



SOUTH AFRICAN WHEAT CROP

Quality Report
2008/2009 Season

INDEX

	Page
Introduction	1
Production and protein distribution graphs	2
Quality 2008/2009 season	3
Wheat grades, cultivars and mycotoxins	4
Wheat class and grade per production area (pie charts)	5
Protein distribution graphs per production area (graphs)	5
Regional quality weighted averages	6
Protein, falling number, hectolitre mass and mixogram peak time over 10 seasons (graphs)	7
Regional quality	8 - 11
RSA wheat production and sampling procedure	12
Average yield per province graph	13
Dryland versus Irrigation area planted for 2008	13
Graphs showing correlation between protein content and 100-gram bake volume over last four seasons	14
Comparison of Flour Quality over last four seasons	15
Quality data plus rheological graphs per production region	16 - 45
Weighted average protein, falling number, hectolitre mass and mixogram peak time per region compared over the last three seasons	46
Grading table	47
Mycotoxin results	47
Summary of RSA wheat quality of 2006/2007 and 2008/2009	48 - 49
Summary of RSA wheat quality of 2007/2008 and 2008/2009	50 - 51
RSA chart plus seed figures	52
Methods	53 - 55
Imported wheat quality compared to RSA crop quality during the 2007/2008 production season	56 - 63

Compiled and issued by the:

Southern African Grain Laboratory
3rd Floor
CSIR building no.4
Meiring Naudé Street
Pretoria
SOUTH AFRICA

P.O.Box 1059
SILVERTON
0127

Tel: +27 (12) 349 2683
Fax: +27(12) 349 2686



E-mail: sagl@mweb.co.za
Website: www.sagl.co.za

SOUTH AFRICAN

COMMERCIAL WHEAT QUALITY FOR THE 2008/2009 SEASON

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Introduction

The final wheat production for the 2008/2009 season of 2 130 000 tons was almost 12 % higher than the previous season's 1 905 000 tons. This is 6.8 % higher than the 10-year average of 1 994 535 tons (1999/2000 to 2008/2009 seasons). A total area of 748 000 hectares was utilized for wheat production (Crop Estimates Committee)

The average hectolitre mass of 77.6 kg/hl was 0.5 kg/hl lower than the previous season as well as the ten year average. The whole wheat protein average of 12.0 % (12 % mb) was equal to the ten year average and better than the 11.0 % of the 2007/2008 season. 27 % of the samples received for this survey were graded as B1, compared to the 13 % of the previous season.

The climatic conditions and rainfall patterns of the various production regions were variable throughout the planting and harvesting seasons.

The quality of the flour was average to good. The dough quality was similar to that of the previous season. Quality differences can be seen between the three major production regions.

The straight-dough optimized 100-gram baking test, showed less variation in volume according to the protein content, than in the previous seasons. The average relationship between protein and bread volume was excellent.

The Southern African Grain Laboratory (SAGL), receives samples from all the production regions, and determines the quality of the annual wheat crop. The results (as averages per region) are made available on the website www.sagl.co.za from December each year. This hard copy report is available from June each year (with the option to download the report from the website).

The SAGL has ISO 17025 accreditation as a testing laboratory and is used as the reference laboratory for grain quality analyses in Southern Africa.

Samples, representing each production region, are fully graded and thousand kernel mass is done. Small samples are milled on the quadromat mill, after which a mixogram analysis is done.

Cultivar identification is done on these samples and sale figures of seed sold by the commercial grain silo owners are obtained.

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

Summaries comparing the quality of the local wheat for the 2006/2007 and 2008/2009 as well as the 2007/2008 and 2008/2009 seasons are provided.

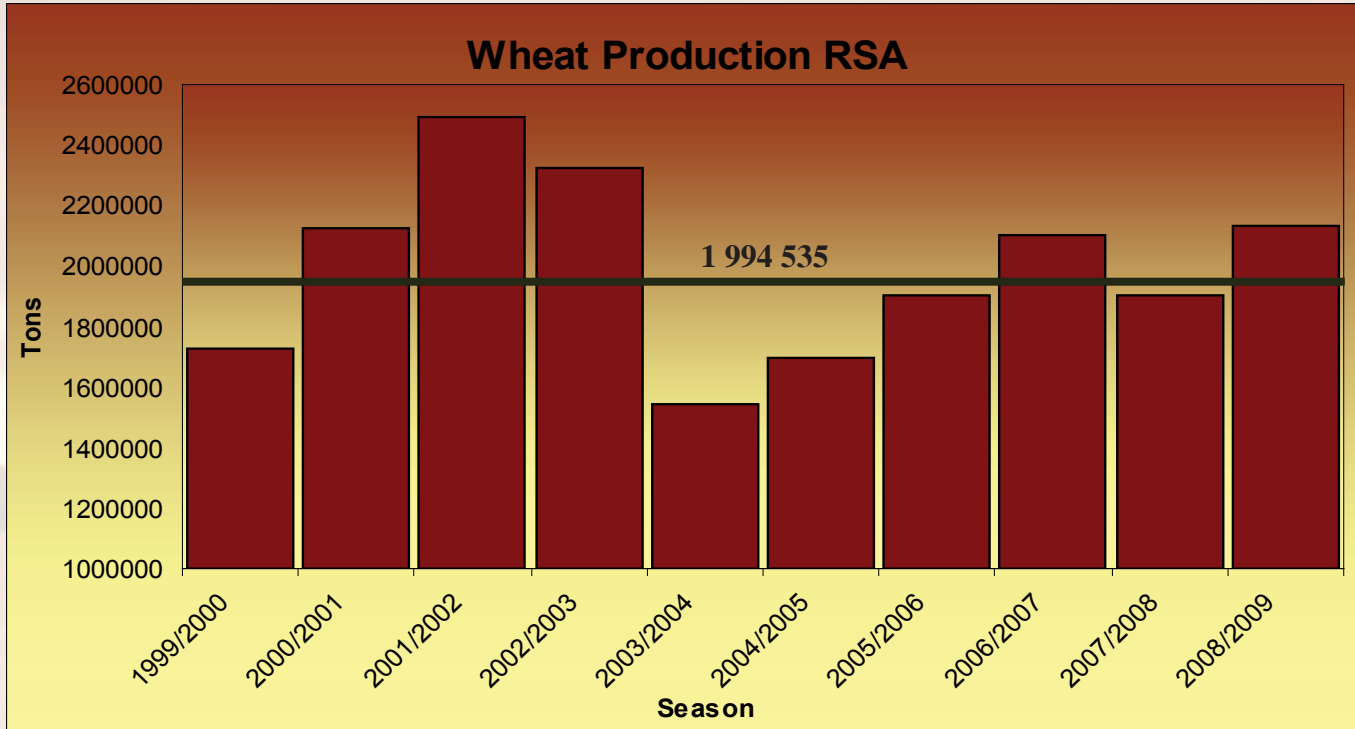
Imported wheat (1 October 2007 - 30 September 2008) (Previous season)

The SAGL is also monitoring the quality of all wheat imported into South Africa. The same analyses which are done on the local crop are also done on the imported wheat. These results may only be made available at the end of each season.

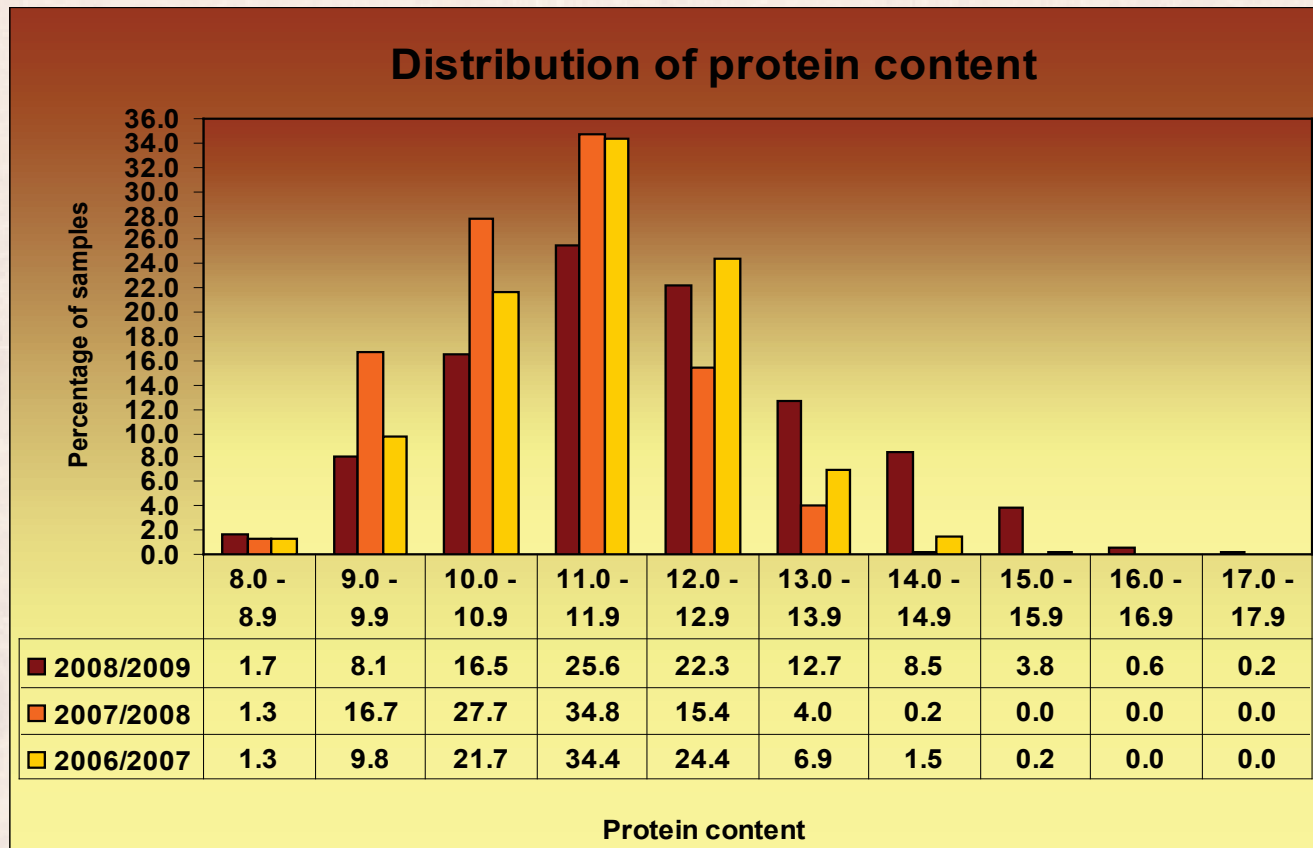
Pages 56 to 63 of this report contain summaries of imported wheat from specific countries during the 2007/2008 season, compared to a summary of the local crop quality for the same season.

The quality of the Argentinian and German flour milled from wheat imported during 2007/2008, were not as good as that same season's local wheat flour, while the flour quality from Canadian and American wheat imported during 2007/2008 compared to that of 2007/2008 seasons's local wheat flour quality.

WHEAT PRODUCTION IN THE RSA OVER THE LAST 10 SEASONS



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



Crop quality of the 2008/2009 season

The weighted protein average of 12.0 % (12 % mb) was the highest of the last three seasons (11.0 % and 11.5 % previously) and equalled the ten year average.

The protein distribution graph of all the wheat produced was slightly skew to the higher proteins (see page 2). The highest percentage of samples (25.6 %) had protein contents ranging from 11.0 - 11.9 %. The second highest percentage of 22.3 % was for protein contents 12.0 - 12.9 % and thirdly 16.5 % for 10.0 - 10.9 % protein content. A quarter of the total number of samples analysed had a protein content of 13.0 % and higher.

The weighted average hectolitre mass was 77.6 kg/hl (0.5 kg/hl lower than the 10 year average). A weighted average thousand kernel mass of 38.3 g was obtained, similar to the previous season.

The weighted average screenings (1.8 mm sieve) was 1.72 %.

The weighted average falling number was 378 seconds. Twenty one samples gave falling number values of less than 250 seconds. These samples were mainly from the Western Cape and the Free State provinces.

The weighted mixogram peak time on flour from the Quadromat mill averaged 2.9 minutes, equal to the ten year average. The weighted mixogram peak time of the flour from the Bühler mill averaged 2.7 minutes.

The weighted average Bühler extraction was 75.7 %, with a weighted average Kent Jones colour of -1.6 KJ.

The farinogram had a weighted average water absorption of 61.1 % (60.8 % the previous year) and a weighted average development time of 4.0 minutes (3.6 minutes last season). The weighted average alveogram strength was 38.0 cm² and the weighted average P/L value 0.90 (41.9 cm² and 0.94 the previous season). The weighted average extensogram strength was 90 cm² (97 cm² previous season).

The loaves baked using the 100 g straight-dough optimized bread making method, which refers to the relationship between the protein content and the bread volume, was evaluated and scored from “Excellent” to “Good”. The baking test with Western Cape (winter rainfall area) wheat flour scored the lowest with an average ranking of “Very good”. The summer rainfall and irrigation areas all scored an “Excellent” average ranking.

Quantity of imported wheat for the 2007/2008 season (previous season)

During the 2007/2008 season, 1 396 499 tons of wheat were imported for RSA. The biggest quantity was imported from Argentina, namely 684 160 tons, followed by USA with 406 562 tons, then Canada with 194 764 tons and Germany with 111 013 tons. (SAGIS web site).

For grading as well as dough and baking quality of the imported wheat, please see pages 56 to 63.

Wheat grades

Representative samples (480) of the crop were graded as follows: 27 % was graded B1, 25 % was graded B2, 21 % was graded B3, 10 % was graded B4 and UT plus COW made up 17 %. This year 14 % more samples graded B1 compared to the previous year.

Grade B1 wheat in the Free State province amounted to 66 % (13 % the previous season) and grade B1 in other summer rainfall and irrigation areas amounted to 18 % (38 % in the previous season). In the irrigation areas 24 % (17 % in the previous season) of the wheat graded as B1 and in the Western Cape Province 18 % graded as B1 (8 % in the previous season).

Cultivars

In the winter rainfall area, SST 027 dominated the market. The Western Cape produced 40 % of all wheat grown in South Africa during the 2008/2009 season. In the Western Cape, SST 027 (40 %) were followed by SST 88 (24 %) and SST 015 (22 %).

The cultivar that dominated the market in the Free State was Elands (30 %) (23% the previous year). Elands was followed by CRN 826 (23 %), SST 835 (18 %) and then PAN 3118 and PAN 3120 with 16 % and 14 % respectively.

The cultivar CRN 826 (45 %) dominated the market in the Vaal and the Orange River areas, followed by SST 835 with 19 % and Duzi with 13 %.

SST 835 (36 %) and CRN 826 (33 %) dominated the North West (mostly irrigation), followed by Duzi (9 %).

In Limpopo, Gauteng and Mpumalanga SST 835 (31 %) was the dominant cultivar followed by Duzi (21 %) and CRN 826 (18 %).

The above information was calculated from the cultivar identification done on all 480 crop samples.

Mycotoxins

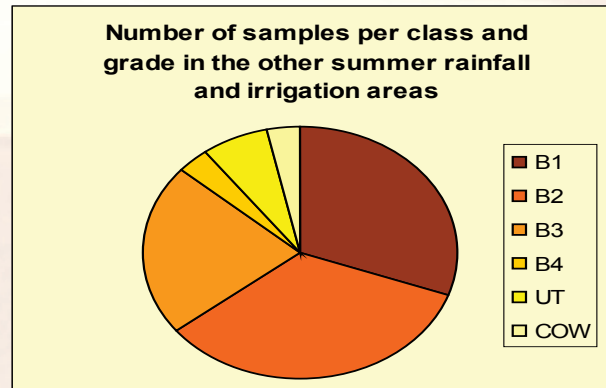
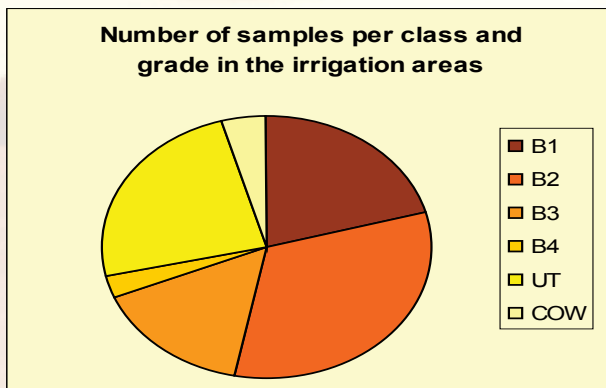
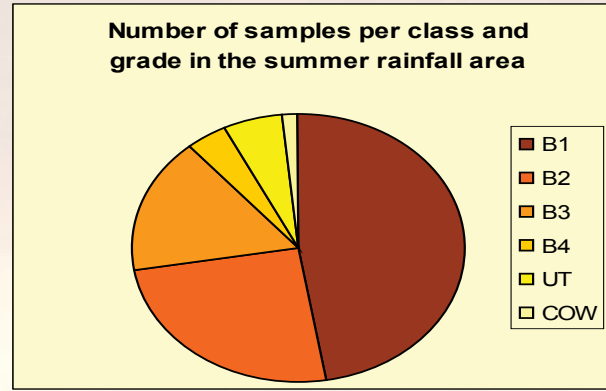
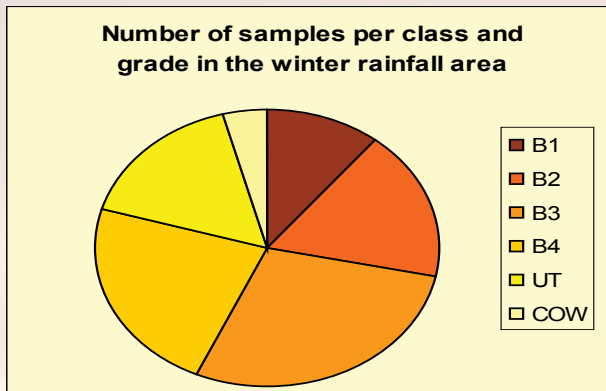
Mycotoxins, as secondary metabolites of moulds or fungi, can cause toxic effects in humans and animals consuming contaminated foods or feeds. Thirty samples (representing different regions) were selected randomly for mycotoxin analyses. These samples were tested for aflatoxin, deoxynivalenol and ochratoxin.

The highest Aflatoxin content found was 3 ppb ($\mu\text{g}/\text{kg}$). In accordance with Act 54 of 1972, Foodstuffs, Cosmetics and Disinfectants, the allowable level of total aflatoxin is 10 ppb ($\mu\text{g}/\text{kg}$). In accordance with Act 36 of 1947, Fertilizers, Farm Feeds, Agricultural and Stock Remedies, the allowable level of total aflatoxin is 10 to 50 ppb ($\mu\text{g}/\text{kg}$).

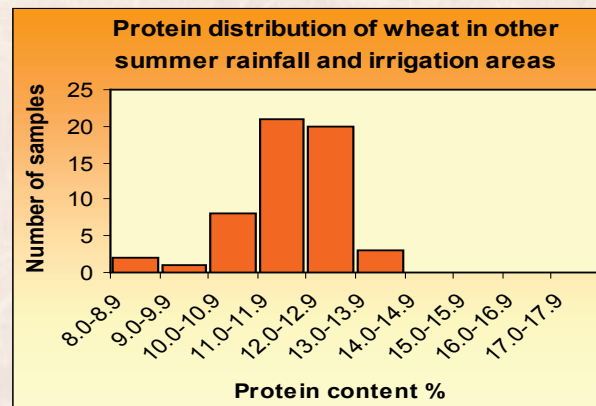
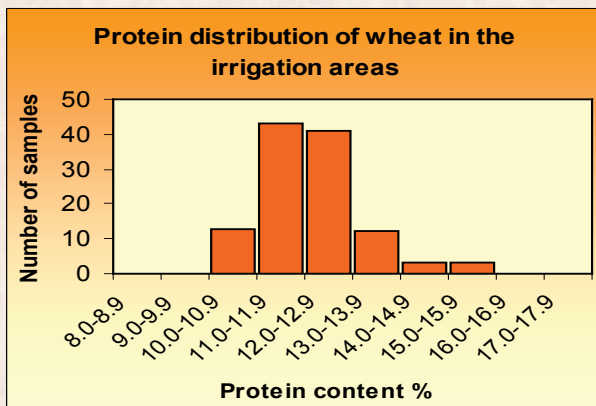
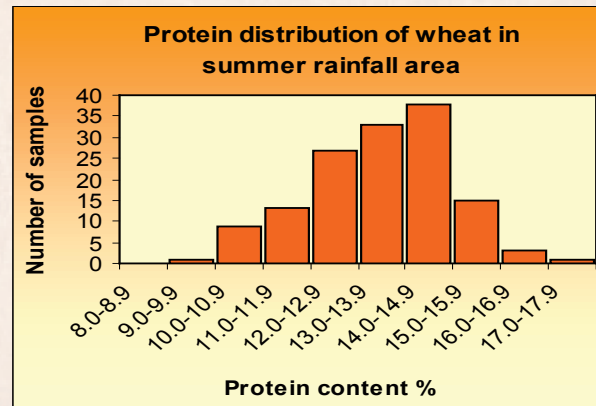
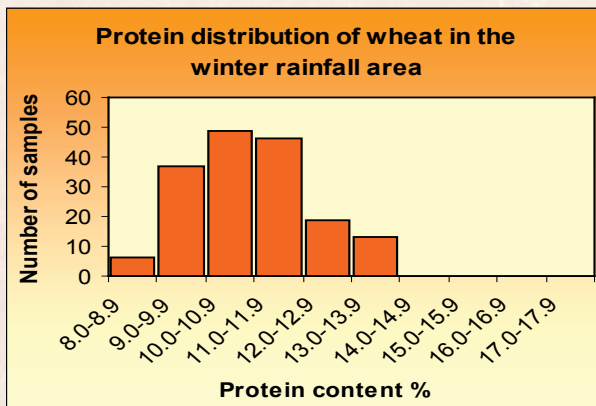
The average deoxynivalenol (DON) content was 0.47 ppm (mg/kg) with the highest value being 3.0 ppm.

Ochratoxin was found in one sample at a level of 1.0 ppb ($\mu\text{g}/\text{kg}$).

Wheat class and grades per production area



Protein distribution graphs per production area

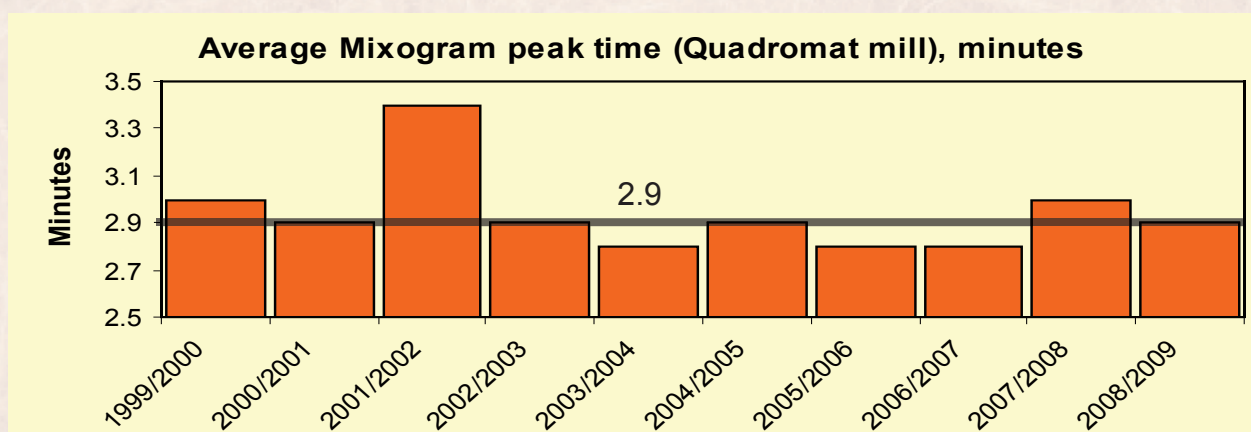
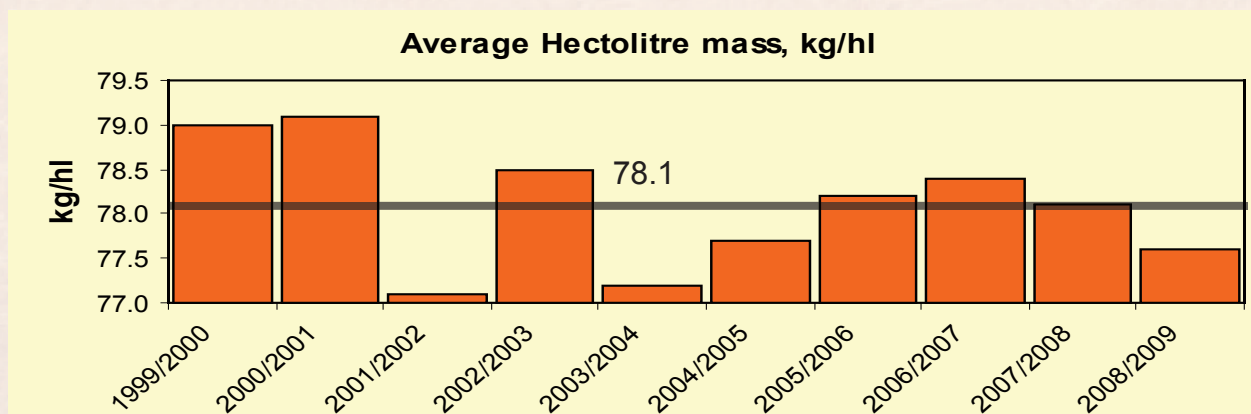
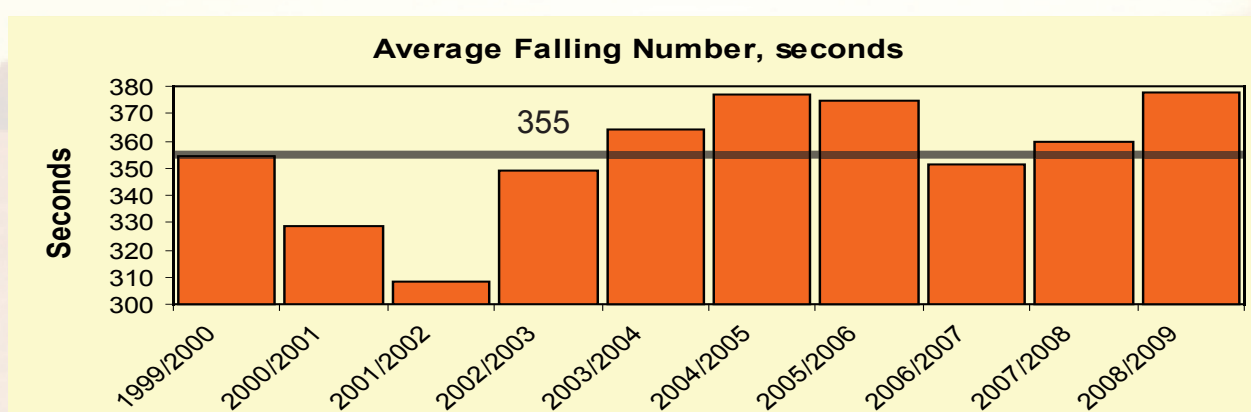
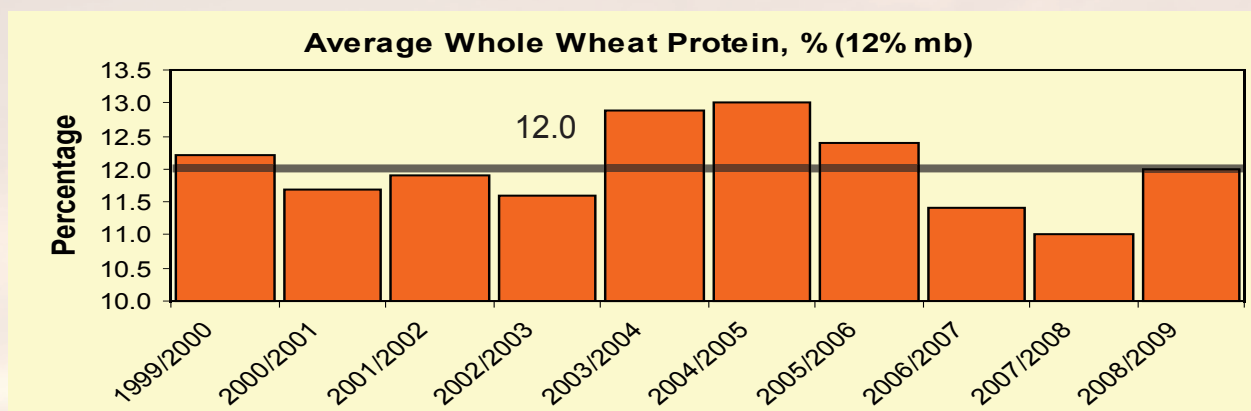


REGIONAL QUALITY WEIGHTED AVERAGES

	<i>Winter rainfall area (Western Cape)</i>			<i>Summer rainfall area (Free State)</i>			<i>Irrigation areas</i>			<i>Other Summer rainfall and Irrigation areas</i>			<i>RSA average</i>		
<i>Individual samples n</i>	166			140			115			59			480		
Regions	1 - 6			21 - 28			10-12, 15-20, 36			8, 30 - 35			All		
Hectolitre mass dirty, kg/hl	77.8			77.4			77.1			78.3			77.6		
1000 kernel mass (13 % mb), g	42.1			34.5			37.0			39.5			38.3		
Falling number, sec	372			346			419			391			378		
Screenings (1,8 mm), %	1.72			1.58			2.04			1.45			1.72		
Protein (12 % mb), % (ww)	10.87			13.40			12.07			11.71			12.00		
Mixogram peak time, min (Quadromat)	2.7			3.3			2.8			3.0			2.9		
<i>Individual samples per class and grade, n</i>	<i>18</i>	<i>29</i>	<i>47</i>	<i>66</i>	<i>35</i>	<i>23</i>	<i>24</i>	<i>37</i>	<i>18</i>	<i>18</i>	<i>20</i>	<i>13</i>	<i>126</i>	<i>121</i>	<i>101</i>
	<i>38</i>	<i>27</i>	<i>7</i>	<i>6</i>	<i>8</i>	<i>2</i>	<i>3</i>	<i>28</i>	<i>5</i>	<i>2</i>	<i>4</i>	<i>2</i>	<i>49</i>	<i>67</i>	<i>16</i>
<i>Composite samples per class and grade, n = 100</i>	<i>B1</i>	<i>B2</i>	<i>B3</i>	<i>B1</i>	<i>B2</i>	<i>B3</i>	<i>B1</i>	<i>B2</i>	<i>B3</i>	<i>B1</i>	<i>B2</i>	<i>B3</i>	<i>B1</i>	<i>B2</i>	<i>B3</i>
	<i>B4</i>	<i>UT</i>	<i>COW</i>	<i>B4</i>	<i>UT</i>	<i>COW</i>	<i>B4</i>	<i>UT</i>	<i>COW</i>	<i>B4</i>	<i>UT</i>	<i>COW</i>	<i>B4</i>	<i>UT</i>	<i>COW</i>
<i>Composite samples, n</i>	<i>3</i>	<i>6</i>	<i>6</i>	<i>8</i>	<i>6</i>	<i>7</i>	<i>6</i>	<i>7</i>	<i>5</i>	<i>5</i>	<i>4</i>	<i>4</i>	<i>22</i>	<i>23</i>	<i>22</i>
	<i>5</i>	<i>5</i>	<i>2</i>	<i>4</i>	<i>3</i>	<i>1</i>	<i>1</i>	<i>6</i>	<i>1</i>	<i>2</i>	<i>2</i>	<i>1</i>	<i>12</i>	<i>16</i>	<i>5</i>
Bühler extraction, %	75.5	75.4	75.5	75.3	75.4	75.0	76.7	76.8	76.8	76.5	76.9	76.2	76.0	76.1	75.8
	75.3	74.9	74.9	75.0	73.8	73.2	75.9	76.0	76.5	74.9	75.8	76.0	75.2	75.2	75.1
Flour colour, KJ	-1.7	-2.0	-1.9	-0.9	-1.0	-1.5	-1.6	-2.1	-1.7	-1.6	-1.8	-1.7	-1.4	-1.7	-1.7
	-2.2	-1.7	-1.3	-0.9	-1.2	-0.9	-1.5	-1.5	-2.0	-1.5	-1.6	1.1	-1.6	-1.5	-0.9
Farinogram:	63.7	62.2	61.0	63.0	61.9	61.2	60.7	59.6	59.1	62.1	60.8	60.0	62.3	61.1	60.5
Water absorption, %	60.2	61.6	62.5	61.3	61.3	58.9	60.3	60.3	60.3	62.1	58.9	58.9	60.9	60.7	60.6
Farinogram:	4.3	3.5	2.4	5.5	4.6	4.8	4.8	4.4	3.6	4.9	3.8	3.4	5.0	4.1	3.6
Development time, min	2.4	2.9	3.3	4.3	4.8	3.5	3.4	4.7	6.0	2.6	1.8	2.5	3.2	3.8	3.7
Alveogram:	36.8	34.2	30.8	49.1	46.4	40.7	37.0	34.9	34.9	41.3	36.6	34.6	42.4	38.0	35.6
Strength (S), cm²	29.8	32.0	32.5	43.6	46.2	39.1	32.6	39.5	45.7	37.0	30.3	33.3	35.8	37.3	36.6
Alveogram:	1.00	1.20	1.42	0.92	0.92	0.87	0.57	0.58	0.63	0.75	0.73	0.68	0.80	0.86	0.93
P/L	1.34	1.32	1.61	0.82	0.92	0.50	0.57	0.51	0.48	1.30	1.28	0.36	1.10	0.94	0.91
Extensogram:	77	67	67	110	114	95	103	89	84	98	88	83	101	90	83
Strength, cm²	66	67	59	112	107	106	69	109	118	88	65	104	85	90	89
Mixogram peak time, min	2.2	2.4	2.6	2.8	2.8	2.7	2.5	2.6	2.7	2.5	2.6	2.7	2.6	2.6	2.7
	2.7	2.5	2.4	2.9	2.9	3.2	2.3	2.6	2.8	2.7	3.0	3.2	2.7	2.7	2.8
Relationship between protein and bread volume	G	EX	VG	VG	EX	VG	EX	EX	EX	EX	EX	EX	VG	EX	VG
	VG	VG	VG	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX

Ex = Excellent VG = Very Good G = Good

WEIGHTED AVERAGE QUALITY OVER 10 SEASONS



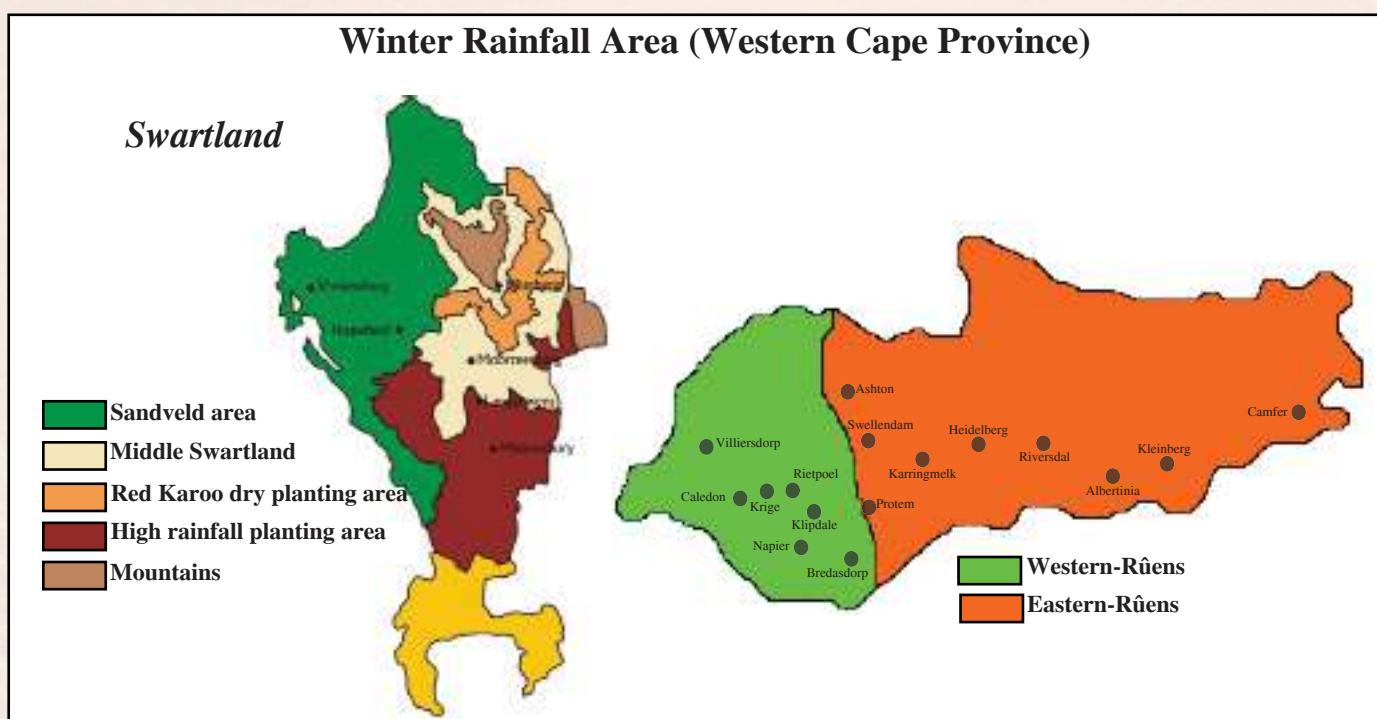
REGIONAL QUALITY

WINTER RAINFALL AREA (Western Cape)

Production regions 1 to 6 fall within the winter rainfall area (Western Cape Province). Region 1 is Namaqualand, regions 2 - 4 are the Swartland area and regions 5 and 6 the Rûens area. The Western Cape had the highest production of all the provinces this season, namely 840 000 tons (40 %) (CEC).

The hectolitre mass averaged 77.8 kg/hl (the previous season 77.7 kg/hl). The thousand kernel mass averaged 42.1 gram, which is higher than the previous season's 38.9 gram. The average falling number was 372 seconds. The average protein content of 10.87 % (12 % mb) was approximately 1.0 - 2.5 % lower than the protein contents of the other production areas.

Planting and harvesting conditions in the Swartland was favourable. The Rûens experienced a dry planting season with heavy rainfall during the harvesting period. As a result of this late rainfall, falling numbers below 250 seconds were observed.



The screenings of 1.72 % was higher than the previous season's 1.58 %. The Bühler extraction averaged 75.3 % (average of wheat grades B1 to B4, UT and COW) and the average colour of the flour was -1.9 KJ units. This colour indicates a very white flour that is preferred by millers and bakers.

The mixogram peak time (Quadromat mill) averaged 2.7 minutes. The average farinogram absorption was 61.6 %. The average strength of the alveogram was 32.4 cm² and the average strength of the extensogram was 67 cm². The alveogram strength in the Free State was 45.1 cm² and in the irrigation areas 36.8 cm².

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

SUMMER RAINFALL AREA (Free State)

Production regions 21 to 28, which fall within the Free State Province, had the second highest production, namely 560 000 tons (27 %) (CEC).

The average yield in the Free State of 2.0 tons/ha was lower than the 2.4 tons/ha of the previous season.

Planting conditions were excellent due to good rainfall, but dry conditions were experienced during spring and early summer. The first significant rainfall happened toward the beginning of the harvesting season.

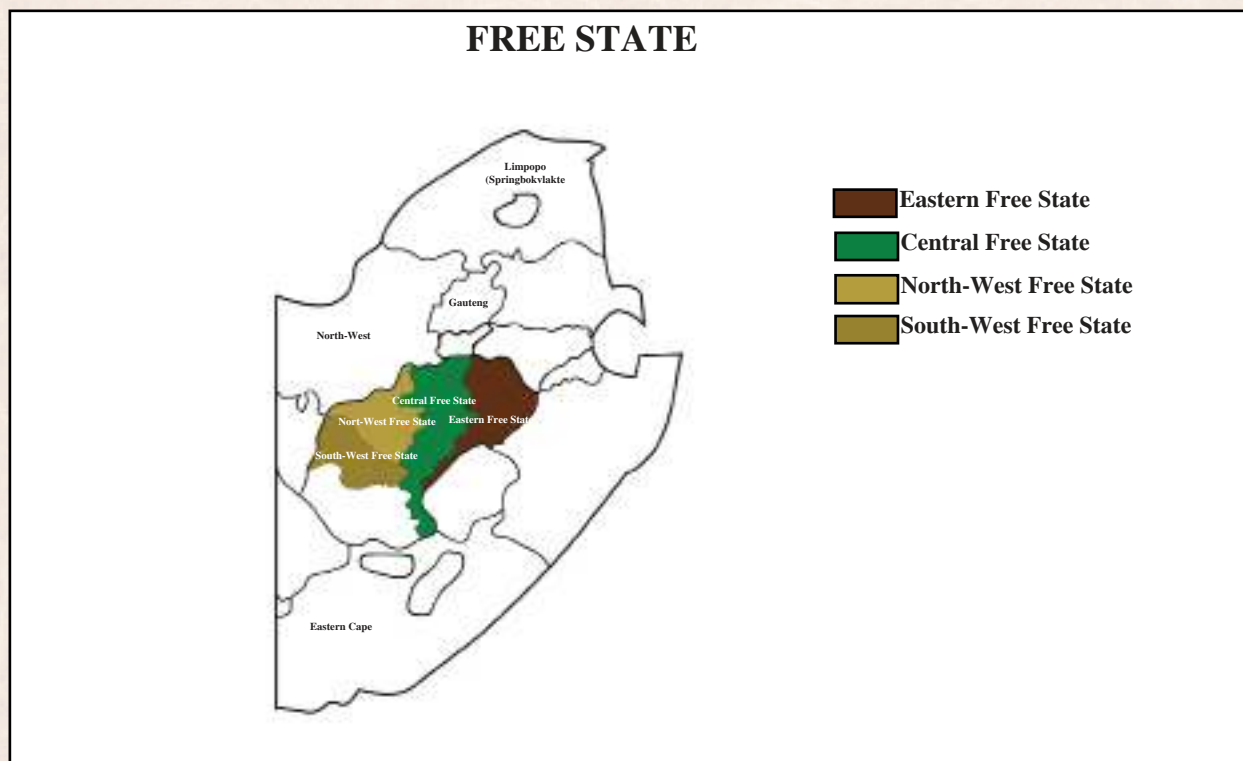
The average hectolitre mass of 77.4 kg/hl was lower than the previous season's 78.7 kg/hl. The physical characteristic thousand kernel mass (34.5 g) was also lower than the previous season's 38.4 g. The average screenings was 1.58 %. The average protein increased from 11.71 % the previous season to 13.40 % (12 % mb) this season. Although the average falling number was 346 seconds, eight samples gave a falling number lower than 250 seconds.

The mixogram (Quadromat) peak time of 3.3 minutes was the same as the previous season, giving the Free State the longest average mixogram peak time of the different regional qualities.

The average Bühler extraction percentage in the Free State was 75.0 % (75.0 % previous season). The Kent Jones flour colour was -1.1 KJ units (-1.6 KJ units in previous season).

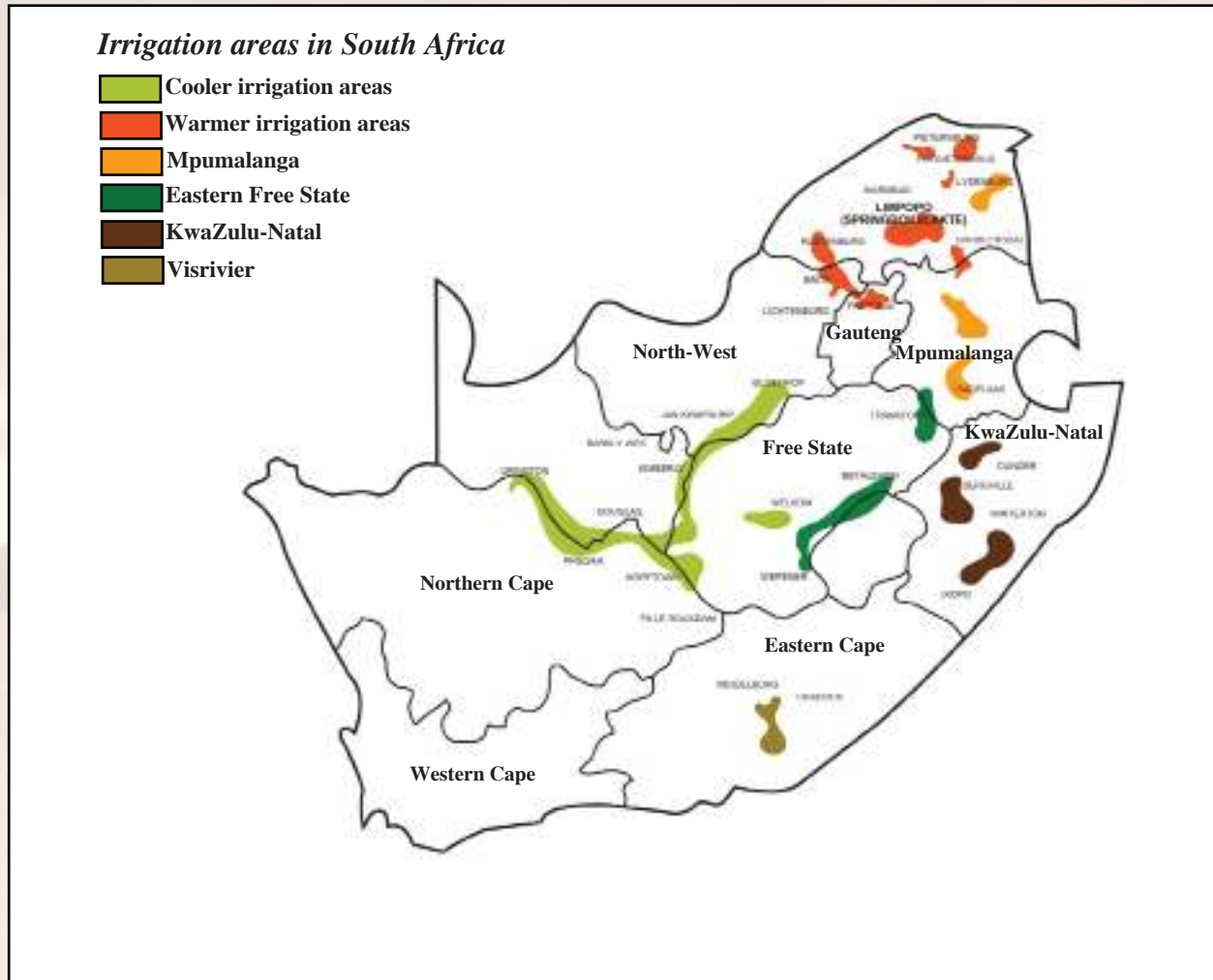
The average farinogram water absorption was 61.8 %, the same as the previous season and more or less the same as the other regions. The wheat from the Free State also usually tends to give a stronger dough than the other regions, with an alveogram strength of 45.1 cm² and an extensogram strength of 107 cm².

The 100-gram baking test showed that the relationship between protein content and bread volume ranged from very good to excellent between the different grades.



IRRIGATION AREAS

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



Production regions 10 - 12, 14 - 20 and 36 falls within the irrigation areas. These areas produced 501 375 tons of wheat this season (24 % of total production) with an average yield of 5.7 tons/hectare.

The climatic conditions and rainfall varied significantly over the different irrigation areas, affecting the hectolitre mass, falling number and yield values reported.

The average hectolitre mass was 77.1 kg/hl (77.8 kg/hl the previous season) and the thousand kernel mass was 37.0 g (38.8 g the previous season). The average falling number was 419 seconds. The average screenings was 2.04 % and the protein averaged 12.07 % (12 % mb).

The average mixogram (Quadromat) peak time was 2.8 minutes which was more or less the same as the previous season.

The average Bühler extraction percentage was 76.5 (76.8 % during the previous season), with an average flour colour of -1.7 KJ units.

The average farinogram water absorption was 60.0 % (61.3 % during previous season), with an average farinogram development time of 4.4 minutes.

The average alveogram strength was 36.8 cm² and the average P/L was 0.57 (42.2 cm² and 0.66 respectively the previous season).

The average extensogram strength was 96 cm². The relationship between protein content and bread volume (with the 100-gram baking test) was shown to be excellent.

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

Other summer rainfall regions, excluding the Free State, are mainly regions 8 (Eastern Cape), 30, 32, 33 (Mpumalanga), 34 (Gauteng) and 35 (Limpopo). They produced in total 188 400 tons during this season (9 % of the total production).

The average hectolitre mass was 78.3 kg/hl (77.8 kg/hl the previous season) and the average thousand kernel mass was 39.5 g (38.9 g the previous season).

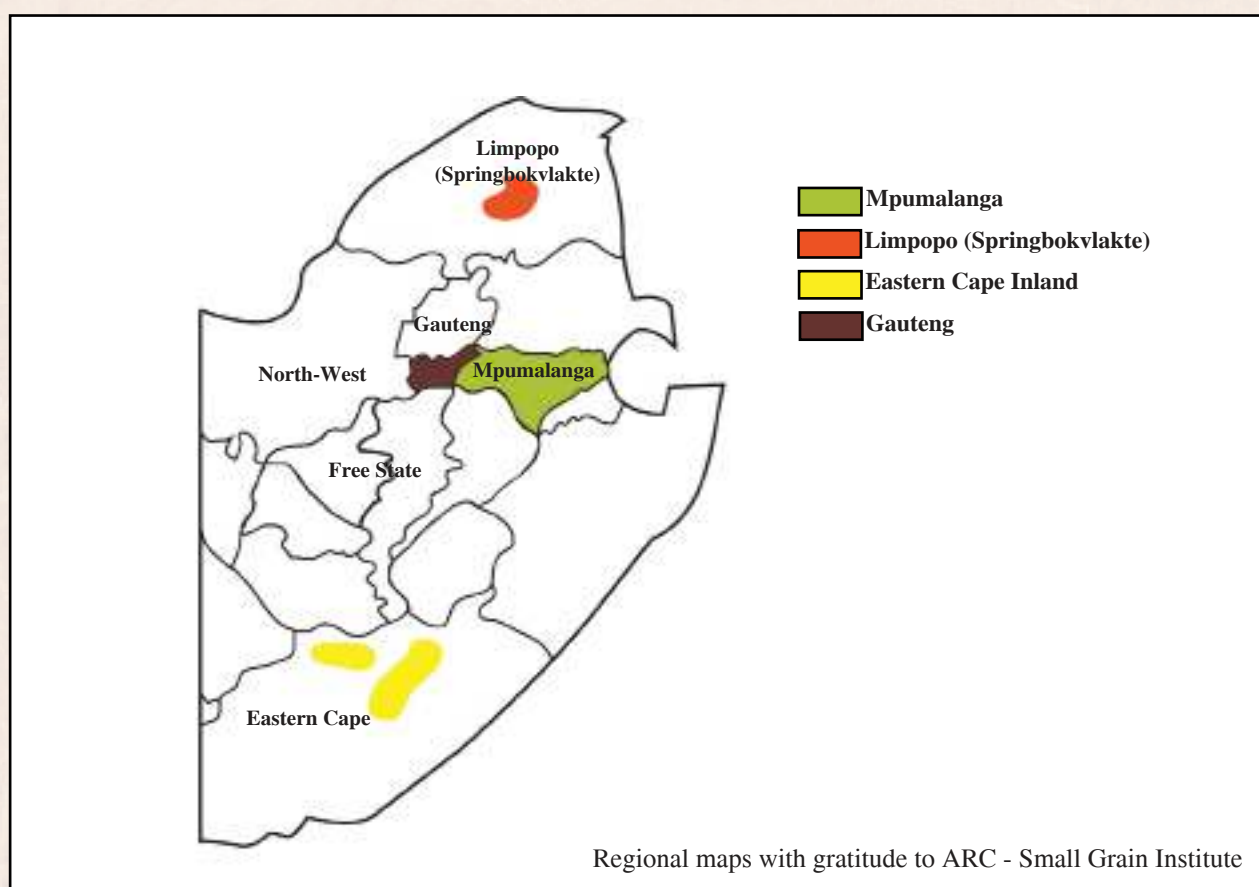
The average falling number was 391 seconds, with the average percentage screenings 1.45 %. The average protein content was 11.71 % (12 % mb), which is similar to the previous year.

The average mixogram (Quadromat) peak time was 3.0 minutes (2.6 minutes the previous season).

The average Bühler extraction was 76.2 %, with an average colour of -1.5 KJ units (76.9 % and -1.6 KJ units the previous season). The farinogram average water absorption was 60.8 % (60.6 % the previous season) and had an average development time of 3.6 minutes.

The average alveogram strength was 36.6 cm², with an average P/L value of 0.83, and the average extensogram strength was 88 cm².

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



South African Winter Cereal Production

Wheat is by far the biggest winter cereal crop planted in South Africa. Other winter crops are barley and canola. Summer field crops are better suited for the South African climatic conditions. Maize being the largest of the different crops, followed by wheat, then sunflower seed, soya-beans, sorghum, barley, groundnuts, dry beans and canola. The annual South African wheat crop is about 20-25 percent of the annual maize crop.

South Africa (made up of nine provinces) is divided into 36 crop production regions with wheat planted in about 32 of these regions. These production regions are described on pages 16 to 44 (on the top of the left page) giving the specific intake silo names for each region.

The three main wheat producing provinces are Western Cape (winter rainfall), Free State (summer rainfall) and the Northern Cape (irrigation). A fourth province worth mentioning is the North-West (mainly irrigation). See table on page 13 and map on page 52.

The Western Cape province produced 840 000 tons and the Free State province followed with 560 000 tons. (Seventh estimate by the Crop Estimates Committee, CEC). These two provinces were responsible for 67 % of the total wheat produced.

The yield in the main production areas ranged from 6.5 tons per hectare in the Northern Cape (irrigation area), 2.0 tons per hectare in the Free State and 2.4 tons per hectare for the Western Cape. Gauteng gave a yield of 6.2 tons per hectare, followed by North West with 5.6 tons per hectare and Limpopo and Mpumalanga both with 5.5 tons per hectare. KwaZulu-Natal and the Eastern Cape gave 4.9 and 4.0 tons per hectare respectively. See graph on page 13.

The local production is not sufficient for domestic requirements and South Africa has to import wheat to meet its domestic consumption of approximately 2.9 million tons every year.

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

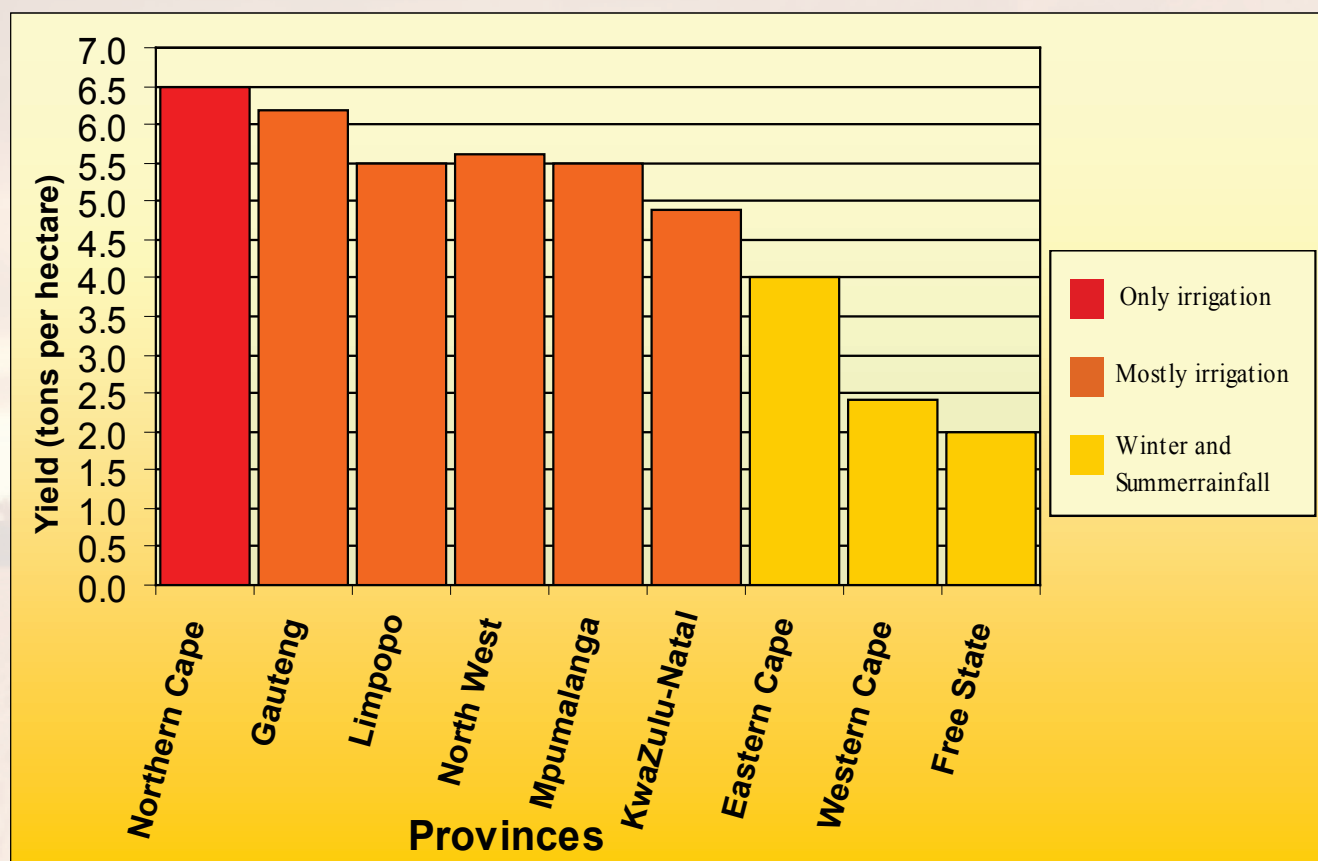
Sampling procedure for the annual quality survey

During the harvest season, a sample of each delivery of wheat is taken according to the prescribed Wheat regulation. A representative sample needs to be drawn for grading purposes before the wheat is taken in at the silo. Of each of these grading samples, about 200 grams is thrown into a 100 kg bin according to grade and class at each silo. The 100 kg bin is divided and a 5 kg sample is sent to the SAGL for the annual quality survey.

After receiving these representative wheat crop samples from all over the country, the SAGL select 480 samples representing the production of wheat for the specific regions/provinces.

South Africa is the only wheat producing country known-of that produces this kind of comprehensive quality information on their national wheat crop as well as making it available to the public.

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



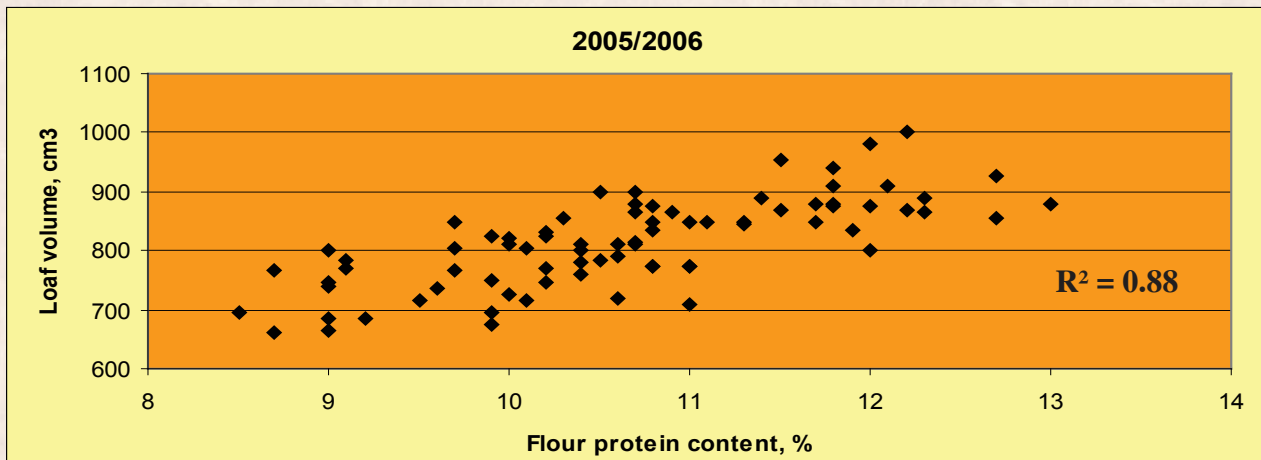
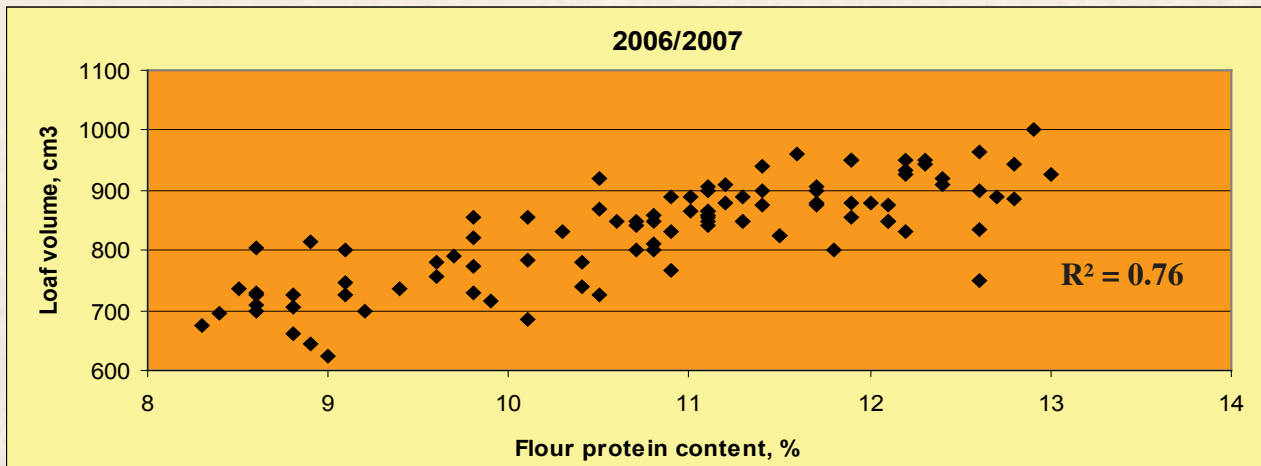
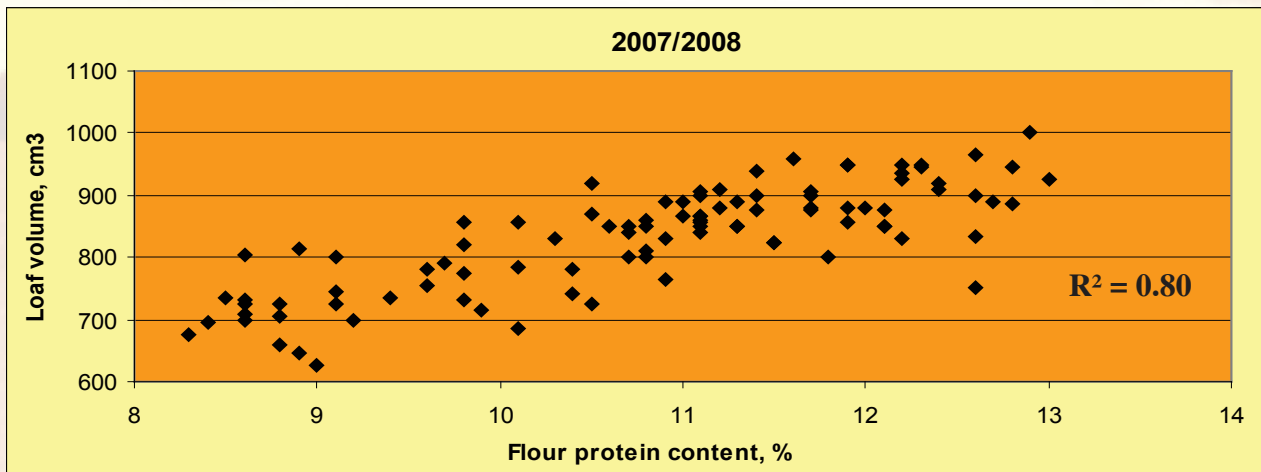
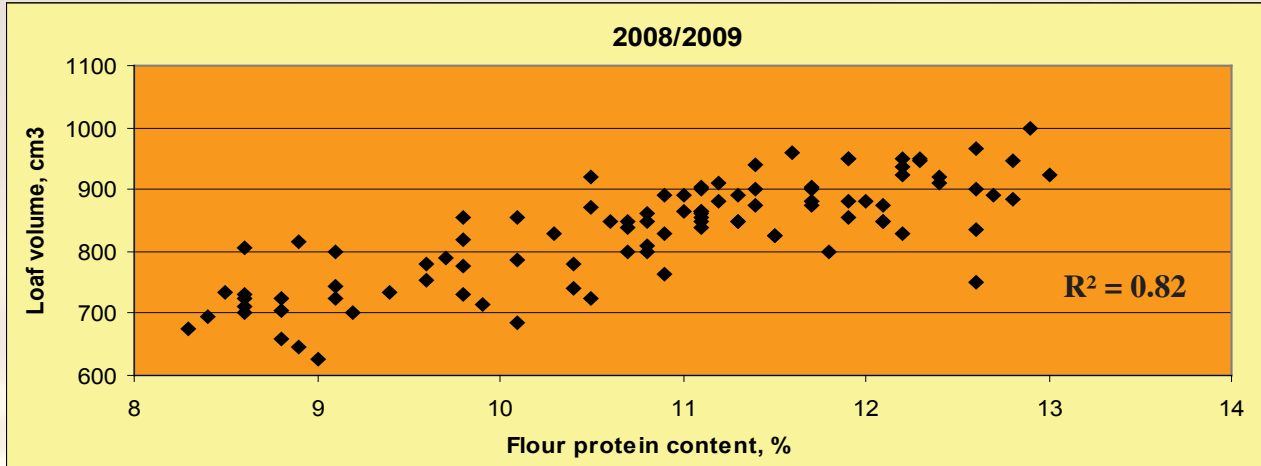
(Based on figures obtained from CEC)

**Dry land versus Irrigation area
planted for the 2008 production season**

Province	HECTARES			PERCENTAGE	
	Dry land	Irrigation	Total	Dry land	Irrigation
Western Cape	347 200	2 800	350 000	99.2	0.8
Free State	240 000	40 000	280 000	85.7	14.3
Eastern Cape	3 575	1 925	5 500	65.0	35.0
Limpopo	3 000	17 000	20 000	15.0	85.0
Northern Cape	2 500	47 500	50 000	5.0	95.0
North West	2 475	22 525	25 000	9.9	90.1
Mpumalanga	500	7 500	8 000	6.2	93.8
KwaZulu-Natal	450	7 050	7 500	6.0	94.0
Gauteng	300	1 700	2 000	15.0	85.0
Total	600 000	148 000	748 000	80.2	19.8

(Figures obtained from CEC)

Straight - dough optimized 100g Baking test Comparison of protein vs loaf volume over the last four seasons



Comparison of Flour Quality over the last four seasons

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

Flour Quality 2007/2008 season			
Flour protein (12 % mb)	10.4	Farinogram water abs. (%)	60.8
Bread volume 100g (cm ³)	827	Farinogram dev. time (min.)	3.6
Mixogram (Bühler) peak time (min)	2.8	Alveogram strength (cm ²)	41.9
Extensogram strength (cm ²)	97	Alveogram P/L	0.94

Flour Quality 2006/2007 season			
Flour protein (12 % mb)	10.6	Farinogram water abs. (%)	61.4
Bread volume 100g (cm ³)	816	Farinogram dev. time (min.)	3.4
Mixogram (Bühler) peak time (min)	2.6	Alveogram strength (cm ²)	36.8
Extensogram strength (cm ²)	82	Alveogram P/L	0.93

Flour Quality 2005/2006 season			
Flour protein (12 % mb)	11.5	Farinogram water abs. (%)	62.3
Bread volume 100g (cm ³)	906	Farinogram dev. time (min.)	5.0
Mixogram (Bühler) peak time (min)	2.5	Alveogram strength (cm ²)	40.7
Extensogram strength (cm ²)	108	Alveogram P/L	0.81

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

PRODUCTION REGION	(1) Namaqualand					(2) Swartland Western Region						
	Intake silos					Bitterfontein Graafwater Landplaas Vanrhynsdorp Vredendal						
WHEAT												
	ave	min	max	stdev		ave	min	max	stdev			
Protein (12% mb), %	11.2	9.4	13.0	1.52		10.3	8.0	11.5	0.84			
Falling number, sec	435	387	478	37.56		390	332	450	27.60			
1000 Kernel mass (13% mb), g	42.4	40.9	44.6	1.56		41.1	36.0	44.4	2.16			
Hectolitre mass (dirty), kg/hl	79.7	79.0	80.8	0.81		76.7	71.5	80.5	1.91			
Screenings (<1.8mm), %	1.63	1.24	2.21	0.42		1.78	0.41	5.13	0.93			
Total damaged kernels, %	1.88	1.52	2.54	0.46		0.58	0.16	1.40	0.32			
Number of samples	4					24						
CULTIVARS												
		SST 027	38.3			SST 027	44.8					
cultivars		SST 88	25.5			SST 015	22.4					
with highest % occurrence		SST 015	20.8			SST 88	20.7					
		SST 035	8.3			SST 035	4.4					
		PAN 3408	4.3			SST 825	3.8					
Number of samples	4					24						
MIXOGRAM (Quadromat)												
	ave	min	max	stdev		ave	min	max	stdev			
Peak time, min	2.7	2.2	3.2	0.41		3.0	2.8	3.6	0.25			
Tail height (6min), mm	45	42	48	2.50		46	41	53	2.57			
Number of samples	4					24						
BÜHLER EXTRACTION, %												
	B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW
	-	74.9	75.3	75.6	74.5	-	-	75.9	75.8	76.1	75.6	-
FLOUR												
Protein (12% mb), %	-	10.4	8.2	9.7	11.9	-	-	10.6	10.0	9.0	8.9	-
Colour, KJ	-	-2.1	-2.4	-2.3	-2.0	-	-	-2.1	-1.9	-2.1	-2.1	-
FARINOGRAM												
Water absorption (14% mb), %	-	62.5	61.4	59.9	65.9	-	-	61.2	60.2	59.4	59.1	-
Development time, min	-	3.0	1.5	2.4	5.0	-	-	3.3	2.7	2.3	2.2	-
Stability, min	-	6.9	4.9	6.8	9.8	-	-	7.9	7.0	5.4	5.4	-
Mixing tolerance index, BU	-	36	54	39	33	-	-	32	38	51	56	-
EXTENSOGRAM (45 min pull)												
Area, cm2	-	75	61	79	86	-	-	74	65	63	64	-
Maximum height, BU	-	330	295	370	310	-	-	320	305	315	320	-
Extensibility, mm	-	154	139	148	195	-	-	155	146	133	132	-
ALVEOGRAM												
Strength (S), cm2	-	36.5	27.7	35.3	43.3	-	-	38.2	34.6	28.7	28.9	-
Stability (P), mm	-	101	106	95	112	-	-	92	91	86	84	-
Distensibility (L), mm	-	74	47	75	79	-	-	88	81	66	69	-
Configuration ratio (P/L)	-	1.37	2.27	1.27	1.41	-	-	1.05	1.12	1.31	1.22	-
MIXOGRAM												
Peak time, min	-	2.3	2.7	2.7	2.2	-	-	2.6	2.9	2.8	2.3	-
100g BAKING TEST												
Loaf volume, cm3	-	800	660	750	880	-	-	850	800	770	725	-
Evaluation	-	1	1	1	1	-	-	0	0	0	0	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

1

2

FARINOGRAM

1

2

EXTENSOGRAM

1

2

ALVEOGRAM

1

2

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

PRODUCTION REGION	(3)						(4)					
	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	0.92			10.3	8.3	11.6	0.95		
Falling number, sec	395	329	587	47.89			377	339	423	27.55		
1000 Kernel mass (13% mb), g	42.8	38.5	50.3	2.29			39.7	35.7	43.9	2.97		
Hectolitre mass (dirty), kg/hl	77.7	72.7	81.6	1.59			79.4	76.5	82.0	1.52		
Screenings (<1.8mm), %	1.81	0.07	4.82	1.13			1.18	0.24	2.48	0.79		
Total damaged kernels, %	1.00	0.32	3.96	0.76			0.62	0.18	1.52	0.37		
Number of samples	71						14					
CULTIVARS												
		SST 027	48.2				SST 027	41.6				
cultivars		SST 015	31.1				SST 88	21.2				
with highest %		SST 88	13.7				SST 57	19.5				
occurrence		SST 57	5.1				SST 015	14.8				
		SST 035	0.9				PAN 3408	2.4				
Number of samples	71						14					
MIXOGRAM (Quadromat)												
	ave	min	max	stdev			ave	min	max	stdev		
Peak time, min	2.7	2.0	4.8	0.39			2.7	2.0	3.3	0.33		
Tail height (6min), mm	46	8	51	5.03			45	42	47	1.56		
Number of samples	71						14					
BÜHLER EXTRACTION, %												
	B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW
	75.5	75.7	75.6	75.3	75.1	74.2	-	74.7	75.1	75.1	-	-
FLOUR												
Protein (12% mb), %	11.3	10.5	9.8	8.6	9.2	8.8	-	10.6	9.6	8.7	-	-
Colour, KJ	-2.1	-2.1	-2.1	-2.5	-2.2	-1.9	-	-2.1	-2.4	-2.5	-	-
FARINOGRAM												
Water absorption (14% mb), %	63.2	64.6	62.3	60.1	61.0	62.4	-	61.0	60.0	60.8	-	-
Development time, min	4.2	4.3	2.4	1.8	1.9	1.9	-	3.7	2.0	1.7	-	-
Stability, min	8.1	7.3	6.5	5.6	5.4	4.7	-	7.6	6.2	5.2	-	-
Mixing tolerance index, BU	35	42	38	46	49	53	-	37	38	52	-	-
EXTENSOGRAM (45 min pull)												
Area, cm2	78	67	72	73	75	51	-	77	67	59	-	-
Maximum height, BU	315	290	325	360	355	285	-	315	310	315	-	-
Extensibility, mm	170	157	150	138	141	125	-	165	149	133	-	-
ALVEOGRAM												
Strength (S), cm2	40.7	36.1	32.0	28.9	32.1	29.1	-	35.5	33.0	29.2	-	-
Stability (P), mm	96	108	99	94	98	109	-	82	82	95	-	-
Distensibility (L), mm	94	64	63	59	63	48	-	91	84	57	-	-
Configuration ratio (P/L)	1.02	1.68	1.57	1.60	1.54	2.27	-	0.90	0.98	1.65	-	-
MIXOGRAM												
Peak time, min	2.1	2.5	2.5	2.9	2.8	2.3	-	2.6	2.7	2.7	-	-
100g BAKING TEST												
Loaf volume, cm3	815	800	720	760	750	700	-	835	790	685	-	-
Evaluation	2	1	2	0	0	1	-	0	0	2	-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

3

4

FARINOGRAM

3

4

EXTENSOGRAM

3

4

ALVEOGRAM

3

4

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

PRODUCTION REGION	(5) Rüens Western Region				(6) Rüens Eastern Region							
	Intake silos											
	Bredasdorp				Albertinia							
	Caledon				Ashton							
	Klipdale				Camfer							
	Krige				Heidelberg							
	Napier				Karringmelksrivier							
	Protem				Kleinberg							
	Rietpoel				Protem							
	Villiersdorp				Riversdal							
					Swellendam							
WHEAT												
	ave	min	max	stdev	ave	min	max	stdev				
Protein (12% mb), %	11.7	9.8	13.3	0.99	11.8	9.7	13.7	1.06				
Falling number, sec	304	189	408	86.85	339	132	449	58.49				
1000 Kernel mass (13% mb), g	42.6	39.0	45.6	1.60	41.9	37.6	48.6	2.52				
Hectolitre mass (dirty), kg/hl	77.6	74.7	79.2	1.16	78.0	74.6	81.0	1.73				
Screenings (<1.8mm), %	1.58	0.36	4.42	1.07	1.81	0.36	3.34	0.84				
Total damaged kernels, %	1.00	0.18	1.66	0.48	1.32	0.00	8.16	1.95				
Number of samples	19				34							
CULTIVARS												
	SST 88		30.3		SST 027		34.2					
cultivars	SST 027		30.3		SST 88		31.6					
with highest %	SST 015		18.5		SST 015		25.8					
occurrence	SST 57		12.0		SST 035		4.1					
	SST 035		5.3		SST 57		3.2					
Number of samples	19				34							
MIXOGRAM (Quadromat)												
	ave	min	max	stdev	ave	min	max	stdev				
Peak time, min	2.4	2.2	2.9	0.20	2.5	1.9	3.3	0.33				
Tail height (6min), mm	46	41	51	3.09	50	45	55	2.69				
Number of samples	19				34							
BÜHLER EXTRACTION, %												
	B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW
	75.3	75.7	76.1	74.6	74.2	-	75.8	75.3	74.8	-	75.0	75.6
FLOUR												
Protein (12% mb), %	11.4	10.3	9.5	10.0	9.5	-	12.2	10.7	10.3	-	10.4	11.4
Colour, KJ	-1.7	-1.6	-1.4	-1.4	-1.4	-	-1.2	-1.7	-1.4	-	-1.0	-0.6
FARINOGRAM												
Water absorption (14% mb), %	63.1	60.8	59.9	60.6	61.5	-	64.7	62.8	62.2	-	60.4	62.5
Development time, min	4.3	3.8	2.5	3.7	2.2	-	4.5	3.0	3.3	-	3.3	4.7
Stability, min	6.1	5.6	5.6	4.8	4.3	-	6.4	6.4	6.8	-	6.4	7.4
Mixing tolerance index, BU	58	51	51	74	59	-	56	40	44	-	43	45
EXTENSOGRAM (45 min pull)												
Area, cm2	78	58	64	54	45	-	76	48	71	-	63	66
Maximum height, BU	285	250	275	225	205	-	265	195	305	-	270	255
Extensibility, mm	184	155	153	160	149	-	198	157	159	-	153	170
ALVEOGRAM												
Strength (S), cm2	33.5	28.7	25.5	27.1	24.6	-	36.1	30.4	32.0	-	31.3	35.8
Stability (P), mm	87	80	79	76	82	-	92	91	97	-	87	89
Distensibility (L), mm	90	81	70	85	63	-	90	73	68	-	77	94
Configuration ratio (P/L)	0.97	0.98	1.14	0.89	1.31	-	1.02	1.24	1.42	-	1.13	0.95
MIXOGRAM												
Peak time, min	2.2	2.2	2.2	2.2	2.2	-	2.2	2.1	2.3	-	2.8	2.4
100g BAKING TEST												
Loaf volume, cm3	825	820	700	745	710	-	915	845	825	-	840	900
Evaluation	2	0	3	2	2	-	1	0	0	-	0	0

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

5

6

FARINOGRAM

5

6

EXTENSOGRAM

5

6

ALVEOGRAM

5

6

**SOUTH AFRICAN
SUMMER RAINFALL AND IRRIGATION WHEAT
Eastern Cape**

**IRRIGATION WHEAT
Vaal and Orange river area**

PRODUCTION REGION	(8)				(10)							
	Eastern Cape Northern Region				Griqualand - West							
Intake silos	Aliwal-North Barkly-East Burgersdorp Cradock Elliot Golden Valley Jamestown Molteno Queenstown				Britstown Douglas Havenga Brug Marydale Modderivier Oranjerivierstasie Prieska Rietrivier Upington							
WHEAT	ave	min	max	stdev	ave	min	max	stdev				
Protein (12% mb), %	13.1	12.7	13.8	0.50	11.6	10.2	12.6	0.65				
Falling number, sec	397	379	407	13.33	430	341	511	39.23				
1000 Kernel mass (13% mb), g	37.1	34.7	40.1	2.24	39.6	33.7	44.0	2.52				
Hectolitre mass (dirty), kg/hl	76.4	75.0	78.4	1.50	79.0	75.9	80.5	1.13				
Screenings (<1.8mm), %	2.47	2.04	2.74	0.31	1.21	0.48	3.78	0.88				
Total damaged kernels, %	0.36	0.06	0.50	0.21	0.19	0.00	0.44	0.12				
Number of samples	4				23							
CULTIVARS												
	SST 015		22.5		SST 835		26.5					
cultivars	CRN 826		21.5		CRN 826		25.6					
with highest %	SST 027		17.8		Duzi		13.3					
occurrence	SST 806		13.8		PAN 3434		11.1					
	SST 835		12.0		Baviaans		10.1					
Number of samples	4				23							
MIXOGRAM (Quadromat)	ave	min	max	stdev	ave	min	max	stdev				
Peak time, min	2.9	2.8	3.0	0.10	2.6	2.2	4.0	0.43				
Tail height (6min), mm	49	48	51	1.26	47	42	50	2.25				
Number of samples	4				23							
BÜHLER EXTRACTION, %	B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW
	-	-	-	75.1	-	-	77.1	77.0	76.1	-	-	-
FLOUR												
Protein (12% mb), %	-	-	-	11.9	-	-	11.8	10.5	10.2	-	-	-
Colour, KJ	-	-	-	-1.3	-	-	-1.8	-2.6	-2.4	-	-	-
FARINOGRAM												
Water absorption (14% mb), %	-	-	-	62.0	-	-	62.1	60.3	58.0	-	-	-
Development time, min	-	-	-	5.0	-	-	4.7	3.7	3.2	-	-	-
Stability, min	-	-	-	7.9	-	-	6.7	6.7	6.4	-	-	-
Mixing tolerance index, BU	-	-	-	41	-	-	51	50	57	-	-	-
EXTENSOGRAM (45 min pull)												
Area, cm2	-	-	-	101	-	-	89	90	91	-	-	-
Maximum height, BU	-	-	-	335	-	-	290	335	365	-	-	-
Extensibility, mm	-	-	-	211	-	-	213	198	175	-	-	-
ALVEOGRAM												
Strength (S), cm2	-	-	-	42.7	-	-	35.2	34.1	33.5	-	-	-
Stability (P), mm	-	-	-	78	-	-	77	72	64	-	-	-
Distensibility (L), mm	-	-	-	124	-	-	100	110	121	-	-	-
Configuration ratio (P/L)	-	-	-	0.63	-	-	0.76	0.66	0.52	-	-	-
MIXOGRAM												
Peak time, min	-	-	-	2.5	-	-	2.3	2.3	2.8	-	-	-
100g BAKING TEST												
Loaf volume, cm3	-	-	-	930	-	-	950	900	940	-	-	-
Evaluation	-	-	-	0	-	-	0	0	0	-	-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

8

10

FARINOGRAM

8

10

EXTENSOGRAM

8

10

ALVEOGRAM

8

10

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

**MAINLY IRRIGATION WHEAT
North-West Province**

PRODUCTION REGION	(11) Vaalharts					(12) North-West Western Region						
Intake silos	Barkly-West Hartswater Jan Kemp Magogong Taung					Bloubank Buhmannsdrif Kameel Kraaipan Madibogo Mafikeng Mareetsane Piet Plessis Springbokpan Vergeleë Vryburg Vryhof						
WHEAT	ave	min	max	stdev		ave	min	max	stdev			
Protein (12% mb), %	11.8	10.6	12.8	0.58		13.5	12.5	15.5	1.15			
Falling number, sec	446	378	574	50.22		446	417	521	37.00			
1000 Kernel mass (13% mb), g	36.3	29.8	40.3	2.51		32.7	29.1	38.6	3.42			
Hectolitre mass (dirty), kg/hl	77.5	75.7	80.8	1.16		75.8	73.2	78.9	1.84			
Screenings (<1.8mm), %	2.83	1.75	4.64	0.80		1.89	0.16	3.60	1.43			
Total damaged kernels, %	0.35	0.00	2.04	0.39		6.74	3.60	10.92	3.15			
Number of samples	24					7						
CULTIVARS												
cultivars	CRN 826		64.4			SST 835		46.7				
with highest % occurrence	Duzi		13.4			CRN 826		38.4				
	SST 835		11.5			SST 806		6.4				
	SST 806		2.7			SST 822		3.4				
	SST 876		2.6			Duzi		2.9				
Number of samples	24					7						
MIXOGRAM (Quadromat)	ave	min	max	stdev		ave	min	max	stdev			
Peak time, min	2.8	2.3	3.2	0.26		3.0	2.3	3.4	0.42			
Tail height (6min), mm	47	43	51	2.27		51	47	57	3.61			
Number of samples	24					7						
BÜHLER EXTRACTION, %	B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW
	76.9	77.0	77.1	-	77.1	-	-	-	-	-	76.0	76.5
FLOUR												
Protein (12% mb), %	11.6	10.6	9.9	-	11.0	-	-	-	-	-	13.6	12.3
Colour, KJ	-2.3	-2.2	-2.3	-	-2.2	-	-	-	-	-	-1.4	-2.0
FARINOGRAM												
Water absorption (14% mb), %	60.0	58.5	58.2	-	59.2	-	-	-	-	-	62.6	60.3
Development time, min	5.0	4.9	4.2	-	4.5	-	-	-	-	-	6.8	6.0
Stability, min	6.6	7.7	6.4	-	7.1	-	-	-	-	-	9.1	10.9
Mixing tolerance index, BU	55	43	49	-	50	-	-	-	-	-	47	30
EXTENSOGRAM (45 min pull)												
Area, cm2	96	83	76	-	94	-	-	-	-	-	129	118
Maximum height, BU	345	335	325	-	335	-	-	-	-	-	360	395
Extensibility, mm	198	174	164	-	194	-	-	-	-	-	242	209
ALVEOGRAM												
Strength (S), cm2	36.1	32.4	31.7	-	35.5	-	-	-	-	-	52.9	45.7
Stability (P), mm	65	65	66	-	68	-	-	-	-	-	80	72
Distensibility (L), mm	138	117	112	-	126	-	-	-	-	-	152	149
Configuration ratio (P/L)	0.47	0.55	0.59	-	0.54	-	-	-	-	-	0.53	0.48
MIXOGRAM												
Peak time, min	2.3	2.8	2.5	-	2.6	-	-	-	-	-	2.5	2.8
100g BAKING TEST												
Loaf volume, cm3	980	925	890	-	925	-	-	-	-	-	1100	1020
Evaluation	0	0	0	-	0	-	-	-	-	-	0	0

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

11

12

FARINOGRAM

11

12

EXTENSOGRAM

11

12

ALVEOGRAM

11

12

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

PRODUCTION REGION	(15) North-West South-Eastern Region				(17) North-West Central Northern Region (Ottosdal)							
	Intake silos											
	Bloemhof Christiana Hertzogville Hoopstad Kingswood				Bospoort Hartbeesfontein Kleinharth Melliodora Ottosdal Rostrataville Vermaas Werda							
WHEAT												
	ave	min	max	stdev	ave	min	max	stdev				
Protein (12% mb), %	12.9	11.9	15.7	1.19	13.8	12.9	15.3	0.92				
Falling number, sec	467	391	679	90.00	344	284	429	62.43				
1000 Kernel mass (13% mb), g	34.3	28.6	41.7	5.25	32.1	27.2	36.6	4.19				
Hectolitre mass (dirty), kg/hl	76.0	73.3	77.8	1.42	74.1	70.5	77.9	2.66				
Screenings (<1.8mm), %	1.62	0.10	8.34	2.73	3.79	1.82	6.71	1.71				
Total damaged kernels, %	0.14	0.00	0.40	0.14	0.25	0.08	0.38	0.11				
Number of samples	9				6							
CULTIVARS												
	CRN 826				CRN 826							
cultivars	SST 835				SST 835							
with highest %	PAN 3120				SST 825							
occurrence	SST 806				SST 806							
	PAN 3118				SST 876							
Number of samples	9				6							
MIXOGRAM (Quadromat)												
	ave	min	max	stdev	ave	min	max	stdev				
Peak time, min	2.6	2.0	3.2	0.38	2.8	2.5	3.2	0.24				
Tail height (6min), mm	48	45	53	2.57	50	48	55	2.66				
Number of samples	9				6							
BÜHLER EXTRACTION, %												
	B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW
	-	75.9	76.7	-	75.3	-	76.5	-	-	-	74.2	-
FLOUR												
Protein (12% mb), %	-	11.9	11.1	-	12.1	-	12.1	-	-	-	13.0	-
Colour, KJ	-	-2.0	-1.7	-	-1.5	-	-1.7	-	-	-	-1.4	-
FARINOGRAM												
Water absorption (14% mb), %	-	61.7	59.5	-	61.2	-	61.3	-	-	-	60.4	-
Development time, min	-	5.7	4.9	-	5.0	-	4.0	-	-	-	4.2	-
Stability, min	-	8.4	7.4	-	8.3	-	6.9	-	-	-	8.2	-
Mixing tolerance index, BU	-	41	53	-	38	-	46	-	-	-	35	-
EXTENSOGRAM (45 min pull)												
Area, cm2	-	106	105	-	105	-	113	-	-	-	133	-
Maximum height, BU	-	375	355	-	375	-	355	-	-	-	395	-
Extensibility, mm	-	193	212	-	196	-	215	-	-	-	232	-
ALVEOGRAM												
Strength (S), cm2	-	42.8	40.4	-	42.2	-	37.3	-	-	-	37.8	-
Stability (P), mm	-	81	71	-	78	-	72	-	-	-	54	-
Distensibility (L), mm	-	121	128	-	125	-	126	-	-	-	185	-
Configuration ratio (P/L)	-	0.67	0.55	-	0.62	-	0.57	-	-	-	0.29	-
MIXOGRAM												
Peak time, min	-	2.4	2.8	-	2.5	-	2.3	-	-	-	2.5	-
100g BAKING TEST												
Loaf volume, cm3	-	1070	1035	-	945	-	1025	-	-	-	1100	-
Evaluation	-	0	0	-	0	-	0	-	-	-	0	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

15

17

FARINOGRAM

15

17

EXTENSOGRAM

15

17

ALVEOGRAM

15

17

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

PRODUCTION REGION	(18) North-West Central Region (Ventersdorp)				(19) North-West Central Region (Lichtenburg)							
	Intake silos				Intake silos							
	Bodenstein Buckingham Coligny Enselspruit Makokskraal Potchefstroom Ventersdorp				Grootpan Halfpad Hibernia Lichtenburg Lottiehalte Lusthof							
WHEAT												
	ave	min	max	stdev	ave	min	max	stdev				
Protein (12% mb), %	12.3	11.7	13.1	0.72	12.2	10.7	13.7	0.79				
Falling number, sec	329	289	355	35.36	396	290	480	50.26				
1000 Kernel mass (13% mb), g	35.8	34.4	37.5	1.56	34.6	28.1	38.8	2.97				
Hectolitre mass (dirty), kg/hl	77.6	76.1	79.1	1.50	76.2	70.8	78.0	2.14				
Screenings (<1.8mm), %	1.13	0.98	1.26	0.14	2.10	0.40	4.94	1.13				
Total damaged kernels, %	1.07	0.60	1.76	0.61	3.17	0.32	7.02	2.07				
Number of samples	3				13							
CULTIVARS												
	CRN 826		59.3		SST 835		64.3					
cultivars	SST 835		21.0		CRN 826		18.2					
with highest %	Duzi		9.0		SST 806		4.2					
occurrence	Krokodil		4.7		Elands		2.8					
	SST 806		3.0		Duzi		2.7					
Number of samples	3				13							
MIXOGRAM (Quadromat)												
	ave	min	max	stdev	ave	min	max	stdev				
Peak time, min	2.7	2.5	2.8	0.17	2.6	2.3	3.0	0.22				
Tail height (6min), mm	45	44	46	1.15	45	42	49	2.50				
Number of samples	3				13							
BÜHLER EXTRACTION, %												
	B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW
	-	77.2	-	-	-	-	75.5	76.4	-	75.9	76.7	-
FLOUR												
Protein (12% mb), %	-	10.9	-	-	-	-	11.9	10.5	-	11.2	11.1	-
Colour, KJ	-	-1.7	-	-	-	-	-1.5	-2.1	-	-1.5	-1.7	-
FARINOGRAM												
Water absorption (14% mb), %	-	57.9	-	-	-	-	60.5	59.6	-	60.3	60.1	-
Development time, min	-	4.0	-	-	-	-	4.0	3.2	-	3.4	3.5	-
Stability, min	-	6.8	-	-	-	-	6.3	5.2	-	6.2	5.7	-
Mixing tolerance index, BU	-	54	-	-	-	-	58	60	-	51	58	-
EXTENSOGRAM (45 min pull)												
Area, cm2	-	100	-	-	-	-	101	65	-	69	91	-
Maximum height, BU	-	330	-	-	-	-	320	250	-	260	305	-
Extensibility, mm	-	204	-	-	-	-	223	188	-	188	207	-
ALVEOGRAM												
Strength (S), cm2	-	29.8	-	-	-	-	37.6	27.5	-	32.6	32.1	-
Stability (P), mm	-	57	-	-	-	-	65	57	-	67	63	-
Distensibility (L), mm	-	130	-	-	-	-	148	121	-	119	126	-
Configuration ratio (P/L)	-	0.44	-	-	-	-	0.44	0.47	-	0.57	0.50	-
MIXOGRAM												
Peak time, min	-	2.4	-	-	-	-	2.3	2.3	-	2.3	2.3	-
100g BAKING TEST												
Loaf volume, cm3	-	895	-	-	-	-	1000	925	-	960	950	-
Evaluation	-	0	-	-	-	-	0	0	-	0	0	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

18

19

FARINOGRAM

18

19

EXTENSOGRAM

18

19

ALVEOGRAM

18

19

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

**SUMMER RAINFALL WHEAT
(AND IRRIGATION)
Free State Province (Central)
(21)
Free State
North-Western Region (Viljoenskroon)**

PRODUCTION REGION

(20)
North-West
Eastern Region

Intake silos

Battery
Boons
Brits
Derby
Koster
Rustenburg
Swartruggens
Syferbult

Attie
Groenebloem
Heuningspruit
Koppies
Rooiwal
Vierfontein
Viljoenskroon
Vredefort
Weiveld

WHEAT

	ave	min	max	stdev	ave	min	max	stdev
Protein (12% mb), %	11.6	10.0	13.3	0.75	11.5	10.9	12.1	0.85
Falling number, sec	411	264	540	76.29	426	404	448	31.11
1000 Kernel mass (13% mb), g	39.4	33.2	43.5	3.20	35.2	34.6	35.7	0.78
Hectolitre mass (dirty), kg/hl	76.4	71.0	79.0	1.64	77.8	77.7	77.9	0.14
Screenings (<1.8mm), %	2.07	0.48	5.98	1.17	2.00	2.00	2.00	0.00
Total damaged kernels, %	0.76	0.12	1.90	0.42	0.19	0.18	0.20	0.01
Number of samples	25				2			

CULTIVARS

cultivars
with highest %
occurrence

	ave	min	max	stdev	ave	min	max	stdev
	SST 835	29.4			CRN 826	60.0		
	Duzi	19.1			SST 835	40.0		
	CRN 826	14.0						
	Kariega	9.6						
	Olifants	8.8						
Number of samples	25				2			

MIXOGRAM (Quadromat)

	ave	min	max	stdev	ave	min	max	stdev
Peak time, min	3.3	2.7	4.0	0.40	2.8	2.5	3.0	0.35
Tail height (6min), mm	48	39	51	2.74	44	43	44	0.71
Number of samples	25				2			

BÜHLER EXTRACTION, %

	B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW
	77.2	76.2	77.1	-	76.7	-	76.5	-	76.6	-	-	-

FLOUR

Protein (12% mb), %	11.3	10.6	9.8	-	10.6	-	11.0	-	9.7	-	-	-
Colour, KJ	-1.2	-1.7	-1.4	-	-0.9	-	-1.6	-	-2.0	-	-	-

FARINOGRAM

Water absorption (14% mb), %	59.3	59.4	58.2	-	58.3	-	60.2	-	57.3	-	-	-
Development time, min	5.3	4.3	1.5	-	3.9	-	4.3	-	3.3	-	-	-
Stability, min	9.6	7.6	7.7	-	7.9	-	6.3	-	6.3	-	-	-
Mixing tolerance index, BU	39	45	25	-	41	-	56	-	54	-	-	-

EXTENSOGRAM (45 min pull)

Area, cm2	109	91	72	-	100	-	87	-	80	-	-	-
Maximum height, BU	400	340	320	-	390	-	310	-	345	-	-	-
Extensibility, mm	195	194	163	-	179	-	199	-	166	-	-	-

ALVEOGRAM

Strength (S), cm2	39.1	33.8	33.9	-	36.2	-	31.3	-	28.4	-	-	-
Stability (P), mm	73	69	74	-	67	-	65	-	62	-	-	-
Distensibility (L), mm	114	110	99	-	118	-	116	-	105	-	-	-
Configuration ratio (P/L)	0.64	0.63	0.75	-	0.57	-	0.56	-	0.59	-	-	-

MIXOGRAM

Peak time, min	3.2	2.8	3.0	-	3.3	-	2.4	-	2.8	-	-	-
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100g BAKING TEST

Loaf volume, cm3	940	955	895	-	940	-	1015	-	930	-	-	-
Evaluation	0	0	0	-	0	-	0	-	0	-	-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

20

21

FARINOGRAM

20

21

EXTENSOGRAM

20

21

ALVEOGRAM

20

21

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

PRODUCTION REGION	(26) Free State South-Eastern Region (Senekal)					(27) Free State Northern Region						
	Intake silos					Gottenburg Heilbron Hoogte Mooigeleë Petrus Steyn Wolwehoek						
WHEAT												
	ave	min	max	stdev		ave	min	max	stdev			
Protein (12% mb), %	14.0	10.2	16.0	1.51		12.8	9.7	14.4	2.69			
Falling number, sec	320	208	445	51.94		370	352	403	28.88			
1000 Kernel mass (13% mb), g	34.2	25.4	42.5	4.00		35.3	30.1	38.1	4.53			
Hectolitre mass (dirty), kg/hl	77.2	72.7	79.4	1.52		77.9	72.3	81.0	4.83			
Screenings (<1.8mm), %	1.36	0.17	4.74	1.26		1.15	0.08	3.14	1.72			
Total damaged kernels, %	0.71	0.08	4.88	1.09		0.24	0.00	0.42	0.22			
Number of samples	25					3						
CULTIVARS												
			Elands	51.1				Elands	46.7			
cultivars			SST 835	11.0				SST 835	18.3			
with highest %			Gariep	6.6				CRN 826	9.7			
occurrence			Betta DN	5.9				SST 356	8.0			
			PAN 3355	4.4				Betta DN	6.3			
Number of samples	25					3						
MIXOGRAM (Quadromat)												
	ave	min	max	stdev		ave	min	max	stdev			
Peak time, min	3.6	2.8	4.7	0.48		3.4	3.2	3.7	0.29			
Tail height (6min), mm	55	43	70	5.07		52	44	57	6.81			
Number of samples	25					3						
BÜHLER EXTRACTION, %												
	B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW
	75.3	76.2	75.1	73.7	73.3	-	75.9	-	-	77.6	73.9	-
FLOUR												
Protein (12% mb), %	13.4	12.6	11.3	13.1	11.9	-	13.6	-	-	8.9	13.5	-
Colour, KJ	-0.2	-0.5	-1.1	-0.4	-1.6	-	0.1	-	-	-2.1	0.0	-
FARINOGRAM												
Water absorption (14% mb), %	62.9	61.3	60.4	61.5	59.1	-	64.8	-	-	58.4	64.1	-
Development time, min	6.2	5.0	4.5	5.0	3.9	-	7.2	-	-	2.0	5.5	-
Stability, min	13.5	11.3	9.5	9.2	9.1	-	16.4	-	-	6.0	11.5	-
Mixing tolerance index, BU	31	28	32	35	34	-	7	-	-	44	25	-
EXTENSOGRAM (45 min pull)												
Area, cm2	123	112	88	108	115	-	123	-	-	80	109	-
Maximum height, BU	425	380	360	390	430	-	430	-	-	330	375	-
Extensibility, mm	200	200	168	192	183	-	200	-	-	166	206	-
ALVEOGRAM												
Strength (S), cm2	53.5	48.8	33.6	48.5	43.6	-	62.7	-	-	28.7	51.8	-
Stability (P), mm	102	87	79	92	85	-	123	-	-	69	101	-
Distensibility (L), mm	100	116	88	103	100	-	91	-	-	97	98	-
Configuration ratio (P/L)	1.02	0.75	0.89	0.89	0.85	-	1.35	-	-	0.71	1.03	-
MIXOGRAM												
Peak time, min	3.2	2.8	2.5	3.0	3.3	-	3.4	-	-	2.8	2.7	-
100g BAKING TEST												
Loaf volume, cm3	930	960	850	950	925	-	975	-	-	810	1010	-
Evaluation	2	0	1	1	0	-	2	-	-	0	1	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

26

27

FARINOGRAM

26

27

EXTENSOGRAM

26

27

ALVEOGRAM

26

27

SOUTH AFRICAN
SUMMER RAINFALL WHEAT (AND IRRIGATION)
Free State Province (North-Western)

PRODUCTION REGION	(22) Free-State North-Western Region (Bothaville)					(23) Free-State North-Western Region (Bultfontein)						
	Intake silos					Intake silos						
	Allanridge Bothaville Mirage Oendaalsrus Schoonspruit Schuttendraai					Bultfontein Losdoorns Protespan Tierfontein Wesselsbron Willemsrust						
WHEAT												
	ave	min	max	stdev		ave	min	max	stdev			
Protein (12% mb), %	14.4	12.7	16.4	1.25		12.9	10.5	15.3	1.18			
Falling number, sec	320	243	378	43.19		379	233	539	75.83			
1000 Kernel mass (13% mb), g	33.5	28.6	37.5	2.73		32.8	28.8	36.7	2.45			
Hectolitre mass (dirty), kg/hl	76.8	74.8	78.5	1.09		77.2	74.7	80.6	1.42			
Screenings (<1.8mm), %	1.97	1.00	2.87	0.72		2.12	0.63	3.53	0.74			
Total damaged kernels, %	0.38	0.16	0.80	0.18		0.29	0.08	1.17	0.23			
Number of samples	10					23						
CULTIVARS												
		CRN 826	25.8				CRN 826	27.4				
cultivars		PAN 3120	16.0				PAN 3118	20.4				
with highest %		PAN 3118	15.1				PAN 3120	13.3				
occurrence		PAN 3349	14.6				PAN 3349	6.6				
		PAN 3355	7.5				Gariep	6.3				
Number of samples	10					23						
MIXOGRAM (Quadromat)												
	ave	min	max	stdev		ave	min	max	stdev			
Peak time, min	2.9	2.2	3.3	0.36		2.9	1.8	3.7	0.40			
Tail height (6min), mm	54	48	60	3.72		51	41	55	3.41			
Number of samples	10					23						
BÜHLER EXTRACTION, %												
	B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW
	74.9	74.3	73.3	-	-	-	74.9	75.7	74.5	-	74.3	-
FLOUR												
Protein (12% mb), %	13.0	12.8	15.4	-	-	-	12.4	11.8	12.3	-	11.4	-
Colour, KJ	-0.8	-0.7	-1.4	-	-	-	-1.6	-1.4	-1.6	-	-1.9	-
FARINOGRAM												
Water absorption (14% mb), %	62.4	62.6	66.4	-	-	-	62.4	61.2	61.5	-	60.7	-
Development time, min	5.0	4.7	8.2	-	-	-	5.2	5.0	4.4	-	4.9	-
Stability, min	8.2	9.2	17.1	-	-	-	9.0	8.1	7.7	-	10.0	-
Mixing tolerance index, BU	43	34	19	-	-	-	36	38	39	-	34	-
EXTENSOGRAM (45 min pull)												
Area, cm ²	96	100	135	-	-	-	118	113	91	-	96	-
Maximum height, BU	340	345	395	-	-	-	385	380	355	-	395	-
Extensibility, mm	197	205	236	-	-	-	210	201	177	-	173	-
ALVEOGRAM												
Strength (S), cm ²	41.0	41.3	65.0	-	-	-	45.9	39.4	41.1	-	43.1	-
Stability (P), mm	84	89	122	-	-	-	89	85	81	-	88	-
Distensibility (L), mm	106	97	98	-	-	-	108	96	108	-	99	-
Configuration ratio (P/L)	0.78	0.92	1.25	-	-	-	0.82	0.88	0.75	-	0.88	-
MIXOGRAM												
Peak time, min	2.7	2.8	2.8	-	-	-	2.5	2.4	2.5	-	2.8	-
100g BAKING TEST												
Loaf volume, cm ³	970	945	1025	-	-	-	1000	1000	955	-	935	-
Evaluation	1	1	3	-	-	-	0	0	0	-	0	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

22

23

FARINOGRAM

22

23

EXTENSOGRAM

22

23

ALVEOGRAM

22

23

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

PRODUCTION REGION	(25) Free State South-Western Region (Bethlehem)				(28) Free State Eastern Region							
	Intake silos											
	Bethlehem				Afrikaskop							
	Clocolan				Ascent							
	De Wetsdorp				Cornelia							
	Ficksburg				Daniëlsrus							
	Fouriesburg				Eeram							
	Marseilles				Frankfort							
	Modderpoort				Harrismith							
	Slabberts				Jim Fouché							
	Tweespruit				Kransfontein							
	Westminster				Memel							
	Zastron				Reitz							
					Tweeling							
					Villiers							
					Vrede							
					Warden							
					Windfield							
WHEAT												
	ave	min	max	stdev	ave	min	max	stdev				
Protein (12% mb), %	13.5	10.6	17.3	1.63	13.2	10.0	15.2	1.40				
Falling number, sec	314	207	436	61.19	376	286	591	64.30				
1000 Kernel mass (13% mb), g	35.8	25.4	41.8	4.43	37.0	31.5	41.6	2.41				
Hectolitre mass (dirty), kg/hl	77.6	68.2	81.3	2.40	78.5	75.2	81.1	1.55				
Screenings (<1.8mm), %	1.49	0.42	3.85	0.76	0.87	0.16	2.54	0.56				
Total damaged kernels, %	0.33	0.00	1.62	0.33	0.46	0.08	1.00	0.28				
Number of samples	31				29							
CULTIVARS												
	Elands		45.1		Elands		30.1					
cultivars	SST 835		7.9		SST 835		28.8					
with highest %	Matlabas		6.6		CRN 826		4.3					
occurrence	SST 946		5.2		SST 876		4.3					
	PAN 3355		5.0		Matlabas		4.2					
Number of samples	31				29							
MIXOGRAM (Quadromat)												
	ave	min	max	stdev	ave	min	max	stdev				
Peak time, min	3.4	2.5	4.5	0.52	3.2	2.0	4.0	0.48				
Tail height (6min), mm	54	43	62	4.78	53	43	63	4.98				
Number of samples	31				29							
BÜHLER EXTRACTION, %												
	B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW
	74.5	75.5	75.1	75.0	-	-	76.0	75.5	76.0	-	-	-
FLOUR												
Protein (12% mb), %	13.4	11.4	11.2	12.7	-	-	12.5	11.8	10.6	-	-	-
Colour, KJ	-1.1	-1.1	-1.1	-0.9	-	-	-0.5	-1.1	-2.0	-	-	-
FARINOGRAM												
Water absorption (14% mb), %	63.6	61.3	60.4	63.0	-	-	63.5	63.0	60.9	-	-	-
Development time, min	5.0	4.7	5.0	4.7	-	-	6.2	3.2	3.9	-	-	-
Stability, min	10.8	9.9	8.3	9.0	-	-	11.0	8.0	6.3	-	-	-
Mixing tolerance index, BU	31	35	40	36	-	-	32	36	48	-	-	-
EXTENSOGRAM (45 min pull)												
Area, cm2	124	110	94	127	-	-	115	107	81	-	-	-
Maximum height, BU	385	440	375	410	-	-	385	385	305	-	-	-
Extensibility, mm	221	175	171	216	-	-	211	194	184	-	-	-
ALVEOGRAM												
Strength (S), cm2	56.6	47.7	39.3	52.3	-	-	54.9	51.2	36.4	-	-	-
Stability (P), mm	98	101	86	96	-	-	103	101	82	-	-	-
Distensibility (L), mm	117	91	94	112	-	-	107	103	96	-	-	-
Configuration ratio (P/L)	0.84	1.10	0.91	0.86	-	-	0.96	0.98	0.85	-	-	-
MIXOGRAM												
Peak time, min	2.8	2.8	2.9	2.8	-	-	2.8	2.8	2.3	-	-	-
100g BAKING TEST												
Loaf volume, cm3	1025	845	885	985	-	-	950	930	890	-	-	-
Evaluation	0	1	0	0	-	-	0	0	0	-	-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

25

28

FARINOGRAM

25

28

EXTENSOGRAM

25

28

ALVEOGRAM

25

28

SOUTH AFRICAN

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

PRODUCTION REGION	(24) Free State Central Region
Intake silos	Bloemfontein Brandfort De Brug Geneva Hennenman Koffiefontein Kroonstad Petrusburg Theunissen Van Tonder Welgeleë Winburg

OTHER SUMMER RAINFALL AND IRRIGATION WHEAT Mpumalanga

PRODUCTION REGION	(30) Mpumalanga Eastern Region
	Amersfoort Badplaas Carolina Davel Ermelo Estancia Lothair Maizefield Mkondo Morgenzon Overvaal Panbult

WHEAT	ave	min	max	stdev	ave	min	max	stdev				
	Protein (12% mb), %	13.4	10.9	15.9	1.27	12.6	12.6	12.7	0.06			
Falling number, sec	347	138	527	80.84	438	414	473	30.83				
1000 Kernel mass (13% mb), g	31.2	25.2	40.2	3.92	40.2	39.9	40.5	0.30				
Hectolitre mass (dirty), kg/hl	76.1	72.3	78.8	1.86	80.0	79.8	80.2	0.20				
Screenings (<1.8mm), %	2.31	0.64	5.44	1.01	2.57	2.48	2.66	0.09				
Total damaged kernels, %	0.30	0.00	1.04	0.26	0.16	0.12	0.18	0.03				
Number of samples	17				3							
CULTIVARS												
	PAN 3118		25.7		Duzi		31.3					
cultivars	Gariep		13.2		SST 835		24.7					
with highest %	CRN 826		12.3		SST 876		14.7					
occurrence	PAN 3120		11.2		CRN 826		11.0					
	PAN 3377		6.1		SST 822		9.3					
Number of samples	17				3							
MIXOGRAM (Quadromat)	ave	min	max	stdev	ave	min	max	stdev				
Peak time, min	3.3	2.3	4.8	0.65	2.3	2.3	2.3	0.00				
Tail height (6min), mm	54	48	66	5.48	47	46	48	1.15				
Number of samples	17				3							
BÜHLER EXTRACTION, %	B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW
	74.2	75.0	74.4	73.5	-	73.2	77.1	-	-	-	-	-
FLOUR												
Protein (12% mb), %	12.9	12.8	11.6	13.4	-	12.6	11.7	-	-	-	-	-
Colour, KJ	-1.4	-1.0	-1.3	0.0	-	-0.9	-1.9	-	-	-	-	-
FARINOGRAM												
Water absorption (14% mb), %	63.9	61.9	61.6	62.2	-	58.9	62.1	-	-	-	-	-
Development time, min	4.8	5.2	4.0	5.3	-	3.5	4.8	-	-	-	-	-
Stability, min	9.3	10.9	7.8	10.6	-	8.0	7.1	-	-	-	-	-
Mixing tolerance index, BU	33	32	37	30	-	39	48	-	-	-	-	-
EXTENSOGRAM (45 min pull)												
Area, cm ²	95	140	99	133	-	106	80	-	-	-	-	-
Maximum height, BU	335	420	385	405	-	370	295	-	-	-	-	-
Extensibility, mm	194	216	181	228	-	205	187	-	-	-	-	-
ALVEOGRAM												
Strength (S), cm ²	47.1	49.7	41.4	44.8	-	39.1	35.8	-	-	-	-	-
Stability (P), mm	98	91	87	86	-	66	78	-	-	-	-	-
Distensibility (L), mm	98	106	100	108	-	132	106	-	-	-	-	-
Configuration ratio (P/L)	1.00	0.86	0.87	0.80	-	0.50	0.74	-	-	-	-	-
MIXOGRAM												
Peak time, min	2.3	3.1	2.8	2.8	-	3.2	2.2	-	-	-	-	-
100g BAKING TEST												
Loaf volume, cm ³	950	1025	980	1020	-	1030	970	-	-	-	-	-
Evaluation	1	0	0	0	-	0	0	-	-	-	-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

24

30

FARINOGRAM

24

30

EXTENSOGRAM

24

30

ALVEOGRAM

24

30

SOUTH AFRICAN OTHER SUMMER RAINFALL AND IRRIGATION WHEAT Mpumalanga

PRODUCTION REGION	(32) Mpumalanga Western Region						(33) Mpumalanga Northern Region					
Intake silos	Argent Dryden Endicott Elof Hawerklip Kendal Ogies						Driefontein Lydenburg Marble Hall Middelburg Stoffelberg Pan Arnot Wonderfontein					
WHEAT												
	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
Protein (12% mb), %	11.9	11.2	12.9	0.70	11.1	8.6	13.0	1.26				
Falling number, sec	321	243	390	60.38	372	227	493	97.21				
1000 Kernel mass (13% mb), g	40.2	36.5	44.4	2.99	41.4	36.9	45.9	2.93				
Hectolitre mass (dirty), kg/hl	78.9	76.7	80.0	1.21	78.4	75.9	80.2	1.42				
Screenings (<1.8mm), %	1.17	0.50	2.20	0.53	1.36	0.21	2.32	0.69				
Total damaged kernels, %	0.62	0.24	1.14	0.32	0.67	0.00	1.88	0.56				
Number of samples	7						10					
CULTIVARS												
				SST 835	41.4				CRN 826	25.6		
cultivars				CRN 826	28.6				Duzi	23.5		
with highest %				SST 806	11.3				SST 876	17.9		
occurrence				SST 876	10.4				SST 835	16.2		
				CRN 826	9.6				Baviaans	4.2		
Number of samples	7						10					
MIXOGRAM (Quadromat)												
	ave	min	max	stdev	ave	min	max	stdev	ave	min	max	stdev
Peak time, min	3.0	2.4	3.7	0.42	2.9	2.5	3.8	0.39				
Tail height (6min), mm	49	47	52	1.81	46	35	53	4.88				
Number of samples	7						10					
BÜHLER EXTRACTION, %												
	B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW
	77.0	76.7	-	-	-	-	76.6	76.6	76.5	-	76.1	-
FLOUR												
Protein (12% mb), %	11.8	10.6	-	-	-	-	11.7	10.5	9.4	-	7.6	-
Colour, KJ	-1.2	-1.5	-	-	-	-	-1.6	-1.8	-1.8	-	-2.5	-
FARINOGRAM												
Water absorption (14% mb), %	61.5	59.7	-	-	-	-	62.6	60.4	58.8	-	57.4	-
Development time, min	4.5	4.0	-	-	-	-	4.8	3.2	1.8	-	1.3	-
Stability, min	7.8	7.1	-	-	-	-	7.7	7.4	5.6	-	3.9	-
Mixing tolerance index, BU	43	54	-	-	-	-	40	37	50	-	70	-
EXTENSOGRAM (45 min pull)												
Area, cm2	107	107	-	-	-	-	94	85	77	-	39	-
Maximum height, BU	360	365	-	-	-	-	335	335	310	-	245	-
Extensibility, mm	209	202	-	-	-	-	196	177	165	-	109	-
ALVEOGRAM												
Strength (S), cm2	42.7	39.3	-	-	-	-	37.8	36.5	30.0	-	19.1	-
Stability (P), mm	76	72	-	-	-	-	81	77	67	-	72	-
Distensibility (L), mm	135	127	-	-	-	-	104	109	101	-	51	-
Configuration ratio (P/L)	0.56	0.56	-	-	-	-	0.78	0.71	0.66	-	1.42	-
MIXOGRAM												
Peak time, min	2.5	2.9	-	-	-	-	2.4	2.8	3.2	-	2.8	-
100g BAKING TEST												
Loaf volume, cm3	980	920	-	-	-	-	935	900	820	-	675	-
Evaluation	0	0	-	-	-	-	0	0	0	-	0	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

32

33

FARINOGRAM

32

33

EXTENSOGRAM

32

33

ALVEOGRAM

32

33

**SOUTH AFRICAN
OTHER SUMMER RAINFALL AND IRRIGATION WHEAT
Gauteng and Limpopo Provinces**

PRODUCTION REGION	(34) Gauteng					(35) Limpopo						
	Intake silos					Alma Crecy Immerpan Lehau Naboomspruit Northam Nutfield Nylstroom Pienaarsrivier Pietersburg Potgietersrus Roedtan Settlers Tzaneen Vaalwater Warmbad						
WHEAT												
	ave	min	max	stdev		ave	min	max	stdev			
Protein (12% mb), %	11.9	10.0	13.5	0.88		11.3	8.2	12.8	1.18			
Falling number, sec	346	181	468	76.95		468	322	556	67.12			
1000 Kernel mass (13% mb), g	37.7	31.6	45.9	3.64		40.6	36.7	46.0	2.89			
Hectolitre mass (dirty), kg/hl	77.2	72.7	81.5	2.19		79.3	72.2	82.4	3.13			
Screenings (<1.8mm), %	1.23	0.34	2.10	0.65		1.40	0.78	2.24	0.48			
Total damaged kernels, %	0.76	0.24	2.28	0.49		1.58	0.00	10.46	2.63			
Number of samples	18					17						
CULTIVARS												
			SST 835	31.9				SST 835	38.2			
cultivars			CRN 826	17.2				Duzi	22.6			
with highest %			Olifants	16.6				SST 876	8.9			
occurrence			SST 876	9.3				Olifants	8.9			
			Kariega	5.6				Kariega	7.8			
Number of samples	18					17						
MIXOGRAM (Quadromat)												
	ave	min	max	stdev		ave	min	max	stdev			
Peak time, min	3.0	2.1	4.3	0.66		3.1	2.3	4.3	0.49			
Tail height (6min), mm	48	41	57	4.55		48	43	52	1.87			
Number of samples	18					17						
BÜHLER EXTRACTION, %												
	B1	B2	B3	B4	UT	COW	B1	B2	B3	B4	UT	COW
	76.0	76.6	77.1	74.1	75.5	-	76.0	77.5	75.9	75.6	-	76.0
FLOUR												
Protein (12% mb), %	11.8	10.9	10.0	12.1	10.8	-	11.6	10.4	9.9	8.9	-	11.2
Colour, KJ	-1.1	-1.7	-1.5	-1.0	-0.6	-	-2.0	-2.1	-2.3	-2.0	-	1.1
FARINOGRAM												
Water absorption (14% mb), %	61.8	61.3	58.5	61.6	60.4	-	62.4	61.8	60.7	62.6	-	58.9
Development time, min	4.9	3.8	3.5	3.5	2.2	-	5.7	4.3	3.2	1.7	-	2.5
Stability, min	7.9	5.9	5.8	6.2	6.7	-	9.6	6.7	6.6	6.0	-	5.8
Mixing tolerance index, BU	40	53	64	52	48	-	37	52	47	42	-	47
EXTENSOGRAM (45 min pull)												
Area, cm2	95	79	81	88	90	-	113	79	74	87	-	104
Maximum height, BU	360	290	305	305	375	-	390	315	315	355	-	320
Extensibility, mm	187	180	183	204	170	-	194	170	164	185	-	228
ALVEOGRAM												
Strength (S), cm2	42.8	33.0	30.0	37.5	41.4	-	47.2	37.5	35.5	36.5	-	33.3
Stability (P), mm	85	74	61	76	95	-	95	87	82	114	-	53
Distensibility (L), mm	110	107	115	113	83	-	106	93	94	59	-	146
Configuration ratio (P/L)	0.77	0.69	0.53	0.67	1.14	-	0.89	0.94	0.88	1.92	-	0.36
MIXOGRAM												
Peak time, min	2.7	2.2	2.7	2.5	3.1	-	2.5	2.5	2.4	2.9	-	3.2
100g BAKING TEST												
Loaf volume, cm3	975	950	855	980	865	-	920	900	850	770	-	980
Evaluation	0	0	0	0	0	-	0	0	0	0	-	0

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

34

35

FARINOGRAM

34

35

EXTENSOGRAM

34

35

ALVEOGRAM

34

35

**SOUTH AFRICAN
IRRIGATION WHEAT
KwaZulu-Natal Province**

PRODUCTION REGION	(36) KwaZulu-Natal					
Intake silos	Bergville Bloedrivier Dannhauser Dundee Mizpah New Amalfi Paulpietersburg Vryheid Winterton					
WHEAT						
	ave	min	max	stdev		
Protein (12% mb), %	12.5	11.3	13.5	0.82		
Falling number, sec	367	306	433	50.92		
1000 Kernel mass (13% mb), g	39.0	37.7	40.6	1.10		
Hectolitre mass (dirty), kg/hl	79.2	75.9	80.5	1.88		
Screenings (<1.8mm), %	1.09	0.56	1.78	0.44		
Total damaged kernels, %	0.90	0.24	1.72	0.66		
Number of samples	5					
CULTIVARS						
		SST 835	38.2			
cultivars		SST 806	31.4			
with highest %		SST 876	12.6			
occurrence		SST 825	11.0			
		Elands	2.4			
Number of samples	5					
MIXOGRAM (Quadromat)						
	ave	min	max	stdev		
Peak time, min	2.9	2.6	3.3	0.29		
Tail height (6min), mm	46	43	50	2.70		
Number of samples	5					
	B1	B2	B3	B4	UT	COW
BÜHLER EXTRACTION, %	77.1	78.2	76.9	-	-	-
FLOUR						
Protein (12% mb), %	12.0	10.7	11.7	-	-	-
Colour, KJ	-1.2	-2.2	-0.5	-	-	-
FARINOGRAM						
Water absorption (14% mb), %	61.0	60.0	61.4	-	-	-
Development time, min	5.5	4.7	4.3	-	-	-
Stability, min	7.3	8.9	6.6	-	-	-
Mixing tolerance index, BU	49	35	53	-	-	-
EXTENSOGRAM (45 min pull)						
Area, cm ²	112	86	75	-	-	-
Maximum height, BU	355	280	295	-	-	-
Extensibility, mm	222	220	174	-	-	-
ALVEOGRAM						
Strength (S), cm ²	36.9	43.7	35.2	-	-	-
Stability (P), mm	68	79	78	-	-	-
Distensibility (L), mm	128	124	103	-	-	-
Configuration ratio (P/L)	0.53	0.64	0.75	-	-	-
MIXOGRAM						
Peak time, min	2.7	3.0	2.5	-	-	-
100g BAKING TEST						
Loaf volume, cm ³	980	910	920	-	-	-
Evaluation	0	0	0	-	-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

36

FARINOGRAM

36

EXTENSOGRAM

36

ALVEOGRAM

36

WEIGHTED AVERAGE RESULTS FOR THE LAST THREE SEASONS

Region	2008/2009					2007/2008					2006/2007				
	Protein (12% mb), %	FN, sec	Hlm, kg/hl	Mixo PT, min	n	Protein (12% mb), %	FN, sec	Hlm, kg/hl	Mixo PT, min	n	Protein (12% mb), %	FN, sec	Hlm, kg/hl	Mixo PT, min	n
1	11.2	435	79.7	2.7	4	11.5	397	77.4	2.7	6	-	-	-	-	-
2	10.3	390	76.7	3.0	24	10.6	374	75.0	3.2	23	11.3	393	77.2	2.6	18
3	10.5	395	77.7	2.7	71	10.4	373	77.8	3.0	78	11.1	362	77.7	2.5	65
4	10.3	377	79.4	2.7	14	10.5	366	78.1	3.0	35	10.4	353	78.9	2.7	17
5	11.7	304	77.6	2.4	19	11.0	370	78.7	2.5	15	11.3	366	76.3	2.5	27
6	11.8	339	78.0	2.5	34	10.5	362	78.5	2.8	34	11.1	359	76.4	2.9	33
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	13.1	397	76.4	2.9	4	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	11.6	430	79.0	2.6	23	11.0	413	79.4	2.5	17	11.9	387	80.8	2.2	27
11	11.8	446	77.5	2.8	24	11.3	388	78.2	2.4	9	11.2	389	77.1	2.7	14
12	13.5	446	75.8	3.0	7	11.8	363	74.9	2.8	3	11.1	356	81.3	2.5	4
13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	-	-	-	-	-	12.1	381	74.7	3.0	6	12.4	346	80.0	2.4	3
15	12.9	467	76.0	2.6	9	11.8	400	77.6	3.0	10	12.0	300	79.7	2.9	13
16	-	-	-	-	-	-	-	-	-	-	12.4	329	78.7	2.5	1
17	13.8	344	74.1	2.8	6	11.8	399	77.1	2.9	3	11.4	365	76.0	2.7	4
18	12.3	329	77.6	2.7	3	11.1	365	77.3	2.8	6	-	-	-	-	-
19	12.2	396	76.2	2.6	13	11.4	385	77.6	2.7	10	11.8	312	78.8	2.4	11
20	11.6	411	76.4	3.3	25	11.2	360	77.4	2.7	13	10.7	360	78.7	3.0	25
21	11.5	426	77.8	2.8	2	12.0	354	78.4	3.6	8	12.2	305	77.5	2.9	12
22	14.1	320	76.8	2.9	10	12.1	383	77.8	2.7	6	13.3	345	77.3	2.6	3
23	12.9	379	77.2	2.9	23	11.5	367	77.7	3.0	25	11.8	322	79.6	2.9	17
24	13.4	347	76.1	3.3	17	11.6	344	77.7	2.9	26	11.7	327	79.0	2.9	27
25	13.5	314	77.6	3.4	31	10.6	325	78.1	3.5	32	10.8	335	78.4	3.3	39
26	14.0	320	77.2	3.6	25	11.1	312	79.2	3.6	26	12.2	320	79.5	3.0	18
27	12.8	370	77.9	3.4	3	11.1	298	80.2	3.2	10	12.7	346	79.8	2.7	8
28	13.2	376	78.5	3.2	29	10.8	337	80.5	3.3	32	12.0	340	78.4	3.0	33
29	-	-	-	-	-	12.6	388	78.1	2.3	3	-	-	-	-	-
30	12.6	438	80.0	2.3	3	11.3	428	78.2	2.3	5	11.6	390	82.7	2.0	4
31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32	11.9	321	78.9	3.0	7	12.3	344	77.8	2.8	3	12.0	319	79.1	2.7	7
33	11.1	372	78.4	2.9	10	-	-	-	-	-	11.3	357	78.8	2.9	11
34	11.9	346	77.2	3.0	18	11.5	378	78.0	2.6	11	11.8	375	77.9	2.6	17
35	11.3	468	79.3	3.1	17	11.4	402	77.4	2.7	10	11.6	352	79.4	2.9	22
36	12.5	367	79.2	2.9	5	12.8	292	78.6	2.9	15	-	-	-	-	-
Ave.	12.0	378	77.6	2.9	480	11.0	360	78.1	3.0	480	11.4	351	78.4	2.8	480

BREAD WHEAT GRADING TABLE 2008/2009

Grade	Minimum			Maximum percentage permissible deviation (m/m)									
				A	B	C	D	E	F	G	H	I	J
	Hectolitre mass, kg	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	3	1	0.5	1	0.5	2	5
Utility grade	70	150	8	10	2	0.5	10	4	0.5	3	0.5	5	10
Other Wheat	<70	<150	<8	>10	>2	>0.5	>10	>4	>0.5	>3	>0.5	>5	>10
Minimum size of working samples	1 kg	300 g clean	Apparatus instructions	25 g sifted	25 g sifted	25 g sifted	500 g unsifted	50 g sifted	100 g sifted	100 g sifted	100 g sifted	25 g sifted	-

MYCOTOXIN RESULTS FOR THE 2008/2009 SEASON

Region	Class and Grade	Aflatoxin	Deoxynivalenol	Ochratoxin
		ppb LOD < 2.0	ppm LOD < 0.25	ppb LOD = 1.0
1	B2	2	0	0
2	B3	2	0	0
3	B3	2	0	0
3	B4	2	0	0
4	B3	2	0	0
5	B1	0	0	0
6	B2	0	0	0
8	B3	2	0.9	0
10	B2	2	0.5	0
11	UT	3	0.45	0
12	COW	0	0	0
15	B2	0	0	0
17	UT	0	0	1
18	B2	3	0.45	0
19	B2	0	2.4	0
20	B2	3	0.75	0
21	B3	0	1.3	0
22	B1	0	0.35	0
23	B2	3	0	0
24	B1	2	0	0
25	B1	0	0	0
26	B1	2	0	0
27	B1	0	0	0
28	B1	3	0.9	0
30	B1	0	0.7	0
32	B2	2	0.55	0
33	B2	0	0.65	0
34	B1	0	0.9	0
35	B2	0	0.25	0
36	B1	2	3.0	0
Average 2008/2009 [max. value]		1.23 [3]	0.47 [3.0]	0.03 [1]
Average 2007/2008 [max. value]		0.33 [5.00]	1.36 [2.70]	0.33 [2.80]
Average 2006/2007 [max. value]		0.00 [<5]	1.46 [2.40]	0.17 [1.40]

Please note:

Limit of detection (LOD) means the lowest level that can be detected accurately by the ROSA-M Reader. All results < LOD are reported as 0.

RSA WHEAT CROP QUALITY SUMMARY

RSA Crop Quality 2006/2007 and 2008/2009 Seasons

Country of origin	RSA Crop Average 2006/2007							RSA Crop Average 2008/2009						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	135	130	104	42	64	5	480	126	121	101	49	67	16	480
WHEAT														
GRADING														
Protein (12% mb), %	12.73	11.48	10.73	9.84	10.93	11.00	11.45	13.27	12.00	11.25	10.69	11.54	12.69	12.00
Moisture, %	10.5	10.4	10.5	12.6	10.5	10.8	10.7	11.5	11.1	11.0	10.9	11.0	11.6	11.2
Falling number, sec	347	362	357	332	346	260	351	364	395	382	346	393	364	378
1000 Kernel mass (13% mb), g	36.4	37.8	37.9	37.9	36.4	35.7	37.2	37.5	38.5	39.1	40.6	37.4	36.6	38.3
Hlm (dirty), kg/hl	79.3	78.9	77.7	77.8	77.0	75.8	78.4	78.6	77.8	77.2	77.4	76.4	76.0	77.6
Screenings (<1.8mm), %	1.44	1.47	1.72	1.52	3.45	3.39	1.81	1.36	1.52	1.74	1.33	2.77	2.76	1.72
Gravel, stones, turf and glass, %	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.13	0.01
Foreign matter, %	0.07	0.08	0.09	0.10	0.10	0.08	0.08	0.09	0.09	0.08	0.10	0.17	0.29	0.11
Other grain & unthreshed ears, %	0.26	0.29	0.35	0.36	0.55	0.22	0.33	0.20	0.24	0.29	0.26	0.34	0.32	0.26
Heat damaged kernels, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Immature kernels, %	0.07	0.06	0.05	0.04	0.02	0.02	0.05	0.12	0.07	0.04	0.05	0.06	0.04	0.07
Insect damaged kernels, %	0.39	0.43	0.54	0.57	0.66	4.14	0.53	0.27	0.42	0.46	0.54	1.13	4.02	0.62
Heavily frost damaged kernels, %	0.03	0.02	0.03	0.00	0.01	0.30	0.03	0.00	0.00	0.00	0.02	0.01	0.00	0.00
Sprouted kernels, %	0.05	0.06	0.05	0.05	0.13	2.12	0.09	0.10	0.09	0.11	0.10	0.14	1.01	0.13
Total damaged kernels, %	0.50	0.55	0.64	0.66	0.82	6.28	0.66	0.49	0.58	0.62	0.75	1.40	5.07	0.85
Combined deviations, %	2.27	2.40	2.80	2.64	4.94	9.96	2.89	2.14	2.42	2.71	2.27	4.49	8.44	2.88
Field fungi, %	0.08	0.12	0.11	0.14	0.19	0.10	0.12	0.08	0.12	0.09	0.04	0.12	0.23	0.10
Storage fungi, %	0.01	0.01	0.03	0.04	0.02	0.02	0.02	0.01	0.01	0.01	0.00	0.01	0.04	0.01
Ergot, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Noxious seeds (Crotalaria sp, Datura sp..)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Noxious seeds (Argemone mexicana..)	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	26	25	21	11	15	2	100	22	23	22	12	16	5	100
BÜHLER EXTRACTION, %	75.2	75.4	75.6	74.7	74.6	72.3	75.1	76.0	76.1	75.7	75.2	75.2	75.1	75.7
FLOUR														
Colour, KJ	-1.1	-1.3	-1.4	-1.5	-0.8	-1.0	-1.2	-1.3	-1.7	-1.7	-1.6	-1.5	-0.9	-1.5
100g BAKING TEST														
Baking water absorption, %	61.7	60.3	59.6	58.7	59.8	60.5	60.3	61.9	60.8	60.0	60.0	60.3	60.1	60.7
Loaf volume, cm ³	893	824	794	718	776	788	816	956	909	870	849	892	926	902
Evaluation	1	1	1	2	1	2	1	1	0	0	1	0	0	0
FARINOGRAM														
Water absorption, %	63.0	61.7	60.5	60.0	60.5	61.5	61.4	62.2	61.1	60.4	60.9	60.7	60.6	61.1
Development time, min	4.6	3.7	2.9	2.1	2.7	2.4	3.4	5.0	4.1	3.6	3.1	3.8	3.7	4.0
Stability, mm	7.2	6.3	5.7	4.5	5.6	6.2	6.1	8.6	7.7	7.3	6.8	7.4	7.4	7.6
Mixing tolerance index, BU	45	50	52	62	53	47	51	42	42	44	46	45	43	43

RSA Crop Quality of 2006/2007 and 2008/2009 Seasons

Country of origin	RSA Crop Average 2006/2007							RSA Crop Average 2008/2009						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	26	25	21	11	15	2	100	22	23	22	12	16	5	100
ALVEOGRAM														
Strength (S) , cm ²	42.3	37.5	33.7	32.0	33.9	38.0	36.8	42.4	38.0	35.6	35.8	37.2	36.6	38.0
Stability (P), mm	88	87	82	87	80	95	85	85	83	82	87	82	78	83
Distensibility (L), mm	110	100	95	80	99	93	99	111	102	95	88	101	114	101
P/L	0.82	0.93	0.92	1.25	0.90	1.20	0.93	0.80	0.86	0.93	1.10	0.94	0.91	0.90
EXTENSOGRAM														
Strength, cm ²	94	80	75	72	80	98	82	101	89	83	85	90	89	90
Max. height, BU	331	323	315	328	327	383	326	348	330	330	337	340	325	336
Extensibility, mm	195	173	164	152	168	175	174	201	184	172	174	179	187	183
MIXOGRAM														
Peak time, min	2.4	2.5	2.6	2.9	2.7	2.9	2.6	2.5	2.6	2.7	2.7	2.7	2.8	2.6
Absorption, %	62.1	60.6	59.8	59.0	60.0	60.2	60.5	62.3	61.0	60.6	60.6	61.1	61.4	61.2
MYCOTOXINS														
Aflatoxin, ppb [max. value]	0.00 [<5]							1.23 [3.00]						
Deoxynivalenol, ppm [max. value]	1.46 [2.40]							0.47 [3.00]						
Ochratoxin A, ppb [max. value]	0.17 [1.40]							0.03 [1.00]						
No. of samples	30							30						

RSA WHEAT CROP QUALITY SUMMARY

RSA Crop Quality 2007/2008 and 2008/2009 Seasons

Country of origin	RSA Crop Average 2007/2008							RSA Crop Average 2008/2009						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	64	137	131	70	54	24	480	126	121	101	49	67	16	480
WHEAT														
GRADING														
Protein (12% mb), %	12.48	11.42	10.59	9.58	10.99	11.66	11.03	13.27	12.00	11.25	10.69	11.54	12.69	12.00
Moisture, %	11.6	11.4	12.0	11.1	11.4	11.8	11.6	11.5	11.1	11.0	10.9	11.0	11.6	11.2
Falling number, sec	369	368	359	351	364	323	360	364	395	382	346	393	364	378
1000 Kernel mass (13% mb), g	38.9	38.7	39.1	39.7	36.4	38.1	38.7	37.5	38.5	39.1	40.6	37.4	36.6	38.3
Hlm (dirty), kg/hl	78.9	78.7	78.0	78.5	76.2	75.5	78.1	78.6	77.8	77.2	77.4	76.4	76.0	77.6
Screenings (<1,8mm), %	1.42	1.36	1.33	1.16	3.01	3.02	1.60	1.36	1.52	1.74	1.33	2.77	2.76	1.72
Gravel, stones, turf and glass, %	0.01	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.13	0.01
Foreign matter, %	0.05	0.05	0.05	0.07	0.08	0.19	0.06	0.09	0.09	0.08	0.10	0.17	0.29	0.11
Other grain & unthreshed ears, %	0.23	0.25	0.30	0.26	0.54	0.32	0.30	0.20	0.24	0.29	0.26	0.34	0.32	0.26
Heat damaged kernels, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Immature kernels, %	0.12	0.11	0.06	0.06	0.16	0.14	0.10	0.12	0.07	0.04	0.05	0.06	0.04	0.07
Insect damaged kernels, %	0.24	0.17	0.15	0.16	0.75	2.08	0.33	0.27	0.42	0.46	0.54	1.13	4.02	0.62
Heavily frost damaged kernels, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.00	0.00
Sprouted kernels, %	0.23	0.19	0.15	0.14	0.17	1.08	0.22	0.10	0.09	0.11	0.10	0.14	1.01	0.13
Total damaged kernels, %	0.59	0.47	0.36	0.35	1.08	3.30	0.65	0.49	0.58	0.62	0.75	1.40	5.07	0.85
Combined deviations, %	2.30	2.13	2.04	1.85	4.71	6.85	2.61	2.14	2.42	2.71	2.27	4.49	8.44	2.88
Field fungi, %	0.14	0.10	0.09	0.06	0.18	0.14	0.11	0.08	0.12	0.09	0.04	0.12	0.23	0.10
Storage fungi, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.01	0.04	0.01
Ergot, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Noxious seeds (Crotalaria sp, Datura sp..)	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Noxious seeds (Argemone mexicana..)	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	23	26	18	14	13	6	100	22	23	22	12	16	5	100
BÜHLER EXTRACTION, %	75.7	76.0	75.7	74.9	75.1	75.4	75.6	76.0	76.1	75.7	75.2	75.2	75.1	75.7
FLOUR														
Colour, KJ	-1.7	-1.9	-2.1	-2.4	-1.7	-0.8	-1.9	-1.3	-1.7	-1.7	-1.6	-1.5	-0.9	-1.5
100g BAKING TEST														
Baking water absorption, %	61.5	60.3	59.4	57.7	59.6	61.2	60.0	61.9	60.8	60.0	60.0	60.3	60.1	60.7
Loaf volume, cm ³	892	857	802	704	800	873	827	956	909	870	849	892	926	902
Evaluation	1	1	1	2	1	1	1	1	0	0	1	0	0	0
FARINOGRAM														
Water absorption, %	62.3	61.0	60.2	59.3	59.8	61.0	60.8	62.2	61.1	60.4	60.9	60.7	60.6	61.1
Development time, min	4.8	3.8	2.9	2.0	3.0	4.4	3.5	5.0	4.1	3.6	3.1	3.8	3.7	4.0
Stability, mm	9.0	7.6	6.6	4.5	6.4	7.9	7.2	8.6	7.7	7.3	6.8	7.4	7.4	7.6
Mixing tolerance index, BU	37	41	44	58	46	43	44	42	42	44	46	45	43	43

RSA Crop Quality of 2007/2008 and 2008/2009 Seasons

Country of origin	RSA Crop Average 2007/2008							RSA Crop Average 2008/2009						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	23	26	18	14	13	6	100	22	23	22	12	16	5	100
ALVEOGRAM														
Strength (S) , cm ²	47.9	42.8	39.8	33.0	39.5	46.9	41.9	42.4	38.0	35.6	35.8	37.2	36.6	38.0
Stability (P), mm	92	86	89	96	86	83	89	85	83	82	87	82	78	83
Distensibility (L), mm	118	114	101	75	101	127	106	111	102	95	88	101	114	101
P/L	0.81	0.78	0.98	1.54	0.93	0.67	0.94	0.80	0.86	0.93	1.10	0.94	0.91	0.90
EXTENSOGRAM														
Strength, cm ²	106	98	93	77	97	114	97	101	89	83	85	90	89	90
Max. height, BU	377	371	384	371	388	392	378	348	330	330	337	340	325	336
Extensibility, mm	195	184	172	142	170	200	178	201	184	172	174	179	187	183
MIXOGRAM														
Peak time, min	2.6	2.6	2.9	3.0	2.8	2.8	2.8	2.5	2.6	2.7	2.7	2.7	2.8	2.6
Absorption, %	62.4	61.0	60.0	58.7	60.2	61.8	60.8	62.3	61.0	60.6	60.6	61.1	61.4	61.2
MYCOTOXINS														
Aflatoxin, ppb [max.value]	0.33 [5.00]							1.23 [3.00]						
Deoxynivalenol, ppm [max. value]	1.36 [2.70]							0.47 [3.00]						
Ochratoxin A, ppb [max. value]	0.33 [2.80]							0.03 [1.00]						
No. of samples	30							30						

RSA WHEAT PRODUCTION AREAS



WHEAT SEED SOLD BY COMMERCIAL GRAIN SILO OWNERS TO WHEAT PRODUCERS FOR THE 2008 PLANTING SEASON

Cultivar	%	Cultivar	%
SST 027	17.95	SST 047	0.52
SST 88	15.19	SST 825	0.457
SST 015	12.69	Tugela	0.456
SST 835	10.01	PAN 3120	0.410
CRN 826	9.92	PAN 3377	0.330
Duzi	6.10	AFG 5548	0.329
SST 57	3.29	Steenbras	0.284
SST 876	3.15	SST 399	0.220
Elands	2.98	Baviaans	0.216
Komati	2.59	SST 966	0.159
SST 806	2.01	SST 334	0.135
Krokodil	1.85	PAN 3144	0.058
SST 822	1.66	PAN 3434	0.056
SST 356	1.45	SST 322	0.055
Kariega	1.12	PAN 3364	0.044
Matlabas	0.97	Inia	0.039
Olifants	0.76	SST 367	0.027
PAN 3349	0.74	SST 935	0.024
PAN 3118	0.60	SST 946	0.023
Gariep	0.58	Marico	0.004
Betta DN	0.53	SST 363	0.001
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			100

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

METHODS

GRADING:

Full grading was done in accordance with the Regulations relating to the grading, packing and marking of wheat intended for sale in the Republic of South Africa (No. R. 905 of 10 July 1998 as amended by Nos. R. 1421 of 6 November 1998, R. 876 of 14 September 2001 and R. 979 of 19 July 2002, R. 1210 of 29 August 2003 and Dispensation: Reference No. 21/4/1/1 and Serial No. 791 of 25 July 2003).

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. Hectolitre mass provides a measure of the bulk density of the 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. A standard sieve is a hand sieve which consists of a slotted, stainless steel sieve with a thickness of 1,0 mm, mounted in durable plastic, with apertures 1,8 mm wide and 12,7 mm long, which fits into an aluminum pan with a solid bottom, and has an inner diameter of 300 mm and an outer diameter of 302,5 mm.

Damaged kernels means wheat kernels and pieces of wheat kernels -

- (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 rootlets are clearly visible.

THOUSAND KERNEL MASS:

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

FALLING NUMBER MILLING:

At least 300 g of wheat is cleaned by using the standard 1,8 mm sieve and by removing coarser impurities by hand. The sample is then milled on the falling number hammer mill fitted with a 0,8 mm screen.

MOISTURE:

ICC Standard No. 110/1 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 AACC method 46-30, 1999.

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

FALLING NUMBER:

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

ICC Standard No. 107/1, 1995 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 water added to the flour is adjusted according to the flour protein content. Industry Accepted Method 020 based on AACC method 54-40A, 1999 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 damped to between 15,0 % and 16,0 % moisture according to the wheat moisture and kernel hardness and allowed to stand for 20 hours. Samples are then milled on a standard Bühler MLU 202 mill and passed through a bran finisher.

BÜHLER EXTRACTION:

The extraction represents the flour yield after milling plus flour obtained from bran that passed through a bran finisher. Flour extraction is calculated from the mass of the total products. Bühler MLU 202 mill set for South African wheat, mill settings and sieve sizes deviate from AACC method 26-21A, 1999.

COLOUR:

The Kent Jones colour is determined by following FTP Method No. 0007/3, 7/1991. This method

determines the influence of the branny material present in flour by measuring reflectance with a light source in the green band of the light spectrum. The lower the Kent Jones colour, the lighter the flour.

FARINOGRAPH:

AACC method 54-21, 1999 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 that have 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, 1992 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.121,1992 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 AACC Method 10-10B, 1999, provides an optimized bread-making method for evaluating bread wheat flour quality and a variety of dough ingredients by a straight-dough method in which all ingredients are incorporated in the initial mixing step.

Keys for the evaluation of the 100g Baking test:

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

Please note:

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

MYCOTOXIN ANALYSES

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

The mycotoxin analyses were carried out using ROSA (Rapid One Step Assay) Quantitative tests, which are lateral flow immuno assay tests, together with the ROSA-M reader for measuring the mycotoxin content. Thirty samples of the 480 wheat crop samples were tested for aflatoxin, deoxynivalenol and ochratoxin.

Fungi	Toxin	Method reference
<i>Aspergillus flavus</i>	Aflatoxin	ROSA Quantitative Method, 28 May 2008
<i>Aspergillus ochraceus</i> and several species of <i>Penicillium sp.</i>	Ochratoxin	ROSA Quantitative Method, 10 September 2008
<i>Fusarium graminearum</i>	Deoxynivalenol (DON)	ROSA Quantitative Method, 11 February 2009

2007/2008 IMPORTED WHEAT QUALITY - ARGENTINA (1 Oct 2007 to 30 Sep 2008)

2007/2008 Imported Wheat Quality Versus 2007/2008 RSA Wheat Quality

Country of origin	Argentina							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	-	13	3	-	28	1	45	64	137	131	70	54	24	480
WHEAT														
GRADING														
Protein (12% mb), %	-	11.21	11.41	-	11.36	11.14	11.31	12.48	11.42	10.59	9.58	10.99	11.66	11.03
Moisture, %	-	11.8	12.1	-	11.9	11.9	11.8	11.6	11.4	12.0	11.1	11.4	11.8	11.6
Falling number, sec	-	406	337	-	399	414	397	369	368	359	351	364	323	360
1000 Kernel mass (13% mb), g	-	35.1	37.8	-	34.0	36.2	34.6	38.9	38.7	39.1	39.7	36.4	38.1	38.7
Hlm (dirty), kg/hl	-	79.5	77.2	-	78.1	77.7	78.5	78.9	78.7	78.0	78.5	76.2	75.5	78.1
Screenings (<1.8mm), %	-	2.33	2.17	-	3.75	3.04	3.22	1.42	1.36	1.33	1.16	3.01	3.02	1.60
Gravel, stones, turf and glass, %	-	0.00	0.00	-	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.00
Foreign matter, %	-	0.04	0.09	-	0.18	0.12	0.13	0.05	0.05	0.05	0.07	0.08	0.19	0.06
Other grain & unthreshed ears, %	-	0.10	0.30	-	0.21	0.48	0.19	0.23	0.25	0.30	0.26	0.54	0.32	0.30
Heat damaged kernels, %	-	0.04	0.03	-	0.02	0.16	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Immature kernels, %	-	0.07	0.04	-	0.07	0.12	0.07	0.12	0.11	0.06	0.06	0.16	0.14	0.10
Insect damaged kernels, %	-	0.18	0.14	-	0.13	0.18	0.14	0.24	0.17	0.15	0.16	0.75	2.08	0.33
Heavily frost damaged kernels, %	-	0.00	0.03	-	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sprouted kernels, %	-	0.29	0.50	-	0.12	0.24	0.20	0.23	0.19	0.15	0.14	0.17	1.08	0.22
Total damaged kernels, %	-	0.58	0.71	-	0.34	0.70	0.44	0.59	0.47	0.36	0.35	1.08	3.30	0.65
Combined deviations, %	-	3.06	3.11	-	4.48	4.34	3.98	2.30	2.13	2.04	1.85	4.71	6.85	2.61
Field fungi, %	-	0.23	0.26	-	0.31	0.08	0.28	0.14	0.10	0.09	0.06	0.18	0.14	0.11
Storage fungi, %	-	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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 sp, Datura sp..)	-	0	0	-	0	0	0	0	0	0	0	0	1	0
Noxious seeds (Argemone mexicana..)	-	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	Yes	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	-	13	3	-	28	1	45	23	26	18	14	13	6	100
BÜHLER EXTRACTION, %	-	73.8	73.4	-	73.5	72.9	73.6	75.7	76.0	75.7	74.9	75.1	75.4	75.6
FLOUR														
Colour, KJ	-	-1.0	-0.6	-	-0.9	-0.7	-0.9	-1.7	-1.9	-2.1	-2.4	-1.7	-0.8	-1.9
100g BAKING TEST														
Baking water absorption, %	-	59.8	60.1	-	60.0	59.9	59.9	61.5	60.3	59.4	57.7	59.6	61.2	60.0
Loaf volume, cm ³	-	686	723	-	704	660	699	892	857	802	704	800	873	827
Evaluation	-	4	3	-	4	5	4	1	1	1	2	1	1	1
FARINOGRAM														
Water absorption, %	-	60.4	60.2	-	60.1	60.9	60.2	62.3	61.0	60.2	59.3	59.8	61.0	60.8
Development time, min	-	1.8	1.8	-	1.8	1.9	1.8	4.8	3.8	2.9	2.0	3.0	4.4	3.5
Stability, mm	-	3.1	2.8	-	3.4	2.3	3.2	9.0	7.6	6.6	4.5	6.4	7.9	7.2
Mixing tolerance index, BU	-	70	72	-	67	78	68	37	41	44	58	46	43	44

2007/2008 Imported Wheat Quality Versus 2007/2008 RSA Wheat Quality

Country of origin	Argentina							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	-	13	3	-	28	1	45	23	26	18	14	13	6	100
ALVEOGRAM														
Strength (S) , cm ²	-	38.4	37.2	-	38.8	33.3	38.4	47.9	42.8	39.8	33.0	39.5	46.9	41.9
Stability (P), mm	-	119	112	-	114	124	116	92	86	89	96	86	83	89
Distensibility (L), mm	-	54	60	-	58	41	56	118	114	101	75	101	127	106
P/L	-	2.30	2.08	-	2.05	3.00	2.15	0.81	0.78	0.98	1.54	0.93	0.67	0.94
EXTENSOGRAM														
Strength, cm ²	-	93	90	-	91	94	91	106	98	93	77	97	114	97
Max. height, BU	-	449	435	-	443	460	445	377	371	384	371	388	392	378
Extensibility, mm	-	145	146	-	143	143	144	195	184	172	142	170	200	178
MIXOGRAM														
Peak time, min	-	4.0	4.3	-	4.0	4.9	4.1	2.6	2.6	2.9	3.0	2.8	2.8	2.8
Absorption, %	-	59.9	60.1	-	60.0	59.9	60.0	62.4	61.0	60.0	58.7	60.2	61.8	60.8
MYCOTOXINS														
Aflatoxin, ppb [max.value]	0.00 [<5]							0.33 [5.00]						
Deoxynivalenol, ppm [max. value]	1.11 [3.50]							1.36 [2.70]						
Ochratoxin A, ppb [max. value]	0.27 [1.90]							0.33 [2.80]						
No. of samples	15							30						

2007/2008 IMPORTED WHEAT QUALITY - CANADA (1 Oct 2007 to 30 Sep 2008)

2007/2008 Imported Wheat Quality Versus 2007/2008 RSA Wheat Quality

Country of origin	Canada							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	4	-	1	1	14	-	20	64	137	131	70	54	24	480
WHEAT														
GRADING														
Protein (12% mb), %	13.28	-	10.19	9.76	13.42	-	13.05	12.48	11.42	10.59	9.58	10.99	11.66	11.03
Moisture, %	12.2	-	12.2	12.6	12.4	-	12.3	11.6	11.4	12.0	11.1	11.4	11.8	11.6
Falling number, sec	403	-	318	327	389	-	385	369	368	359	351	364	323	360
1000 Kernel mass (13% mb), g	34.0	-	32.1	32.4	31.8	-	32.2	38.9	38.7	39.1	39.7	36.4	38.1	38.7
Hlm (dirty), kg/hl	80.8	-	74.3	74.1	78.0	-	78.2	78.9	78.7	78.0	78.5	76.2	75.5	78.1
Screenings (<1.8mm), %	2.52	-	2.80	2.96	4.33	-	3.82	1.42	1.36	1.33	1.16	3.01	3.02	1.60
Gravel, stones, turf and glass, %	0.00	-	0.00	0.00	0.00	-	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.00
Foreign matter, %	0.05	-	0.06	0.12	0.05	-	0.06	0.05	0.05	0.05	0.07	0.08	0.19	0.06
Other grain & unthreshed ears, %	0.46	-	0.24	0.24	0.34	-	0.36	0.23	0.25	0.30	0.26	0.54	0.32	0.30
Heat damaged kernels, %	0.02	-	0.00	0.00	0.03	-	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Immature kernels, %	0.02	-	0.00	0.00	0.00	-	0.01	0.12	0.11	0.06	0.06	0.16	0.14	0.10
Insect damaged kernels, %	0.14	-	0.14	0.08	0.15	-	0.14	0.24	0.17	0.15	0.16	0.75	2.08	0.33
Heavily frost damaged kernels, %	0.04	-	0.00	0.00	0.03	-	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sprouted kernels, %	0.06	-	0.56	0.24	0.16	-	0.16	0.23	0.19	0.15	0.14	0.17	1.08	0.22
Total damaged kernels, %	0.24	-	0.70	0.32	0.34	-	0.34	0.59	0.47	0.36	0.35	1.08	3.30	0.65
Combined deviations, %	3.27	-	3.80	3.64	5.06	-	4.57	2.30	2.13	2.04	1.85	4.71	6.85	2.61
Field fungi, %	0.04	-	0.00	0.00	0.06	-	0.05	0.14	0.10	0.09	0.06	0.18	0.14	0.11
Storage fungi, %	0.02	-	0.00	0.00	0.05	-	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ergot, %	0.02	-	0.00	0.00	0.01	-	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Noxious seeds (Crotalaria sp, Datura sp..)	0	-	0	0	0	-	0	0	0	0	0	0	1	0
Noxious seeds (Argemone mexicana..)	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	4	-	1	1	14	-	20	23	26	18	14	13	6	100
BÜHLER EXTRACTION, %	75.3	-	72.7	73.2	74.2	-	74.3	75.7	76.0	75.7	74.9	75.1	75.4	75.6
FLOUR														
Colour, KJ	-1.4	-	-0.2	0.1	-1.0	-	-1.0	-1.7	-1.9	-2.1	-2.4	-1.7	-0.8	-1.9
100g BAKING TEST														
Baking water absorption, %	62.8	-	51.6	51.6	62.6	-	61.6	61.5	60.3	59.4	57.7	59.6	61.2	60.0
Loaf volume, cm ³	889	-	640	635	897	-	870	892	857	802	704	800	873	827
Evaluation	2	-	3	3	2	-	2	1	1	1	2	1	1	1
FARINOGRAM														
Water absorption, %	62.7	-	51.0	49.8	60.7	-	60.1	62.3	61.0	60.2	59.3	59.8	61.0	60.8
Development time, min	4.0	-	1.4	1.4	3.8	-	3.6	4.8	3.8	2.9	2.0	3.0	4.4	3.5
Stability, mm	8.8	-	2.6	2.1	8.1	-	7.7	9.0	7.6	6.6	4.5	6.4	7.9	7.2
Mixing tolerance index, BU	39	-	54	81	42	-	44	37	41	44	58	46	43	44

2007/2008 Imported Wheat Quality Versus 2007/2008 RSA Wheat Quality

Country of origin	Canada							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	4	-	1	1	14	-	20	23	26	18	14	13	6	100
ALVEOGRAM														
Strength (S) , cm ²	52.2	-	17.4	16.4	50.2	-	47.3	47.9	42.8	39.8	33.0	39.5	46.9	41.9
Stability (P), mm	103	-	39	38	94	-	90	92	86	89	96	86	83	89
Distensibility (L), mm	100	-	96	95	107	-	104	118	114	101	75	101	127	106
P/L	1.04	-	0.41	0.40	0.90	-	0.88	0.81	0.78	0.98	1.54	0.93	0.67	0.94
EXTENSOGRAM														
Strength, cm ²	107	-	-	-	123	-	121	106	98	93	77	97	114	97
Max. height, BU	388	-	-	-	444	-	437	377	371	384	371	388	392	378
Extensibility, mm	192	-	-	-	195	-	195	195	184	172	142	170	200	178
MIXOGRAM														
Peak time, min	3.2	-	4.3	5.5	3.6	-	3.6	2.6	2.6	2.9	3.0	2.8	2.8	2.8
Absorption, %	62.8	-	58.6	58.2	62.8	-	62.4	62.4	61.0	60.0	58.7	60.2	61.8	60.8
MYCOTOXINS														
Aflatoxin, ppb [max.value]	0.33 [<5]							0.33 [5.00]						
Deoxynivalenol, ppm [max. value]	0.23 [0.70]							1.36 [2.70]						
Ochratoxin A, ppb [max. value]	0.75 [2.00]							0.33 [2.80]						
No. of samples	6							30						

2007/2008 IMPORTED WHEAT QUALITY - GERMANY (1 Oct 2007 to 30 Sep 2008)

2007/2008 Imported Wheat Quality Versus 2007/2008 RSA Wheat Quality

Country of origin	Germany							RSA Crop Average						
	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
Class and Grade bread wheat														
No. of samples	-	1	-	1	-	-	2	64	137	131	70	54	24	480
WHEAT														
GRADING														
Protein (12% mb), %	-	11.62	-	11.93	-	-	11.78	12.48	11.42	10.59	9.58	10.99	11.66	11.03
Moisture, %	-	12.6	-	12.1	-	-	12.4	11.6	11.4	12.0	11.1	11.4	11.8	11.6
Falling number, sec	-	332	-	279	-	-	306	369	368	359	351	364	323	360
1000 Kernel mass (13% mb), g	-	40.3	-	37.7	-	-	39.0	38.9	38.7	39.1	39.7	36.4	38.1	38.7
Hlm (dirty), kg/hl	-	76.8	-	73.4	-	-	75.1	78.9	78.7	78.0	78.5	76.2	75.5	78.1
Screenings (<1.8mm), %	-	1.47	-	2.13	-	-	1.80	1.42	1.36	1.33	1.16	3.01	3.02	1.60
Gravel, stones, turf and glass, %	-	0.00	-	0.00	-	-	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.00
Foreign matter, %	-	0.04	-	0.10	-	-	0.07	0.05	0.05	0.05	0.07	0.08	0.19	0.06
Other grain & unthreshed ears, %	-	0.54	-	0.58	-	-	0.56	0.23	0.25	0.30	0.26	0.54	0.32	0.30
Heat damaged kernels, %	-	0.00	-	0.00	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Immature kernels, %	-	0.00	-	0.00	-	-	0.00	0.12	0.11	0.06	0.06	0.16	0.14	0.10
Insect damaged kernels, %	-	0.00	-	0.08	-	-	0.04	0.24	0.17	0.15	0.16	0.75	2.08	0.33
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, %	-	0.08	-	0.00	-	-	0.04	0.23	0.19	0.15	0.14	0.17	1.08	0.22
Total damaged kernels, %	-	0.08	-	0.08	-	-	0.08	0.59	0.47	0.36	0.35	1.08	3.30	0.65
Combined deviations, %	-	2.13	-	2.89	-	-	2.51	2.30	2.13	2.04	1.85	4.71	6.85	2.61
Field fungi, %	-	0.00	-	0.08	-	-	0.04	0.14	0.10	0.09	0.06	0.18	0.14	0.11
Storage fungi, %	-	0.00	-	0.00	-	-	0.00	0.00	0.00	0.00	0.00	0.00	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 sp, Datura sp..)	-	0	-	0	-	-	0	0	0	0	0	0	1	0
Noxious seeds (Argemone mexicana..)	-	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	-	1	-	1	-	-	2	23	26	18	14	13	6	100
BÜHLER EXTRACTION, %	-	74.8	-	73.4	-	-	74.1	75.7	76.0	75.7	74.9	75.1	75.4	75.6
FLOUR														
Colour, KJ	-	0.1	-	0.4	-	-	0.3	-1.7	-1.9	-2.1	-2.4	-1.7	-0.8	-1.9
100g BAKING TEST														
Baking water absorption, %	-	60.3	-	60.6	-	-	60.5	61.5	60.3	59.4	57.7	59.6	61.2	60.0
Loaf volume, cm ³	-	775	-	780	-	-	778	892	857	802	704	800	873	827
Evaluation	-	2	-	2	-	-	2	1	1	1	2	1	1	1
FARINOGRAM														
Water absorption, %	-	58.4	-	59.7	-	-	59.1	62.3	61.0	60.2	59.3	59.8	61.0	60.8
Development time, min	-	1.8	-	1.9	-	-	1.9	4.8	3.8	2.9	2.0	3.0	4.4	3.5
Stability, mm	-	2.9	-	2.8	-	-	2.9	9.0	7.6	6.6	4.5	6.4	7.9	7.2
Mixing tolerance index, BU	-	71	-	69	-	-	70	37	41	44	58	46	43	44

2007/2008 Imported Wheat Quality Versus 2007/2008 RSA Wheat Quality

Country of origin	Germany							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	-	1	-	1	-	-	2	23	26	18	14	13	6	100
ALVEOGRAM														
Strength (S) , cm ²	-	37.6	-	38.7	-	-	38.2	47.9	42.8	39.8	33.0	39.5	46.9	41.9
Stability (P), mm	-	104	-	110	-	-	107	92	86	89	96	86	83	89
Distensibility (L), mm	-	62	-	62	-	-	62	118	114	101	75	101	127	106
P/L	-	1.67	-	1.78	-	-	1.73	0.81	0.78	0.98	1.54	0.93	0.67	0.94
EXTENSOGRAM														
Strength, cm ²	-	87	-	84	-	-	86	106	98	93	77	97	114	97
Max. height, BU	-	430	-	425	-	-	428	377	371	384	371	388	392	378
Extensibility, mm	-	140	-	135	-	-	138	195	184	172	142	170	200	178
MIXOGRAM														
Peak time, min	-	4.2	-	3.5	-	-	3.9	2.6	2.6	2.9	3.0	2.8	2.8	2.8
Absorption, %	-	60.3	-	60.6	-	-	60.5	62.4	61.0	60.0	58.7	60.2	61.8	60.8
MYCOTOXINS														
Aflatoxin, ppb [max.value]	<5 [<5]							0.33 [5.00]						
Deoxynivalenol, ppm [max. value]	0.00 [0.00]							1.36 [2.70]						
Ochratoxin A, ppb [max. value]	0.00 [0.00]							0.33 [2.80]						
No. of samples	1							30						

2007/2008 IMPORTED WHEAT QUALITY - USA (1 Oct 2007 to 30 Sep 2008)

2007/2008 Imported Wheat Quality Versus 2007/2008 RSA Season

Country of origin	USA							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	2	3	3	1	15	-	24	64	137	131	70	54	24	480
WHEAT														
GRADING														
Protein (12% mb), %	12.65	11.48	11.46	11.88	12.14	-	12.01	12.48	11.42	10.59	9.58	10.99	11.66	11.03
Moisture, %	11.5	11.6	12.7	12.8	11.6	-	11.8	11.6	11.4	12.0	11.1	11.4	11.8	11.6
Falling number, sec	468	478	273	302	366	-	374	369	368	359	351	364	323	360
1000 Kernel mass (13% mb), g	31.4	31.7	38.9	40.8	30.4	-	32.1	38.9	38.7	39.1	39.7	36.4	38.1	38.7
Hlm (dirty), kg/hl	79.2	79.0	75.4	72.9	77.1	-	77.1	78.9	78.7	78.0	78.5	76.2	75.5	78.1
Screenings (<1,8mm), %	2.92	2.34	2.17	2.24	4.16	-	3.50	1.42	1.36	1.33	1.16	3.01	3.02	1.60
Gravel, stones, turf and glass, %	0.00	0.00	0.00	0.00	0.00	-	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.00
Foreign matter, %	0.37	0.12	0.07	0.32	0.14	-	0.16	0.05	0.05	0.05	0.07	0.08	0.19	0.06
Other grain & unthreshed ears, %	0.26	0.13	0.30	0.68	0.26	-	0.27	0.23	0.25	0.30	0.26	0.54	0.32	0.30
Heat damaged kernels, %	0.00	0.04	0.00	0.00	0.03	-	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Immature kernels, %	0.00	0.00	0.00	0.00	0.00	-	0.00	0.12	0.11	0.06	0.06	0.16	0.14	0.10
Insect damaged kernels, %	0.13	0.05	0.09	0.00	0.24	-	0.18	0.24	0.17	0.15	0.16	0.75	2.08	0.33
Heavily frost damaged kernels, %	0.00	0.00	0.32	0.32	0.02	-	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sprouted kernels, %	0.25	0.11	0.53	0.00	0.36	-	0.32	0.23	0.19	0.15	0.14	0.17	1.08	0.22
Total damaged kernels, %	0.38	0.20	0.62	0.00	0.62	-	0.52	0.59	0.47	0.36	0.35	1.08	3.30	0.65
Combined deviations, %	3.93	2.79	3.17	3.24	5.19	-	4.45	2.30	2.13	2.04	1.85	4.71	6.85	2.61
Field fungi, %	0.00	0.00	0.19	0.16	0.13	-	0.11	0.14	0.10	0.09	0.06	0.18	0.14	0.11
Storage fungi, %	0.00	0.00	0.00	0.00	0.01	-	0.01	0.00	0.00	0.00	0.00	0.00	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 sp, Datura sp..)	0	0	0	0	0	-	0	0	0	0	0	0	1	0
Noxious seeds (Argemone mexicana..)	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	2	3	3	1	15	-	24	23	26	18	14	13	6	100
BÜHLER EXTRACTION, %	74.4	73.2	73.1	73.2	73.3	-	73.4	75.7	76.0	75.7	74.9	75.1	75.4	75.6
FLOUR														
Colour, KJ	-1.2	-0.9	0.4	0.2	-0.4	-	-0.4	-1.7	-1.9	-2.1	-2.4	-1.7	-0.8	-1.9
100g BAKING TEST														
Baking water absorption, %	61.8	60.2	59.9	60.6	60.8	-	60.7	61.5	60.3	59.4	57.7	59.6	61.2	60.0
Loaf volume, cm ³	885	795	768	780	848	-	831	892	857	802	704	800	873	827
Evaluation	1	1	1	2	1	-	1	1	1	1	2	1	1	1
FARINOGRAM														
Water absorption, %	60.5	57.9	57.2	59.5	58.0	-	58.1	62.3	61.0	60.2	59.3	59.8	61.0	60.8
Development time, min	2.8	1.9	1.6	1.7	2.4	-	2.2	4.8	3.8	2.9	2.0	3.0	4.4	3.5
Stability, mm	8.6	4.0	3.0	4.0	6.4	-	5.7	9.0	7.6	6.6	4.5	6.4	7.9	7.2
Mixing tolerance index, BU	38	62	74	55	52	-	55	37	41	44	58	46	43	44

2007/2008 Imported Wheat Quality Versus 2007/2008 RSA Wheat Quality

Country of origin	USA							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	2	3	3	1	15	-	24	23	26	18	14	13	6	100
ALVEOGRAM														
Strength (S) , cm ²	56.0	44.9	32.3	38.8	44.8	-	43.9	47.9	42.8	39.8	33.0	39.5	46.9	41.9
Stability (P), mm	107	121	92	118	90	-	97	92	86	89	96	86	83	89
Distensibility (L), mm	98	62	69	58	94	-	86	118	114	101	75	101	127	106
P/L	1.12	1.95	1.47	2.01	0.98	-	1.22	0.81	0.78	0.98	1.54	0.93	0.67	0.94
EXTENSOGRAM														
Strength, cm ²	124	119	89	102	114	-	112	106	98	93	77	97	114	97
Max. height, BU	483	570	422	440	478	-	482	377	371	384	371	388	392	378
Extensibility, mm	177	147	146	162	167	-	162	195	184	172	142	170	200	178
MIXOGRAM														
Peak time, min	3.9	4.6	3.6	3.8	4.2	-	4.1	2.6	2.6	2.9	3.0	2.8	2.8	2.8
Absorption, %	61.8	60.2	59.9	60.6	61.0	-	60.8	62.4	61.0	60.0	58.7	60.2	61.8	60.8
MYCOTOXINS														
Aflatoxin, ppb [max.value]	0.91 [6.00]							0.33 [5.00]						
Deoxynivalenol, ppm [max. value]	0.29 [1.40]							1.36 [2.70]						
Ochratoxin A, ppb [max. value]	0.69 [4.00]							0.33 [2.80]						
No. of samples	11							30						

