74
														
EXTENSOGRAM														
Strength, cm²	102	82	72	70	85	-	84	110	85	71	72	99	129	92
Max. height, BU	365	313	299	308	320	-	325	374	325	284	317	364	425	341
Extensibility, mm	204	189	171	159	190	-	185	215	188	175	162	194	225	194
														
MIXOGRAM														
Peak time, min	2.9	2.6	2.9	3.0	2.7	-	2.8	2.8	2.7	2.7	3.0	3.0	2.9	2.8
Absorption, %	61.8	60.7	59.5	59.5	60.9	-	60.6	61.9	60.4	59.5	58.8	61.0	63.4	60.7
														
MYCOTOXINS	**UPLC - MS/MS**							**UPLC - MS/MS**						
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 [380]							ND [151]						
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 91 - 103.

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 92 - 93 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.

BüHLER MILLING:

Cleaned wheat samples are conditioned/ tempered 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.

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.

GLUTEN:

Wheat gluten is the water-insoluble complex protein fraction seperated 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 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.

SAGL implements a validated SAGL In-house multi-mycotoxin screening method using UPLC - MS/MS. 40 of the 340 wheat crop samples were tested for Aflatoxin G_1; B_1; G_2; B_2, Fumonisin B_1; B_2; B_3, Deoxynivalenol, 15-ADON, HT2 - Toxin, T-2 Toxin, Zearalenone and Ochratoxin A.

SAGIS
South African Grain Information Services NPC
Suid-Afrikaanse Graaninligtingsdiens NWM
Reg no. 1997/019 186/08

WHEAT IMPORTS PER COUNTRY

2012/13 Season (29 Sep 2012 - 27 Sep 2013)

FROM COUNTRY	FOR RSA TON	FOR AFRICA TON	TOTAL TON
Argentina	98 029	0	98 029
Australia	189 925	10 460	200 385
Brazil	234 733	4 402	239 135
Canada	48 583	1 809	50 392
Germany	95 476	3 000	98 476
Lesotho	384	0	384
Russia	245 228	7 470	252 698
Swaziland	288	0	288
Ukraine	341 976	4 800	346 776
Uruguay	99 033	1 676	100 709
USA	42 572	0	42 572
	1 396 227	**33 617**	**1 429 844**

WHEAT EXPORTS PER COUNTRY

2012/13 Season (29 Sep 2012 - 27 Sep 2013)

TO COUNTRY	FROM RSA TO AFRICA TON	FROM OVERSEAS TO AFRICA TON	TOTAL TON
Botswana	91 811	1 985	93 796
Lesotho	73 485	22 186	95 671
Mozambique	0	1 809	1 809
Namibia	25 510	0	25 510
Swaziland	21 516	8 013	29 529
Zimbabwe	65 977	0	65 977
	278 299	**33 993**	**312 292**

WHEAT IMPORTS PER COUNTRY

2013/14 Season (28 Sep 2013 - 4 Jul 2014)

FROM COUNTRY	FOR RSA TON	FOR AFRICA TON	TOTAL TON
Australia	50 595	3 000	53 595
Canada	68 686	0	68 686
Finland	25 430	0	25 430
Germany	114 581	440	115 021
Latvia	22 014	0	22 014
Lithuania	40 532	0	40532
Russian Federation	609 891	26 920	636 811
Ukraine	327 820	20 441	348 261
USA	49 013	0	49 013
	1 308 562	**50 801**	**1 359 363**

WHEAT EXPORTS PER COUNTRY

2013/14 Season (28 Sep 2013 - 4 Jul 2014)

TO COUNTRY	FROM RSA TO AFRICA TON	FROM OVERSEAS TO AFRICA TON	TOTAL TON
Botswana	66 195	12 731	78 926
Lesotho	46 714	32 065	78 779
Namibia	27 032	0	27 032
Swaziland	8 047	7 250	15 297
Zimbabwe	40 928	440	41 368
	188 916	**52 486**	**241 402**

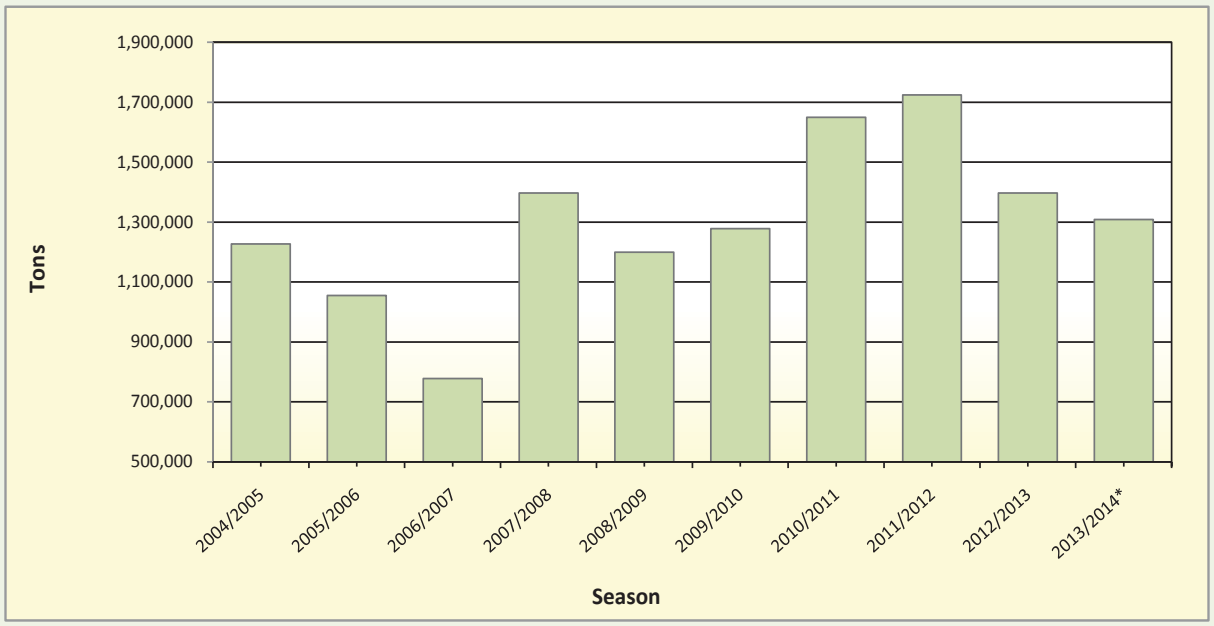
Imported Wheat

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 SAGIS.

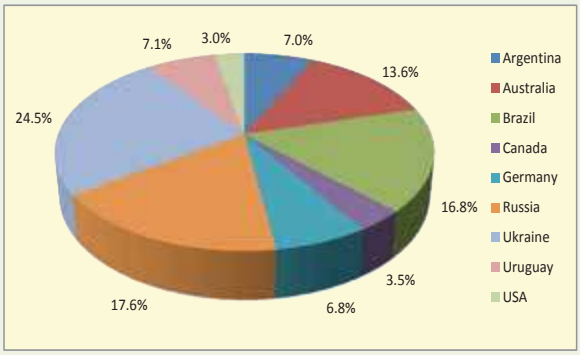
Import figures per season are calculated from 1 October to 30 September of the following year.

Graph 14: Total wheat imports for domestic use since the 2004/2005 season



*2013/2014 season figure includes imports up to 4 July 2014.

Graph 15: Wheat imports per origin for domestic use 2012/2013 season



Graph 16: Wheat imports per origin for domestic use 2013/2014 season

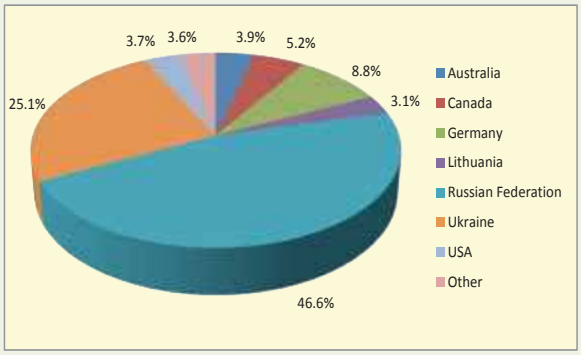


Table 7: Total wheat imports per country per season for use in RSA

	Season										Total
	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009	2009/2010	2010/2011	2011/2012	2012/2013	2013/2014*	
Argentina	574,600	392,930	310,524	684,160	368,739	-	629,600	652,279	98,029	-	**3,710,861**
Australia	154,112	59,927	-	-	74,714	55,312	181,637	247,675	189,925	50,595	**1,013,897**
Brazil	-	-	-	-	42,449	123,944	58,551	276,420	234,733	-	**736,097**
Canada	43,766	62,643	153,694	194,764	54,831	72,911	79,697	45,252	48,583	68,686	**824,827**
Finland	-	-	-	-	-	-	-	-	-	25,430	**25,430**
France	-	9,920	-	-	-	-	-	-	-	-	**9,920**
Germany	115,332	354,718	80,649	111,013	518,002	809,934	88,581	105,964	95,476	114,581	**2,394,250**
Latvia	-	-	-	-	-	-	-	-	-	22,014	**22,014**
Lesotho	-	-	-	-	-	-	-	-	384	-	**384**
Lithuania	-	-	-	-	-	1,611	-	8,880	-	40,532	**51,023**
Poland	-	-	-	-	13,013	-	-	-	-	-	**13,013**
Romania	-	-	-	-	-	-	-	36,071	-	-	**36,071**
Russia	-	-	-	-	-	-	-	154,129	245,228	609,891	**1,009,248**
Swaziland	-	-	-	-	-	-	-	-	288		**288**
UK	27,586	-	-	-	-	-	-	-	-	-	**27,586**
Ukraine	29,935	85,979	-	-	13,521	41,230	-	39,016	341,976	327,820	**879,477**
Uruguay	-	-	-	-	-	-	25,249	45,250	99,033	-	**169,532**
USA	281,165	88,651	232,266	406,562	113,434	173,030	586,200	112,915	42,572	49,013	**2,085,808**
Total	**1,226,496**	**1,054,768**	**777,133**	**1,396,499**	**1,198,703**	**1,277,972**	**1,649,515**	**1,723,851**	**1,396,227**	**1,308,562**	**13,009,726**

*2013/2014 season figures include imports up to 4 July 2014.

Quality summary of imported wheat (1 October 2012 to 30 September 2013) (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 91 to 103), 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 67 to 84. This imported wheat quality is compared to a summary of the local crop quality of the same (2012/2013) 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 8 on page 66. 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. Local wheat compared well with Canadian wheat in this regard. 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. Brazil and Russia had the highest levels of screenings.

American wheat had the lowest whole wheat protein contents resulting in the lowest average by one percent. Brazil is the only country with a falling number average below 220 seconds, individual sample results ranged between 110 and 417 seconds.

The ability of wheat flour to produce dough with good gas-holding capability is attributable to gluten as 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. As in the previous season, the Canadian wheat had the highest protein content resulting in the highest gluten content. However, when evaluating gluten content, the protein content should also be taken into account. In general a wet gluten content of 28.0% or higher is expected from wheat with a flour protein content of 10%. The wet gluten content of good quality white bread flour normally ranges between 27 – 33%.

Flour with higher water absorption is preferred by bakers as this result in increased dough yields. The acceptable range for white bread flour is 60.0 – 65.0%, average 61.0 – 63.0%. Wheat from only Australia, Brazil and Canada fell within this range. 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 good protein quality. The farinogram development times of the imported wheat (Australia and Canada excluded) were much shorter than the South African wheat. The American wheat showed extremely poor quality on the Farinograph.

Acceptable ranges for the Alveograph parameters are as follows: Strength 30 – 45 cm^2, stability (P) 65 – 120 mm, distensibility (L) 80 – 120 mm and P/L 0.80 – 1.50. A good correlation exists between alveogram strength and protein quality. Except for Germany, all countries showed an increase in distensiblity values compared to the previous season. Short distensibility values, as observed with German wheat, can result in lower loaf volumes. The American wheat again showed the weakest quality on the Alveograph.

In general, Extensograph strength values ranging between 80 – 150 cm^2, maximum heights of 300 – 550 BU and extensibility values of 170 – 220 mm, indicate good baking quality. The tendency towards shorter extensibility values compared to local wheat can also be seen on the Extensograph as with the Alveograph distensibility values. The poor quality observed on the wheat from the USA is confirmed with the Extensograph results.

The imported wheat samples, except for Canada, again showed a tendency towards longer mixogram mixing times. Australian 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. Australian wheat showed the best and Brazilian wheat the worst correlation between the protein content and 100 g loaf volume.

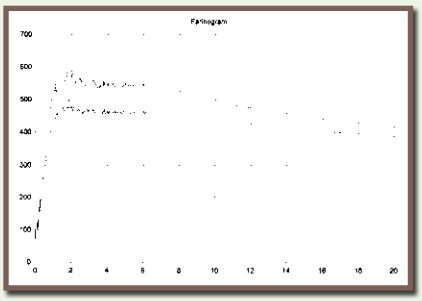
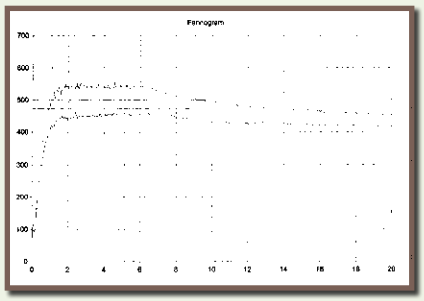
Composite samples of holds per shipment per country are tested for mycotoxin residues by means of a multi-mycotoxin analysis. The mycotoxin results overall did not raise concerns, although the DON levels were higher than in the previous two seasons and two samples from Uruguay exceeded the EU maximum limits for unprocessed cereals (1 250 µg/kg).

Table 8: Average quality data of imported wheat during the 2012/2013 season (previous season)

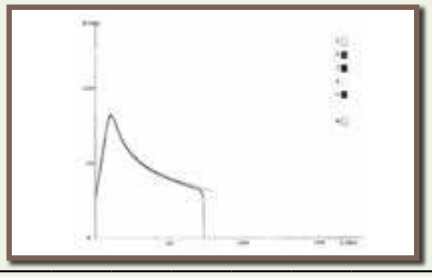
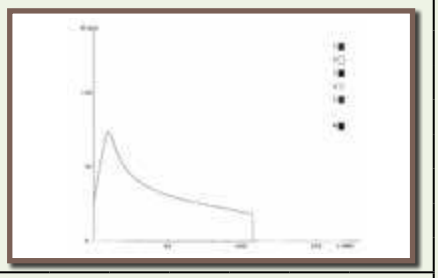
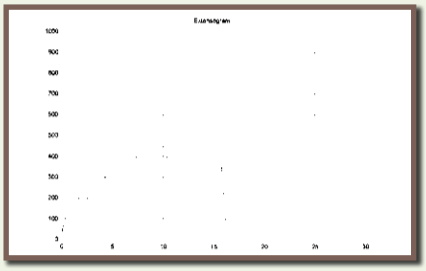
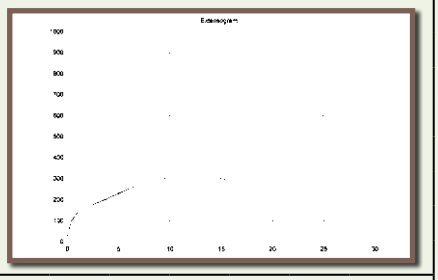
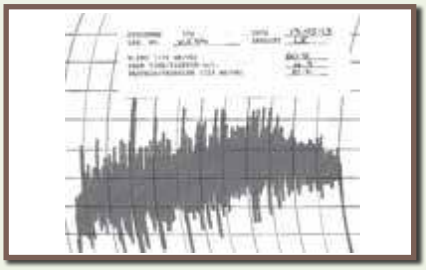
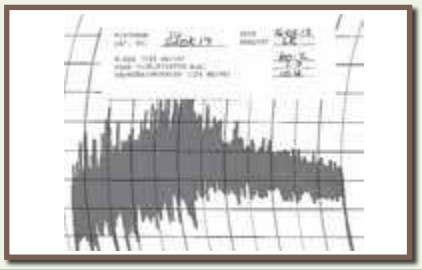
	Argentina	Australia	Brazil	Canada	Germany	Russia	Ukraine	Uruguay	USA	RSA
Hlm, kg/hl	78.8	83.1	77.7	81.5	80.5	77.8	79.9	78.6	79.3	81.3
Screenings, %	2.57	1.92	3.19	2.41	1.07	3.57	1.75	2.28	2.36	1.46
WWF Protein, % (12% mb)	11.8	11.4	12.4	13.1	11.1	11.7	11.8	11.6	10.1	11.4
WWF Falling number, sec	*397*	*417*	*218*	*368*	*341*	*387*	*355*	*410*	*373*	*360*
Number of samples	14	34	44	7	10	16	30	18	10	337
Flour Protein, % (12% mb)	10.4	10.3	10.6	12.0	9.7	10.5	10.6	10.4	8.4	10.7
Flour colour, KJ	-1.9	-3.2	-0.9	-1.9	-2.3	-2.2	-2.1	-1.6	-2.2	-2.9
Minolta CM-5 colour										
L*	93.25	94.03	92.82	92.66	93.70	93.27	93.51	93.26	94.83	93.85
b*	10.75	10.26	10.21	15.15	10.00	11.13	10.64	10.99	8.44	9.92
Wet gluten, % (14% mb)	26.5	26.4	27.8	32.9	26.3	27.1	27.1	26.2	21.5	29.0
Dry gluten, % (14% mb)	9.1	9.3	9.5	11.6	9.2	9.6	9.5	9.1	7.0	10.0
Gluten Index	92	91	79	67	85	94	91	89	69	83
Farinogram										
Water absorption, % (14% mb)	58.3	60.9	60.1	63.2	58.6	58.2	58.4	57.7	51.4	60.8
Development time, min	2.0	4.9	1.9	4.8	1.8	2.5	2.3	2.0	1.3	5.1
Stability, min	7.0	11.8	5.9	7.4	6.4	10.7	10.4	7.3	2.3	7.9
Alveogram										
Strength, cm^2	35.2	44.7	33.4	40.4	31.6	39.7	36.6	32.6	17.0	36.7
Stability, mm	92	109	95	112	103	101	95	92	43	86
Distensibility, mm	72	83	70	86	56	72	71	71	94	105
P/L	1.38	1.37	1.41	2.03	2.01	1.43	1.38	1.60	0.47	0.96
Extensogram										
Strength, cm^2	95	114	78	86	76	98	92	84	55	84
Maximum height, BU	440	458	366	352	394	455	423	412	301	325
Extensibility, mm	161	185	155	174	139	160	159	150	127	185
Mixogram										
Peak time, min	4.5	3.5	4.0	3.2	3.9	4.4	4.3	4.3	3.8	2.8
100 g Baking test										
Volume, cm^3	810	837	729	814	728	774	812	762	703	886
Evaluation	1	0	4	3	2	2	1	2	1	0
Number of samples	*14*	*34*	*44*	*7*	*10*	*16*	*30*	*18*	*10*	*70*

2012/2013 IMPORTED WHEAT QUALITY - ARGENTINA (1 Oct 2012 to 30 Sep 2013)

2012/2013 Imported Wheat Quality Versus 2012/2013 RSA Wheat Quality

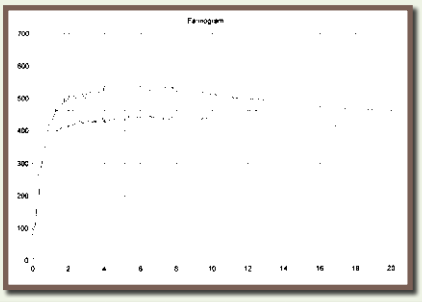
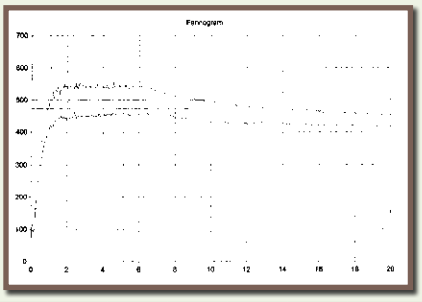
Country of origin	Argentina Average							RSA Crop Average						
Class and Grade bread wheat	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	***3***	***3***	***2***	***2***	***-***	***4***	***14***	***74***	***95***	***69***	***36***	***59***	***4***	***337***
WHEAT														
GRADING														
Protein (12% mb), %	12.18	11.86	11.71	11.86	-	11.45	11.79	12.59	11.55	10.50	10.15	11.30	12.23	11.38
Moisture, %	12.1	12.0	11.8	11.9	-	11.9	11.9	11.1	11.1	11.0	11.1	11.2	12.1	11.1
Falling number, sec	428	321	375	440	-	422	397	375	371	361	355	333	280	360
1000 Kernel mass (13% mb), g	31.4	29.7	32.3	28.2	-	31.7	30.8	39.5	40.4	41.2	41.4	39.2	36.9	40.2
Hlm (dirty), kg/hl	80.2	78.3	78.0	80.1	-	77.8	78.8	81.7	81.7	81.9	81.7	79.5	75.1	81.3
Screenings (<1,8mm), %	2.28	2.38	2.25	3.39	-	2.70	2.57	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	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00
Foreign matter, %	0.06	0.15	0.06	0.20	-	0.30	0.17	0.08	0.10	0.13	0.14	0.25	0.25	0.13
Other grain & unthreshed ears, %	0.58	0.59	0.12	0.28	-	0.55	0.46	0.37	0.42	0.34	0.40	1.04	0.64	0.50
Heat damaged kernels, %	0.02	0.05	0.00	0.00	-	0.02	0.02	0.04	0.02	0.02	0.03	0.02	0.00	0.02
Immature kernels, %	0.16	0.05	0.04	0.07	-	0.22	0.12	0.20	0.15	0.11	0.09	0.25	0.12	0.16
Insect damaged kernels, %	0.04	0.20	0.24	0.36	-	0.40	0.25	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
Sprouted kernels, %	0.01	0.37	0.40	0.00	-	0.03	0.15	0.32	0.16	0.07	0.09	0.42	1.96	0.24
Total damaged kernels, %	0.24	0.67	0.68	0.43	-	0.67	0.55	0.80	0.65	0.47	0.53	1.38	2.39	0.78
Combined deviations, %	3.15	3.80	3.10	4.28	-	4.22	3.75	2.38	2.43	2.08	2.72	4.91	6.88	2.86
Field fungi, %	1.85	0.43	0.63	2.27	-	1.87	1.44	0.49	0.40	0.35	0.28	0.45	1.69	0.42
Storage fungi, %	0.45	0.23	0.26	0.30	-	0.39	0.34	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
Noxious seeds (*Crotalaria spp., etc.*)	0	0	0	0	-	0	0	0	0	0	0	0	0	0
Noxious seeds (*Argemone mexicana, etc.*)	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
Undesirable odour	No	No	No	No	-	No	No	No	No	No	No	No	No	No
	B1	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	***3***	***3***	***2***	***2***	***-***	***4***	***14***	***22***	***17***	***13***	***11***	***7***	***-***	***70***
BÜHLER EXTRACTION, %	72.4	71.9	71.2	71.9	-	73.7	72.4	73.5	73.5	73.1	72.7	72.1	-	73.2
FLOUR														
Colour, KJ (wet)	-2.0	-1.5	-1.8	-2.2	-	-2.1	-1.9	-2.8	-2.8	-3.0	-2.8	-2.8	-	-2.9
Colour, Minolta CM5 (dry)														
L*	93.21	93.14	93.33	93.23	-	93.35	93.25	93.76	93.82	94.02	93.84	93.88	-	93.85
a*	0.60	0.55	0.53	0.59	-	0.54	0.56	0.44	0.42	0.38	0.38	0.43	-	0.41
b*	11.09	10.20	10.33	11.24	-	10.88	10.75	9.73	9.91	9.99	10.19	10.00	-	9.92
Protein (12% mb), %	10.9	10.3	10.1	10.6	-	10.2	10.4	11.7	10.8	9.7	9.6	10.9	-	10.7
Wet Gluten (14% mb), %	27.7	26.3	26.3	26.3	-	25.8	26.5	31.7	29.4	26.4	25.4	30.0	-	29.0
Dry Gluten (14% mb), %	9.5	8.9	8.9	9.6	-	8.9	9.1	11.0	10.2	9.0	8.8	10.3	-	10.0
Gluten Index	90	93	90	96	-	91	92	84	78	87	83	81	-	83
100g BAKING TEST														
Baking water absorption, %	60.8	60.1	59.9	59.4	-	59.6	60.0	61.3	60.4	59.3	59.2	60.4	-	60.3
Loaf volume, cm^3	860	790	770	850	-	789	810	930	900	828	822	916	-	886
Evaluation	0	2	2	0	-	1	1	0	0	0	0	0	-	0
FARINOGRAM														
Water absorption, %	58.1	59.1	59.8	57.5	-	57.5	58.3	61.3	60.6	60.5	60.3	61.3	-	60.8
Development time, min	2.3	1.9	2.0	1.9	-	1.9	2.0	6.4	5.0	4.1	4.0	4.9	-	5.1
Stability, mm	12.3	3.9	5.5	6.6	-	6.4	7.0	9.7	7.4	7.0	7.3	7.3	-	7.9
Mixing tolerance index, BU	14	47	43	40	-	35	35	34	42	38	35	36	-	37
														

2012/2013 Imported Wheat Quality Versus 2012/2013 RSA Wheat Quality

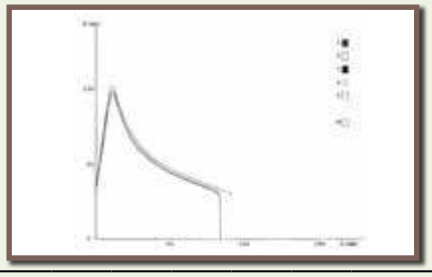
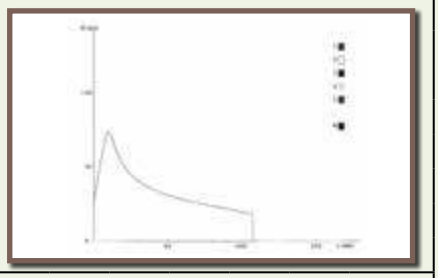
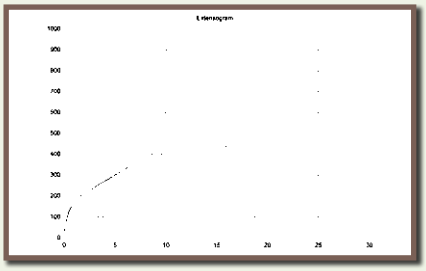
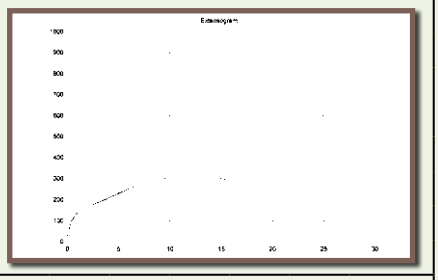
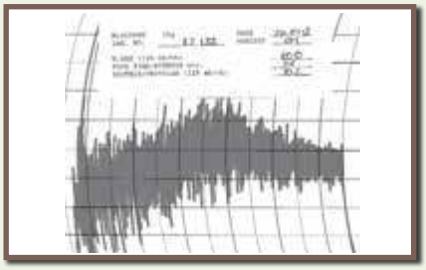
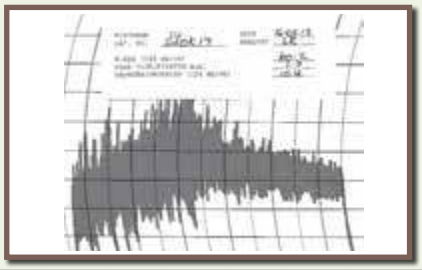
Country of origin	Argentina Average							RSA Crop Average						
Class and Grade bread wheat	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	***3***	***3***	***2***	***2***	***-***	***4***	***14***	***22***	***17***	***13***	***11***	***7***	***-***	***70***
ALVEOGRAM														
Strength (S), cm²	37.4	37.4	30.0	36.4	-	33.8	35.2	43.1	35.1	32.6	31.8	36.5	-	36.7
Stability (P), mm	85	103	97	87	-	89	92	86	81	90	91	86	-	86
Distensibility (L), mm	85	66	56	77	-	74	72	120	109	90	84	104	-	105
P/L	1.01	1.59	1.77	1.15	-	1.42	1.38	0.77	0.80	1.23	1.34	0.89	-	0.96
														
EXTENSOGRAM														
Strength, cm²	109	87	82	101	-	95	95	102	82	72	70	85	-	84
Max. height, BU	471	423	391	450	-	450	440	365	313	299	308	320	-	325
Extensibility, mm	172	154	153	170	-	156	161	204	189	171	159	190	-	185
														
MIXOGRAM														
Peak time, min	4.3	4.7	4.5	4.8	-	4.4	4.5	2.9	2.6	2.9	3.0	2.7	-	2.8
Absorption, %	60.8	60.1	59.9	60.4	-	60.1	60.3	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						
Fum B_3 (µg/kg)	ND							ND						
Deoxynivalenol (µg/kg) [max. value]	322 [1043]							< LOQ [380]						
15-ADON (µg/kg) [max. value]	< LOQ [< LOQ]							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	***7***							***40***						

2012/2013 IMPORTED WHEAT QUALITY - AUSTRALIA (1 Oct 2012 to 30 Sep 2013)

2012/2013 Imported Wheat Quality Versus 2012/2013 RSA Wheat Quality

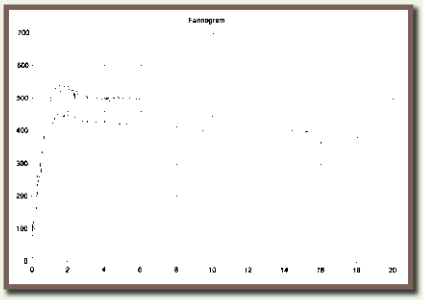
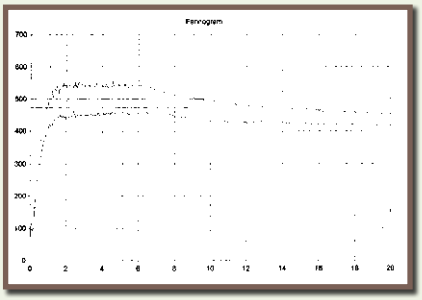
Country of origin	Australia Average							RSA Crop Average						
Class and Grade bread wheat	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	***2***	***22***	***5***	***1***	***3***	***1***	***34***	***74***	***95***	***69***	***36***	***59***	***4***	***337***
WHEAT **GRADING**														
Protein (12% mb), %	12.48	11.32	10.73	13.19	11.73	12.79	11.43	12.59	11.55	10.50	10.15	11.30	12.23	11.38
Moisture, %	11.4	10.8	10.3	11.9	11.4	12.2	10.9	11.1	11.1	11.0	11.1	11.2	12.1	11.1
Falling number, sec	398	440	475	202	236	416	417	375	371	361	355	333	280	360
1000 Kernel mass (13% mb), g	35.9	36.8	32.9	30.3	37.7	36.7	36.1	39.5	40.4	41.2	41.4	39.2	36.9	40.2
Hlm (dirty), kg/hl	81.0	83.7	84.0	75.9	82.4	80.4	83.1	81.7	81.7	81.9	81.7	79.5	75.1	81.3
Screenings (<1,8mm), %	1.96	1.82	2.42	3.04	1.66	1.08	1.92	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	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00
Foreign matter, %	0.15	0.28	0.17	0.24	0.13	0.14	0.24	0.08	0.10	0.13	0.14	0.25	0.25	0.13
Other grain & unthreshed ears, %	0.32	0.38	0.33	0.24	0.18	0.44	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	0.00	0.00	0.04	0.02	0.02	0.03	0.02	0.00	0.02
Immature kernels, %	0.12	0.01	0.03	0.08	0.09	0.06	0.03	0.20	0.15	0.11	0.09	0.25	0.12	0.16
Insect damaged kernels, %	0.00	0.04	0.06	0.16	0.19	0.00	0.06	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	0.20	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sprouted kernels, %	0.26	0.01	0.00	0.92	2.51	0.16	0.27	0.32	0.16	0.07	0.09	0.42	1.96	0.24
Total damaged kernels, %	0.38	0.07	0.09	1.16	2.79	0.22	0.36	0.80	0.65	0.47	0.53	1.38	2.39	0.78
Combined deviations, %	2.80	2.55	3.02	4.68	4.76	1.88	2.87	2.38	2.43	2.08	2.72	4.91	6.88	2.86
Field fungi, %	1.00	0.10	0.05	0.29	0.26	1.16	0.20	0.49	0.40	0.35	0.28	0.45	1.69	0.42
Storage fungi, %	0.24	0.03	0.00	0.08	0.16	0.56	0.07	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 (*Crotalaria spp., etc.*)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Noxious seeds (*Argemone mexicana, 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	***2***	***22***	***5***	***1***	***3***	***1***	***34***	***22***	***17***	***13***	***11***	***7***	***-***	***70***
BÜHLER EXTRACTION, %	72.7	72.2	72.4	71.1	72.2	73.5	72.3	73.5	73.5	73.1	72.7	72.1	-	73.2
FLOUR														
Colour, KJ	-2.8	-3.2	-3.4	-3.4	-2.9	-2.6	-3.2	-2.8	-2.8	-3.0	-2.8	-2.8	-	-2.9
Colour, Minolta CM5 (dry)														
L*	93.93	94.04	94.08	94.25	93.90	94.07	94.03	93.76	93.82	94.02	93.84	93.88	-	93.85
a*	0.40	0.42	0.41	0.36	0.37	0.41	0.41	0.44	0.42	0.38	0.38	0.43	-	0.41
b*	9.70	10.52	10.02	9.84	9.66	9.24	10.26	9.73	9.91	9.99	10.19	10.00	-	9.92
Protein (12% mb), %	11.5	10.3	9.8	10.1	10.0	11.6	10.3	11.7	10.8	9.7	9.6	10.9	-	10.7
Wet Gluten (14% mb), %	30.1	26.4	24.0	27.1	26.4	32.1	26.4	31.7	29.4	26.4	25.4	30.0	-	29.0
Dry Gluten (14% mb), %	10.6	9.2	8.7	9.1	9.1	11.2	9.3	11.0	10.2	9.0	8.8	10.3	-	10.0
Gluten Index	91	91	97	90	92	78	91	84	78	87	83	81	-	83
100g BAKING TEST														
Baking water absorption, %	61.5	60.1	59.6	59.9	59.8	61.7	60.1	61.3	60.4	59.3	59.2	60.4	-	60.3
Loaf volume, cm³	930	837	795	810	835	905	837	930	900	828	822	916	-	886
Evaluation	0	0	0	0	0	0	0	0	0	0	0	0	-	0
FARINOGRAM														
Water absorption, %	61.3	60.6	59.9	61.4	63.6	62.2	60.9	61.3	60.6	60.5	60.3	61.3	-	60.8
Development time, min	5.0	5.6	2.5	1.9	3.5	6.9	4.9	6.4	5.0	4.1	4.0	4.9	-	5.1
Stability, mm	12.9	12.5	11.1	11.3	8.3	10.0	11.8	9.7	7.4	7.0	7.3	7.3	-	7.9
Mixing tolerance index, BU	20	21	15	9	33	29	21	34	42	38	35	36	-	37
														

2012/2013 Imported Wheat Quality Versus 2012/2013 RSA Wheat Quality

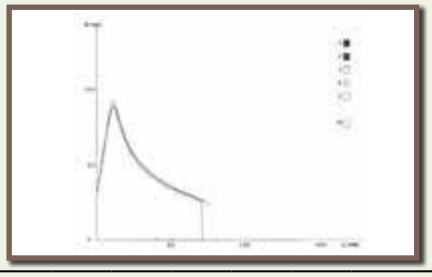
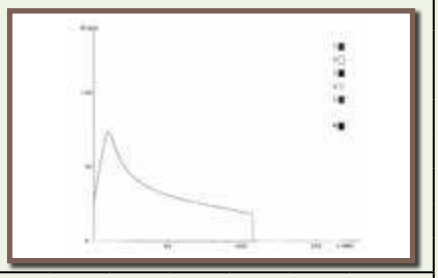
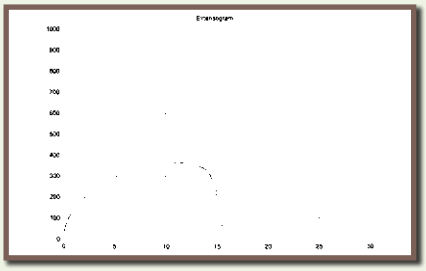
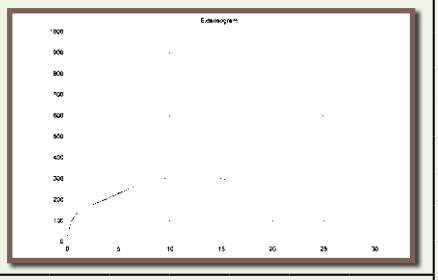
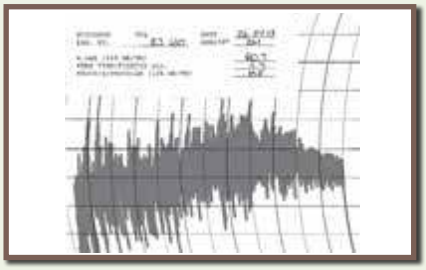
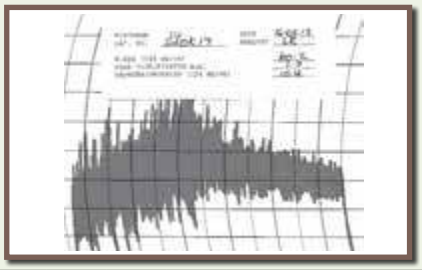
Country of origin	Australia Average							RSA Crop Average						
Class and Grade bread wheat	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	***2***	***22***	***5***	***1***	***3***	***1***	***34***	***22***	***17***	***13***	***11***	***7***	***-***	***70***
ALVEOGRAM														
Strength (S), cm²	46.6	45.1	46.2	42.7	38.9	43.1	44.7	43.1	35.1	32.6	31.8	36.5	-	36.7
Stability (P), mm	101	107	110	120	122	93	109	86	81	90	91	86	-	86
Distensibility (L), mm	95	85	82	68	58	103	83	120	109	90	84	104	-	105
P/L	1.09	1.29	1.37	1.76	2.12	0.90	1.37	0.77	0.80	1.23	1.34	0.89	-	0.96
														
EXTENSOGRAM														
Strength, cm²	136	114	116	96	105	111	114	102	82	72	70	85	-	84
Max. height, BU	465	458	487	446	441	368	458	365	313	299	308	320	-	325
Extensibility, mm	215	186	177	161	176	217	185	204	189	171	159	190	-	185
														
MIXOGRAM														
Peak time, min	3.6	3.5	3.7	3.3	3.6	3.0	3.5	2.9	2.6	2.9	3.0	2.7	-	2.8
Absorption, %	61.5	60.2	59.6	59.9	59.8	61.7	60.2	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						
Fum B_3 (µg/kg)	ND							ND						
Deoxynivalenol (µg/kg) [max. value]	< LOQ [553]							< LOQ [380]						
15-ADON (µg/kg)	ND							ND						
Ochratoxin A (µg/kg)	ND							ND						
Zearalenone (µg/kg) [max. value]	< LOQ [32]							ND						
HT-2 (µg/kg)	ND							ND						
T-2 Toxin (µg/kg)	ND							ND						
No. of samples	***11***							***40***						

2012/2013 IMPORTED WHEAT QUALITY - BRAZIL (1 Oct 2012 to 30 Sep 2013)

2012/2013 Imported Wheat Quality Versus 2012/2013 RSA Wheat Quality

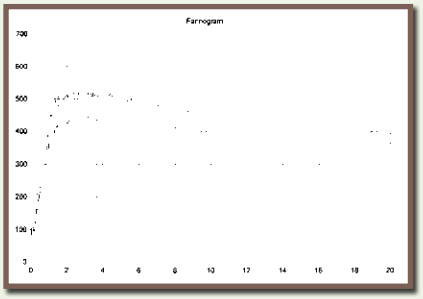
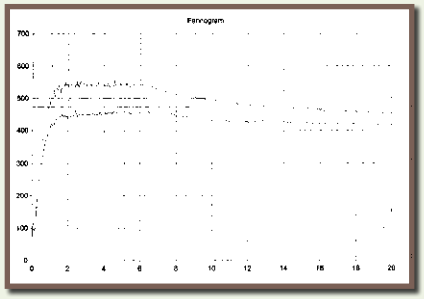
Country of origin	Brazil Average							RSA Crop Average						
Class and Grade bread wheat	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	***15***	***8***	***-***	***15***	***5***	***1***	***44***	***74***	***95***	***69***	***36***	***59***	***4***	***337***
WHEAT **GRADING**														
Protein (12% mb), %	12.69	11.71	-	12.42	12.65	12.06	12.40	12.59	11.55	10.50	10.15	11.30	12.23	11.38
Moisture, %	12.2	12.2	-	11.6	11.6	12.5	11.9	11.1	11.1	11.0	11.1	11.2	12.1	11.1
Falling number, sec	211	267	-	214	168	259	218	375	371	361	355	333	280	360
1000 Kernel mass (13% mb), g	29.2	35.3	-	29.5	28.2	30.5	30.3	39.5	40.4	41.2	41.4	39.2	36.9	40.2
Hlm (dirty), kg/hl	77.3	79.6	-	77.7	75.7	79.3	77.7	81.7	81.7	81.9	81.7	79.5	75.1	81.3
Screenings (<1,8mm), %	3.42	2.07	-	3.30	4.20	2.15	3.19	1.14	1.25	1.13	1.64	2.32	3.60	1.46
Gravel, stones, turf and glass, %	0.02	0.01	-	0.02	0.08	0.00	0.02	0.00	0.01	0.01	0.01	0.00	0.00	0.00
Foreign matter, %	0.29	0.12	-	0.22	0.32	0.12	0.23	0.08	0.10	0.13	0.14	0.25	0.25	0.13
Other grain & unthreshed ears, %	0.20	0.32	-	0.22	0.31	0.31	0.24	0.37	0.42	0.34	0.40	1.04	0.64	0.50
Heat damaged kernels, %	0.02	0.00	-	0.01	0.00	0.00	0.01	0.04	0.02	0.02	0.03	0.02	0.00	0.02
Immature kernels, %	0.05	0.01	-	0.01	0.01	0.08	0.03	0.20	0.15	0.11	0.09	0.25	0.12	0.16
Insect damaged kernels, %	0.23	0.17	-	0.19	0.22	0.00	0.20	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
Sprouted kernels, %	0.51	0.26	-	0.41	0.65	0.72	0.45	0.32	0.16	0.07	0.09	0.42	1.96	0.24
Total damaged kernels, %	0.81	0.43	-	0.62	0.87	0.80	0.68	0.80	0.65	0.47	0.53	1.38	2.39	0.78
Combined deviations, %	4.73	2.95	-	4.36	5.78	3.38	4.37	2.38	2.43	2.08	2.72	4.91	6.88	2.86
Field fungi, %	0.29	0.29	-	0.36	0.34	0.71	0.33	0.49	0.40	0.35	0.28	0.45	1.69	0.42
Storage fungi, %	0.07	0.15	-	0.11	0.51	0.60	0.16	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
Noxious seeds (*Crotalaria spp., etc.*)	0	0	-	0	0	0	0	0	0	0	0	0	0	0
Noxious seeds (*Argemone mexicana, etc.*)	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
Undesirable odour	No	No	-	No	No	No	No	No	No	No	No	No	No	No
	B1	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	***15***	***8***	***-***	***15***	***5***	***1***	***44***	***22***	***17***	***13***	***11***	***7***	***-***	***70***
BÜHLER EXTRACTION, %	67.0	71.4	-	67.9	66.8	69.4	68.2	73.5	73.5	73.1	72.7	72.1	-	73.2
FLOUR														
Colour, KJ	-0.7	-1.4	-	-1.1	0.0	-1.3	-0.9	-2.8	-2.8	-3.0	-2.8	-2.8	-	-2.9
Colour, Minolta CM5 (dry)														
L*	92.79	93.05	-	92.83	92.43	93.15	92.82	93.76	93.82	94.02	93.84	93.88	-	93.85
a*	0.67	0.52	-	0.59	0.71	0.63	0.62	0.44	0.42	0.38	0.38	0.43	-	0.41
b*	9.99	10.21	-	10.40	10.34	9.87	10.21	9.73	9.91	9.99	10.19	10.00	-	9.92
Protein (12% mb), %	10.8	10.2	-	10.7	10.8	10.3	10.6	11.7	10.8	9.7	9.6	10.9	-	10.7
Wet Gluten (14% mb), %	28.6	26.4	-	27.8	27.9	27.2	27.8	31.7	29.4	26.4	25.4	30.0	-	29.0
Dry Gluten (14% mb), %	9.6	9.1	-	9.5	9.5	9.1	9.5	11.0	10.2	9.0	8.8	10.3	-	10.0
Gluten Index	77	89	-	77	71	84	79	84	78	87	83	81	-	83
100g BAKING TEST														
Baking water absorption, %	60.7	60.1	-	60.1	60.7	60.1	60.4	61.3	60.4	59.3	59.2	60.4	-	60.3
Loaf volume, cm³	713	782	-	722	719	715	729	930	900	828	822	916	-	886
Evaluation	4	2	-	4	4	4	4	0	0	0	0	0	-	0
FARINOGRAM														
Water absorption, %	60.8	59.4	-	59.8	60.5	60.4	60.1	61.3	60.6	60.5	60.3	61.3	-	60.8
Development time, min	1.8	1.9	-	1.8	1.9	2.0	1.9	6.4	5.0	4.1	4.0	4.9	-	5.1
Stability, mm	6.7	4.2	-	6.0	5.1	8.3	5.9	9.7	7.4	7.0	7.3	7.3	-	7.9
Mixing tolerance index, BU	34	48	-	39	43	33	39	34	42	38	35	36	-	37
														

2012/2013 Imported Wheat Quality Versus 2012/2013 RSA Wheat Quality

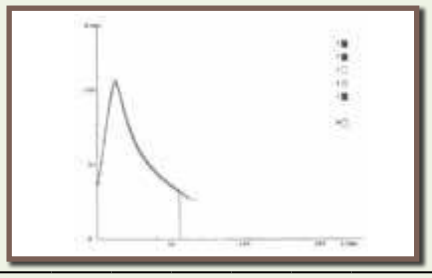
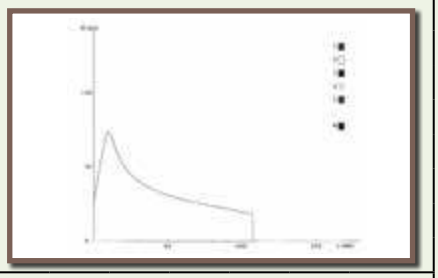
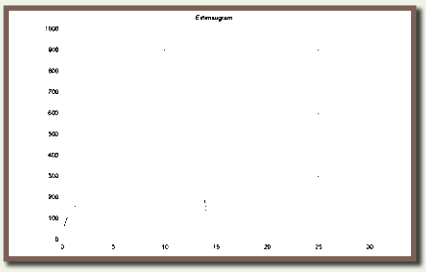
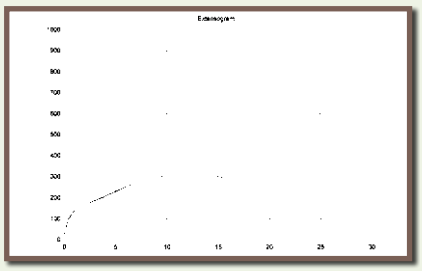
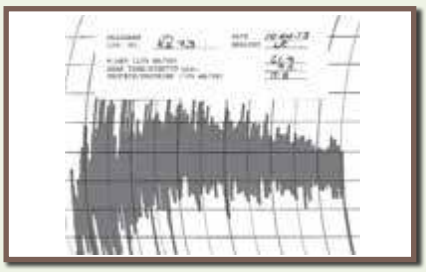
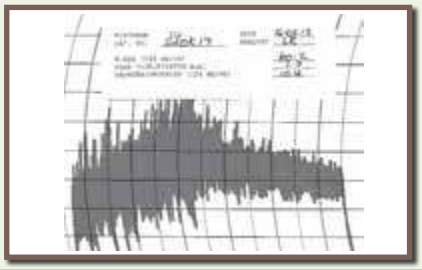
Country of origin	Brazil Average							RSA Crop Average						
Class and Grade bread wheat	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	***15***	***8***	***-***	***15***	***5***	***1***	***44***	***22***	***17***	***13***	***11***	***7***	***-***	***70***
ALVEOGRAM														
Strength (S), cm²	33.2	34.3	-	33.7	31.6	33.6	33.4	43.1	35.1	32.6	31.8	36.5	-	36.7
Stability (P), mm	96	103	-	92	89	102	95	86	81	90	91	86	-	86
Distensibility (L), mm	70	60	-	75	74	60	70	120	109	90	84	104	-	105
P/L	1.39	1.78	-	1.26	1.22	1.70	1.41	0.77	0.80	1.23	1.34	0.89	-	0.96
														
EXTENSOGRAM														
Strength, cm²	76	85	-	78	70	87	78	102	82	72	70	85	-	84
Max. height, BU	352	403	-	371	329	403	366	365	313	299	308	320	-	325
Extensibility, mm	158	154	-	152	153	160	155	204	189	171	159	190	-	185
														
MIXOGRAM														
Peak time, min	3.8	4.6	-	4.0	3.7	3.8	4.0	2.9	2.6	2.9	3.0	2.7	-	2.8
Absorption, %	60.7	60.1	-	60.6	60.7	60.1	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						
Fum B_3 (µg/kg)	ND							ND						
Deoxynivalenol (µg/kg) [max. value]	274 [670]							< LOQ [380]						
15-ADON (µg/kg) [max. value]	< LOQ [< LOQ]							ND						
Ochratoxin A (µg/kg)	ND							ND						
Zearalenone (µg/kg) [max. value]	< LOQ [26]							ND						
HT-2 (µg/kg)	ND							ND						
T-2 Toxin (µg/kg)	ND							ND						
No. of samples	***13***							***40***						

2012/2013 IMPORTED WHEAT QUALITY - CANADA (1 Oct 2012 to 30 Sep 2013)

2012/2013 Imported Wheat Quality Versus 2012/2013 RSA Wheat Quality

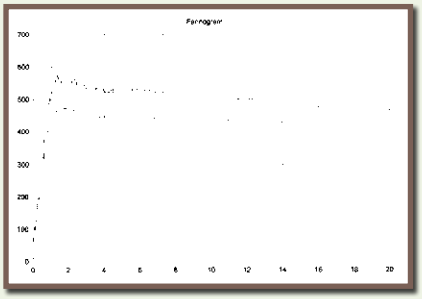
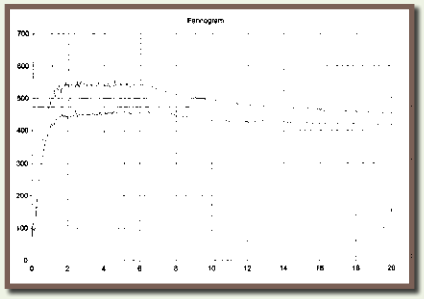
Country of origin	Canada Average							RSA Crop Average						
Class and Grade bread wheat	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	***5***	***-***	***-***	***1***	***-***	***1***	***7***	***74***	***95***	***69***	***36***	***59***	***4***	***337***
WHEAT														
GRADING														
Protein (12% mb), %	12.96	-	-	14.18	-	12.75	13.11	12.59	11.55	10.50	10.15	11.30	12.23	11.38
Moisture, %	11.9	-	-	12.0	-	11.0	11.8	11.1	11.1	11.0	11.1	11.2	12.1	11.1
Falling number, sec	357	-	-	373	-	418	368	375	371	361	355	333	280	360
1000 Kernel mass (13% mb), g	39.7	-	-	38.4	-	40.7	39.7	39.5	40.4	41.2	41.4	39.2	36.9	40.2
Hlm (dirty), kg/hl	81.0	-	-	82.0	-	83.6	81.5	81.7	81.7	81.9	81.7	79.5	75.1	81.3
Screenings (<1,8mm), %	2.35	-	-	3.45	-	1.70	2.41	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	0.01	0.01	0.01	0.00	0.00	0.00
Foreign matter, %	0.10	-	-	0.21	-	0.02	0.10	0.08	0.10	0.13	0.14	0.25	0.25	0.13
Other grain & unthreshed ears, %	0.22	-	-	0.18	-	0.54	0.26	0.37	0.42	0.34	0.40	1.04	0.64	0.50
Heat damaged kernels, %	0.03	-	-	0.12	-	0.26	0.08	0.04	0.02	0.02	0.03	0.02	0.00	0.02
Immature kernels, %	0.03	-	-	0.08	-	0.21	0.06	0.20	0.15	0.11	0.09	0.25	0.12	0.16
Insect damaged kernels, %	0.04	-	-	0.00	-	0.04	0.03	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
Sprouted kernels, %	0.11	-	-	0.00	-	0.29	0.12	0.32	0.16	0.07	0.09	0.42	1.96	0.24
Total damaged kernels, %	0.21	-	-	0.20	-	0.80	0.29	0.80	0.65	0.47	0.53	1.38	2.39	0.78
Combined deviations, %	2.87	-	-	4.04	-	3.06	3.07	2.38	2.43	2.08	2.72	4.91	6.88	2.86
Field fungi, %	0.35	-	-	1.12	-	0.26	0.45	0.49	0.40	0.35	0.28	0.45	1.69	0.42
Storage fungi, %	0.08	-	-	0.14	-	0.63	0.17	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Ergot, %	0.01	-	-	0.02	-	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Noxious seeds (*Crotalaria spp., etc.*)	0	-	-	0	-	0	0	0	0	0	0	0	0	0
Noxious seeds (*Argemone mexicana, etc.*)	0	-	-	0	-	0	0	0	0	0	0	0	0	0
Live insects	No	-	-	No	-	No	No	No	No	No	No	No	No	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	***5***	***-***	***-***	***1***	***-***	***1***	***7***	***22***	***17***	***13***	***11***	***7***	***-***	***70***
BÜHLER EXTRACTION, %	71.3	-	-	64.2	-	65.4	69.4	73.5	73.5	73.1	72.7	72.1	-	73.2
FLOUR														
Colour, KJ	-2.1	-	-	-1.4	-	-1.4	-1.9	-2.8	-2.8	-3.0	-2.8	-2.8	-	-2.9
Colour, Minolta CM5 (dry)														
L*	93.02	-	-	91.48	-	92.02	92.66	93.76	93.82	94.02	93.84	93.88	-	93.85
a*	0.50	-	-	0.71	-	0.50	0.53	0.44	0.42	0.38	0.38	0.43	-	0.41
b*	13.27	-	-	20.87	-	18.85	15.15	9.73	9.91	9.99	10.19	10.00	-	9.92
Protein (12% mb), %	11.9	-	-	13.1	-	11.8	12.0	11.7	10.8	9.7	9.6	10.9	-	10.7
Wet Gluten (14% mb), %	32.4	-	-	36.3	-	32.2	32.9	31.7	29.4	26.4	25.4	30.0	-	29.0
Dry Gluten (14% mb), %	11.6	-	-	12.2	-	11.2	11.6	11.0	10.2	9.0	8.8	10.3	-	10.0
Gluten Index	72	-	-	56	-	51	67	84	78	87	83	81	-	83
100g BAKING TEST														
Baking water absorption, %	62.2	-	-	60.7	-	62.9	62.1	61.3	60.4	59.3	59.2	60.4	-	60.3
Loaf volume, cm^3	879	-	-	675	-	630	814	930	900	828	822	916	-	886
Evaluation	2	-	-	6	-	6	3	0	0	0	0	0	-	0
FARINOGRAM														
Water absorption, %	62.3	-	-	63.7	-	67.1	63.2	61.3	60.6	60.5	60.3	61.3	-	60.8
Development time, min	5.2	-	-	3.7	-	3.9	4.8	6.4	5.0	4.1	4.0	4.9	-	5.1
Stability, mm	8.0	-	-	5.8	-	6.1	7.4	9.7	7.4	7.0	7.3	7.3	-	7.9
Mixing tolerance index, BU	37	-	-	44	-	38	38	34	42	38	35	36	-	37
														

2012/2013 Imported Wheat Quality Versus 2012/2013 RSA Wheat Quality

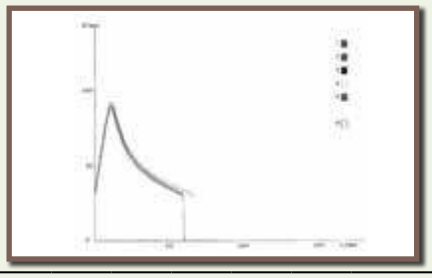
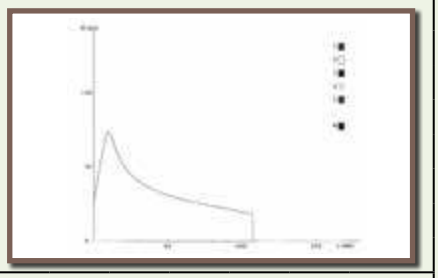
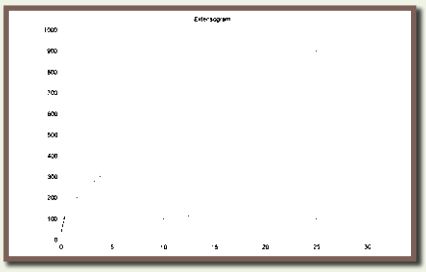
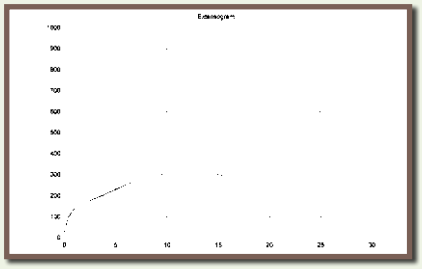
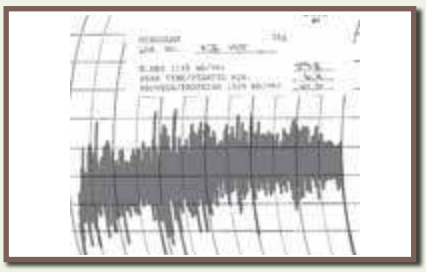
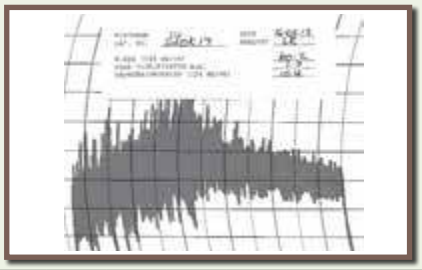
Country of origin	Canada Average							RSA Crop Average						
Class and Grade bread wheat	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	***5***	***-***	***-***	***1***	***-***	***1***	***7***	***22***	***17***	***13***	***11***	***7***	***-***	***70***
ALVEOGRAM														
Strength (S), cm²	42.2	-	-	37.0	-	34.7	40.4	43.1	35.1	32.6	31.8	36.5	-	36.7
Stability (P), mm	102	-	-	126	-	148	112	86	81	90	91	86	-	86
Distensibility (L), mm	101	-	-	56	-	39	86	120	109	90	84	104	-	105
P/L	1.64	-	-	2.25	-	3.79	2.03	0.77	0.80	1.23	1.34	0.89	-	0.96
														
EXTENSOGRAM														
Strength, cm²	97	-	-	67	-	53	86	102	82	72	70	85	-	84
Max. height, BU	362	-	-	324	-	326	352	365	313	299	308	320	-	325
Extensibility, mm	191	-	-	146	-	120	174	204	189	171	159	190	-	185
														
MIXOGRAM														
Peak time, min	3.1	-	-	3.5	-	3.5	3.2	2.9	2.6	2.9	3.0	2.7	-	2.8
Absorption, %	62.1	-	-	63.7	-	61.9	62.3	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						
Fum B_3 (µg/kg)	ND							ND						
Deoxynivalenol (µg/kg) [max. value]	164 [493]							< LOQ [380]						
15-ADON (µg/kg)	ND							ND						
Ochratoxin A (µg/kg)	ND							ND						
Zearalenone (µg/kg)	ND							ND						
HT-2 (µg/kg) [max. value]	< LOQ [21]							ND						
T-2 Toxin (µg/kg)	ND							ND						
No. of samples	***3***							***40***						

2012/2013 IMPORTED WHEAT QUALITY - GERMANY (1 Oct 2012 to 30 Sep 2013)

2012/2013 Imported Wheat Quality Versus 2012/2013 RSA Wheat Quality

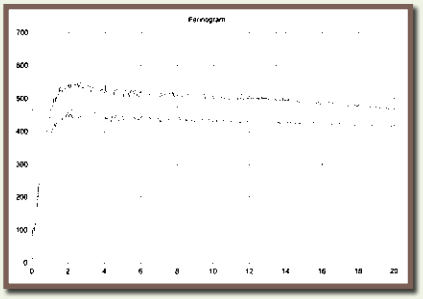
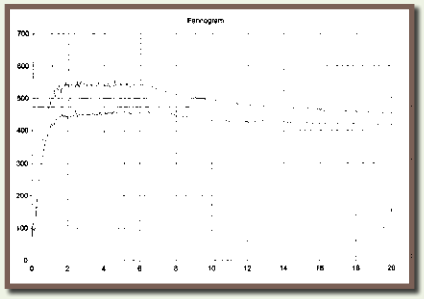
Country of origin	Germany Average							RSA Crop Average						
Class and Grade bread wheat	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	***-***	***4***	***4***	***-***	***-***	***2***	***10***	***74***	***95***	***69***	***36***	***59***	***4***	***337***
WHEAT														
GRADING														
Protein (12% mb), %	-	11.36	10.81	-	-	11.24	11.11	12.59	11.55	10.50	10.15	11.30	12.23	11.38
Moisture, %	-	12.6	12.3	-	-	12.5	12.4	11.1	11.1	11.0	11.1	11.2	12.1	11.1
Falling number, sec	-	326	356	-	-	340	341	375	371	361	355	333	280	360
1000 Kernel mass (13% mb), g	-	46.3	43.9	-	-	45.4	45.2	39.5	40.4	41.2	41.4	39.2	36.9	40.2
Hlm (dirty), kg/hl	-	80.4	80.5	-	-	80.7	80.5	81.7	81.7	81.9	81.7	79.5	75.1	81.3
Screenings (<1,8mm), %	-	1.34	0.65	-	-	1.40	1.07	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	0.01	0.01	0.01	0.00	0.00	0.00
Foreign matter, %	-	0.20	0.19	-	-	0.15	0.18	0.08	0.10	0.13	0.14	0.25	0.25	0.13
Other grain & unthreshed ears, %	-	0.80	0.57	-	-	1.32	0.81	0.37	0.42	0.34	0.40	1.04	0.64	0.50
Heat damaged kernels, %	-	0.01	0.04	-	-	0.20	0.06	0.04	0.02	0.02	0.03	0.02	0.00	0.02
Immature kernels, %	-	0.08	0.00	-	-	0.11	0.05	0.20	0.15	0.11	0.09	0.25	0.12	0.16
Insect damaged kernels, %	-	0.15	0.18	-	-	0.14	0.16	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
Sprouted kernels, %	-	0.00	0.08	-	-	0.14	0.06	0.32	0.16	0.07	0.09	0.42	1.96	0.24
Total damaged kernels, %	-	0.24	0.30	-	-	0.59	0.33	0.80	0.65	0.47	0.53	1.38	2.39	0.78
Combined deviations, %	-	2.57	1.70	-	-	3.45	2.40	2.38	2.43	2.08	2.72	4.91	6.88	2.86
Field fungi, %	-	0.48	0.08	-	-	0.69	0.36	0.49	0.40	0.35	0.28	0.45	1.69	0.42
Storage fungi, %	-	0.23	0.18	-	-	1.04	0.37	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
Noxious seeds (*Crotalaria spp., etc.*)	-	0	0	-	-	0	0	0	0	0	0	0	0	0
Noxious seeds (*Argemone mexicana, etc.*)	-	0	0	-	-	0	0	0	0	0	0	0	0	0
Live insects	-	No	No	-	-	No	No	No	No	No	No	No	No	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	***-***	***4***	***4***	***-***	***-***	***2***	***10***	***22***	***17***	***13***	***11***	***7***	***-***	***70***
BÜHLER EXTRACTION, %	-	73.3	73.0	-	-	73.4	73.2	73.5	73.5	73.1	72.7	72.1	-	73.2
FLOUR														
Colour, KJ	-	-2.2	-2.8	-	-	-1.8	-2.3	-2.8	-2.8	-3.0	-2.8	-2.8	-	-2.9
Colour, Minolta CM5 (dry)														
L*	-	93.68	93.77	-	-	93.60	93.70	93.76	93.82	94.02	93.84	93.88	-	93.85
a*	-	0.50	0.44	-	-	0.50	0.47	0.44	0.42	0.38	0.38	0.43	-	0.41
b*	-	10.00	10.09	-	-	9.80	10.00	9.73	9.91	9.99	10.19	10.00	-	9.92
Protein (12% mb), %	-	10.1	9.3	-	-	9.9	9.7	11.7	10.8	9.7	9.6	10.9	-	10.7
Wet Gluten (14% mb), %	-	27.5	24.7	-	-	27.3	26.3	31.7	29.4	26.4	25.4	30.0	-	29.0
Dry Gluten (14% mb), %	-	9.5	8.8	-	-	9.3	9.2	11.0	10.2	9.0	8.8	10.3	-	10.0
Gluten Index	-	83	89	-	-	81	85	84	78	87	83	81	-	83
100g BAKING TEST														
Baking water absorption, %	-	60.1	59.1	-	-	60.3	59.7	61.3	60.4	59.3	59.2	60.4	-	60.3
Loaf volume, cm³	-	755	659	-	-	813	728	930	900	828	822	916	-	886
Evaluation	-	2	4	-	-	0	2	0	0	0	0	0	-	0
FARINOGRAM														
Water absorption, %	-	58.5	58.1	-	-	59.8	58.6	61.3	60.6	60.5	60.3	61.3	-	60.8
Development time, min	-	2.0	1.6	-	-	2.1	1.8	6.4	5.0	4.1	4.0	4.9	-	5.1
Stability, mm	-	10.5	1.8	-	-	7.4	6.4	9.7	7.4	7.0	7.3	7.3	-	7.9
Mixing tolerance index, BU	-	30	76	-	-	35	49	34	42	38	35	36	-	37
														

2012/2013 Imported Wheat Quality Versus 2012/2013 RSA Wheat Quality

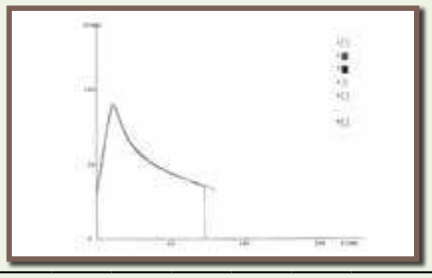
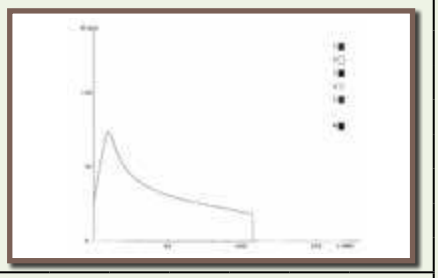
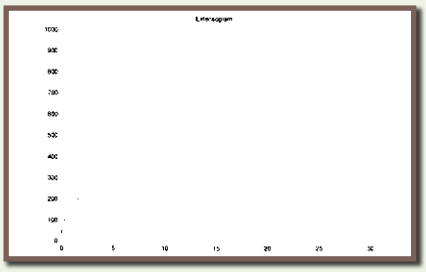
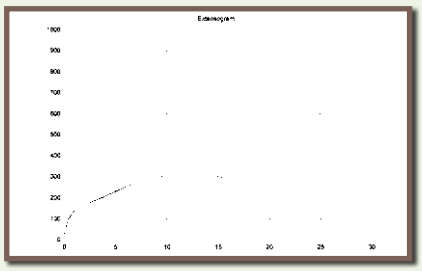
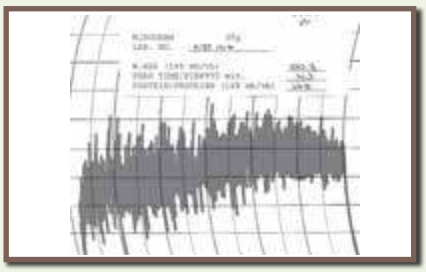
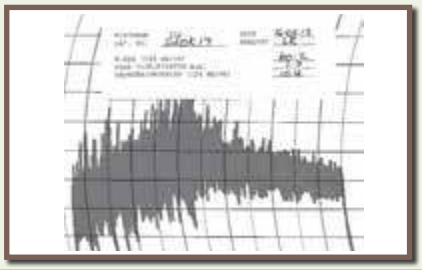
Country of origin	Germany Average							RSA Crop Average						
Class and Grade bread wheat	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	***-***	***4***	***4***	***-***	***-***	***2***	***10***	***22***	***17***	***13***	***11***	***7***	***-***	***70***
ALVEOGRAM														
Strength (S), cm²	-	34.7	27.1	-	-	34.5	31.6	43.1	35.1	32.6	31.8	36.5	-	36.7
Stability (P), mm	-	97	110	-	-	103	103	86	81	90	91	86	-	86
Distensibility (L), mm	-	70	39	-	-	64	56	120	109	90	84	104	-	105
P/L	-	1.41	2.80	-	-	1.63	2.01	0.77	0.80	1.23	1.34	0.89	-	0.96
														
EXTENSOGRAM														
Strength, cm²	-	82	66	-	-	85	76	102	82	72	70	85	-	84
Max. height, BU	-	399	385	-	-	402	394	365	313	299	308	320	-	325
Extensibility, mm	-	149	125	-	-	154	139	204	189	171	159	190	-	185
														
MIXOGRAM														
Peak time, min	-	3.8	4.0	-	-	3.8	3.9	2.9	2.6	2.9	3.0	2.7	-	2.8
Absorption, %	-	59.9	59.1	-	-	59.8	59.5	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						
Fum B_3 (µg/kg)	ND							ND						
Deoxynivalenol (µg/kg) [max. value]	ND							< LOQ [380]						
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	***3***							***40***						

2012/2013 IMPORTED WHEAT QUALITY - RUSSIA (1 Oct 2012 to 30 Sep 2013)

2012/2013 Imported Wheat Quality Versus 2012/2013 RSA Wheat Quality

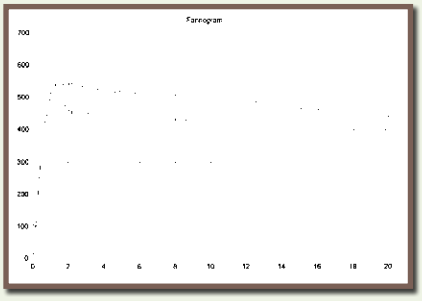
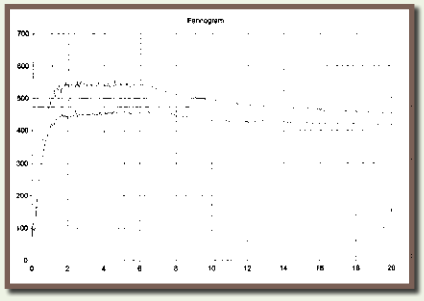
Country of origin	Russia Average							RSA Crop Average						
Class and Grade bread wheat	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	***-***	***5***	***-***	***1***	***3***	***7***	***16***	***74***	***95***	***69***	***36***	***59***	***4***	***337***
WHEAT **GRADING**														
Protein (12% mb), %	-	11.16	-	11.17	11.84	11.99	11.65	12.59	11.55	10.50	10.15	11.30	12.23	11.38
Moisture, %	-	11.0	-	11.3	12.3	12.0	11.7	11.1	11.1	11.0	11.1	11.2	12.1	11.1
Falling number, sec	-	386	-	362	393	389	387	375	371	361	355	333	280	360
1000 Kernel mass (13% mb), g	-	37.4	-	36.3	34.2	35.2	35.8	39.5	40.4	41.2	41.4	39.2	36.9	40.2
Hlm (dirty), kg/hl	-	80.7	-	80.3	74.0	77.0	77.8	81.7	81.7	81.9	81.7	79.5	75.1	81.3
Screenings (<1,8mm), %	-	2.38	-	3.13	5.53	3.63	3.57	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	0.00	0.01	0.01	0.01	0.00	0.00	0.00
Foreign matter, %	-	0.13	-	0.18	0.50	0.64	0.43	0.08	0.10	0.13	0.14	0.25	0.25	0.13
Other grain & unthreshed ears, %	-	0.41	-	0.42	1.31	0.65	0.68	0.37	0.42	0.34	0.40	1.04	0.64	0.50
Heat damaged kernels, %	-	0.00	-	0.00	0.00	0.05	0.02	0.04	0.02	0.02	0.03	0.02	0.00	0.02
Immature kernels, %	-	0.02	-	0.00	0.03	0.06	0.04	0.20	0.15	0.11	0.09	0.25	0.12	0.16
Insect damaged kernels, %	-	0.31	-	0.36	0.15	0.24	0.25	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
Sprouted kernels, %	-	0.00	-	0.08	0.00	0.19	0.09	0.32	0.16	0.07	0.09	0.42	1.96	0.24
Total damaged kernels, %	-	0.32	-	0.44	0.17	0.53	0.39	0.80	0.65	0.47	0.53	1.38	2.39	0.78
Combined deviations, %	-	3.25	-	4.17	7.52	5.46	5.07	2.38	2.43	2.08	2.72	4.91	6.88	2.86
Field fungi, %	-	0.16	-	0.24	0.29	0.29	0.25	0.49	0.40	0.35	0.28	0.45	1.69	0.42
Storage fungi, %	-	0.02	-	0.12	0.19	0.49	0.26	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
Noxious seeds (*Crotalaria spp., etc.*)	-	0	-	0	0	0	0	0	0	0	0	0	0	0
Noxious seeds (*Argemone mexicana, etc.*)	-	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
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	***-***	***5***	***-***	***1***	***3***	***7***	***16***	***22***	***17***	***13***	***11***	***7***	***-***	***70***
BÜHLER EXTRACTION, %	-	72.2	-	71.3	71.7	73.3	72.6	73.5	73.5	73.1	72.7	72.1	-	73.2
FLOUR														
Colour, KJ	-	-2.6	-	-2.5	-1.9	-2.0	-2.2	-2.8	-2.8	-3.0	-2.8	-2.8	-	-2.9
Colour, Minolta CM5 (dry)														
L*	-	93.41	-	93.55	93.13	93.19	93.27	93.76	93.82	94.02	93.84	93.88	-	93.85
a*	-	0.45	-	0.43	0.49	0.52	0.49	0.44	0.42	0.38	0.38	0.43	-	0.41
b*	-	11.25	-	11.28	10.97	11.10	11.13	9.73	9.91	9.99	10.19	10.00	-	9.92
Protein (12% mb), %	-	10.0	-	10.0	10.7	10.9	10.5	11.7	10.8	9.7	9.6	10.9	-	10.7
Wet Gluten (14% mb), %	-	25.2	-	25.1	27.8	28.3	27.1	31.7	29.4	26.4	25.4	30.0	-	29.0
Dry Gluten (14% mb), %	-	9.2	-	8.8	9.8	9.9	9.6	11.0	10.2	9.0	8.8	10.3	-	10.0
Gluten Index	-	96	-	97	94	92	94	84	78	87	83	81	-	83
100g BAKING TEST														
Baking water absorption, %	-	57.8	-	59.8	58.3	60.0	59.0	61.3	60.4	59.3	59.2	60.4	-	60.3
Loaf volume, cm^3	-	741	-	775	812	782	774	930	900	828	822	916	-	886
Evaluation	-	2	-	1	1	2	2	0	0	0	0	0	-	0
FARINOGRAM														
Water absorption, %	-	57.4	-	56.8	57.6	59.2	58.2	61.3	60.6	60.5	60.3	61.3	-	60.8
Development time, min	-	2.0	-	2.3	2.5	2.8	2.5	6.4	5.0	4.1	4.0	4.9	-	5.1
Stability, mm	-	7.5	-	8.4	13.2	12.2	10.7	9.7	7.4	7.0	7.3	7.3	-	7.9
Mixing tolerance index, BU	-	34	-	35	19	12	22	34	42	38	35	36	-	37
														

2012/2013 Imported Wheat Quality Versus 2012/2013 RSA Wheat Quality

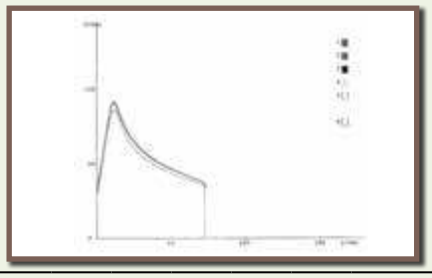
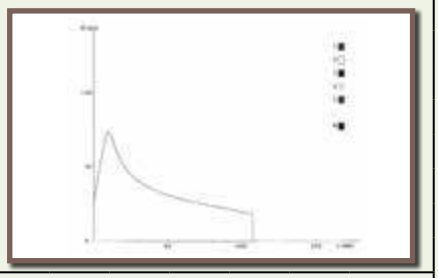
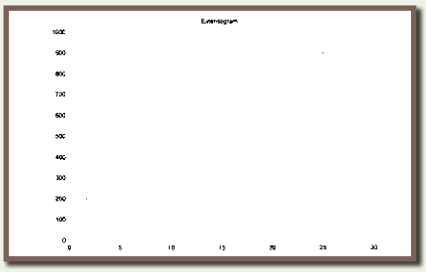
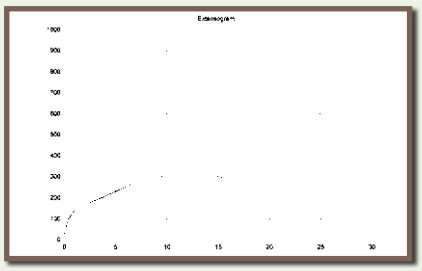
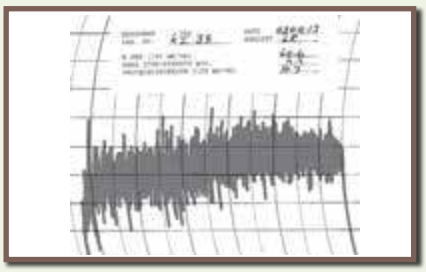
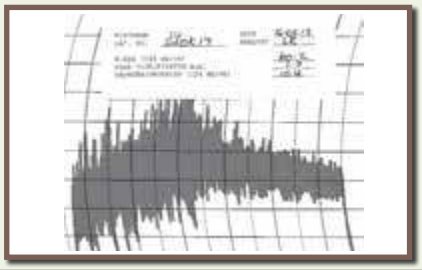
Country of origin	Russia Average							RSA Crop Average						
Class and Grade bread wheat	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	***-***	***5***	***-***	***1***	***3***	***7***	***16***	***22***	***17***	***13***	***11***	***7***	***-***	***70***
ALVEOGRAM														
Strength (S), cm²	-	39.5	-	35.9	44.5	38.3	39.7	43.1	35.1	32.6	31.8	36.5	-	36.7
Stability (P), mm	-	99	-	89	98	104	101	86	81	90	91	86	-	86
Distensibility (L), mm	-	72		76	87	65	72	120	109	90	84	104	-	105
P/L	-	1.39	-	1.17	1.13	1.63	1.43	0.77	0.80	1.23	1.34	0.89	-	0.96
														
EXTENSOGRAM														
Strength, cm²	-	98	-	93	99	98	98	102	82	72	70	85	-	84
Max. height, BU	-	451	-	442	466	455	455	365	313	299	308	320	-	325
Extensibility, mm	-	161	-	157	158	161	160	204	189	171	159	190	-	185
														
MIXOGRAM														
Peak time, min	-	4.7	-	4.9	4.3	4.0	4.4	2.9	2.6	2.9	3.0	2.7	-	2.8
Absorption, %	-	59.8	-	59.8	60.6	60.8	60.4	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						
Fum B_3 (µg/kg)	ND							ND						
Deoxynivalenol (µg/kg) [max. value]	ND							< LOQ [380]						
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	***7***							***40***						

2012/2013 IMPORTED WHEAT QUALITY - UKRAINE (1 Oct 2012 to 30 Sep 2013)

2012/2013 Imported Wheat Quality Versus 2012/2013 RSA Wheat Quality

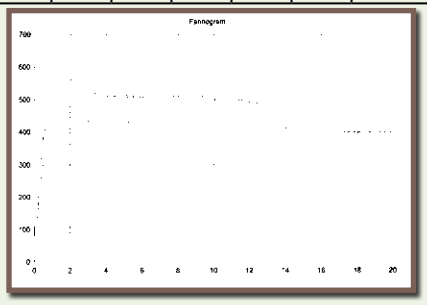
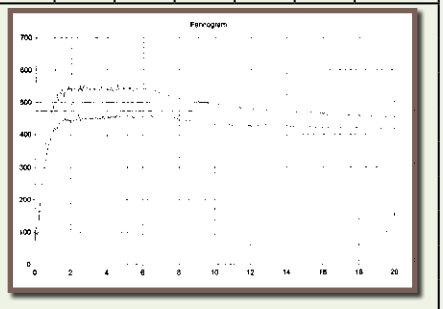
Country of origin	Ukraine Average							RSA Crop Average						
Class and Grade bread wheat	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	***11***	***16***	***2***	***1***	***-***	***-***	***30***	***74***	***95***	***69***	***36***	***59***	***4***	***337***
WHEAT														
GRADING														
Protein (12% mb), %	12.18	11.68	11.59	11.20	-	-	11.84	12.59	11.55	10.50	10.15	11.30	12.23	11.38
Moisture, %	11.8	12.3	12.1	10.7	-	-	12.1	11.1	11.1	11.0	11.1	11.2	12.1	11.1
Falling number, sec	359	346	415	339	-	-	355	375	371	361	355	333	280	360
1000 Kernel mass (13% mb), g	38.0	37.7	36.1	36.7	-	-	37.7	39.5	40.4	41.2	41.4	39.2	36.9	40.2
Hlm (dirty), kg/hl	80.3	79.7	78.6	79.4	-	-	79.9	81.7	81.7	81.9	81.7	79.5	75.1	81.3
Screenings (<1,8mm), %	1.30	1.94	1.97	3.27	-	-	1.75	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	0.00	0.01	0.01	0.01	0.00	0.00	0.00
Foreign matter, %	0.14	0.12	0.10	0.16	-	-	0.13	0.08	0.10	0.13	0.14	0.25	0.25	0.13
Other grain & unthreshed ears, %	0.36	0.52	0.18	0.10	-	-	0.42	0.37	0.42	0.34	0.40	1.04	0.64	0.50
Heat damaged kernels, %	0.01	0.01	0.03	0.00	-	-	0.01	0.04	0.02	0.02	0.03	0.02	0.00	0.02
Immature kernels, %	0.05	0.07	0.00	0.00	-	-	0.05	0.20	0.15	0.11	0.09	0.25	0.12	0.16
Insect damaged kernels, %	0.26	0.22	0.24	0.12	-	-	0.23	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
Sprouted kernels, %	0.11	0.18	0.00	0.00	-	-	0.13	0.32	0.16	0.07	0.09	0.42	1.96	0.24
Total damaged kernels, %	0.43	0.47	0.27	0.12	-	-	0.43	0.80	0.65	0.47	0.53	1.38	2.39	0.78
Combined deviations, %	2.23	3.05	2.52	3.65	-	-	2.73	2.38	2.43	2.08	2.72	4.91	6.88	2.86
Field fungi, %	0.37	0.47	0.29	0.08	-	-	0.41	0.49	0.40	0.35	0.28	0.45	1.69	0.42
Storage fungi, %	0.25	0.26	0.20	0.00	-	-	0.24	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
Noxious seeds (*Crotalaria spp., etc.*)	0	0	0	0	-	-	0	0	0	0	0	0	0	0
Noxious seeds (*Argemone mexicana, etc.*)	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
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	***11***	***16***	***2***	***1***	***-***	***-***	***30***	***22***	***17***	***13***	***11***	***7***	***-***	***70***
BÜHLER EXTRACTION, %	73.3	73.0	73.8	72.2	-	-	73.1	73.5	73.5	73.1	72.7	72.1	-	73.2
FLOUR														
Colour, KJ	-2.2	-2.0	-2.3	-2.5	-	-	-2.1	-2.8	-2.8	-3.0	-2.8	-2.8	-	-2.9
Colour, Minolta CM5 (dry)														
L*	93.54	93.48	93.57	93.45	-	-	93.51	93.76	93.82	94.02	93.84	93.88	-	93.85
a*	0.50	0.49	0.45	0.44	-	-	0.49	0.44	0.42	0.38	0.38	0.43	-	0.41
b*	10.51	10.67	10.84	11.07	-	-	10.64	9.73	9.91	9.99	10.19	10.00	-	9.92
Protein (12% mb), %	11.0	10.5	10.5	10.1	-	-	10.6	11.7	10.8	9.7	9.6	10.9	-	10.7
Wet Gluten (14% mb), %	28.4	26.4	26.6	25.2	-	-	27.1	31.7	29.4	26.4	25.4	30.0	-	29.0
Dry Gluten (14% mb), %	9.9	9.3	9.1	8.6	-	-	9.5	11.0	10.2	9.0	8.8	10.3	-	10.0
Gluten Index	91	91	87	96	-	-	91	84	78	87	83	81	-	83
100g BAKING TEST														
Baking water absorption, %	60.2	59.5	59.4	59.9	-	-	59.8	61.3	60.4	59.3	59.2	60.4	-	60.3
Loaf volume, cm³	842	789	835	800	-	-	812	930	900	828	822	916	-	886
Evaluation	1	2	0	0	-	-	1	0	0	0	0	0	-	0
FARINOGRAM														
Water absorption, %	58.6	58.4	58.0	57.3	-	-	58.4	61.3	60.6	60.5	60.3	61.3	-	60.8
Development time, min	2.5	2.2	2.4	2.0	-	-	2.3	6.4	5.0	4.1	4.0	4.9	-	5.1
Stability, mm	11.6	9.5	11.8	10.4	-	-	10.4	9.7	7.4	7.0	7.3	7.3	-	7.9
Mixing tolerance index, BU	17	31	26	24	-	-	25	34	42	38	35	36	-	37
														

2012/2013 Imported Wheat Quality Versus 2012/2013 RSA Wheat Quality

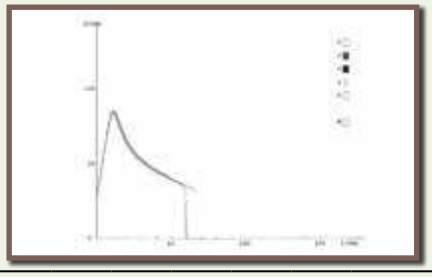
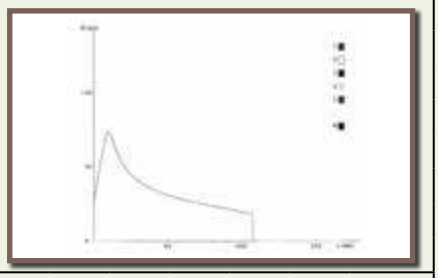
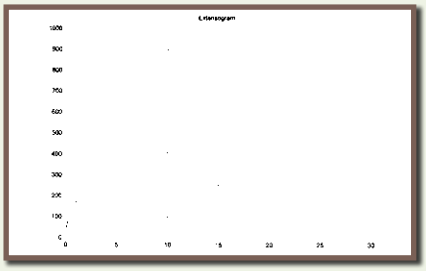
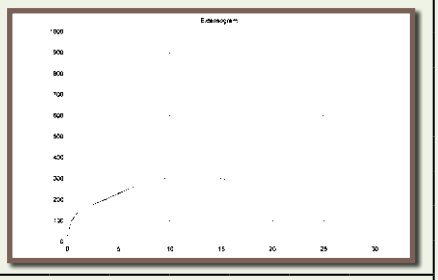
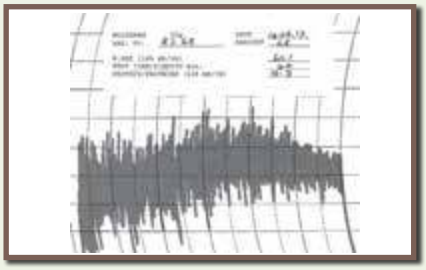
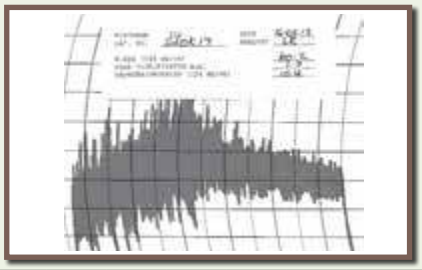
Country of origin	Ukraine Average							RSA Crop Average						
Class and Grade bread wheat	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	***11***	***16***	***2***	***1***	***-***	***-***	***30***	***22***	***17***	***13***	***11***	***7***	***-***	***70***
ALVEOGRAM														
Strength (S), cm²	38.8	35.2	35.2	38.2	-	-	36.6	43.1	35.1	32.6	31.8	36.5	-	36.7
Stability (P), mm	95	96	89	93	-	-	95	86	81	90	91	86	-	86
Distensibility (L), mm	76	67	75	78	-	-	71	120	109	90	84	104	-	105
P/L	1.26	1.50	1.20	1.19	-	-	1.38	0.77	0.80	1.23	1.34	0.89	-	0.96
														
EXTENSOGRAM														
Strength, cm²	95	90	90	89	-	-	92	102	82	72	70	85	-	84
Max. height, BU	441	409	430	447	-	-	423	365	313	299	308	320	-	325
Extensibility, mm	160	160	154	150	-	-	159	204	189	171	159	190	-	185
														
MIXOGRAM														
Peak time, min	4.2	4.4	4.3	4.3	-	-	4.3	2.9	2.6	2.9	3.0	2.7	-	2.8
Absorption, %	60.9	60.3	60.4	59.9	-	-	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						
Fum B_3 (µg/kg)	ND							ND						
Deoxynivalenol (µg/kg) [max. value]	< LOQ [306]							< LOQ [380]						
15-ADON (µg/kg)	ND							ND						
Ochratoxin A (µg/kg)	ND							ND						
Zearalenone (µg/kg) [max. value]	< LOQ [31]							ND						
HT-2 (µg/kg)	ND							ND						
T-2 Toxin (µg/kg)	ND							ND						
No. of samples	***11***							***40***						

2012/2013 IMPORTED WHEAT QUALITY - URUGUAY (1 Oct 2012 to 30 Sep 2013)

2012/2013 Imported Wheat Quality Versus 2012/2013 RSA Wheat Quality

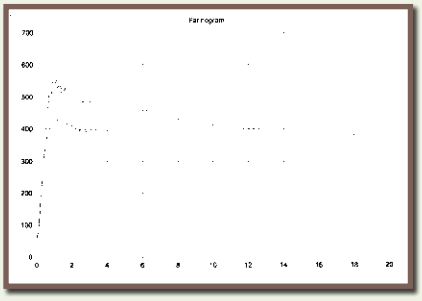
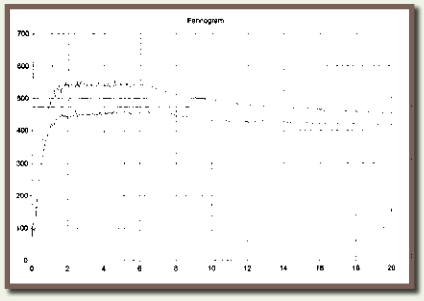
Country of origin	Uruguay Average							RSA Crop Average						
Class and Grade bread wheat	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	***-***	***9***	***5***	***1***	***-***	***3***	***18***	***74***	***95***	***69***	***36***	***59***	***4***	***337***
WHEAT														
GRADING														
Protein (12% mb), %	-	11.62	11.53	12.54	-	11.52	11.63	12.59	11.55	10.50	10.15	11.30	12.23	11.38
Moisture, %	-	12.2	12.5	12.5	-	12.2	12.3	11.1	11.1	11.0	11.1	11.2	12.1	11.1
Falling number, sec	-	427	428	203	-	399	410	375	371	361	355	333	280	360
1000 Kernel mass (13% mb), g	-	29.8	31.9	33.7	-	30.6	30.7	39.5	40.4	41.2	41.4	39.2	36.9	40.2
Hlm (dirty), kg/hl	-	78.5	78.5	76.6	-	79.3	78.6	81.7	81.7	81.9	81.7	79.5	75.1	81.3
Screenings (<1,8mm), %	-	2.33	2.07	3.90	-	1.94	2.28	1.14	1.25	1.13	1.64	2.32	3.60	1.46
Gravel, stones, turf and glass, %	-	0.00	0.00	0.01	-	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00
Foreign matter, %	-	0.20	0.16	0.27	-	0.20	0.19	0.08	0.10	0.13	0.14	0.25	0.25	0.13
Other grain & unthreshed ears, %	-	0.40	0.16	0.21	-	0.43	0.33	0.37	0.42	0.34	0.40	1.04	0.64	0.50
Heat damaged kernels, %	-	0.06	0.00	0.00	-	0.00	0.03	0.04	0.02	0.02	0.03	0.02	0.00	0.02
Immature kernels, %	-	0.06	0.05	0.00	-	0.01	0.05	0.20	0.15	0.11	0.09	0.25	0.12	0.16
Insect damaged kernels, %	-	0.26	0.28	0.04	-	0.40	0.28	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
Sprouted kernels, %	-	0.00	0.06	0.28	-	0.00	0.03	0.32	0.16	0.07	0.09	0.42	1.96	0.24
Total damaged kernels, %	-	0.38	0.39	0.32	-	0.41	0.38	0.80	0.65	0.47	0.53	1.38	2.39	0.78
Combined deviations, %	-	3.30	2.79	4.70	-	2.98	3.18	2.38	2.43	2.08	2.72	4.91	6.88	2.86
Field fungi, %	-	1.40	0.88	0.51	-	2.78	1.43	0.49	0.40	0.35	0.28	0.45	1.69	0.42
Storage fungi, %	-	0.09	0.05	0.20	-	0.12	0.09	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
Noxious seeds (*Crotalaria spp., etc.*)	-	0	0	0	-	0	0	0	0	0	0	0	0	0
Noxious seeds (*Argemone mexicana, etc.*)	-	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
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	***-***	***9***	***5***	***1***	***-***	***3***	***18***	***22***	***17***	***13***	***11***	***7***	***-***	***70***
BÜHLER EXTRACTION, %	-	73.4	72.4	67.7	-	73.7	72.9	73.5	73.5	73.1	72.7	72.1	-	73.2
FLOUR														
Colour, KJ	-	-1.8	-1.1	-1.1	-	-2.1	-1.6	-2.8	-2.8	-3.0	-2.8	-2.8	-	-2.9
Colour, Minolta CM5 (dry)														
L*	-	93.31	93.12	92.93	-	93.43	93.26	93.76	93.82	94.02	93.84	93.88	-	93.85
a*	-	0.60	0.64	0.61	-	0.54	0.60	0.44	0.42	0.38	0.38	0.43	-	0.41
b*	-	11.16	10.87	10.03	-	10.99	10.99	9.73	9.91	9.99	10.19	10.00	-	9.92
Protein (12% mb), %	-	10.4	10.1	11.0	-	10.4	10.4	11.7	10.8	9.7	9.6	10.9	-	10.7
Wet Gluten (14% mb), %	-	26.5	24.6	28.7	-	27.1	26.2	31.7	29.4	26.4	25.4	30.0	-	29.0
Dry Gluten (14% mb), %	-	9.2	8.6	10.2	-	9.3	9.1	11.0	10.2	9.0	8.8	10.3	-	10.0
Gluten Index	-	91	89	73	-	90	89	84	78	87	83	81	-	83
100g BAKING TEST														
Baking water absorption, %	-	58.6	59.2	56.9	-	60.2	58.9	61.3	60.4	59.3	59.2	60.4	-	60.3
Loaf volume, cm^3	-	806	683	640	-	803	762	930	900	828	822	916	-	886
Evaluation	-	1	4	6	-	1	2	0	0	0	0	0	-	0
FARINOGRAM														
Water absorption, %	-	57.1	58.3	60.7	-	57.6	57.7	61.3	60.6	60.5	60.3	61.3	-	60.8
Development time, min	-	2.0	1.7	1.7	-	2.3	2.0	6.4	5.0	4.1	4.0	4.9	-	5.1
Stability, mm	-	8.8	3.6	6.6	-	9.0	7.3	9.7	7.4	7.0	7.3	7.3	-	7.9
Mixing tolerance index, BU	-	25	48	31	-	31	33	34	42	38	35	36	-	37
														

2012/2013 Imported Wheat Quality Versus 2012/2013 RSA Wheat Quality

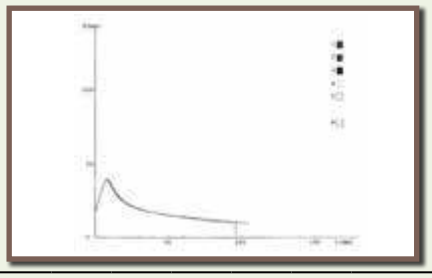
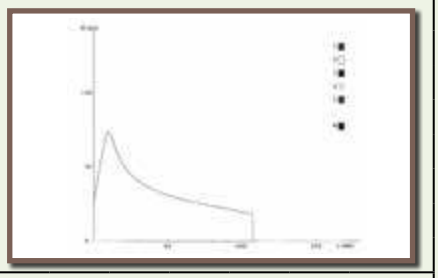
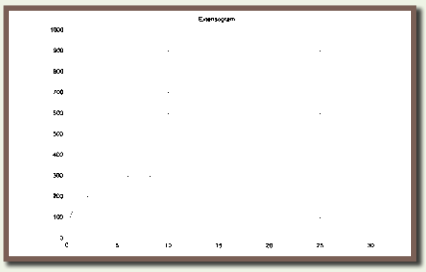
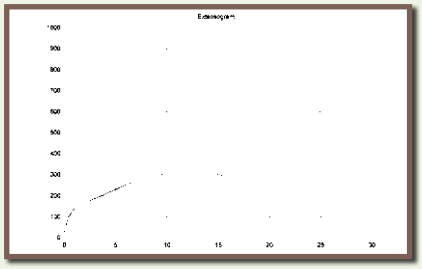
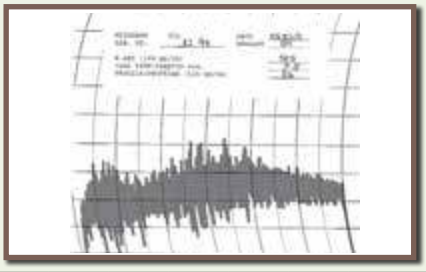
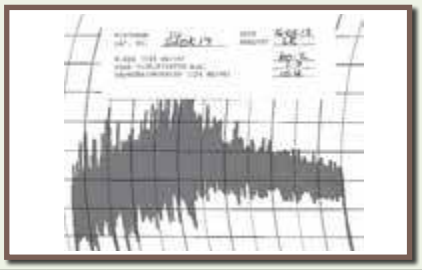
Country of origin	Uruguay Average							RSA Crop Average						
Class and Grade bread wheat	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	***-***	***9***	***5***	***1***	***-***	***3***	***18***	***22***	***17***	***13***	***11***	***7***	***-***	***70***
ALVEOGRAM														
Strength (S), cm²	-	32.5	32.0	34.6	-	33.0	32.6	43.1	35.1	32.6	31.8	36.5	-	36.7
Stability (P), mm	-	87	106	94	-	81	92	86	81	90	91	86	-	86
Distensibility (L), mm	-	77	55	76	-	79	71	120	109	90	84	104	-	105
P/L	-	1.50	2.18	1.24	-	1.05	1.60	0.77	0.80	1.23	1.34	0.89	-	0.96
														
EXTENSOGRAM														
Strength, cm²	-	86	81	71	-	87	84	102	82	72	70	85	-	84
Max. height, BU	-	420	414	341	-	413	412	365	313	299	308	320	-	325
Extensibility, mm	-	152	143	151	-	153	150	204	189	171	159	190	-	185
														
MIXOGRAM														
Peak time, min	-	4.2	4.5	4.3	-	4.3	4.3	2.9	2.6	2.9	3.0	2.7	-	2.8
Absorption, %	-	60.3	60.0	60.9	-	60.2	60.2	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						
Fum B_3 (µg/kg)	ND							ND						
Deoxynivalenol (µg/kg)	1074 [1334]							< LOQ [380]						
15-ADON (µg/kg) [max. value]	< LOQ [< LOQ]							ND						
Ochratoxin A (µg/kg)	ND							ND						
Zearalenone (µg/kg) [max. value]	< LOQ [69]							ND						
HT-2 (µg/kg)	ND							ND						
T-2 Toxin (µg/kg)	ND							ND						
No. of samples	***7***							***40***						

2012/2013 IMPORTED WHEAT QUALITY - USA (1 Oct 2012 to 30 Sep 2013)

2012/2013 Imported Wheat Quality Versus 2012/2013 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	***-***	***-***	***8***	***2***	***-***	***-***	***10***	***74***	***95***	***69***	***36***	***59***	***4***	***337***
WHEAT														
GRADING														
Protein (12% mb), %	-	-	10.24	9.67	-	-	10.13	12.59	11.55	10.50	10.15	11.30	12.23	11.38
Moisture, %	-	-	11.6	11.9	-	-	11.7	11.1	11.1	11.0	11.1	11.2	12.1	11.1
Falling number, sec	-	-	382	339	-	-	373	375	371	361	355	333	280	360
1000 Kernel mass (13% mb), g	-	-	34.0	32.9	-	-	33.8	39.5	40.4	41.2	41.4	39.2	36.9	40.2
Hlm (dirty), kg/hl	-	-	79.3	79.6	-	-	79.3	81.7	81.7	81.9	81.7	79.5	75.1	81.3
Screenings (<1,8mm), %	-	-	2.22	2.91	-	-	2.36	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	0.01	0.01	0.01	0.00	0.00	0.00
Foreign matter, %	-	-	0.22	0.24	-	-	0.22	0.08	0.10	0.13	0.14	0.25	0.25	0.13
Other grain & unthreshed ears, %	-	-	0.72	0.00	-	-	0.58	0.37	0.42	0.34	0.40	1.04	0.64	0.50
Heat damaged kernels, %	-	-	0.01	0.04	-	-	0.02	0.04	0.02	0.02	0.03	0.02	0.00	0.02
Immature kernels, %	-	-	0.01	0.00	-	-	0.01	0.20	0.15	0.11	0.09	0.25	0.12	0.16
Insect damaged kernels, %	-	-	0.07	0.02	-	-	0.06	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
Sprouted kernels, %	-	-	0.09	0.00	-	-	0.07	0.32	0.16	0.07	0.09	0.42	1.96	0.24
Total damaged kernels, %	-	-	0.19	0.06	-	-	0.16	0.80	0.65	0.47	0.53	1.38	2.39	0.78
Combined deviations, %	-	-	3.35	3.20	-	-	3.32	2.38	2.43	2.08	2.72	4.91	6.88	2.86
Field fungi, %	-	-	0.19	0.13	-	-	0.17	0.49	0.40	0.35	0.28	0.45	1.69	0.42
Storage fungi, %	-	-	0.09	0.04	-	-	0.08	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
Noxious seeds (*Crotalaria spp., etc.*)	-	-	0	0	-	-	0	0	0	0	0	0	0	0
Noxious seeds (*Argemone mexicana, etc.*)	-	-	0	0	-	-	0	0	0	0	0	0	0	0
Live insects	-	-	No	No	-	-	No	No	No	No	No	No	No	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	***-***	***-***	***8***	***2***	***-***	***-***	***10***	***22***	***17***	***13***	***11***	***7***	***-***	***70***
BÜHLER EXTRACTION, %	-	-	70.8	70.3	-	-	70.7	73.5	73.5	73.1	72.7	72.1	-	73.2
FLOUR														
Colour, KJ	-	-	-2.2	-2.1	-	-	-2.2	-2.8	-2.8	-3.0	-2.8	-2.8	-	-2.9
Colour, Minolta CM5 (dry)														
L*	-	-	94.83	94.84	-	-	94.83	93.76	93.82	94.02	93.84	93.88	-	93.85
a*	-	-	0.25	0.26	-	-	0.25	0.44	0.42	0.38	0.38	0.43	-	0.41
b*	-	-	8.46	8.36	-	-	8.44	9.73	9.91	9.99	10.19	10.00	-	9.92
Protein (12% mb), %	-	-	8.5	8.0	-	-	8.4	11.7	10.8	9.7	9.6	10.9	-	10.7
Wet Gluten (14% mb), %	-	-	21.8	20.4	-	-	21.5	31.7	29.4	26.4	25.4	30.0	-	29.0
Dry Gluten (14% mb), %	-	-	7.1	6.7	-	-	7.0	11.0	10.2	9.0	8.8	10.3	-	10.0
Gluten Index	-	-	70	67	-	-	69	84	78	87	83	81	-	83
100g BAKING TEST														
Baking water absorption, %	-	-	54.7	54.6	-	-	54.7	61.3	60.4	59.3	59.2	60.4	-	60.3
Loaf volume, cm³	-	-	718	645	-	-	703	930	900	828	822	916	-	886
Evaluation	-	-	1	2	-	-	1	0	0	0	0	0	-	0
FARINOGRAM														
Water absorption, %	-	-	51.4	51.5	-	-	51.4	61.3	60.6	60.5	60.3	61.3	-	60.8
Development time, min	-	-	1.3	1.3	-	-	1.3	6.4	5.0	4.1	4.0	4.9	-	5.1
Stability, mm	-	-	2.4	2.1	-	-	2.3	9.7	7.4	7.0	7.3	7.3	-	7.9
Mixing tolerance index, BU	-	-	67	73	-	-	68	34	42	38	35	36	-	37
														

2012/2013 Imported Wheat Quality Versus 2012/2013 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	***-***	***-***	***8***	***2***	***-***	***-***	***10***	***22***	***17***	***13***	***11***	***7***	***-***	***70***
ALVEOGRAM														
Strength (S), cm²	-	-	17.4	15.6	-	-	17.0	43.1	35.1	32.6	31.8	36.5	-	36.7
Stability (P), mm	-	-	43	46	-	-	43	86	81	90	91	86	-	86
Distensibility (L), mm	-	-	97	80	-	-	94	120	109	90	84	104	-	105
P/L	-	-	0.44	0.57	-	-	0.47	0.77	0.80	1.23	1.34	0.89	-	0.96
														
EXTENSOGRAM														
Strength, cm²	-	-	55	50	-	-	55	102	82	72	70	85	-	84
Max. height, BU	-	-	303	285	-	-	301	365	313	299	308	320	-	325
Extensibility, mm	-	-	128	119	-	-	127	204	189	171	159	190	-	185
														
MIXOGRAM														
Peak time, min	-	-	3.9	3.8	-	-	3.8	2.9	2.6	2.9	3.0	2.7	-	2.8
Absorption, %	-	-	58.5	58.1	-	-	58.4	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						
Fum B_3 (µg/kg)	ND							ND						
Deoxynivalenol (µg/kg) [max. value]	151 [232]							< LOQ [380]						
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	***5***							***40***						

sanas
South African National Accreditation System

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

ANNEXURE A

SCHEDULE OF ACCREDITATION

Facility Number: T0116

Permanent Address of Laboratory: Southern African Grain Laboratory (NPC) Grain Building 477 Witherite Road The Willows 0040	**Technical Signatories:**	Ms J Nortjé (All) Ms M Fourie (In House Method 012) Ms M Hammes (Chemical) Ms E Vorster (Rheological) Ms A de Jager (Nutrients & Contaminants) Ms A Saville (In-House Method 026) Ms M Henning (Chemical) Ms W Louw (In-House Methods 001, 002, 003, 010, and 026) Ms D Moleke (Rheological) Ms I Terblanche (Rheological) Ms H Meyer (Chemical, Nutrients & Contaminants) Ms J Kruger (Chemical, excluding In-House Method 012)
Postal Address: Postnet Suite # 391 Private Bag X 1 The Willows 0041	**Nominated Representative:** **Management Representative:**	Ms S du Preez Ms W Louw
Tel: (012) 807-4019 Fax: (086) 216-7672 E-mail: info@sagl.co.za	Issue No.: Date of Issue: Expiry Date:	20 09 April 2014 31 October 2014

Materials / Products Tested	Type of Tests / Properties Measured, Range of Measurement	Standard Specifications, Equipment / Technique Used
CHEMICAL		
Ground Barley	Moisture (Oven Method)	Analytical EBC Method 3.2, Latest Edition
Cereal and cereal products specifically- wheat, rice, (hulled paddy), barley, millet, rye and oats as grains, semolina and flour	Moisture (Oven Method)	ICC Std No.110/1, Latest Edition
Flour, semolina, bread, all kind of grains and cereal products, and food products (except those that are sugar coated)	Moisture (Oven method)	AACCI 44-15.02, Latest Edition
All flours, cereal grains, oilseeds and animal feeds	Nitrogen and protein (Combustion method - Dumas)	AACCI 46-30.01, Latest Edition

Acting Field Manager

Facility No.: T0116
Date of Issue: 09 April 2014
Expiry Date: 31 October 2014

Materials / Products Tested	Type of Tests / Properties Measured, Range of Measurement	Standard Specifications, Equipment / Technique Used
Food stuff	Dietary fibre (total)	In-House Method 012
Food stuff and feeds	Carbohydrates (by difference) (calculation) Energy value (calculation) Total digestible nutrition value (calculation)	SOP MC 23
Food stuff and feeds	Determination of ash	In-House Method 011
Wheat kernels	Moisture (Oven method)	Government Gazette Wheat Grading Regulation, Latest Edition (72 hour, 103ºC)
Flours of grains, e.g. barley, oats, triticale, maize, rye, sorghum and wheat; oilseeds like soybeans and sunflower, feeds and mixed feeds and foodstuffs	Crude Fat (Ether extraction by Soxhlet)	In-House Method 024
Meal and flour of wheat, rye, barley, other grains, starch containing and malted products	Falling number	ICC No 107/1, Latest Edition
NUTRIENTS & CONTAMINANTS		
Vitamin fortified food and feed products and fortification mixes grain based	Vitamin A as all trans Retinol (Saponification) (HPLC)	In-House Method 001
Vitamin fortified food and feed products and fortification mixes grain based	Thiamine Mononitrate (HPLC) Riboflavin (HPLC) Nicotinamide (HPLC) Pyridoxine Hydrochloride (HPLC)	In-House Method 002
Vitamin fortified food and feed products and fortification mixes grain based	Folic Acid (HPLC)	In-House Method 003
Grain based food and feed products (fortified and unfortified) and fortification mixes	Total sodium (Na) Total Iron (Fe) Total zinc (Zn)	In House Method 010

Acting Field Manager

Facility No.: T0116
Date of Issue: 09 April 2014
Expiry Date: 31 October 2014

Materials / Products Tested	Type of Tests / Properties Measured, Range of Measurement	Standard Specifications, Equipment / Technique Used
Food and feed	Multi-Mycotoxin: - Aflatoxin G_1, B_1, G_2, B_2 and total - Deoxynivalenol (DON), 15-ADON - Fumonisin B_1, B_2, B_3 - Ochratoxin A - T2, HT-2 - Zearalenone	In-House Method 026
GRADING		
Maize	Defective kernels (white maize/yellow maize)	Government Gazette Maize Regulation, Latest Edition
Cereal as grains (wheat, barley, rye and oats)	Hectolitre mass (Kern222)	ISO 7971-3, Latest Edition
Wheat	Screenings	Government Gazette Wheat Grading Regulation, Latest Edition
RHEOLOGICAL		
Wheat flour	Alveograph (Rheological properties)	ICC No 121, Latest Edition
Flours	Farinograph (Rheological properties)	AACCI 54.02, Latest Edition (Rheological behaviour of Flour Farinograph: Constant Flour Weight procedure)
Hard, soft and durum wheat, (flour and whole wheat flour)	Mixograph (Rheological properties)	Industry Accepted Method 020 (based on AACCI 54-40.02, Latest Edition Mixograph Method)

ISSUED BY THE SOUTH AFRICAN NATIONAL ACCREDITATION SYSTEM

Acting Field Manager

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 ASSURURANCE 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 HET:

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

AgLASA
AGRI LABORATORY ASSOCIATION OF SOUTHERN AFRICA
AGRI LABORATORIUM ASSOSIASIE VAN SUIDELIKE AFRIKA

Bipea
partner of your Quality

PROFICIENCY TESTING PROGRAMS

CERTIFICATE OF PARTICIPATION

This certificate is awarded to:

SOUTHERN AFRICAN GRAIN LABORATORY

THE WILLOWS - PRETORIA - SOUTH AFRICA

for its participation in BIPEA interlaboratory comparisons for the annual series 2013-2014.

May 14, 2014 - Gennevilliers France

BIPEA Member

BIPEA Director

Certificate n° 13-14 / 11119

AACC INTERNATIONAL

RECOGNITION OF ANALYTICAL PERFORMANCE

Analysis of Mixograph

Southern African Grain Laboratory
Pretoria SOUTH AFRICA

Achieved Outstanding Accuracy and Precision for the year 2013
in check samples including the following analyses:

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

Executive Vice President

President

AACC INTERNATIONAL

RECOGNITION OF ANALYTICAL PERFORMANCE

Analysis of Feed

Southern African Grain Laboratory
Pretoria SOUTH AFRICA

Achieved Outstanding Accuracy and Precision for the year 2013
in check samples including the following analyses:

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

Executive Vice President

President

AACC INTERNATIONAL

RECOGNITION OF ANALYTICAL PERFORMANCE

Analysis of Hard Wheat Flour

Southern African Grain Laboratory
Pretoria, SOUTH AFRICA

Achieved Outstanding Accuracy and Precision for the year 2013
in check samples including the following analyses:

Moisture, Protein, Ash

Executive Vice President

President

No. R. 1186 **17 December 2010**

AGRICULTURAL PRODUCT STANDARDS ACT, 1990
(ACT No. 119 OF 1990)

REGULATIONS RELATING TO THE GRADING, PACKING AND MARKING OF BREAD WHEAT INTENDED FOR SALE IN THE REPUBLIC OF SOUTH AFRICA

The Minister of Agriculture, Forestry and Fisheries, acting under section 15 of the Agricultural Product Standards Act, 1990 (Act No. 119 of 1990), has

(a) made the regulations in the Schedule;

(b) determined that the said regulations shall come into operations on the date of publication; and

(c) repealed the regulations published in Government Notice No's R. 905 of 10 July 1998 as amended by R.1421 of 6 November 1998, R.876 of 14 September 2001, R.979 of 19 July 2002, and R.1210 of 29 August 2003.

SCHEDULE

Definitions

1. Unless the context otherwise indicates, any word or expression in these regulations to which a meaning has been assigned in the Act shall have that meaning, and;

"**animal rests**" means dead rodents, dead birds and dung;

"bag" means a bag manufactured from - -

(a) jute or phormium or a mixture of jute and phormium; or

(b) polypropylene that complies with SABS specification CKS632;

"bulk container" means any vehicle or container in which bulk wheat is stored or transported;

"**consignment**" means --

(a) a quantity of wheat of the same class, which belongs to the same owner, delivered at any one time under cover of the same consignment note, delivery note or receipt note, or delivered by the same vehicle or bulk container, or loaded from the same bin of a grain elevator or from a ship's hold; or

(b) in the case where a quantity referred to in paragraph (a), is subdivided into different grades, each such quantity of each of the different grades;

"container" means a bag or bulk container;

"**cultivar list**" means the list of cultivars determined from time to time by the Executive Officer: Agricultural Product Standards and which is obtainable from the Executive Officer: Agricultural Product Standards, Private Bag X258, Pretoria, 0001;

"**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;

"**ergot sclerotia**" means the sclerotia of the fungus *Claviceps purpurea*; and "**ergot**" has a corresponding meaning;

"**falling number**" means the time in seconds according to Hagberg-Perten as a measure of the degree of Alpha-Amylase activity in grain and flour;

"**field fungi infected wheat**" means wheat of which the kernels are visibly infected with fungi, and that -

(a) clearly have greyish brush-ends that are discoloured as a whole; or where field fungi growth is present from the brush-ends into the crease;

(b) have a dull, lifeless, chalky or pinkish and shrunken appearance as a result of *Fusarium* infection;

"**foreign matter**" means all material excluding wheat, other grain and unthreshed ears;

"**heavily frost-damaged wheat**" means --

(a) wheat which have been damaged by severe frost during the milk to soft dough stage and which is characterised by the kernels being fairly plump but covered entirely with small blisters extending into the crease, excluding --

(i) kernels in which blistering is confined to the back of the kernel; and

(ii) immature wrinkled kernels in which wrinkling has been caused by frost while the kernels were still immature; and

(b) kernels which have a slightly flaked-off bran coat due to frost: *Provided that evidence of* frost damage is present and that the bran coat had not been rubbed off due to handling;

"**hectolitre mass**" means the mass in kilogram per hectolitre;

"**insect**" in relation to wheat, means any live insect that is injurious to stored grain irrespective of the stage of development of that insect;

"**other grain**" means the kernels or pieces of kernels of barley, oats, triticale, maize, rye and sorghum;

"**poisonous seeds**" means the seeds or bits of seeds of plant species that may in terms of the Foodstuffs, Cosmetics and Disinfectants Act, 1972 (Act No. 54 of 1972) represent a hazard to human or animal health when consumed, including seeds of *Argemone mexicana, Convolvulus spp.*, *Crotalaria spp., Datura spp.*, *Ipomoea purpurea, Lolium temulentum, Ricinus communis* or *Xanthium spp.*;

"**protein content**" means the percentage protein in wheat on a 12% moisture basis;

"**screenings**" means all material that passes through the standard sieve;

"standard sieve" is a slotted sieve - -

(a) with a flat bottom of metal sheet of 1,0 mm thickness with apertures 12,7 mm long and 1,8 mm wide with rounded ends. The spacing between the slots in the same row must be 2,43 mm wide and the spacing between the rows of slots must be 2,0 mm wide. The slots

must be alternately orientated with a slot always opposite the solid inter segment of the next row of slots.

(b) of which the upper surface of the sieve is smooth;

(c) with a round frame of suitable material with an inner diameter of between 300 mm and 310 mm maximum and at least 50 mm high;

(d) that fits onto a tray with a solid bottom and must be at least 20 mm above the bottom of the tray;

"**stinking smut infection**" means wheat that is infected with *Tilletia spp.* with the exception of wheat infected with *Tilletia indica* (karnal bunt). Wheat is considered stinking smut infected if one or more of the following characteristics are present:

(a) an unmistakable stinking smut odour; or

(b) wheat kernels that are smeared with stinking smut; or

(c) more than four stinking smut balls (or pieces of balls equal to four stinking smut balls) per 100 g of wheat;

"**storage fungi infected wheat**" means wheat that are visibly infected with fungi, and that show -

(a) blue, green, blackish or yellow fungal growth anywhere on the kernel; or

(b) visible mould beneath the bran;

"**the Act**" means the Agricultural Product Standards Act, 1990 (Act No. 119 of 1990);

"**unthreshed ears**" means ears and bits of ears of wheat, barley, triticale and rye that still contain seeds that are completely covered with glumes; and

"**wheat**" means the kernels and pieces of kernels of the species *Triticum aestivum.*

Restrictions on sale of wheat

2. (1) No person shall sell a consignment of wheat in the Republic of South Africa --

(a) unless the wheat is sold according to the classes set out in regulation 3;

(b) unless the wheat complies with the standards for the classes set out in regulation 4;

(c) unless the wheat, where applicable, complies with the grades of wheat and the standards for grades set out in regulations 5 and 6 respectively;

(d) unless the wheat is packed in accordance with the packing requirements set out in regulation 7;

(e) unless the containers or sale documents, as the case may be, are marked in accordance with the marking requirements set out in regulation 8; and

(f) if such wheat contains a substance that renders it unfit for human consumption or for processing into or utilisation thereof as food or feed.

(2) The Executive Officer may grant written exemption, entirely or partially, to any person on such conditions as he or she may deem necessary, from the provisions of subregulation (1).

PART I

QUALITY STANDARDS

Classes of wheat

3. The classes of wheat are --

(a) Bread Wheat; and

(b) Other Wheat.

Standards for classes

4. (1) Notwithstanding the provisions of sub regulations (2) and (3), all consignments of wheat must --

(a) be free from any toxin, chemical or other substances that renders it unsuitable for human consumption or for processing into or utilisation thereof as food or feed and may not exceed the permissible deviations regarding aflatoxin in terms of the Foodstuffs, Cosmetics and Disinfectants Act, 1972 (Act No. 54 of 1972);

(b) contain not more poisonous seeds or ergot sclerotia than permitted in terms of the Foodstuffs, Cosmetics and Disinfectants Act, 1972 (Act No. 54 of 1972);

(c) be free from organisms of phytosanitary importance as determined in terms of the Agricultural Pest Act, 1983 (Act No. 36 of 1983);

(d) be free from mould infected, sour and rancid other grain, foreign matter and any other matter;

(e) be free from any undesired odour, taste or colour not typical of undamaged and sound wheat;

(f) be free from animal rests;

(g) with the exception of Other Wheat, be free from insects;

(h) with the exception of Other Wheat, be free from stinking smut infection; and

(i) with the exception of Other Wheat, have a moisture content not exceeding 13 per cent.

(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; and

(b) it complies with the standards for Grade 1, Grade 2, Grade 3, Grade 4 or Utility Grade set out in regulation 6.

(3) A consignment of wheat shall be classified as Other Wheat if it does not comply with the standards for Bread Wheat.

Grades of wheat

5. (1) The grades for Bread Wheat shall be as follows:

(a) Grade 1;

(b) Grade 2;

(c) Grade 3;

(d) Grade 4; and

(e) Utility grade.

(2) No grades are determined for Other Wheat.

Standards for grades of wheat

6. (1) Subject to the provisions of subregulations (2), (3) and (4), a consignment of wheat shall be graded as --

(a) Grade 1 if the nature of deviation, specified in column 1 of Table 1 of the Annexure, in that consignment does not exceed the percentage specified in column 2 of the said table opposite the deviation concerned;

(b) Grade 2 if the nature of deviation, specified in column 1 of Table 1 of the Annexure, in that consignment does not exceed the percentage specified in column 3 of the said table opposite the deviation concerned;

(c) Grade 3 if the nature of deviation, specified in column 1 of Table 1 of the Annexure, in that consignment does not exceed the percentage specified in column 4 of the said table opposite the deviation concerned;

(d) Grade 4 if the nature of deviation, specified in column 1 of Table 1 of the Annexure, in that consignment does not exceed the percentage specified in column 5 of the said table opposite the deviation concerned; and

(e) Utility Grade if the nature of deviation, specified in column 1 of Table 1 of the Annexure, in that consignment does not exceed the percentage specified in column 6 of the said table opposite the deviation concerned.

(2) The minimum hector litre masses for the different grades are as follows:

(a) Grade 1 - 77 kg;

(b) Grade 2 - 76 kg;

(c) Grade 3 - 74 kg;

(d) Grade 4 - 72 kg; and

(e) Utility Grade - 70 kg.

(3) (a) Grade 1, Grade 2 and Grade 3 shall have a minimum falling number value of not less than 250 seconds;

(b) Grade 4 shall have a minimum falling number value of not less than 200 seconds.

(c) Utility Grade shall have a minimum falling number value of not less than 150 seconds.

(d) Notwithstanding the provision of paragraph (a), wheat shall be deemed to comply with the requirements of the paragraph concerned if it deviates with not more than 30 seconds lower than the minimum prescribed for Grade 1, Grade 2 and Grade 3, as the case may be.

(4) The minimum protein content (on a 12 per-cent moisture basis) for the different grades shall be as follows:

(a) Grade 1 - 12 per cent;

(b) Grade 2 - 11 per cent;

(c) Grade 3 - 10 per cent;

(d) Grade 4 - 9 per cent; and

(e) Utility Grade - 8 per cent.

PART II

PACKING AND MARKING REQUIREMENTS

Packing requirements

7. Wheat of different grades shall be packed in different containers, or stored separately.

Marking requirements

8. (1) Every container or the accompanying sale documents of a consignment of wheat shall be marked or endorsed by means of appropriate symbols specified in subregulation (2), with --

(a) the class of the wheat; and

(b) the grade.

(2) The symbols referred to in subregulation (1) shall appear in the order of class and grade.

(3) The symbols used to indicate the different --

(a) classes shall be --

(i) B in the case of Bread Wheat; and

(ii) O in the case of Other Wheat;

(b) grades shall be --

(i) 1 in the case of Grade 1;

(ii) 2 in the case of Grade 2;

(iii) 3 in the case of Grade 3;

(iv) 4 in the case of Grade 4; and

(v) UT in the case of Utility Grade.

PART III

SAMPLING

Taking of sample

9. (1) A sample of a consignment of wheat shall --

(a) in the case of wheat delivered in bags and subject to regulation 10, be obtained by sampling at least ten per cent of the bags, chosen from that consignment at random, with a bag probe: Provided that at least 25 bags in a consignment shall be sampled and where a consignment consists of less than 25 bags, all the bags in that consignment shall be sampled; and

(b) in the case of wheat delivered in bulk and subject to regulation 10, be obtained by sampling that consignment throughout the whole depth of the layer, in at least six different places, chosen at random in that bulk quantity, with a bulk sampling apparatus.

(2) The collective sample obtained in subregulation (1)(a) or (b) shall --

(a) have a total mass of at least 10 kg; and

(b) be thoroughly mixed by means of dividing before further examination.

(3) If it is suspected that the sample referred to in sub regulation (1)(a) is not representative of that consignment, an additional five per cent of the remaining bags, chosen from that consignment at random, shall be emptied into a suitable bulk container and sampled in the manner contemplated in subregulation (1)(b).

(4) If it is suspected that the sample referred to in sub regulation (1)(b) is not representative of that consignment, an additional representative sample shall be obtained by using an alternative sampling pattern, apparatus or method.

(5) A sample taken in terms of these regulations shall be deemed to be representative of the consignment from which it was taken.

Sampling if contents differ

10. (1) If, after an examination of the wheat taken from different bags in a consignment in terms of regulation 9(1)(a), it appears that the contents of those bags differ substantially --

(a) the bags concerned shall be placed separately;

(b) all the bags in the consignment concerned shall be sampled with a bag probe in order to do such separation; and

(c) each group of bags with similar contents in that consignment shall for the purposes of these regulations be deemed to be a separate consignment.

(2) If, after the discharge of a consignment of wheat in bulk has commenced, it is suspected that the consignment could be of a class or grade other than that determined by means of the initial sampling, the discharge shall immediately be stopped and the part of the consignment remaining in the bulk container as well as the wheat already in the hopper shall be sampled anew with a bulk sampling apparatus or by catching at least 20 samples, by means of a suitable container, at regular intervals throughout the whole offloading period from the stream of wheat flowing in bulk.

Working sample

11. A working sample is obtained by dividing the representative sample of the consignment according to the ICC (International Association for Cereal Science and Technology) 101/1 method.

PART IV

DETERMINATION OF OTHER SUBSTANCES

Determination of undesirable odours and harmful substances

12. A consignment of wheat or a sample of a consignment of wheat shall be sensorial assessed or chemically analysed in order to determine --

(a) whether it contains a substance that renders the wheat unfit for human consumption or for processing into or for utilisation as food or feed; and

(b) whether it has a musty, sour, rancid or other undesirable odour: Provided that a working sample of unscreened wheat that is ground in a grain mill to a fine meal may be used for the determination concerned.

PART V

DETERMINATION OF CLASS, HECTOLITRE MASS, MOISTURE CONTENT, PROTEIN CONTENT AND FALLING NUMBER

Determination of class

13. The class of a consignment of wheat shall be determined as follows:

(a) Obtain a working sample of at least 500 g and screen the working sample in the manner prescribed in regulation 18.

(b) Take at least 100 g of the screened wheat and remove all other grain, un threshed ears and foreign matter by hand.

(c) Obtain a working sample of at least 25 g each after all other grain, un threshed ears and foreign matter have been removed and separate the different cultivars.

(d) Determine the combined mass of all of the cultivars that belongs according to the cultivar list to the same class and express the mass thus determined as a percentage of the mass of the working sample.

(e) Such percentage represents the percentage of all the cultivars that belongs according to the cultivar list to the same class in the consignment.

Determination of the hectolitre mass

14. The hectolitre mass of a consignment of unscreened wheat may be determined by any suitable instrument: Provided that the instrument complies with and has been calibrated to, the specifications detailed in ISO (International Organization for Standardization) 7971-3.

Determination of moisture content

15. The moisture content of a consignment wheat may be determined by any suitable method: Provided that the results thus obtained is in accordance with the maximum permissible deviation for a class 1 moisture meter as detailed in ISO (International Organization for Standardization) 7700/1 based on the results of the 72 hour, 103°C oven dried method [AACC (American Association of Cereal Chemists) Method 44-15A].

Determination of protein content

16. The percentage of protein of a consignment of wheat may be determined according to any suitable method: Provided that --

(a) the determination shall be conducted on a sample which had been sifted using a screen with the same apertures as the standard sieve and from which other grain, un threshed ears and foreign matter had been removed by hand; and

(b) the results thus obtained are in accordance (± 0,3 per cent) with the results obtained by the Dumas Combustion Analysis Method [AACC (American Association of Cereal Chemists) Method 46-30].

Determination of falling number in wheat

17. (1) The falling number of a consignment of wheat may be determined according to any suitable method: Provided that --

(a) the determination shall be conducted on a sample which had been sifted using a screen with the same apertures as the standard sieve and from which other grain, un threshed ears and foreign matter had been removed by hand; and

(b) the results thus obtained are in accordance (± 5 percent) with the results obtained by the ICC (International Association for Cereal Science and Technology) 107/1 method.

(2) If the falling number of a consignment of wheat is determined according to the ICC (International Association for Cereal Science and Technology) 107/1 method --

(a) the sampling in the mentioned method shall be replaced with the manner prescribed in regulation 9; and

(b) only the altitude corrected value shall be used.

PART VI

DETERMINATION OF PERCENTAGE DEVIATIONS

Determination of percentage screenings

18. (1) The percentage screenings in a consignment of wheat shall be determined as follows:

(a) Obtain a working sample of at least 500 g.

(b) Place the sample on the standard sieve and screen the sample by moving the sieve 50 strokes to and fro, alternately away from and towards the operator of the sieve, in the same direction as the long axes of the slots of the sieve. Move the sieve, which rests on a table or other suitable smooth surface, 250 mm to 460 mm away from and towards the operator with each stroke. The prescribed 50 strokes must be completed within 50 to 60 seconds: Provided that the screening process may also be performed in some or other container or an automatic sieving apparatus.

(c) Determine the mass of the material that has passed through the sieve and express it as a percentage of the mass of the working sample.

(d) Such percentage represents the percentage screenings in the consignment.

Determination of the percentage heavily frost-damaged wheat

19. The percentage heavily frost-damaged wheat in a consignment of wheat shall be determined as follows:

(a) Obtain a working sample of at least 25 g of a screened sample.

(b) Remove all heavily frost-damaged kernels by hand and determine the mass thereof.

(c) Express the mass thus determined as a percentage of the mass of the working sample.

(d) Such percentage represents the percentage heavily frost-damaged wheat in the consignment concerned.

Determination of the percentages other grain and unthreshed ears

20. The percentage other grain and unthreshed ears in a consignment of wheat shall be determined as follows:

(a) Obtain a working sample of at least 50 g from a screened sample.

(b) Remove all other grain and unthreshed ears by hand and determine the mass thereof.

(c) Express the mass thus determined as a percentage of the mass of the working sample.

(d) Such percentage represents the percentage other grain and unthreshed ears in the consignment concerned.

Determination of the percentage foreign matter

21. The percentage foreign matter in a consignment of wheat is determined as follows:

(a) Obtain a working sample of at least 100 g from a screened sample.

(b) Remove all foreign matter by hand and determine the mass thereof.

(c) Express the mass thus determined as a percentage of the mass of the working sample.

(d) Such percentage represents the percentage foreign matter in the consignment concerned.

Determination of the percentage damaged wheat

22. The percentage damaged wheat in a consignment of wheat shall be determined as follows:

(a) Obtain a working sample of at least 25 g of a screened sample.

(b) Remove all damaged kernels by hand and determines the mass thereof.

(c) Express the mass thus determined as a percentage of the mass of the working sample.

(d) Such percentage represents the percentage damaged wheat in the consignment concerned.

Determination of the percentage heat-damaged wheat

23. The percentage heat-damaged wheat in a consignment of wheat shall be determined as follows:

(a) Obtain a working sample of at least 100 g from a screened sample.

(b) Remove all heat-damaged kernels by hand and determine the mass thereof. Kernels from an additional working sample may also be sensorially assessed (by smelling and tasting the kernels) to confirm suspicion of heat damage.

(c) Express the mass thus determined as a percentage of the mass of the working sample.

(d) Such percentage represents the percentage heat-damaged wheat in the consignment concerned.

Determination of percentage field fungi infected wheat

24. The percentage field fungi infected wheat in a consignment of wheat shall be determined as follows:

(a) Obtain a working sample of at least 25 g from a screened sample.

(b) Remove all field fungi infected kernels by hand and determine the mass thereof.

(c) Express the mass thus determined as a percentage of the mass of the working sample.

(d) Such percentage represents the percentage of field fungi infected wheat in the consignment concerned.

Determination of percentage storage fungi infected wheat

25. The percentage storage fungi infected wheat in a consignment of wheat shall be determined as follows:

(a) Obtain a working sample of at least 100 g from a screened sample.

(b) Remove all storage fungi infected kernels by hand and determine the mass thereof.

(c) Express the mass thus obtained as a percentage of the mass of the working sample.

(d) Such percentage represents the percentage storage fungi infected wheat in the consignment concerned.

PART VII

Offence and penalties

26. Any person who contravenes or fails to comply with any provision of these regulations shall be guilty of an offence and upon conviction be liable to a fine of not exceeding R50 000 or to imprisonment for a period not exceeding two years, or to both that fine or imprisonment.

ANNEXURE/AANHANGSEL

TABLE 1/TABEL 1

STANDARDS FOR GRADES OF BREAD WHEAT/ STANDAARDE VIR GRADE VAN BROODKORING

"

Nature of deviation/ Aard van afwyking	Maximum percentage permissible deviation (m/m)/ Maksimum persentasie toelaatbare afwyking (m/m)				
	Grade 1/ Graad 1	Grade 2/ Graad 2	Grade 3/ Graad 3	Grade 4/ Graad 4	Utility Grade/ Utiliteit-graad
1	3	4	5	6	7
(a) Heavily frost-damaged kernels/ Erg rypbeskadigde korrels	5	5	5	5	10
(b) Field fungi infected kernels/Land-swambesmette korrels	2	2	2	2	2
(c) Storage fungi infected kernels/ Opbergingswambesmette korrels	0,5	0,5	0,5	0,5	0,5
(d) Screenings/Sifsels	3	3	3	4	10
(e) Other grain and unthreshed ears/ Ander graan en ongedorste are	1	1	1	1	4
(f) Gravel, stones, turf and glass/ Gruis, klippies, turf en glas	0,5	0,5	0,5	0,5	0,5
(g) Foreign matter including gravel, stones, turf and glass: Provided that such deviations are individually within the limits specified in item (f)/ Vreemde voorwerpe met inbegrip van gruis, klippies, turf en glas: Met dien verstande dat sodanige afwykings individueel binne die perke is in item (f) aangegee	1	1	1	1	3
(h) Heat-damaged kernels/Hittebeskadigde korrels	0,5	0,5	0,5	0,5	0,5

Nature of deviation/ Aard van afwyking	Maximum percentage permissible deviation (m/m)/ Maksimum persentasie toelaatbare afwyking (m/m)				
	Grade 1/ Graad 1	Grade 2/ Graad 2	Grade 3/ Graad 3	Grade 4/ Graad 4	Utility Grade/ Utiliteit-graad
1	3	4	5	6	7
(i) Damaged kernels, including heat-damaged kernels: Provided that such deviations are individually within the limit specified in item (h) and provided further that the minimum falling number value prescribed in regulation 6(3) for the grade concerned is at least complied with/Beskadigde korrels met inbegrip van hittebeskadigde korrels: Met dien verstande dat sodanige afwyking individueel binne die perke is in item (h) aangegee en met dien verstande voorts dat minstens aan die minimum valgetalwaarde in regulasie 6(3) vir die betrokke graad voorgeskryf, voldoen word	2	2	2	2	5
(j) Deviations in items (d), (e), (g) and (i) collectively: Provided that such deviations are individually within the limits of the said items/ Afwykings in items (d), (e), (g) en (i) gesamentlik: Met dien verstande dat sodanige afwykings individueel binne die perke van genoemde items is	5	5	5	5	10

"