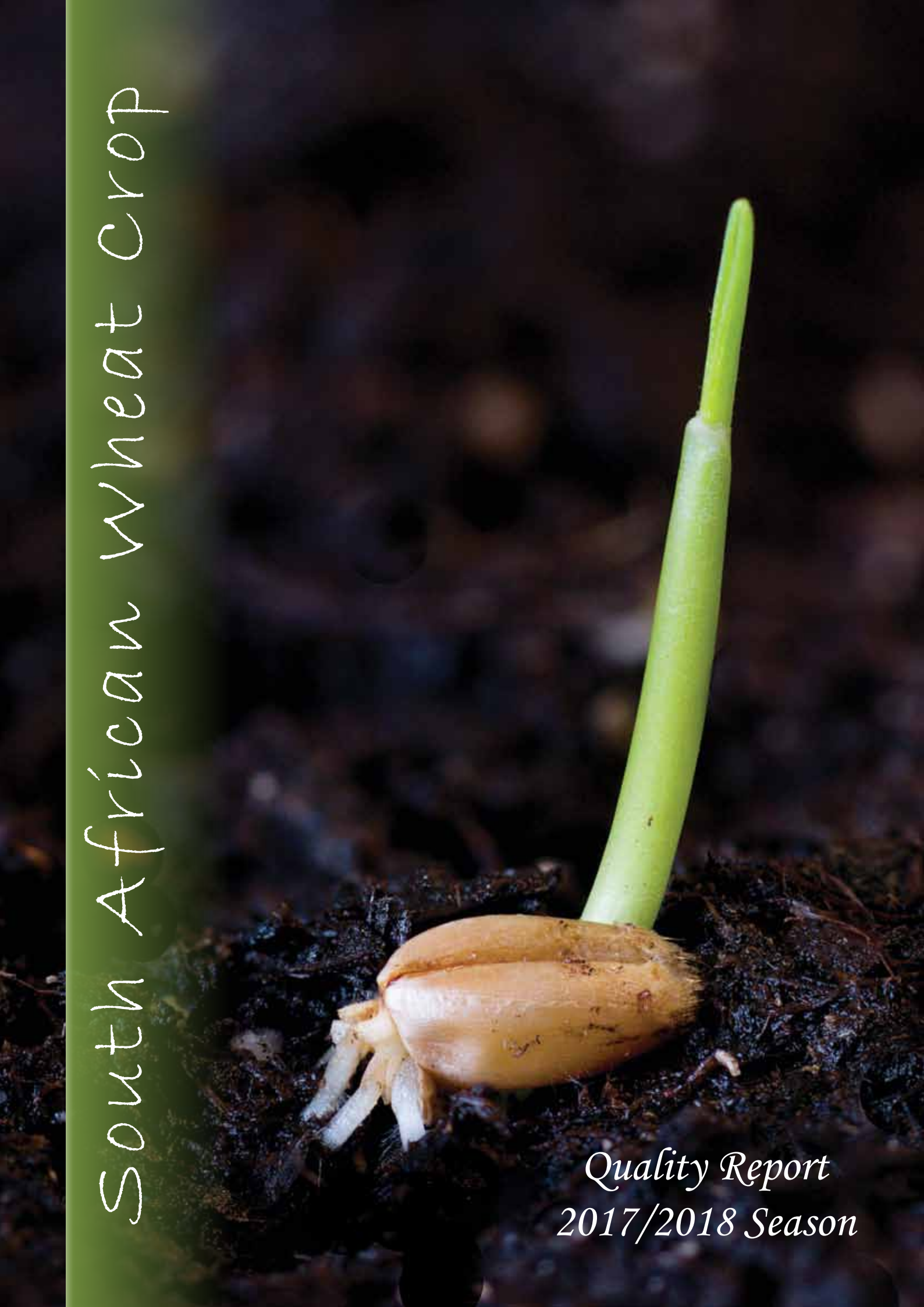
South African Wheat Crop



Quality Report
2017/2018 Season

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South African
COMMERCIAL WHEAT QUALITY FOR THE 2017/2018 SEASON

Acknowledgements

With gratitude to:

- The Winter Cereal Trust for its financial support in conducting this survey.
- Agbiz Grain and its members for their cooperation in providing the samples to make this survey possible.
- The Crop Estimates Committee (CEC) of the Department of Agriculture, Forestry and Fisheries (DAFF) for providing production related figures.
- South African Grain Information Service (SAGIS) for providing supply and demand figures relating to wheat and wheat products.
- South African Weather Service for providing seasonal climate watch and rainfall information.

Summary

The commercial wheat crop of the 2017/2018 season was set at 1.535 million tons which is 375 000 tons (19.6%) lower than the previous season's crop. A total area of 491 600 hectares was utilized for wheat production and the average yield was 3.12 tons per hectare (Figures obtained from the CEC).

The whole wheat protein average of 12.6% increased by 0.6% compared to the previous season, the ten- year national average is 11.9%. The percentage of samples having protein contents higher than 12.0% increased from 47.8% last season to 63.5%. During the 2015/2016 season this percentage was 68.2%. The average hectoliter mass was 80.7 kg/hl, slightly lower than the 81.5 kg/hl of the 2016/2017 season. The hectoliter mass of 10% of the samples was below the minimum Grade 1 requirement of 77 kg/hl, compared to the 4% of the previous season.

The average falling number this season was 371 seconds. Five of the samples analysed gave falling number values below 250 seconds and of these four were below 220 seconds. The average mixogram peak time of 2.7 minutes was equal to the previous two seasons and slightly lower than the ten-year average of 2.9 minutes.

Introduction

This report provides the results of the twentieth annual wheat crop quality survey performed by the Southern African Grain Laboratory NPC (SAGL). SAGL was established in 1997 on request of the Grain Industry. SAGL is an ISO 17025 accredited testing laboratory and participates in a number of proficiency testing schemes, both nationally and internationally as part of our ongoing quality assurance procedures to demonstrate technical competency and international comparability.

During the harvesting season (October to December for the southern production regions and November to January for the Northern production regions), a representative sample of each delivery of wheat was taken according to the prescribed wheat regulation.

A sub-sample of each of these grading samples was collected in a bin according to grade and class per silo bin at each silo. This composite bin sample was then divided and a 3 kg sample was sent to SAGL for the annual wheat crop quality survey. SAGL received and analysed 304 samples to provide as best possible a proportional representation of the production of wheat in all the different production regions.

Cultivar identification was performed on these samples and sales figures of seed sold by the commercial grain silo owners were requested. The samples were graded and the thousand kernel mass determined. Sub-samples were milled on a Quadromat Junior mill for mixograph analyses.

Composite samples were made up per class and grade for each production region and milled on a Bühler MLU 202 laboratory mill. Moisture, protein, ash and colour determinations were done and RVA analyses conducted. Rheological tests, namely gluten, mixogram, farinogram, alveogram, extensogram and 100-gram baking tests, were then performed. Multi-mycotoxin analyses were performed on 40 samples randomly selected to represent the different production regions. Amino acid analyses were also performed on a selection of samples.

The results (as averages per region) are made available weekly on the SAGL website (www.sagl.co.za) soon after the first samples are received. The hard copy reports are distributed to all Directly Affected Groups and interested parties and are also available for download in a PDF format from the website.

In addition to the quality information compared over a number of seasons, production figures (obtained from the CEC) relating to hectares planted, tons produced and yields obtained on a national as well as provincial basis, over a ten season period, are provided in this report.

SAGIS supply and demand information over several seasons is presented in table and graph format. Information with regards to the manufacture, import and export of wheat products as well as the manufacture of pan baked products is also incorporated into the report.

Data on wheat imported for domestic use during the 2016/2017 (previous) season is included and compared to the quality of the local crop over the corresponding period.

Seasonal climate watch data as well as rainfall figures for the Western Cape, Free State and North West provinces from the South African Weather Service, are also provided.

The national bread wheat grading regulations as published in the Government Gazette of 29 January 2016 are provided as the last section of the report.

The goal of this crop quality survey is to accumulate quality data on the commercial wheat crop on a national level. This valuable data reveals general tendencies and highlights quality differences in the commercial wheat produced in different local production regions. A detailed database containing reliable analytical data collected over several seasons is essential to enable industry to comment on proposed legislative levels and to supply reliable data for targeted research projects.

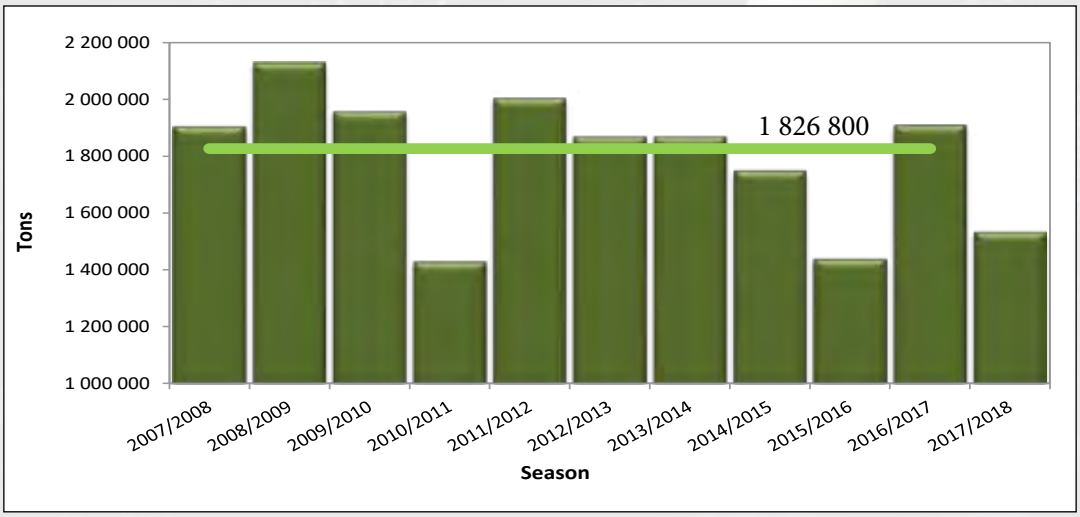
Production

Wheat contributed 79% to the total winter cereal crop production in South Africa this season. Other winter crops produced are malting barley and canola.

South Africa (comprising nine provinces) is divided into 36 crop production regions with wheat planted in approximately 28 of these regions. Please see Figure 1 (RSA Provincial map) and Figure 2 (RSA Crop Production Regional map) on pages 28 and 29.

The national CEC's estimated total production figures were revised, using as basis for the calculations, SAGIS' published figures of actual deliveries. Figures to determine on-farm usage and retentions obtained from a wheat utilization survey conducted by DAFF, were added to the SAGIS delivery figures to calculate the final crop production figures.

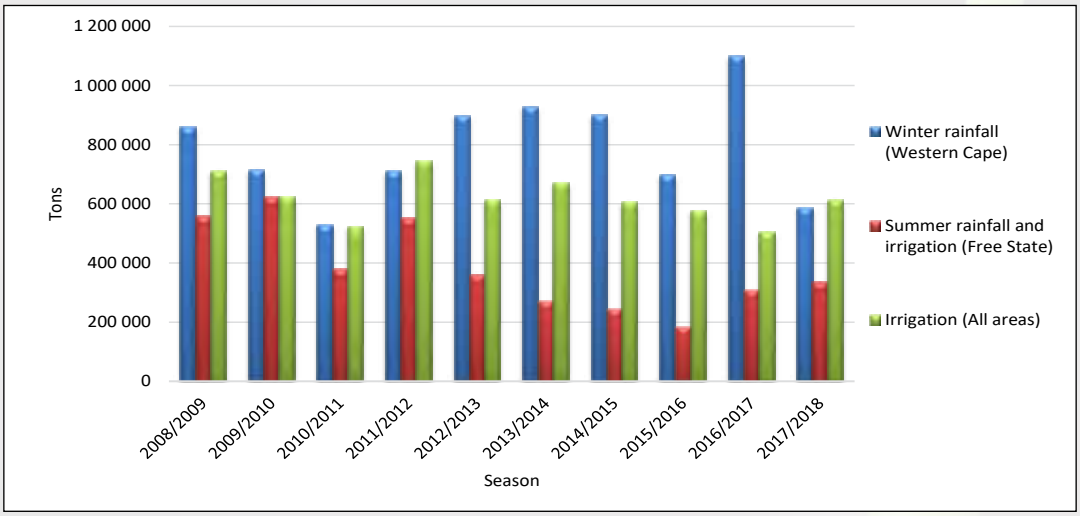
Graph 1: Wheat production in the RSA from the 2007/2008 to 2017/2018 seasons



Figures provided by the CEC.

The final production figure of 1 535 000 tons is 16% lower than the ten-year production average of 1 826 800 tons (2007/2008 to 2016/2017 seasons). The severely drought stricken Western Cape produced 586 800 tons of wheat this season, contributing 38.2% of the total crop, compared to the 57.5% of the previous season. The Free State's wheat production (336 000 tons) was the highest of the last five seasons. This figure was also the second highest nationally. The irrigation areas of the Northern Cape, the third largest wheat producing area this season, produced 311 650 tons, 45 650 tons more than last season. The remainder of the wheat was produced mainly in Limpopo with 132 000 tons, representing an increase of 27% compared to the 2016/2017 season and North West, where production increased by 20% to 83 700 tons. Please see Graphs 1 and 2.

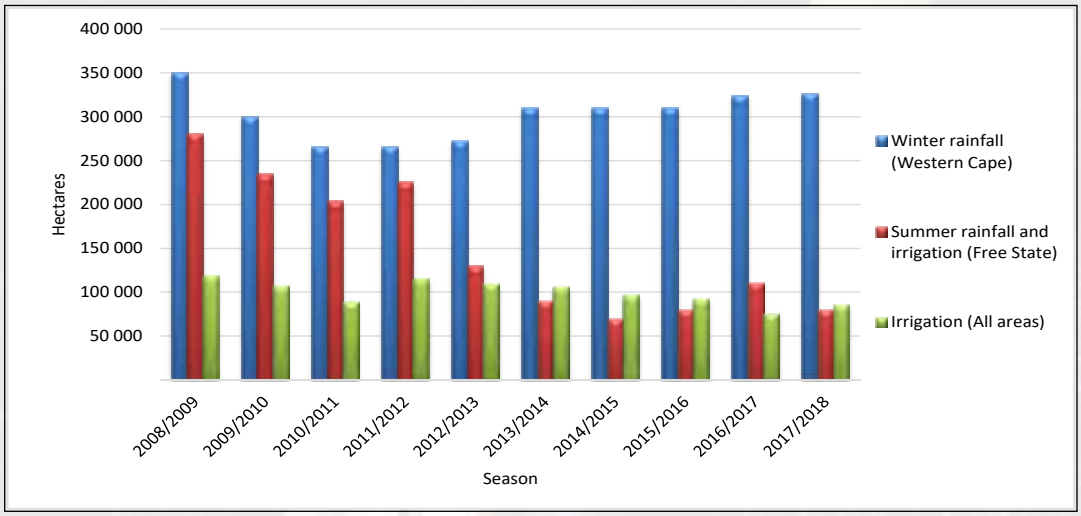
Graph 2: Wheat production figures per production area over seasons



Figures provided by the CEC.

The area utilized for wheat production decreased by 3.3% to 491 600 hectares from 508 365 hectares in the previous season. The almost 51% decline in dryland area planted in the Free State, were off set by a 56% increase in irrigation area planted and a 35% total yield increase. Nationally, dry land area decreased by 9.7% year on year and irrigation area increased by close to 22% year on year. Please see Graph 3.

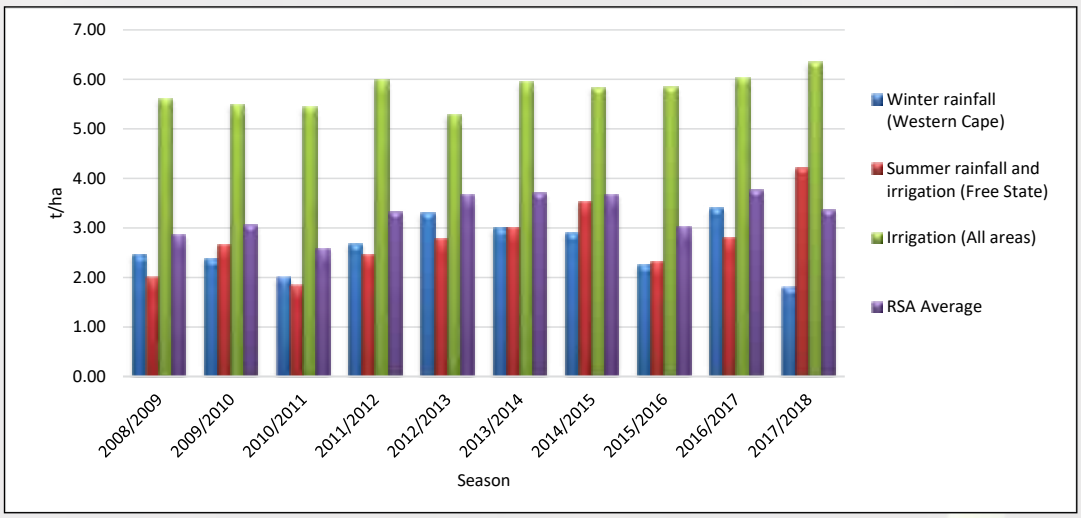
Graph 3: Area planted per production area over seasons



Figures provided by the CEC.

The yield in the main production areas ranged from 1.80 tons per hectare (t/ha) in the winter rainfall area of the Western Cape to 4.20 t/ha in the Free State (summer rainfall and irrigation) to 8.20 t/ha for irrigation wheat produced in the Northern Cape. The national yield average decreased from 3.76 t/ha in the previous season to 3.12 t/ha. The drought in the Western Cape was the main contributor to this decrease in yield. Please refer to Graph 4.

Graph 4: Average yield per production area over seasons



Figures provided by the CEC.

Table 1 provides an overview of the dry land versus irrigation wheat production in the 2017/2018 season, compared to the 2016/2017 season.

Table1: Wheat production overview over two seasons

Province	Type of production	2016/2017			2017/2018		
		Hectares planted, ha	Production, tons	Yield, t/ha	Hectares planted, ha	Production, tons	Yield, t/ha
Western Cape	Dryland	315 000	1 055 700	3.35	320 000	562 800	1.76
	Irrigation	8 000	42 500	5.31	6 000	24 000	4.00
	Total	323 000	1 098 200	3.40	326 000	586 800	1.80
Northern Cape	Dryland	1 000	1 000	1.00	-	-	-
	Irrigation	34 000	265 000	7.79	38 000	311 650	8.20
	Total	35 000	266 000	7.60	38 000	311 650	8.20
Free State	Dryland	86 000	184 000	2.14	42 500	74 000	1.74
	Irrigation	24 000	124 460	5.19	37 500	262 000	6.99
	Total	110 000	308 460	2.80	80 000	336 000	4.20
Eastern Cape	Dryland	700	1 700	2.43	600	1 400	2.33
	Irrigation	1 500	9 300	6.20	1 300	8 100	6.23
	Total	2 200	11 000	5.00	1 900	9 500	5.00
KwaZulu-Natal	Dryland	-	-	-	-	-	-
	Irrigation	6 500	37 050	5.70	7 500	45 750	6.10
	Total	6 500	37 050	5.70	7 500	45 750	6.10
Mpumalanga	Dryland	300	900	3.00	500	1 500	3.00
	Irrigation	2 000	12 900	6.45	3 500	23 900	6.83
	Total	2 300	13 800	6.00	4 000	25 400	6.35
Limpopo	Dryland	850	2 000	2.35	1 000	3 600	3.60
	Irrigation	16 150	101 700	6.30	19 000	128 400	6.76
	Total	17 000	103 700	6.10	20 000	132 000	6.60
Gauteng	Dryland	30	70	2.33	-	-	-
	Irrigation	335	2 120	6.33	700	4 200	6.00
	Total	365	2 190	6.00	700	4 200	6.00
North West	Dryland	80	200	2.50	80	200	2.50
	Irrigation	11 920	69 400	5.80	13 420	83 500	6.22
	Total	12 000	69 600	5.80	13 500	83 700	6.20
RSA	Dryland	403 960	1 245 570	3.08	364 680	643 500	1.76
	Irrigation	104 405	664 430	6.36	126 920	891 500	7.02
	Total	508 365	1 910 000	3.76	491 600	1 535 000	3.12

Figures provided by the CEC.

Supply and Demand

World wheat production for the 2017/2018 season is estimated at 757.92 million metric tons according to the *World Agricultural Supply and Demand Estimates (WASDE) report 579 of 12 July 2018*, world production for 2018/2019 is projected to be 736.26 million metric tons.

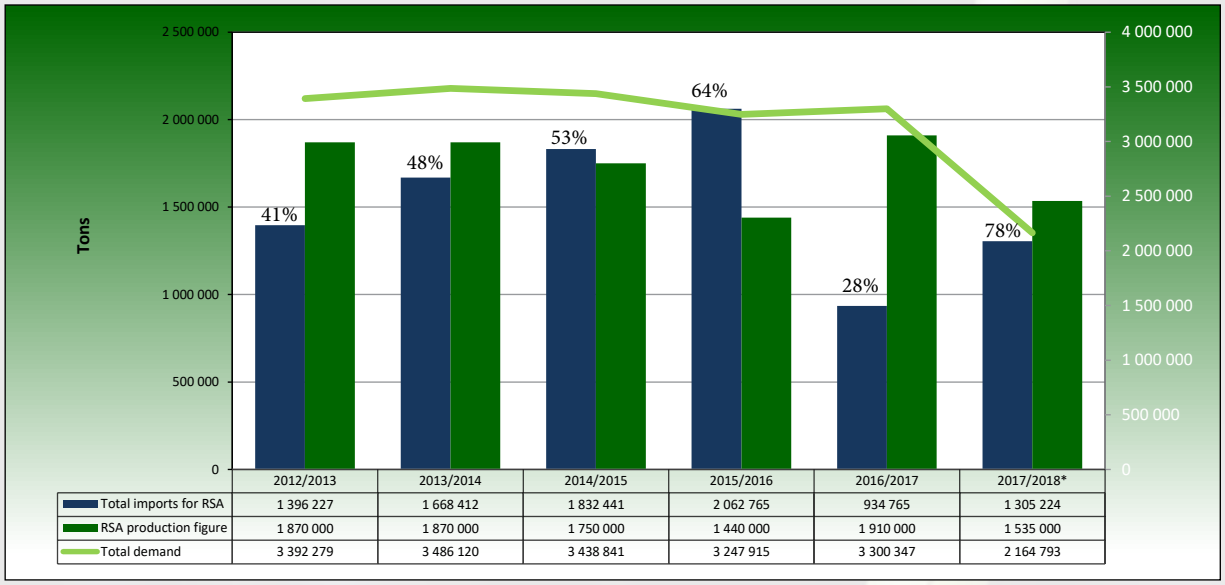
South Africa is a net importer of wheat and relies on imports to supply local demand. Demand for wheat processing (human, animal, and gristing) was fairly stable over the past four seasons, varying 63 116 tons between the highest and lowest. Eight months into the 2017/2018 season this figure stands at 2 066 592 tons, 65% of the previous season's figure.

During the 2016/2017 season 934 765 tons of wheat were imported for local use. This figure constitutes an almost 55% decrease compared to the severe drought stricken 2015/2016 season. A quarter (237 508 tons) of the total amount of wheat imported during the 2016/2017 season, originated in Germany, followed by 182 993 tons from the Russian Federation and 144 402 tons from the Czech Republic. Please see pages 86 to 107 for the quality of the wheat imported during 2016/2017. 92 898 tons of local wheat were exported to countries such as Zimbabwe, Botswana and Lesotho and Zambia during the corresponding period.

The amount of wheat imported for local consumption during the current marketing season (up to 13 July 2018), amounts to 1 677 162 tons according to SAGIS. Almost 36% of this wheat originated in the Russian Federation.

The RSA wheat marketing season commences on the 1st of October every year.

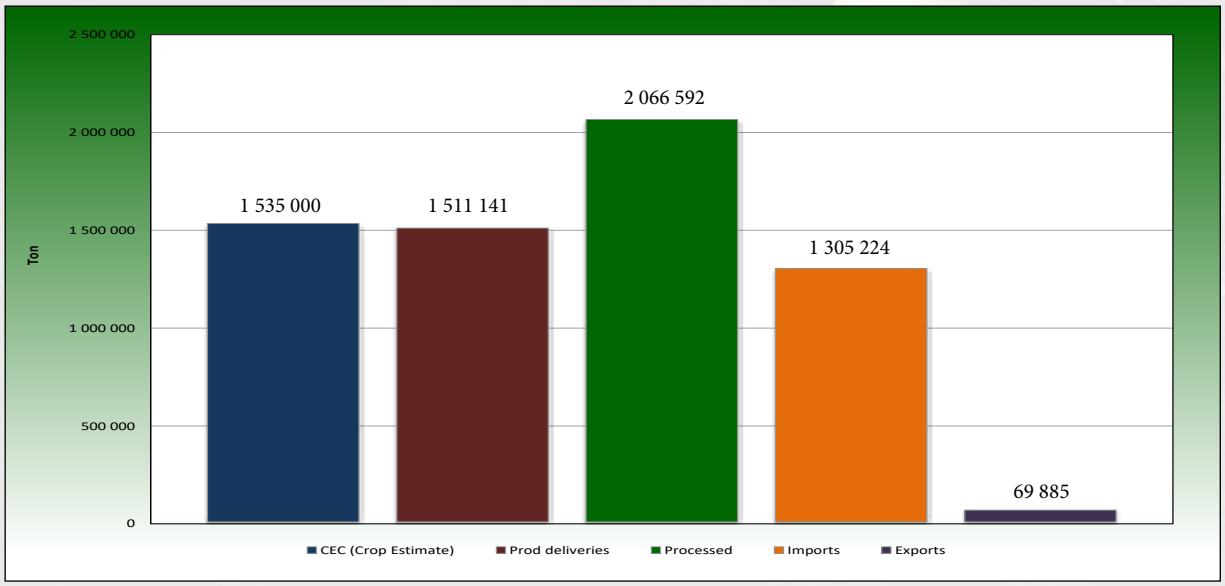
Graph 5: Wheat import figures as a percentage of the total demand over six seasons



	2012/2013	2013/2014	2014/2015	2015/2016	2016/2017	2017/2018*
Total imports for RSA	1 396 227	1 668 412	1 832 441	2 062 765	934 765	1 305 224
RSA production figure	1 870 000	1 870 000	1 750 000	1 440 000	1 910 000	1 535 000
Total demand	3 392 279	3 486 120	3 438 841	3 247 915	3 300 347	2 164 793

*2017/2018 season figure includes imports and total demand from October to May.

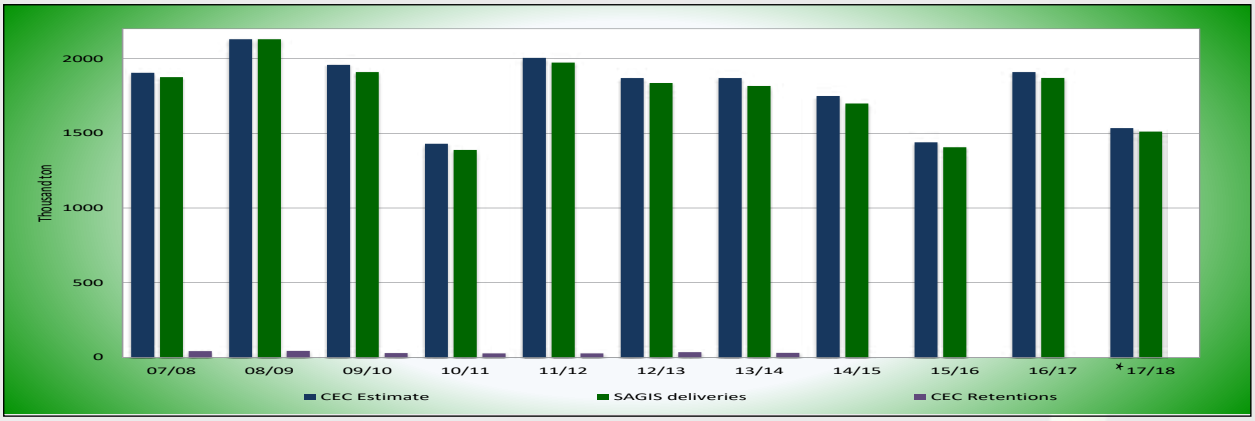
Graph 6: Wheat supply and demand overview 2017/2018 season (Oct - May)



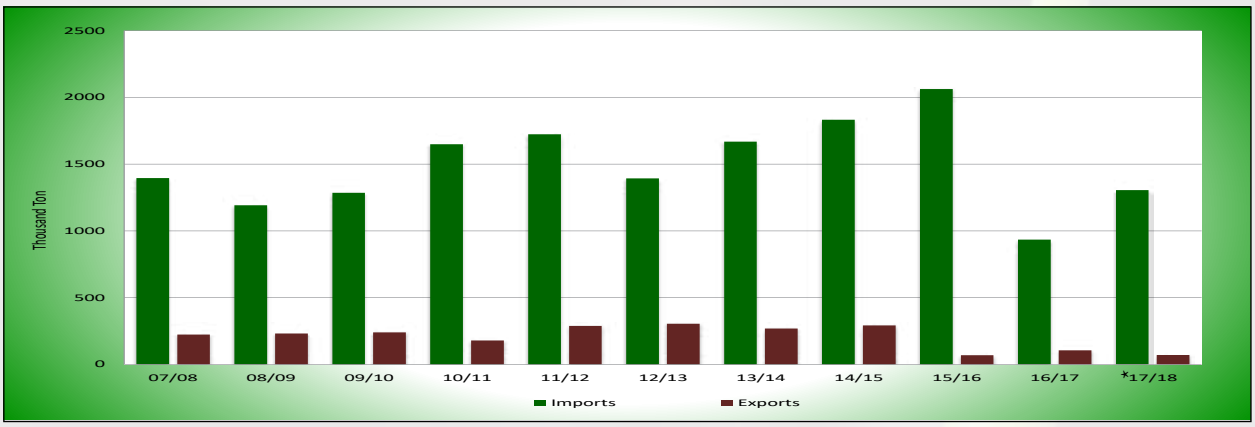
Figures provided by SAGIS, (Publication date: 2018-06-26)

WHEAT: SUPPLY AND DEMAND TABLE BASED ON SAGIS' INFO											Publication date: 2018-06-26							
	Season (Oct - Sep)																Current Season Oct - May	10 YEAR AVERAGE 2007/8-2016/17
	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	
																	8	
CEC	2 493 000	2 321 000	1 540 000	1 680 000	1 905 000	2 105 000	1 905 000	2 130 000	1 958 000	1 430 000	2 005 000	1 870 000	1 870 000	1 750 000	1 440 000	1 910 000	1 535 000	**1 639 800**
CEC (Retention)		33 000	40 000	38 000	50 000	40 000	42 000	43 000	29 000	27 000	26 500	35 000	30 000	0	0	0	0	**20 250**
SUPPLY																		
Opening stock (1 Oct)	551 000	580 000	897 000	598 000	574 000	582 000	376 000	509 000	694 000	579 000	478 000	651 180	489 253	488 526	596 823	827 232	341 424	**519 976**
Prod deliveries	2 415 000	2 387 000	1 512 000	1 670 000	1 893 000	2 045 000	1 876 000	2 130 000	1 910 000	1 389 000	1 973 000	1 837 137	1 816 981	1 699 546	1 406 752	1 870 525	1 511 141	**1 609 196**
Imports	407 000	747 000	1 042 000	1 227 000	1 055 000	777 000	1 396 000	1 192 000	1 285 000	1 649 000	1 724 000	1 393 215	1 668 412	1 832 441	2 062 765	934 765	1 305 224	**1 346 919**
Surplus	0	0	6 000	6 000	9 000	32 000	0	13 000	0	23 000	14 000	0	0	15 151	8 807	9 249	2 587	**8 321**
Total supply	3 373 000	3 714 000	3 457 000	3 501 000	3 531 000	3 436 000	3 648 000	3 844 000	3 889 000	3 640 000	4 189 000	3 881 532	3 974 646	4 035 664	4 075 147	3 641 771	3 160 376	**3 484 411**
DEMAND																		
Processed	2 541 000	2 577 000	2 653 000	2 736 000	2 793 000	2 820 000	2 845 000	2 857 000	3 017 000	2 945 000	3 202 000	3 040 086	3 175 834	3 112 718	3 144 414	3 163 196	2 066 592	**2 732 641**
-human	2 519 000	2 575 000	2 652 000	2 734 000	2 781 000	2 818 000	2 844 000	2 849 000	2 991 000	2 944 000	3 066 000	3 008 378	3 122 134	3 109 022	3 142 077	3 160 660	2 064 260	**2 711 414**
-animal	22 000	2 000	1 000	2 000	12 000	2 000	1 000	8 000	26 000	1 000	136 000	31 694	53 695	3 696	2 337	2 536	2 332	**21 226**
-gristing	0	0	0	0	0	0	0	0	0	0	0	14	5	0	0	0	0	**1**
-bio-fuel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Withdrawn by producers	31 000	24 000	13 000	7 000	10 000	7 000	12 000	12 000	14 000	6 000	4 000	3 934	3 127	1 320	1 834	1 880	910	**5 697**
Released to end-consumers	7 000	5 000	2 000	2 000	4 000	4 000	2 000	5 000	3 000	6 000	7 000	7 322	3 095	2 802	1 907	1 256	1 458	**3 629**
Seed for planting purposes	27 000	20 000	21 000	18 000	26 000	17 000	22 000	26 000	17 000	13 000	18 000	15 998	18 198	22 705	18 800	24 067	16 052	**17 757**
Net receipts(-)/disp(+)	15 000	11 000	12 000	6 000	5 000	1 000	26 000	19 000	15 000	13 000	19 000	19 990	16 172	7 468	12 435	5 101	9 896	**13 699**
Deficit	23 000	1 000	0	0	0	0	9 000	0	4 000	0	0	713	1 243	0	0	0	0	**1 371**
Exports	149 000	179 000	158 000	158 000	111 000	211 000	223 000	231 000	240 000	179 000	288 000	304 236	268 451	291 828	68 525	104 847	69 885	**193 044**
Total Demand	2 793 000	2 817 000	2 859 000	2 927 000	2 949 000	3 060 000	3 139 000	3 150 000	3 310 000	3 162 000	3 538 000	3 392 279	3 486 120	3 438 841	3 247 915	3 300 347	2 164 793	**2 967 838**
Ending Stock (30 Sep)	580 000	897 000	598 000	574 000	582 000	376 000	509 000	694 000	579 000	478 000	651 000	489 253	488 526	596 823	827 232	341 424	995 583	**516 573**
- processed p/month	211 800	214 800	221 100	228 000	232 800	235 000	237 100	238 100	251 400	245 400	266 800	253 341	264 653	259 393	262 035	263 600	258 324	**227 717**
- months' stock	2.7	4.2	2.7	2.5	2.5	1.6	2.1	2.9	2.3	1.9	2.4	1.9	1.8	1.8	3.2	1.3	3.9	**2**
Note: ***Figures for current season up to date																		

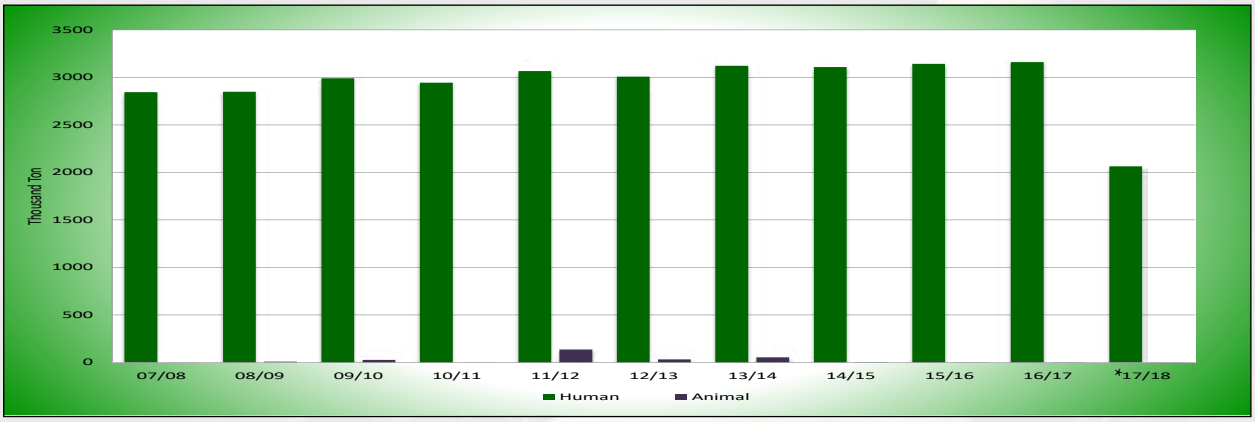
Graph 7: Wheat: CEC Estimate, Retentions and SAGIS deliveries over seasons



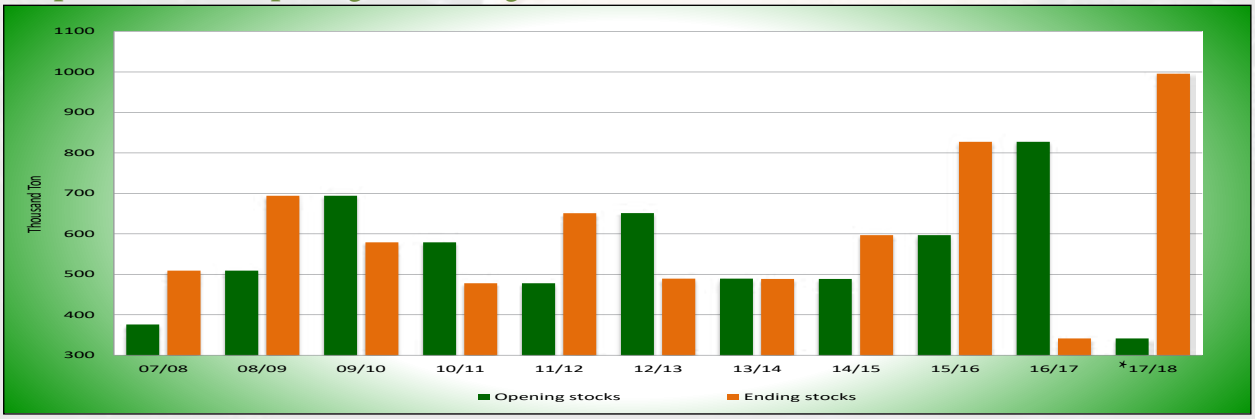
Graph 8: Wheat: Imports and exports over seasons



Graph 9: Wheat: RSA consumption over seasons



Graph 10: Wheat: Opening and ending stocks over seasons



Figures provided by SAGIS, *17/18 figures (Oct - May)

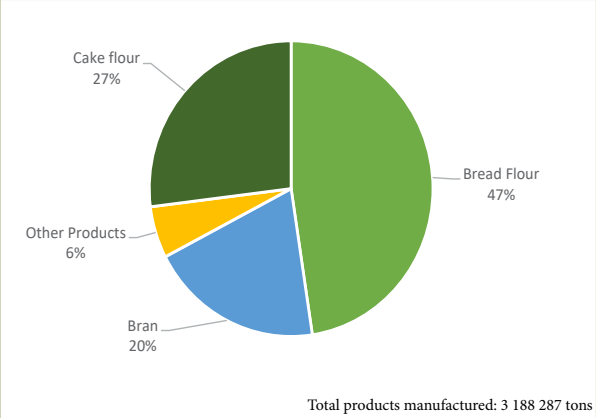
Wheat Product Information

On 14 November 2014, the Minister of Agriculture, Forestry & Fisheries announced new statutory measures for the manufacturing of maize & wheaten products.

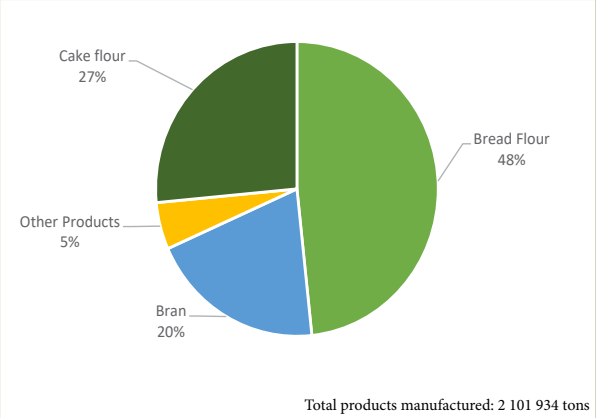
To comply with the abovementioned statutory measures, manufacturers of these products have to register with SAGIS and submit information with regards to the manufacture, import and export of wheat products, as well as the manufacture of pan baked products.

Please see graphs 11 to 16 below as well as the tables on pages 9 and 10 for wheat product and pan baked product progressive figures received by SAGIS.

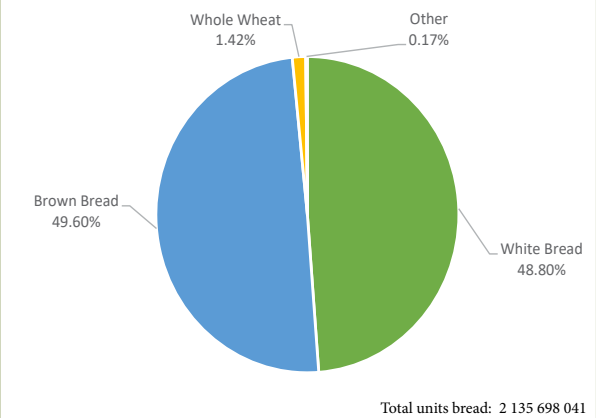
Graph 11: Wheat products manufactured from Oct 2016 - Sept 2017



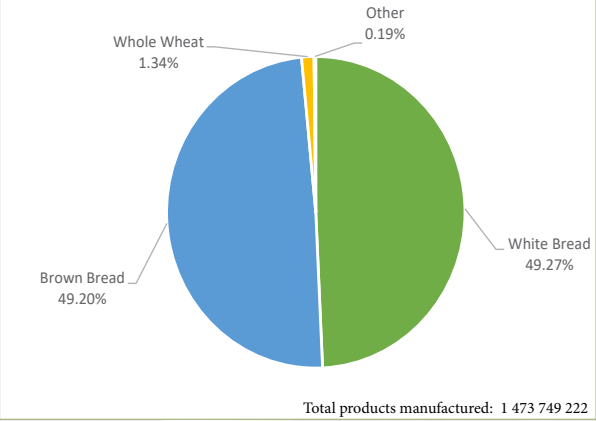
Graph 12: Wheat products manufactured from Oct 2017 - May 2018



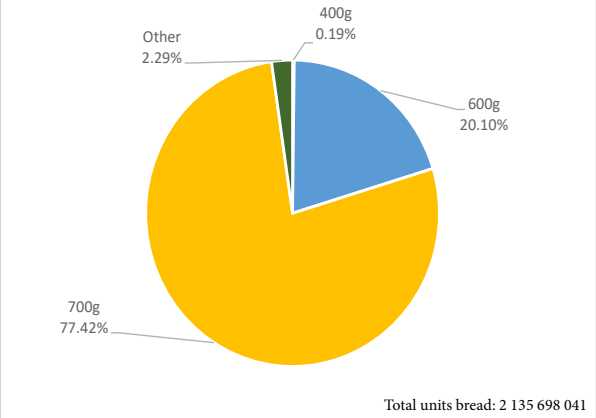
Graph 13: Pan baked bread per type from Oct 2016 - Sept 2017



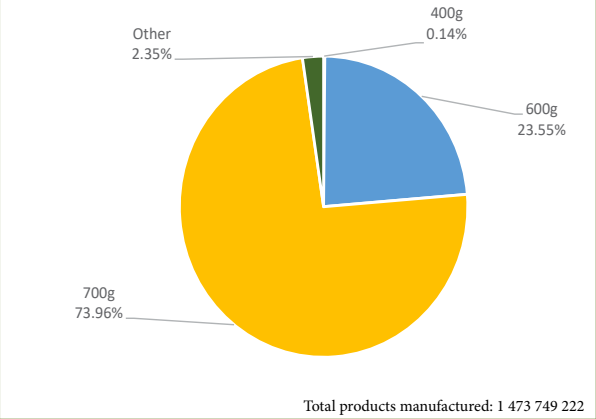
Graph 14: Pan baked bread per type from Oct 2017 - May 2018



Graph 15: Pan baked bread per mass Oct 2016 - Sept 2017



Graph 16: Pan baked bread per mass Oct 2017 - May 2018



WHEATEN PRODUCTS MANUFACTURED PER MARKETING YEAR			
	Marketing year: Oct 2015 - Sep 2016 Manufactured Tons Progressive: 12 Months	Marketing year: Oct 2016 - Sep 2017 Manufactured Tons Progressive: 12 Months	Marketing year: Oct 2017 - May 2018 Manufactured Tons Progressive: 8 Months
Cake Flour	821 935	859 666	556 773
Self-Raising Flour	16 210	17 845	10 679
White Bread Flour	1 114 696	1 086 256	746 009
Brown Bread Flour	402 431	427 996	267 231
Other Flour (Industrial)	141 380	143 889	82 967
Whole Wheat Meal	3 027	3 566	2 281
Bran	629 298	630 287	421 325
Semolina	16 334	18 782	14 669
Total (Tons)	**3 145 311**	**3 188 287**	**2 101 934**

WHEATEN PRODUCTS IMPORTED PER MARKETING YEAR			
	Marketing year: Oct 2015 - Sep 2016 Manufactured Tons Progressive: 12 Months	Marketing year: Oct 2016 - Sep 2017 Manufactured Tons Progressive: 12 Months	Marketing year: Oct 2017 - May 2018 Manufactured Tons Progressive: 8 Months
Cake Flour	40	0	0
Self-Raising Flour	0	0	0
White Bread Flour	840	0	0
Brown Bread Flour	40	0	0
Other Flour (Industrial)	0	0	0
Whole Wheat Meal	0	0	0
Bran	450	243	406
Semolina	0	0	0
Total (Tons)	**1 370**	**243**	**406**

WHEATEN PRODUCTS EXPORTED PER MARKETING YEAR			
	Marketing year: Oct 2015 - Sep 2016 Manufactured Tons Progressive: 12 Months	Marketing year: Oct 2016 - Sep 2017 Manufactured Tons Progressive: 12 Months	Marketing year: Oct 2017 - May 2018 Manufactured Tons Progressive: 8 Months
Cake Flour	2 125	1 714	1 621
Self-Raising Flour	0	29	23
White Bread Flour	7 274	1 966	5 851
Brown Bread Flour	1 853	3 796	13 050
Other Flour (Industrial)	1 976	86	74
Whole Wheat Meal	0	0	16
Bran	393	223	249
Semolina	0	0	0
Total (Tons)	**13 621**	**7 814**	**20 884**

PAN BAKED PRODUCTS PER MANUFACTURED PER YEAR			
	Marketing year: Oct 2015 - Sep 2016 Manufactured Tons Progressive: 12 Months	**Marketing year: Oct 2016 - Sep 2017 Manufactured Tons Progressive: 12 Months**	**Marketing year: Oct 2017 - May 2018 Manufactured Tons Progressive: 8 Months**
WHITE BREAD			
400g (Units)	2 536 957	2 772 734	1 302 447
600g (Units)	184 045 416	192 408 295	158 066 532
700g (Units)	830 681 443	839 930 529	561 510 572
Other (Units)	9 294 235	7 153 230	5 288 823
White Bread (Total Units)	**1 026 558 051**	**1 042 264 788**	**726 168 374**
BROWN BREAD			
400g (Units)	1 064 964	1 131 378	642 736
600g (Units)	213 511 631	235 801 836	188 413 304
700g (Units)	771 863 722	805 745 291	524 395 182
Other (Units)	20 137 121	16 638 015	11 595 470
Brown Bread (Total Units)	**1 006 577 438**	**1 059 316 520**	**725 046 692**
WHOLE WHEAT			
400g (Units)	27 137	16 565	9 401
600g (Units)	507 374	617 299	394 876
700g (Units)	8 707 512	7 397 611	3 895 468
Other (Units)	22 726 394	22 364 064	15 461 334
Whole Wheat (Total Units)	**31 968 417**	**30 395 539**	**19 761 079**
OTHER			
400g (Units)	61 892	56 236	44 364
600g (Units)	385 483	431 695	223 043
700g (Units)	487 173	399 645	219 039
Other (Units)	1 946 688	2 833 618	2 286 631
Other (Total Units)	**2 881 236**	**3 721 194**	**2 773 077**
Total	**2 067 985 142**	**2 135 698 041**	**1 473 749 222**

Assuring the quality of South African wheat

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

The classification of wheat cultivars is an attempt to provide the wheat industry with new cultivars that perform well agronomically and possess suitable milling, rheological and baking characteristics. Analytical procedures and classification norms are compiled in conjunction with wheat breeders, millers and bakers to ensure market-directed and quality-driven wheat production in the interest of wheat producers and processors. The availability of new and improved wheat varieties is important as a constant demand exists for higher yields, better quality, better processing properties and increased disease resistance.

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

As the breeding and development of new wheat varieties with the suitable quality characteristics is an expensive, long-term project, classification norms and quality standards are provided to breeders as guidelines that should stand the test of time. Changing the classification norms and establishing new quality standards are for this reason thoroughly investigated and carefully considered to ensure that the long-term goals of breeding programs are achieved. Recent amendments include reducing the number of years' data (from three to two) required for final release of irrigation cultivars as well as relaxed quality criteria with regards to certain quality parameters for high yielding lines.

The effect of the climate, rainfall, environmental interaction, cultivation practices and other factors that influence wheat quality, makes the use of fixed criteria or norms for classification purposes impractical. For this reason, cultivars are used as biological quality standards, and acceptable deviations from the standard are established as classification norms. Producers continuously strive to improve the wheat yield and quality by selecting the best cultivars for commercial production in a specific area. High grading standards are set to ensure adequate quality control.

Historically, breeder lines were approved for final classification by the Research Technical Committee for Wheat of the Winter Cereal Trust. The function of evaluating and approving cultivars for release, is now (since April 2018) performed by the Wheat Forum Cultivar Committee. A line approved for release, is registered as a cultivar in accordance with the Plant Breeders' Act, 1976 (Act 15 of 1976) by the applicable breeder company (plant breeder's rights are a form of Intellectual Property rights).

Up until the 2016/2017 season, each cultivar also had to be classified in terms of the Regulations relating to the Grading, Packing and marking of Bread Wheat intended for Sale in the Republic of South Africa under the Agricultural Product Standards (APS) Act, 1990 (Act No. 119 of 1990). The cultivar was then included on the Cultivar list as determined by the Executive Officer: Agricultural Product Standards. All cultivars listed are subject to compulsory certification by SANSOR (South African National Seed Organization) on behalf of the Minister of Agriculture, to ensure cultivar purity and good seed quality. Cultivars can only be listed on the Cultivar list if Breeders' Rights have been obtained.

The Department of Agriculture, Forestry and Fisheries decided to exclude the Cultivar list from the Agricultural Product Standards Act and the Wheat Forum requested that the Cultivar list as well as a document 'Analysis Procedure and Evaluation Norms for the Classification of Wheat Breeders' Lines for the RSA', including the Wheat Cultivar Release Criteria, are to be hosted on the website of the SAGL. SAGL was tasked to submit a proposal regarding the protocol that is to apply in respect of the acceptance, maintenance and publication of these documents, this process is currently underway.

Since wheat is a self-pollinating crop, meaning that grain produced has the same genetic composition as the

parent, seed can be harvested and replanted, which results in less seed being sold. In South Africa, approximately 70% of wheat is planted with farm saved seed. The investment in the development of new cultivars is as a result only covered by a small portion of the market. A lack of return on investment therefore prevent new seed companies and new cultivars from entering the market. This situation is however not unique to South Africa. In order to address this issue, various End Point Royalty systems were investigated and the outcome was a proposal to establish a statutory levy for breeding and technology, in addition to the industry statutory levy that has been implemented for many years.

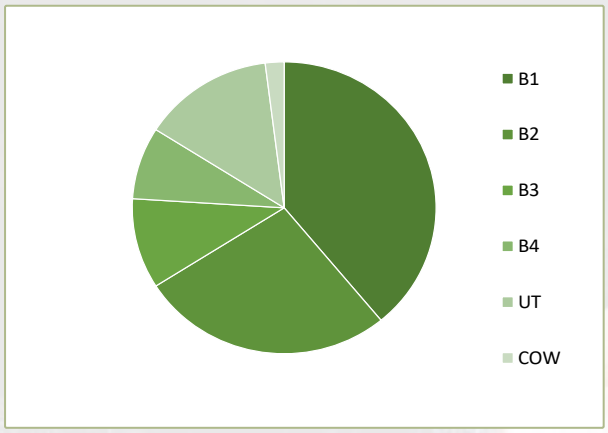
After meetings and consultations with stakeholders and various experts, the South African Cultivar & Technology Agency NPC (SACTA) was established in June 2016. SACTA has been recommended by role-players in the different industries as the body to administer the breeding and technology levy and will make payments to the seed companies from funds collected by means of the levies. The payments will be according to actual performance, calculated each year based on the market share achieved. It is envisaged that this system will eventually be implemented for all self-pollinating crops.

Wheat grades

The 304 representative crop samples were graded as follows: 47% was graded B1, 25% was graded B2, 7% was graded B3, 5% was graded B4, 14% UT (Utility Grade) and 2% COW (Class Other Wheat). The majority of the samples (71%) downgraded to Utility Grade was as a result of either the percentage screenings or mainly other grain and unthreshed ears, individually, or in combination with the combined deviations, exceeding the maximum allowable level for grades B1 to B4. Most of these downgraded samples originated from the Western Cape.

Grade B1 wheat in the Free State province amounted to 51% (71% in the previous season). In the Irrigation areas 43% (52% in the previous season) of the wheat was graded as B1 and in the Western Cape Province 48% was graded as B1 (22% in the previous season).

Graph 17: Percentage of samples per class and grade in the 2016/2017 season



Graph 18: Percentage of samples per class and grade in the 2017/2018 season

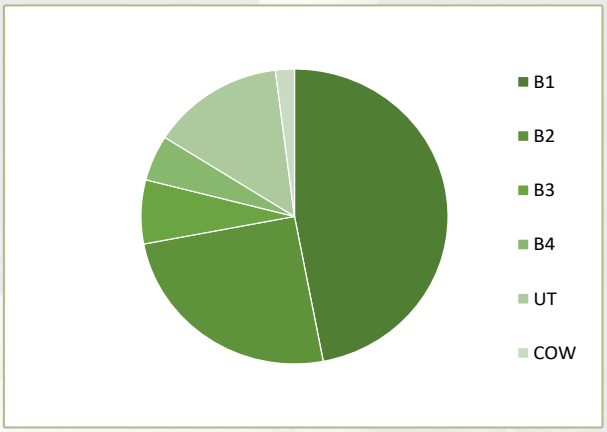


Table 2: Bread Wheat Grading Table

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

Government Notice No. R. 64 of 29 January 2016.

WHEAT SEED SOLD BY COMMERCIAL GRAIN STORAGE COMPANIES TO WHEAT PRODUCERS FOR THE 2017 PLANTING SEASON

Cultivar	%	Cultivar	%
SST 056	17.73	SST 347	0.33
SST 0147	16.44	SST 316	0.31
SST 087	9.04	SST 866	0.31
SST 0127	8.91	Elands	0.22
SST 0117	7.79	PAN 3111	0.19
SST 884	6.16	SST 387	0.16
SST 015	5.59	PAN 3368	0.12
SST 895	3.13	PAN 3408	0.11
SST 835	3.13	Kariega	0.10
SST 88	2.99	CRN 826	0.06
SST 096	2.85	Duzi	0.05
SST 806	2.45	SST 876	0.044
SST 875	2.39	Senqu	0.041
PAN 3471	1.85	PAN 3118	0.0248
SST 843	1.25	PAN 3379	0.0248
Matlabas	1.09	SST 877	0.0192
SST 356	0.92	Krokodil	0.0170
PAN 3497	0.83	SST 8135	0.0165
PAN 3161	0.72	Ratel	0.0146
SST 374	0.66	Koonap	0.0051
PAN 3400	0.66	PAN 3195	0.0051
SST 822	0.63	PAN 3120	0.0034
SST 027	0.60	SST 317	0.0034
			100

Most popular cultivars according to cultivar identification

Farmers in the Western Cape preferred SST 087 (32.5%), SST 056 (24.4%) and SST 88 (15.3%). SST 015 (13.8%) and SST 0127 (13.1%) were also popular cultivars.

In the Vaal and Orange River areas PAN 3471 (28.7%), SST 884 (23.1%) and SST 875 (19.7%) were the most popular cultivars.

The most preferred cultivars in North West province were SST 843 (30.9%), followed by SST 884 (19.8%) and SST 875 (15.5%).

In regions 21 to 24 of the Free State the most planted cultivar was PAN 3471 (37.4%), followed by SST 387 (11.2%), SST 884 (9.5%), PAN 3400 (8.5%) and SST 875 (8.0%). PAN 3161 was the preferred cultivar in regions 25 to 28 and represented 20.5%. SST 884 (14.0%), Elands (10.0%) and PAN 3111 and SST 875 both with 6.5%, were also popular cultivars.

In Mpumalanga, Gauteng, Limpopo and KwaZulu-Natal, SST 884 (34.0%) was the preferred cultivar, followed by SST 875 (30.1%), SST 895 (10.7%) and SST 835 (9.7%).

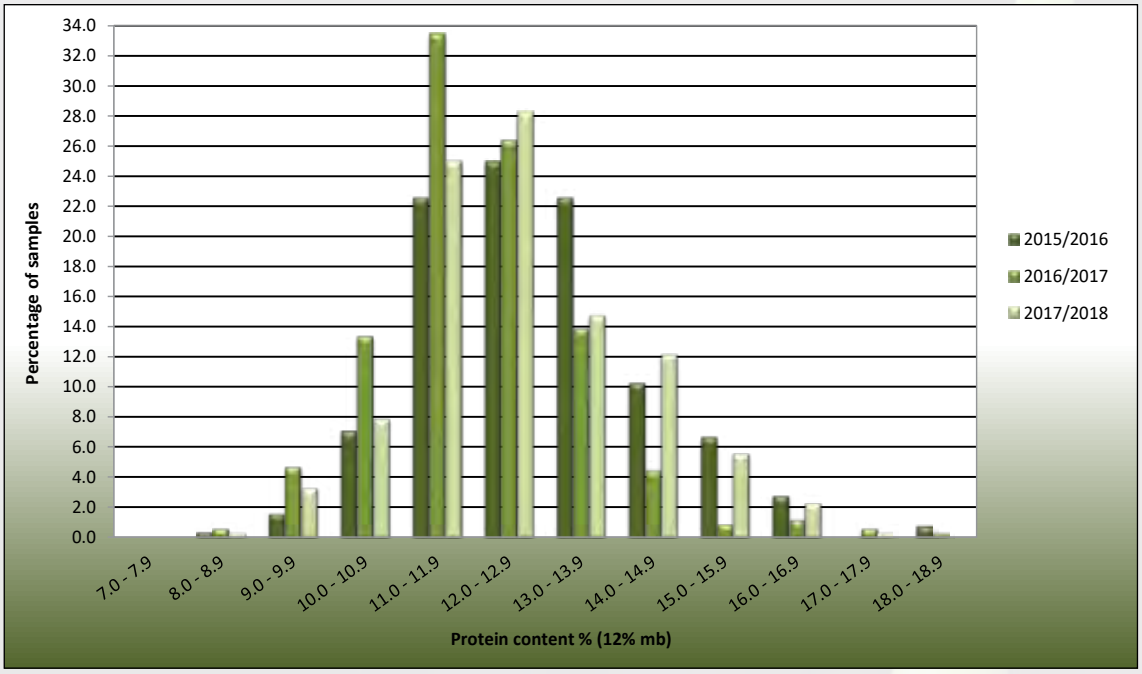
The above-mentioned percentages are weighted averages based on the top five cultivars per region provided on pages 34 to 60. The top five cultivars per region were calculated from the cultivar identification done on each of the 304 crop samples.

Crop quality of the 2017/2018 season

All national, seasonal and regional averages provided in this report are weighted averages.

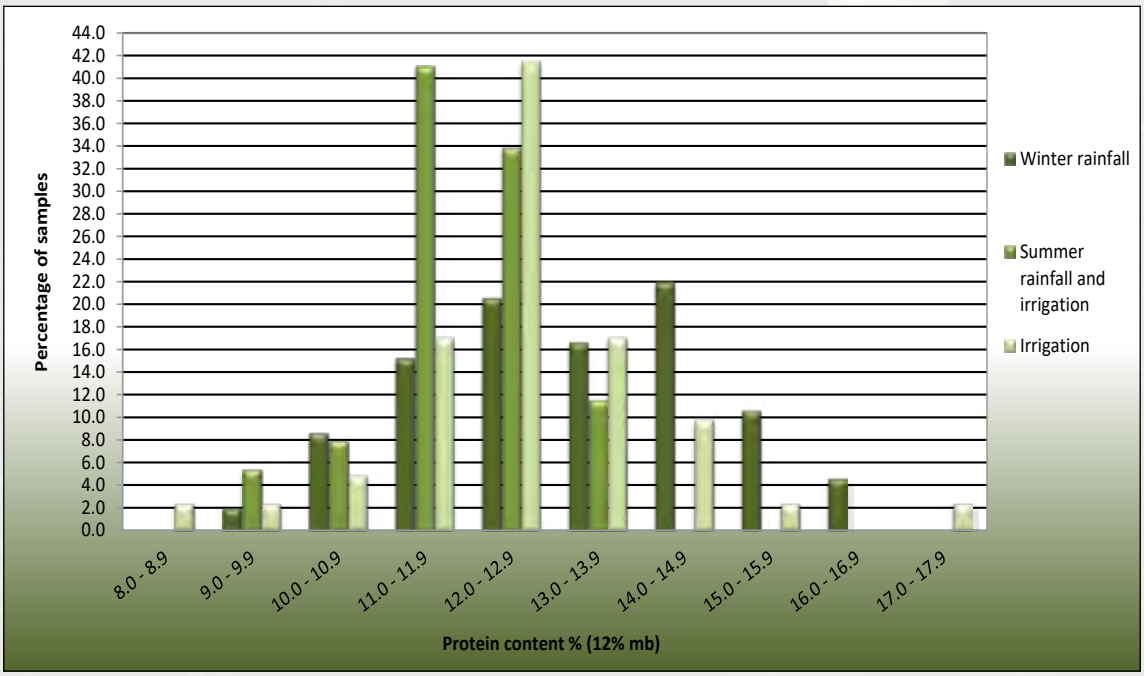
The national whole wheat protein average increased from 12.0% in the previous season to 12.6%. This is the second highest average since the 2004/2005 season and can be attributed to the above average protein values observed in the Western Cape where severe drought conditions were experienced. Please see Graphs 19 and 20 for the protein content distribution over the last three seasons and between the three major production areas.

Graph 19: Protein content distribution over the last three seasons



The Winter rainfall areas reported the highest whole wheat protein average, namely 13.2% since the start of this annual survey twenty years ago. The Irrigation areas averaged 11.9% and the production regions in the Free State province 12.6%.

Graph 20: Protein content distribution between the three production areas during the 2017/2018 season



Flour protein content is on average 0.5 to 1.2% lower than that of whole wheat and averaged 11.3% this season. The protein loss can be attributed to the removal of the bran and aleuron layer as well as the germ during milling. The protein content is reported on a 12% moisture basis.

The average hectoliter mass decreased by 0.8 kg/hl to 80.7 kg/hl compared to the previous season and compares very well with the eight-year weighted average of 80.6 kg/hl for determinations done by means of the Kern 222 instrument. Of the 31 samples that reported values below the 77 kg/hl minimum level for grade B1 wheat, 26 originated in the Western Cape (Winter rainfall area) as can be expected due to the drought, the remaining five samples originated from the Free State production regions. The regional averages ranged from 79.1 kg/hl in the Western Cape to 83.2 kg/hl in the Irrigation areas.

The 1000 kernel mass, reported on a 13% moisture basis, decreased from 38.6 g last season to 37.7 g this season. The 2015/2016 season's average was 36.8 g. Averages over production areas varied from 36.2 g in the Western Cape to 39.6 g in the Irrigation areas. The weighted average percentage screenings obtained with a 1.8 mm slotted sieve was 1.51%, 0.35% lower than the previous season and also the lowest value of the past five seasons. The Winter rainfall areas reported the highest average percentage, namely 1.79% and the Irrigation areas the lowest of 1.05%. 28 of the 304 samples exceeded the 3% maximum permissible screenings level for grade B3 and of these 11 exceeded the 4% maximum permissible level for grade B4. Most of these samples originated in the Western Cape.

The national weighted average falling number value was 371 seconds, higher than last season's 356 seconds and equal to the ten-year weighted average value of 369 seconds. Five of the samples analysed for this survey reported falling number values below 250 seconds and of these four were below 220 seconds. All but one of these samples originated in the Free State area, the other sample in the Western Cape. The highest average falling number value of 385 seconds, was reported for the Irrigation areas. All falling number values reported, are corrected for the altitude at which the test is performed. The results of this, as well as previous surveys, provide evidence that low falling number values are not a significant problem in South Africa.

The weighted mixogram peak time on flour milled on the Quadromat Junior mill averaged 2.7 minutes, equal to the previous two seasons and slightly shorter than the ten-year average of 2.9 minutes. The weighted mixogram peak time of the flour from the Bühler mill was 2.6 minutes, also equal to the previous two seasons. Mixing time, in general, decreases as protein content increases to about 12.0%, thereafter remaining approximately constant with flour protein increases.

Extraction rate is an indication of the flour yield that can be obtained from a given amount of wheat. The extraction rate achievable on industrial scale mills is a number of percentage points higher than on laboratory scale mills due to an increase in roller surface area. Industrial type mills are also set to obtain optimum extraction rates within certain quality parameters, whereas the milling procedure and laboratory scale mill at SAGL is not set to optimize extraction but rather indicate differences in milling quality. Composite samples per class and grade per production region are cleaned, tempered/conditioned and then milled to facilitate flour and dough quality assessment. The weighted average Bühler MLU 202 laboratory mill extraction for the 70 composite samples was 73.1%, higher than the 72.5% of the previous season.

The average Kent Jones colour this season was -4.1 KJ units, lower than the -3.8 KJ units of the previous season. As from the 2012/2013 survey, a dry colour determination by means of a Konica Minolta CM-5 spectrophotometer is also included. Please see the comparison of the CIE L*a*b* values obtained below. The average and range (in brackets) are provided to assist with interpretation of these parameters:
2017/2018 season: L* 93.78 (93.44 – 94.24), a* 0.43 (0.30 – 0.57) and b* 9.84 (8.36 – 11.24)
2016/2017 season: L* 93.71 (92.17 – 94.30), a* 0.46 (0.34 – 0.63) and b* 10.12 (9.03 – 11.65)
2015/2016 season: L* 93.78 (92.99 – 94.40), a* 0.47 (0.06 – 0.59) and b* 9.75 (8.51 – 11.39)
2014/2015 season: L* 93.77 (92.98 – 94.30), a* 0.44 (0.22 – 0.59) and b* 9.72 (8.21 – 11.11)
2013/2014 season: L* 93.99 (93.11 – 94.59), a* 0.40 (0.29 – 0.57) and b* 9.50 (8.49 – 10.63)
2012/2013 season: L* 93.85 (93.14 – 94.39), a* 0.41 (0.26 – 0.54) and b* 9.92 (8.65 – 11.35).
L* represents lightness (100 being white and 0 being black), a* represents green to red variation and b* represents variation from blue to yellow.

The average ash content was calculated to be 0.60 % on a dry basis (moisture free basis), compared to the 0.59% of the previous season. According to the Wheat product regulations (Government Notice No. R. 405 of 5 May 2017), cake flour's ash content should not exceed 0.65%, white bread flour's ash content should be between 0.60 to 1.00% and that of all-purpose wheat flour between 0.55 and 0.75%.

The Rapid Visco Analyser (RVA) average peak viscosity of the samples analysed was 2269 cP (centipoise), the minimum viscosity 1715 cP and the final viscosity 2548 cP. Last season the values were 2257 cP, 1742 cP and 2570 cP respectively. The analysis conditions were kept constant during all of the analyses. Results are reported on a 14% moisture basis.

The wet gluten (14% mb) averaged 30.7% and the dry gluten, also on a 14% moisture basis, 10.4%. These values are equal to the previous season. The average gluten index value was 93 (94 last season), ranging between 75 and 100. The gluten index provides an indication of the gluten strength (higher being better) and is not influenced by the protein content. A value between 70 and 100 is generally accepted as good quality for pan bread baking purposes.

The farinograph analysis resulted in an average water absorption of 60.3% (60.1% the previous season) and an average development time of 5.5 minutes (5.2 minutes the previous season). The stability value of 8.0 minutes compared well with the 8.3 minutes reported previously. There was also no significant difference between the mixing tolerance indexes of these two seasons, namely 40 BU and 37 BU respectively.

The average alveogram strength was 39.2 cm^2 and the average P/L value 0.81 (37.0 cm^2 and 0.57 the previous season). The distensibility of the dough as determined by the Alveograph decreased compared to the previous season, indicating a more elastic dough.

The average extensogram strength was 106 cm^2 (99 cm^2 previous season). The maximum height in Brabender Units were higher than last season (382 BU in 2017/2018 and 364 BU in 2016/2017), but still compared well. The extensibility values were similar, 198 mm now and 193 mm previously.

When viewing the comparisons between seasons (Table 4 and Graph 22 on pages 20 to 22), it is interesting to notice that the average values of the 2017/2018 and 2015/2016 seasons' farinograph, alveograph and extensograph results are almost identical, while the 2016/2017 and 2014/2015 results are very similar.

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

This is the second season, that amino acid profiles of local wheat were determined as part of this survey. Total Amino acid analyses that included 18 amino acids namely Aspartic acid, Glutamic acid, Serine, Glycine, Histidine, Arginine, Threonine, Alanine, Proline, Tyrosine, Valine, Isoleucine, Leucine, Phenylalanine, Lysine, Tryptophan, Cystine and Methionine were performed on forty samples, randomly selected to represent different regions as well as grades. Please see Table 7 on pages 68 and 69 for the results and page 77 for information on the methods followed.

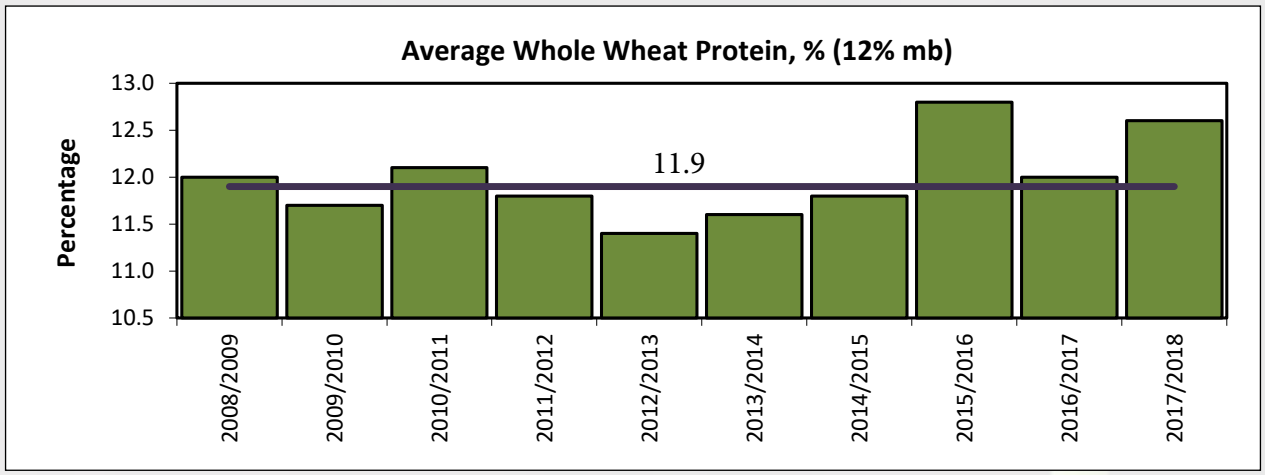
Mycotoxin analyses were performed on forty wheat samples, randomly selected to represent different regions as well as grades. The samples were tested by means of a SANAS ISO/IEC 17025 accredited multi-mycotoxin screening method using UPLC-MS/MS. With this technique simultaneous quantification and confirmation of Aflatoxin B_1; B_2; G_1; G_2, Fumonisin B_1; B_2; B_3, Deoxynivalenol, 15-ADON, HT-2 Toxin, T-2 Toxin, Zearalenone and Ochratoxin A is possible in one run.

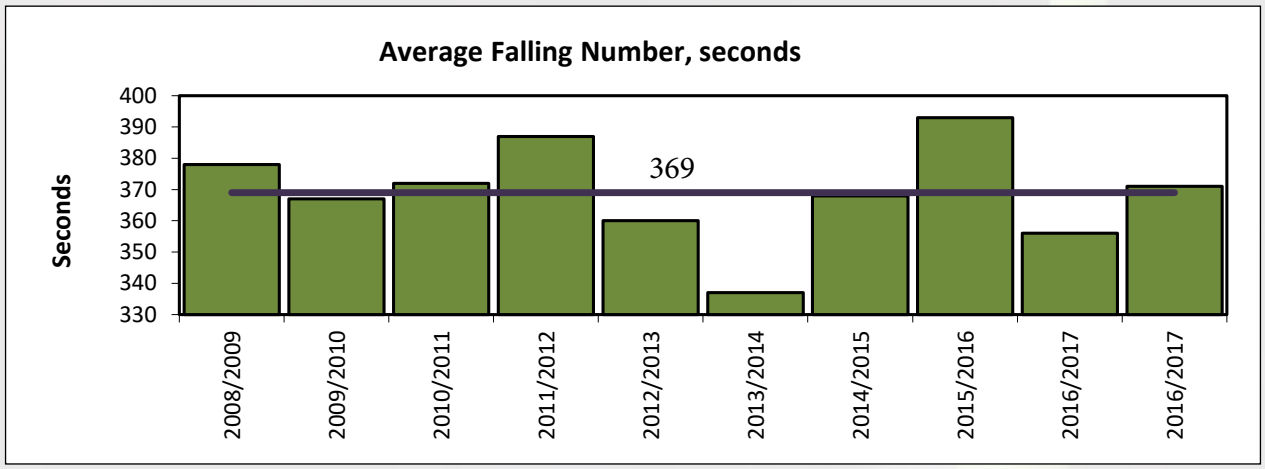
Seven samples tested positive for deoxynivalenol (DON) residues. The average value of the seven positive results was 202 µg/kg (ppb) and the highest value obtained 570 µg/kg, which is still well below national and international maximum residue levels. Please see the mycotoxin results on pages 64 and 65. Last season, four samples tested positive for DON residues with an average value of 289 µg/kg (ppb), the highest value obtained was 501 µg/kg.

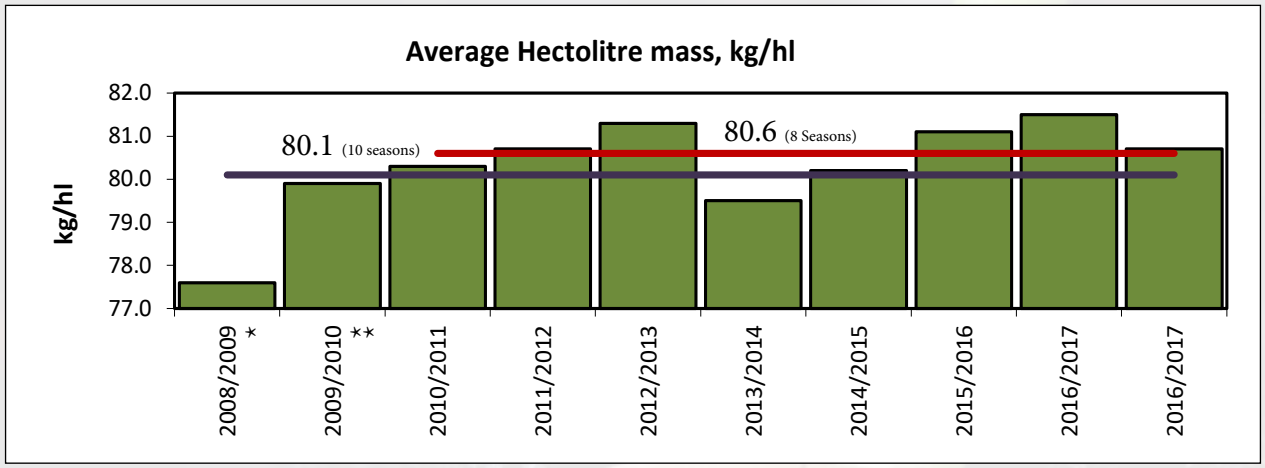
Table 3: Weighted average results for the last three seasons

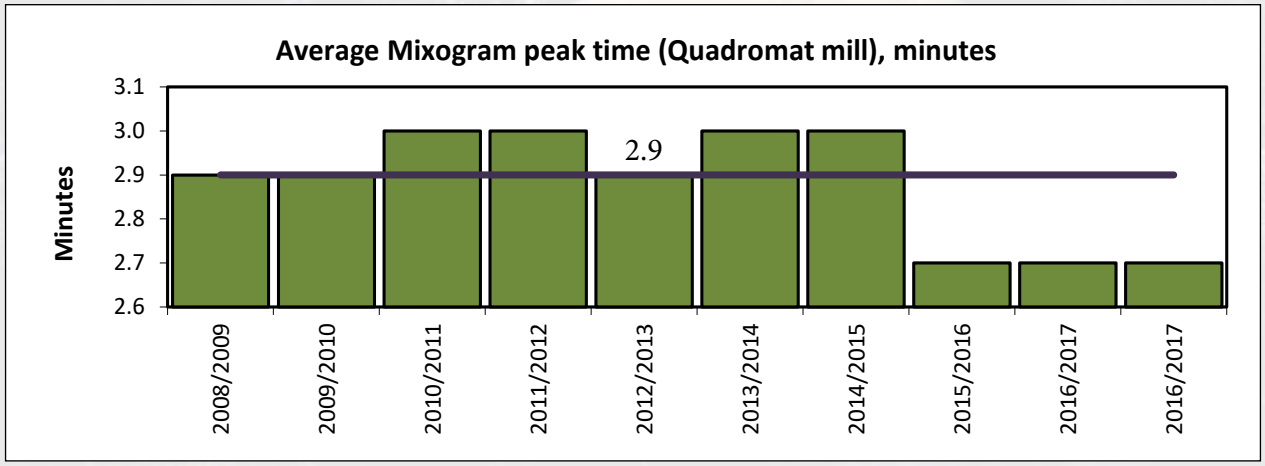
	2017/2018					2016/2017					2015/2016				
Region	Protein (12% mb), %	FN, sec	Hlm, kg/hl	Mixo PT, min	*n*	Protein (12% mb), %	FN, sec	Hlm, kg/hl	Mixo PT, min	*n*	Protein (12% mb), %	FN, sec	Hlm, kg/hl	Mixo PT, min	*n*
1	12.5	391	76.3	2.5	*3*	11.9	377	80.5	2.8	*3*	-	-	-	-	-
2	14.3	343	75.9	2.6	*13*	11.6	351	79.4	2.7	*20*	15.0	397	77.1	2.6	*10*
3	14.6	392	78.1	2.6	*52*	11.4	359	81.8	2.4	*77*	14.4	402	78.6	2.7	*33*
4	13.1	373	79.7	2.8	*17*	11.2	352	82.1	2.5	*30*	12.4	379	80.5	2.8	*15*
5	11.9	361	80.7	2.6	*42*	11.2	359	80.6	2.5	*20*	11.1	377	81.0	2.5	*23*
6	11.8	349	80.2	2.6	*24*	11.3	343	80.8	2.3	*24*	11.3	357	80.7	2.4	*20*
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	11.6	365	84.8	2.3	*30*	12.0	361	84.3	2.7	*38*	12.8	378	84.0	2.3	*24*
11	11.8	397	82.6	2.6	*14*	12.6	397	81.2	2.7	*6*	12.5	408	83.2	2.5	*7*
12	12.6	403	81.0	3.3	*4*	12.8	360	82.1	3.1	*4*	13.2	409	82.0	3.0	*8*
13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	13.0	432	82.3	4.1	*3*	13.0	371	82.9	2.6	*8*	12.2	428	79.4	3.0	*11*
15	12.4	455	82.2	2.9	*7*	-	-	-	-	-	12.6	410	83.6	2.4	*4*
16	11.9	380	81.8	2.8	*1*	-	-	-	-	-	11.5	540	83.8	3.0	*1*
17	12.9	378	81.9	3.3	*4*	11.4	373	81.4	2.5	*4*	-	-	-	-	-
18	12.2	393	81.5	3.0	*1*	-	-	-	-	-	13.1	430	82.5	2.4	*1*
19	11.7	382	81.8	3.6	*11*	12.3	388	81.9	3.2	*13*	11.8	402	81.1	3.0	*13*
20	11.7	372	82.5	2.9	*8*	12.2	373	81.7	3.4	*15*	12.3	425	83.8	3.3	*8*
21	12.5	297	81.9	2.8	*1*	-	-	-	-	-	13.0	460	78.7	3.8	*1*
22	11.6	352	80.0	3.0	*3*	15.8	349	78.7	2.7	*3*	12.7	409	83.2	2.4	*2*
23	13.9	388	80.8	2.5	*6*	15.9	309	77.1	2.8	*9*	13.7	409	78.6	3.2	*8*
24	12.4	400	80.3	2.8	*11*	13.7	347	82.0	2.7	*8*	12.3	398	81.3	2.6	*11*
25	-	-	-	-	-	14.0	293	78.9	3.3	*11*	13.5	349	81.7	2.7	*9*
26	12.4	290	79.1	3.4	*5*	-	-	-	-	-	13.8	386	79.2	2.9	*2*
27	12.2	358	79.4	3.3	*3*	-	-	-	-	-	-	-	-	-	-
28	12.7	272	79.3	3.0	*12*	13.0	327	80.1	3.4	*10*	13.5	379	81.4	2.5	*11*
29	-	-	-	-	-	12.7	291	80.8	3.1	*1*	-	-	-	-	-
30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31	-	-	-	-	-	-	-	-	-		-	-	-	-	-
32	-	-	-	-	-	13.5	372	81.2	3.1	*3*	13.4	401	80.6	2.8	*3*
33	11.8	368	83.7	2.9	*11*	12.2	399	81.6	3.7	*13*	12.5	391	85.4	3.0	*4*
34	12.4	363	81.5	2.9	*1*	13.2	319	81.2	3.5	*3*	13.2	399	81.4	2.7	*3*
35	11.3	366	83.5	3.1	*8*	11.7	354	82.2	3.0	*11*	12.1	401	82.3	3.1	*11*
36	12.4	410	83.4	2.7	*9*	13.2	379	81.8	3.1	*3*	13.6	429	84.0	2.9	*9*
Ave.	**12.6**	**371**	**80.7**	**2.7**	***304***	**12.0**	**356**	**81.5**	**2.7**	***337***	**12.8**	**393**	**81.1**	**2.7**	***252***

Graph 21: Weighted average quality over 10 seasons









*** Hectolitre mass determined using Two-level funnel method**

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

Table 4: Comparison of Flour Quality over the last four seasons

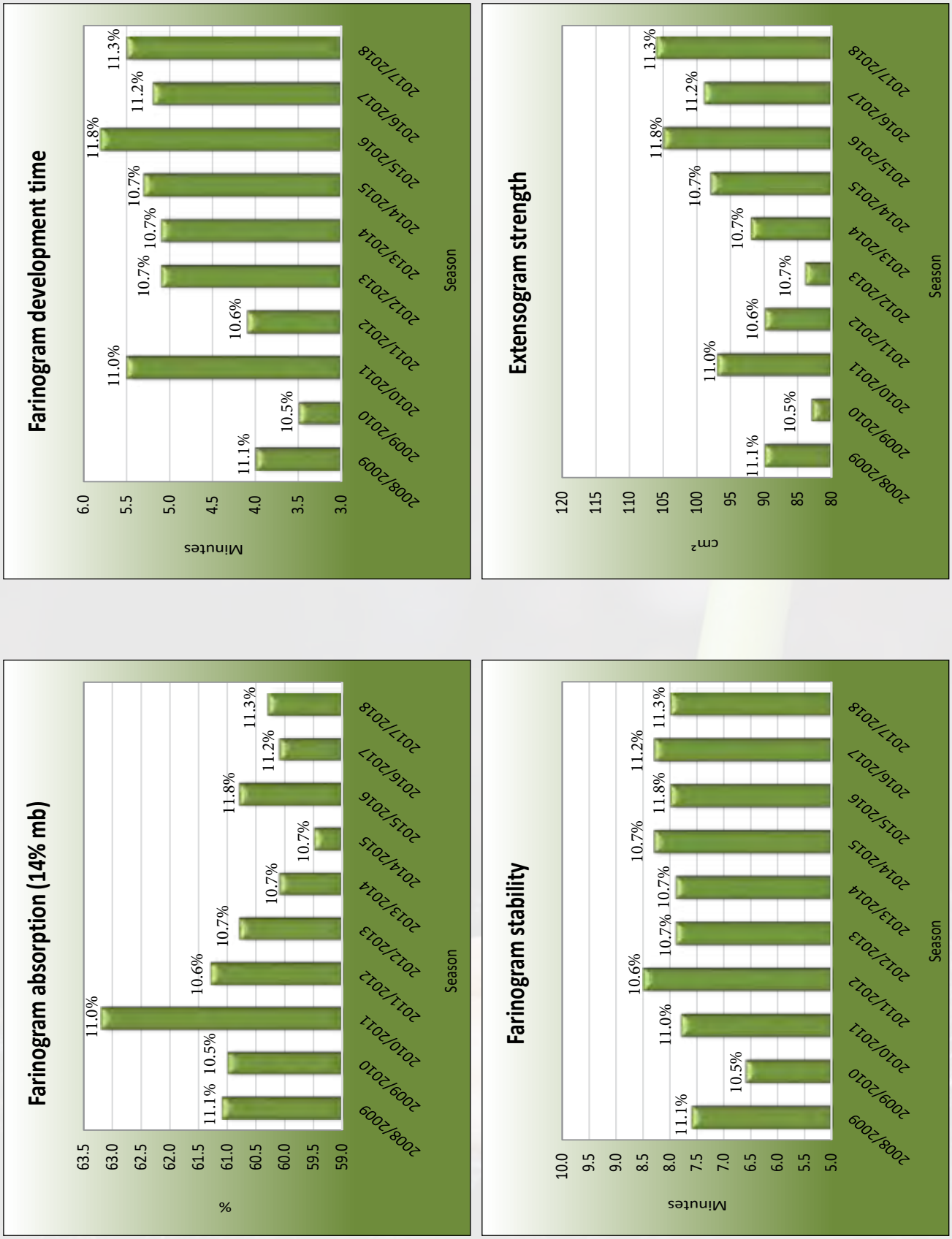
Flour Quality 2017/2018 season			
Flour protein (12% mb) (%)	11.3	Farinogram abs. (14% mb) (%)	60.3
Bread volume 100g (cm^3)	1096	Farinogram dev. time (min)	5.5
Mixogram (Bühler) peak time (min)	2.6	Alveogram strength (cm^2)	39.2
Wet gluten (14% mb) (%)	30.7	Alveogram P/L	0.81
Dry gluten (14% mb) (%)	10.4	Extensogram strength (cm^2)	106

Flour Quality 2016/2017 season			
Flour protein (12% mb) (%)	11.2	Farinogram abs. (14% mb) (%)	60.1
Bread volume 100g (cm^3)	1040	Farinogram dev. time (min)	5.2
Mixogram (Bühler) peak time (min)	2.6	Alveogram strength (cm^2)	37.0
Wet gluten (14% mb) (%)	30.7	Alveogram P/L	0.57
Dry gluten (14% mb) (%)	10.5	Extensogram strength (cm^2)	99

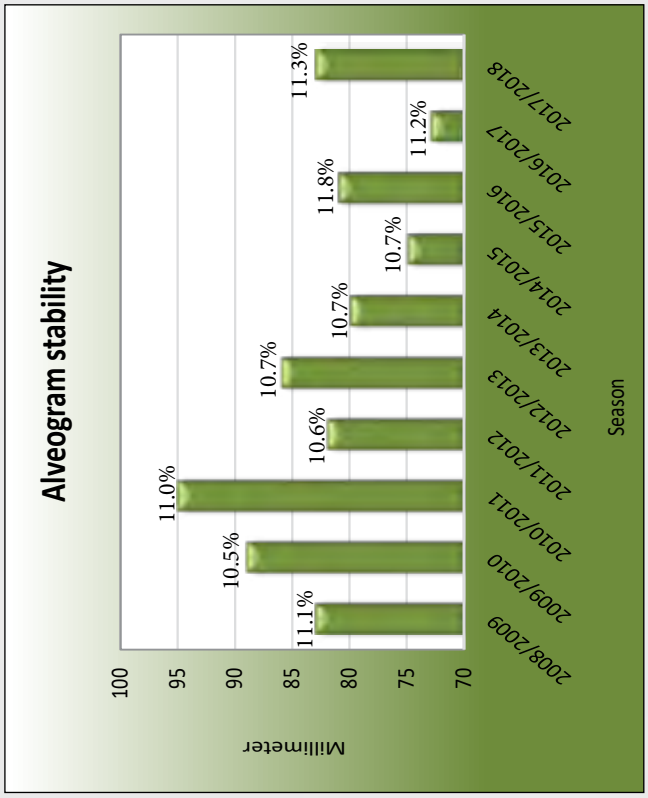
Flour Quality 2015/2016 season			
Flour protein (12% mb) (%)	11.8	Farinogram abs. (14% mb) (%)	60.8
Bread volume 100g (cm^3)	1047	Farinogram dev. time (min)	5.8
Mixogram (Bühler) peak time (min)	2.6	Alveogram strength (cm^2)	38.3
Wet gluten (14% mb) (%)	31.9	Alveogram P/L	0.75
Dry gluten (14% mb) (%)	11.0	Extensogram strength (cm^2)	105

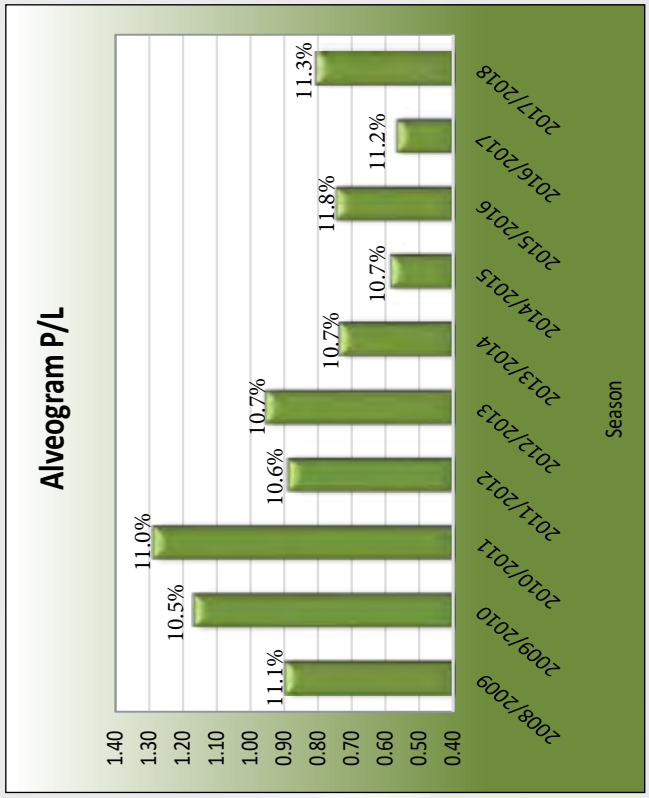
Flour Quality 2014/2015 season			
Flour protein (12% mb) (%)	10.7	Farinogram abs. (14% mb) (%)	59.5
Bread volume 100g (cm^3)	889	Farinogram dev. time (min)	5.3
Mixogram (Bühler) peak time (min)	2.7	Alveogram strength (cm^2)	38.1
Wet gluten (14% mb) (%)	28.9	Alveogram P/L	0.59
Dry gluten (14% mb) (%)	9.8	Extensogram strength (cm^2)	98

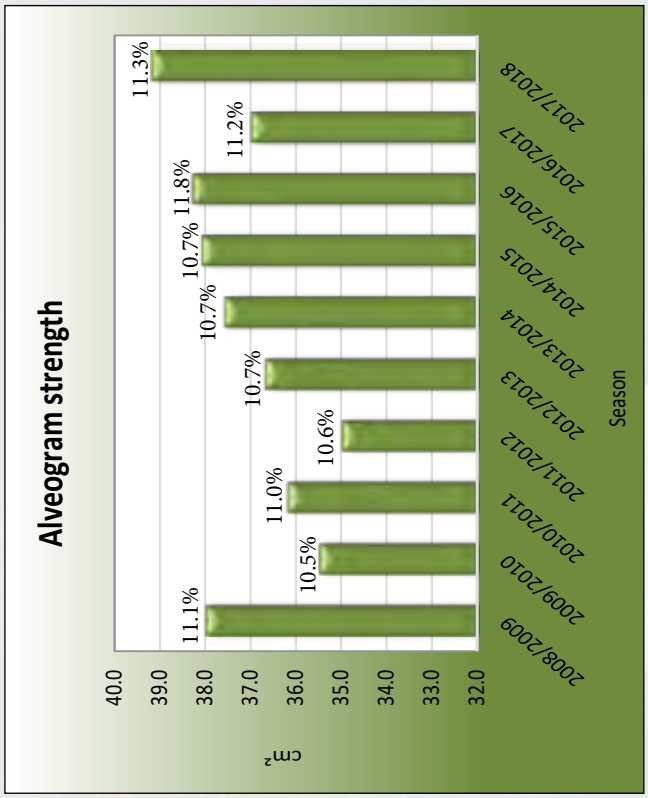
Graph 22: Comparison of rheological quality over seasons (Flour protein content (12% mb) is indicated above each bar)

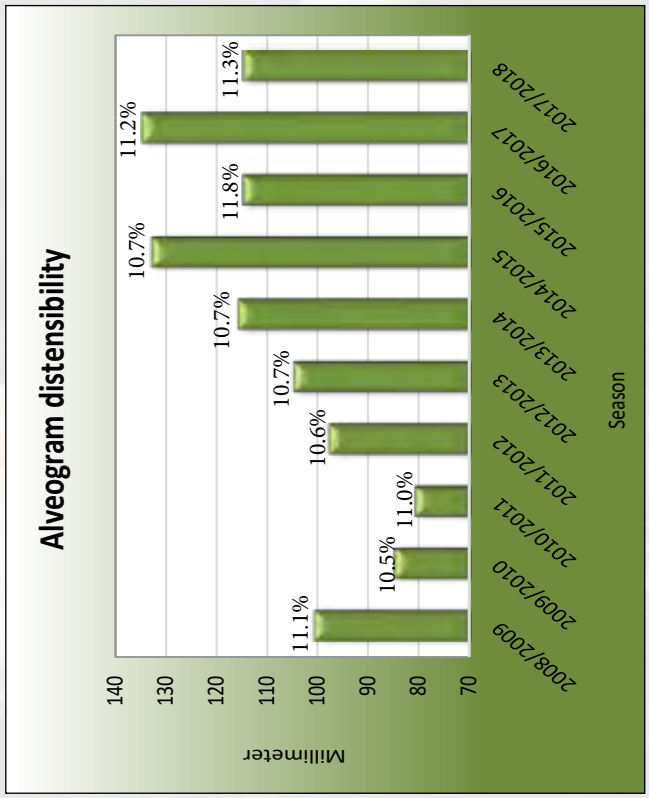


Graph 22: Comparison of rheological quality over seasons (Flour protein content (12% mb) is indicated above each bar) (continue)









REGIONAL QUALITY SUMMARY

WINTER RAINFALL AREA
(Western Cape)

The Western Cape Province has a Mediterranean climate, characterized by cool, wet winters and hot dry summers. More than 80% of the rainfall is received in winter between April and September, making the Western Cape a predominantly winter rainfall area. Mean annual rainfall varies from 200 to 450 mm. The Swartland (on the west coast) and the Rûens (Southern Cape) are the main distinguishable geographic regions of the winter rainfall area.

These two separate wheat farming regions are divided into individual areas according to amongst other their climate, soils and geographic position. The Swartland region is divided into the following areas: Sandveld, Koringberg, Middle Swartland and High Rainfall Area. The Rûens region is divided into the Western Rûens, Southern Rûens and Eastern Rûens.

The Rûens generally receives higher rainfall than the Swartland, but some areas of the Swartland have better, deeper soils. Wheat is generally planted from the second half of April until the middle of June and harvested during October to December.

The climatic conditions in the Swartland region, leading up to the planting season, showed some bleak prospects for the year ahead. Low rainfall together with high temperatures resulted in the depletion of the already low soil moisture. Most parts of the Swartland received about 50 mm of rain in the first five months, compared to the 90 mm in the previous year and the long-term average of about 130 mm for the first five months. Planting conditions were therefore far from ideal.

Climatic conditions in the Rûens varied a lot during the past seasons. Rainfall vaired from 50% less than the long-term average in certain regions to 20% more than the long-term average. The planting season initially started off with sufficient soil moisture, but this diminished as weeks progressed. The Eastern Rûens region was the hardest hit by dry conditions post planting and although good rains were recorded from June/July, damaged was already done in some areas.

The hectolitre mass averaged 79.1 kg/hl compared to the previous season's 81.3 kg/hl. The thousand kernel mass averaged 36.2 g, 3.4 g lower than the previous season and 1.5 g lower than the national average. The average falling number was 370 seconds. The average whole wheat protein content was 13.2% (12% mb), 11.4% in 2016/2017.

The percentage screenings of 1.79% was lower than the previous season's 2.16%, but still the highest of the three areas and 0.28% higher than the national average for 2017/2018. The mixogram peak time (Quadromat Junior mill) averaged 2.6 minutes, the shortest of the three major production areas, although only slightly so. The Bühler extraction averaged 71.5% (average of wheat grades B1 to B4, UT as well as Class Other), slightly lower than 2016/2017. The average wet colour of the flour was -3.9 KJ units and the dry colour L* value (indicating lightness) 93.77. These colour values indicate a white/light flour that is preferred by millers and bakers and compare well to previous seasons. The average ash content was equal to the 0.58% (db) of the previous year.

The flour protein content averaged 12.0%. The average wet and dry gluten values namely 32.5% and 11.1% (14% mb) were respectively 4.4% and 1.5% higher than the previous season. This can be expected given the almost 2% increase in protein content on average. The gluten index was 93. The average farinogram absorption was 60.9% and the development time 5.7 minutes, the stability averaged 9.4 minutes. The average alveogram strength was 41.4 cm^2, 10.0 cm^2 higher than last season. The alveogram P/L value was 0.70 compared to the 0.61 of 2016/2017. The average strength on the extensogram was 112 cm^2. The

overall increase in rheological strength values, compared to the previous season, can be attributed to the higher protein content. The mixogram peak time on the Bühler milled flour averaged 2.4 minutes, similar to last season. The 100-gram baking test showed on average an excellent relationship between protein content and bread volume.

SUMMER RAINFALL AND IRRIGATION AREA (Free State)

The summer rainfall area (predominantly the Free State Province) is a major dryland wheat production region of South Africa. Considerable variation in precipitation, soil types and average temperature occurs from east to west. The Free State is therefore commonly divided into four distinct dryland wheat production regions, namely: South Western Free State, North Western Free State, Central Free State and Eastern Free State.

Rainfall, particularly the distribution thereof through the growing season, is important for successful wheat production in the summer rainfall areas. Planting dates vary from early to late according to region and commences in May and continues until July. Harvesting takes place from December to January.

Good rains occurred in the fallow period during January and February in all regions. During January the rainfall was close to the long-term average, in February the precipitation was however almost three times more than the average figures. In the months leading up to planting time, only 50% of the long-term average was recorded in all regions. This lead to sub-optimum conditions during planting time and the early stages of development, unless soil moisture conservation practices was at an optimum level. From the last week of September into the first ten days of October a fair amount of rainfall was recorded in the Eastern and the North Western Free State. In the Central Free State, however, the first significant rain only occurred in November.

The average hectolitre mass was 79.9 kg/hl, 0.5 kg/hl higher than in 2016/2017. The thousand kernel mass (37.9 g) was 2.5 g higher than the previous season. The average percentage screenings was 1.48%, similar to the national average. The average whole wheat protein content decreased from 14.3% the previous season to 12.6% (12% mb) this season. The falling number of 338 seconds, although the lowest average of the three areas, is already within the higher range of acceptable falling number values.

The mixogram (Quadromat Junior) peak time was 2.9 minutes compared to the mostly above 3.0 minute averages of the previous seasons. The average Bühler extraction percentage in the Free State was equal to the previous season's 73.6%. The Kent Jones flour colour was -4.1 KJ units and the L* value 93.69, indicating a slightly whiter and brighter flour than last season. The average ash content was 0.61% and the average flour protein content 10.9%. The wet gluten content (14% mb) was 29.9% and the dry gluten 10.0%, a decrease of 8.2% and 3.2% respectively compared to the previous season, which is understandable given the 2.8% decrease in flour protein content. The gluten index averaged 94.

The average farinogram water absorption of 59.8% was lower than the previous season's 62.7% and also the lowest of the three areas. The development time averaged 5.0 and the stability 7.2 minutes, both shorter than in 2016/2017. The average alveogram strength of 35.6 cm^2 and extensogram strength of 96 cm^2 were both also noticeably lower than in the previous season. These observations can be expected taking the lower protein content, compared to last season, into account. The Bühler milled flour had an average mixograph peak time of 2.8 minutes. The 100-gram baking test showed that the relationship between protein content and bread volume was excellent between the different grades. Based on the average number values, the Free State wheat had the weakest rheological (dough) quality.

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

Generally, the irrigation wheat production areas of South Africa can be divided into four main geographic regions – the Cooler Central irrigation region in the Northern Cape, the Warmer Northern irrigation region in the North West, Limpopo and Gauteng provinces, the Highveld region in Mpumalanga and the Free State, and lastly, the KwaZulu-Natal region.

Planting commences as early as the end of May and continues until the end of July. Harvesting takes place from October to December.

Temperature conditions during this season showed slight deviations to the long-term average in all the production regions. Minimum temperatures in the KwaZulu-Natal and Cooler Irrigation regions were below normal during July and August, which could explain the higher yields obtained in these regions. In the Highveld region minimum temperatures were very close to the long-term average. In the Warmer Irrigation region, the minimum temperatures were slightly higher than the long-term average.

The irrigation wheat had the highest weighted average hectolitre mass of 83.2 kg/hl, as in the previous season. The thousand kernel mass increased by 1.4 g to 39.6 g. The average falling number was 385 seconds (the highest of the three areas). The screenings averaged 1.05%, the lowest of the three areas.

The whole wheat protein content was on average 11.9%, the lowest average content of the three areas. The flour's protein content of 11.0%, was equal to the previous season. The mixogram (Quadromat Junior) peak time averaged 2.8 minutes. The average Bühler extraction was 74.0%, slightly higher than last season and again also the highest of the three production areas.

The dry colour L* value was 93.83 and the Kent Jones wet colour value -4.3 KJ units. The ash content averaged 0.61%. The wet and dry gluten contents were 29.8% and 10.0% respectively and the gluten index 93. The average farinogram water absorption was 60.1% (58.9% during the previous season), the development time 5.6 minutes and the stability 7.5 minutes.

Alveogram strength averaged 38.9 cm^2 and the P/L 0.80 (37.1 cm^2 and 0.49 respectively the previous season). Higher P/L values are indicative of dough being less extensible (having shorter L values) than dough with higher P/L values and therefore also more elastic. A P/L value of 0.80 is very well situated within the general acceptable range of P/L values for bread baking purposes. The average extensogram strength was 106 cm^2. The mixogram peak time averaged 2.8 minutes. The relationship between protein content and 100 g bread volume was also shown to be excellent.

Production area and climatic condition information were kindly provided by ARC-Small Grain.

Please see the results provided per individual production region on pages 34 to 61.

Table 5: Regional quality weighted averages

	Winter rainfall area (Western Cape)			Summer rainfall and Irrigation area (Free State)			Irrigation areas			RSA average		
Number of samples per area	**151**			**41**			**112**			**304**		
Regions	**1 - 6**			**21 - 28**			**10 - 11, 12 - 20, 33, 34, 35, 36**			**All**		
Hectolitre mass dirty, kg/hl	79.1			79.9			83.2			80.7		
1000 kernel mass (13% mb), g	36.2			37.9			39.6			37.7		
Falling number, sec	370			338			385			371		
Screenings (1.8 mm sieve), %	1.79			1.48			1.05			1.51		
Protein (12% mb), % (ww)	13.2			12.6			11.9			12.6		
Mixogram peak time, min (Quadromat Junior)	2.6			2.9			2.8			2.7		
Composite samples per class and grade	***B1***	***B2***	***B3***	***B1***	***B2***	***B3***	***B1***	***B2***	***B3***	***B1***	***B2***	***B3***
	B4	***UT***	***COW***	***B4***	***UT***	***COW***	***B4***	***UT***	***COW***	***B4***	***UT***	***COW***
Composite samples, n = 70	***5***	***4***	***3***	***7***	***5***	***2***	***13***	***10***	***4***	***25***	***19***	***9***
	3	***6***	***2***	***1***	***1***	***-***	***3***	***1***	***-***	***7***	***8***	***2***
Bühler extraction, %	71.4	71.2	72.4	73.1	74.2	75.2	73.9	74.4	73.7	73.2	73.6	73.6
	72.0	71.2	71.2	74.0	71.4	-	73.1	74.1	-	72.8	71.6	71.2
Flour colour, KJ (wet)	-4.0	-3.8	-3.8	-3.8	-4.4	-4.2	-4.3	-4.3	-4.5	-4.1	-4.2	-4.2
	-4.2	-4.0	-3.5	-4.6	-3.1	-	-4.3	-4.6	-	-4.3	-3.9	-3.5
Colour, Konica Minolta CM5 (dry)												
L*	93.81	93.68	93.65	93.45	93.94	93.96	93.76	93.83	93.95	93.68	93.83	93.85
	93.93	93.85	93.59	94.12	93.05	-	93.91	93.99	-	93.95	93.77	93.59
b*	10.37	10.50	10.12	9.91	9.44	10.13	9.32	9.68	9.81	9.69	9.79	9.99
	10.43	10.28	9.78	9.32	10.25	-	9.42	10.04	-	9.84	10.25	9.78
Ash (db), %	0.57	0.59	0.57	0.60	0.62	0.60	0.61	0.61	0.64	0.60	0.61	0.61
	0.56	0.59	0.65	0.61	0.60	-	0.59	0.63	-	0.58	0.60	0.65
Flour protein (12% mb), %	12.4	12.8	11.4	12.0	10.4	9.4	11.9	10.7	9.7	12.0	11.1	10.2
	11.2	12.0	12.0	8.1	11.1	-	9.5	10.6	-	10.0	11.7	11.9

Table 5: Regional quality weighted averages (continue)

	Winter rainfall area (Western Cape)			Summer rainfall and Irrigation area (Free State)			Irrigation areas			RSA average		
Regions	1 - 6			21 - 28			10 - 11, 12 - 20, 33, 34, 35, 36			All		
Composite samples per class and grade	***B1***	***B2***	***B3***	***B1***	***B2***	***B3***	***B1***	***B2***	***B3***	***B1***	***B2***	***B3***
	B4	***UT***	***COW***	***B4***	***UT***	***COW***	***B4***	***UT***	***COW***	***B4***	***UT***	***COW***
Composite samples, n = 70	***5***	***4***	***3***	***7***	***5***	***2***	***13***	***10***	***4***	***25***	***19***	***9***
	3	***6***	***2***	***1***	***1***	-	***3***	***1***	-	***7***	***8***	***2***
Wet gluten (14% mb), %	33.7	35.0	30.7	33.4	29.0	24.4	32.0	29.6	26.6	32.7	30.6	27.5
	30.1	32.1	31.6	21.4	30.0	-	25.0	30.8	-	26.7	31.7	31.6
Dry gluten (14% mb), %	11.6	12.1	10.4	11.2	9.6	8.3	10.9	9.9	8.7	11.1	10.3	9.2
	10.2	11.1	10.9	7.0	10.1	-	8.4	10.1	-	9.0	10.8	10.9
Gluten Index	94	93	94	92	96	99	94	91	93	93	93	94
	93	94	90	97	92	-	95	83	-	94	92	90
Farinogram: Water absorption (14% mb), %	60.9	61.8	60.6	60.8	59.2	59.5	61.0	59.9	58.7	60.9	60.1	59.5
	60.1	60.9	60.4	56.0	60.7	-	58.4	60.7	-	58.8	60.9	60.4
Farinogram: Development time, min	6.0	6.5	5.2	5.6	4.9	3.5	6.8	4.9	4.1	6.3	5.2	4.3
	5.0	5.6	5.2	3.2	5.2	-	4.8	4.3	-	4.7	5.4	5.2
Farinogram: Stability, min	9.8	10.9	8.2	7.7	6.0	8.4	9.3	6.1	5.8	9.0	7.1	7.2
	9.1	9.7	7.2	6.2	7.3	-	7.0	5.4	-	7.8	8.8	7.2
Alveogram: Strength (S), cm^2	46.1	39.0	38.9	40.7	33.4	31.4	46.1	34.4	31.7	44.6	36.1	34.0
	40.1	42.9	36.1	18.8	35.3	-	34.3	31.8	-	34.6	40.6	36.1
Alveogram: P/L	0.59	0.73	0.77	0.69	0.71	2.73	0.79	0.79	0.80	0.72	0.75	1.22
	0.75	0.74	0.69	0.90	1.14	-	0.84	0.85	-	0.81	0.80	0.69
Extensogram: Strength, cm^2	127	119	97	106	89	91	126	97	82	121	100	89
	98	116	95	62	93	-	88	82	-	89	109	95
Mixogram peak time, min	2.4	2.4	2.3	2.6	2.7	3.2	3.0	2.6	2.8	2.8	2.6	2.7
	2.5	2.3	2.5	3.2	2.9	-	2.9	2.3	-	2.7	2.4	2.5
Relationship between protein and bread volume	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX
	EX	EX	EX	EX	EX	-	EX	EX	-	EX	EX	EX

EX = Excellent

RSA Production Regions

The RSA is divided into 9 provinces as illustrated in Figure 1.

Figure 1: RSA Provinces

Provincial map with gratitude to SiQ.

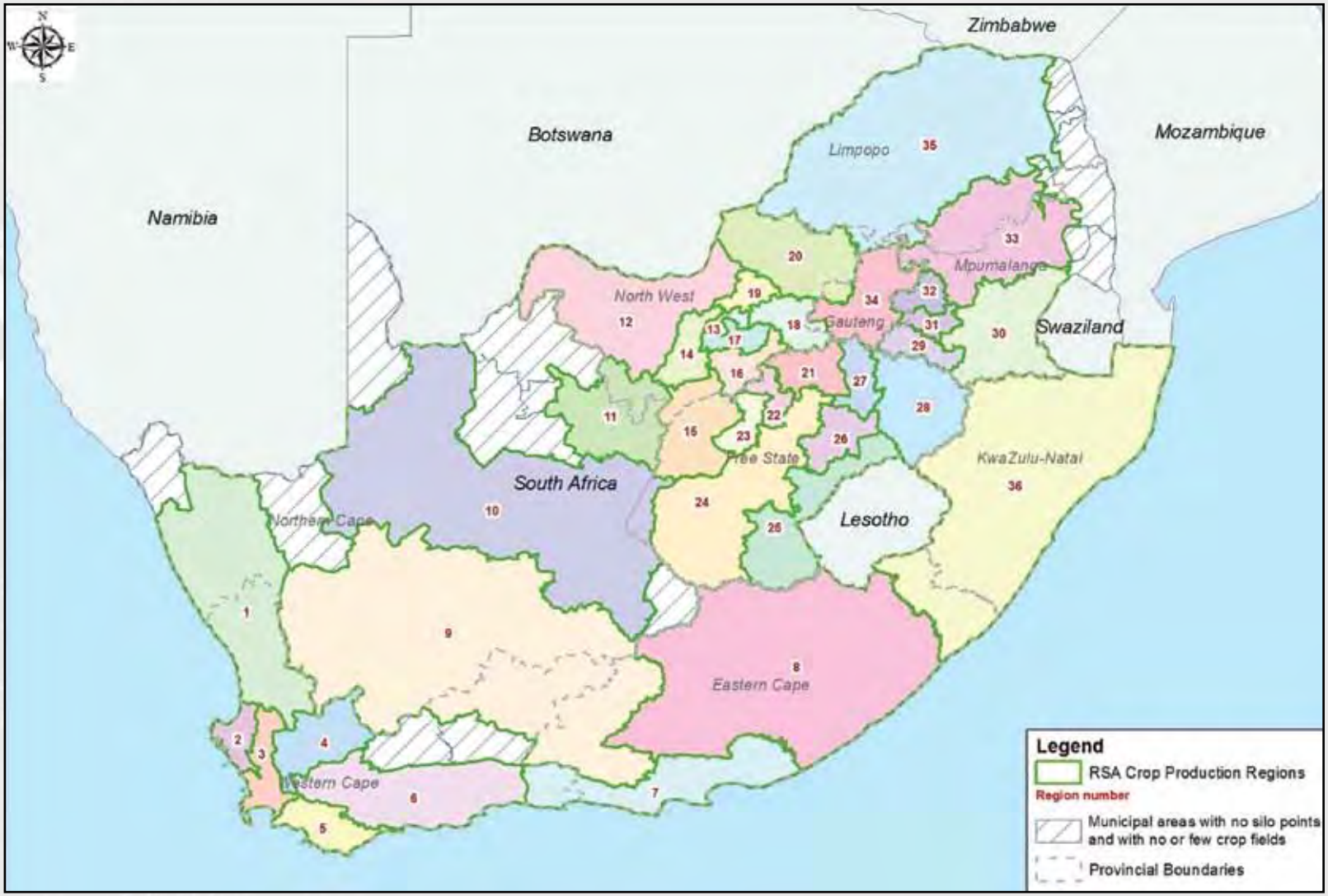
The 9 provinces are divided into 36 grain production regions.

The regions are distributed as follows:
Region 1: Namakwaland
Regions 2 and 3: Swartland
Regions 4 to 6: Rûens
Regions 7 and 8: Eastern Cape
Region 9: Karoo
Region 10: Griqualand West
Region 11: Vaalharts
Regions 12 to 20: North West
Regions 21 to 28: Free State
Regions 29 to 33: Mpumalanga
Region 34: Gauteng
Region 35: Limpopo
Region 36: KwaZulu-Natal

Please see the Crop Production Regions map on the next page.

The production regions from which wheat samples were received for the crop quality survey of the 2017/2018 production season, are named and described on pages 30 to 33. All the silo/intake stands as well as the type of storage structure, situated in a particular region, are provided.

Figure 2: RSA Crop Production Regions



Regional map with gratitude to Agbiz Grain and SiQ.

Grain Production Regions

Silo/Intake stands per region indicating type of storage structure

Region 1: Namakwaland Region

Kaap Agri	Graafwater (Bags/Bins)		

Region 2: Swartland Western Region

Kaap Agri	Darling (Bins)	Overberg Agri	Bergrivier (Bins)
Kaap Agri	Vredenburg (Bins)	Overberg Agri	Koperfontein (Bins)

Region 3: Swartland Central Region

Kaap Agri	Eendekuil *(Bins)*	Overberg Agri	Moravia *(Bins)*
Kaap Agri	Klipheuwel *(Bins)*	Afgri	Eensgezind *(Bunkers)*
Kaap Agri	Malmesbury *(Bins)*	Afgri	Klipfontein *(Bunkers)*
Kaap Agri	Piketberg *(Bins)*	Afgri	Malandam *(Bunkers)*
Kaap Agri	Pools *(Bins)*	BKB Grainco	Pampoen-kraal *(Bunkers)*
Kaap Agri	Ruststasie *(Bins)*	BKB Grainco	Eenboom *(Bunkers)*
Overberg Agri	Koringberg *(Bins)*	BKB Grainco	Melkboom *(Bunkers)*
Overberg Agri	Moorreesburg *(Bins)*		

Region 4: Swartland Eastern Region

Kaap Agri	Ceres *(Bunkers)*	Kaap Agri	Porterville *(Bins)*
Kaap Agri	Ceres *(Bins)*	Kaap Agri	Riebeeck-Wes *(Bins)*
Kaap Agri	Gouda *(Bins)*	Overberg Agri	Leliedam *(Bins)*
Kaap Agri	Halfmanshof *(Bins)*	BKB Grainco	Winterhoek *(Bunkers)*

Region 5: Rûens Western Region

Overberg Agri	Bredasdorp *(Bags/Bins/Bunkers)*	Overberg Agri	Napier *(Bags/Bins)*
Overberg Agri	Caledon *(Bins/Bunkers)*	Overberg Agri	Ou Plaas *(Bunkers)*
Overberg Agri	Klipdale *(Bags/Bins)*	Overberg Agri	Protem *(Bags/Bins)*
Overberg Agri	Krige *(Bags/Bins/Bunkers)*	Overberg Agri	Rietpoel *(Bags/Bins/Bunkers)*
Overberg Agri	Lemoenskop *(Bunkers)*		

Region 6: Rûens Eastern Region

SSK	Albertinia *(Bins)*	SSK	Krombeks *(Bins)*
SSK	Ashton *(Bags/Bins)*	SSK	Protem *(Bags/Bins)*
SSK	Heidelberg *(Bins)*	SSK	Riversdal *(Bins)*
SSK	Herold *(Bins)*	SSK	Swellendam *(Bags/Bins)*
SSK	Karringmelk *(Bags/Bins)*		

Region 10: Griqualand West Region

GWK	Douglas *(Bags/Bins)*	GWK	Trans Oranje *(Bags/Bins/Bunkers)*
GWK	Luckhoff *(Bins)*	OVK	Havenga Brug *(Bins)*
GWK	Marydale *(Bins)*	OVK	Morgenzon *(Bins)*
GWK	Modderrivier *(Bags/Bins/Bulk)*	OVK	Oranjerivier *(Bins/Bunkers)*
GWK	Prieska *(Bins/Dams)*	OVK	Prieska *(Bins/Bunkers)*
GWK	Rietrivier *(Bins)*	OVK	Rietrivier *(Bins)*

Region 11: Vaalharts Region

GWK	Barkly-Wes *(Bins/Bulk)*	Senwes	Jan Kempdorp *(Bins)*
GWK	Jan Kempdorp *(Bags/Bunkers)*	Senwes	Magogong *(Bins)*
Senwes	Hartswater *(Bins)*		

Grain Production Regions

Silo/Intake stands per region indicating type of storage structure

Region 12: North West Western Region			
NWK	Blaauwbank *(Bins)*	NWK	Mareetsane *(Bins)*
NWK	Bührmannsdrif *(Bins)*	Suidwes Landbou	Kameel *(Bins)*
NWK	Kameel *(Bins)*	Suidwes Landbou	Vryburg *(Bins)*

Region 14: North West Southern Region			
NWK	Barberspan *(Bins)*	NWK	Taaibospan *(Bins)*
NWK	Delareyville *(Bins)*	Suidwes Landbou	Amalia *(Bins)*
NWK	Excelsior *(Bins)*	Suidwes Landbou	Hallatshope *(Bins)*
NWK	Geysdorp *(Bins)*	Suidwes Landbou	Migdol *(Bins)*
NWK	Migdol *(Bins)*	Suidwes Landbou	Schweizer-Reneke *(Bins)*
NWK	Nooitgedacht *(Bins)*		

Region 15: North West South-Eastern Region			
Suidwes Landbou	Bloemhof *(Bins)*	Suidwes Landbou	Kingswood *(Bins)*
Suidwes Landbou	Christiana *(Bins)*	Suidwes Landbou	Kruising *(Bunkers)*
Suidwes Landbou	Hertzogville *(Bins)*	Suidwes Landbou	Poppieland *(Bunkers)*
Suidwes Landbou	Hoopstad *(Bins)*		

Region 16: North West Central-Eastern Region			
Senwes	Regina *(Bins)*	Suidwes Landbou	Makwassie *(Bins)*
Suidwes Landbou	Bamboesspruit *(Bins)*	Suidwes Landbou	Strydpoort *(Bins)*
Suidwes Landbou	Leeudoringstad *(Bins)*	Suidwes Landbou	Wolmaranstad*(Bins)*

Region 17: North West Central-Northern Region (Ottosdal)			
NWK	Boschpoort *(Bags/Bins/Bulk)*	NWK	Vermaas *(Bins)*
NWK	Kleinharts *(Bins)*	Senwes	Hartbeesfontein *(Bins)*
NWK	Ottosdal *(Bins)*	Senwes	Melliodora *(Bins)*
NWK	Rostrataville *(Bins)*	Senwes	Werda *(Bins)*

Region 18: North West Central Region (Ventersdorp)			
NWK	Bodenstein *(Bins)*	Senwes	Makokskraal *(Bins)*
NWK	Coligny *(Bins)*	Senwes	Potchefstroom*(Bins)*
Senwes	Buckingham *(Bins)*	Senwes	Ventersdorp *(Bins)*
Senwes	Enselspruit *(Bins)*		

Region 19: North West Central Region (Lichtenburg)			
Afgri	Lichtenburg *(Bunkers)*	NWK	Lottie Halte *(Bins)*
NWK	Grootpan *(Bins)*	NWK	Lusthof *(Bins)*
NWK	Halfpad *(Bins)*	NWK	Lichtenburg Silo 3 *(Bins)*
NWK	Hibernia *(Bins)*	NWK	Lichtenburg Silo 5 *(Bins)*

Region 20: North West Eastern Region			
Afgri	Battery ((*Bins)*	NWK	Koster *(Bins)*
Afgri	Brits *(Bins)*	NWK	Swartruggens *(Bins)*
NWK	Boons *(Bins)*	NWK	Syferbult *(Bins)*
NWK	Derby *(Bins)*		

Grain Production Regions

Silo/Intake stands per region indicating type of storage structure

Region 21: Free State North-Western Region (Viljoenskroon)			
Senwes	Attie *(Bins)*	Senwes	Vierfontein *(Bins)*
Senwes	Groenebloem *(Bins)*	Senwes	Viljoenskroon *(Bins)*
Senwes	Heuningspruit *(Bins)*	Senwes	Vredefort *(Bins)*
Senwes	Koppies *(Bins)*	Senwes	Weiveld *(Bins)*
Senwes	Rooiwal *(Bins)*		

Region 22: Free State North-Western Region (Bothaville)			
Senwes	Allanrigde *(Bins)*	Senwes	Schoonspruit *(Bins)*
Senwes	Bothaville *(Bins)*	Senwes	Schuttesdraai *(Bins)*
Senwes	Mirage *(Bins)*	Suidwes Landbou	Misgunst (Bunkers)
Senwes	Odendaalsrus *(Bins)*		

Region 23: Free State North-Western Region (Bultfontein)			
Senwes	Bultfontein *(Bins)*	Senwes	Tierfontein *(Bins)*
Senwes	Losdoorns *(Bins)*	Senwes	Wesselsbron *(Bins)*
Senwes	Protespan *(Bins)*	Senwes	Willemsrus *(Bins)*

Region 24: Free State Central Region			
Senwes	Bloemfontein *(Bins)*	Senwes	Petrusburg *(Bins)*
Senwes	Brandfort *(Bins)*	Senwes	Theunissen *(Bins)*
Senwes	De Brug *(Bins)*	Senwes	Van Tonder *(Bins)*
Senwes	Geneva *(Bins)*	Senwes	Welgeleë *(Bins)*
Senwes	Hennenman *(Bins)*	Senwes	Winburg *(Bins)*
Senwes	Kroonstad *(Bins)*		

Region 26: Free State South-Eastern Region			
Afgri	Kaallaagte *(Bins)*	Afgri	Monte Video *(Bins)*
Afgri	Libertas *(Bins)*	Afgri	Senekal *(Bins)*
Afgri	Marquard *(Bins)*	Senwes	Arlington *(Bins)*
Afgri	Meets *(Bins)*	Senwes	Steynsrus *(Bins)*

Region 27: Free State Northern Region			
Senwes	Gottenburg *(Bins)*	Senwes	Mooigeleë *(Bins)*
Senwes	Heilbron *(Bins)*	Senwes	Wolwehoek *(Bins)*
Senwes	Hoogte *(Bins)*	VKB	Petrus Steyn *(Bins)*

Region 28: Free State Eastern Region			
Afgri	Afrikaskop *(Bins/Bunkers)*	VKB	Jim Fouché *(Bins)*
Afgri	Eeram *(Bins)*	VKB	Memel *(Bins)*
Afgri	Harrismith *(Bins)*	VKB	Reitz *(Bins)*
Afgri	Kransfontein *(Bins/Bunkers)*	VKB	Tweeling *(Bins)*
VKB	Ascent *(Bins)*	VKB	Villiers *(Bins/Bulk)*
VKB	Cornelia *(Bins)*	VKB	Vrede *(Bins)*
VKB	Daniëlsrus *(Bins)*	VKB	Warden *(Bins)*
VKB	Frankfort *(Bins)*	VKB	Windfield *(Bins)*

Grain Production Regions

Silo/Intake stands per region indicating type of storage structure

Region 33: Mpumalanga Northern Region			
Afgri	Arnot *(Bins)*	Afgri	Middelburg *(Bins)*
Afgri	Driefontein *(Bins)*	Afgri	Pan *(Bins)*
Afgri	Lydenburg *(Bins)*	Afgri	Stoffberg *(Bins)*
Afgri	Marble Hall *(Bins)*	Afgri	Wonderfontein *(Bins)*

Region 34: Gauteng Region			
Afgri	Bloekomspruit *(Bins)*	Afgri	Nigel *(Bins)*
Afgri	Bronkhorstspruit *(Bins)*	Afgri	Pretoria Wes *(Bins)*
Afgri	Glenroy *(Bins)*	Afgri	Vogelvallei *(Bunkers)*
Afgri	Goeie Hoek *(Bins)*	Senwes	Middelvlei *(Bins)*
Afgri	Kaalfontein *(Bins)*	Senwes	Oberholzer *(Bins)*
Afgri	Kliprivier (Bunkers)	Senwes	Raathsvlei *(Bins)*
Afgri	Meyerton (Bunkers)		

Region 35: Limpopo Region			
Afgri	Northam *(Bins)*	NTK	Nylstroom (Modimolle) *(Bins)*
NTK	Alma *(Bins)*	NTK	Potgietersrus (Mokopane) *(Bins)*
NTK	Lehau *(Bins)*	NTK	Roedtan *(Bins)*
NTK	Naboomspruit (Mookgophong) *(Bins)*	NTK	Settlers *(Bins)*
NTK	Nutfield *(Bins)*	NTK	Warmbad (Bela-Bela) *(Bins)*

Region 36: KwaZulu-Natal Region			
Afgri	Bergville *(Bins/Bunkers)*	Afgri	Paulpietersburg *(Bins)*
Afgri	Bloedrivier *(Bins)*	Afgri	Pietermaritzburg *(Bins)*
Afgri	Dannhauser *(Bins)*	Afgri	Vryheid *(Bins)*
Afgri	Dundee *(Bins)*	Afgri	Winterton *(Bins/Bunkers)*
Afgri	Mizpah *(Bins)*		

South African Quality data per production region
WINTER RAINFALL WHEAT

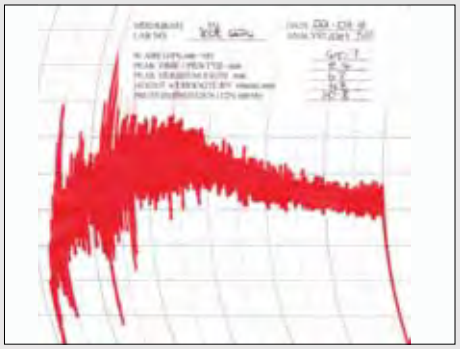
PRODUCTION REGION	(1) Namakwaland Region				(2) Swartland Western Region			
WHEAT								
	ave	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Protein (12% mb), %	12.5	11.8	13.5	0.91	14.3	12.5	15.9	0.93
Falling number, sec	391	355	441	44.68	343	187	388	51.66
1000 Kernel mass (13% mb), g	38.8	36.8	41.8	2.65	32.5	22.0	36.7	3.79
Hectolitre mass (dirty), kg/hl	76.3	75.0	77.6	1.30	75.9	72.7	79.5	2.04
Screenings (<1.8 mm sieve), %	4.77	4.25	5.50	0.65	3.34	1.68	5.14	1.21
Total damaged kernels, %	4.55	3.30	6.64	1.82	2.20	0.76	7.92	1.86
Combined deviations, %	10.08	8.25	12.98	2.54	6.40	3.48	13.55	2.71
Number of samples	***3***				***13***			
CULTIVARS								
	SST 015	33.7			SST 056	30.2		
cultivars	SST 056	27.3			SST 087	29.5		
with highest %	SST 087	17.0			SST 88	21.8		
occurrence	SST 88	16.0			SST 015	10.1		
	SST 047	6.0			SST 0127	8.0		
Number of samples	***3***				***13***			
MIXOGRAM (Quadromat Junior)								
	ave	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Peak time, min	2.5	2.3	2.8	0.26	2.6	2.3	3.0	0.20
Tail height (6 min), mm	48	46	49	1.53	49	43	52	2.37
Number of samples	***3***				***13***			

	COMPOSITE SAMPLES											
CLASS AND GRADE	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**
Bühler Extraction, %	-	-	-	-	71.6	71.7	72.0	71.1	-	-	70.8	70.7
FLOUR												
Protein (12% mb), %	-	-	-	-	12.0	10.5	12.6	15.0	-	-	13.7	13.4
Ash (db), %	-	-	-	-	0.66	0.68	0.56	0.58	-	-	0.58	0.62
Colour, KJ (wet)	-	-	-	-	-4.0	-3.7	-3.9	-3.7	-	-	-3.5	-3.2
Colour, Konica Minolta CM5 (dry)												
L*	-	-	-	-	94.03	93.70	93.62	93.44	-	-	93.64	93.48
a*	-	-	-	-	0.36	0.30	0.44	0.40	-	-	0.36	0.31
b*	-	-	-	-	9.52	9.86	11.24	11.12	-	-	10.25	9.69
RVA												
Peak Viscosity, cP	-	-	-	-	2270	2400	2297	2096	-	-	2154	2377
Minimum viscosity (Through), cP	-	-	-	-	1478	1676	1581	1490	-	-	1684	1656
Final Viscosity, cP	-	-	-	-	2574	2731	2697	2343	-	-	2355	2704
Peak Time, min	-	-	-	-	7.00	7.00	7.00	7.00	-	-	7.00	7.00
GLUTEN												
Wet gluten (14% mb), %	-	-	-	-	32.5	27.8	34.2	39.9	-	-	36.7	35.4
Dry gluten (14% mb), %	-	-	-	-	11.4	9.4	11.9	13.9	-	-	12.7	12.4
Gluten Index	-	-	-	-	94	87	92	89	-	-	93	93
FARINOGRAM												
Water absorption (14% mb), %	-	-	-	-	62.5	59.4	60.2	62.9	-	-	60.7	61.3
Development time, min	-	-	-	-	5.7	4.2	5.7	7.3	-	-	6.0	6.2
Stability, min	-	-	-	-	7.5	5.2	8.9	9.5	-	-	10.0	9.2
Mixing tolerance index, BU	-	-	-	-	38	53	29	28	-	-	29	31
EXTENSOGRAM (45 min pull)												
Area, cm^2	-	-	-	-	97	72	119	131	-	-	141	117
Maximum height, BU	-	-	-	-	347	291	394	391	-	-	410	365
Extensibility, mm	-	-	-	-	199	169	216	241	-	-	246	231
ALVEOGRAM												
Strength (S), cm^2	-	-	-	-	38.8	31.0	39.8	44.0	-	-	49.4	41.1
Stability (P), mm	-	-	-	-	96	84	73	84	-	-	75	73
Distensibility (L), mm	-	-	-	-	94	93	149	122	-	-	181	152
Configuration ratio (P/L)	-	-	-	-	1.02	0.90	0.49	0.69	-	-	0.41	0.48
MIXOGRAM												
Peak time, min	-	-	-	-	2.1	2.5	2.4	2.3	-	-	2.4	2.4
100g BAKING TEST												
Loaf volume, cm^3	-	-	-	-	1096	981	1177	1209	-	-	1243	1184
Evaluation (see page 77)	-	-	-	-	0	0	0	0	-	-	0	0

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

1



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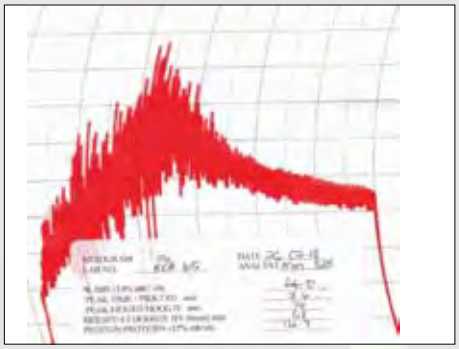
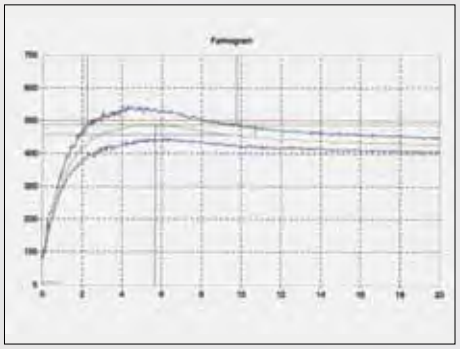
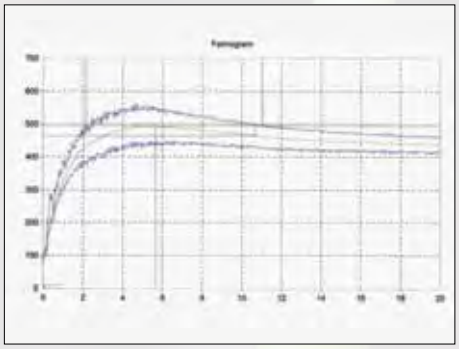


FARINOGRAM

1

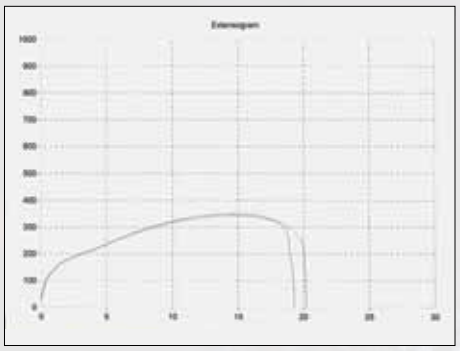


2



EXTENSOGRAM

1



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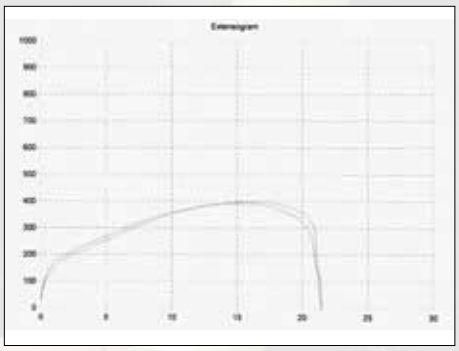
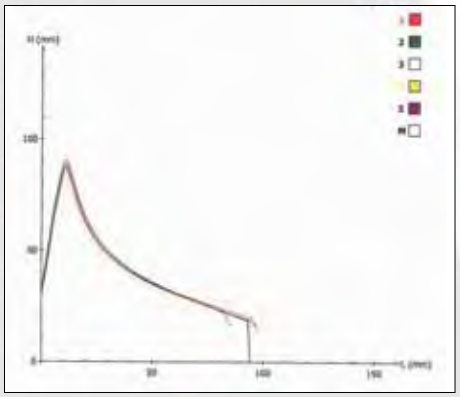
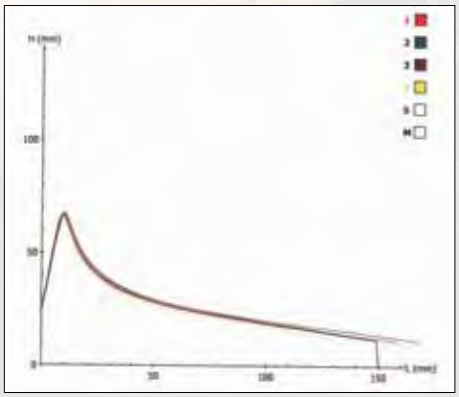


ALVEOGRAM

1



2



South African Quality data per production region
WINTER RAINFALL WHEAT

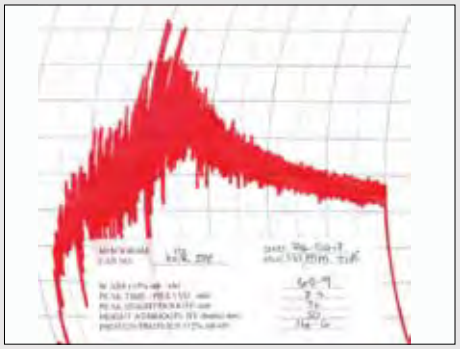
PRODUCTION REGION	(3) Swartland Central Region				(4) Swartland Eastern Region			
WHEAT								
	ave	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Protein (12% mb), %	14.6	9.6	16.5	1.20	13.1	10.9	14.1	0.95
Falling number, sec	392	300	509	36.15	373	291	427	33.69
1000 Kernel mass (13% mb), g	33.1	29.5	38.4	1.85	34.9	31.6	40.6	2.18
Hectolitre mass (dirty), kg/hl	78.1	73.9	81.7	1.67	79.7	77.5	81.0	1.11
Screenings (<1.8 mm sieve), %	2.12	0.30	3.70	0.76	2.06	0.10	3.33	1.02
Total damaged kernels, %	1.17	0.18	2.58	0.53	0.88	0.48	1.80	0.31
Combined deviations, %	3.92	1.32	5.40	1.04	3.81	2.29	5.27	0.99
Number of samples	***52***				***17***			
CULTIVARS								
	SST 056	32.0			SST 056	25.2		
cultivars	SST 087	22.6			SST 087	22.3		
with highest %	SST 88	21.8			SST 88	20.3		
occurrence	SST 015	13.4			SST 015	18.4		
	SST 0127	9.6			SST 0127	13.5		
Number of samples	***52***				***17***			
MIXOGRAM (Quadromat Junior)								
	ave	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Peak time, min	2.6	2.1	3.4	0.23	2.8	2.3	3.0	0.19
Tail height (6 min), mm	51	42	56	2.96	49	44	52	2.34
Number of samples	***52***				***17***			

	COMPOSITE SAMPLES											
CLASS AND GRADE	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**
Bühler Extraction, %	70.9	70.6	71.7	70.2	71.1	-	71.7	-	-	72.0	71.7	-
FLOUR												
Protein (12% mb), %	13.3	14.6	14.9	15.4	12.9	-	12.3	-	-	9.7	12.7	-
Ash (db), %	0.60	0.57	0.49	0.55	0.58	-	0.56	-	-	0.56	0.54	-
Colour, KJ (wet)	-3.6	-3.6	-3.5	-3.7	-4.0	-	-4.2	-	-	-4.2	-4.3	-
Colour, Konica Minolta CM5 (dry)												
L*	93.55	93.64	93.70	93.84	93.82	-	93.93	-	-	93.87	94.08	-
a*	0.50	0.42	0.43	0.41	0.40	-	0.36	-	-	0.32	0.36	-
b*	10.43	10.52	10.11	9.99	10.15	-	10.36	-	-	10.71	10.30	-
RVA												
Peak Viscosity, cP	2241	2190	2215	2194	2352	-	2325	-	-	2163	1987	-
Minimum viscosity (Through), cP	1650	1557	1519	1542	1721	-	1750	-	-	1672	1507	-
Final Viscosity, cP	2557	2438	2406	2479	2699	-	2682	-	-	2546	2294	-
Peak Time, min	7.00	7.00	7.00	7.00	7.00	-	7.00	-	-	7.00	7.00	-
GLUTEN												
Wet gluten (14% mb), %	35.9	40.7	41.5	43.4	35.2	-	32.8	-	-	24.9	33.7	-
Dry gluten (14% mb), %	12.5	14.2	14.1	14.7	12.2	-	11.2	-	-	8.6	11.5	-
Gluten Index	94	96	92	92	95	-	97	-	-	92	97	-
FARINOGRAM												
Water absorption (14% mb), %	61.4	62.5	63.2	62.9	61.1	-	60.7	-	-	60.1	60.9	-
Development time, min	6.7	8.2	7.7	8.0	6.9	-	6.5	-	-	4.2	6.5	-
Stability, min	11.0	16.3	12.8	16.6	12.8	-	9.8	-	-	6.5	13.0	-
Mixing tolerance index, BU	28	21	25	16	22	-	32	-	-	41	20	-
EXTENSOGRAM (45 min pull)												
Area, cm^2	150	153	150	163	144	-	144	-	-	75	151	-
Maximum height, BU	435	428	394	402	439	-	443	-	-	336	467	-
Extensibility, mm	248	256	272	289	245	-	238	-	-	159	237	-
ALVEOGRAM												
Strength (S), cm^2	55.0	53.5	56.7	64.7	48.0	-	47.4	-	-	30.9	50.7	-
Stability (P), mm	85	84	80	82	81	-	80	-	-	90	79	-
Distensibility (L), mm	163	157	193	197	141	-	140	-	-	76	168	-
Configuration ratio (P/L)	0.52	0.54	0.41	0.42	0.57	-	0.57	-	-	1.18	0.47	-
MIXOGRAM												
Peak time, min	2.3	2.5	2.3	2.6	2.4	-	2.4	-	-	2.3	2.5	-
100g BAKING TEST												
Loaf volume, cm^3	1200	1242	1319	1304	1235	-	1155	-	-	923	1212	-
Evaluation (see page 77)	00	0	0	0	0	-	0	-	-	0	0	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

3



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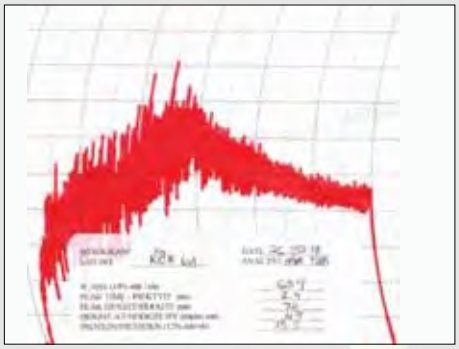
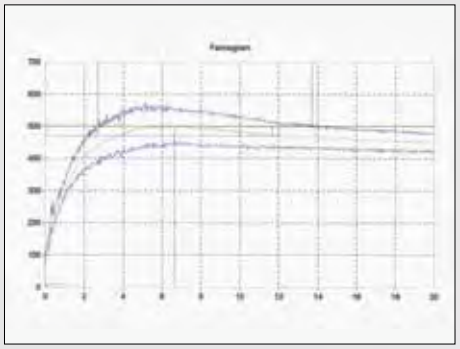


FARINOGRAM

3



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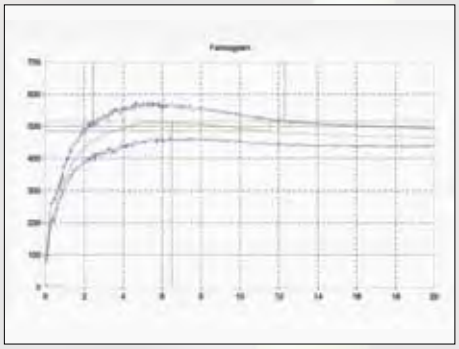
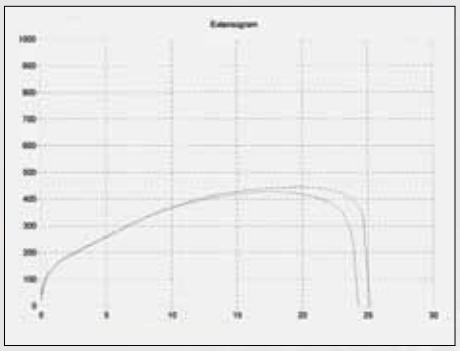


EXTENSOGRAM

3



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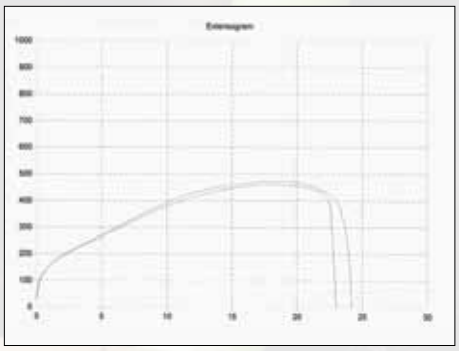
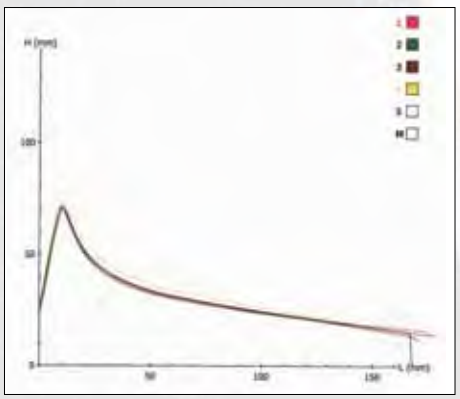


ALVEOGRAM

3



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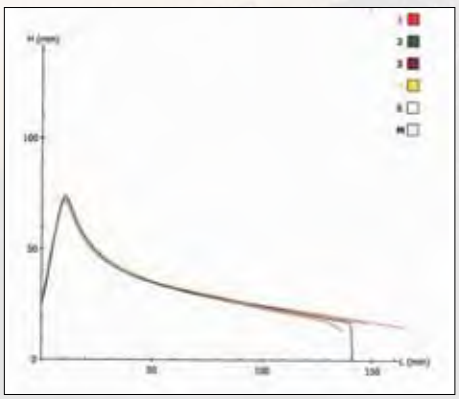


South African Quality data per production region
WINTER RAINFALL WHEAT

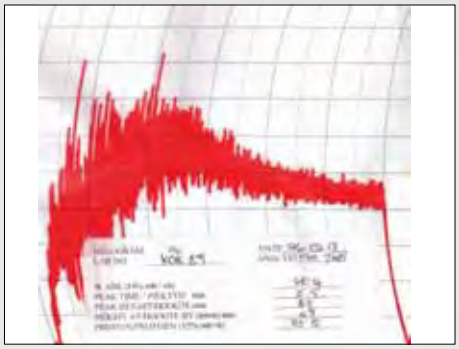
PRODUCTION REGION	(5) Rûens Western Region				(6) Rûens Eastern Region			
WHEAT								
	ave	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Protein (12% mb), %	11.9	9.3	14.6	1.27	11.8	9.9	13.6	0.93
Falling number, sec	361	268	455	39.99	349	316	443	23.47
1000 Kernel mass (13% mb), g	39.0	32.9	45.2	3.26	40.9	36.4	45.9	2.48
Hectolitre mass (dirty), kg/hl	80.7	76.0	82.6	1.72	80.2	78.4	82.2	0.85
Screenings (<1.8 mm sieve), %	0.76	0.05	2.24	0.65	1.50	0.18	3.61	0.92
Total damaged kernels, %	0.60	0.12	1.20	0.25	0.92	0.14	4.46	0.85
Combined deviations, %	2.10	0.42	5.03	1.27	3.17	1.78	5.51	1.20
Number of samples	***42***				***24***			
CULTIVARS								
	SST 087	44.0			SST 087	42.4		
cultivars	SST 056	18.5			SST 0127	17.8		
with highest %	SST 0127	17.1			SST 056	16.3		
occurrence	SST 015	11.7			SST 015	13.2		
	SST 88	7.3			SST 88	9.4		
Number of samples	***42***				***24***			
MIXOGRAM (Quadromat Junior)								
	ave	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Peak time, min	2.6	2.2	2.8	0.16	2.6	2.0	3.3	0.31
Tail height (6 min), mm	49	42	55	2.97	50	43	54	2.94
Number of samples	***42***				***24***			

	COMPOSITE SAMPLES											
CLASS AND GRADE	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**
Bühler Extraction, %	70.9	71.3	72.8	73.9	70.2	-	71.3	71.7	72.8	-	71.7	-
FLOUR												
Protein (12% mb), %	11.8	11.2	9.6	8.3	10.0	-	11.9	10.5	9.6	-	10.5	-
Ash (db), %	0.59	0.61	0.60	0.56	0.62	-	0.56	0.59	0.61	-	0.58	-
Colour, KJ (wet)	-4.1	-3.9	-3.9	-4.8	-4.0	-	-4.1	-4.1	-3.9	-	-4.0	-
Colour, Konica Minolta CM5 (dry)												
L*	93.91	93.73	93.63	94.09	93.62	-	94.03	93.92	93.61	-	93.91	-
a*	0.48	0.52	0.57	0.33	0.55	-	0.43	0.44	0.48	-	0.41	-
b*	10.05	10.24	10.03	10.58	11.19	-	9.76	10.10	10.23	-	10.26	-
RVA												
Peak Viscosity, cP	2335	2098	2370	2354	2331	-	2433	2387	2297	-	2354	-
Minimum viscosity (Through), cP	1706	1626	1849	1858	1734	-	1859	1854	1779	-	1758	-
Final Viscosity, cP	2725	2396	2837	2841	2751	-	2860	2856	2744	-	2804	-
Peak Time, min	7.00	7.00	7.00	7.00	7.00	-	7.00	7.00	7.00	-	7.00	-
GLUTEN												
Wet gluten (14% mb), %	32.8	31.0	26.2	22.0	27.1	-	33.0	28.4	24.5	-	27.2	-
Dry gluten (14% mb), %	11.0	10.4	8.8	7.3	9.2	-	11.2	9.7	8.3	-	9.3	-
Gluten Index	92	92	93	94	88	-	95	94	96	-	96	-
FARINOGRAM												
Water absorption (14% mb), %	61.0	61.2	59.1	57.2	60.7	-	61.2	60.4	59.6	-	59.7	-
Development time, min	5.8	5.2	4.0	2.8	4.0	-	5.5	5.2	3.8	-	4.7	-
Stability, min	9.5	8.5	5.8	4.2	5.9	-	10.0	9.3	5.9	-	8.7	-
Mixing tolerance index, BU	31	33	49	60	40	-	25	29	45	-	30	-
EXTENSOGRAM (45 min pull)												
Area, cm^2	113	101	74	57	74	-	109	91	67	-	89	-
Maximum height, BU	386	351	302	245	294	-	385	338	266	-	329	-
Extensibility, mm	211	205	172	156	172	-	201	191	170	-	191	-
ALVEOGRAM												
Strength (S), cm^2	45.0	37.2	31.5	24.8	31.7	-	43.1	39.4	28.6	-	39.0	-
Stability (P), mm	88	91	77	67	94	-	86	86	89	-	88	-
Distensibility (L), mm	132	96	108	105	81	-	124	119	74	-	111	-
Configuration ratio (P/L)	0.67	0.95	0.71	0.64	1.16	-	0.69	0.72	1.20	-	0.79	-
MIXOGRAM												
Peak time, min	2.5	2.3	2.4	2.5	2.0	-	2.4	2.4	2.3	-	2.3	-
100g BAKING TEST												
Loaf volume, cm^3	1096	1046	963	862	945	-	1093	1056	1004	-	1040	-
Evaluation (see page 77)	0	0	0	0	0	-	0	0	0	-	0	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

5



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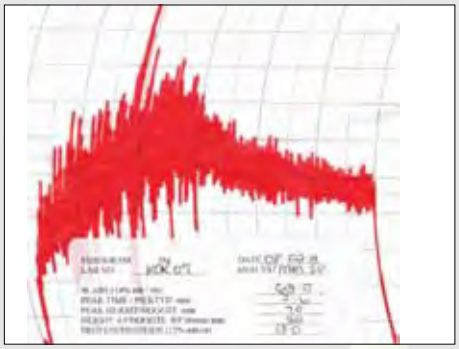
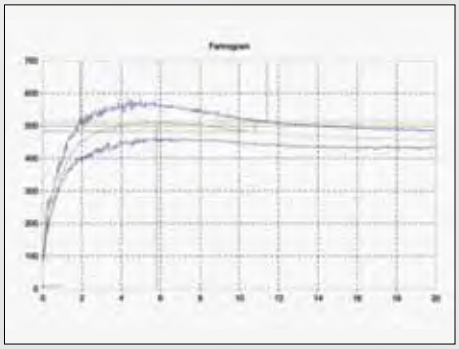


FARINOGRAM

5



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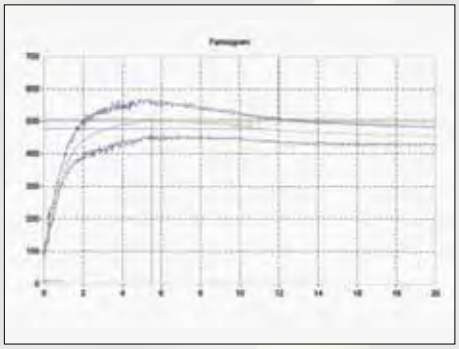
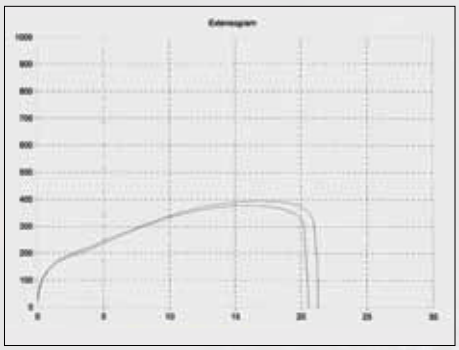


EXTENSOGRAM

5



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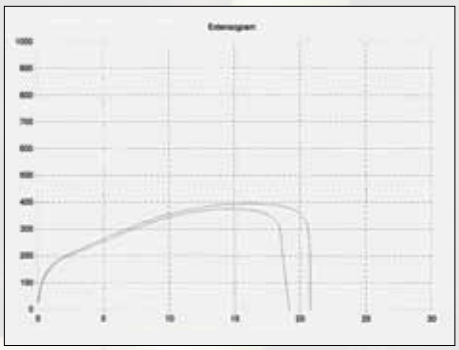
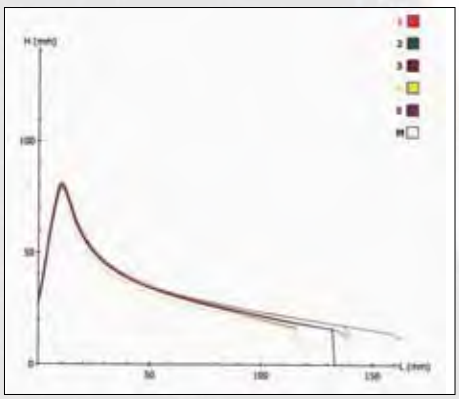


ALVEOGRAM

5



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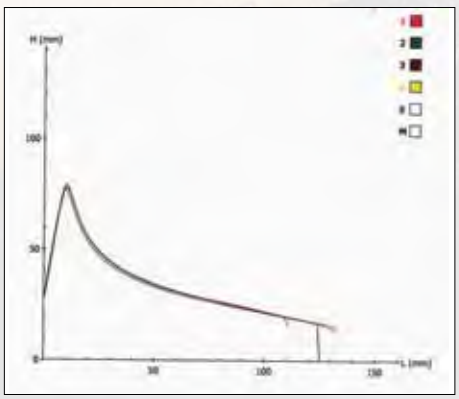


South African Quality data per production region
IRRIGATION WHEAT

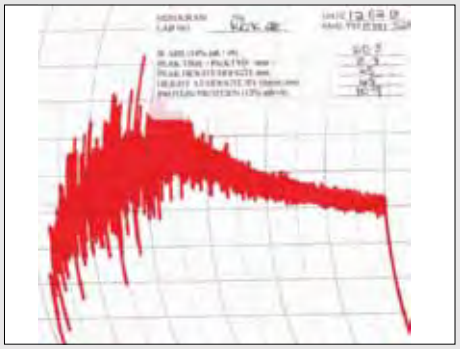
PRODUCTION REGION	(10) Griqualand West Region				(11) Vaalharts Region			
WHEAT								
Protein (12% mb), %	11.6	9.3	12.7	0.79	11.8	9.9	13.7	0.90
Falling number, sec	365	300	443	32.21	397	344	472	36.02
1000 Kernel mass (13% mb), g	40.2	36.1	48.8	2.72	40.5	33.3	45.7	3.69
Hectolitre mass (dirty), kg/hl	84.8	83.2	86.3	0.91	82.6	80.0	85.3	1.56
Screenings (<1.8 mm sieve), %	0.73	0.10	1.86	0.48	1.32	0.23	2.19	0.59
Total damaged kernels, %	0.56	0.12	2.24	0.43	0.36	0.08	0.74	0.20
Combined deviations, %	1.70	0.47	3.28	0.86	2.63	0.95	3.60	0.83
Number of samples	***30***				***14***			
CULTIVARS								
	PAN 3471	23.8			PAN 3471	39.2		
cultivars	SST 875	24.5			SST 884	26.6		
with highest %	SST 884	21.4			SST 875	9.4		
occurrence	SST 835	9.7			SST 895	8.1		
	BAVIAANS	6.0			SST 835	6.9		
Number of samples	***30***				***14***			
MIXOGRAM (Quadromat Junior)								
	ave	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Peak time, min	2.3	1.7	2.8	0.29	2.6	2.2	3.0	0.21
Tail height (6 min), mm	43	36	50	3.90	46	41	52	2.95
Number of samples	***30***				***14***			

	COMPOSITE SAMPLES											
CLASS AND GRADE	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**
Bühler Extraction, %	73.9	73.5	73.4	-	-	-	73.4	74.6	-	-	74.1	-
FLOUR												
Protein (12% mb), %	11.6	10.6	9.8	-	-	-	11.2	10.6	-	-	10.6	-
Ash (db), %	0.55	0.60	0.65	-	-	-	0.61	0.60	-	-	0.63	-
Colour, KJ (wet)	-4.7	-4.8	-4.9	-	-	-	-4.5	-4.7	-	-	-4.6	-
Colour, Konica Minolta CM5 (dry)												
L*	93.93	94.11	94.10	-	-	-	93.97	93.93	-	-	93.99	-
a*	0.52	0.50	0.49	-	-	-	0.44	0.47	-	-	0.47	-
b*	10.24	9.89	10.12	-	-	-	9.76	10.23	-	-	10.04	-
RVA												
Peak Viscosity, cP	2298	2378	2303	-	-	-	2255	2252	-	-	2127	-
Minimum viscosity (Through), cP	1729	1774	1727	-	-	-	1651	1712	-	-	1600	-
Final Viscosity, cP	2561	2672	2589	-	-	-	2418	2544	-	-	2409	-
Peak Time, min	7.00	7.00	7.00	-	-	-	7.00	7.00	-	-	7.00	-
GLUTEN												
Wet gluten (14% mb), %	32.5	30.7	27.8	-	-	-	32.4	30.7	-	-	30.8	-
Dry gluten (14% mb), %	10.8	9.9	8.8	-	-	-	10.5	9.9	-	-	10.1	-
Gluten Index	90	85	90	-	-	-	86	85	-	-	83	-
FARINOGRAM												
Water absorption (14% mb), %	61.3	60.9	59.3	-	-	-	61.3	60.4	-	-	60.7	-
Development time, min	5.0	5.0	4.3	-	-	-	5.5	4.0	-	-	4.3	-
Stability, min	5.5	5.9	6.0	-	-	-	6.1	5.3	-	-	5.4	-
Mixing tolerance index, BU	49	49	44	-	-	-	51	51	-	-	53	-
EXTENSOGRAM (45 min pull)												
Area, cm^2	138	127	69	-	-	-	94	84	-	-	82	-
Maximum height, BU	504	469	322	-	-	-	381	322	-	-	306	-
Extensibility, mm	205	199	154	-	-	-	176	191	-	-	189	-
ALVEOGRAM												
Strength (S), cm^2	36.5	30.3	30.4	-	-	-	37.3	33.5	-	-	31.8	-
Stability (P), mm	79	86	75	-	-	-	90	75	-	-	81	-
Distensibility (L), mm	115	77	101	-	-	-	98	115	-	-	95	-
Configuration ratio (P/L)	0.69	1.12	0.74	-	-	-	0.92	0.65	-	-	0.85	-
MIXOGRAM												
Peak time, min	2.2	2.4	2.6	-	-	-	2.5	2.4	-	-	2.3	-
100g BAKING TEST												
Loaf volume, cm^3	1193	1104	1004	-	-	-	1071	1085	-	-	1086	-
Evaluation (see page 77)	0	0	0	-	-	-	0	0	-	-	0	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

10



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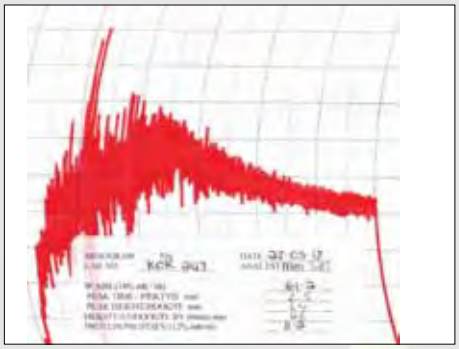
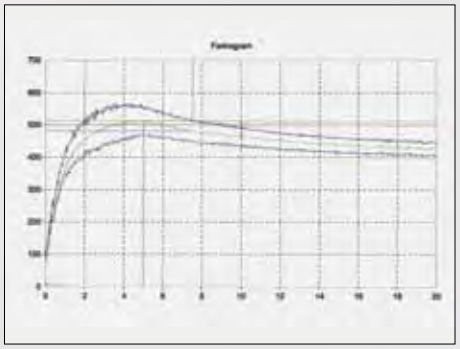


FARINOGRAM

10



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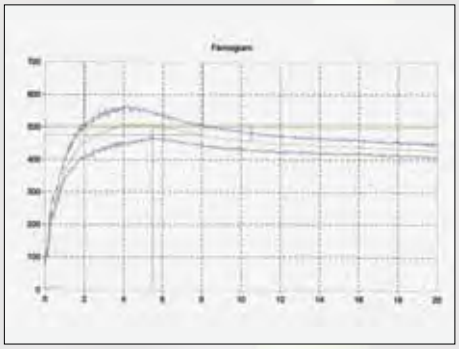
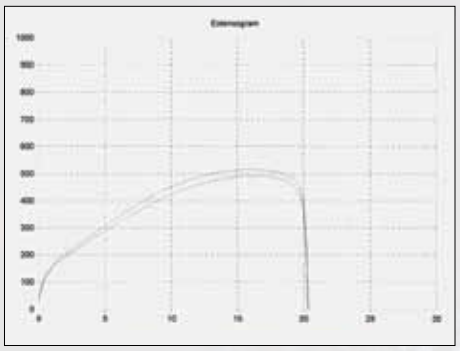


EXTENSOGRAM

10



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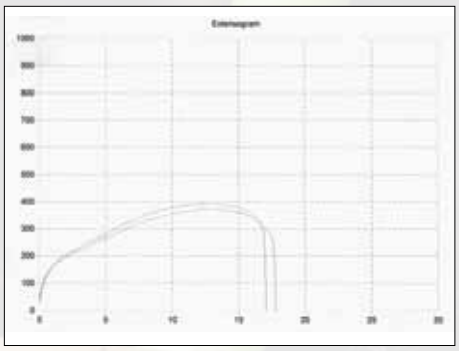
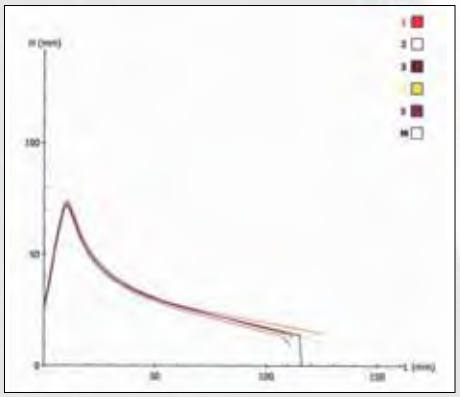
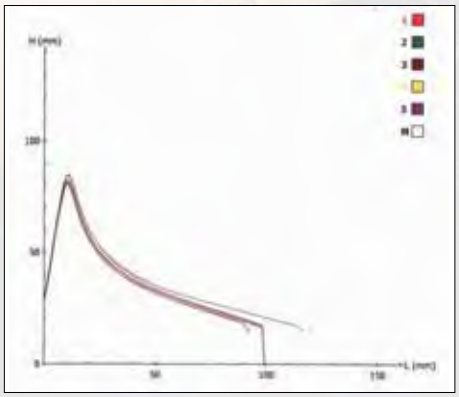


ALVEOGRAM

10



11



South African Quality data per production region
IRRIGATION WHEAT

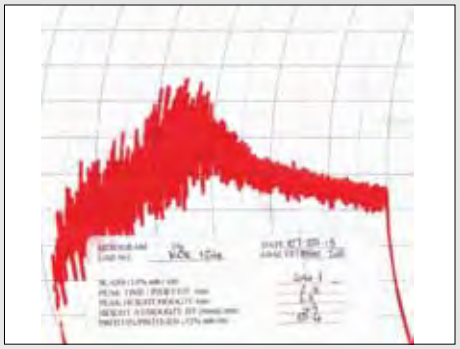
PRODUCTION REGION	(12) North West Western Region				(14) North West Southern Region			
WHEAT								
	ave	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Protein (12% mb), %	12.6	11.9	13.6	0.86	13.0	12.6	13.6	0.55
Falling number, sec	403	378	435	24.35	432	412	455	21.66
1000 Kernel mass (13% mb), g	37.7	31.0	43.2	6.37	39.5	38.6	40.1	0.79
Hectolitre mass (dirty), kg/hl	81.0	80.9	81.1	0.10	82.3	81.7	82.8	0.55
Screenings (<1.8 mm sieve), %	0.85	0.06	1.73	0.92	1.49	1.41	1.59	0.09
Total damaged kernels, %	0.27	0.18	0.36	0.08	0.21	0.18	0.24	0.03
Combined deviations, %	1.35	0.24	2.43	1.24	1.93	1.83	1.98	0.08
Number of samples	***4***				***3***			
CULTIVARS								
	SST 843	41.5			SST 843	35.7		
cultivars	SST 884	34.8			SST 875	31.0		
with highest %	SST 875	18.5			PAN 3497	14.0		
occurrence	PAN 3471	4.0			SST 884	14.0		
	KARIEGA	1.3			SST 835	5.3		
Number of samples	***4***				***3***			
MIXOGRAM (Quadromat Junior)								
	ave	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Peak time, min	3.3	2.3	5.5	1.47	4.1	3.9	4.3	0.21
Tail height (6 min), mm	49	45	55	4.73	56	55	57	1.15
Number of samples	***4***				***3***			

	COMPOSITE SAMPLES											
CLASS AND GRADE	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**
Bühler Extraction, %	73.7	74.9	-	-	-	-	74.8	-	-	-	-	-
FLOUR												
Protein (12% mb), %	12.9	11.2	-	-	-	-	12.1	-	-	-	-	-
Ash (db), %	0.61	0.60	-	-	-	-	0.63	-	-	-	-	-
Colour, KJ (wet)	-4.6	-4.3	-	-	-	-	-4.1	-	-	-	-	-
Colour, Konica Minolta CM5 (dry)												
L*	93.98	94.16	-	-	-	-	93.67	-	-	-	-	-
a*	0.48	0.39	-	-	-	-	0.45	-	-	-	-	-
b*	9.14	8.41	-	-	-	-	8.92	-	-	-	-	-
RVA												
Peak Viscosity, cP	2606	2378	-	-	-	-	2471	-	-	-	-	-
Minimum viscosity (Through), cP	1949	1654	-	-	-	-	1723	-	-	-	-	-
Final Viscosity, cP	2899	2657	-	-	-	-	2653	-	-	-	-	-
Peak Time, min	7.00	7.00	-	-	-	-	7.00	-	-	-	-	-
GLUTEN												
Wet gluten (14% mb), %	32.1	31.4	-	-	-	-	31.0	-	-	-	-	-
Dry gluten (14% mb), %	11.6	10.7	-	-	-	-	10.7	-	-	-	-	-
Gluten Index	100	86	-	-	-	-	98	-	-	-	-	-
FARINOGRAM												
Water absorption (14% mb), %	60.1	60.0	-	-	-	-	59.8	-	-	-	-	-
Development time, min	9.9	4.5	-	-	-	-	10.0	-	-	-	-	-
Stability, min	17.5	5.2	-	-	-	-	15.0	-	-	-	-	-
Mixing tolerance index, BU	15	58	-	-	-	-	26	-	-	-	-	-
EXTENSOGRAM (45 min pull)												
Area, cm^2	178	100	-	-	-	-	141	-	-	-	-	-
Maximum height, BU	557	362	-	-	-	-	531	-	-	-	-	-
Extensibility, mm	235	198	-	-	-	-	201	-	-	-	-	-
ALVEOGRAM												
Strength (S), cm^2	63.0	38.3	-	-	-	-	52.6	-	-	-	-	-
Stability (P), mm	93	71	-	-	-	-	103	-	-	-	-	-
Distensibility (L), mm	129	150	-	-	-	-	97	-	-	-	-	-
Configuration ratio (P/L)	0.72	0.47	-	-	-	-	1.06	-	-	-	-	-
MIXOGRAM												
Peak time, min	4.0	2.2	-	-	-	-	3.9	-	-	-	-	-
100g BAKING TEST												
Loaf volume, cm^3	1222	1196	-	-	-	-	1129	-	-	-	-	-
Evaluation (see page 77)	0	0	-	-	-	-	0	-	-	-	-	

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

12



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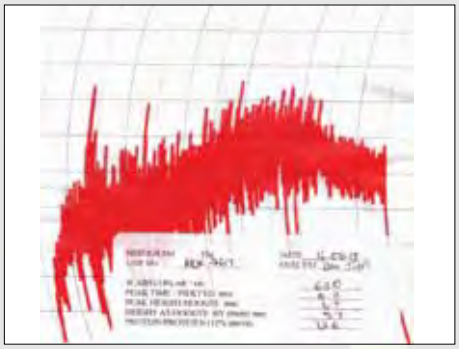
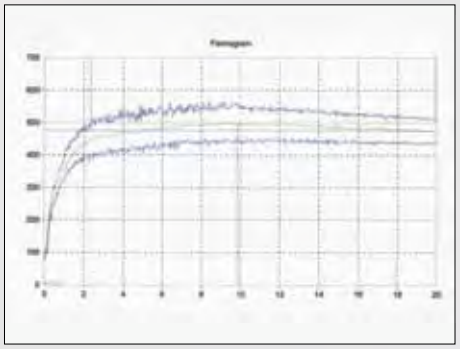


FARINOGRAM

12



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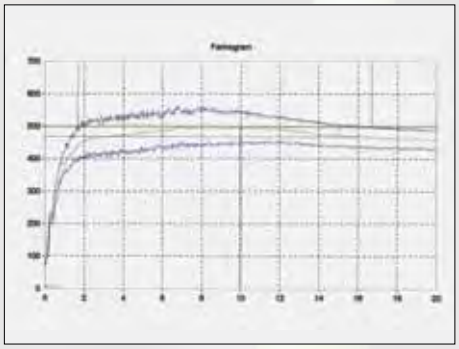
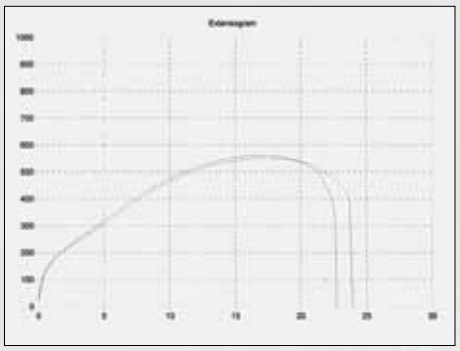


EXTENSOGRAM

12



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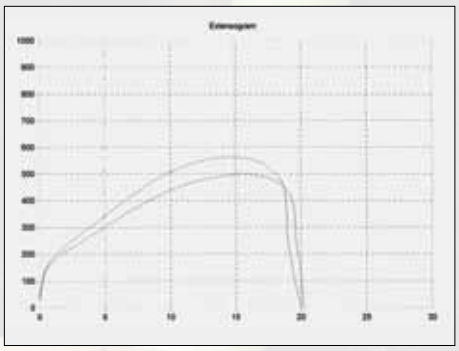
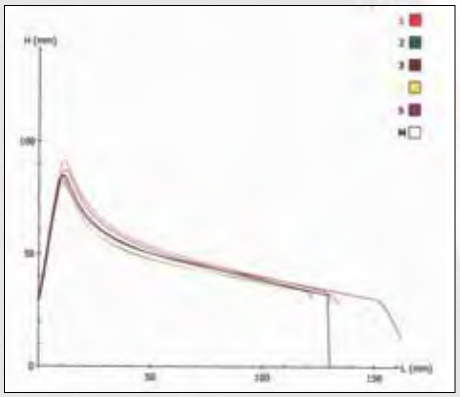


ALVEOGRAM

12



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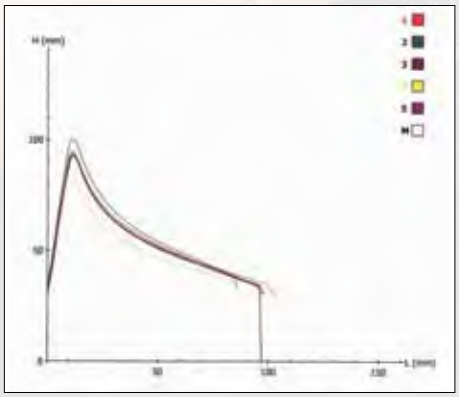


South African Quality data per production region
IRRIGATION WHEAT

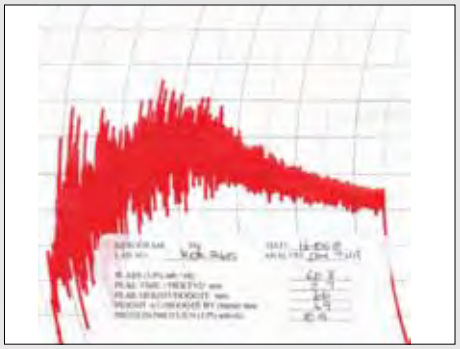
PRODUCTION REGION	(15) North West South-Eastern Region				(16) North West Central-Eastern Region			
WHEAT	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Protein (12% mb), %	12.4	11.5	13.8	0.79	11.9	-	-	-
Falling number, sec	455	403	579	59.81	380	-	-	-
1000 Kernel mass (13% mb), g	41.7	34.5	45.3	3.52	41.0	-	-	-
Hectolitre mass (dirty), kg/hl	82.2	81.5	82.9	0.56	81.8	-	-	-
Screenings (<1.8 mm sieve), %	1.01	0.43	1.99	0.55	1.19	-	-	-
Total damaged kernels, %	0.23	0.12	0.30	0.07	0.32	-	-	-
Combined deviations, %	1.35	0.61	2.55	0.68	1.73	-	-	-
Number of samples	***7***				***1***			
CULTIVARS								
	PAN 3471	34.6			SST 843	56.0		
cultivars	PAN 3400	18.6			SST 875	44.0		
with highest %	SST 884	17.3			-	-		
occurrence	PAN 3497	13.7			-	-		
	SST 347	6.0			-	-		
Number of samples	***7***				***1***			
MIXOGRAM (Quadromat Junior)	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Peak time, min	2.9	2.5	3.4	0.31	2.8	-	-	-
Tail height (6 min), mm	49	46	52	1.86	47	-	-	-
Number of samples	***7***				***1***			

	COMPOSITE SAMPLES											
CLASS AND GRADE	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**
Bühler Extraction, %	74.7	75.1	-	-	-	-	-	74.6	-	-	-	-
FLOUR												
Protein (12% mb), %	11.9	10.6	-	-	-	-	-	10.9	-	-	-	-
Ash (db), %	0.62	0.64	-	-	-	-	-	0.67	-	-	-	-
Colour, KJ (wet)	-4.3	-4.3	-	-	-	-	-	-4.0	-	-	-	-
Colour, Konica Minolta CM5 (dry)												
L*	93.56	93.81	-	-	-	-	-	93.73	-	-	-	-
a*	0.46	0.44	-	-	-	-	-	0.44	-	-	-	-
b*	10.03	10.12	-	-	-	-	-	9.97	-	-	-	-
RVA												
Peak Viscosity, cP	2431	2330	-	-	-	-	-	2359	-	-	-	-
Minimum viscosity (Through), cP	1791	1716	-	-	-	-	-	1770	-	-	-	-
Final Viscosity, cP	2606	2574	-	-	-	-	-	2539	-	-	-	-
Peak Time, min	7.00	7.00	-	-	-	-	-	7.00	-	-	-	-
GLUTEN												
Wet gluten (14% mb), %	31.8	29.1	-	-	-	-	-	29.9	-	-	-	-
Dry gluten (14% mb), %	10.7	9.6	-	-	-	-	-	10.0	-	-	-	-
Gluten Index	94	97	-	-	-	-	-	93	-	-	-	-
FARINOGRAM												
Water absorption (14% mb), %	61.4	60.6	-	-	-	-	-	59.4	-	-	-	-
Development time, min	5.3	5.2	-	-	-	-	-	5.7	-	-	-	-
Stability, min	6.1	7.2	-	-	-	-	-	6.5	-	-	-	-
Mixing tolerance index, BU	47	43	-	-	-	-	-	52	-	-	-	-
EXTENSOGRAM (45 min pull)												
Area, cm^2	97	99	-	-	-	-	-	97	-	-	-	-
Maximum height, BU	365	374	-	-	-	-	-	380	-	-	-	-
Extensibility, mm	191	189	-	-	-	-	-	184	-	-	-	-
ALVEOGRAM												
Strength (S), cm^2	41.7	37.3	-	-	-	-	-	34.9	-	-	-	-
Stability (P), mm	83	85	-	-	-	-	-	76	-	-	-	-
Distensibility (L), mm	120	101	-	-	-	-	-	110	-	-	-	-
Configuration ratio (P/L)	0.69	0.84	-	-	-	-	-	0.69	-	-	-	-
MIXOGRAM												
Peak time, min	2.6	2.7	-	-	-	-	-	2.7	-	-	-	-
100g BAKING TEST												
Loaf volume, cm^3	1156	1152	-	-	-	-	-	1116	-	-	-	-
Evaluation (see page 77)	0	0	-	-	-	-	-	0	-	-	-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

15



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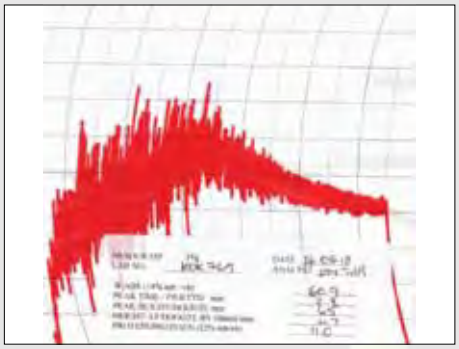
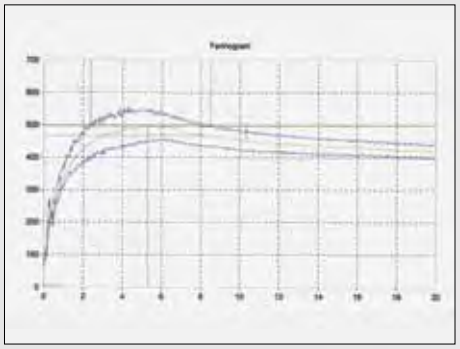


FARINOGRAM

15



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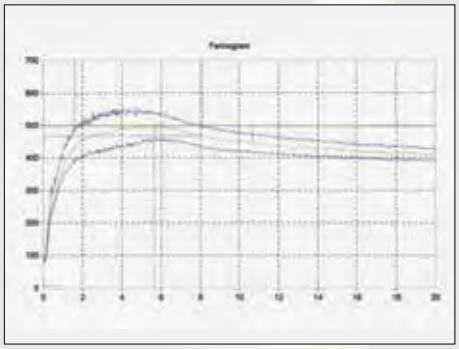
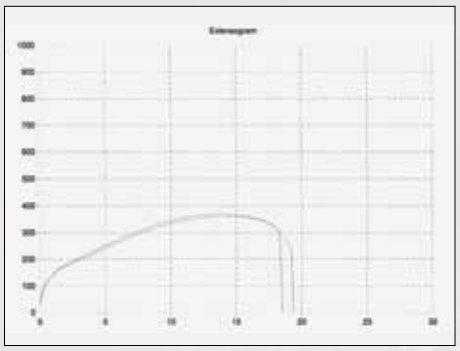


EXTENSOGRAM

15



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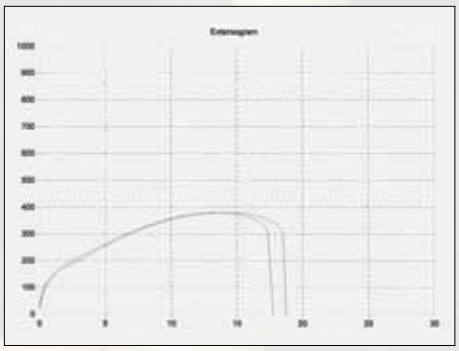
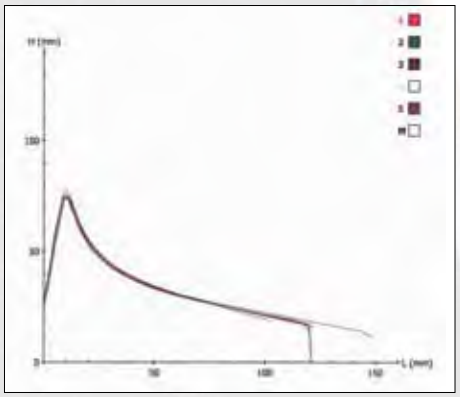


ALVEOGRAM

15



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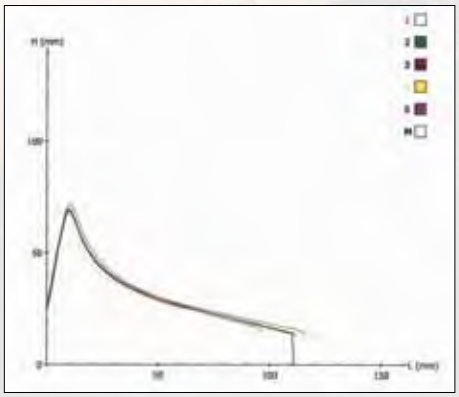


South African Quality data per production region
IRRIGATION WHEAT

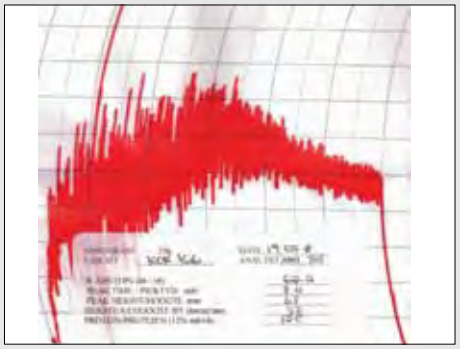
PRODUCTION REGION	(17) North West Central-Northern Region (Ottosdal)				(18) North West Central Region (Ventersdorp)			
WHEAT	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Protein (12% mb), %	12.9	11.9	13.9	0.82	12.2	-	-	-
Falling number, sec	378	339	395	26.36	393	-	-	-
1000 Kernel mass (13% mb), g	36.9	34.9	38.2	1.44	39.3	-	-	-
Hectolitre mass (dirty), kg/hl	81.9	81.1	82.3	0.53	81.5	-	-	-
Screenings (<1.8 mm sieve), %	1.83	0.53	3.34	1.49	2.17	-	-	-
Total damaged kernels, %	0.37	0.14	0.58	0.24	0.36	-	-	-
Combined deviations, %	2.78	1.09	4.88	1.93	2.95	-	-	-
Number of samples	***4***				***1***			
CULTIVARS								
	SST 843	68.0			PAN 3471	57.0		
cultivars	SST 884	17.3			SST 884	25.0		
with highest %	SST 875	6.0			PAN 3400	18.0		
occurrence	SST 835	4.8			-	-		
	PAN 3471	4.0			-	-		
Number of samples	***4***				***1***			
MIXOGRAM (Quadromat Junior)	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Peak time, min	3.3	2.5	3.8	0.55	3.0	-	-	-
Tail height (6 min), mm	51	46	53	3.37	48	-	-	-
Number of samples	***4***				***1***			

	COMPOSITE SAMPLES											
CLASS AND GRADE	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**
Bühler Extraction, %	71.9	-	-	71.4	-	-	73.8	-	-	-	-	-
FLOUR												
Protein (12% mb), %	12.4	-	-	10.5	-	-	11.2	-	-	-	-	-
Ash (db), %	0.63	-	-	0.66	-	-	0.58	-	-	-	-	-
Colour, KJ (wet)	-4.5	-	-	-3.9	-	-	-4.1	-	-	-	-	-
Colour, Konica Minolta CM5 (dry)												
L*	94.08	-	-	93.63	-	-	94.01	-	-	-	-	-
a*	0.41	-	-	0.44	-	-	0.33	-	-	-	-	-
b*	8.94	-	-	9.56	-	-	8.48	-	-	-	-	-
RVA												
Peak Viscosity, cP	2368	-	-	2314	-	-	2429	-	-	-	-	-
Minimum viscosity (Through), cP	1663	-	-	1679	-	-	1778	-	-	-	-	-
Final Viscosity, cP	2602	-	-	2578	-	-	2622	-	-	-	-	-
Peak Time, min	7.00	-	-	7.00	-	-	7.00	-	-	-	-	-
GLUTEN												
Wet gluten (14% mb), %	31.8	-	-	30.0	-	-	30.8	-	-	-	-	-
Dry gluten (14% mb), %	11.1	-	-	9.8	-	-	10.4	-	-	-	-	-
Gluten Index	98	-	-	88	-	-	96	-	-	-	-	-
FARINOGRAM												
Water absorption (14% mb), %	62.1	-	-	61.9	-	-	60.0	-	-	-	-	-
Development time, min	7.9	-	-	4.3	-	-	6.5	-	-	-	-	-
Stability, min	10.5	-	-	4.6	-	-	8.5	-	-	-	-	-
Mixing tolerance index, BU	30	-	-	58	-	-	39	-	-	-	-	-
EXTENSOGRAM (45 min pull)												
Area, cm^2	134	-	-	76	-	-	118	-	-	-	-	-
Maximum height, BU	484	-	-	317	-	-	461	-	-	-	-	-
Extensibility, mm	202	-	-	169	-	-	192	-	-	-	-	-
ALVEOGRAM												
Strength (S), cm^2	54.9	-	-	33.2	-	-	41.9	-	-	-	-	-
Stability (P), mm	102	-	-	91	-	-	85	-	-	-	-	-
Distensibility (L), mm	107	-	-	91	-	-	104	-	-	-	-	-
Configuration ratio (P/L)	0.95	-	-	1.00	-	-	0.82	-	-	-	-	-
MIXOGRAM												
Peak time, min	3.2	-	-	2.3	-	-	3.1	-	-	-	-	-
100g BAKING TEST												
Loaf volume, cm^3	1208	-	-	1025	-	-	1079	-	-	-	-	-
Evaluation (see page 77)	0	-	-	0	-	-	0	-	-	-	-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

17



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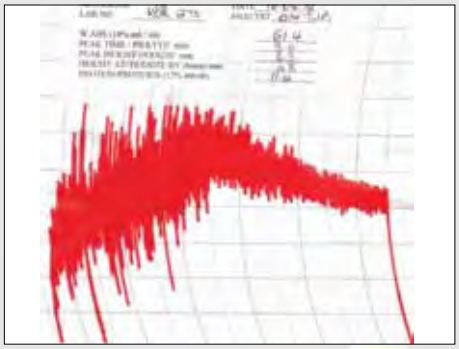
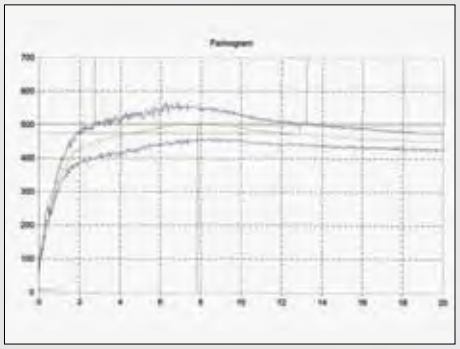


FARINOGRAM

17



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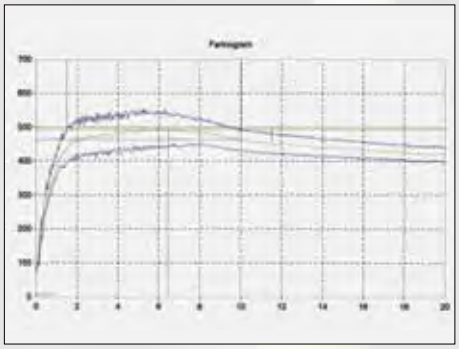
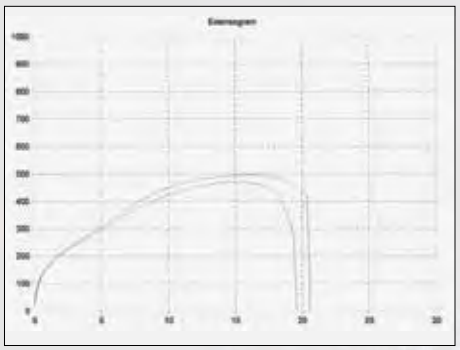
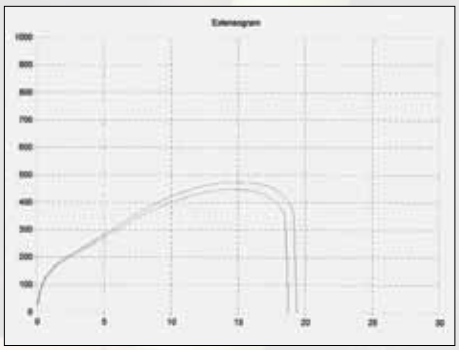


EXTENSOGRAM

17

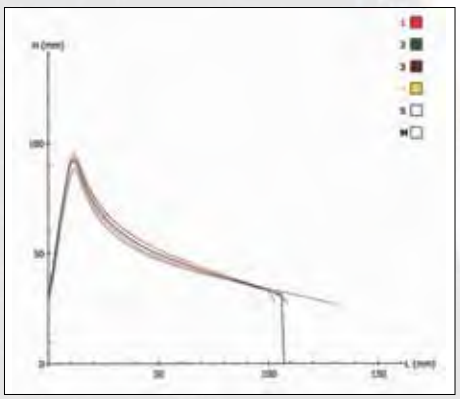


18



ALVEOGRAM

17



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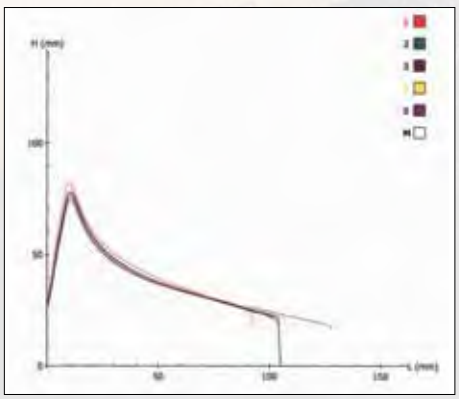


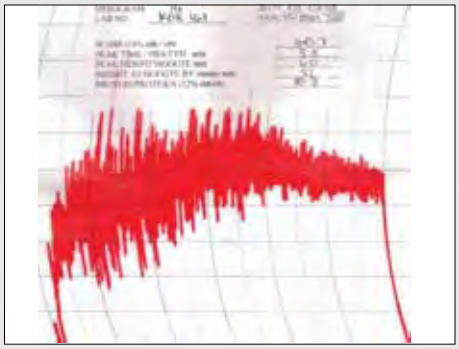
South African Quality data per production region
IRRIGATION WHEAT

PRODUCTION REGION	(19) North West Central Region (Lichtenburg)						(20) North West Eastern Region					
WHEAT												
	ave	**min**	**max**	**stdev**			**ave**	**min**	**max**	**stdev**		
Protein (12% mb), %	11.7	9.6	13.5	1.31			11.7	10.7	13.0	0.75		
Falling number, sec	382	331	426	31.00			372	330	434	36.39		
1000 Kernel mass (13% mb), g	38.7	32.7	42.5	3.02			41.2	38.5	47.2	2.88		
Hectolitre mass (dirty), kg/hl	81.8	80.9	82.5	0.51			82.5	78.9	85.6	1.89		
Screenings (<1.8 mm sieve), %	0.90	0.11	1.85	0.70			1.28	0.83	1.97	0.44		
Total damaged kernels, %	0.42	0.24	1.16	0.26			0.65	0.32	0.84	0.15		
Combined deviations, %	1.56	0.52	2.59	0.72			2.51	1.95	3.24	0.43		
Number of samples	***11***						***8***					
CULTIVARS												
	SST 843	43.2					SST 875	27.0				
cultivars	SST 884	26.5					DUZI	20.5				
with highest %	SST 875	13.8					SST 843	15.9				
occurrence	SST 835	5.1					SST 884	10.3				
	PAN 3471	3.8					OLIFANTS	6.3				
Number of samples	***11***						***8***					
MIXOGRAM (Quadromat Junior)												
	ave	**min**	**max**	**stdev**			**ave**	**min**	**max**	**stdev**		
Peak time, min	3.6	2.1	4.6	0.81			2.9	2.3	4.7	0.76		
Tail height (6 min), mm	49	42	55	4.38			47	42	57	4.57		
Number of samples	***11***						***8***					
	COMPOSITE SAMPLES											
CLASS AND GRADE	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**
Bühler Extraction, %	73.6	72.9	73.6	74.2	-	-	75.1	75.5	74.3	-	-	-
FLOUR												
Protein (12% mb), %	12.6	10.8	9.9	9.2	-	-	11.8	10.5	9.6	-	-	-
Ash (db), %	0.57	0.60	0.58	0.54	-	-	0.61	0.59	0.63	-	-	-
Colour, KJ (wet)	-4.1	-4.2	-4.5	-4.5	-	-	-3.9	-4.4	-4.2	-	-	-
Colour, Konica Minolta CM5 (dry)												
L*	93.71	93.84	94.18	94.05	-	-	93.59	93.70	93.76	-	-	-
a*	0.46	0.43	0.42	0.38	-	-	0.33	0.46	0.42	-	-	-
b*	9.00	9.36	9.81	9.58	-	-	8.36	9.90	9.68	-	-	-
RVA												
Peak Viscosity, cP	2460	2298	2474	2454	-	-	2227	2435	2517	-	-	-
Minimum viscosity (Through), cP	1743	1676	1789	1794	-	-	1701	1864	1909	-	-	-
Final Viscosity, cP	2705	2588	2847	2849	-	-	2435	2783	2797	-	-	-
Peak Time, min	7.00	7.00	7.00	7.00	-	-	7.00	7.00	7.00	-	-	-
GLUTEN												
Wet gluten (14% mb), %	32.1	28.3	27.2	21.8	-	-	31.0	29.4	25.8	-	-	-
Dry gluten (14% mb), %	11.4	9.7	8.9	7.5	-	-	10.9	9.5	8.7	-	-	-
Gluten Index	99	96	94	100	-	-	96	86	90	-	-	-
FARINOGRAM												
Water absorption (14% mb), %	61.4	60.6	59.2	57.0	-	-	60.9	59.1	58.1	-	-	-
Development time, min	10.0	5.0	4.5	5.8	-	-	6.5	4.0	3.7	-	-	-
Stability, min	14.4	6.6	5.6	10.3	-	-	7.5	4.8	5.4	-	-	-
Mixing tolerance index, BU	27	46	55	29	-	-	41	56	48	-	-	-
EXTENSOGRAM (45 min pull)												
Area, cm^2	152	106	85	111	-	-	133	76	90	-	-	-
Maximum height, BU	513	411	353	466	-	-	444	291	354	-	-	-
Extensibility, mm	219	190	171	180	-	-	220	188	184	-	-	-
ALVEOGRAM												
Strength (S), cm^2	60.4	34.6	35.5	39.3	-	-	45.1	30.7	30.7	-	-	-
Stability (P), mm	108	91	76	84	-	-	77	68	75	-	-	-
Distensibility (L), mm	106	82	121	101	-	-	135	119	96	-	-	-
Configuration ratio (P/L)	1.02	1.11	0.63	0.83	-	-	0.57	0.57	0.78	-	-	-
MIXOGRAM												
Peak time, min	3.6	2.7	2.6	3.4	-	-	2.9	2.4	2.9	-	-	-
100g BAKING TEST												
Loaf volume, cm^3	1203	1197	1023	1006	-	-	1207	1099	993	-	-	-
Evaluation (see page 77)	0	0	0	0	-	-	0	0	0	-	-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

19



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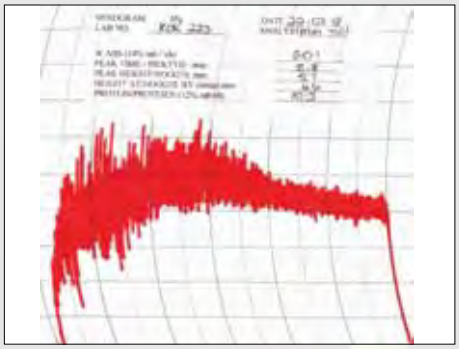
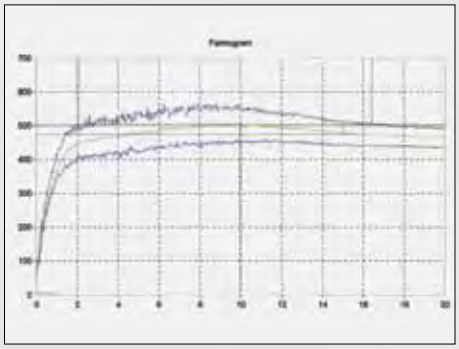


FARINOGRAM

19



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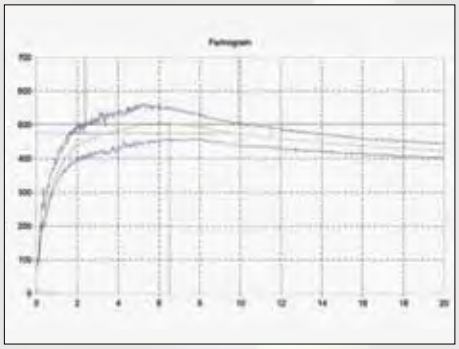
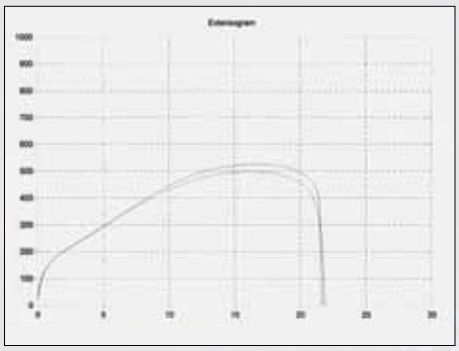


EXTENSOGRAM

19



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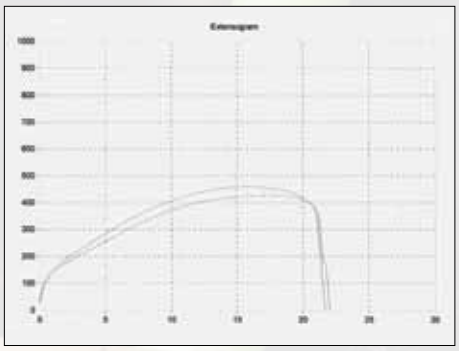
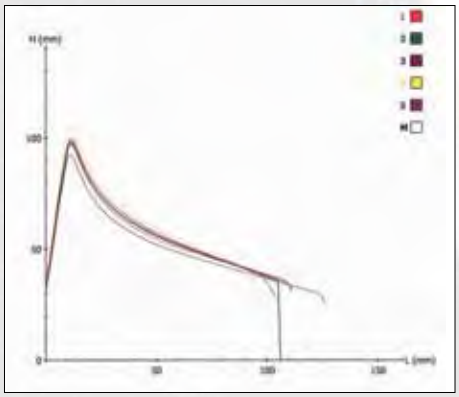


ALVEOGRAM

19



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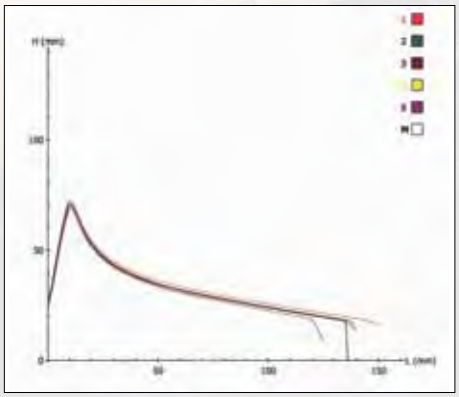


South African Quality data per production region
SUMMER RAINFALL AND IRRIGATION WHEAT

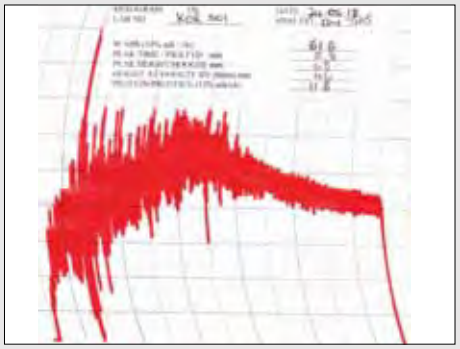
PRODUCTION REGION	(21) Free State North-Western Region (Viljoenskroon)				(22) Free State North-Western Region (Bothaville)			
WHEAT	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Protein (12% mb), %	12.5	-	-	-	11.6	10.4	12.9	1.25
Falling number, sec	297	-	-	-	352	320	395	38.84
1000 Kernel mass (13% mb), g	39.2	-	-	-	39.9	32.8	44.4	6.20
Hectolitre mass (dirty), kg/hl	81.9	-	-	-	80.0	79.7	80.3	0.31
Screenings (<1.8 mm sieve), %	1.58	-	-	-	1.03	0.98	1.08	0.05
Total damaged kernels, %	0.40	-	-	-	0.59	0.32	0.82	0.25
Combined deviations, %	2.12	-	-	-	1.75	1.56	1.92	0.18
Number of samples	***1***				***3***			
CULTIVARS								
	SST 884	72.0			SST 387	55.0		
cultivars	PAN 3471	28.0			BAVIAANS	11.3		
with highest %	-	-			SST 884	10.3		
occurrence	-	-			SST 875	9.3		
	-	-			PAN 3471	7.0		
Number of samples	***1***				***3***			
MIXOGRAM (Quadromat Junior)	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Peak time, min	2.8	-	-	-	3.0	2.8	3.1	0.17
Tail height (6 min), mm	46	-	-	-	48	47	50	1.53
Number of samples	***1***				***3***			

	COMPOSITE SAMPLES											
CLASS AND GRADE	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**
Bühler Extraction, %	74.8	-	-	-	-	-	73.2	76.4	77.7	-	-	-
FLOUR												
Protein (12% mb), %	11.3	-	-	-	-	-	11.7	10.6	9.6	-	-	-
Ash (db), %	0.61	-	-	-	-	-	0.61	0.58	0.57	-	-	-
Colour, KJ (wet)	-3.6	-	-	-	-	-	-4.0	-4.2	-4.2	-	-	-
Colour, Konica Minolta CM5 (dry)												
L*	93.53	-	-	-	-	-	93.91	93.90	94.06	-	-	-
a*	0.38	-	-	-	-	-	0.38	0.41	0.31	-	-	-
b*	9.05	-	-	-	-	-	10.20	9.81	9.99	-	-	-
RVA												
Peak Viscosity, cP	2018	-	-	-	-	-	2244	2248	2358	-	-	-
Minimum viscosity (Through), cP	1685	-	-	-	-	-	1911	1840	1765	-	-	-
Final Viscosity, cP	2126	-	-	-	-	-	2335	2458	2619	-	-	-
Peak Time, min	6.93	-	-	-	-	-	6.80	7.00	7.00	-	-	-
GLUTEN												
Wet gluten (14% mb), %	31.7	-	-	-	-	-	32.3	30.5	25.6	-	-	-
Dry gluten (14% mb), %	10.5	-	-	-	-	-	10.9	10.4	8.5	-	-	-
Gluten Index	94	-	-	-	-	-	97	97	99	-	-	-
FARINOGRAM												
Water absorption (14% mb), %	59.6	-	-	-	-	-	58.9	59.3	58.3	-	-	-
Development time, min	3.8	-	-	-	-	-	6.2	5.0	5.0	-	-	-
Stability, min	5.7	-	-	-	-	-	8.8	5.7	6.2	-	-	-
Mixing tolerance index, BU	55	-	-	-	-	-	37	53	52	-	-	-
EXTENSOGRAM (45 min pull)												
Area, cm^2	96	-	-	-	-	-	115	87	80	-	-	-
Maximum height, BU	341	-	-	-	-	-	401	305	329	-	-	-
Extensibility, mm	206	-	-	-	-	-	207	203	176	-	-	-
ALVEOGRAM												
Strength (S), cm^2	35.2	-	-	-	-	-	42.7	37.0	33.3	-	-	-
Stability (P), mm	71	-	-	-	-	-	67	66	70	-	-	-
Distensibility (L), mm	126	-	-	-	-	-	167	145	118	-	-	-
Configuration ratio (P/L)	0.56	-	-	-	-	-	0.40	0.46	0.59	-	-	-
MIXOGRAM												
Peak time, min	2.6	-	-	-	-	-	2.9	2.7	2.9	-	-	-
100g BAKING TEST												
Loaf volume, cm^3	1158	-	-	-	-	-	1057	1085	1047	-	-	-
Evaluation (see page 77)	0	-	-	-	-	-	0	0	0	-	-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

21



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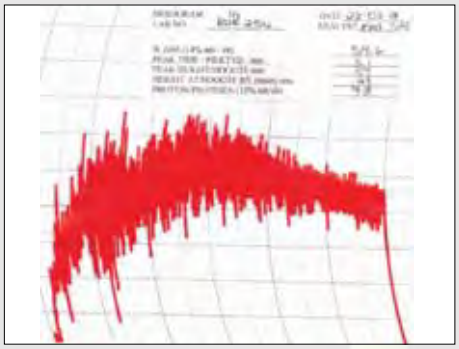
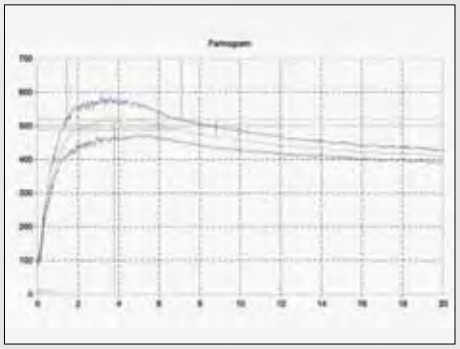


FARINOGRAM

21



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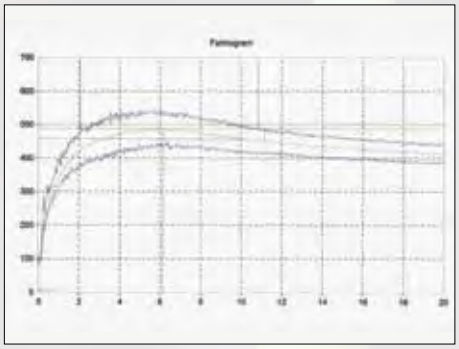
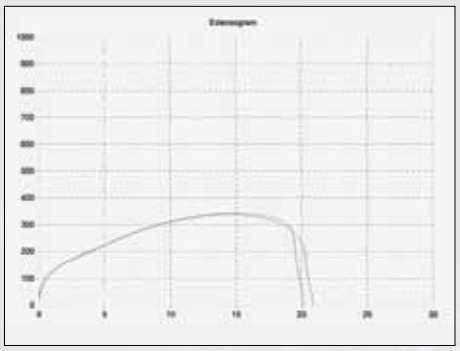


EXTENSOGRAM

21



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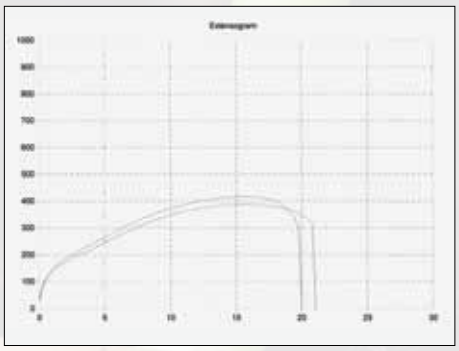
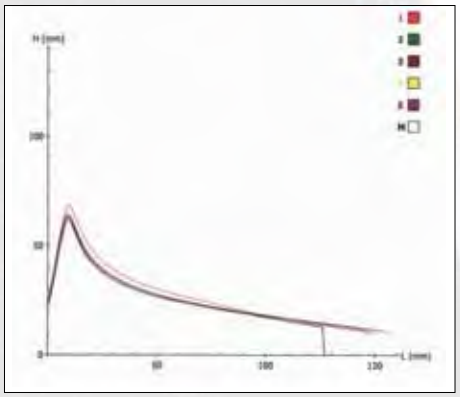


ALVEOGRAM

21



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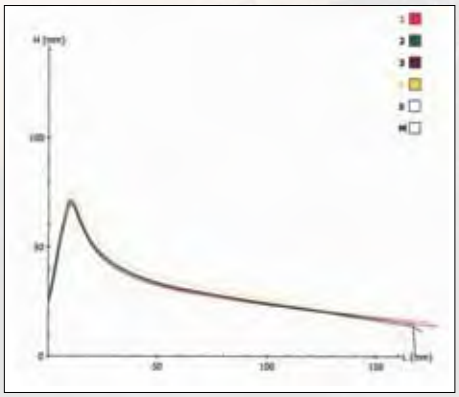


South African Quality data per production region
SUMMER RAINFALL AND IRRIGATION WHEAT

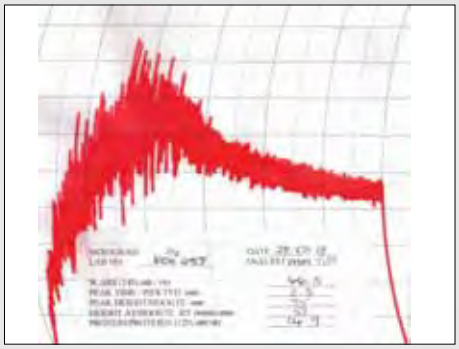
PRODUCTION REGION	(23) Free State North-Western Region (Bultfontein)				(24) Free State Central Region			
WHEAT								
	ave	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Protein (12% mb), %	13.9	11.7	17.1	2.06	12.4	10.5	14.9	1.16
Falling number, sec	388	263	445	66.93	400	359	463	32.18
1000 Kernel mass (13% mb), g	37.3	33.1	42.1	3.50	35.3	29.4	49.0	5.37
Hectolitre mass (dirty), kg/hl	80.8	79.0	82.4	1.54	80.3	77.7	82.1	1.45
Screenings (<1.8 mm sieve), %	2.06	1.18	3.70	1.17	2.38	1.11	5.22	1.33
Total damaged kernels, %	0.69	0.16	1.88	0.71	0.23	0.12	0.48	0.10
Combined deviations, %	3.12	1.50	6.06	2.10	2.95	1.96	5.34	1.13
Number of samples	***6***				***11***			
CULTIVARS								
	PAN 3471	43.2			PAN 3471	43.4		
cultivars	SST 387	13.7			PAN 3400	16.3		
with highest %	PAN 3120	11.7			PAN 3161	9.1		
occurrence	PAN 3368	10.3			SST 875	8.9		
	SST 875	7.2			SST 884	8.8		
Number of samples	***6***				***11***			
MIXOGRAM (Quadromat Junior)								
	ave	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Peak time, min	2.5	1.6	3.2	0.58	2.8	2.4	4.0	0.49
Tail height (6 min), mm	48	45	51	2.28	48	44	53	2.81
Number of samples	***6***				***11***			

	COMPOSITE SAMPLES											
CLASS AND GRADE	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**
Bühler Extraction, %	73.6	74.5	-	-	-	-	71.7	72.1	72.6	-	-	-
FLOUR												
Protein (12% mb), %	12.9	10.4	-	-	-	-	12.2	10.5	9.2	-	-	-
Ash (db), %	0.65	0.63	-	-	-	-	0.60	0.64	0.63	-	-	-
Colour, KJ (wet)	-3.9	-4.7	-	-	-	-	-4.4	-4.7	-4.2	-	-	-
Colour, Konica Minolta CM5 (dry)												
L*	93.47	94.24	-	-	-	-	93.60	94.03	93.85	-	-	-
a*	0.50	0.40	-	-	-	-	0.44	0.40	0.37	-	-	-
b*	9.78	9.16	-	-	-	-	10.23	9.68	10.27	-	-	-
RVA												
Peak Viscosity, cP	1597	2606	-	-	-	-	2457	2423	2394	-	-	-
Minimum viscosity (Through), cP	1405	1860	-	-	-	-	1877	1729	1716	-	-	-
Final Viscosity, cP	1712	2874	-	-	-	-	2710	2730	2706	-	-	-
Peak Time, min	6.73	7.00	-	-	-	-	7.00	7.00	7.00	-	-	-
GLUTEN												
Wet gluten (14% mb), %	37.5	28.4	-	-	-	-	34.0	29.1	23.1	-	-	-
Dry gluten (14% mb), %	12.2	9.4	-	-	-	-	11.1	9.5	8.0	-	-	-
Gluten Index	75	97	-	-	-	-	91	93	98	-	-	-
FARINOGRAM												
Water absorption (14% mb), %	61.5	57.9	-	-	-	-	60.7	58.5	60.6	-	-	-
Development time, min	4.8	5.2	-	-	-	-	5.2	4.7	1.9	-	-	-
Stability, min	4.9	6.5	-	-	-	-	6.5	5.6	10.6	-	-	-
Mixing tolerance index, BU	51	54	-	-	-	-	46	51	25	-	-	-
EXTENSOGRAM (45 min pull)												
Area, cm^2	91	105	-	-	-	-	112	88	102	-	-	-
Maximum height, BU	324	402	-	-	-	-	395	361	481	-	-	-
Extensibility, mm	201	188	-	-	-	-	207	178	160	-	-	-
ALVEOGRAM												
Strength (S), cm^2	38.2	37.4	-	-	-	-	34.6	28.9	29.4	-	-	-
Stability (P), mm	73	67	-	-	-	-	80	77	146	-	-	-
Distensibility (L), mm	147	154	-	-	-	-	96	83	30	-	-	-
Configuration ratio (P/L)	0.50	0.44	-	-	-	-	0.83	0.93	4.87	-	-	-
MIXOGRAM												
Peak time, min	2.0	2.9	-	-	-	-	2.4	2.4	3.4	-	-	-
100g BAKING TEST												
Loaf volume, cm^3	1153	1097	-	-	-	-	1250	1068	856	-	-	-
Evaluation (see page 77)	0	0	-	-	-	-	0	0	0	-	-	-

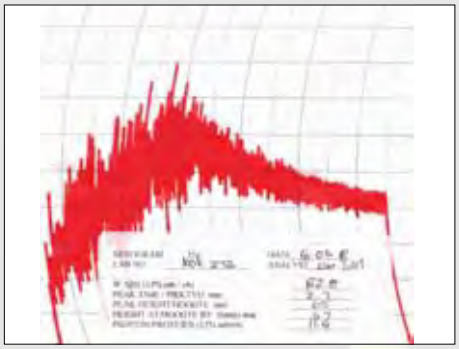
RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

23

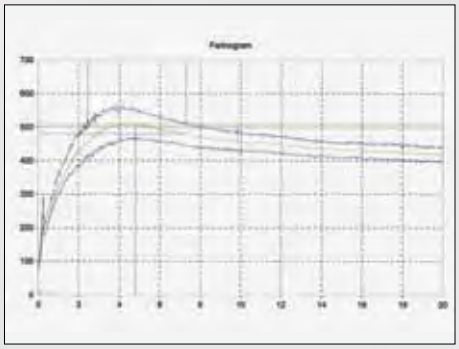


24



FARINOGRAM

23



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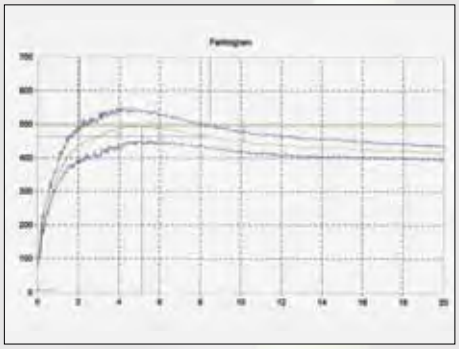
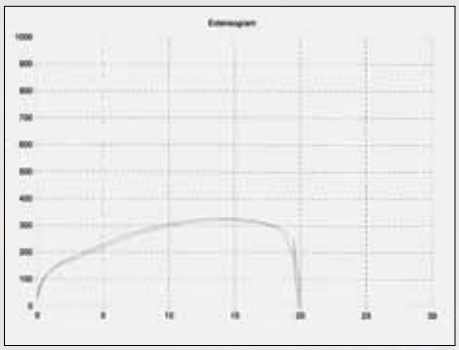


EXTENSOGRAM

23



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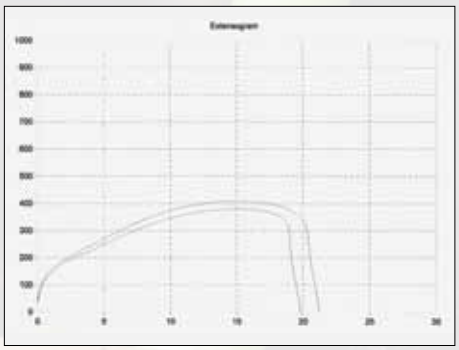
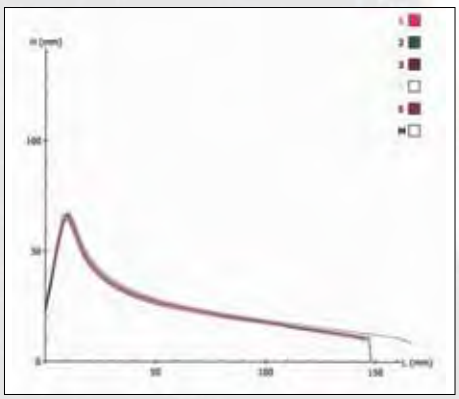


ALVEOGRAM

23



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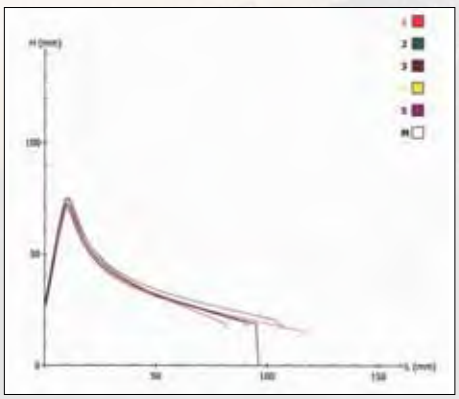


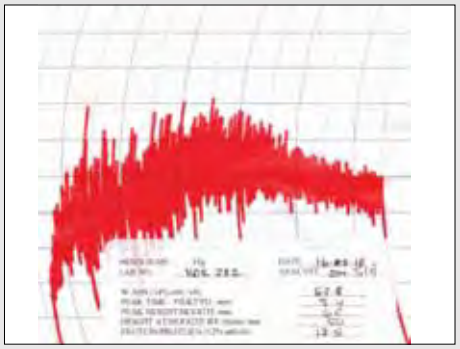
South African Quality data per production region
SUMMER RAINFALL AND IRRIGATION WHEAT

PRODUCTION REGION	(26) Free State South-Eastern Region						(27) Free State Northern Region					
WHEAT												
	ave	**min**	**max**	**stdev**			**ave**	**min**	**max**	**stdev**		
Protein (12% mb), %	12.4	9.2	14.7	2.19			12.2	12.0	12.6	0.32		
Falling number, sec	290	208	348	55.56			358	324	410	45.54		
1000 Kernel mass (13% mb), g	36.0	32.9	39.8	3.12			40.3	37.7	42.2	2.35		
Hectolitre mass (dirty), kg/hl	79.1	75.3	83.7	4.12			79.4	78.3	80.2	1.00		
Screenings (<1.8 mm sieve), %	3.01	1.39	6.58	2.11			0.83	0.49	1.38	0.48		
Total damaged kernels, %	1.03	0.38	2.32	0.86			0.41	0.32	0.46	0.08		
Combined deviations, %	4.79	1.89	10.72	3.64			1.47	1.07	2.26	0.69		
Number of samples	***5***						***3***					
CULTIVARS												
	ELANDS	40.0					PAN 3400	21.0				
cultivars	SST 884	22.2					SST 88	13.3				
with highest %	PAN 3400	9.4					SST 087	12.0				
occurrence	PAN 3471	8.4					SST 356	12.0				
	SST 356	7.2					SST 398	12.0				
Number of samples	***5***						***3***					
MIXOGRAM (Quadromat Junior)												
	ave	**min**	**max**	**stdev**			**ave**	**min**	**max**	**stdev**		
Peak time, min	3.4	2.8	4.2	0.52			3.3	3.1	3.4	0.17		
Tail height (6 min), mm	50	44	57	4.82			54	53	56	1.53		
Number of samples	***5***						***3***					
	COMPOSITE SAMPLES											
CLASS AND GRADE	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**
Bühler Extraction, %	72.3	74.2	-	74.0	-	-	73.0	-	-	-	-	-
FLOUR												
Protein (12% mb), %	12.5	10.1	-	8.1	-	-	11.5	-	-	-	-	-
Ash (db), %	0.53	0.64	-	0.61	-	-	0.60	-	-	-	-	-
Colour, KJ (wet)	-3.6	-4.5	-	-4.6	-	-	-3.9	-	-	-	-	-
Colour, Konica Minolta CM5 (dry)												
L*	93.08	93.93	-	94.12	-	-	93.46	-	-	-	-	-
a*	0.42	0.42	-	0.38	-	-	0.44	-	-	-	-	-
b*	10.10	9.37	-	9.32	-	-	10.19	-	-	-	-	-
RVA												
Peak Viscosity, cP	2047	2260	-	2185	-	-	2390	-	-	-	-	-
Minimum viscosity (Through), cP	1640	1838	-	1878	-	-	1865	-	-	-	-	-
Final Viscosity, cP	2291	2462	-	2409	-	-	2694	-	-	-	-	-
Peak Time, min	6.93	7.00	-	6.93	-	-	7.00	-	-	-	-	-
GLUTEN												
Wet gluten (14% mb), %	35.7	28.1	-	21.4	-	-	30.2	-	-	-	-	-
Dry gluten (14% mb), %	12.0	9.1	-	7.0	-	-	10.3	-	-	-	-	-
Gluten Index	96	96	-	97	-	-	98	-	-	-	-	-
FARINOGRAM												
Water absorption (14% mb), %	61.1	59.2	-	56.0	-	-	60.8	-	-	-	-	-
Development time, min	7.2	4.8	-	3.2	-	-	6.8	-	-	-	-	-
Stability, min	10.1	5.7	-	6.2	-	-	11.6	-	-	-	-	-
Mixing tolerance index, BU	31	51	-	46	-	-	25	-	-	-	-	-
EXTENSOGRAM (45 min pull)												
Area, cm^2	110	84	-	62	-	-	122	-	-	-	-	-
Maximum height, BU	408	325	-	312	-	-	426	-	-	-	-	-
Extensibility, mm	197	182	-	139	-	-	207	-	-	-	-	-
ALVEOGRAM												
Strength (S), cm^2	46.5	31.2	-	18.8	-	-	46.6	-	-	-	-	-
Stability (P), mm	88	70	-	62	-	-	90	-	-	-	-	-
Distensibility (L), mm	115	115	-	69	-	-	117	-	-	-	-	-
Configuration ratio (P/L)	0.77	0.61	-	0.90	-	-	0.77	-	-	-	-	-
MIXOGRAM												
Peak time, min	2.9	2.8	-	3.2	-	-	2.9	-	-	-	-	-
100g BAKING TEST												
Loaf volume, cm^3	1117	1046	-	921	-	-	1142	-	-	-	-	-
Evaluation (see page 77)	0	0	-	0	-	-	0	-	-	-	-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

26



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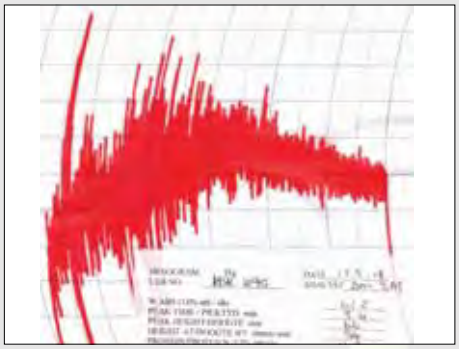
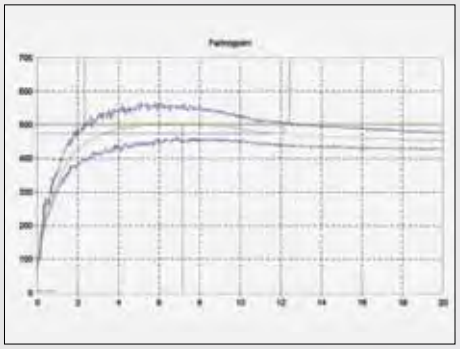


FARINOGRAM

26



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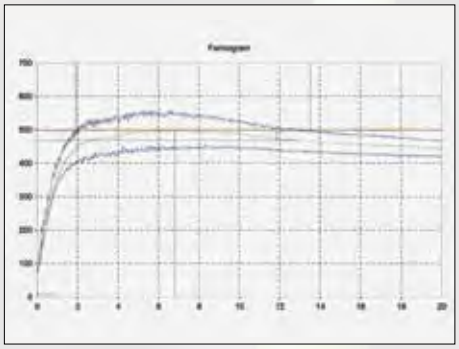
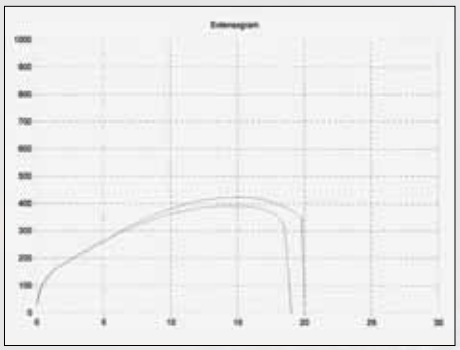


EXTENSOGRAM

26



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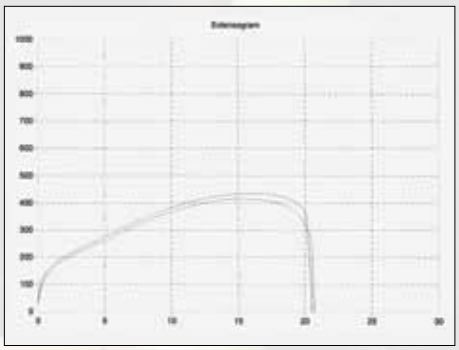
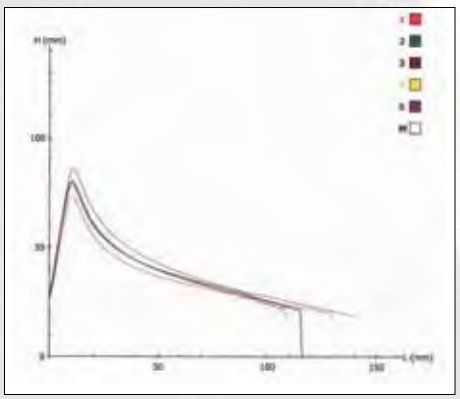


ALVEOGRAM

26



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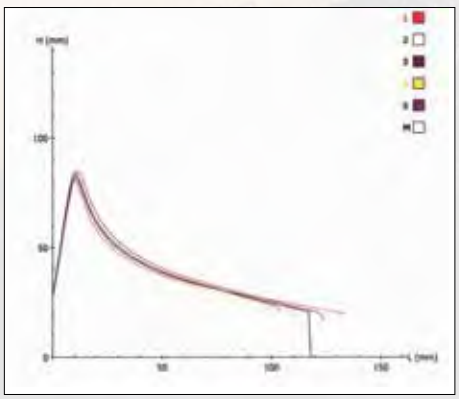


South African Quality data per production region

SUMMER RAINFALL AND IRRIGATION WHEAT

IRRIGATION WHEAT

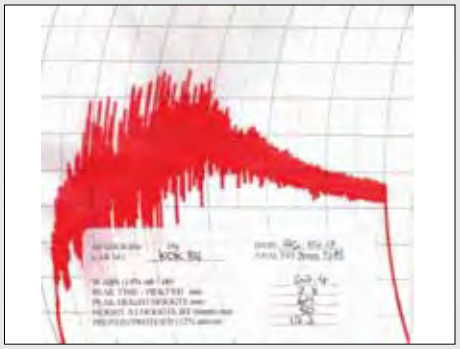
PRODUCTION REGION	(28) Free State Eastern Region				(33) Mpumalanga Northern Region			
WHEAT	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Protein (12% mb), %	12.7	8.8	14.6	1.49	11.8	10.7	12.4	0.52
Falling number, sec	272	89	407	84.83	368	326	461	34.10
1000 Kernel mass (13% mb), g	40.1	36.8	47.8	3.37	39.5	37.4	41.9	1.28
Hectolitre mass (dirty), kg/hl	79.3	75.5	82.1	2.42	83.7	82.9	84.7	0.70
Screenings (<1.8 mm sieve), %	0.79	0.03	3.12	0.80	1.16	0.67	1.55	0.36
Total damaged kernels, %	2.08	0.16	12.80	3.53	0.60	0.16	0.92	0.24
Combined deviations, %	3.72	0.35	14.26	4.05	2.07	1.72	2.56	0.28
Number of samples	***12***				***11***			
CULTIVARS								
	PAN 3161	34.1			SST 884	41.4		
cultivars	SST 884	14.0			SST 875	19.5		
with highest %	SST 875	10.8			SST 895	17.0		
occurrence	PAN 3111	10.8			DUZI	6.7		
	SST 347	8.3			SST 835	5.5		
Number of samples	***12***				***11***			
MIXOGRAM (Quadromat Junior)	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Peak time, min	3.0	2.3	3.6	0.38	2.9	2.7	3.3	0.18
Tail height (6 min), mm	49	37	57	5.30	49	45	51	2.05
Number of samples	***12***				***11***			

	COMPOSITE SAMPLES											
CLASS AND GRADE	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**
Bühler Extraction, %	72.9	73.6	-	-	71.4	-	73.4	74.1	73.3	-	-	-
FLOUR												
Protein (12% mb), %	11.8	10.3	-	-	11.1	-	11.2	10.5	9.5	-	-	-
Ash (db), %	0.61	0.62	-	-	0.60	-	0.64	0.65	0.69	-	-	-
Colour, KJ (wet)	-3.5	-4.0	-	-	-3.1	-	-4.0	-4.1	-4.5	-	-	-
Colour, Konica Minolta CM5 (dry)												
L*	93.13	93.60	-	-	93.05	-	93.48	93.45	93.76	-	-	-
a*	0.41	0.39	-	-	0.38	-	0.51	0.54	0.54	-	-	-
b*	9.82	9.16	-	-	10.25	-	9.85	9.94	9.63	-	-	-
RVA												
Peak Viscosity, cP	1605	2243	-	-	1047	-	2282	2357	2652	-	-	-
Minimum viscosity (Through), cP	1405	1763	-	-	812	-	1975	1831	2055	-	-	-
Final Viscosity, cP	1749	2486	-	-	1194	-	2512	2633	2973	-	-	-
Peak Time, min	6.67	7.00	-	-	6.07	-	6.47	7.00	7.00	-	-	-
GLUTEN												
Wet gluten (14% mb), %	32.5	28.8	-	-	30.0	-	31.0	28.7	25.5	-	-	-
Dry gluten (14% mb), %	11.1	9.5	-	-	10.1	-	10.2	9.8	8.5	-	-	-
Gluten Index	92	95	-	-	92	-	92	93	96	-	-	-
FARINOGRAM												
Water absorption (14% mb), %	62.7	60.9	-	-	60.7	-	61.0	59.1	58.0	-	-	-
Development time, min	5.5	4.8	-	-	5.2	-	5.2	5.3	3.7	-	-	-
Stability, min	6.6	6.4	-	-	7.3	-	8.0	7.0	6.3	-	-	-
Mixing tolerance index, BU	45	46	-	-	45	-	35	42	41	-	-	-
EXTENSOGRAM (45 min pull)												
Area, cm^2	99	83	-	-	93	-	106	98	84	-	-	-
Maximum height, BU	350	321	-	-	395	-	414	386	369	-	-	-
Extensibility, mm	204	185	-	-	170	-	190	185	164	-	-	-
ALVEOGRAM												
Strength (S), cm^2	41.3	32.7	-	-	35.3	-	38.8	31.0	30.3	-	-	-
Stability (P), mm	95	89	-	-	92	-	89	84	83	-	-	-
Distensibility (L), mm	95	81	-	-	81	-	95	77	79	-	-	-
Configuration ratio (P/L)	1.00	1.10	-	-	1.14	-	0.94	1.09	1.05	-	-	-
MIXOGRAM												
Peak time, min	2.5	2.8	-	-	2.9	-	2.8	2.8	3.1	-	-	-
100g BAKING TEST												
Loaf volume, cm^3	1103	902	-	-	1016	-	1071	1081	910	-	-	-
Evaluation (see page 77)	0	0	-	-	0	-	0	0	0	-	-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

28



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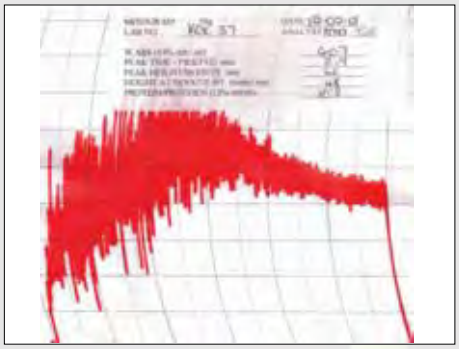
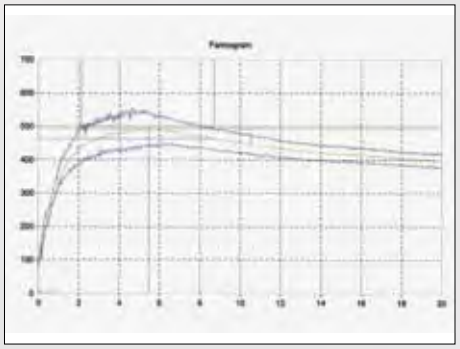


FARINOGRAM

28



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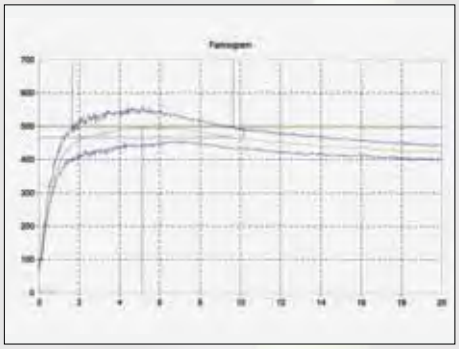
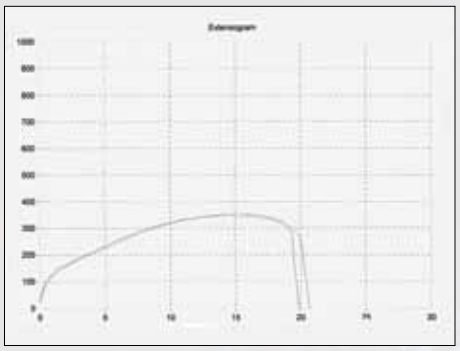


EXTENSOGRAM

28



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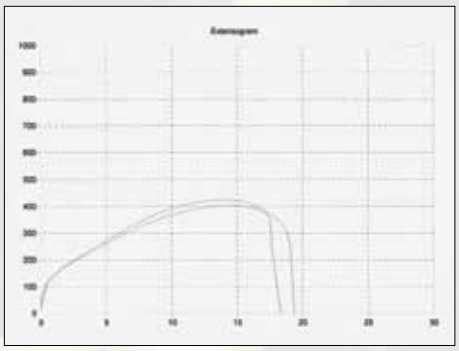
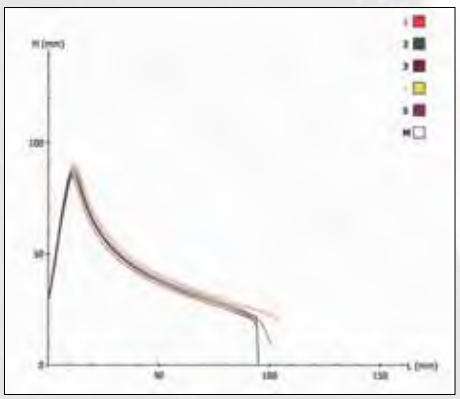
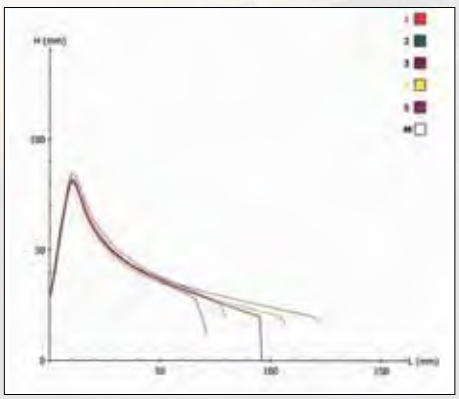


ALVEOGRAM

28



33



South African Quality data per production region
IRRIGATION WHEAT

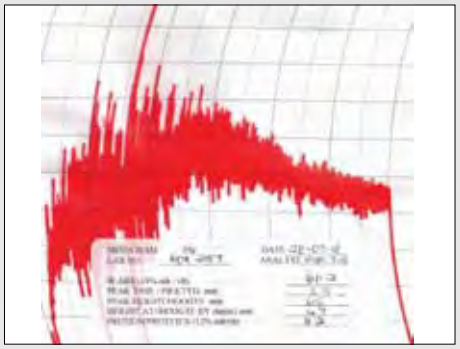
PRODUCTION REGION	(34) Gauteng Region				(35) Limpopo Region			
WHEAT	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Protein (12% mb), %	12.4	-	-	-	11.3	9.3	13.5	1.36
Falling number, sec	363	-	-	-	366	339	424	26.04
1000 Kernel mass (13% mb), g	38.2	-	-	-	39.4	30.7	46.3	6.48
Hectolitre mass (dirty), kg/hl	81.5	-	-	-	83.5	80.4	84.9	1.59
Screenings (<1.8 mm sieve), %	1.34	-	-	-	0.70	0.22	1.73	0.55
Total damaged kernels, %	0.64	-	-	-	0.41	0.06	0.80	0.22
Combined deviations, %	2.02	-	-	-	1.45	0.84	2.17	0.48
Number of samples	***1***				***8***			
CULTIVARS								
cultivars with highest % occurrence	SST 884	38.0			SST 884	41.3		
	SST 875	34.0			SST 875	30.6		
	OLIFANTS	16.0			SST 843	11.0		
	KROKODIL	12.0			SST 895	7.8		
	-	-			PAN 3471	3.9		
Number of samples	***1***				***8***			
MIXOGRAM (Quadromat Junior)	**ave**	**min**	**max**	**stdev**	**ave**	**min**	**max**	**stdev**
Peak time, min	2.9	-	-	-	3.1	2.7	3.4	0.26
Tail height (6 min), mm	49	-	-	-	48	42	55	4.55
Number of samples	***1***				***8***			

	COMPOSITE SAMPLES											
CLASS AND GRADE	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**
Bühler Extraction, %	73.6	-	-	-	-	-	74.0	73.7	-	73.8	-	-
FLOUR												
Protein (12% mb), %	11.2	-	-	-	-	-	12.3	10.9	-	8.8	-	-
Ash (db), %	0.60	-	-	-	-	-	0.66	0.62	-	0.58	-	-
Colour, KJ (wet)	-4.3	-	-	-	-	-	-4.2	-4.4	-	-4.6	-	-
Colour, Konica Minolta CM5 (dry)												
L*	93.66	-	-	-	-	-	93.44	93.68	-	94.05	-	-
a*	0.41	-	-	-	-	-	0.54	0.51	-	0.40	-	-
b*	9.02	-	-	-	-	-	10.18	9.90	-	9.11	-	-
RVA												
Peak Viscosity, cP	1748	-	-	-	-	-	2251	2317	-	2706	-	-
Minimum viscosity (Through), cP	1503	-	-	-	-	-	1569	1881	-	2169	-	-
Final Viscosity, cP	1896	-	-	-	-	-	2502	2601	-	3033	-	-
Peak Time, min	6.67	-	-	-	-	-	7.00	7.00	-	7.00	-	-
GLUTEN												
Wet gluten (14% mb), %	31.3	-	-	-	-	-	34.6	29.4	-	23.1	-	-
Dry gluten (14% mb), %	10.2	-	-	-	-	-	11.6	9.9	-	7.8	-	-
Gluten Index	95	-	-	-	-	-	92	97	-	96	-	-
FARINOGRAM												
Water absorption (14% mb), %	60.1	-	-	-	-	-	62.4	59.8	-	56.2	-	-
Development time, min	5.2	-	-	-	-	-	6.7	5.3	-	4.3	-	-
Stability, min	7.2	-	-	-	-	-	8.9	6.5	-	6.2	-	-
Mixing tolerance index, BU	45	-	-	-	-	-	31	48	-	52	-	-
EXTENSOGRAM (45 min pull)												
Area, cm^2	109	-	-	-	-	-	149	96	-	76	-	-
Maximum height, BU	382	-	-	-	-	-	468	380	-	351	-	-
Extensibility, mm	208	-	-	-	-	-	234	187	-	156	-	-
ALVEOGRAM												
Strength (S), cm^2	40.7	-	-	-	-	-	50.2	37.2	-	30.3	-	-
Stability (P), mm	75	-	-	-	-	-	92	85	-	72	-	-
Distensibility (L), mm	132	-	-	-	-	-	124	98	-	103	-	-
Configuration ratio (P/L)	0.57	-	-	-	-	-	0.74	0.87	-	0.70	-	-
MIXOGRAM												
Peak time, min	2.8	-	-	-	-	-	2.7	2.8	-	2.9	-	-
100g BAKING TEST												
Loaf volume, cm^3	1076	-	-	-	-	-	1129	1073	-	941	-	-
Evaluation (see page 77)	0	-	-	-	-	-	0	0	-	0	-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

MIXOGRAM

34



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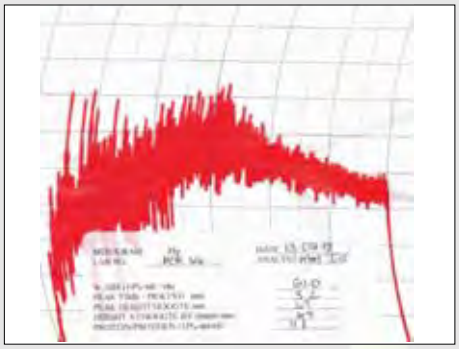
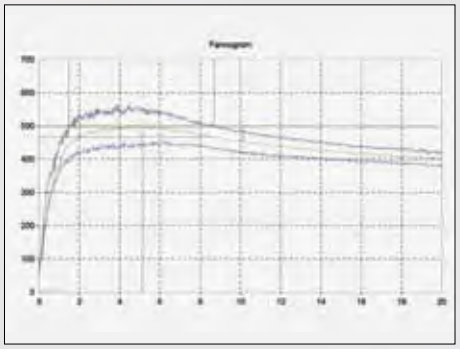


FARINOGRAM

34



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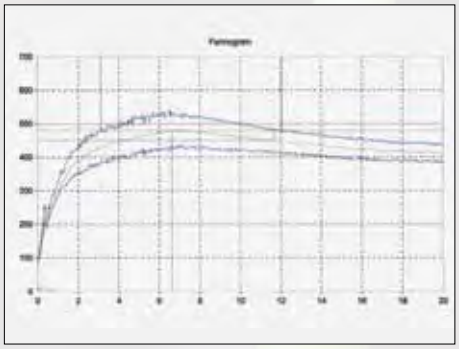
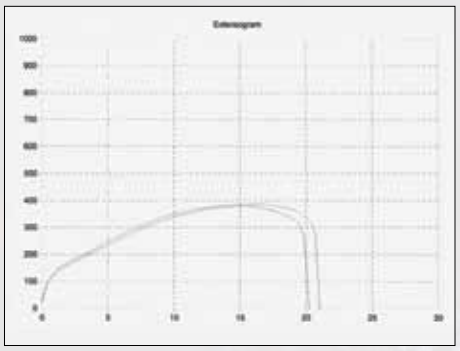


EXTENSOGRAM

34



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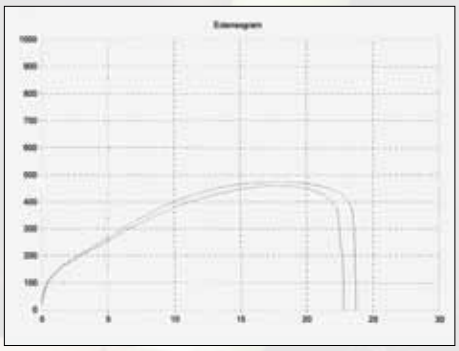
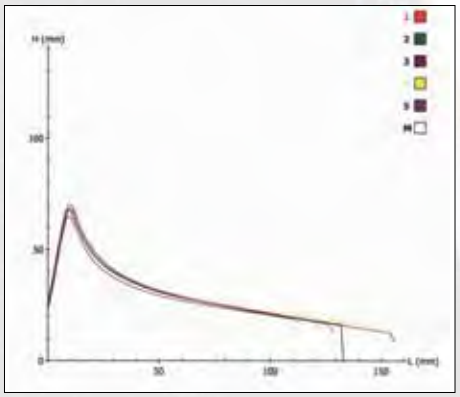


ALVEOGRAM

34



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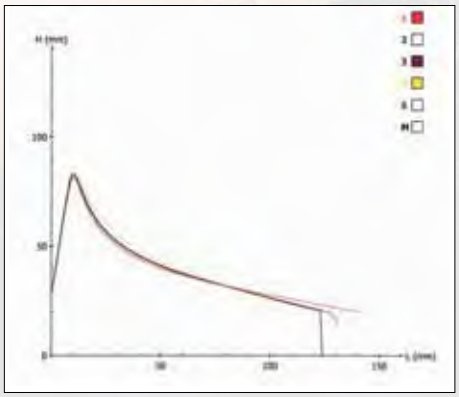


South African Quality data per production region
IRRIGATION WHEAT

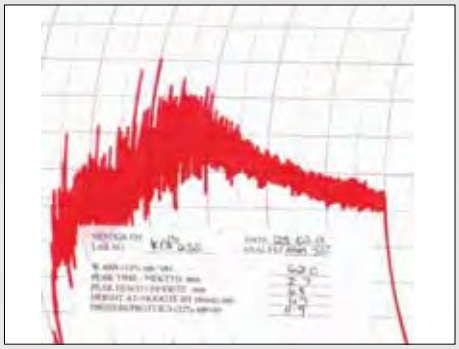
PRODUCTION REGION	(36) KwaZulu-Natal Region			
WHEAT				
	ave	**min**	**max**	**stdev**
Protein (12% mb), %	12.4	11.7	13.2	0.54
Falling number, sec	410	263	473	65.30
1000 Kernel mass (13% mb), g	36.8	34.4	43.4	2.94
Hectolitre mass (dirty), kg/hl	83.4	81.6	85.3	1.44
Screenings (<1.8 mm sieve), %	1.33	0.61	2.05	0.41
Total damaged kernels, %	0.25	0.10	0.48	0.13
Combined deviations, %	1.96	1.23	2.59	0.39
Number of samples		***9***		
CULTIVARS				
	SST 875	42.1		
cultivars	SST 835	24.4		
with highest %	SST 884	18.1		
occurrence	SST 895	6.9		
	PAN 3471	5.9		
Number of samples		***9***		
MIXOGRAM (Quadromat Junior)				
	ave	**min**	**max**	**stdev**
Peak time, min	2.7	2.2	3.2	0.31
Tail height (6 min), mm	48	45	51	1.83
Number of samples		***9***		

	COMPOSITE SAMPLES					
CLASS AND GRADE	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**
Bühler Extraction, %	74.8	74.8	-	-	-	-
FLOUR						
Protein (12% mb), %	11.9	10.6	-	-	-	-
Ash (db), %	0.60	0.57	-	-	-	-
Colour, KJ (wet)	-4.2	-4.1	-	-	-	-
Colour, Konica Minolta CM5 (dry)						
L*	93.79	93.88	-	-	-	-
a*	0.43	0.41	-	-	-	-
b*	9.22	9.11	-	-	-	-
RVA						
Peak Viscosity, cP	2311	1685	-	-	-	-
Minimum viscosity (Through), cP	1671	1488	-	-	-	-
Final Viscosity, cP	2576	1846	-	-	-	-
Peak Time, min	7.00	6.87	-	-	-	-
GLUTEN						
Wet gluten (14% mb), %	33.6	28.7	-	-	-	-
Dry gluten (14% mb), %	11.9	9.8	-	-	-	-
Gluten Index	84	95	-	-	-	-
FARINOGRAM						
Water absorption (14% mb), %	60.7	59.1	-	-	-	-
Development time, min	5.0	5.3	-	-	-	-
Stability, min	5.4	6.0	-	-	-	-
Mixing tolerance index, BU	50	53	-	-	-	-
EXTENSOGRAM (45 min pull)						
Area, cm^2	91	91	-	-	-	-
Maximum height, BU	333	341	-	-	-	-
Extensibility, mm	198	195	-	-	-	-
ALVEOGRAM						
Strength (S), cm^2	36.1	36.3	-	-	-	-
Stability (P), mm	75	69	-	-	-	-
Distensibility (L), mm	123	141	-	-	-	-
Configuration ratio (P/L)	0.61	0.49	-	-	-	-
MIXOGRAM						
Peak time, min	2.3	2.6	-	-	-	-
100g BAKING TEST						
Loaf volume, cm^3	1169	1116	-	-	-	-
Evaluation (see page 77)	0	0	-	-	-	-

RHEOLOGICAL GRAPHS PER PRODUCTION REGION

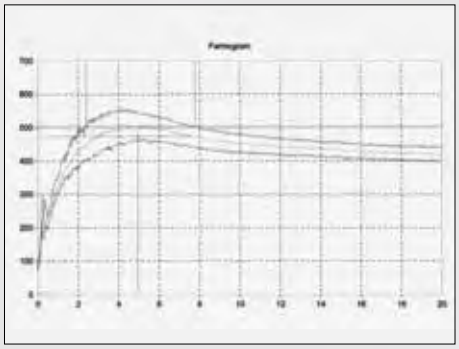
MIXOGRAM

36



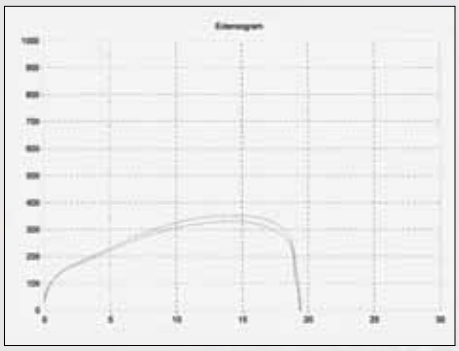
FARINOGRAM

36



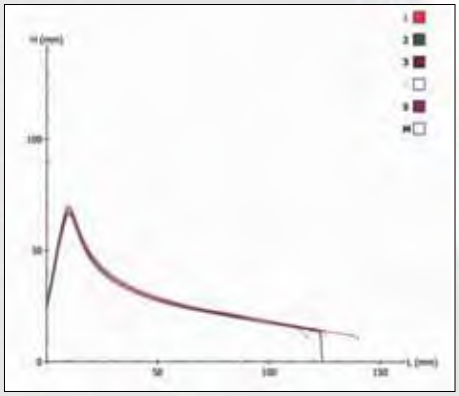
EXTENSOGRAM

36



ALVEOGRAM

36



Mycotoxins

Mycotoxins, toxic chemical compounds produced by moulds, can contaminate commodities either in the field or during storage and are invisible, odourless and tasteless. The only proven way to determine whether grain, cereals, feed or food are contaminated, is by analytical testing. According to the Food and Agriculture Organization, food losses due to mycotoxin contamination are estimated at 25% on a global scale and pose a real threat to food security, especially in Africa where the magnitude of losses is difficult to estimate because of a lack of information.

Mycotoxin production is foremost a food safety issue, although the occurrence of moulds can also lead to damage ranging from rancidity, odour, flavour changes, loss of nutrients and germ layer destruction resulting in a reduction in quality. Most mycotoxins are toxic in very low concentrations so this requires sensitive and reliable methods for their detection.

Effective management to prevent food losses or adverse health effects as a result of long-term exposure to contaminated food is only possible when adequate reliable testing data is available. Well-timed interventions in the food and feed value chain can then be based on these testing results.

The accredited multi-mycotoxin assessments included in the annual wheat crop quality survey for the past eight seasons, provide the most comprehensive overview of the multi-mycotoxin risk in commercial wheat produced and delivered to commercial grain storage companies in South Africa. Approximately 10 - 20% of the wheat crop samples were selected every season to proportionally represent all the production regions.

The absence of Aflatoxin B_1, B_2, G_1, G_2, Fumonisin B_1, B_2, B_3, Ochratoxin A, Zearalenone, T2-toxin and HT-2 toxin in the wheat samples over the past seven seasons were confirmed in the 2017/2018 season. The Deoxynivalenol residue levels measured, were all well below national and international maximum residue levels.

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

National Mycotoxin Regulations

According to the Foodstuffs, Cosmetics and Disinfectants Act (Act 54 of 1972) and regulations published under Government Notice No. R. 1145, dated 8 October 2004, all foodstuffs, ready for human consumption, may not contain more than 10 µg/kg of aflatoxin, of which aflatoxin B_1 may not exceed 5 µg/kg.

Amendments to Government Notice No. R. 1145, dated 8 October 2004, published under Government Notice No. 987 of 05 September 2016, specify that:

- Cereal grains (wheat, maize and barley) intended for further processing, may not contain more than 2 000 µg/kg of Deoxinyvalenol.
- Flour, meal, semolina and flakes derived from wheat, maize or barley, ready for human consumption, may not contain more than 1 000 µg/kg of Deoxinyvalenol.

Further processing means any other treatment or processing method that has been proven to reduce levels of fungus produced toxins in foodstuffs intended for human consumption.

International Mycotoxin Regulations

The Maximum, advisory and guidance levels for mycotoxins on cereals from the European Union, USA, China and Codex are provided below for comparison purposes.

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

Aflatoxins

- All cereals and all products derived from cereals, including processed cereal products, with the exception of maize, rice, processed cereal-based foods for infants and young children and dietary foods for special medical purposes intended specifically for infants, $B_1 \leq 2.0$ µg/kg.
- All cereals and all products derived from cereals, including processed cereal products, with the exception

of maize, rice, processed cereal-based foods for infants and young children and dietary foods for special medical purposes intended specifically for infants, sum of $B_1 + B_2 + G_1 + G_2 \leq 40$ µg/kg.

Ochratoxin A

- Unprocessed cereals, ≤ 5.0 µg/kg.
- All products derived from unprocessed cereals, including processed cereal products and cereals intended for direct human consumption with certain exceptions (see full regulation), ≤ 3.0 µg/kg.

Deoxynivalenol

- Unprocessed cereals other than durum wheat, oats and maize, ≤ 1 250 µg/kg.
- Cereals intended for direct human consumption, cereal flour, bran and germ as end product marketed for direct human consumption, with the certain exceptions (see full regulation) ≤ 750 µg/kg.
- Bread (including small bakery wares), pastries, biscuits, cereal snacks and breakfast cereals, ≤ 500 µg/kg.

Zearalenone

- Unprocessed cereals other than maize ≤ 100 µg/kg.
- Cereals intended for direct human consumption, cereal flour, bran and germ as end product marketed for direct human consumption and the germ with certain exceptions (see full regulation) ≤ 75 µg/kg.
- Bread (including small bakery wares), pastries, biscuits, cereal snacks and breakfast cereals, excluding maize-snacks and maize-based breakfast cereals, ≤ 50 µg/kg.[1]

T-2 and HT-2 toxin

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

In the USA, the Food and Drug Administration (FDA) actions levels for Aflatoxin for all commodities intended for human consumption is 20 µg/kg (excluding Aflatoxin M1 in milk where the maximum level is 0.5 µg/kg). Advisory maximum levels for DON in finished wheat products intended for human consumption is 1 000 µg/kg.[3]

In China the maximum level for Aflatoxin B_1 in wheat is 5.0 µg/kg. The maximum level for DON in cereals and their products including wheat and wheat meal is 1 000 µg/kg. Ochratoxin A in cereals and processed products of milled grains may not exceed 5.0 µg/kg and Zearalenone in wheat flour may not exceed 60 µg/kg.[4]

According to Codex, Ochratoxin A in raw wheat may not exceed 5 µg/kg and the proposed maximum level for DON is 2 mg/kg in raw wheat and 1 mg/kg in flour, semolina, meal and flakes derived from wheat.[5]

References:

1. COMMISSION REGULATION (EC) No 1881/226 of 19 December 2006 setting maximum levels for certain contaminants in foodstuffs.
2. COMMISSION RECOMMENDATION of 27 March 2013 on the presence of T-2 and HT-2 toxin in cereals and cereal products.
3. FDA Mycotoxin Regulatory Guidance, A Guide for Grain Elevators, Feed Manufacturers, Grain Processors and Exporters, August 2011.
4. National Food Safety Standard, Maximum Levels of Mycotoxins in Foods, GB 2761-2017.
5. CODEX General Standard for contaminants and toxins in food and feed, CODEX STAN 193-1995, Revised in 1997, 2006, 2008, 2009, Amended 2009.

Table 6: Mycotoxin results for the 2017/2018 season

Region	Class and Grade	Aflatoxin (µg/kg)				Fumonisin (µg/kg)			Deoxynivalenol (µg/kg)	15-ADON (µg/kg)	Ochratoxin A (µg/kg)	Zearalenone (µg/kg)	HT-2 Toxin (µg/kg)	T-2 Toxin (µg/kg)
		B_1	B_2	G_1	G_2	B_1	B_2	B_3						
		LOQ												
		5 µg/kg	5 µg/kg	5 µg/kg	5 µg/kg	20 µg/kg	20 µg/kg	20 µg/kg	100 µg/kg	100 µg/kg	5 µg/kg	20 µg/kg	20 µg/kg	20 µg/kg
1	UT	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2	B1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2	UT	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3	B1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3	B2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3	B3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3	B4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4	B1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4	B3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4	UT	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5	B1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5	B2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5	B3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5	UT	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
6	B1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
6	B2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
6	UT	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
10	B1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
10	B1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
10	B3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
11	UT	ND	ND	ND	ND	ND	ND	ND	174	ND	ND	ND	ND	ND
12	B1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
14	B1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
15	B1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
16	B2	ND	ND	ND	ND	ND	ND	ND	116	ND	ND	ND	ND	ND
17	B1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
19	B1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
19	B4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
20	B2	ND	ND	ND	ND	ND	ND	ND	<100	ND	ND	ND	ND	ND
21	B1	ND	ND	ND	ND	ND	ND	ND	124	ND	ND	ND	ND	ND

Table 6: Mycotoxin results for the 2017/2018 season (continue)

Region	Class and Grade	Aflatoxin (µg/kg)				Fumonisin (µg/kg)			Deoxynivalenol (µg/kg)	15-ADON (µg/kg)	Ochratoxin A (µg/kg)	Zearalenone (µg/kg)	HT-2 Toxin (µg/kg)	T-2 Toxin (µg/kg)
		B_1	B_2	G_1	G_2	B_1	B_2	B_3						
		LOQ												
		5 µg/kg	5 µg/kg	5 µg/kg	5 µg/kg	20 µg/kg	20 µg/kg	20 µg/kg	100 µg/kg	100 µg/kg	5 µg/kg	20 µg/kg	20 µg/kg	20 µg/kg
22	B2	ND	ND	ND	ND	ND	ND	ND	<100	ND	ND	ND	ND	ND
23	B1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
24	B1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
26	B1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
27	B1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
28	B1	ND	ND	ND	ND	ND	ND	ND	123	ND	ND	ND	ND	ND
33	B1	ND	ND	ND	ND	ND	ND	ND	199	ND	ND	ND	ND	ND
33	B2	ND	ND	ND	ND	ND	ND	ND	570	ND	ND	ND	ND	ND
35	B2	ND	ND	ND	ND	ND	ND	ND	109	ND	ND	ND	ND	ND
36	B1	ND	ND	ND	ND	ND	ND	ND	<100	ND	ND	ND	ND	ND
Total number of samples		40	40	40	40	40	40	40	40	40	40	40	40	40
Average of total number of samples		0	0	0	0	0	0	0	35	0	0	0	0	0
Number of positive results		0	0	0	0	0	0	0	7	0	0	0	0	0
Average of positive results		-	-	-	-	-	-	-	202	-	-	-	-	-
Maximum of positive results		-	-	-	-	-	-	-	570	-	-	-	-	-

Note:

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

Amino Acid Profile

Amino acids are the building blocks of proteins and approximately 22 amino acids are commonly distributed among the proteins of all biological materials. Of these, 18 can be found in cereal grain proteins. Amino acids are organic compounds containing basic amine (-NH2) and acidic carboxyl (-COOH) functional groups, in addition to a side chain (R group) specific to each amino acid.

Amino acid composition is an important feature in determining the nutritional value of wheat for human and animal diets. Amino acids are considered crucial to good health, contributing considerably to the health of the human nervous system, hormone production as well as muscular structure and are needed by vital organs and for cellular structure.

The classification of amino acids is based on different features, one being whether the amino acid can be acquired through the diet. According to this, three types are identified: essential, conditionally essential and non-essential amino acids. Classification as essential or non-essential, does however not reflect their actual importance, since all of them are necessary for human health. Essential amino acids are considered "essential" as they cannot be synthesized by the body and must be obtained from the diet. The nine essential amino acids are phenylalanine, valine, threonine, tryptophan, methionine, leucine, isoleucine, lysine and histidine. Arginine, cysteine, glycine, glutamine, proline and tyrosine, are considered conditionally essential in the human diet, meaning their synthesis can be limited under special pathophysiological conditions. Alanine, aspartic acid, asparagine, glutamic acid and serine are non-essential amino acids, meaning they can be synthesized by the body.[1,2]

Whole meal and white flours from different classes and varieties of wheat grown in three different countries (USA, USSR and Australia) show generally similar amino acid compositions, with high contents of glutamic acid (including glutamine) and proline, very low tryptophan, and relatively low contents of lysine and threonine. Compared with the range of variation in the protein contents of these samples, the variation in their amino acid compositions resulting either from genetic differences or growing conditions such as fertilizer level is rather limited. The reason being that the amino acid compositions of the major endosperm proteins, representing close to 80% of the total wheat proteins, are very similar. Differences in the expression of levels of individual protein genes therefore do not usually result in significant differences in the amino acid compositions of the samples.

Significant variation in amino acid composition may however occur in extreme cases. Research showed that lysine and threonine were for example higher in yellow-berry kernels compared to normal kernels, while glutamic acid (including glutamine) was significantly lower. Extreme differences in fertilization conditions may also result in significant variation in the compositions of whole grain flour or specific protein fractions. It has been found that the proportions of glutamine, proline and phenylalanine in wheat grain and flour all increased with increased levels of nitrogen fertilization, whereas threonine, serine, glycine, alanine, valine and sulphur amino acids decreased.

In a study where wheat was grown under even more extreme fertilization conditions, with variation in nitrogen and sulphur, the grain amino acid composition changed significantly. Less than half of the amounts of cysteine and methionine were present in grain grown with no sulphur and high nitrogen levels compared to grain grown with adequate levels of sulphur.

Proteins are not distributed uniformly throughout a wheat kernel with variation occurring in both the protein content and composition. Even though the starchy endosperm's protein concentration is only a third of that in the germ and less than half of that in the aleurone layer, the starchy endosperm proteins still represent close to three quarters of the total grain protein. The starchy endosperm is characterized by high levels of glutamine and proline and low levels of basic amino acids, while the aleurone and germ contain significantly less proline and glutamine, with high levels of arginine and asparagine in the aleurone layer and germ, respectively. Since the various morphological parts of the wheat kernel differ in protein content and composition, milling extraction rates affect the content and composition of flour.

A large number of flour fractions or mill streams are produced during commercial flour milling which are recombined to provide flours with specific processing characteristics. As a result of the irregular distribution of components within the wheat kernel, these flour streams also vary in their composition and functional properties.

The amino acid compositions of flours differ from those of the grains from which they were milled in containing less lysine, arginine, aspartate (+ asparagine), glycine and alanine but more glutamate (+ glutamine) and proline. Analyses of manually dissected pericarp, testa, aleurone, starchy endosperm and germ suggest that these differences in composition result from differences in the distribution of protein classes throughout the wheat kernel, for example the proportions of basic amino acids increase and the nitrogen content decreases from the outside towards the centre of the endosperm.[3]

Due to the fact that cystine consists of two cysteine molecules, joined by a disulfide (S-S) bond, cysteine and cystine are interchangeable in wheat. The ratio of cysteine to cystine is dependent on the degree of oxidation in a dough. Addition of an oxidizing agent, such as ascorbic acid, will increase the amount of cystine at the expense of cysteine. This has a "strengthening" effect on the gluten by increasing its elasticity.[2]

The results of the samples analysed by SAGL and reported as g amino acid/100 g sample, are provided in Table 7 on pages 68 and 69. The values obtained for all amino acids on these samples, were within the normal range reported for wheat in literature, deficient in certain essential amino acids, such as tryptophan, lysine, threonine, methionine and histidine, but high in glutamic acid and proline, which is not essential.

Due to the fact that protein and amino acid composition of wheat varies with crop varieties, application of fertilizers, irrigation practices, soil composition and climatic conditions, the amino acid content showed a wide variation between samples. The only exception being tryptophan, ranging from 0.14 to 0.17 g/100 g this season and between 0.13 to 0.19 g/100 g the previous season. Tryptophan is nutritionally important since it is a precursor for important metabolites such as serotonin and nicotinamide. The World Health Organisation's (WHO) recommended daily dose for tryptohan is 4 mg/kg/day.[4]

Lysine values varied between 0.33 and 0.44 g/100 g, comprising ± 2.4 – 3.2 % of the total amino acid content. Lysine is the precursor for carnitine and is required for the structural modification of collagen together with the amino acids glycine and proline.[1] The WHO recommended daily dose for lysine is 30 mg/kg/day. Threonine's WHO recommended daily dose is 15 mg/kg/day[4] and ranged from 0.35 to 0.52 g/100 g this season and from 0.32 to 0.54 g/100 g the previous season. Threonine supports digestive function, the immune system, liver and cardiovascular function as well as the central nervous system.[5]

Methionine values were higher this season than during the previous season, ranging from 0.22 to 0.37 g/100 g, compared to 0.18 and 0.26 g/100 g previously. The WHO daily recommendation is 15 mg/kg/day for the sulphur containing amino acids in total.[4] The main functions of methionine include building of various protein molecules and the synthesis of the equally important sulphurous amino acid, cysteine.[5]

The values for histidine varied between 0.26 and 0.39 g/100 g and comprises ± 2.1 – 2.3 % of the total amino acid content. Histidine is involved in the formation of proteins, it influences several of the metabolic reactions in the body and assists in regulating blood pH values. The results also showed that the samples were high in the essential amino acid leucine, with values ranging from 0.43 to 1.20 g/100 g. Phenylalanine values varied between 0.53 and 0.88 g/100 g.

The results showed that the samples were rich in glutamic acid and proline, together contributing ± 42% of the total amino acid content. Glutamic acid contributes to the health of the immune and digestive systems, as well as energy production. Proline is a non-essential amino acid manufactured mainly from ornithine, glutamine and glutamate in the liver and is one of the principal amino acids required by the body for building collagen.[5]

References:

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4. World Health Organization. Protein and amino acids requirements in human nutrition: report of a joint FAO/WHO/UNU expert consultation, Teck. Rep. Series no 935, World Health Organization, Geneva, Switzerland 2007.
5. http://aminoacidstudies.org

Table 7: Amino acid content of wheat samples originating from different production regions

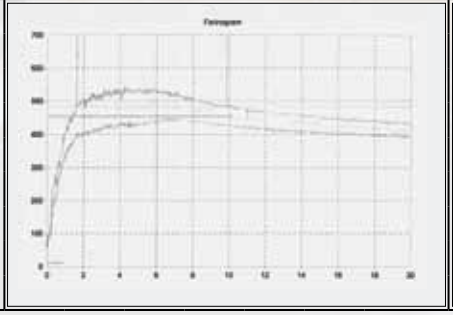
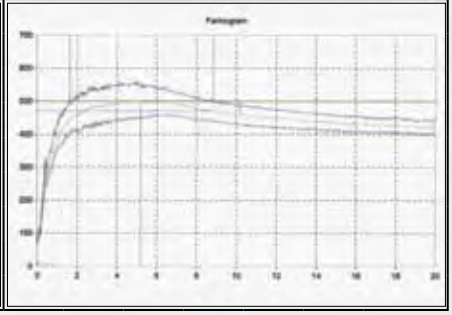
Region	Grade	Amino Acid																	
		Tryptophan	Methionine	Cystine	Histidine	Serine	Arginine	Glycine	Aspartic acid	Glutamic acid	Threonine	Alanine	Proline	Lysine	Tyrosine	Valine	Isoleucine	Leucine	Phenyl-alanine
		g/100g (as is)																	
1	UT	0.15	0.29	0.41	0.30	0.66	0.58	0.57	0.67	4.23	0.40	0.47	1.39	0.36	0.32	0.57	0.43	0.87	0.59
2	B1	0.14	0.32	0.45	0.38	0.84	0.70	0.69	0.86	5.31	0.48	0.56	1.83	0.44	0.34	0.76	0.60	1.16	0.85
2	UT	0.16	0.32	0.43	0.29	0.63	0.53	0.54	0.64	3.97	0.39	0.45	1.31	0.35	0.23	0.58	0.44	0.86	0.58
3	B4	0.16	0.37	0.42	0.37	0.84	0.68	0.69	0.81	5.52	0.49	0.56	1.87	0.44	0.36	0.73	0.58	1.16	0.83
3	B2	0.17	0.28	0.38	0.36	0.83	0.69	0.68	0.80	5.08	0.48	0.54	1.78	0.43	0.40	0.71	0.57	1.13	0.82
3	B1	0.17	0.31	0.39	0.32	0.73	0.62	0.63	0.74	4.66	0.44	0.50	1.53	0.39	0.31	0.62	0.48	0.97	0.67
3	B3	0.14	0.34	0.48	0.39	0.89	0.73	0.75	0.83	5.88	0.52	0.58	2.03	0.44	0.43	0.76	0.60	1.20	0.88
4	B1	0.16	0.29	0.41	0.35	0.78	0.67	0.66	0.77	4.90	0.46	0.52	1.64	0.41	0.33	0.67	0.55	1.08	0.73
4	B3	0.15	0.27	0.38	0.29	0.63	0.53	0.55	0.65	3.93	0.39	0.45	1.30	0.36	0.23	0.58	0.43	0.84	0.57
4	UT	0.17	0.29	0.39	0.33	0.75	0.62	0.64	0.77	4.63	0.45	0.52	1.64	0.39	0.28	0.68	0.51	1.00	0.76
5	UT	0.15	0.28	0.40	0.29	0.62	0.56	0.54	0.65	3.91	0.39	0.45	1.28	0.36	0.30	0.57	0.43	0.86	0.59
5	B2	0.15	0.24	0.34	0.28	0.63	0.52	0.54	0.65	3.96	0.38	0.44	1.27	0.35	0.27	0.56	0.43	0.43	0.85
5	B3	0.14	0.28	0.37	0.27	0.58	0.68	0.39	0.61	3.65	0.36	0.42	1.17	0.34	0.26	0.53	0.40	0.80	0.54
5	B1	0.15	0.30	0.41	0.30	0.67	0.57	0.57	0.66	4.24	0.41	0.46	1.40	0.36	0.29	0.59	0.46	0.91	0.63
6	B1	0.15	0.28	0.38	0.31	0.71	0.56	0.61	0.72	4.59	0.42	0.48	1.55	0.38	0.29	0.60	0.47	0.96	0.68
6	B2	0.15	0.26	0.44	0.28	0.63	0.54	0.53	0.65	3.89	0.38	0.44	1.28	0.34	0.29	0.56	0.43	0.87	0.59
6	UT	0.16	0.28	0.47	0.31	0.70	0.56	0.59	0.69	4.49	0.42	0.48	1.50	0.37	0.29	0.61	0.47	0.95	0.65
10	B2	0.16	0.28	0.39	0.31	0.67	0.57	0.59	0.69	4.43	0.40	0.47	1.46	0.37	0.29	0.60	0.46	0.93	0.65
10	B1	0.16	0.28	0.39	0.33	0.74	0.63	0.64	0.76	4.70	0.43	0.51	1.53	0.40	0.31	0.64	0.51	1.02	0.68
10	B3	0.14	0.22	0.30	0.27	0.59	0.52	0.52	0.62	3.72	0.36	0.43	1.18	0.33	0.26	0.51	0.39	0.80	0.54
11	UT	0.16	0.25	0.36	0.27	0.59	0.50	0.53	0.61	3.77	0.36	0.43	1.22	0.34	0.22	0.54	0.41	0.80	0.54

Table 7: Amino acid content of wheat samples originating from different production regions (continue)

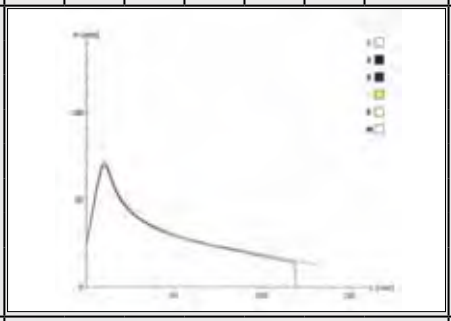
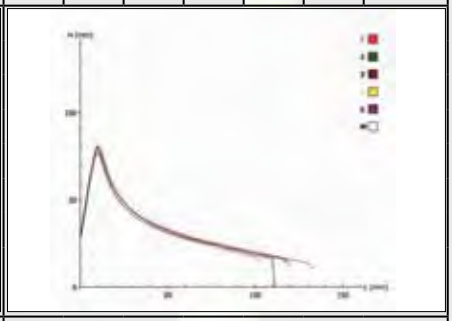
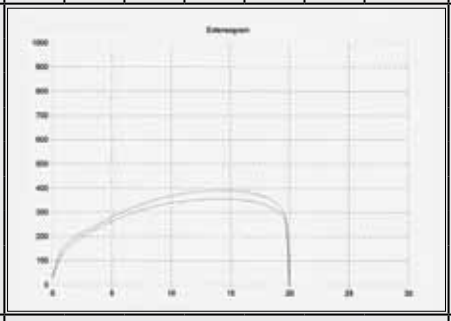
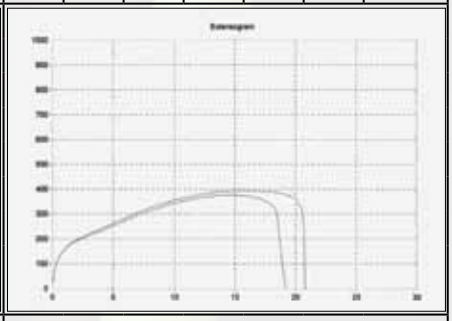
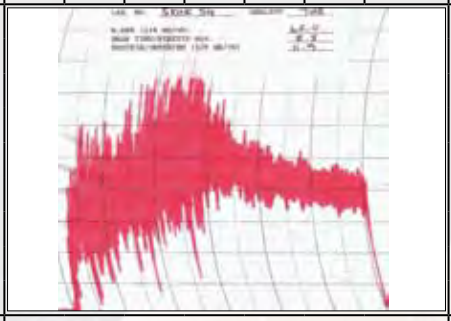
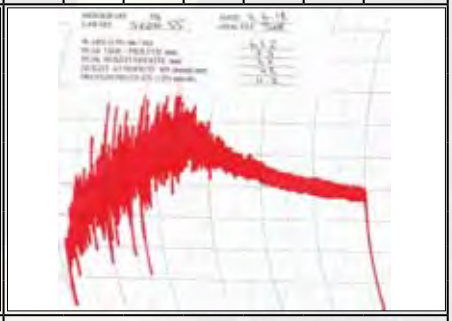
Region	Grade	Amino Acid																
		Tryptophan	Methionine	Cystine	Histidine	Serine	Arginine	Glycine	Aspartic acid	Glutamic acid	Threonine	Alanine	Proline	Lysine	Tyrosine	Valine	Isoleucine	Leucine	Phenyl-alanine
		g/100g (as is)																	
14	B1	0.15	0.27	0.36	0.32	0.68	0.60	0.60	0.72	4.56	0.41	0.49	1.47	0.36	0.32	0.60	0.47	0.94	0.70
15	B1	0.15	0.28	0.39	0.32	0.71	0.59	0.61	0.76	4.55	0.42	0.50	1.49	0.38	0.25	0.64	0.48	0.96	0.66
16	B2	0.15	0.26	0.37	0.30	0.65	0.58	0.58	0.70	4.09	0.39	0.48	1.37	0.43	0.28	0.58	0.46	0.91	0.61
17	B1	0.15	0.35	0.46	0.33	0.73	0.61	0.64	0.77	4.67	0.43	0.52	1.55	0.38	0.30	0.64	0.47	0.94	0.65
19	B1	0.16	0.29	0.39	0.34	0.72	0.59	0.63	0.76	4.81	0.42	0.49	1.58	0.37	0.28	0.64	0.50	0.99	0.71
19	B4	0.15	0.25	0.32	0.26	0.57	0.50	0.52	0.60	3.64	0.35	0.43	1.18	0.34	0.22	0.52	0.39	0.79	0.53
20	B2	0.15	0.27	0.36	0.31	0.66	0.59	0.57	0.68	4.32	0.40	0.47	1.39	0.37	0.29	0.60	0.46	0.91	0.65
21	B1	0.15	0.29	0.41	0.31	0.67	0.57	0.58	0.70	4.50	0.41	0.47	1.44	0.37	0.27	0.61	0.47	0.93	0.66
22	B2	0.15	0.28	0.38	0.31	0.66	0.56	0.57	0.72	4.15	0.40	0.48	1.39	0.40	0.28	0.62	0.46	0.94	0.63
23	B1	0.15	0.30	0.43	0.31	0.68	0.59	0.59	0.73	4.40	0.41	0.50	1.43	0.38	0.28	0.61	0.47	0.94	0.65
24	B1	0.15	0.28	0.40	0.30	0.66	0.58	0.58	0.69	4.14	0.40	0.48	1.42	0.36	0.28	0.60	0.45	0.91	0.62
26	B1	0.15	0.28	0.40	0.35	0.77	0.64	0.63	0.77	5.04	0.45	0.53	1.71	0.38	0.33	0.70	0.54	1.08	0.76
27	B1	0.15	0.29	0.40	0.30	0.67	0.59	0.57	0.68	4.31	0.41	0.47	1.42	0.35	0.29	0.59	0.46	0.92	0.64
28	B1	0.15	0.22	0.29	0.33	0.72	0.63	0.64	0.75	4.66	0.43	0.50	1.60	0.38	0.33	0.63	0.48	0.97	0.68
33	B1	0.16	0.27	0.37	0.32	0.68	0.59	0.59	0.71	4.36	0.41	0.48	1.45	0.37	0.29	0.60	0.46	0.95	0.65
33	B2	0.17	0.25	0.35	0.29	0.63	0.56	0.57	0.68	4.09	0.38	0.45	1.34	0.37	0.28	0.56	0.43	0.87	0.61
35	B2	0.15	0.26	0.33	0.30	0.66	0.60	0.61	0.73	4.20	0.40	0.47	1.40	0.38	0.29	0.58	0.44	0.91	0.61
36	B1	0.16	0.27	0.37	0.30	0.66	0.60	0.58	0.71	4.26	0.40	0.48	1.41	0.38	0.32	0.59	0.45	0.90	0.62
2017/2018 Minimum		**0.14**	**0.22**	**0.29**	**0.26**	**0.57**	**0.50**	**0.39**	**0.60**	**3.64**	**0.35**	**0.42**	**1.17**	**0.33**	**0.22**	**0.51**	**0.39**	**0.43**	**0.53**
2017/2018 Maximum		**0.17**	**0.37**	**0.48**	**0.39**	**0.89**	**0.73**	**0.75**	**0.86**	**5.88**	**0.52**	**0.58**	**2.03**	**0.44**	**0.43**	**0.76**	**0.60**	**1.20**	**0.88**
2016/2017 Minimum		**0.13**	**0.18**	**0.31**	**0.23**	**0.51**	**0.45**	**0.45**	**0.54**	**3.02**	**0.32**	**0.37**	**0.99**	**0.31**	**0.23**	**0.46**	**0.34**	**0.70**	**0.46**
2016/2017 Maximum		**0.19**	**0.26**	**0.55**	**0.44**	**0.93**	**0.83**	**0.77**	**0.88**	**6.39**	**0.54**	**0.61**	**2.18**	**0.49**	**0.49**	**0.82**	**0.66**	**1.32**	**1.01**

RSA WHEAT CROP QUALITY SUMMARY

RSA Crop Quality 2015/2016 and 2017/2018 Seasons

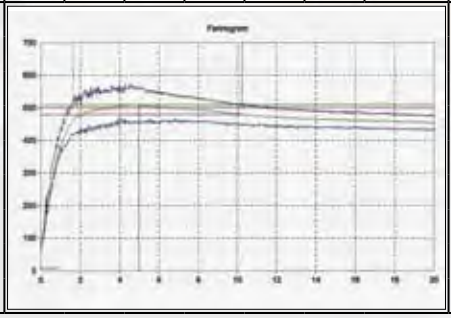
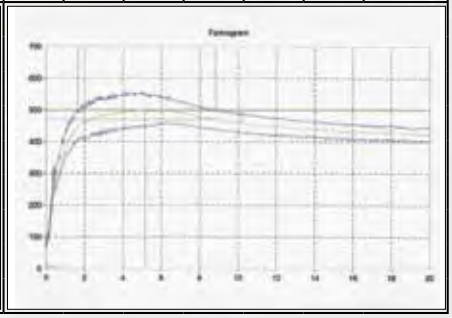
Country of origin	RSA Crop Average 2015/2016							RSA Crop Average 2017/2018						
Class and Grade bread wheat	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	***124***	***56***	***18***	***11***	***39***	***4***	***252***	***142***	***77***	***22***	***15***	***42***	***6***	***304***
WHEAT														
GRADING														
Protein (12% mb), %	13.3	11.7	11.2	13.3	13.0	14.9	12.8	13.1	12.0	11.0	11.9	13.0	13.3	12.6
Moisture, %	10.3	10.8	10.9	10.6	10.6	10.4	10.5	10.0	10.1	10.0	9.5	10.3	10.2	10.0
Falling number, sec	401	391	367	405	383	375	393	379	368	367	380	360	301	371
1000 Kernel mass (13% mb), g	36.3	39.4	39.3	34.6	34.9	30.6	36.8	36.9	39.4	40.9	37.0	36.4	34.2	37.7
Hlm (dirty), kg/hl	82.3	81.6	80.2	79.3	78.6	73.8	81.1	80.9	81.7	81.6	81.3	78.4	75.8	80.7
Screenings (<1.8 mm sieve), %	1.33	1.36	1.28	2.73	3.05	4.47	1.71	1.31	1.21	0.98	1.98	2.61	3.24	1.51
Gravel, stones, turf and glass, %	0.00	0.01	0.01	0.00	0.01	0.20	0.01	0.01	0.01	0.02	0.00	0.01	0.07	0.01
Foreign matter, %	0.09	0.11	0.13	0.18	0.30	0.58	0.14	0.11	0.13	0.10	0.10	0.29	0.39	0.14
Other grain & unthreshed ears, %	0.41	0.41	0.43	0.47	1.36	2.16	0.59	0.35	0.38	0.28	0.42	0.94	0.86	0.45
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	0.01	0.05	0.00
Immature kernels, %	0.08	0.06	0.03	0.10	0.04	0.12	0.06	0.05	0.04	0.02	0.01	0.11	0.30	0.06
Insect damaged kernels, %	0.34	0.43	0.56	0.37	0.78	2.16	0.47	0.59	0.54	0.60	0.55	1.20	3.44	0.72
Heavily frost damaged kernels, %	0.00	0.00	0.05	0.00	0.05	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sprouted kernels, %	0.02	0.01	0.00	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.00	0.05	1.93	0.06
Total damaged kernels, %	0.44	0.51	0.59	0.49	0.83	2.30	0.56	0.66	0.61	0.65	0.56	1.36	5.73	0.84
Combined deviations, %	2.26	2.38	2.43	3.87	5.54	9.51	2.99	2.43	2.32	2.01	3.06	5.20	10.22	2.94
Field fungi, %	0.09	0.09	0.12	0.28	0.06	0.06	0.10	0.10	0.08	0.07	0.11	0.13	1.23	0.12
Storage fungi, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.00
Ergot, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Poisonous seeds (*Crotalaria spp., etc.*)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poisonous seeds (*Argemone mexicana, etc.*)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Live insects	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Undesirable odour	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	B1	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	***25***	***19***	***9***	***8***	***9***	***-***	***70***	***25***	***19***	***9***	***7***	***8***	***2***	***70***
Bühler Extraction, %	73.7	73.8	73.2	73.0	72.4	-	73.4	73.2	73.6	73.6	72.8	71.6	71.2	73.1
FLOUR														
Colour, KJ (wet)	-3.6	-3.6	-3.3	-3.5	-3.4	-	-3.5	-4.1	-4.2	-4.2	-4.3	-3.9	-3.5	-4.1
Colour, Konica Minolta CM5 (dry)														
L*	93.79	93.80	93.68	93.76	93.85	-	93.78	93.68	93.83	93.85	93.95	93.77	93.59	93.78
a*	0.49	0.47	0.42	0.47	0.47	-	0.47	0.44	0.44	0.45	0.38	0.41	0.31	0.43
b*	9.73	9.66	9.83	9.74	9.90	-	9.75	9.69	9.79	9.99	9.84	10.25	9.78	9.84
Protein (12% mb), %	12.4	11.2	10.9	11.9	12.0	-	11.8	12.0	11.1	10.2	10.0	11.7	11.9	11.3
Wet Gluten (14% mb), %	33.8	30.1	29.3	32.2	32.4	-	31.9	32.7	30.6	27.5	26.7	31.7	31.6	30.7
Dry Gluten (14% mb), %	11.8	10.4	9.7	11.2	11.1	-	11.0	11.1	10.3	9.2	9.0	10.8	10.9	10.4
Gluten Index	95	95	95	95	94	-	95	93	93	94	94	92	90	93
100g BAKING TEST														
Baking water absorption, %	62.5	61.1	60.7	62.1	62.3	-	61.8	62.2	61.1	60.2	60.2	61.9	62.3	61.4
Loaf volume, cm^3	1097	1012	985	1029	1060	-	1047	1145	1104	1013	997	1109	1083	1096
Evaluation	0	0	0	1	0	-	0	0	0	0	0	0	0	0
FARINOGRAM														
Water absorption (14% mb), %	61.4	60.8	59.6	60.6	60.5	-	60.8	60.9	60.1	59.5	58.8	60.9	60.4	60.3
Development time, min	6.2	5.3	5.7	5.8	5.9	-	5.8	6.3	5.2	4.3	4.7	5.4	5.2	5.5
Stability, mm	8.4	7.2	8.1	8.1	8.5	-	8.0	9.0	7.1	7.2	7.8	8.8	7.2	8.0
Mixing tolerance index, BU	37	39	38	39	36	-	38	37	45	43	43	35	42	40
														

RSA Crop Quality of 2015/2016 and 2017/2018 Seasons

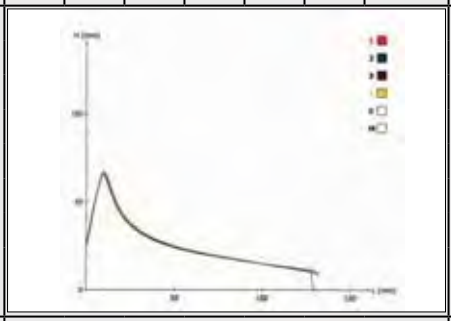
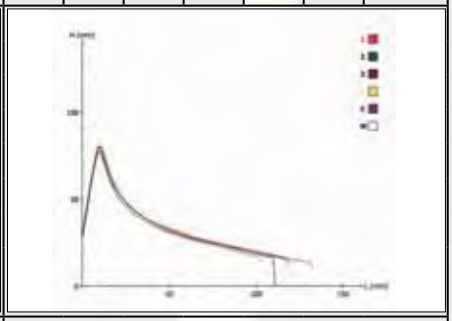
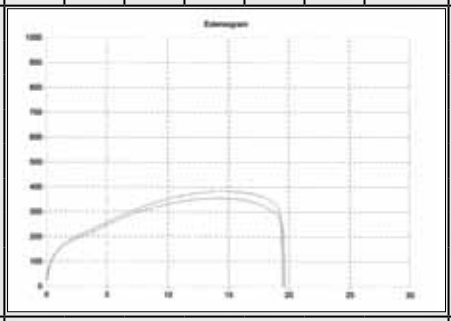
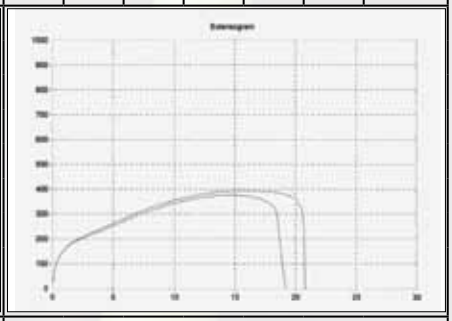
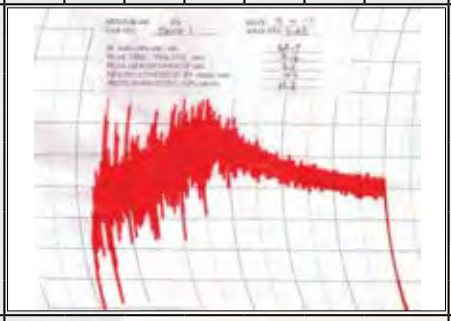
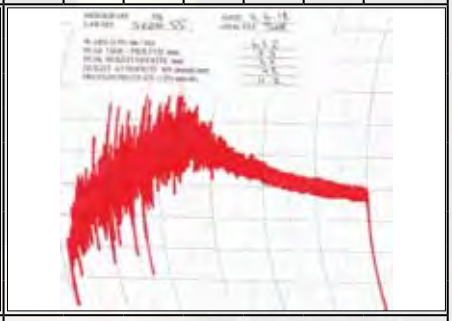
Country of origin	RSA Crop Average 2015/2016							RSA Crop Average 2017/2018						
Class and Grade bread wheat	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	***25***	***19***	***9***	***8***	***9***	***-***	***70***	***25***	***19***	***9***	***7***	***8***	***2***	***70***
ALVEOGRAM														
Strength (S), cm²	41.5	35.6	33.6	39.8	38.1	-	38.3	44.6	36.1	34.0	34.6	40.6	36.1	39.2
Stability (P), mm	83	83	78	78	79	-	81	85	79	86	78	86	79	83
Distensibility (L), mm	120	104	108	127	117	-	115	122	113	102	106	119	123	115
P/L	0.72	0.82	0.81	0.65	0.71	-	0.75	0.72	0.75	1.22	0.81	0.80	0.69	0.81
														
EXTENSOGRAM														
Strength, cm²	114	94	100	111	105	-	105	121	100	89	89	109	95	106
Max. height, BU	395	357	365	367	359	-	373	421	365	352	347	373	328	382
Extensibility, mm	207	186	187	207	204	-	198	209	197	180	178	206	200	198
														
MIXOGRAM														
Peak time, min	2.5	2.6	2.7	2.5	2.6	-	2.6	62.2	61.1	60.2	60.2	61.9	62.3	61.4
Water absorption (14% mb), %	62.8	61.2	61.0	62.4	62.3	-	62.0	2.8	2.6	2.7	2.7	2.4	2.5	2.6
														
MYCOTOXINS														
Aflatoxin B_1 (µg/kg)	ND							ND						
Aflatoxin B_2 (µg/kg)	ND							ND						
Aflatoxin G_1 (µg/kg)	ND							ND						
Aflatoxin G_2 (µg/kg)	ND							ND						
Fumonisin B_1 (µg/kg)	ND							ND						
Fumonisin B_2 (µg/kg)	ND							ND						
Fumonisin B_3 (µg/kg)	ND							ND						
Deoxynivalenol (µg/kg) [max. value]	<100 [593]							<100 [570]						
Ochratoxin A (µg/kg)	ND							ND						
Zearalenone (µg/kg)	ND							ND						
T-2 Toxin (µg/kg)	ND							ND						
No. of samples	***40***							***40***						

RSA WHEAT CROP QUALITY SUMMARY

RSA Crop Quality 2016/2017 and 2017/2018 Seasons

Country of origin	RSA Crop Average 2016/2017							RSA Crop Average 2017/2018						
Class and Grade bread wheat	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	***130***	***91***	***33***	***28***	***48***	***7***	***337***	***142***	***77***	***22***	***15***	***42***	***6***	***304***
WHEAT														
GRADING														
Protein (12% mb), %	13.0	11.5	11.0	11.0	11.4	13.6	12.0	13.1	12.0	11.0	11.9	13.0	13.3	12.6
Moisture, %	9.9	9.8	9.8	9.9	9.7	10.2	9.9	10.0	10.1	10.0	9.5	10.3	10.2	10.0
Falling number, sec	358	361	343	359	349	358	356	379	368	367	380	360	301	371
1000 Kernel mass (13% mb), g	37.7	39.6	40.5	37.8	38.6	35.6	38.6	36.9	39.4	40.9	37.0	36.4	34.2	37.7
Hlm (dirty), kg/hl	81.7	82.0	81.8	81.5	80.7	77.7	81.5	80.9	81.7	81.6	81.3	78.4	75.8	80.7
Screenings (<1.8 mm sieve), %	1.35	1.64	1.53	2.70	3.03	4.37	1.86	1.31	1.21	0.98	1.98	2.61	3.24	1.51
Gravel, stones, turf and glass, %	0.01	0.01	0.01	0.00	0.01	0.39	0.02	0.01	0.01	0.02	0.00	0.01	0.07	0.01
Foreign matter, %	0.16	0.16	0.15	0.15	0.31	0.82	0.19	0.11	0.13	0.10	0.10	0.29	0.39	0.14
Other grain & unthreshed ears, %	0.34	0.36	0.29	0.29	0.74	0.44	0.40	0.35	0.38	0.28	0.42	0.94	0.86	0.45
Heat damaged kernels, %	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.00
Immature kernels, %	0.04	0.03	0.04	0.01	0.04	0.03	0.03	0.05	0.04	0.02	0.01	0.11	0.30	0.06
Insect damaged kernels, %	0.36	0.48	0.41	0.49	0.94	0.32	0.49	0.59	0.54	0.60	0.55	1.20	3.44	0.72
Heavily frost damaged kernels, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sprouted kernels, %	0.16	0.14	0.11	0.06	0.16	1.09	0.16	0.02	0.02	0.02	0.00	0.05	1.93	0.06
Total damaged kernels, %	0.56	0.64	0.56	0.55	1.14	1.45	0.68	0.66	0.61	0.65	0.56	1.36	5.73	0.84
Combined deviations, %	2.40	2.82	2.55	3.70	5.21	7.21	3.14	2.43	2.32	2.01	3.06	5.20	10.22	2.94
Field fungi, %	0.32	0.35	0.32	0.43	0.41	0.57	0.36	0.10	0.08	0.07	0.11	0.13	1.23	0.12
Storage fungi, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.00
Ergot, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Poisonous seeds (*Crotalaria spp., etc.*)	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Poisonous seeds (*Argemone mexicana, etc.*)	0	0	0	0	0	1	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***	***14***	***11***	***10***	***11***	***1***	***70***	***25***	***19***	***9***	***7***	***8***	***2***	***70***
Bühler Extraction, %	72.8	72.7	72.2	72.8	71.6	73.1	72.5	73.2	73.6	73.6	72.8	71.6	71.2	73.1
FLOUR														
Colour, KJ (wet)	-3.7	-3.8	-3.6	-4.0	-3.8	-3.4	-3.8	-4.1	-4.2	-4.2	-4.3	-3.9	-3.5	-4.1
Colour, Konica Minolta CM5 (dry)														
L*	93.65	93.68	93.68	93.90	93.77	93.38	93.71	93.68	93.83	93.85	93.95	93.77	93.59	93.78
a*	0.46	0.49	0.44	0.45	0.43	0.44	0.46	0.44	0.44	0.45	0.38	0.41	0.31	0.43
b*	9.91	10.21	10.17	10.48	10.05	10.15	10.12	9.69	9.79	9.99	9.84	10.25	9.78	9.84
Protein (12% mb), %	12.1	11.1	10.7	9.9	11.2	12.6	11.2	12.0	11.1	10.2	10.0	11.7	11.9	11.3
Wet Gluten (14% mb), %	33.0	30.7	29.5	25.9	31.0	34.3	30.7	32.7	30.6	27.5	26.7	31.7	31.6	30.7
Dry Gluten (14% mb), %	11.5	10.5	10.0	8.8	10.6	12.0	10.5	11.1	10.3	9.2	9.0	10.8	10.9	10.4
Gluten Index	95	93	94	96	93	96	94	93	93	94	94	92	90	93
100g BAKING TEST														
Baking water absorption, %	62.4	61.3	60.8	59.7	61.3	63.0	61.3	62.2	61.1	60.2	60.2	61.9	62.3	61.4
Loaf volume, cm^3	1104	1029	987	957	1036	1167	1040	1145	1104	1013	997	1109	1083	1096
Evaluation	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FARINOGRAM														
Water absorption (14% mb), %	60.8	60.1	60.2	57.8	60.3	59.7	60.1	60.9	60.1	59.5	58.8	60.9	60.4	60.3
Development time, min	6.2	5.3	5.0	3.7	4.7	6.5	5.2	6.3	5.2	4.3	4.7	5.4	5.2	5.5
Stability, mm	9.0	8.0	7.8	7.3	8.3	9.3	8.3	9.0	7.1	7.2	7.8	8.8	7.2	8.0
Mixing tolerance index, BU	35	38	39	40	36	34	37	37	45	43	43	35	42	40
														

RSA Crop Quality of 2016/2017 and 2017/2018 Seasons

Country of origin	RSA Crop Average 2016/2017							RSA Crop Average 2017/2018						
Class and Grade bread wheat	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	***23***	***14***	***11***	***10***	***11***	***1***	***70***	***25***	***19***	***9***	***7***	***8***	***2***	***70***
ALVEOGRAM														
Strength (S), cm²	42.4	34.9	34.1	31.3	36.2	37.8	37.0	44.6	36.1	34.0	34.6	40.6	36.1	39.2
Stability (P), mm	74	72	77	69	76	71	73	85	79	86	78	86	79	83
Distensibility (L), mm	155	133	116	126	127	120	135	122	113	102	106	119	123	115
P/L	0.49	0.57	0.68	0.56	0.61	0.59	0.57	0.72	0.75	1.22	0.81	0.80	0.69	0.81
														
EXTENSOGRAM														
Strength, cm²	113	93	85	89	97	126	99	121	100	89	89	109	95	106
Max. height, BU	388	359	326	368	348	420	364	421	365	352	347	373	328	382
Extensibility, mm	210	186	184	168	195	217	193	209	197	180	178	206	200	198
														
MIXOGRAM														
Peak time, min	2.6	2.5	2.6	2.8	2.5	2.9	2.6	62.2	61.1	60.2	60.2	61.9	62.3	61.4
Water absorption (14% mb), %	62.4	61.1	60.9	59.9	61.4	63.0	61.4	2.8	2.6	2.7	2.7	2.4	2.5	2.6
														
MYCOTOXINS														
Aflatoxin B_1 (µg/kg)	ND							ND						
Aflatoxin B_2 (µg/kg)	ND							ND						
Aflatoxin G_1 (µg/kg)	ND							ND						
Aflatoxin G_2 (µg/kg)	ND							ND						
Fumonisin B_1 (µg/kg)	ND							ND						
Fumonisin B_2 (µg/kg)	ND							ND						
Fumonisin B_3 (µg/kg)	ND							ND						
Deoxynivalenol (µg/kg) [max. value]	<100 [501]							<100 [570]						
Ochratoxin A (µg/kg)	ND							ND						
Zearalenone (µg/kg)	ND							ND						
T-2 Toxin (µg/kg)	ND							ND						
No. of samples	***40***							***40***						

GRADING:

Full grading was conducted in accordance with the Regulations relating to the grading, packing and marking of bread wheat intended for sale in the Republic of South Africa (No. R. 64 of 29 January 2016). Please see pages 134 to 147.

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

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

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

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

Screenings means all material that passes through a standard sieve. For the definition of a standard sieve please refer to the definitions of Regulation No. R. 64 on page 136 of this report.

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

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

THOUSAND KERNEL MASS:

This is the weight in grams of one thousand kernels of grain and provides a measure of grain size and density. This determination does not include kernels that are broken or chipped and is done according to Industry Accepted Method 008. Thousand kernel mass is reported on a 13% moisture basis.

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 a falling number hammer mill fitted with a 0.8 mm screen.

NEAR INFRARED SPECTROSCOPY (NIRS):

NIRS is a measurement technique based on the fact that the constituents to be measured, absorb electromagnetic radiation in the near infrared region of the electromagnetic spectrum. The moisture and protein content of the whole wheat flour and Quadromat milled flour samples are measured with a SpectraStar 2400 NIR Analyser RTW.

The calibration on the NIR was developed by the SAGL and is verified by analyzing every fifth sample by means of the primary methods, described on the next page under Moisture and Protein.

FALLING NUMBER:

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

ICC Standard No. 107/1, latest edition is used to determine the falling number. The altitude-corrected value is reported on a 14% moisture basis.

QUADROMAT JUNIOR 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.

BüHLER MILLING:

Cleaned wheat samples are conditioned to between 15.0% and 16.0% moisture according to the wheat moisture and kernel hardness and allowed to stand for a minimum of 18 hours (18 - 24 hours). Samples are then milled on a 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. The Bühler MLU 202 mill is set for South African wheat, mill settings and sieve sizes deviate from AACCI method 26-21.02, latest edition.

MOISTURE:

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

PROTEIN:

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

This method prescribes a generic combustion method for the determination of crude protein. Combustion of the sample at high temperature (1 100 °C) in pure oxygen sets nitrogen free, which is measured by thermal conductivity detection. The total nitrogen content of the whole wheat flour and flour samples are determined and converted to equivalent protein by multiplication with a factor of 5.7 to obtain the protein content.

COLOUR:

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

The Kent Jones colour (so called wet colour) is determined by following FTP Method No. 0007/3, 7/1991. This method determines the influence of bran and/or extraneous material present in flour by measuring the reflectance of a flour-water slurry at a wavelength of 540 nm. The lower the Kent Jones colour, the lighter/brighter the flour and vice versa.

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

ASH:

Ash is defined as the quantity of mineral matter that remains as incombustible residue, after incineration of a sample in a muffle furnace by application of the described working method. The ash constituents of wheat are taken from the minerals of the soil. The total mineral content as well as the relative proportions of individual elements depend largely upon the soil, rainfall and other climatic conditions during growth.

Since the level of minerals present in flour is related to the rate of extraction, the ash content also indicates milling performance by indirectly revealing the amount of bran contamination. In-house method No. 011, based on the AACCI method 08-02.01 Rapid (Magnesium Acetate) method, is used for the determination.

RAPID VISCO ANALYSER:

AACCI method 76-21.01, latest edition, is followed to prepare a complete pasting curve by means of the Rapid Visco Analyser (RVA). The RVA is a rotational viscometer, able to continuously record the viscosity of a sample (under controlled temperature conditions) as the starch granules hydrate, swell and disintegrate (gelatinization and pasting), followed by possible realignment of the starch molecules during cooling (retrogradation).

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

The results are reported in centipoise (cP) on a 14% moisture basis. Results can also be converted to RVU (rapid visco unit), 1 RVU = 12 cP.

GLUTEN:

Wheat gluten is the water-insoluble complex protein fraction present in wheat flours. The ability of wheat

flour to produce dough with good gas retaining properties is attributed to gluten. Gluten is a plastic elastic substance composed principally of two functional protein components. Glutenin, the high molecular weight fraction, contributes elasticity (is less extensible) and Gliadin, the low molecular weight fraction, provides the viscous component (is highly extensible and less elastic).

The gluten content of wheat flour is determined by means of AACCI Method 38-12.02, latest edition. Wet gluten is washed from meal or flour by an automatic washing apparatus (Glutomatic).

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

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

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

FARINOGRAPH:

AACCI method 54-21.02, latest edition constant flour weight procedure is followed, using 300 g of flour on a 14% moisture basis.

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

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

The **stability**, measured in minutes, 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** (MTI) value is the difference, in Brabender units (BU), 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:

The extensograph measures the resistance and extensibility of a fully mixed, relaxed flour-water dough, by measuring the force required to stretch the dough with a hook until it breaks. ICC Standard No. 114/1, latest edition is followed.

The **strength**, measured in cm^2, 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/resistance**, measure in BU, 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**, measured in millimeters, is the mean length at the base of the two curves and indicates the stretch ability of the dough.

ALVEOGRAPH:

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. ICC Standard No. 121, latest edition is followed.

Strength (S): The area under the curve gives an indication of the dough strength and is measured in cm^2.

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 (force required to blow the bubble of dough) and is measured in millimetres.

Distensibility (L): The length of the curve, measured along the base line in millimetres, corresponds to the maximum volume of air that the bubble can withhold. Provides an indication of the extensibility 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 (viscoelastic properties).

MIXOGRAPH:

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

Mixogram peak time is the time measured in minutes that 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.

100 g BAKING TEST:

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

Keys for the evaluation of the 100 g 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.

AMINO ACID PROFILE:

The protein bound amino acids (Aspartic acid (Asp), Glutamic acid (Glu), Serine (Ser), Glycine (Gly), Histidine (His), Arginine (Arg), Threonine (Thr), Alanine (Ala), Proline (Pro), Tyrosine (Tyr), Valine (Val), Isoleucine (Ileu), Leucine (Leu), Phenylalanine (Phe) and Lysine (Lys)) were determine by using In-house method No. 028, (AccQ-Tag method).

Samples (400 mg) are hydrolysed with 6 N hydrochloric acid (HCl) for 24 hours and then derivatized with 6-aminoquinolyl-N-hydroxysuccinimidyl carbomate (AQC) to produce stable derivatives. These amino acids are then analysed by a reverse phase UPLC method, using a Waters Acquity H-Class UPLC with Empower software (Waters, Millipore Corp., Milford, MA).

In-house method No. 15, where the sample is first oxidized and dried, was followed for the determination of Cysteine (as Cysteic acid) and Methionine (as Methionine sulfone). The samples were then analysed with liquid chromatography using a modified Pico-Tag method.

For the determination of Tryptophan according to In-house method No. 007, the samples are hydrolysed under alkaline conditions with a saturated barium hydroxide solution heated to 110 °C for 20 hours. The hydrolysate is analysed by reverse phase liquid chromatography with UV detection at 285 nm.

MYCOTOXIN ANALYSES:

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

SAGL implements a validated SAGL In-house multi-mycotoxin screening method using UPLC - MS/MS. 40 of the 304 wheat crop samples were tested for Aflatoxin B_1; B_2; G_1; G_2, Fumonisin B_1; B_2; B_3, Deoxynivalenol, 15-ADON, HT2 Toxin, T-2 Toxin, Zearalenone and Ochratoxin A.

Wheat Imports and Exports

WHEAT EXPORTS/IMPORTS PER COUNTRY

2016/2017 Season (1 Oct 2016 - 29 Sep 2017)

RSA EXPORTS		IMPORTS FOR RSA		IMPORTS FOR OTHER COUNTRIES		EXPORTS OF IMPORTED WHEAT		IMPORTS PER HARBOUR	
To Country	Tons	From Country	Tons	From Country	Tons	To Country	Tons	Harbour	Tons
Botswana	19 168	Argentina	35 613	Argentina	5 853	Botswana	92 449	Cape Town	3 850
Lesotho	18 326	Australia	24 816	Australia	2 484	Lesotho	67 034	Durban	1 056 011
Mozambique	2 992	Canada	27 841	Canada	12 917	Swaziland	42 138	East London	55 162
Namibia	9 367	Czech Republic	144 402	Czech Republic	31 403	Zambia	4 999	Port Elizabeth	39 724
Swaziland	2 529	Germany	237 508	Germany	56 761	Zimbabwe	20 154		
Zambia	15 312	Latvia	17 098	Latvia	5 978				
Zimbabwe	25 204	Poland	76 912	Poland	14 002				
		Romania	112 334	Romania	11 289				
		Russian Federation	182 993	Russian Federation	71 688				
		Ukraine	13 568	United States	7 607				
		United States	61 680						
Total	**92 898**	**Total**	**934 765**	**Total**	**219 982**	**Total**	**226 774**	**Total**	**1 154 747**

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

WHEAT EXPORTS/IMPORTS PER COUNTRY

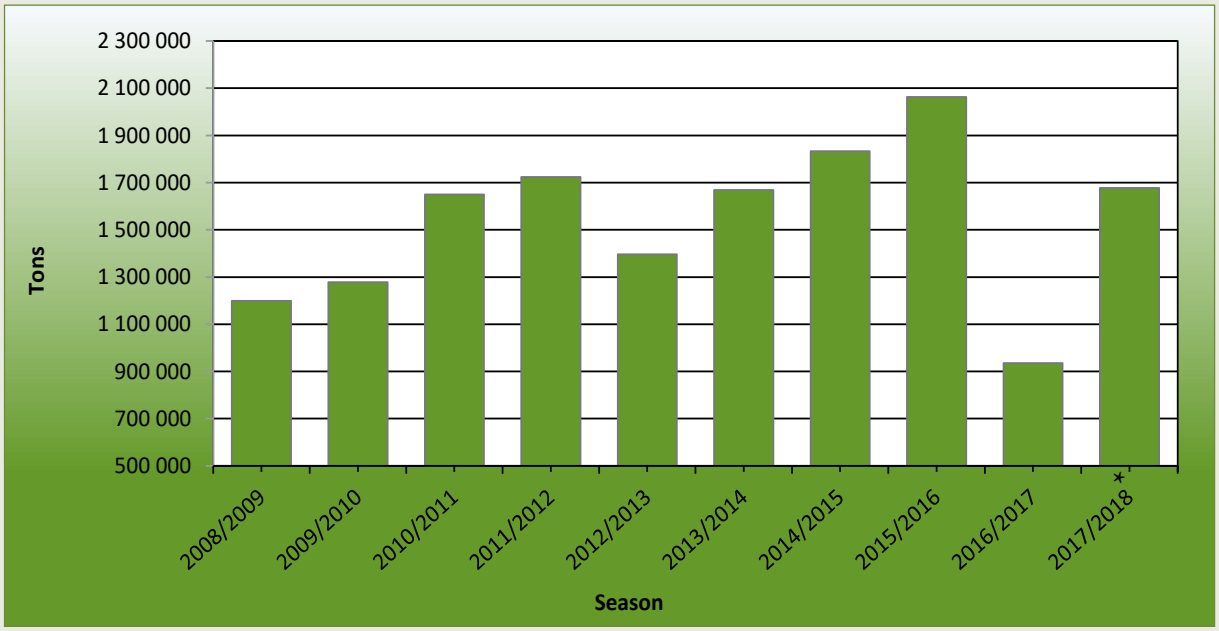
2017/2018 Season (30 Sep 2017 - 13 Jul 2018)

RSA EXPORTS		IMPORTS FOR RSA		IMPORTS FOR OTHER COUNTRIES		EXPORTS OF IMPORTED WHEAT		IMPORTS PER HARBOUR	
To Country	**Tons**	**From Country**	**Tons**	**From Country**	**Tons**	**To country**	**Tons**	**Harbour**	**Tons**
Botswana	7 062	Argentina	134 817	Argentina	13 572	Botswana	84 050	Cape Town	228 123
Lesotho	6 918	Germany	283 427	Germany	25 215	Lesotho	50 722	Durban	1 517 591
Namibia	9 700	Latvia	138 522	Latvia	31 735	Mozambique	1 479	East London	60 364
Swaziland	10 704	Lithuania	184 356	Lithuania	16 864	Swaziland	25 231	Port Elizabeth	41 532
Zambia	24 333	Poland	22 416	Poland	8 008	Zimbabwe	12 209	Richards Bay	25 601
Zimbabwe	1 405	Romania	101 449	Russian Federation	94 103				
		Russian Federation	596 291	Ukraine	3 560				
		Ukraine	135 669	United States	2 992				
		United States	80 215						
Total	**60 122**	**Total**	**1 677 162**	**Total**	**196 049**	**Total**	**173 691**	**Total**	**1 873 211**

Quantity of wheat imported to the RSA

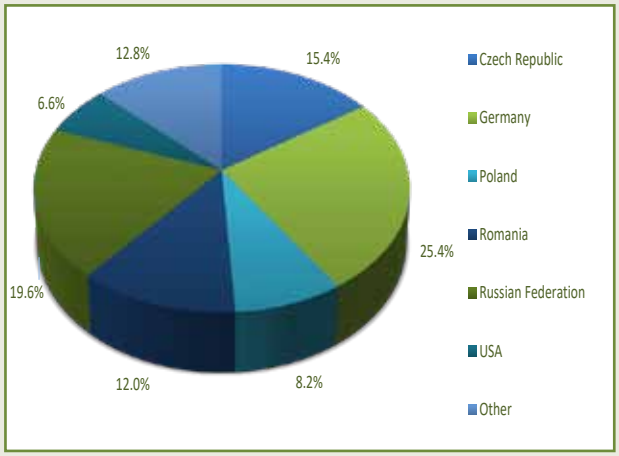
The graphs and table given below and on the next page, are based on progressive import figures per country provided by SAGIS.

Graph 23: Total wheat imports for domestic use from the 2008/2009 season

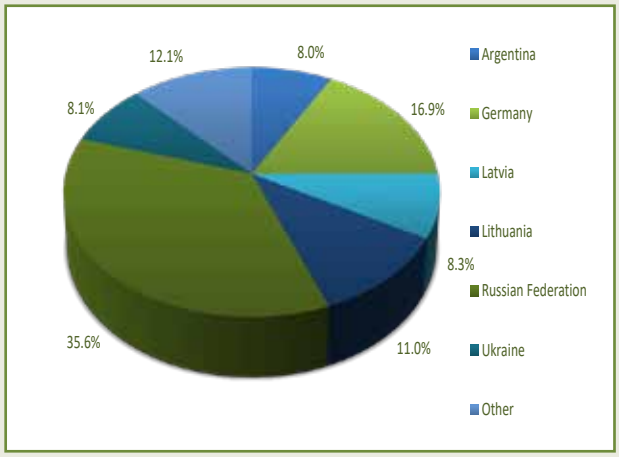


*2017/2018 season figure includes imports up to 13 July 2018.

Graph 24: Wheat imports per origin for domestic use 2016/2017 season



Graph 25: Wheat imports per origin for domestic use 2017/2018 season



*2017/2018 season figure includes imports up to 13 July 2018.

Table 8: Total wheat imports per country per season for use in the RSA

	Season										Total (Tons)
	2008/2009	2009/2010	2010/2011	2011/2012	2012/2013	2013/2014	2014/2015	2015/2016	2016/2017	2017/2018*	
Argentina	368 739	-	629 600	652 279	98 029	-	59 607	49 516	35 613	134 817	2 028 200
Australia	74 714	55 312	181 637	247 675	189 925	49 780	95 254	38 457	24 816	-	957 570
Brazil	42 449	123 944	58 551	276 420	234 733	-	-	-	-	-	736 097
Canada	54 831	72 911	79 697	45 252	48 583	111 289	105 457	102 816	27 841	-	648 677
Czech Republic	-	-	-	-	-	-	-	-	144 402	-	144 402
Finland	-	-	-	-	-	25 430	-	-	-	-	25 430
France	-	-	-	-	-	-	-	-	-	-	0
Germany	518 002	809 934	88 581	105 964	95 476	179 436	348 385	283 451	237 508	283 427	2 950 164
Latvia	-	-	-	-	-	22 013	61 005	-	17 098	138 522	238 638
Lesotho	-	-	-	-	384	-	-	-	-	-	384
Lithuania	-	1 611	-	8 880	-	40 532	43 791	151 047	-	184 356	430 217
Poland	13 013	-	-	-	-	-	91 483	185 036	76 912	22 416	388 860
Romania	-	-	-	36 071	-	-	-	-	112 334	101 449	249 854
Russian Federation	-	-	-	154 129	245 228	800 964	719 784	956 705	182 993	596 291	3 656 094
Swaziland	-	-	-	-	288		-	-	-	-	288
UK	-	-	-	-	-	-	-	-	-	-	0
Ukraine	13 521	41 230	-	39 016	341 976	372 500	279 364	109 350	13 568	135 669	1 346 194
Uruguay	-	-	25 249	45 250	99 033	-	-	-	-	-	169 532
USA	113 434	173 030	586 200	112 915	42 572	66 468	28 311	186 387	61 680	80 215	1 451 212
Total	1 198 703	1 277 972	1 649 515	1 723 851	1 396 227	1 668 412	1 832 441	2 062 765	934 765	1 677 162	15 421 813

*2017/2018 season figures include imports up to 13 July 2018.

Quality summary of imported wheat (1 October 2016 to 30 September 2017) (Previous season)

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

For grading as well as dough and baking quality results of the imported wheat per country, please refer to pages 86 to 107. This imported wheat quality is compared to a summary of the local crop quality of the corresponding (2016/2017) season. To simplify the comparison between the quality of the different countries of import and South African wheat, the average quality per country was summarised in Table 9 on pages 84 and 85. The minimum, maximum and standard deviation per country was also calculated. Please take note of the number of samples analysed when comparing results, the higher the number of samples, the more reliable the average result will be.

A total number of 93 samples of wheat imported from the following eleven countries were received (number of samples received in brackets): Argentina (3), Australia (1), Canada (7), Czech Republic (2), Germany (37), Latvia (4), Poland (8), Romania (9), Russian Federation (22), Ukraine (4) and USA (6). Wheat imported for purposes other than bread baking (e.g. soft types for biscuit making) is included in this data set.

Most of the wheat imported to South Africa is blended with local wheat to obtain a certain milling and baking quality as per individual company specifications. Milling companies will blend higher and lower quality wheat to obtain the most cost-effective grist formulation that conforms to a specific quality. The main objective is to supply the most consistent quality of flour to their customers (bakers) as possible, as in the end, consistency is one of the most important quality parameters.

Towards the end of the production season, it may however become necessary for milling companies to mill wheat blends consisting only of imported wheat. Transportation cost is also an important factor for consideration. The grist formulation of mills situated at the coast will as a result consist mainly of imported wheat whereas inland mills will mill a combination of local and imported wheat.

Hectolitre mass is an important grading factor that also provides an indication of flour extraction potential. 18% of the samples had hectoliter mass values below 77 kg/hl (minimum requirement for South African grade B1 wheat), compared to the 7% and 3% of the previous two seasons. These samples originated from the Russian Federation, Poland and the Ukraine which reported the lowest hectoliter mass values overall.

Screenings represent all material that passes through a standard sieve (1.8 mm), with 3% the maximum allowed for grades 1 to 3 according to RSA grading regulations. When comparing screening results originating from different countries, it is important to keep in mind that sieve aperture size and shape as well as sample preparation procedures vary between countries. Samples from Poland, the Ukraine and Russian Federation reported the highest levels of screenings, which explains the low hectolitre mass values observed on these samples at least in part.

None of the samples reported falling number results below 220 seconds. The wheat imported from Australia had the highest falling number value as in the previous three seasons.

The protein content and rheological characteristics of the wheat imported from the USA varied from low and weak to average and fair. The average values are therefore not a true reflection of the overall imported USA wheat bread baking quality, since most of the wheat imported were most probably not intended for bread baking purposes.

The ability of wheat flour to produce dough with good gas-holding capability is attributable to gluten as gluten imparts the elasticity and extensibility characteristics to the dough. Good quality gluten is capable of producing a loaf of bread with a high volume and good crumb texture. As in the previous seasons, the imported Canadian wheat had the highest protein content resulting in the highest gluten content. When evaluating gluten results, it is important to take the protein content into account. The ratio of wet gluten to total protein content is normally between 2.5 – 2.8 to 1. The wet gluten content of good quality white bread flour normally ranges between 27 – 33% (14% mb). The difference between wet and dry gluten is an indication of the water-holding capacity of the gluten proteins which is in turn related to protein quality. This water-holding capacity is also one of the factors determining flour water absorption.

Flour with higher water absorption is preferred by bakers as this results in increased dough yields. The acceptable range for white bread flour is normally between 60.0 – 64.0%, averaging 61.0 – 62.0%. In general, longer farinogram development times of 3.5 to 6.0 minutes and stabilities of 8.0 to 12.0 minutes will be an indication of good baking quality, which is associated with good protein quality.

Acceptable ranges for the alveogram parameters generally are as follows: Strength 30 – 45 cm^2, stability (P) 65 – 120 mm, distensibility (L) 80 – 120 mm and P/L 0.70 – 1.50. A good correlation exists between alveogram strength and protein quality. Low/short distensibility values, indicated by high P/L values can result in lower loaf volumes. High/long distensibility values, are indicative of soft doughs with excess stretching properties, which can also result in low loaf volumes due to poor gas retention properties. In general, extensogram strength values ranging between 80 – 150 cm^2, maximum heights of 300 – 550 BU and extensibility values of 170 – 220 mm, indicate good baking quality.

Most of the imported wheat samples, again showed a tendency towards longer mixogram mixing times. Some of these long mixing times can be explained by low protein levels in the samples. Flours having undesirably low protein starch ratios, require more time to produce continuous protein phases during mixing. Mixing time provides an indication of the amount of time needed to mix the dough to optimum development, between 2.8 and 3.5 minutes are considered acceptable in South Africa. The longer the mixing time, the larger the risk that the dough will not be mixed to optimum development, which will negatively influence the bread quality and cause lower loaf volumes.

Composite samples of holds per shipment per country were tested for the presence of mycotoxin residues by means of a multi-mycotoxin analysis. The mycotoxin results did not raise any concerns. Deoxynivalenol (DON) residues were observed on some of the samples, but none of the levels exceeded national or international maximum residue levels.

Table 9: Summary of the quality results of imported wheat during the 2016/2017 season

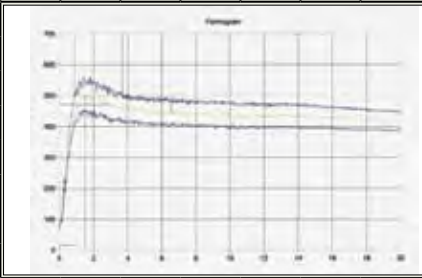
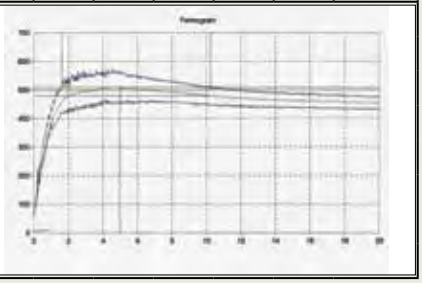
Quality parameter	Argentina				Australia				Canada				Czech Republic				Germany				Latvia			
	Ave	Min	Max	Stdev	Ave	Min	Max	Stdev	Ave	Min	Max	Stdev	Ave	Min	Max	Stdev	Ave	Min	Max	Stdev	Ave	Min	Max	Stdev
Hectolitre mass, kg/hl	80.3	79.7	81.3	0.85	85.3	-			81.9	81.6	82.5	0.31	78.8	78.7	78.8	0.07	79.5	77.9	81.3	0.88	78.6	78.4	78.9	0.22
Screenings (<1.8mm), %	3.15	3.00	3.32	0.16	1.90	-	-	-	2.78	1.56	4.68	1.25	2.08	1.94	2.22	0.20	1.90	1.02	3.30	0.60	2.22	2.06	2.39	0.15
1000 Kernel mass, g (13 % mb)	34.2	33.0	35.2	1.11	37.4	-	-	-	32.6	30.4	34.1	1.57	41.5	41.2	41.8	0.42	42.8	38.8	46.3	2.06	40.3	39.1	41.3	0.97
WWF Protein (12% mb), %	10.2	9.8	10.4	0.34	12.3	-	-	-	14.1	13.5	14.6	0.47	11.4	11.4	11.4	0.04	11.4	10.8	12.0	0.29	12.7	12.5	12.7	0.09
WWF Falling number, sec	355	338	365	15.04	509	-	-	-	360	323	412	27.91	354	326	381	38.89	331	281	365	25.53	296	271	337	30.58
Number of samples	*3*				*1*				*7*				*2*				*37*				*4*			
Flour moisture, %	13.6	13.5	13.7	0.10	14.2	-	-	-	14.3	14.0	14.6	0.19	13.6	13.4	13.7	0.21	14.0	13.2	14.6	0.28	13.7	13.5	14.2	0.33
Flour Protein, % (12 % mb)	8.9	8.5	9.0	0.27	10.9	-	-	-	12.8	12.3	13.4	0.49	9.9	9.9	10.0	0.06	10.0	9.5	10.5	0.25	11.5	11.4	11.6	0.09
Ash, % (db)	0.58	0.56	0.60	0.02	0.55	-	-	-	0.58	0.54	0.67	0.05	0.54	0.53	0.54	0.01	0.50	0.44	0.55	0.03	0.53	0.46	0.58	0.05
Colour, KJ (wet)	-3.5	-3.6	-3.4	0.10	-3.7	-	-	-	-3.6	-4.0	-3.1	0.36	-3.1	-3.2	-3.0	0.14	-3.2	-3.5	-2.9	0.16	-2.9	-3.0	-2.7	0.13
Konica Minolta CM-5 colour, L*	93.70	93.63	93.81	0.09	93.36	-	-	-	93.24	93.08	93.46	0.16	93.46	93.46	93.46	0.00	93.49	93.25	93.71	0.11	93.14	93.08	93.19	0.05
Konica Minolta CM-5 colour, b*	10.46	10.32	10.54	0.12	10.06	-	-	-	10.44	10.24	10.73	0.19	10.21	10.10	10.31	0.15	9.97	9.03	10.76	0.47	9.66	9.61	9.75	0.07
Wet gluten, % (14 % mb)	20.9	20.1	21.3	0.67	28.6	-	-	-	34.6	32.9	36.5	1.19	26.2	25.7	26.7	0.71	26.4	24.6	28.5	1.05	31.2	30.7	31.5	0.36
Dry gluten, % (14 % mb)	7.3	7.1	7.4	0.17	10.0	-	-	-	12.0	11.1	13.0	0.66	8.9	8.5	9.2	0.49	9.1	8.2	10.6	0.51	11.1	10.8	11.3	0.21
Gluten Index	99	99	100	0.58	99	-	-	-	96	95	98	1.13	97	96	97	0.71	97	94	100	1.42	76	10	98	43.99
Farinogram																								
Water absorption, % (14% mb)	55.1	55.1	55.2	0.06	58.8	-	-	-	60.9	60.1	62.1	0.78	56.4	56.3	56.4	0.07	56.6	55.5	58.2	0.59	57.5	57.3	57.7	0.16
Development time, min	1.5	1.5	1.5	0.00	8.2	-	-	-	8.0	6.8	9.2	0.78	2.0	2.0	2.0	0.00	2.1	1.7	2.7	0.27	3.3	2.9	3.7	0.35
Stability, mm	3.0	2.5	3.6	0.57	16.1	-	-	-	12.8	10.6	14.7	1.99	8.7	8.2	9.1	0.64	7.0	2.7	11.0	2.16	11.5	9.8	13.1	1.72
Alveogram																								
Strength, cm^2	30.5	27.8	33.8	3.04	44.6	-	-	-	49.5	45.3	56.7	4.26	33.2	32.0	34.3	1.63	33.7	24.5	39.6	3.28	37.1	34.1	39.3	2.19
Stability, mm	79	70	88	9.02	98	-	-	-	76	68	86	6.81	77	74	79	3.54	79	66	93	6.14	88	83	91	3.42
Distensibility, mm	73	60	82	11.53	91	-	-	-	151	135	163	9.49	94	91	97	4.24	93	60	123	15.42	85	71	91	9.32
P/L	1.12	0.91	1.47	0.31	1.08	-	-	-	0.51	0.42	0.64	0.07	0.82	0.76	0.87	0.08	0.88	0.54	1.39	0.21	1.05	0.91	1.28	0.16
Extensogram																								
Strength, cm^2	91	89	92	2.12	119	-	-	-	129	110	150	15.49	89	84	93	6.36	89	72	104	6.53	98	92	107	6.38
Max. height, BU	468	466	469	2.12	538	-	-	-	424	366	466	34.92	410	385	434	34.65	414	336	464	29.56	420	388	465	33.44
Extensibility, mm	141	137	144	4.95	165	-	-	-	224	205	237	12.62	154	153	155	1.41	154	142	164	6.19	170	164	181	7.80
Mixogram																								
Peak time, min	5.0	4.8	5.2	0.21	3.6	-	-	-	3.1	2.9	3.3	0.13	3.6	3.4	3.8	0.28	3.7	2.6	4.5	0.44	4.4	4.2	4.9	0.32
100g Baking Test																								
Loaf volume, cm^3	837	815	853	19.86	992	-	-	-	1104	1079	1136	20.75	861	800	921	85.56	904	809	995	46.56	1041	1021	1078	26.70
Evaluation	0	0	0	0.00	0	-	-	-	0	0	0	0.00	0	0	0	0.00	0	0	0	0.00	0	0	0	0.00
Number of samples	*3*				*1*				*7*				*2*				*37*				*4*			

Table 9: Summary of the quality results of imported wheat during the 2016/2017 season (continue)

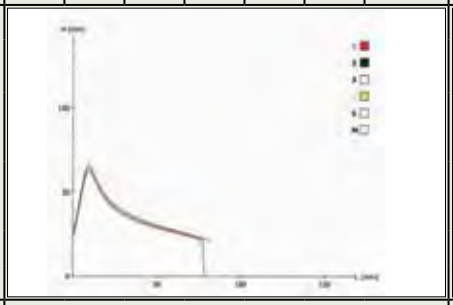
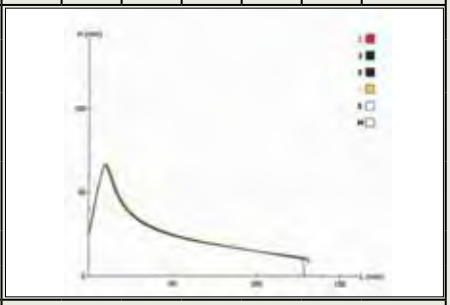
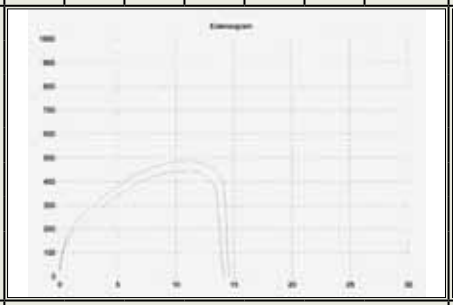
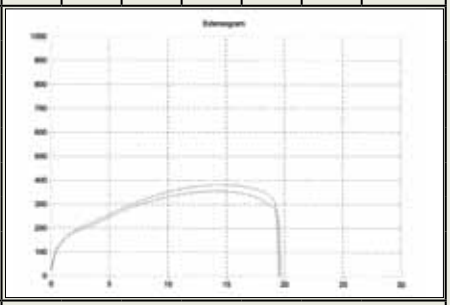
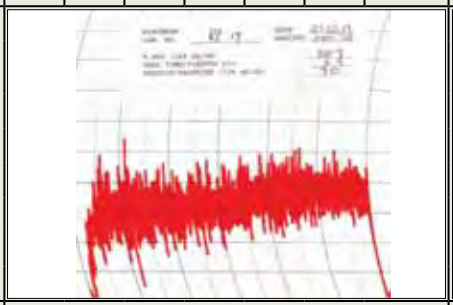
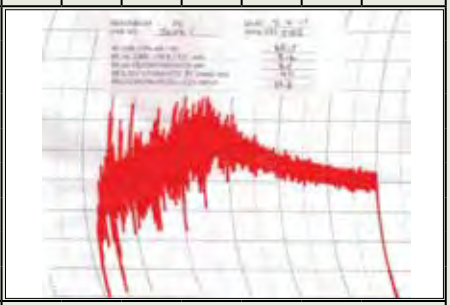
Quality parameter	Poland				Romania				Russian Federation				Ukraine				USA				RSA crop average 2016/2017			
	Ave	Min	Max	Stdev	Ave	Min	Max	Stdev	Ave	Min	Max	Stdev	Ave	Min	Max	Stdev	Ave	Min	Max	Stdev	Ave	Min	Max	Stdev
Hectolitre mass, kg/hl	78.0	75.7	80.7	2.10	78.3	77.3	80.4	1.18	76.9	74.5	79.3	1.25	62.4	60.1	63.7	1.58	79.2	78.9	79.3	0.15	81.5	74.3	86.0	2.07
Screenings (<1.8mm), %	9.00	1.74	15.20	4.25	2.89	2.18	3.30	0.47	4.62	3.02	7.90	1.54	6.66	6.41	6.87	0.19	3.62	2.84	4.03	0.43	1.86	0.03	9.32	1.32
1000 Kernel mass, g (13 % mb)	40.2	36.8	43.1	2.16	39.2	37.0	41.6	1.42	37.6	35.1	41.7	1.34	37.2	36.3	38.3	0.87	31.2	28.6	35.7	3.32	38.6	25.5	49.2	3.61
WWF Protein (12% mb), %	12.2	11.8	13.0	0.36	10.6	10.1	11.3	0.43	11.0	10.8	11.2	0.10	11.2	11.2	11.3	0.04	10.7	9.1	11.5	1.04	12.0	8.8	18.9	1.43
WWF Falling number, sec	310	295	341	17.25	363	311	391	30.90	343	273	494	58.01	325	305	352	19.82	398	316	456	57.51	356	128	629	42.09
Number of samples	*8*				*9*				*22*				*4*				*6*				*337*			
Flour moisture, %	14.2	13.8	14.4	0.23	13.9	13.5	14.2	0.23	13.5	12.8	14.2	0.44	13.4	13.0	14.0	0.43	13.5	13.2	13.8	0.26	13.8	13.2	15.1	0.31
Flour Protein, % (12 % mb)	10.7	10.4	11.4	0.29	9.2	8.9	9.8	0.36	9.8	9.7	10.0	0.10	10.0	10.0	10.0	0.02	9.2	7.3	10.1	1.30	11.2	8.3	17.0	1.77
Ash, % (db)	0.56	0.54	0.58	0.02	0.51	0.48	0.54	0.02	0.56	0.51	0.64	0.03	0.52	0.51	0.54	0.02	0.52	0.44	0.57	0.05	0.59	0.52	0.67	0.03
Colour, KJ (wet)	-2.9	-3.2	-2.6	0.18	-3.1	-3.2	-3.0	0.07	-2.7	-3.3	-1.8	0.34	-3.0	-3.1	-2.9	0.10	-3.4	-3.7	-3.2	0.17	-3.8	-4.4	-2.0	0.48
Konica Minolta CM-5 colour, L*	93.15	92.96	93.38	0.17	93.12	92.81	93.31	0.18	93.11	92.38	93.53	0.29	93.22	93.11	93.29	0.09	93.89	93.30	94.97	0.76	93.71	92.17	94.30	0.43
Konica Minolta CM-5 colour, b*	9.63	9.35	10.46	0.37	10.28	9.85	11.10	0.47	11.26	9.58	11.98	0.82	10.89	10.84	11.02	0.09	9.97	8.84	10.51	0.73	10.12	9.03	11.65	0.53
Wet gluten, % (14 % mb)	28.8	28.0	30.7	0.86	22.5	20.3	25.2	1.73	25.0	23.3	25.9	0.69	24.8	24.5	25.2	0.33	23.2	18.3	24.5	2.73	30.7	20.9	51.1	5.56
Dry gluten, % (14 % mb)	9.9	9.3	11.1	0.53	8.0	7.5	8.9	0.52	8.4	8.1	9.0	0.24	8.7	8.6	8.8	0.10	8.0	5.9	8.6	1.16	10.5	7.0	17.4	1.99
Gluten Index	98	96	99	0.99	99	98	100	0.83	97	94	99	1.29	100	99	100	0.58	99	95	100	2.24	94	63	99	5.17
Farinogram																								
Water absorption, % (14% mb)	56.9	55.8	59.1	1.05	55.7	54.8	58.1	1.06	56.9	54.8	58.4	1.21	55.4	55.2	55.5	0.13	52.0	48.0	53.9	2.38	60.1	54.2	68.5	2.38
Development time, min	2.4	2.0	2.8	0.27	2.2	1.2	7.6	2.03	2.2	1.5	7.6	1.22	1.8	1.7	2.0	0.15	1.7	1.0	2.2	0.50	5.2	1.7	9.3	1.75
Stability, mm	8.9	6.0	13.4	2.39	7.1	3.7	15.6	3.56	7.2	3.3	12.1	2.76	5.0	4.0	6.8	1.33	8.4	1.3	14.5	5.47	8.3	3.7	15.9	3.15
Alveogram																								
Strength, cm^2	39.2	35.0	50.9	5.17	25.6	20.5	36.2	5.50	30.9	25.7	37.2	2.62	29.7	27.8	31.3	1.48	22.8	13.3	30.4	7.33	37.0	22.2	59.5	8.70
Stability, mm	75	69	93	7.98	78	71	92	8.54	90	72	105	8.22	85	78	93	6.60	59	29	77	19.88	73	52	107	10.07
Distensibility, mm	114	102	138	12.14	65	48	88	12.63	64	52	82	7.82	61	57	70	5.97	76	62	113	18.43	135	80	210	24.81
P/L	0.67	0.51	0.83	0.10	1.24	0.93	1.79	0.25	1.45	0.99	1.94	0.26	1.41	1.11	1.60	0.21	0.84	0.26	1.21	0.36	0.57	0.30	1.15	0.16
Extensogram																								
Strength, cm^2	105	93	135	13.68	70	61	101	13.29	82	72	93	5.40	102	99	104	2.38	100	55	117	25.38	99	53	153	25.33
Max. height, BU	451	389	518	49.33	349	310	490	60.13	418	384	471	22.39	466	457	474	6.98	506	355	566	86.29	364	227	540	74.59
Extensibility, mm	169	154	192	11.88	139	134	147	4.99	143	132	157	6.92	160	155	165	4.57	143	109	158	19.61	193	144	269	25.98
Mixogram																								
Peak time, min	4.1	3.7	4.9	0.37	4.5	3.2	5.1	0.70	4.4	3.3	5.2	0.41	5.4	4.8	5.9	0.47	5.3	4.6	5.8	0.47	2.6	1.9	3.5	0.39
100g Baking Test																								
Loaf volume, cm^3	955	912	990	26.52	865	821	909	27.25	866	809	931	30.88	941	938	944	2.65	894	697	964	102.64	1040	789	1270	104.80
Evaluation	0	0	0	0.00	0	0	0	0.00	0	0	0	0.00	0	0	0	0.00	0	0	0	0.00	0	0	2	0.24
Number of samples	*8*				*9*				*22*				*4*				*6*				*70*			

2016/2017 IMPORTED WHEAT QUALITY - ARGENTINA (1 Oct 2016 to 30 Sep 2017)

2016/2017 Imported Wheat Quality Versus 2016/2017 RSA Wheat Quality

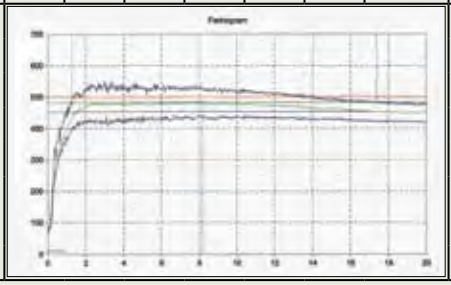
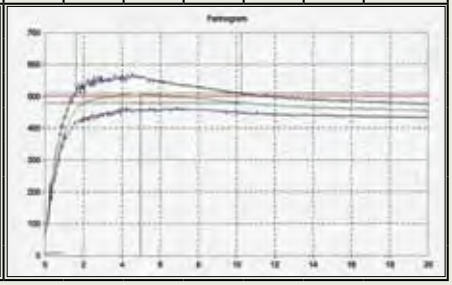
Country of origin	Argentina Average							RSA Crop Average						
Class and Grade bread wheat	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	-	-	-	*3*	-	-	*3*	*130*	*91*	*33*	*28*	*48*	*7*	*337*
WHEAT														
GRADING														
Protein (12% mb), %	-	-	-	10.2	-	-	10.2	13.0	11.5	11.0	11.0	11.4	13.6	12.0
Moisture, %	-	-	-	11.2	-	-	11.2	9.9	9.8	9.8	9.9	9.7	10.2	9.9
Falling number, sec	-	-	-	355	-	-	355	358	361	343	359	349	358	356
1000 Kernel mass (13% mb), g	-	-	-	34.2	-	-	34.2	37.7	39.6	40.5	37.8	38.6	35.6	38.6
Hlm (dirty), kg/hl	-	-	-	80.3	-	-	80.3	81.7	82.0	81.8	81.5	80.7	77.7	81.5
Screenings (<1.8 mm sieve), %	-	-	-	3.15	-	-	3.15	1.35	1.64	1.53	2.70	3.03	4.37	1.86
Gravel, stones, turf and glass, %	-	-	-	0.00	-	-	0.00	0.01	0.01	0.01	0.00	0.01	0.39	0.02
Foreign matter, %	-	-	-	0.15	-	-	0.15	0.16	0.16	0.15	0.15	0.31	0.82	0.19
Other grain & unthreshed ears, %	-	-	-	0.34	-	-	0.34	0.34	0.36	0.29	0.29	0.74	0.44	0.40
Heat damaged kernels, %	-	-	-	0.03	-	-	0.03	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Immature kernels, %	-	-	-	0.07	-	-	0.07	0.04	0.03	0.04	0.01	0.04	0.03	0.03
Insect damaged kernels, %	-	-	-	0.11	-	-	0.11	0.36	0.48	0.41	0.49	0.94	0.32	0.49
Heavily frost damaged kernels, %	-	-	-	0.00	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sprouted kernels, %	-	-	-	0.08	-	-	0.08	0.16	0.14	0.11	0.06	0.16	1.09	0.16
Total damaged kernels, %	-	-	-	0.31	-	-	0.31	0.56	0.64	0.56	0.55	1.14	1.45	0.68
Combined deviations, %	-	-	-	3.95	-	-	3.95	2.40	2.82	2.55	3.70	5.21	7.21	3.14
Field fungi, %	-	-	-	0.78	-	-	0.78	0.32	0.35	0.32	0.43	0.41	0.57	0.36
Storage fungi, %	-	-	-	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
Poisonous seeds (*Crotalaria spp., etc.*)	-	-	-	0	-	-	0	0	0	0	0	0	1	0
Poisonous seeds (*Argemone mexicana, etc.*)	-	-	-	0	-	-	0	0	0	0	0	0	1	0
Live insects	-	-	-	No	-	-	No	No	No	No	No	No	No	No
Undesirable odour	-	-	-	No	-	-	No	No	No	No	No	No	No	No
	B1	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	-	-	-	*3*	-	-	*3*	*23*	*14*	*11*	*10*	*11*	*1*	*70*
Bühler Extraction, %	-	-	-	71.9	-	-	71.9	72.8	72.7	72.2	72.8	71.6	73.1	72.5
FLOUR														
Colour, KJ (wet)	-	-	-	-3.5	-	-	-3.5	-3.7	-3.8	-3.6	-4.0	-3.8	-3.4	-3.8
Colour, Konica Minolta CM5 (dry)														
L*	-	-	-	93.70	-	-	93.70	93.65	93.68	93.68	93.90	93.77	93.38	93.71
a*	-	-	-	0.50	-	-	0.50	0.46	0.49	0.44	0.45	0.43	0.44	0.46
b*	-	-	-	10.46	-	-	10.46	9.91	10.21	10.17	10.48	10.05	10.15	10.12
Ash (db), %	-	-	-	0.58	-	-	0.58	0.58	0.60	0.58	0.60	0.60	0.62	0.59
Protein (12% mb), %	-	-	-	8.9	-	-	8.9	12.1	11.1	10.7	9.9	11.2	12.6	11.2
Wet Gluten (14% mb), %	-	-	-	20.9	-	-	20.9	33.0	30.7	29.5	25.9	31.0	34.3	30.7
Dry Gluten (14% mb), %	-	-	-	7.3	-	-	7.3	11.5	10.5	10.0	8.8	10.6	12.0	10.5
Gluten Index	-	-	-	99	-	-	99	95	93	94	96	93	96	94
100g BAKING TEST														
Baking water absorption, %	-	-	-	58.8	-	-	58.8	62.4	61.3	60.8	59.7	61.3	63.0	61.3
Loaf volume, cm^3	-	-	-	837	-	-	837	1104	1029	987	957	1036	1167	1040
Evaluation	-	-	-	0	-	-	0	0	0	0	0	0	0	0
FARINOGRAM														
Water absorption (14% mb), %	-	-	-	55.1	-	-	55.1	60.8	60.1	60.2	57.8	60.3	59.7	60.1
Development time, min	-	-	-	1.5	-	-	1.5	6.2	5.3	5.0	3.7	4.7	6.5	5.2
Stability, mm	-	-	-	3.0	-	-	3.0	9.0	8.0	7.8	7.3	8.3	9.3	8.3
Mixing tolerance index, BU	-	-	-	54	-	-	54	35	38	39	40	36	34	37
														

2016/2017 Imported Wheat Quality Versus 2016/2017 RSA Wheat Quality

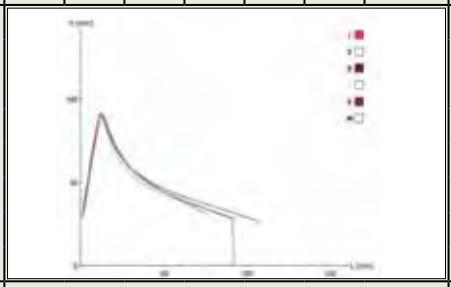
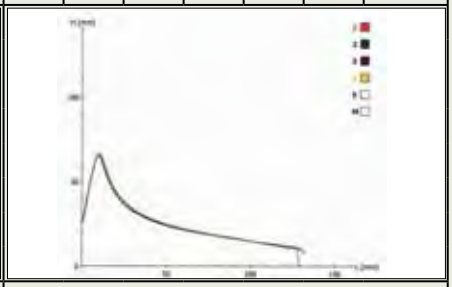
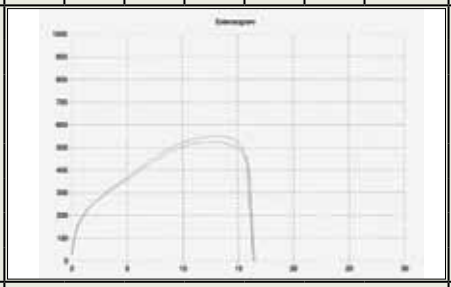
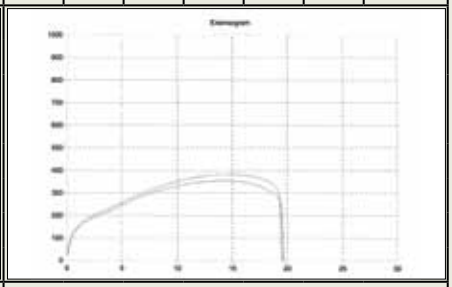
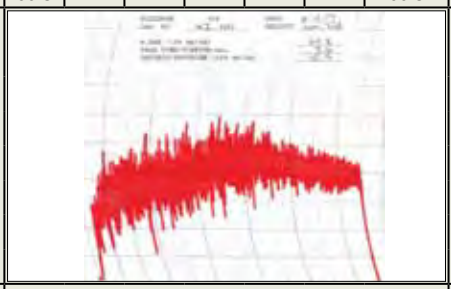
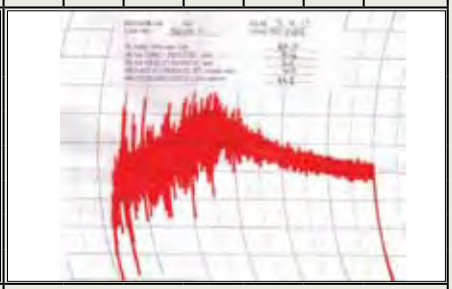
Country of origin	Argentina Average							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	-	-	-	3	-	-	3	23	14	11	10	11	1	70
ALVEOGRAM														
Strength (S), cm²	-	-	-	30.5	-	-	30.5	42.4	34.9	34.1	31.3	36.2	37.8	37.0
Stability (P), mm	-	-	-	79	-	-	79	74	72	77	69	76	71	73
Distensibility (L), mm	-	-	-	73	-	-	73	155	133	116	126	127	120	135
P/L	-	-	-	1.12	-	-	1.12	0.49	0.57	0.68	0.56	0.61	0.59	0.57
														
EXTENSOGRAM														
Strength, cm²	-	-	-	91	-	-	91	113	93	85	89	97	126	99
Max. height, BU	-	-	-	468	-	-	468	388	359	326	368	348	420	364
Extensibility, mm	-	-	-	141	-	-	141	210	186	184	168	195	217	193
														
MIXOGRAM														
Peak time, min	-	-	-	5.0	-	-	5.0	2.6	2.5	2.6	2.8	2.5	2.9	2.6
Water absorption (14% mb), %	-	-	-	58.8	-	-	58.8	62.4	61.1	60.9	59.9	61.4	63.0	61.4
														
MYCOTOXINS														
Aflatoxin B_1 (µg/kg)	0 [0]							ND						
Aflatoxin B_2 (µg/kg)	0 [0]							ND						
Aflatoxin G_1 (µg/kg)	0 [0]							ND						
Aflatoxin G_2 (µg/kg)	0 [0]							ND						
Fumonisin B_1 (µg/kg)	0 [0]							ND						
Fumonisin B_2 (µg/kg)	0 [0]							ND						
Fumonisin B_3 (µg/kg)	0 [0]							ND						
Deoxynivalenol (µg/kg) [max. value]	737 [737]							<100 [501]						
15-ADON (µg/kg) [max. value]	0 [0]							ND						
Ochratoxin A (µg/kg)	0 [0]							ND						
Zearalenone (µg/kg)	0 [0]							ND						
HT-2 (µg/kg)	0 [0]							ND						
T-2 Toxin (µg/kg)	0 [0]							ND						
No. of samples	1							40						

2016/2017 IMPORTED WHEAT QUALITY - AUSTRALIA (1 Oct 2016 to 30 Sep 2017)

2016/2017 Imported Wheat Quality Versus 2016/2017 RSA Wheat Quality

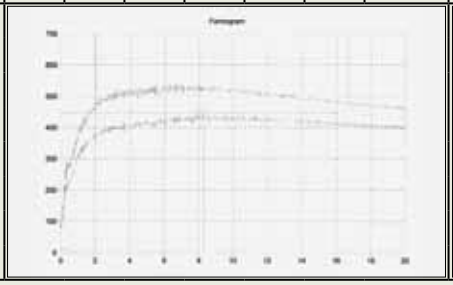
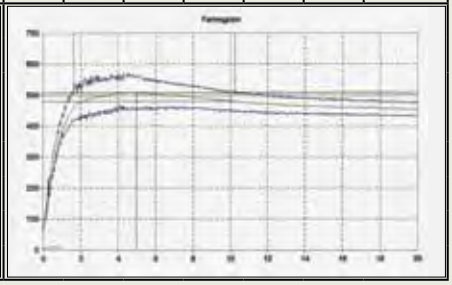
Country of origin	Australia Average							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	*1*	*-*	*-*	*-*	*-*	*-*	*1*	*130*	*91*	*33*	*28*	*48*	*7*	*337*
WHEAT														
GRADING														
Protein (12% mb), %	12.3	-	-	-	-	-	12.3	13.0	11.5	11.0	11.0	11.4	13.6	12.0
Moisture, %	10.6	-	-	-	-	-	10.6	9.9	9.8	9.8	9.9	9.7	10.2	9.9
Falling number, sec	509	-	-	-	-	-	509	358	361	343	359	349	358	356
1000 Kernel mass (13% mb), g	37.4	-	-	-	-	-	37.4	37.7	39.6	40.5	37.8	38.6	35.6	38.6
Hlm (dirty), kg/hl	85.3	-	-	-	-	-	85.3	81.7	82.0	81.8	81.5	80.7	77.7	81.5
Screenings (<1.8 mm sieve), %	1.90	-	-	-	-	-	1.90	1.35	1.64	1.53	2.70	3.03	4.37	1.86
Gravel, stones, turf and glass, %	0.00	-	-	-	-	-	0.00	0.01	0.01	0.01	0.00	0.01	0.39	0.02
Foreign matter, %	0.16	-	-	-	-	-	0.16	0.16	0.16	0.15	0.15	0.31	0.82	0.19
Other grain & unthreshed ears, %	0.48	-	-	-	-	-	0.48	0.34	0.36	0.29	0.29	0.74	0.44	0.40
Heat damaged kernels, %	0.00	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Immature kernels, %	0.08	-	-	-	-	-	0.08	0.04	0.03	0.04	0.01	0.04	0.03	0.03
Insect damaged kernels, %	0.64	-	-	-	-	-	0.64	0.36	0.48	0.41	0.49	0.94	0.32	0.49
Heavily frost damaged kernels, %	0.00	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sprouted kernels, %	0.00	-	-	-	-	-	0.00	0.16	0.14	0.11	0.06	0.16	1.09	0.16
Total damaged kernels, %	0.72	-	-	-	-	-	0.72	0.56	0.64	0.56	0.55	1.14	1.45	0.68
Combined deviations, %	3.26	-	-	-	-	-	3.26	2.40	2.82	2.55	3.70	5.21	7.21	3.14
Field fungi, %	0.24	-	-	-	-	-	0.24	0.32	0.35	0.32	0.43	0.41	0.57	0.36
Storage fungi, %	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
Poisonous seeds (*Crotalaria spp., etc.*)	0	-	-	-	-	-	0	0	0	0	0	0	1	0
Poisonous seeds (*Argemone mexicana, etc.*)	0	-	-	-	-	-	0	0	0	0	0	0	1	0
Live insects	No	-	-	-	-	-	No	No	No	No	No	No	No	No
Undesirable odour	No	-	-	-	-	-	No	No	No	No	No	No	No	No
	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	*1*	*-*	*-*	*-*	*-*	*-*	*1*	*23*	*14*	*11*	*10*	*11*	*1*	*70*
Bühler Extraction, %	74.4	-	-	-	-	-	74.4	72.8	72.7	72.2	72.8	71.6	73.1	72.5
FLOUR														
Colour, KJ (wet)	-3.7	-	-	-	-	-	-3.7	-3.7	-3.8	-3.6	-4.0	-3.8	-3.4	-3.8
Colour, Konica Minolta CM5 (dry)														
L*	93.36	-	-	-	-	-	93.36	93.65	93.68	93.68	93.90	93.77	93.38	93.71
a*	0.53	-	-	-	-	-	0.53	0.46	0.49	0.44	0.45	0.43	0.44	0.46
b*	10.06	-	-	-	-	-	10.06	9.91	10.21	10.17	10.48	10.05	10.15	10.12
Ash (db), %	0.55	-	-	-	-	-	0.55	0.58	0.60	0.58	0.60	0.60	0.62	0.59
Protein (12% mb), %	10.9	-	-	-	-	-	10.9	12.1	11.1	10.7	9.9	11.2	12.6	11.2
Wet Gluten (14% mb), %	28.6	-	-	-	-	-	28.6	33.0	30.7	29.5	25.9	31.0	34.3	30.7
Dry Gluten (14% mb), %	10.0	-	-	-	-	-	10.0	11.5	10.5	10.0	8.8	10.6	12.0	10.5
Gluten Index	99	-	-	-	-	-	99	95	93	94	96	93	96	94
100g BAKING TEST														
Baking water absorption, %	60.8	-	-	-	-	-	60.8	62.4	61.3	60.8	59.7	61.3	63.0	61.3
Loaf volume, cm^3	992	-	-	-	-	-	992	1104	1029	987	957	1036	1167	1040
Evaluation	0	-	-	-	-	-	0	0	0	0	0	0	0	0
FARINOGRAM														
Water absorption (14% mb), %	58.8	-	-	-	-	-	58.8	60.8	60.1	60.2	57.8	60.3	59.7	60.1
Development time, min	8.2	-	-	-	-	-	8.2	6.2	5.3	5.0	3.7	4.7	6.5	5.2
Stability, mm	16.1	-	-	-	-	-	16.1	9.0	8.0	7.8	7.3	8.3	9.3	8.3
Mixing tolerance index, BU	15	-	-	-	-	-	15	35	38	39	40	36	34	37
														

2016/2017 Imported Wheat Quality Versus 2016/2017 RSA Wheat Quality

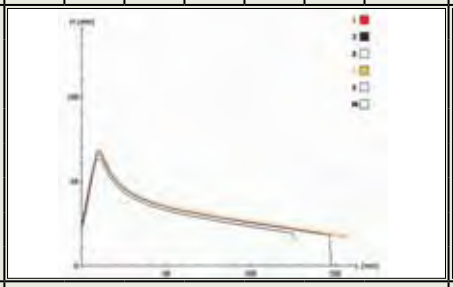
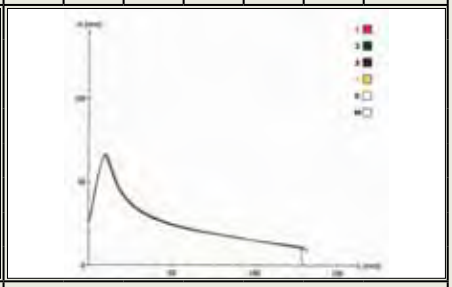
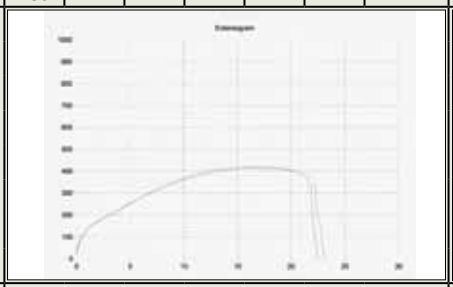
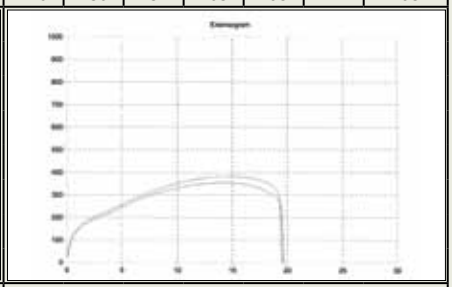
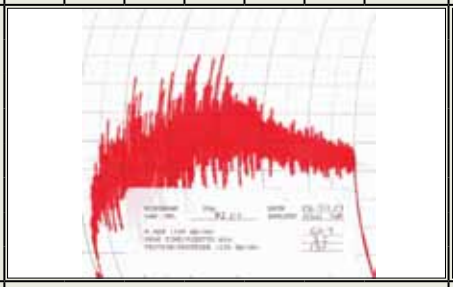
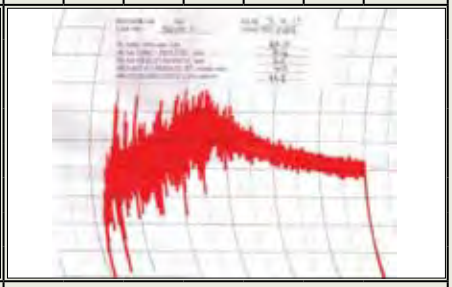
Country of origin	Australia Average							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	1	-	-	-	-	-	1	*23*	*14*	*11*	*10*	*11*	*1*	*70*
ALVEOGRAM														
Strength (S), cm²	44.6	-	-	-	-	-	44.6	42.4	34.9	34.1	31.3	36.2	37.8	37.0
Stability (P), mm	98	-	-	-	-	-	98	74	72	77	69	76	71	73
Distensibility (L), mm	91	-	-	-	-	-	91	155	133	116	126	127	120	135
P/L	1.08	-	-	-	-	-	1.08	0.49	0.57	0.68	0.56	0.61	0.59	0.57
														
EXTENSOGRAM														
Strength, cm²	119	-	-	-	-	-	119	113	93	85	89	97	126	99
Max. height, BU	538	-	-	-	-	-	538	388	359	326	368	348	420	364
Extensibility, mm	165	-	-	-	-	-	165	210	186	184	168	195	217	193
														
MIXOGRAM														
Peak time, min	3.6	-	-	-	-	-	3.6	2.6	2.5	2.6	2.8	2.5	2.9	2.6
Water absorption (14% mb), %	60.8	-	-	-	-	-	60.8	62.4	61.1	60.9	59.9	61.4	63.0	61.4
														
MYCOTOXINS														
Aflatoxin B_1 (µg/kg)	0 [0]							ND						
Aflatoxin B_2 (µg/kg)	0 [0]							ND						
Aflatoxin G_1 (µg/kg)	0 [0]							ND						
Aflatoxin G_2 (µg/kg)	0 [0]							ND						
Fumonisin B_1 (µg/kg)	0 [0]							ND						
Fumonisin B_2 (µg/kg)	0 [0]							ND						
Fumonisin B_3 (µg/kg)	0 [0]							ND						
Deoxynivalenol (µg/kg) [max. value]	0 [0]							<100 [501]						
15-ADON (µg/kg) [max. value]	0 [0]							ND						
Ochratoxin A (µg/kg)	0 [0]							ND						
Zearalenone (µg/kg)	0 [0]							ND						
HT-2 (µg/kg)	0 [0]							ND						
T-2 Toxin (µg/kg)	0 [0]							ND						
No. of samples	*1*							*40*						

2016/2017 IMPORTED WHEAT QUALITY - CANADA (1 Oct 2016 to 30 Sep 2017)

2016/2017 Imported Wheat Quality Versus 2016/2017 RSA Wheat Quality

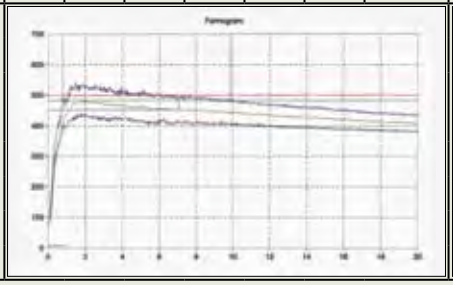
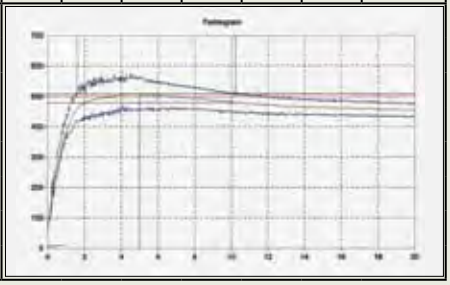
Country of origin	Canada Average							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	*2*	*-*	*-*	*-*	*5*	*-*	*7*	*130*	*91*	*33*	*28*	*48*	*7*	*337*
WHEAT														
GRADING														
Protein (12% mb), %	14.4	-	-	-	13.9	-	14.1	13.0	11.5	11.0	11.0	11.4	13.6	12.0
Moisture, %	11.9	-	-	-	11.9	-	11.9	9.9	9.8	9.8	9.9	9.7	10.2	9.9
Falling number, sec	388	-	-	-	348	-	360	358	361	343	359	349	358	356
1000 Kernel mass (13% mb), g	32.8	-	-	-	32.5	-	32.6	37.7	39.6	40.5	37.8	38.6	35.6	38.6
Hlm (dirty), kg/hl	82.4	-	-	-	81.8	-	81.9	81.7	82.0	81.8	81.5	80.7	77.7	81.5
Screenings (<1.8 mm sieve), %	1.72	-	-	-	3.21	-	2.78	1.35	1.64	1.53	2.70	3.03	4.37	1.86
Gravel, stones, turf and glass, %	0.00	-	-	-	0.00	-	0.00	0.01	0.01	0.01	0.00	0.01	0.39	0.02
Foreign matter, %	0.09	-	-	-	0.11	-	0.11	0.16	0.16	0.15	0.15	0.31	0.82	0.19
Other grain & unthreshed ears, %	0.08	-	-	-	1.58	-	1.15	0.34	0.36	0.29	0.29	0.74	0.44	0.40
Heat damaged kernels, %	0.00	-	-	-	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Immature kernels, %	0.00	-	-	-	0.00	-	0.00	0.04	0.03	0.04	0.01	0.04	0.03	0.03
Insect damaged kernels, %	0.10	-	-	-	0.04	-	0.05	0.36	0.48	0.41	0.49	0.94	0.32	0.49
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, %	0.04	-	-	-	0.05	-	0.05	0.16	0.14	0.11	0.06	0.16	1.09	0.16
Total damaged kernels, %	0.14	-	-	-	0.08	-	0.10	0.56	0.64	0.56	0.55	1.14	1.45	0.68
Combined deviations, %	2.03	-	-	-	4.99	-	4.14	2.40	2.82	2.55	3.70	5.21	7.21	3.14
Field fungi, %	0.36	-	-	-	0.53	-	0.48	0.32	0.35	0.32	0.43	0.41	0.57	0.36
Storage fungi, %	0.04	-	-	-	0.06	-	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ergot, %	0.02	-	-	-	0.02	-	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Poisonous seeds (*Crotalaria spp., etc.*)	0	-	-	-	0	-	0	0	0	0	0	0	1	0
Poisonous seeds (*Argemone mexicana, etc.*)	0	-	-	-	0	-	0	0	0	0	0	0	1	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	*2*	*-*	*-*	*-*	*5*	*-*	*7*	*23*	*14*	*11*	*10*	*11*	*1*	*70*
Bühler Extraction, %	71.8	-	-	-	71.6	-	71.6	72.8	72.7	72.2	72.8	71.6	73.1	72.5
FLOUR														
Colour, KJ	-3.2	-	-	-	-3.8	-	-3.6	-3.7	-3.8	-3.6	-4.0	-3.8	-3.4	-3.8
Colour, Konica Minolta CM5 (dry)														
L*	93.12	-	-	-	93.29	-	93.24	93.65	93.68	93.68	93.90	93.77	93.38	93.71
a*	0.64	-	-	-	0.60	-	0.61	0.46	0.49	0.44	0.45	0.43	0.44	0.46
b*	10.45	-	-	-	10.44	-	10.44	9.91	10.21	10.17	10.48	10.05	10.15	10.12
Ash (db), %	0.65	-	-	-	0.55	-	0.58	0.58	0.60	0.58	0.60	0.60	0.62	0.59
Protein (12% mb), %	13.3	-	-	-	12.7	-	12.8	12.1	11.1	10.7	9.9	11.2	12.6	11.2
Wet Gluten (14% mb), %	36.0	-	-	-	34.1	-	34.6	33.0	30.7	29.5	25.9	31.0	34.3	30.7
Dry Gluten (14% mb), %	12.5	-	-	-	11.8	-	12.0	11.5	10.5	10.0	8.8	10.6	12.0	10.5
Gluten Index	98	-	-	-	96	-	96	95	93	94	96	93	96	94
100g BAKING TEST														
Baking water absorption, %	64.0	-	-	-	62.7	-	63.1	62.4	61.3	60.8	59.7	61.3	63.0	61.3
Loaf volume, cm^3	1094	-	-	-	1108	-	1104	1104	1029	987	957	1036	1167	1040
Evaluation	0	-	-	-	0	-	0	0	0	0	0	0	0	0
FARINOGRAM														
Water absorption (14% mb), %	61.9	-	-	-	60.5	-	60.9	60.8	60.1	60.2	57.8	60.3	59.7	60.1
Development time, min	8.2	-	-	-	7.9	-	8.0	6.2	5.3	5.0	3.7	4.7	6.5	5.2
Stability, mm	14.3	-	-	-	12.2	-	12.8	9.0	8.0	7.8	7.3	8.3	9.3	8.3
Mixing tolerance index, BU	20	-	-	-	26	-	24	35	38	39	40	36	34	37
														

2016/2017 Imported Wheat Quality Versus 2016/2017 RSA Wheat Quality

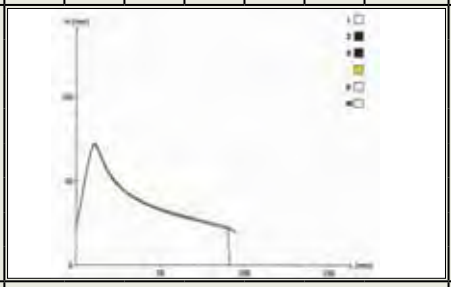
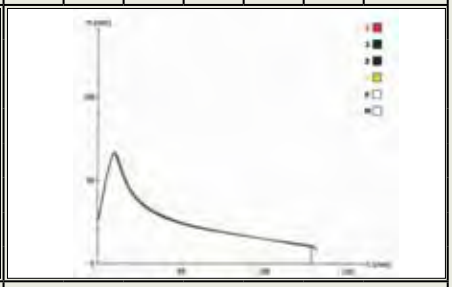
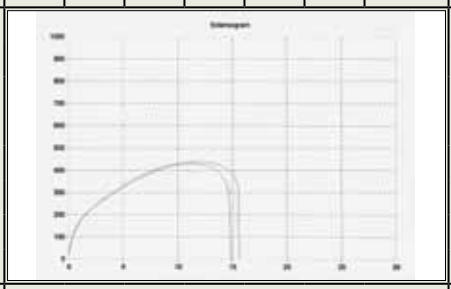
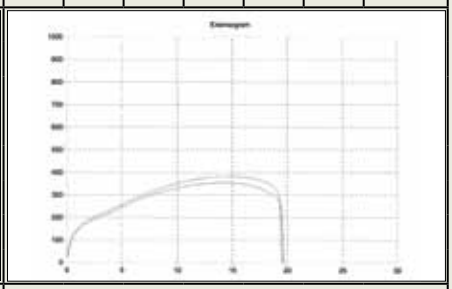
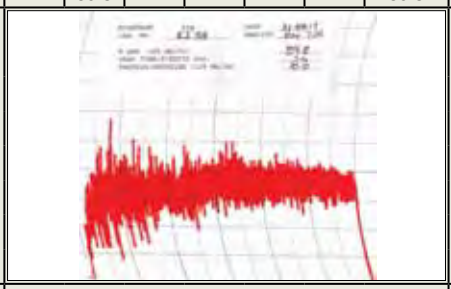
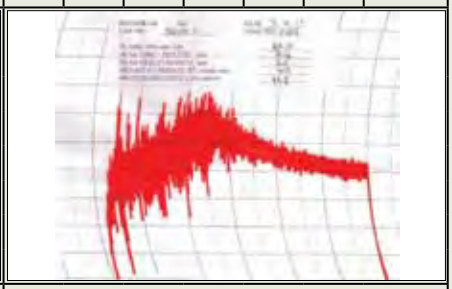
Country of origin	Canada Average							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	*2*	*-*	*-*	*-*	*5*	*-*	*7*	*23*	*14*	*11*	*10*	*11*	*1*	*70*
ALVEOGRAM														
Strength (S), cm²	54.6	-	-	-	47.4	-	49.5	42.4	34.9	34.1	31.3	36.2	37.8	37.0
Stability (P), mm	85	-	-	-	73	-	76	74	72	77	69	76	71	73
Distensibility (L), mm	146	-	-	-	153	-	151	155	133	116	126	127	120	135
P/L	0.59	-	-	-	0.48	-	0.51	0.49	0.57	0.68	0.56	0.61	0.59	0.57
														
EXTENSOGRAM														
Strength, cm²	133	-	-	-	127	-	129	113	93	85	89	97	126	99
Max. height, BU	425	-	-	-	424	-	424	388	359	326	368	348	420	364
Extensibility, mm	230	-	-	-	221	-	224	210	186	184	168	195	217	193
														
MIXOGRAM														
Peak time, min	3.3	-	-	-	3.1	-	3.1	2.6	2.5	2.6	2.8	2.5	2.9	2.6
Water absorption (14% mb), %	64.0	-	-	-	63.3	-	63.5	62.4	61.1	60.9	59.9	61.4	63.0	61.4
														
MYCOTOXINS														
Aflatoxin B_1 (µg/kg)	0 [0]							ND						
Aflatoxin B_2 (µg/kg)	0 [0]							ND						
Aflatoxin G_1 (µg/kg)	0 [0]							ND						
Aflatoxin G_2 (µg/kg)	0 [0]							ND						
Fumonisin B_1 (µg/kg)	0 [0]							ND						
Fumonisin B_2 (µg/kg)	0 [0]							ND						
Fumonisin B_3 (µg/kg)	0 [0]							ND						
Deoxynivalenol (µg/kg) [max. value]	458 [745]							<100 [501]						
15-ADON (µg/kg)	0 [0]							ND						
Ochratoxin A (µg/kg)	0 [0]							ND						
Zearalenone (µg/kg) [max. value]	0 [0]							ND						
HT-2 (µg/kg)	0 [0]							ND						
T-2 Toxin (µg/kg)	0 [0]							ND						
No. of samples	*3*							*40*						

2016/2017 IMPORTED WHEAT QUALITY - CZECH REPUBLIC (1 Oct 2016 to 30 Sep 2017)

2016/2017 Imported Wheat Quality Versus 2016/2017 RSA Wheat Quality

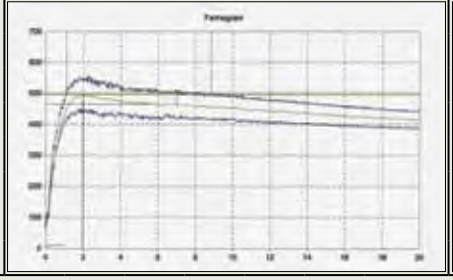
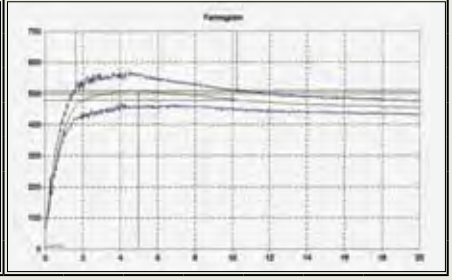
Country of origin	Czech Republic Average							RSA Crop Average						
Class and Grade bread wheat	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	*-*	*2*	*-*	*-*	*-*	*-*	*2*	*130*	*91*	*33*	*28*	*48*	*7*	*337*
WHEAT														
GRADING														
Protein (12% mb), %	-	11.4	-	-	-	-	11.4	13.0	11.5	11.0	11.0	11.4	13.6	12.0
Moisture, %	-	12.3	-	-	-	-	12.3	9.9	9.8	9.8	9.9	9.7	10.2	9.9
Falling number, sec	-	354	-	-	-	-	354	358	361	343	359	349	358	356
1000 Kernel mass (13% mb), g	-	41.5	-	-	-	-	41.5	37.7	39.6	40.5	37.8	38.6	35.6	38.6
Hlm (dirty), kg/hl	-	78.8	-	-	-	-	78.8	81.7	82.0	81.8	81.5	80.7	77.7	81.5
Screenings (<1.8 mm sieve), %	-	2.08	-	-	-	-	2.08	1.35	1.64	1.53	2.70	3.03	4.37	1.86
Gravel, stones, turf and glass, %	-	0.00	-	-	-	-	0.00	0.01	0.01	0.01	0.00	0.01	0.39	0.02
Foreign matter, %	-	0.09	-	-	-	-	0.09	0.16	0.16	0.15	0.15	0.31	0.82	0.19
Other grain & unthreshed ears, %	-	0.18	-	-	-	-	0.18	0.34	0.36	0.29	0.29	0.74	0.44	0.40
Heat damaged kernels, %	-	0.00	-	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Immature kernels, %	-	0.00	-	-	-	-	0.00	0.04	0.03	0.04	0.01	0.04	0.03	0.03
Insect damaged kernels, %	-	0.12	-	-	-	-	0.12	0.36	0.48	0.41	0.49	0.94	0.32	0.49
Heavily frost damaged kernels, %	-	0.00	-	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sprouted kernels, %	-	0.36	-	-	-	-	0.36	0.16	0.14	0.11	0.06	0.16	1.09	0.16
Total damaged kernels, %	-	0.48	-	-	-	-	0.48	0.56	0.64	0.56	0.55	1.14	1.45	0.68
Combined deviations, %	-	2.83	-	-	-	-	2.83	2.40	2.82	2.55	3.70	5.21	7.21	3.14
Field fungi, %	-	0.28	-	-	-	-	0.28	0.32	0.35	0.32	0.43	0.41	0.57	0.36
Storage fungi, %	-	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
Poisonous seeds (*Crotalaria spp., etc.*)	-	0	-	-	-	-	0	0	0	0	0	0	1	0
Poisonous seeds (*Argemone mexicana, etc.*)	-	0	-	-	-	-	0	0	0	0	0	0	1	0
Live insects	-	No	-	-	-	-	No	No	No	No	No	No	No	No
Undesirable odour	-	No	-	-	-	-	No	No	No	No	No	No	No	No
	B1	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	*-*	*2*	*-*	*-*	*-*	*-*	*2*	*23*	*14*	*11*	*10*	*11*	*1*	*70*
Bühler Extraction, %	-	72.9	-	-	-	-	72.9	72.8	72.7	72.2	72.8	71.6	73.1	72.5
FLOUR														
Colour, KJ	-	-3.1	-	-	-	-	-3.1	-3.7	-3.8	-3.6	-4.0	-3.8	-3.4	-3.8
Colour, Konica Minolta CM5 (dry)														
L*	-	93.46	-	-	-	-	93.46	93.65	93.68	93.68	93.90	93.77	93.38	93.71
a*	-	0.51	-	-	-	-	0.51	0.46	0.49	0.44	0.45	0.43	0.44	0.46
b*	-	10.21	-	-	-	-	10.21	9.91	10.21	10.17	10.48	10.05	10.15	10.12
Ash (db), %	-	0.54	-	-	-	-	0.54	0.58	0.60	0.58	0.60	0.60	0.62	0.59
Protein (12% mb), %	-	9.9	-	-	-	-	9.9	12.1	11.1	10.7	9.9	11.2	12.6	11.2
Wet Gluten (14% mb), %	-	26.2	-	-	-	-	26.2	33.0	30.7	29.5	25.9	31.0	34.3	30.7
Dry Gluten (14% mb), %	-	8.9	-	-	-	-	8.9	11.5	10.5	10.0	8.8	10.6	12.0	10.5
Gluten Index	-	97	-	-	-	-	97	95	93	94	96	93	96	94
100g BAKING TEST														
Baking water absorption, %	-	59.7	-	-	-	-	59.7	62.4	61.3	60.8	59.7	61.3	63.0	61.3
Loaf volume, cm^3	-	861	-	-	-	-	861	1104	1029	987	957	1036	1167	1040
Evaluation	-	0	-	-	-	-	0	0	0	0	0	0	0	0
FARINOGRAM														
Water absorption (14% mb), %	-	56.4	-	-	-	-	56.4	60.8	60.1	60.2	57.8	60.3	59.7	60.1
Development time, min	-	2.0	-	-	-	-	2.0	6.2	5.3	5.0	3.7	4.7	6.5	5.2
Stability, mm	-	8.7	-	-	-	-	8.7	9.0	8.0	7.8	7.3	8.3	9.3	8.3
Mixing tolerance index, BU	-	30	-	-	-	-	30	35	38	39	40	36	34	37
														

2016/2017 Imported Wheat Quality Versus 2016/2017 RSA Wheat Quality

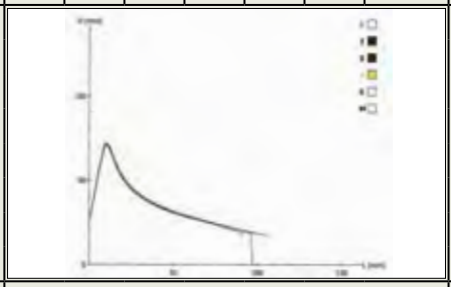
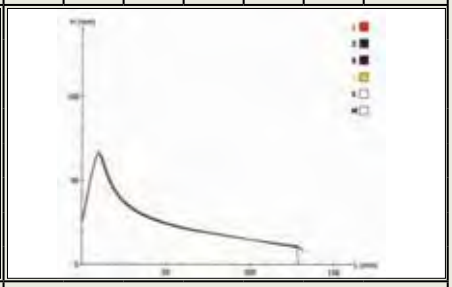
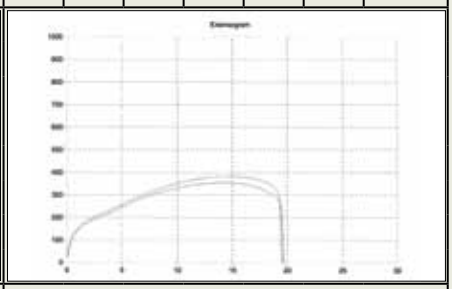
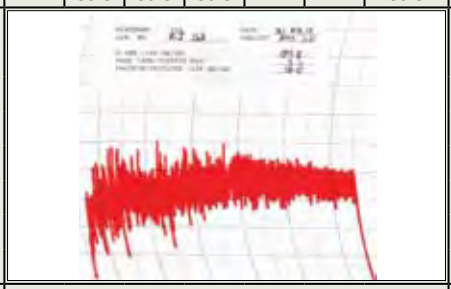
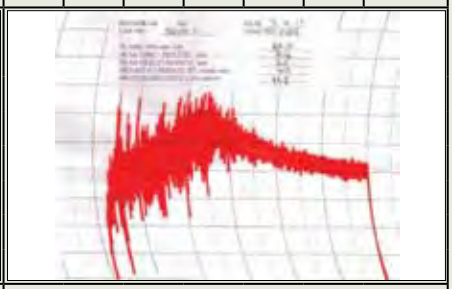
Country of origin	Czech Republic Average							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	-	*2*	-	-	-	-	*2*	*23*	*14*	*11*	*10*	*11*	*1*	*70*
ALVEOGRAM														
Strength (S), cm²	-	33.2	-	-	-	-	33.2	42.4	34.9	34.1	31.3	36.2	37.8	37.0
Stability (P), mm	-	77	-	-	-	-	77	74	72	77	69	76	71	73
Distensibility (L), mm	-	94	-	-	-	-	94	155	133	116	126	127	120	135
P/L	-	0.82	-	-	-	-	0.82	0.49	0.57	0.68	0.56	0.61	0.59	0.57
														
EXTENSOGRAM														
Strength, cm²	-	89	-	-	-	-	89	113	93	85	89	97	126	99
Max. height, BU	-	410	-	-	-	-	410	388	359	326	368	348	420	364
Extensibility, mm	-	154	-	-	-	-	154	210	186	184	168	195	217	193
														
MIXOGRAM														
Peak time, min	-	3.6	-	-	-	-	3.6	2.6	2.5	2.6	2.8	2.5	2.9	2.6
Water absorption (14% mb), %	-	59.8	-	-	-	-	59.8	62.4	61.1	60.9	59.9	61.4	63.0	61.4
														
MYCOTOXINS														
Aflatoxin B_1 (µg/kg)	0 [0]							ND						
Aflatoxin B_2 (µg/kg)	0 [0]							ND						
Aflatoxin G_1 (µg/kg)	0 [0]							ND						
Aflatoxin G_2 (µg/kg)	0 [0]							ND						
Fumonisin B_1 (µg/kg)	0 [0]							ND						
Fumonisin B_2 (µg/kg)	0 [0]							ND						
Fumonisin B_3 (µg/kg)	0 [0]							ND						
Deoxynivalenol (µg/kg) [max. value]	0 [0]							<100 [501]						
15-ADON (µg/kg) [max. value]	0 [0]							ND						
Ochratoxin A (µg/kg)	0 [0]							ND						
Zearalenone (µg/kg) [max. value]	0 [0]							ND						
HT-2 (µg/kg)	0 [0]							ND						
T-2 Toxin (µg/kg)	0 [0]							ND						
No. of samples	*1*							*40*						

2016/2017 IMPORTED WHEAT QUALITY - GERMANY (1 Oct 2016 to 30 Sep 2017)

2016/2017 Imported Wheat Quality Versus 2016/2017 RSA Wheat Quality

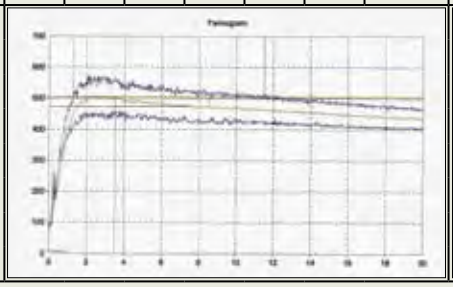
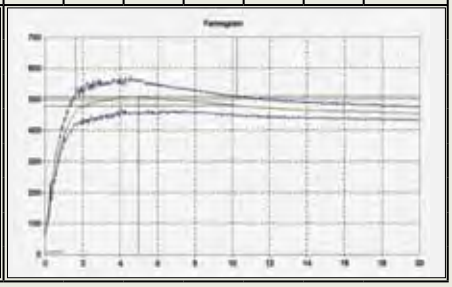
Country of origin	Germany Average							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	-	*33*	*2*	*2*	-	-	*37*	*130*	*91*	*33*	*28*	*48*	*7*	*337*
WHEAT														
GRADING														
Protein (12% mb), %	-	11.4	10.8	11.4	-	-	11.4	13.0	11.5	11.0	11.0	11.4	13.6	12.0
Moisture, %	-	11.7	11.4	11.8	-	-	11.7	9.9	9.8	9.8	9.9	9.7	10.2	9.9
Falling number, sec	-	334	291	326	-	-	331	358	361	343	359	349	358	356
1000 Kernel mass (13% mb), g	-	42.6	43.0	45.2	-	-	42.8	37.7	39.6	40.5	37.8	38.6	35.6	38.6
Hlm (dirty), kg/hl	-	79.5	78.8	80.5	-	-	79.5	81.7	82.0	81.8	81.5	80.7	77.7	81.5
Screenings (<1.8 mm sieve), %	-	1.81	2.16	3.22	-	-	1.90	1.35	1.64	1.53	2.70	3.03	4.37	1.86
Gravel, stones, turf and glass, %	-	0.00	0.00	0.00	-	-	0.00	0.01	0.01	0.01	0.00	0.01	0.39	0.02
Foreign matter, %	-	0.10	0.33	0.11	-	-	0.12	0.16	0.16	0.15	0.15	0.31	0.82	0.19
Other grain & unthreshed ears, %	-	0.30	0.41	0.30	-	-	0.30	0.34	0.36	0.29	0.29	0.74	0.44	0.40
Heat damaged kernels, %	-	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Immature kernels, %	-	0.01	0.00	0.00	-	-	0.01	0.04	0.03	0.04	0.01	0.04	0.03	0.03
Insect damaged kernels, %	-	0.06	0.04	0.00	-	-	0.06	0.36	0.48	0.41	0.49	0.94	0.32	0.49
Heavily frost damaged kernels, %	-	0.01	0.00	0.00	-	-	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sprouted kernels, %	-	0.20	0.58	0.34	-	-	0.23	0.16	0.14	0.11	0.06	0.16	1.09	0.16
Total damaged kernels, %	-	0.27	0.62	0.34	-	-	0.29	0.56	0.64	0.56	0.55	1.14	1.45	0.68
Combined deviations, %	-	2.48	3.52	3.97	-	-	2.62	2.40	2.82	2.55	3.70	5.21	7.21	3.14
Field fungi, %	-	0.36	1.58	0.23	-	-	0.42	0.32	0.35	0.32	0.43	0.41	0.57	0.36
Storage fungi, %	-	0.01	0.00	0.00	-	-	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
Poisonous seeds (*Crotalaria spp., etc.*)	-	0	0	0	-	-	0	0	0	0	0	0	1	0
Poisonous seeds (*Argemone mexicana, etc.*)	-	0	0	0	-	-	0	0	0	0	0	0	1	0
Live insects	-	No	No	No	-	-	No	No	No	No	No	No	No	No
Undesirable odour	-	No	No	No	-	-	No	No	No	No	No	No	No	No
	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	-	*33*	*2*	*2*	-	-	*37*	*23*	*14*	*11*	*10*	*11*	*1*	*70*
Bühler Extraction, %	-	73.3	72.6	73.6	-	-	73.3	72.8	72.7	72.2	72.8	71.6	73.1	72.5
FLOUR														
Colour, KJ	-	-3.2	-3.0	-3.1	-	-	-3.2	-3.7	-3.8	-3.6	-4.0	-3.8	-3.4	-3.8
Colour, Konica Minolta CM5 (dry)														
L*	-	93.50	93.35	93.46	-	-	93.49	93.65	93.68	93.68	93.90	93.77	93.38	93.71
a*	-	0.49	0.53	0.52	-	-	0.49	0.46	0.49	0.44	0.45	0.43	0.44	0.46
b*	-	10.01	9.12	10.22	-	-	9.97	9.91	10.21	10.17	10.48	10.05	10.15	10.12
Ash (db), %	-	0.50	0.54	0.53	-	-	0.50	0.58	0.60	0.58	0.60	0.60	0.62	0.59
Protein (12% mb), %	-	10.0	9.5	9.9	-	-	10.0	12.1	11.1	10.7	9.9	11.2	12.6	11.2
Wet Gluten (14% mb), %	-	26.5	24.7	27.4	-	-	26.4	33.0	30.7	29.5	25.9	31.0	34.3	30.7
Dry Gluten (14% mb), %	-	9.2	8.2	9.8	-	-	9.1	11.5	10.5	10.0	8.8	10.6	12.0	10.5
Gluten Index	-	97	96	98	-	-	97	95	93	94	96	93	96	94
100g BAKING TEST														
Baking water absorption, %	-	59.8	59.3	59.8	-	-	59.8	62.4	61.3	60.8	59.7	61.3	63.0	61.3
Loaf volume, cm^3	-	908	860	878	-	-	904	1104	1029	987	957	1036	1167	1040
Evaluation	-	0	0	0	-	-	0	0	0	0	0	0	0	0
FARINOGRAM														
Water absorption (14% mb), %	-	56.6	55.9	57.0	-	-	56.6	60.8	60.1	60.2	57.8	60.3	59.7	60.1
Development time, min	-	2.1	1.9	1.8	-	-	2.1	6.2	5.3	5.0	3.7	4.7	6.5	5.2
Stability, mm	-	7.3	3.9	5.9	-	-	7.0	9.0	8.0	7.8	7.3	8.3	9.3	8.3
Mixing tolerance index, BU	-	39	54	42	-	-	40	35	38	39	40	36	34	37
														

2016/2017 Imported Wheat Quality Versus 2016/2017 RSA Wheat Quality

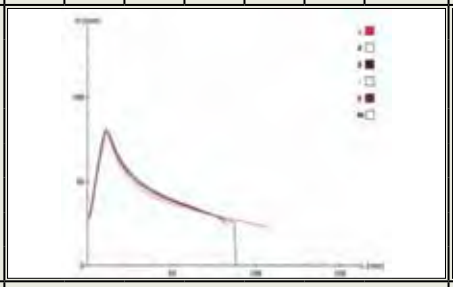
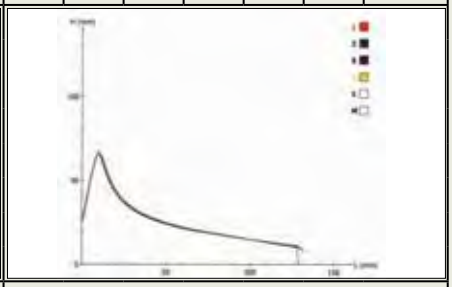
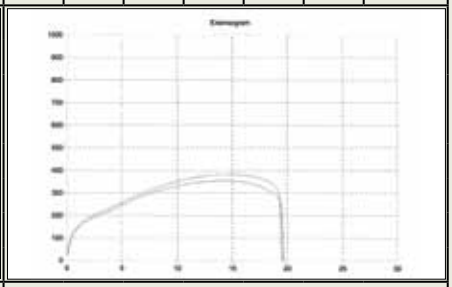
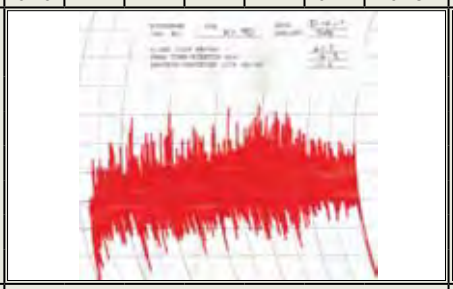
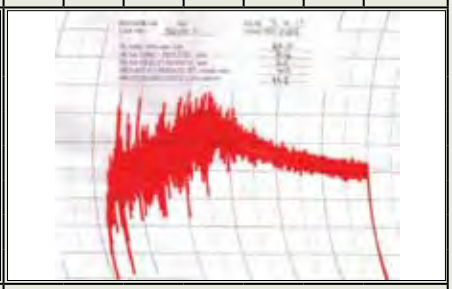
Country of origin	Germany Average							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	-	*33*	*2*	*2*	-	-	*37*	*23*	*14*	*11*	*10*	*11*	*1*	*70*
ALVEOGRAM														
Strength (S), cm²	-	34.1	26.6	34.3	-	-	33.7	42.4	34.9	34.1	31.3	36.2	37.8	37.0
Stability (P), mm	-	80	77	78	-	-	79	74	72	77	69	76	71	73
Distensibility (L), mm	-	94	72	99	-	-	93	155	133	116	126	127	120	135
P/L	-	0.88	1.11	0.79	-	-	0.88	0.49	0.57	0.68	0.56	0.61	0.59	0.57
														
EXTENSOGRAM														
Strength, cm²	-	90	73	91	-	-	89	113	93	85	89	97	126	99
Max. height, BU	-	417	364	423	-	-	414	388	359	326	368	348	420	364
Extensibility, mm	-	155	144	155	-	-	154	210	186	184	168	195	217	193
														
MIXOGRAM														
Peak time, min	-	3.7	3.6	3.6	-	-	3.7	2.6	2.5	2.6	2.8	2.5	2.9	2.6
Water absorption (14% mb), %	-	59.8	59.3	59.8	-	-	59.8	62.4	61.1	60.9	59.9	61.4	63.0	61.4
														
MYCOTOXINS														
Aflatoxin B_1 (µg/kg)	0 [0]							ND						
Aflatoxin B_2 (µg/kg)	0 [0]							ND						
Aflatoxin G_1 (µg/kg)	0 [0]							ND						
Aflatoxin G_2 (µg/kg)	0 [0]							ND						
Fumonisin B_1 (µg/kg)	0 [0]							ND						
Fumonisin B_2 (µg/kg)	0 [0]							ND						
Fumonisin B_3 (µg/kg)	0 [0]							ND						
Deoxynivalenol (µg/kg) [max. value]	0 [0]							<100 [501]						
15-ADON (µg/kg)	0 [0]							ND						
Ochratoxin A (µg/kg)	0 [0]							ND						
Zearalenone (µg/kg)	0 [0]							ND						
HT-2 (µg/kg) [max. value]	0 [0]							ND						
T-2 Toxin (µg/kg)	0 [0]							ND						
No. of samples	*10*							*40*						

2016/2017 IMPORTED WHEAT QUALITY - LATVIA (1 Oct 2016 to 30 Sep 2017)

2016/2017 Imported Wheat Quality Versus 2016/2017 RSA Wheat Quality

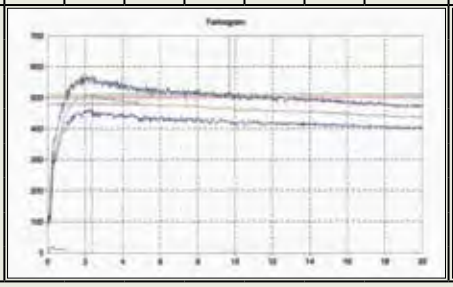
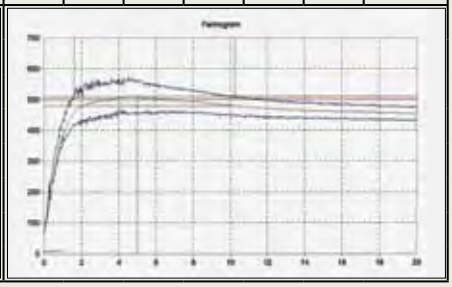
Country of origin	Latvia Average							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	*3*	*-*	*-*	*-*	*-*	*1*	*4*	*130*	*91*	*33*	*28*	*48*	*7*	*337*
WHEAT														
GRADING														
Protein (12% mb), %	12.7	-	-	-	-	12.5	12.7	13.0	11.5	11.0	11.0	11.4	13.6	12.0
Moisture, %	12.5	-	-	-	-	12.5	12.5	9.9	9.8	9.8	9.9	9.7	10.2	9.9
Falling number, sec	294	-	-	-	-	300	296	358	361	343	359	349	358	356
1000 Kernel mass (13% mb), g	40.1	-	-	-	-	40.8	40.3	37.7	39.6	40.5	37.8	38.6	35.6	38.6
Hlm (dirty), kg/hl	78.7	-	-	-	-	78.5	78.6	81.7	82.0	81.8	81.5	80.7	77.7	81.5
Screenings (<1.8 mm sieve), %	2.16	-	-	-	-	2.39	2.22	1.35	1.64	1.53	2.70	3.03	4.37	1.86
Gravel, stones, turf and glass, %	0.00	-	-	-	-	0.00	0.00	0.01	0.01	0.01	0.00	0.01	0.39	0.02
Foreign matter, %	0.07	-	-	-	-	0.10	0.08	0.16	0.16	0.15	0.15	0.31	0.82	0.19
Other grain & unthreshed ears, %	0.27	-	-	-	-	0.20	0.26	0.34	0.36	0.29	0.29	0.74	0.44	0.40
Heat damaged kernels, %	0.00	-	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Immature kernels, %	0.12	-	-	-	-	0.08	0.11	0.04	0.03	0.04	0.01	0.04	0.03	0.03
Insect damaged kernels, %	0.07	-	-	-	-	0.08	0.07	0.36	0.48	0.41	0.49	0.94	0.32	0.49
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	-	-	-	-	0.08	0.08	0.16	0.14	0.11	0.06	0.16	1.09	0.16
Total damaged kernels, %	0.27	-	-	-	-	0.24	0.26	0.56	0.64	0.56	0.55	1.14	1.45	0.68
Combined deviations, %	2.77	-	-	-	-	2.93	2.81	2.40	2.82	2.55	3.70	5.21	7.21	3.14
Field fungi, %	0.19	-	-	-	-	0.24	0.21	0.32	0.35	0.32	0.43	0.41	0.57	0.36
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
Poisonous seeds (*Crotalaria spp., etc.*)	0	-	-	-	-	0	0	0	0	0	0	0	1	0
Poisonous seeds (*Argemone mexicana, etc.*)	6	-	-	-	-	8	6	0	0	0	0	0	1	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	*3*	*-*	*-*	*-*	*-*	*1*	*4*	*23*	*14*	*11*	*10*	*11*	*1*	*70*
Bühler Extraction, %	71.8	-	-	-	-	71.4	71.7	72.8	72.7	72.2	72.8	71.6	73.1	72.5
FLOUR														
Colour, KJ	-2.8	-	-	-	-	-3.0	-2.9	-3.7	-3.8	-3.6	-4.0	-3.8	-3.4	-3.8
Colour, Konica Minolta CM5 (dry)														
L*	93.16	-	-	-	-	93.08	93.14	93.65	93.68	93.68	93.90	93.77	93.38	93.71
a*	0.55	-	-	-	-	0.55	0.55	0.46	0.49	0.44	0.45	0.43	0.44	0.46
b*	9.62	-	-	-	-	9.75	9.66	9.91	10.21	10.17	10.48	10.05	10.15	10.12
Ash (db), %	0.52	-	-	-	-	0.55	0.53	0.58	0.60	0.58	0.60	0.60	0.62	0.59
Protein (12% mb), %	11.5	-	-	-	-	11.4	11.5	12.1	11.1	10.7	9.9	11.2	12.6	11.2
Wet Gluten (14% mb), %	31.4	-	-	-	-	30.7	31.2	33.0	30.7	29.5	25.9	31.0	34.3	30.7
Dry Gluten (14% mb), %	11.1	-	-	-	-	10.8	11.1	11.5	10.5	10.0	8.8	10.6	12.0	10.5
Gluten Index	68	-	-	-	-	98	76	95	93	94	96	93	96	94
100g BAKING TEST														
Baking water absorption, %	61.6	-	-	-	-	61.4	61.5	62.4	61.3	60.8	59.7	61.3	63.0	61.3
Loaf volume, cm^3	1029	-	-	-	-	1078	1041	1104	1029	987	957	1036	1167	1040
Evaluation	0	-	-	-	-	0	0	0	0	0	0	0	0	0
FARINOGRAM														
Water absorption (14% mb), %	57.6	-	-	-	-	57.3	57.5	60.8	60.1	60.2	57.8	60.3	59.7	60.1
Development time, min	3.5	-	-	-	-	2.9	3.3	6.2	5.3	5.0	3.7	4.7	6.5	5.2
Stability, mm	12.0	-	-	-	-	9.8	11.5	9.0	8.0	7.8	7.3	8.3	9.3	8.3
Mixing tolerance index, BU	28	-	-	-	-	39	31	35	38	39	40	36	34	37
														

2016/2017 Imported Wheat Quality Versus 2016/2017 RSA Wheat Quality

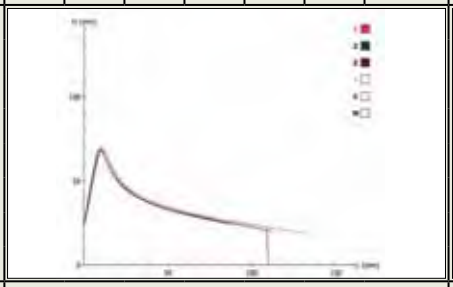
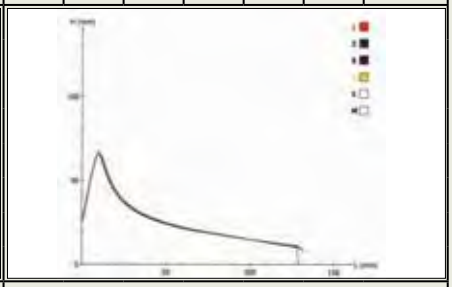
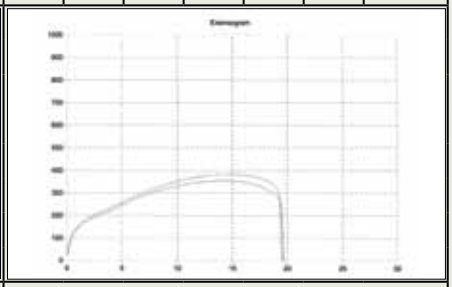
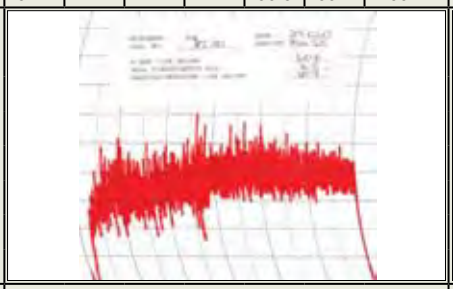
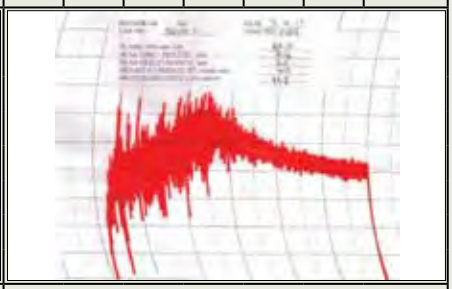
Country of origin	Latvia Average							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	*3*	*-*	*-*	*-*	*-*	*1*	*4*	*23*	*14*	*11*	*10*	*11*	*1*	*70*
ALVEOGRAM														
Strength (S), cm²	37.1	-	-	-	-	37.0	37.1	42.4	34.9	34.1	31.3	36.2	37.8	37.0
Stability (P), mm	89	-	-	-	-	83	88	74	72	77	69	76	71	73
Distensibility (L), mm	83	-	-	-	-	91	85	155	133	116	126	127	120	135
P/L	1.09	-	-	-	-	0.91	1.05	0.49	0.57	0.68	0.56	0.61	0.59	0.57
														
EXTENSOGRAM														
Strength, cm²	99	-	-	-	-	96	98	113	93	85	89	97	126	99
Max. height, BU	431	-	-	-	-	388	420	388	359	326	368	348	420	364
Extensibility, mm	167	-	-	-	-	181	170	210	186	184	168	195	217	193
														
MIXOGRAM														
Peak time, min	4.5	-	-	-	-	4.3	4.4	2.6	2.5	2.6	2.8	2.5	2.9	2.6
Water absorption (14% mb), %	61.6	-	-	-	-	61.4	61.5	62.4	61.1	60.9	59.9	61.4	63.0	61.4
														
MYCOTOXINS														
Aflatoxin B_1 (µg/kg)	0 [0]							ND						
Aflatoxin B_2 (µg/kg)	0 [0]							ND						
Aflatoxin G_1 (µg/kg)	0 [0]							ND						
Aflatoxin G_2 (µg/kg)	0 [0]							ND						
Fumonisin B_1 (µg/kg)	0 [0]							ND						
Fumonisin B_2 (µg/kg)	0 [0]							ND						
Fumonisin B_3 (µg/kg)	0 [0]							ND						
Deoxynivalenol (µg/kg) [max. value]	0 [0]							<100 [501]						
15-ADON (µg/kg)	0 [0]							ND						
Ochratoxin A (µg/kg)	0 [0]							ND						
Zearalenone (µg/kg)	0 [0]							ND						
HT-2 (µg/kg)	0 [0]							ND						
T-2 Toxin (µg/kg)	0 [0]							ND						
No. of samples	*1*							*40*						

2016/2017 IMPORTED WHEAT QUALITY - POLAND (1 Oct 2016 to 30 Sep 2017)

2016/2017 Imported Wheat Quality Versus 2016/2017 RSA Wheat Quality

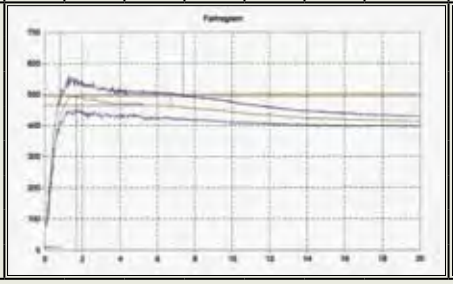
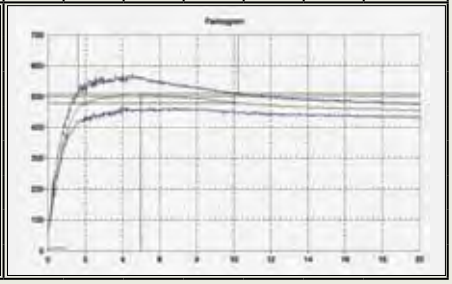
Country of origin	Poland Average							RSA Crop Average						
Class and Grade bread wheat	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	*1*	*-*	*-*	*-*	*4*	*3*	*8*	*130*	*91*	*33*	*28*	*48*	*7*	*337*
WHEAT														
GRADING														
Protein (12% mb), %	13.0	-	-	-	12.2	11.9	12.2	13.0	11.5	11.0	11.0	11.4	13.6	12.0
Moisture, %	11.3	-	-	-	12.2	12.0	12.0	9.9	9.8	9.8	9.9	9.7	10.2	9.9
Falling number, sec	319	-	-	-	306	312	310	358	361	343	359	349	358	356
1000 Kernel mass (13% mb), g	41.6	-	-	-	39.2	41.2	40.2	37.7	39.6	40.5	37.8	38.6	35.6	38.6
Hlm (dirty), kg/hl	79.7	-	-	-	76.1	79.8	78.0	81.7	82.0	81.8	81.5	80.7	77.7	81.5
Screenings (<1.8 mm sieve), %	1.74	-	-	-	7.51	13.40	9.00	1.35	1.64	1.53	2.70	3.03	4.37	1.86
Gravel, stones, turf and glass, %	0.00	-	-	-	0.08	0.00	0.04	0.01	0.01	0.01	0.00	0.01	0.39	0.02
Foreign matter, %	0.20	-	-	-	0.34	0.36	0.33	0.16	0.16	0.15	0.15	0.31	0.82	0.19
Other grain & unthreshed ears, %	0.80	-	-	-	0.38	0.45	0.46	0.34	0.36	0.29	0.29	0.74	0.44	0.40
Heat damaged kernels, %	0.00	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Immature kernels, %	0.00	-	-	-	0.00	0.00	0.00	0.04	0.03	0.04	0.01	0.04	0.03	0.03
Insect damaged kernels, %	0.08	-	-	-	0.09	0.16	0.11	0.36	0.48	0.41	0.49	0.94	0.32	0.49
Heavily frost damaged kernels, %	0.00	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sprouted kernels, %	0.16	-	-	-	0.14	0.10	0.13	0.16	0.14	0.11	0.06	0.16	1.09	0.16
Total damaged kernels, %	0.24	-	-	-	0.22	0.26	0.24	0.56	0.64	0.56	0.55	1.14	1.45	0.68
Combined deviations, %	2.98	-	-	-	8.44	14.47	10.02	2.40	2.82	2.55	3.70	5.21	7.21	3.14
Field fungi, %	0.96	-	-	-	0.90	0.66	0.82	0.32	0.35	0.32	0.43	0.41	0.57	0.36
Storage fungi, %	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
Poisonous seeds (*Crotalaria spp., etc.*)	0	-	-	-	0	0	0	0	0	0	0	0	1	0
Poisonous seeds (*Argemone mexicana, etc.*)	0	-	-	-	0	0	0	0	0	0	0	0	1	0
Live insects	No	-	-	-	No	No	No	No	No	No	No	No	No	No
Undesirable odour	No	-	-	-	No	No	No	No	No	No	No	No	No	No
	B1	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	*1*	*-*	*-*	*-*	*4*	*3*	*8*	*23*	*14*	*11*	*10*	*11*	*1*	*70*
Bühler Extraction, %	72.1	-	-	-	71.6	72.8	72.1	72.8	72.7	72.2	72.8	71.6	73.1	72.5
FLOUR														
Colour, KJ	-2.9	-	-	-	-2.8	-3.0	-2.9	-3.7	-3.8	-3.6	-4.0	-3.8	-3.4	-3.8
Colour, Konica Minolta CM5 (dry)														
L*	93.09	-	-	-	93.28	92.99	93.15	93.65	93.68	93.68	93.90	93.77	93.38	93.71
a*	0.52	-	-	-	0.53	0.49	0.51	0.46	0.49	0.44	0.45	0.43	0.44	0.46
b*	10.46	-	-	-	9.48	9.55	9.63	9.91	10.21	10.17	10.48	10.05	10.15	10.12
Ash (db), %	0.54	-	-	-	0.57	0.55	0.56	0.58	0.60	0.58	0.60	0.60	0.62	0.59
Protein (12% mb), %	11.4	-	-	-	10.7	10.5	10.7	12.1	11.1	10.7	9.9	11.2	12.6	11.2
Wet Gluten (14% mb), %	30.7	-	-	-	28.6	28.3	28.8	33.0	30.7	29.5	25.9	31.0	34.3	30.7
Dry Gluten (14% mb), %	11.1	-	-	-	9.9	9.7	9.9	11.5	10.5	10.0	8.8	10.6	12.0	10.5
Gluten Index	99	-	-	-	98	98	98	95	93	94	96	93	96	94
100g BAKING TEST														
Baking water absorption, %	61.4	-	-	-	60.6	60.4	60.7	62.4	61.3	60.8	59.7	61.3	63.0	61.3
Loaf volume, cm^3	982	-	-	-	952	948	955	1104	1029	987	957	1036	1167	1040
Evaluation	0	-	-	-	0	0	0	0	0	0	0	0	0	0
FARINOGRAM														
Water absorption (14% mb), %	59.1	-	-	-	56.3	56.9	56.9	60.8	60.1	60.2	57.8	60.3	59.7	60.1
Development time, min	2.8	-	-	-	2.3	2.3	2.4	6.2	5.3	5.0	3.7	4.7	6.5	5.2
Stability, mm	13.4	-	-	-	9.1	7.1	8.9	9.0	8.0	7.8	7.3	8.3	9.3	8.3
Mixing tolerance index, BU	29	-	-	-	38	42	38	35	38	39	40	36	34	37
														

2016/2017 Imported Wheat Quality Versus 2016/2017 RSA Wheat Quality

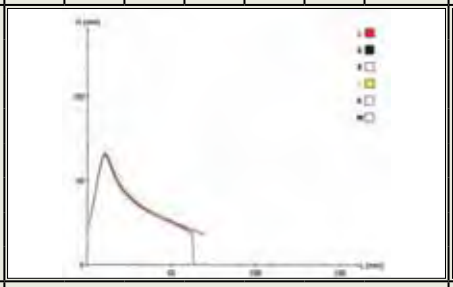
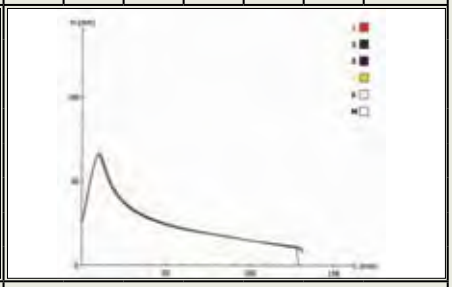
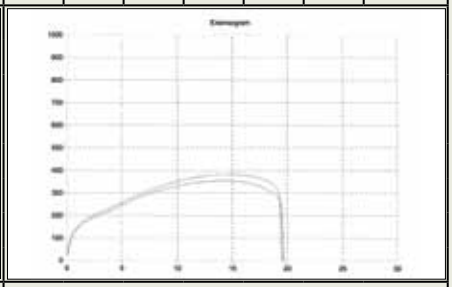
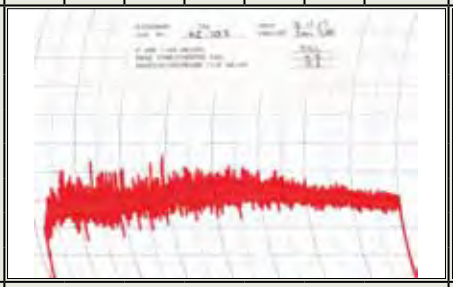
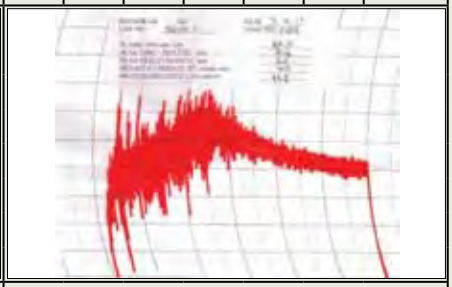
Country of origin	Poland Average							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	*1*	*-*	*-*		*4*	*3*	*8*	*23*	*14*	*11*	*10*	*11*	*1*	*70*
ALVEOGRAM														
Strength (S), cm²	50.9	-	-	-	38.2	36.6	39.2	42.4	34.9	34.1	31.3	36.2	37.8	37.0
Stability (P), mm	93	-	-	-	72	75	75	74	72	77	69	76	71	73
Distensibility (L), mm	112	-	-	-	121	106	114	155	133	116	126	127	120	135
P/L	0.83	-	-	-	0.60	0.71	0.67	0.49	0.57	0.68	0.56	0.61	0.59	0.57
														
EXTENSOGRAM														
Strength, cm²	135	-	-	-	98	104	105	113	93	85	89	97	126	99
Max. height, BU	518	-	-	-	413	480	451	388	359	326	368	348	420	364
Extensibility, mm	192	-	-	-	172	158	169	210	186	184	168	195	217	193
														
MIXOGRAM														
Peak time, min	4.9	-	-	-	4.1	3.9	4.1	2.6	2.5	2.6	2.8	2.5	2.9	2.6
Water absorption (14% mb), %	61.4	-	-	-	60.6	60.4	60.7	62.4	61.1	60.9	59.9	61.4	63.0	61.4
														
MYCOTOXINS														
Aflatoxin B_1 (µg/kg)	0 [0]							ND						
Aflatoxin B_2 (µg/kg)	0 [0]							ND						
Aflatoxin G_1 (µg/kg)	0 [0]							ND						
Aflatoxin G_2 (µg/kg)	0 [0]							ND						
Fumonisin B_1 (µg/kg)	0 [0]							ND						
Fumonisin B_2 (µg/kg)	0 [0]							ND						
Fumonisin B_3 (µg/kg)	0 [0]							ND						
Deoxynivalenol (µg/kg) [max. value]	143 [235]							<100 [501]						
15-ADON (µg/kg)	0 [0]							ND						
Ochratoxin A (µg/kg)	0 [0]							ND						
Zearalenone (µg/kg)	<20 [20]							ND						
HT-2 (µg/kg)	0 [0]							ND						
T-2 Toxin (µg/kg)	0 [0]							ND						
No. of samples	*3*							*40*						

2016/2017 IMPORTED WHEAT QUALITY - ROMANIA (1 Oct 2016 to 30 Sep 2017)

2016/2017 Imported Wheat Quality Versus 2016/2017 RSA Wheat Quality

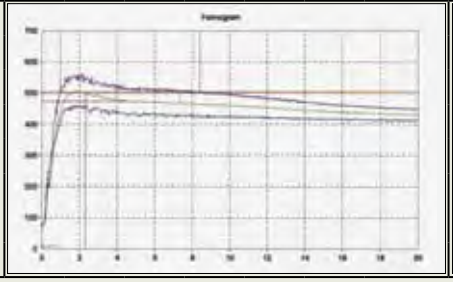
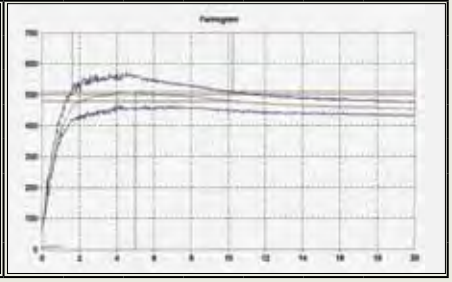
Country of origin	Romania Average							RSA Crop Average						
Class and Grade bread wheat	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	*-*	*2*	*1*	*-*	*-*	*6*	*9*	*130*	*91*	*33*	*28*	*48*	*7*	*337*
WHEAT														
GRADING														
Protein (12% mb), %	-	11.3	10.8	-	-	10.4	10.6	13.0	11.5	11.0	11.0	11.4	13.6	12.0
Moisture, %	-	11.0	10.0	-	-	11.8	11.4	9.9	9.8	9.8	9.9	9.7	10.2	9.9
Falling number, sec	-	386	383	-	-	352	363	358	361	343	359	349	358	356
1000 Kernel mass (13% mb), g	-	41.1	38.8	-	-	38.7	39.2	37.7	39.6	40.5	37.8	38.6	35.6	38.6
Hlm (dirty), kg/hl	-	80.4	78.1	-	-	77.7	78.3	81.7	82.0	81.8	81.5	80.7	77.7	81.5
Screenings (<1.8 mm sieve), %	-	2.27	2.33	-	-	3.19	2.89	1.35	1.64	1.53	2.70	3.03	4.37	1.86
Gravel, stones, turf and glass, %	-	0.00	0.00	-	-	0.00	0.00	0.01	0.01	0.01	0.00	0.01	0.39	0.02
Foreign matter, %	-	0.38	0.12	-	-	0.18	0.22	0.16	0.16	0.15	0.15	0.31	0.82	0.19
Other grain & unthreshed ears, %	-	0.19	0.16	-	-	0.23	0.21	0.34	0.36	0.29	0.29	0.74	0.44	0.40
Heat damaged kernels, %	-	0.00	0.00	-	-	0.04	0.03	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Immature kernels, %	-	0.00	0.00	-	-	0.00	0.00	0.04	0.03	0.04	0.01	0.04	0.03	0.03
Insect damaged kernels, %	-	0.14	0.00	-	-	0.03	0.05	0.36	0.48	0.41	0.49	0.94	0.32	0.49
Heavily frost damaged kernels, %	-	0.00	0.00	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sprouted kernels, %	-	0.37	0.16	-	-	0.19	0.23	0.16	0.14	0.11	0.06	0.16	1.09	0.16
Total damaged kernels, %	-	0.51	0.16	-	-	0.26	0.30	0.56	0.64	0.56	0.55	1.14	1.45	0.68
Combined deviations, %	-	3.35	2.77	-	-	3.86	3.62	2.40	2.82	2.55	3.70	5.21	7.21	3.14
Field fungi, %	-	0.41	0.24	-	-	0.20	0.25	0.32	0.35	0.32	0.43	0.41	0.57	0.36
Storage fungi, %	-	0.00	0.00	-	-	0.08	0.05	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
Poisonous seeds (*Crotalaria spp., etc.*)	-	0	0	-	-	0	0	0	0	0	0	0	1	0
Poisonous seeds (*Argemone mexicana, etc.*)	-	0	4	-	-	14	10	0	0	0	0	0	1	0
Live insects	-	No	No	-	-	No	No	No	No	No	No	No	No	No
Undesirable odour	-	No	No	-	-	No	No	No	No	No	No	No	No	No
	B1	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	*-*	*2*	*1*	*-*	*-*	*6*	*9*	*23*	*14*	*11*	*10*	*11*	*1*	*70*
Bühler Extraction, %	-	73.8	73.3	-	-	72.6	72.9	72.8	72.7	72.2	72.8	71.6	73.1	72.5
FLOUR														
Colour, KJ	-	-3.2	-3.1	-	-	-3.1	-3.1	-3.7	-3.8	-3.6	-4.0	-3.8	-3.4	-3.8
Colour, Konica Minolta CM5 (dry)														
L*	-	92.83	93.31	-	-	93.19	93.12	93.65	93.68	93.68	93.90	93.77	93.38	93.71
a*	-	0.48	0.42	-	-	0.36	0.39	0.46	0.49	0.44	0.45	0.43	0.44	0.46
b*	-	11.09	10.28	-	-	10.02	10.28	9.91	10.21	10.17	10.48	10.05	10.15	10.12
Ash (db), %	-	0.53	0.54	-	-	0.50	0.51	0.58	0.60	0.58	0.60	0.60	0.62	0.59
Protein (12% mb), %	-	9.8	9.3	-	-	9.0	9.2	12.1	11.1	10.7	9.9	11.2	12.6	11.2
Wet Gluten (14% mb), %	-	25.2	22.3	-	-	21.6	22.5	33.0	30.7	29.5	25.9	31.0	34.3	30.7
Dry Gluten (14% mb), %	-	8.8	7.7	-	-	7.8	8.0	11.5	10.5	10.0	8.8	10.6	12.0	10.5
Gluten Index	-	99	98	-	-	99	99	95	93	94	96	93	96	94
100g BAKING TEST														
Baking water absorption, %	-	59.6	59.1	-	-	58.4	58.8	62.4	61.3	60.8	59.7	61.3	63.0	61.3
Loaf volume, cm^3	-	892	861	-	-	857	865	1104	1029	987	957	1036	1167	1040
Evaluation	-	0	0	-	-	0	0	0	0	0	0	0	0	0
FARINOGRAM														
Water absorption (14% mb), %	-	57.4	55.5	-	-	55.2	55.7	60.8	60.1	60.2	57.8	60.3	59.7	60.1
Development time, min	-	4.7	1.5	-	-	1.5	2.2	6.2	5.3	5.0	3.7	4.7	6.5	5.2
Stability, mm	-	12.1	6.6	-	-	5.5	7.1	9.0	8.0	7.8	7.3	8.3	9.3	8.3
Mixing tolerance index, BU	-	27	36	-	-	39	36	35	38	39	40	36	34	37
														

2016/2017 Imported Wheat Quality Versus 2016/2017 RSA Wheat Quality

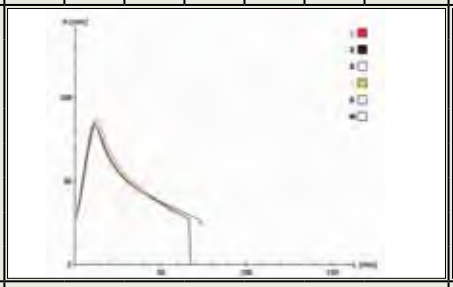
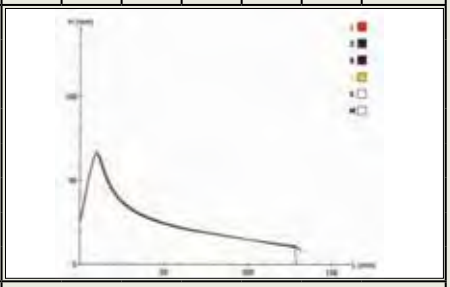
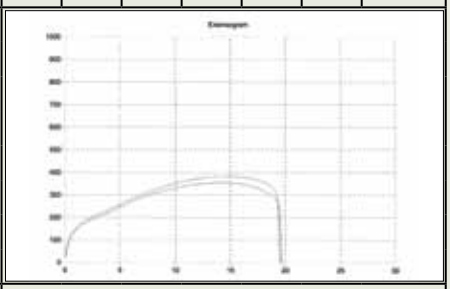
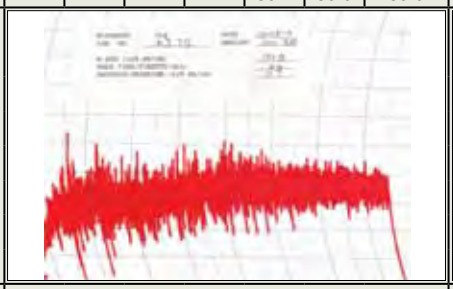
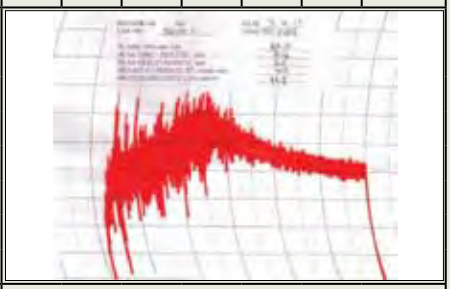
Country of origin	Romania Average							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	-	2	1	-	-	6	9	23	14	11	10	11	1	70
ALVEOGRAM														
Strength (S), cm²	-	34.9	22.9	-	-	22.9	25.6	42.4	34.9	34.1	31.3	36.2	37.8	37.0
Stability (P), mm	-	91	75	-	-	75	78	74	72	77	69	76	71	73
Distensibility (L), mm	-	82	57	-	-	61	65	155	133	116	126	127	120	135
P/L	-	1.13	1.32	-	-	1.27	1.24	0.49	0.57	0.68	0.56	0.61	0.59	0.57
														
EXTENSOGRAM														
Strength, cm²	-	92	65	-	-	64	70	113	93	85	89	97	126	99
Max. height, BU	-	448	327	-	-	320	349	388	359	326	368	348	420	364
Extensibility, mm	-	146	138	-	-	137	139	210	186	184	168	195	217	193
														
MIXOGRAM														
Peak time, min	-	3.4	4.8	-	-	4.8	4.5	2.6	2.5	2.6	2.8	2.5	2.9	2.6
Water absorption (14% mb), %	-	59.6	59.1	-	-	58.9	59.1	62.4	61.1	60.9	59.9	61.4	63.0	61.4
														
MYCOTOXINS														
Aflatoxin B_1 (µg/kg)	0 [0]							ND						
Aflatoxin B_2 (µg/kg)	0 [0]							ND						
Aflatoxin G_1 (µg/kg)	0 [0]							ND						
Aflatoxin G_2 (µg/kg)	0 [0]							ND						
Fumonisin B_1 (µg/kg)	0 [0]							ND						
Fumonisin B_2 (µg/kg)	0 [0]							ND						
Fumonisin B_3 (µg/kg)	0 [0]							ND						
Deoxynivalenol (µg/kg) [max. value]	0 [<100]							<100 [501]						
15-ADON (µg/kg)	0 [0]							ND						
Ochratoxin A (µg/kg)	0 [0]							ND						
Zearalenone (µg/kg)	0 [0]							ND						
HT-2 (µg/kg)	0 [0]							ND						
T-2 Toxin (µg/kg)	0 [0]							ND						
No. of samples	3							40						

2016/2017 IMPORTED WHEAT QUALITY - RUSSIAN FEDERATION (1 Oct 2016 to 30 Sep 2017)

2016/2017 Imported Wheat Quality Versus 2016/2017 RSA Wheat Quality

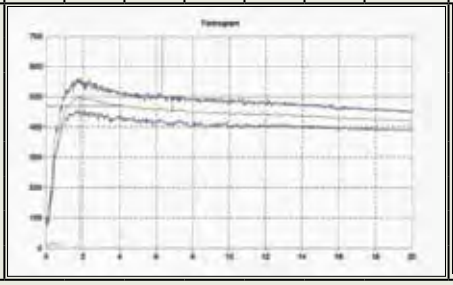
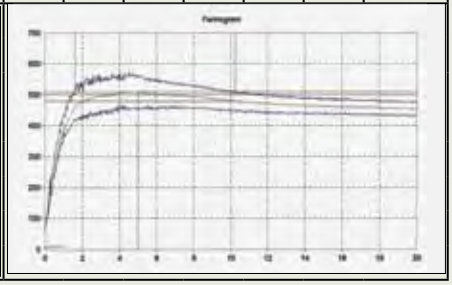
Country of origin	Russian Federation Average							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	-	-	-	-	*4*	*18*	*22*	*130*	*91*	*33*	*28*	*48*	*7*	*337*
WHEAT														
GRADING														
Protein (12% mb), %	-	-	-	-	11.1	11.0	11.0	13.0	11.5	11.0	11.0	11.4	13.6	12.0
Moisture, %	-	-	-	-	10.8	11.1	11.0	9.9	9.8	9.8	9.9	9.7	10.2	9.9
Falling number, sec	-	-	-	-	298	353	343	358	361	343	359	349	358	356
1000 Kernel mass (13% mb), g	-	-	-	-	37.6	37.6	37.6	37.7	39.6	40.5	37.8	38.6	35.6	38.6
Hlm (dirty), kg/hl	-	-	-	-	76.2	77.1	76.9	81.7	82.0	81.8	81.5	80.7	77.7	81.5
Screenings (<1.8 mm sieve), %	-	-	-	-	4.65	4.61	4.62	1.35	1.64	1.53	2.70	3.03	4.37	1.86
Gravel, stones, turf and glass, %	-	-	-	-	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.39	0.02
Foreign matter, %	-	-	-	-	0.27	0.21	0.22	0.16	0.16	0.15	0.15	0.31	0.82	0.19
Other grain & unthreshed ears, %	-	-	-	-	0.43	0.39	0.40	0.34	0.36	0.29	0.29	0.74	0.44	0.40
Heat damaged kernels, %	-	-	-	-	0.02	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Immature kernels, %	-	-	-	-	0.00	0.00	0.00	0.04	0.03	0.04	0.01	0.04	0.03	0.03
Insect damaged kernels, %	-	-	-	-	0.22	0.32	0.30	0.36	0.48	0.41	0.49	0.94	0.32	0.49
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, %	-	-	-	-	1.22	0.29	0.46	0.16	0.14	0.11	0.06	0.16	1.09	0.16
Total damaged kernels, %	-	-	-	-	1.45	0.65	0.79	0.56	0.64	0.56	0.55	1.14	1.45	0.68
Combined deviations, %	-	-	-	-	6.79	5.89	6.03	2.40	2.82	2.55	3.70	5.21	7.21	3.14
Field fungi, %	-	-	-	-	0.25	0.23	0.23	0.32	0.35	0.32	0.43	0.41	0.57	0.36
Storage fungi, %	-	-	-	-	0.08	0.04	0.04	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
Poisonous seeds (*Crotalaria spp., etc.*)	-	-	-	-	0	0	0	0	0	0	0	0	1	0
Poisonous seeds (*Argemone mexicana, etc.*)	-	-	-	-	5	24	20	0	0	0	0	0	1	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	-	-	-	-	*4*	*18*	*22*	*23*	*14*	*11*	*10*	*11*	*1*	*70*
Bühler Extraction, %	-	-	-	-	73.3	72.8	72.9	72.8	72.7	72.2	72.8	71.6	73.1	72.5
FLOUR														
Colour, KJ	-	-	-	-	-2.6	-2.7	-2.7	-3.7	-3.8	-3.6	-4.0	-3.8	-3.4	-3.8
Colour, Konica Minolta CM5 (dry)														
L*	-	-	-	-	93.14	93.11	93.11	93.65	93.68	93.68	93.90	93.77	93.38	93.71
a*	-	-	-	-	0.48	0.48	0.48	0.46	0.49	0.44	0.45	0.43	0.44	0.46
b*	-	-	-	-	11.73	11.16	11.26	9.91	10.21	10.17	10.48	10.05	10.15	10.12
Ash (db), %	-	-	-	-	0.55	0.57	0.56	0.58	0.60	0.58	0.60	0.60	0.62	0.59
Protein (12% mb), %	-	-	-	-	9.9	9.8	9.8	12.1	11.1	10.7	9.9	11.2	12.6	11.2
Wet Gluten (14% mb), %	-	-	-	-	25.5	24.9	25.0	33.0	30.7	29.5	25.9	31.0	34.3	30.7
Dry Gluten (14% mb), %	-	-	-	-	8.5	8.4	8.4	11.5	10.5	10.0	8.8	10.6	12.0	10.5
Gluten Index	-	-	-	-	97	97	97	95	93	94	96	93	96	94
100g BAKING TEST														
Baking water absorption, %	-	-	-	-	59.7	59.6	59.6	62.4	61.3	60.8	59.7	61.3	63.0	61.3
Loaf volume, cm^3	-	-	-	-	862	867	866	1104	1029	987	957	1036	1167	1040
Evaluation	-	-	-	-	0	0	0	0	0	0	0	0	0	0
FARINOGRAM														
Water absorption (14% mb), %	-	-	-	-	57.9	56.7	56.9	60.8	60.1	60.2	57.8	60.3	59.7	60.1
Development time, min	-	-	-	-	2.1	2.3	2.2	6.2	5.3	5.0	3.7	4.7	6.5	5.2
Stability, mm	-	-	-	-	8.0	7.0	7.2	9.0	8.0	7.8	7.3	8.3	9.3	8.3
Mixing tolerance index, BU	-	-	-	-	26	37	35	35	38	39	40	36	34	37
														

2016/2017 Imported Wheat Quality Versus 2016/2017 RSA Wheat Quality

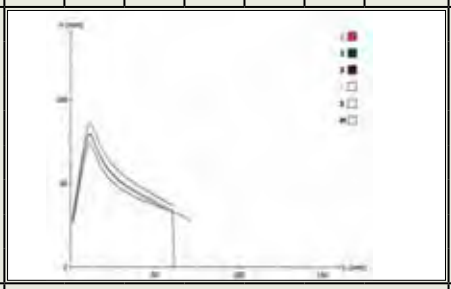
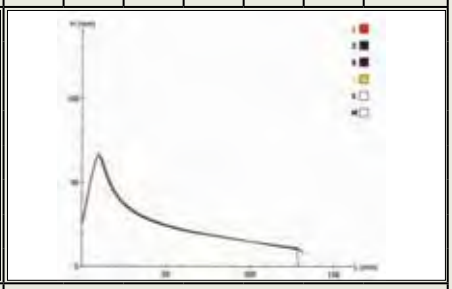
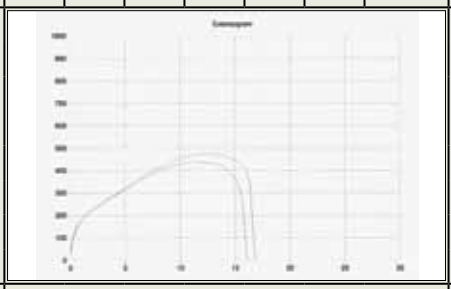
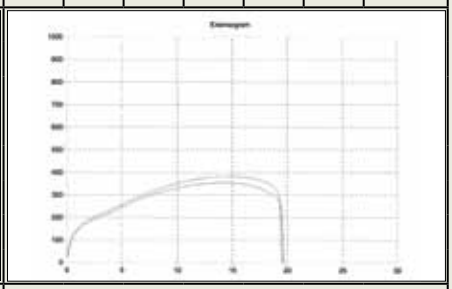
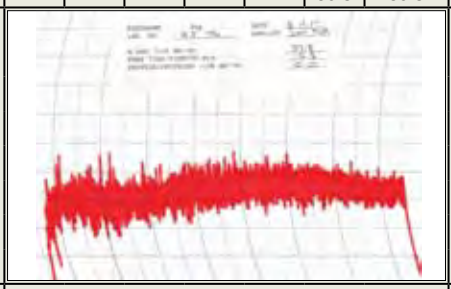
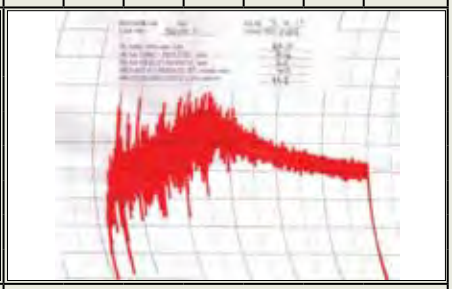
Country of origin	Russian Federation Average							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	-	-	-	-	*4*	*18*	*22*	*23*	*14*	*11*	*10*	*11*	*1*	*70*
ALVEOGRAM														
Strength (S), cm²	-	-	-	-	32.9	30.5	30.9	42.4	34.9	34.1	31.3	36.2	37.8	37.0
Stability (P), mm	-	-	-	-	95	89	90	74	72	77	69	76	71	73
Distensibility (L), mm	-	-	-	-	65	63	64	155	133	116	126	127	120	135
P/L	-	-	-	-	1.47	1.44	1.45	0.49	0.57	0.68	0.56	0.61	0.59	0.57
														
EXTENSOGRAM														
Strength, cm²	-	-	-	-	81	82	82	113	93	85	89	97	126	99
Max. height, BU	-	-	-	-	414	419	418	388	359	326	368	348	420	364
Extensibility, mm	-	-	-	-	143	143	143	210	186	184	168	195	217	193
														
MIXOGRAM														
Peak time, min	-	-	-	-	4.0	4.5	4.4	2.6	2.5	2.6	2.8	2.5	2.9	2.6
Water absorption (14% mb), %	-	-	-	-	59.7	59.6	59.6	62.4	61.1	60.9	59.9	61.4	63.0	61.4
														
MYCOTOXINS														
Aflatoxin B_1 (µg/kg)	0 [0]							ND						
Aflatoxin B_2 (µg/kg)	0 [0]							ND						
Aflatoxin G_1 (µg/kg)	0 [0]							ND						
Aflatoxin G_2 (µg/kg)	0 [0]							ND						
Fumonisin B_1 (µg/kg)	0 [0]							ND						
Fumonisin B_2 (µg/kg)	0 [0]							ND						
Fumonisin B_3 (µg/kg)	0 [0]							ND						
Deoxynivalenol (µg/kg) [max. value]	0 [<100]							<100 [501]						
15-ADON (µg/kg)	0 [0]							ND						
Ochratoxin A (µg/kg)	0 [0]							ND						
Zearalenone (µg/kg) [max. value]	0 [0]							ND						
HT-2 (µg/kg)	0 [0]							ND						
T-2 Toxin (µg/kg)	0 [0]							ND						
No. of samples	*6*							*40*						

2016/2017 IMPORTED WHEAT QUALITY - UKRAINE (1 Oct 2016 to 30 Sep 2017)

2016/2017 Imported Wheat Quality Versus 2016/2017 RSA Wheat Quality

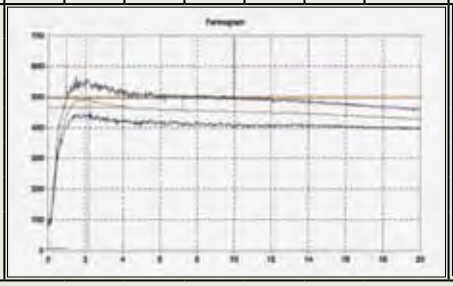
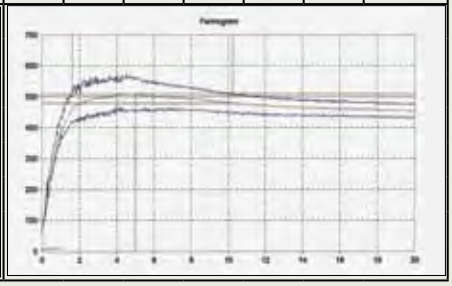
Country of origin	Ukraine Average							RSA Crop Average						
Class and Grade bread wheat	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	-	-	-	-	-	*4*	*4*	*130*	*91*	*33*	*28*	*48*	*7*	*337*
WHEAT														
GRADING														
Protein (12% mb), %	-	-	-	-	-	11.2	11.2	13.0	11.5	11.0	11.0	11.4	13.6	12.0
Moisture, %	-	-	-	-	-	11.5	11.5	9.9	9.8	9.8	9.9	9.7	10.2	9.9
Falling number, sec	-	-	-	-	-	325	325	358	361	343	359	349	358	356
1000 Kernel mass (13% mb), g	-	-	-	-	-	37.2	37.2	37.7	39.6	40.5	37.8	38.6	35.6	38.6
Hlm (dirty), kg/hl	-	-	-	-	-	62.4	62.4	81.7	82.0	81.8	81.5	80.7	77.7	81.5
Screenings (<1.8 mm sieve), %	-	-	-	-	-	6.66	6.66	1.35	1.64	1.53	2.70	3.03	4.37	1.86
Gravel, stones, turf and glass, %	-	-	-	-	-	0.00	0.00	0.01	0.01	0.01	0.00	0.01	0.39	0.02
Foreign matter, %	-	-	-	-	-	2.05	2.05	0.16	0.16	0.15	0.15	0.31	0.82	0.19
Other grain & unthreshed ears, %	-	-	-	-	-	0.75	0.75	0.34	0.36	0.29	0.29	0.74	0.44	0.40
Heat damaged kernels, %	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Immature kernels, %	-	-	-	-	-	0.00	0.00	0.04	0.03	0.04	0.01	0.04	0.03	0.03
Insect damaged kernels, %	-	-	-	-	-	0.15	0.15	0.36	0.48	0.41	0.49	0.94	0.32	0.49
Heavily frost damaged kernels, %	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sprouted kernels, %	-	-	-	-	-	0.06	0.06	0.16	0.14	0.11	0.06	0.16	1.09	0.16
Total damaged kernels, %	-	-	-	-	-	0.21	0.21	0.56	0.64	0.56	0.55	1.14	1.45	0.68
Combined deviations, %	-	-	-	-	-	9.66	9.66	2.40	2.82	2.55	3.70	5.21	7.21	3.14
Field fungi, %	-	-	-	-	-	0.04	0.04	0.32	0.35	0.32	0.43	0.41	0.57	0.36
Storage fungi, %	-	-	-	-	-	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
Poisonous seeds (*Crotalaria spp., etc.*)	-	-	-	-	-	0	0	0	0	0	0	0	1	0
Poisonous seeds (*Argemone mexicana, etc.*)	-	-	-	-	-	22	22	0	0	0	0	0	1	0
Live insects	-	-	-	-	-	No	No	No	No	No	No	No	No	No
Undesirable odour	-	-	-	-	-	No	No	No	No	No	No	No	No	No
	B1	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**	**B1**	**B2**	**B3**	**B4**	**UT**	**COW**	**Average**
No. of samples	-	-	-	-	-	*4*	*4*	*23*	*14*	*11*	*10*	*11*	*1*	*70*
Bühler Extraction, %	-	-	-	-	-	71.9	71.9	72.8	72.7	72.2	72.8	71.6	73.1	72.5
FLOUR														
Colour, KJ	-	-	-	-	-	-3.0	-3.0	-3.7	-3.8	-3.6	-4.0	-3.8	-3.4	-3.8
Colour, Konica Minolta CM5 (dry)														
L*	-	-	-	-	-	93.22	93.22	93.65	93.68	93.68	93.90	93.77	93.38	93.71
a*	-	-	-	-	-	0.47	0.47	0.46	0.49	0.44	0.45	0.43	0.44	0.46
b*	-	-	-	-	-	10.89	10.89	9.91	10.21	10.17	10.48	10.05	10.15	10.12
Ash (db), %	-	-	-	-	-	0.52	0.52	0.58	0.60	0.58	0.60	0.60	0.62	0.59
Protein (12% mb), %	-	-	-	-	-	10.0	10.0	12.1	11.1	10.7	9.9	11.2	12.6	11.2
Wet Gluten (14% mb), %	-	-	-	-	-	24.8	24.8	33.0	30.7	29.5	25.9	31.0	34.3	30.7
Dry Gluten (14% mb), %	-	-	-	-	-	8.7	8.7	11.5	10.5	10.0	8.8	10.6	12.0	10.5
Gluten Index	-	-	-	-	-	100	100	95	93	94	96	93	96	94
100g BAKING TEST														
Baking water absorption, %	-	-	-	-	-	59.8	59.8	62.4	61.3	60.8	59.7	61.3	63.0	61.3
Loaf volume, cm^3	-	-	-	-	-	941	941	1104	1029	987	957	1036	1167	1040
Evaluation	-	-	-	-	-	0	0	0	0	0	0	0	0	0
FARINOGRAM														
Water absorption (14% mb), %	-	-	-	-	-	55.4	55.4	60.8	60.1	60.2	57.8	60.3	59.7	60.1
Development time, min	-	-	-	-	-	1.8	1.8	6.2	5.3	5.0	3.7	4.7	6.5	5.2
Stability, mm	-	-	-	-	-	5.0	5.0	9.0	8.0	7.8	7.3	8.3	9.3	8.3
Mixing tolerance index, BU	-	-	-	-	-	48	48	35	38	39	40	36	34	37
														

2016/2017 Imported Wheat Quality Versus 2016/2017 RSA Wheat Quality

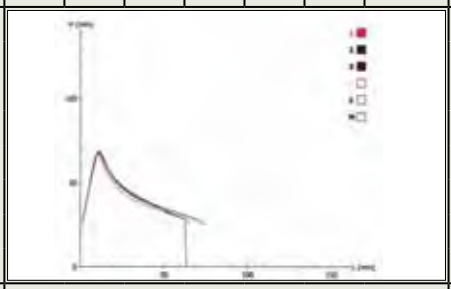
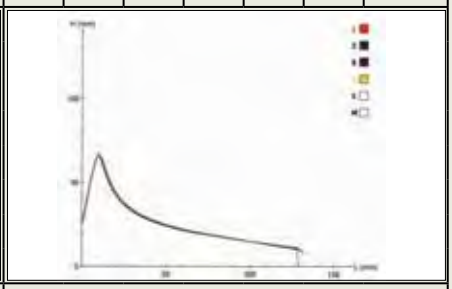
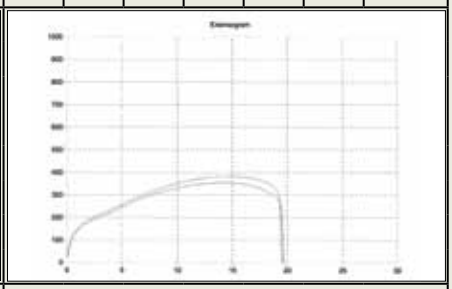
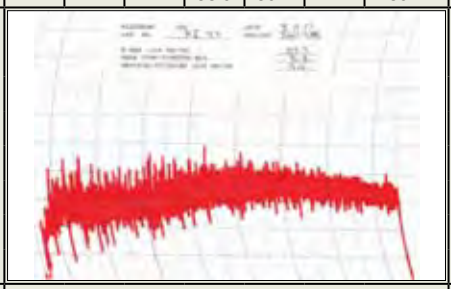
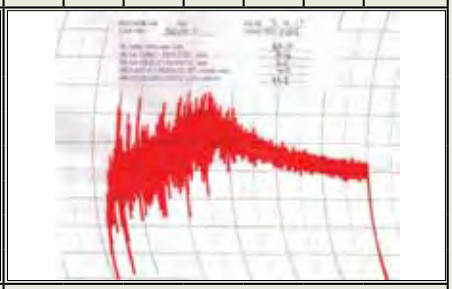
Country of origin	Ukraine Average							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	-	-	-	-	-	*4*	*4*	*23*	*14*	*11*	*10*	*11*	*1*	*70*
ALVEOGRAM														
Strength (S), cm²	-	-	-	-	-	29.7	29.7	42.4	34.9	34.1	31.3	36.2	37.8	37.0
Stability (P), mm	-	-	-	-	-	85	85	74	72	77	69	76	71	73
Distensibility (L), mm	-	-	-	-	-	61	61	155	133	116	126	127	120	135
P/L	-	-	-	-	-	1.41	1.41	0.49	0.57	0.68	0.56	0.61	0.59	0.57
														
EXTENSOGRAM														
Strength, cm²	-	-	-	-	-	102	102	113	93	85	89	97	126	99
Max. height, BU	-	-	-	-	-	466	466	388	359	326	368	348	420	364
Extensibility, mm	-	-	-	-	-	160	160	210	186	184	168	195	217	193
														
MIXOGRAM														
Peak time, min	-	-	-	-	-	5.4	5.4	2.6	2.5	2.6	2.8	2.5	2.9	2.6
Water absorption (14% mb), %	-	-	-	-	-	59.8	59.8	62.4	61.1	60.9	59.9	61.4	63.0	61.4
														
MYCOTOXINS														
Aflatoxin B_1 (µg/kg)	0 [0]							ND						
Aflatoxin B_2 (µg/kg)	0 [0]							ND						
Aflatoxin G_1 (µg/kg)	0 [0]							ND						
Aflatoxin G_2 (µg/kg)	0 [0]							ND						
Fumonisin B_1 (µg/kg)	0 [0]							ND						
Fumonisin B_2 (µg/kg)	0 [0]							ND						
Fumonisin B_3 (µg/kg)	0 [0]							ND						
Deoxynivalenol (µg/kg) [max. value]	<100 [<100]							<100 [501]						
15-ADON (µg/kg)	0 [0]							ND						
Ochratoxin A (µg/kg)	0 [0]							ND						
Zearalenone (µg/kg) [max. value]	0 [0]							ND						
HT-2 (µg/kg)	0 [0]							ND						
T-2 Toxin (µg/kg)	0 [0]							ND						
No. of samples	*1*							*40*						

2016/2017 IMPORTED WHEAT QUALITY - USA (1 Oct 2016 to 30 Sep 2017)

2016/2017 Imported Wheat Quality Versus 2016/2017 RSA Wheat Quality

Country of origin	USA Average							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	-	-	-	*4*	*2*	-	*6*	*130*	*91*	*33*	*28*	*48*	*7*	*337*
WHEAT														
GRADING														
Protein (12% mb), %	-	-	-	10.4	11.3	-	10.7	13.0	11.5	11.0	11.0	11.4	13.6	12.0
Moisture, %	-	-	-	10.8	10.6	-	10.8	9.9	9.8	9.8	9.9	9.7	10.2	9.9
Falling number, sec	-	-	-	376	44.3	-	398	358	361	343	359	349	358	356
1000 Kernel mass (13% mb), g	-	-	-	32.2	29.1	-	31.2	37.7	39.6	40.5	37.8	38.6	35.6	38.6
Hlm (dirty), kg/hl	-	-	-	79.2	79.1	-	79.2	81.7	82.0	81.8	81.5	80.7	77.7	81.5
Screenings (<1.8 mm sieve), %	-	-	-	3.44	4.00	-	3.62	1.35	1.64	1.53	2.70	3.03	4.37	1.86
Gravel, stones, turf and glass, %	-	-	-	0.02	0.00	-	0.01	0.01	0.01	0.01	0.00	0.01	0.39	0.02
Foreign matter, %	-	-	-	0.17	0.17	-	0.17	0.16	0.16	0.15	0.15	0.31	0.82	0.19
Other grain & unthreshed ears, %	-	-	-	0.41	0.72	-	0.51	0.34	0.36	0.29	0.29	0.74	0.44	0.40
Heat damaged kernels, %	-	-	-	0.00	0.24	-	0.08	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Immature kernels, %	-	-	-	0.00	0.00	-	0.00	0.04	0.03	0.04	0.01	0.04	0.03	0.03
Insect damaged kernels, %	-	-	-	0.15	0.27	-	0.19	0.36	0.48	0.41	0.49	0.94	0.32	0.49
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, %	-	-	-	0.16	0.00	-	0.11	0.16	0.14	0.11	0.06	0.16	1.09	0.16
Total damaged kernels, %	-	-	-	0.31	0.51	-	0.37	0.56	0.64	0.56	0.55	1.14	1.45	0.68
Combined deviations, %	-	-	-	4.32	5.40	-	4.68	2.40	2.82	2.55	3.70	5.21	7.21	3.14
Field fungi, %	-	-	-	0.33	0.16	-	0.27	0.32	0.35	0.32	0.43	0.41	0.57	0.36
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
Poisonous seeds (*Crotalaria spp., etc.*)	-	-	-	0	0	-	0	0	0	0	0	0	1	0
Poisonous seeds (*Argemone mexicana, etc.*)	-	-	-	2	2	-	2	0	0	0	0	0	1	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	-	-	-	*4*	*2*	-	*6*	*23*	*14*	*11*	*10*	*11*	*1*	*70*
Bühler Extraction, %	-	-	-	70.7	70.9	-	70.8	72.8	72.7	72.2	72.8	71.6	73.1	72.5
FLOUR														
Colour, KJ	-	-	-	-3.5	-3.3	-	-3.4	-3.7	-3.8	-3.6	-4.0	-3.8	-3.4	-3.8
Colour, Konica Minolta CM5 (dry)														
L*	-	-	-	94.18	93.33	-	93.89	93.65	93.68	93.68	93.90	93.77	93.38	93.71
a*	-	-	-	0.33	0.45	-	0.37	0.46	0.49	0.44	0.45	0.43	0.44	0.46
b*	-	-	-	9.76	10.41	-	9.97	9.91	10.21	10.17	10.48	10.05	10.15	10.12
Ash (db), %	-	-	-	0.50	0.56	-	0.52	0.58	0.60	0.58	0.60	0.60	0.62	0.59
Protein (12% mb), %	-	-	-	8.8	9.9	-	9.2	12.1	11.1	10.7	9.9	11.2	12.6	11.2
Wet Gluten (14% mb), %	-	-	-	22.4	24.4	-	23.2	33.0	30.7	29.5	25.9	31.0	34.3	30.7
Dry Gluten (14% mb), %	-	-	-	7.6	8.6	-	8.0	11.5	10.5	10.0	8.8	10.6	12.0	10.5
Gluten Index	-	-	-	98	100	-	99	95	93	94	96	93	96	94
100g BAKING TEST														
Baking water absorption, %	-	-	-	56.6	56.7	-	56.6	62.4	61.3	60.8	59.7	61.3	63.0	61.3
Loaf volume, cm^3	-	-	-	867	949	-	894	1104	1029	987	957	1036	1167	1040
Evaluation	-	-	-	0	0	-	0	0	0	0	0	0	0	0
FARINOGRAM														
Water absorption (14% mb), %	-	-	-	51.1	53.9	-	52.0	60.8	60.1	60.2	57.8	60.3	59.7	60.1
Development time, min	-	-	-	1.6	2.1	-	1.7	6.2	5.3	5.0	3.7	4.7	6.5	5.2
Stability, mm	-	-	-	7.3	10.5	-	8.4	9.0	8.0	7.8	7.3	8.3	9.3	8.3
Mixing tolerance index, BU	-	-	-	61	35	-	52	35	38	39	40	36	34	37
														

2016/2017 Imported Wheat Quality Versus 2016/2017 RSA Wheat Quality

Country of origin	USA Average							RSA Crop Average						
Class and Grade bread wheat	B1	B2	B3	B4	UT	COW	Average	B1	B2	B3	B4	UT	COW	Average
No. of samples	-	-	-	*4*	*2*	-	*6*	*23*	*14*	*11*	*10*	*11*	*1*	*70*
ALVEOGRAM														
Strength (S), cm²	-	-	-	20.0	28.5	-	22.8	42.4	34.9	34.1	31.3	36.2	37.8	37.0
Stability (P), mm	-	-	-	51	76	-	59	74	72	77	69	76	71	73
Distensibility (L), mm	-	-	-	81	68	-	76	155	133	116	126	127	120	135
P/L	-	-	-	0.69	1.13	-	0.84	0.49	0.57	0.68	0.56	0.61	0.59	0.57
														
EXTENSOGRAM														
Strength, cm²	-	-	-	94	110	-	100	113	93	85	89	97	126	99
Max. height, BU	-	-	-	477	550	-	506	388	359	326	368	348	420	364
Extensibility, mm	-	-	-	140	147	-	143	210	186	184	168	195	217	193
														
MIXOGRAM														
Peak time, min	-	-	-	5.2	5.6	-	5.3	2.6	2.5	2.6	2.8	2.5	2.9	2.6
Water absorption (14% mb), %	-	-	-	58.9	59.7	-	59.1	62.4	61.1	60.9	59.9	61.4	63.0	61.4
														
MYCOTOXINS														
Aflatoxin B_1 (µg/kg)	0 [0]							ND						
Aflatoxin B_2 (µg/kg)	0 [0]							ND						
Aflatoxin G_1 (µg/kg)	0 [0]							ND						
Aflatoxin G_2 (µg/kg)	0 [0]							ND						
Fumonisin B_1 (µg/kg)	0 [0]							ND						
Fumonisin B_2 (µg/kg)	0 [0]							ND						
Fumonisin B_3 (µg/kg)	0 [0]							ND						
Deoxynivalenol (µg/kg) [max. value]	330 [503]							<100 [501]						
15-ADON (µg/kg)	0 [<100]							ND						
Ochratoxin A (µg/kg)	0 [0]							ND						
Zearalenone (µg/kg) [max. value]	0 [0]							ND						
HT-2 (µg/kg)	0 [0]							ND						
T-2 Toxin (µg/kg)	0 [0]							ND						
No. of samples	*3*							*40*						

sanas
South African National Accreditation System

CERTIFICATE OF ACCREDITATION

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

SOUTHERN AFRICAN GRAIN LABORATORY NPC

Co. Reg. No.: 1997/018518/08

Facility Accreditation Number: **T0116**

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

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

CHEMICAL AND PHYSICAL ANALYSIS

The facility is accredited in accordance with the recognised International Standard

ISO/IEC 17025:2005

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

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

Mr R Josias
Chief Executive Officer
Effective Date: 01 November 2014
Certificate Expires: 31 October 2019

ANNEXURE A

SCHEDULE OF ACCREDITATION

Facility Number: **T0116**

Permanent Address of Laboratory:

Southern African Grain Laboratory (NPC)
Agri-Hub Office Park - Grain Building
477 Witherite Road
The Willows
Pretoria
0040

Technical Signatories:

Ms J Nortje (All Methods)
Ms M Bothma (All Chemical Methods)
Ms M Hammes (All Chemical Methods)
Ms A de Jager (Nutrients & Contaminants)
Ms W Louw (In-house Methods 001, 002, 003, 010 & 026)
Ms D Moleke (Rheological Methods)
Ms I Terblanche (Rheological Methods)
Ms H Meyer (All Chemical, Nutrients and Contaminants & Grading Methods)
Ms J Kruger (All Chemical Methods)
Ms P Modiba (All Chemical Methods)
Ms M Motlanthe (In-house Methods 001, 003 & 026)
Mr B van Der Linde (Grading)
Ms M Ramare (All Chemical Methods Excl. In-House Method 012 and SOP MC23)
Ms Z Skhosana (In-house Method 026)
Ms T de Beer (Rheological Methods)

Postal Address:

Postnet Suite # 391
Private Bag X1
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Tel: (012) 807-4019
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E-mail: Paulina.Modiba@sagl.co.za

Nominated Representative:

Ms PM Modiba

Issue No.: 27
Date of Issue: 22 February 2018
Expiry Date: 31 October 2019

Material or Products Tested	Type of Tests / Properties Measured, Range of Measurement	Standard Specifications, Techniques / Equipment Used
CHEMICAL		
Ground Barley	Moisture (Oven Method)	Analytical EBC Method 3.2, latest Edition (2 hour; 130^{0}C)
Cereal and cereal products specifically-wheat, rice, (hulled paddy), barley, millet, rye, and oats as grain, semolina and flour	Moisture (Oven Method)	ICC Std No 110/1, Latest Edition (90 min; 130°C) (2 hour; 130°C)
Flour, semolina, bread, all kind of grains and cereal products and food products (except those that are sugar coated)	Moisture (Oven Method)	AACCI 44-15.02, Latest Edition (1 hour; 130°C) (72 hour; 103°C)

Maize Grits	Moisture (Oven Method)	Analytical EBC Method 6.2.2, latest edition (4 hours, 130^{0}C)
Animal feed, Plant tissue and Sunflower (Milled)	Moisture (Oven Method)	AgriLASA 2.1, Latest Edition (5 hours, 105^{0}C)
All flours, cereal grains, oilseeds and animal feeds	Nitrogen and protein (Combustion method - Dumas)	AACCI 46-30.01, Latest Edition
Cereal based food stuff	Dietary fibres (Total)	In-house method 012
Food stuff and feeds	Carbohydrates (by difference) (calculation) Energy value (calculation) Total digestible nutritional value (calculation)	SOP MC 23
Food Stuff and feeds	Determination of Ash	In-house method 011
Wheat Kernels	Moisture (Oven Method)	Government Gazette Wheat Regulation, Latest Edition (72 hour, 103°C)
Flours of grains e.g. barley, oats, triticale, maize, rye, sorghum and wheat; oilseeds like soybeans and sunflower, feeds and mixed feeds and foodstuffs	Crude fat (Ether extraction by Soxhlet)	In-house method 024
Meal and flour of wheat, rye, barley, other grains, starch containing and malted products	Falling number	ICC Std 107/1, Latest Edition
NUTRIENTS AND CONTAMINANTS		
Vitamin fortified food and feed products and fortification mixes grain based	Vitamin A as all trans Retinol (Saponification) (HPLC)	In-house method 001
	Thiamine Mononitrate (HPLC) Riboflavin (HPLC) Nicotinamide (HPLC) Pyridoxine Hydrochloride (HPLC)	In-house method 002
	Folic Acid (HPLC)	In-house method 003
Grain based food and feed products (fortified and unfortified) and fortification mixes	Total Sodium (Na) Total Iron (Fe) Total Zinc (Zn)	In-house method 010

Food and feed	Multi-Mycotoxin: -Aflatoxin G_1, B_1, G_2, B_2 and total -Deoxynivalenol (DON), 15-ADON -Fumonisin B_1, B_2, B_3 -Ochratoxin A -T2, HT-2 - Zearalenone	In-house method 026
GRADING		
Maize	Defective kernels (White maize/ yellow maize)	Government Gazette Maize Regulation, Latest Edition
Cereal as grains (Wheat, barley, rye and oats)	Hectolitre mass (Kern222)	ISO 7971-3, Latest edition
Wheat	Screenings	Government Gazette Wheat Grading Regulation, Latest Edition
RHEOLOGICAL		
Wheat flour	Alveograph (Rheological properties)	ICC Std.121, Latest Edition
Flours	Farinograph (Rheological properties)	AACCI 54-02, Latest Edition (Rheological behaviour of flour Farinograph: Constant Flour Weight procedure)
Hard, soft and durum wheat (flour and whole wheat flour)	Mixograph (Rheological properties)	Industry accepted method 020 (Based on AACCI 54-40.02, Latest Edition Mixograph Method)

Original Date of Accreditation: 01 November 1999

ISSUED BY THE SOUTH AFRICAN NATIONAL ACCREDITATION SYSTEM

Accreditation Manager

BIPEA

CERTIFICATE OF PARTICIPATION

PROFICIENCY TESTING PROGRAMS

This certificate is awarded to:

SOUTHERN AFRICAN GRAIN LABORATORY NPC

THE WILLOWS - PRETORIA - South Africa

for its participation in BIPEA's interlaboratory comparisons for the 2016-2017 annual series.

Monday, September 11, 2017 - Paris FRANCE

BIPEA member

BIPEA Director

Certificate n° 16-17 / 11119

AACC INTERNATIONAL

RECOGNITION OF ANALYTICAL PERFORMANCE

Analysis of Mixograph

Southern African Grain Laboratory
Petoria, SOUTH AFRICA

Achieved Outstanding Accuracy and Precision for the year 2017
in check samples including the following analyses:

Moisture, Peak time, Peak ht, 8 min ht, Slope

Executive Vice President

President

AACC INTERNATIONAL

RECOGNITION OF ANALYTICAL PERFORMANCE

Analysis of Hard Wheat Flour

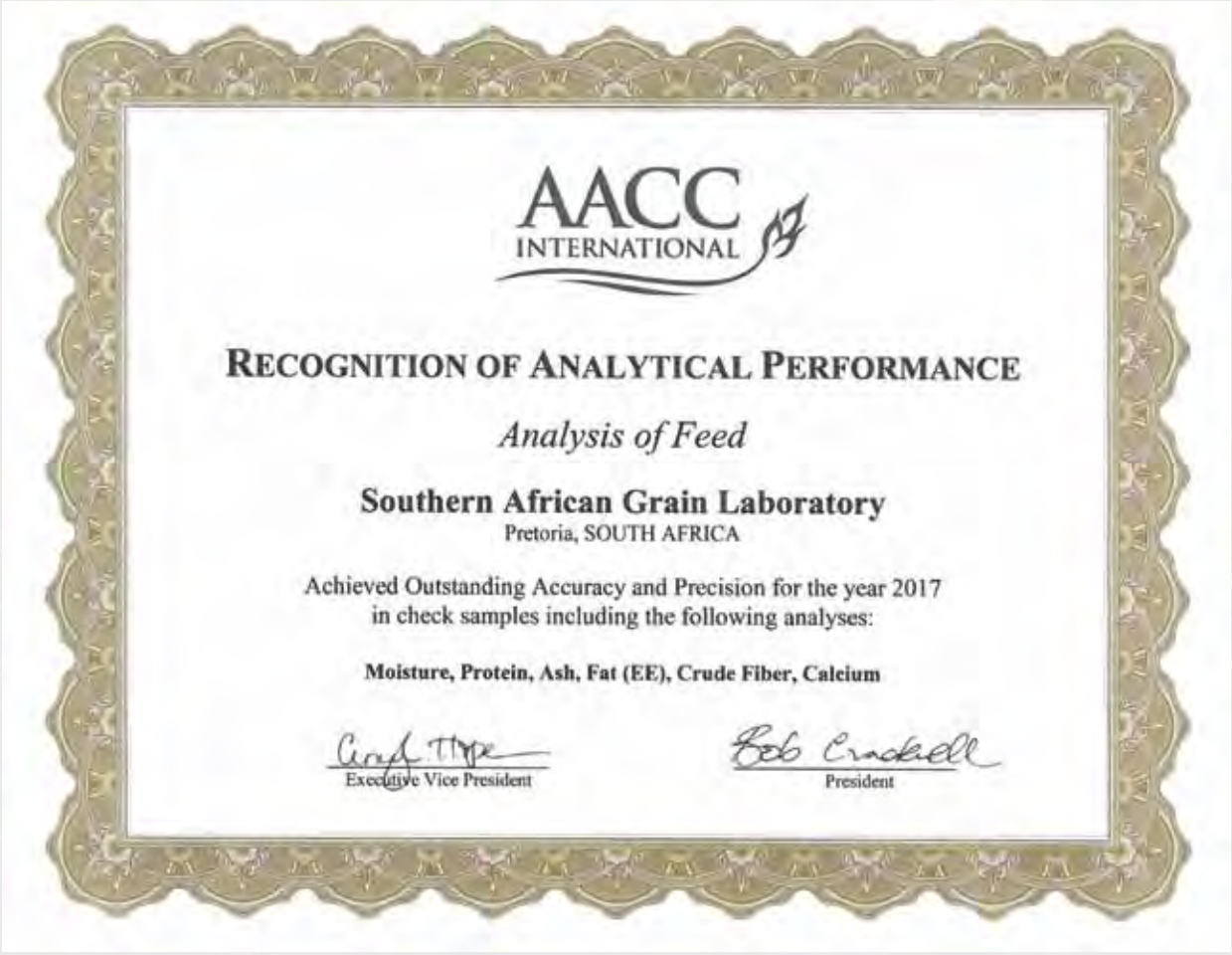
Southern African Grain Laboratory
Pretoria, SOUTH AFRICA

Achieved Outstanding Accuracy and Precision for the year 2017
in check samples including the following analyses:

Moisture, Protein, Ash, Falling Number

Executive Vice President

President



AACC INTERNATIONAL

RECOGNITION OF ANALYTICAL PERFORMANCE

Analysis of Feed

Southern African Grain Laboratory
Pretoria, SOUTH AFRICA

Achieved Outstanding Accuracy and Precision for the year 2017
in check samples including the following analyses:

Moisture, Protein, Ash, Fat (EE), Crude Fiber, Calcium

Executive Vice President

President

Seasonal Climate Watch

August to December 2018

Date issued: Jul 24, 2018

1. Overview

The El Niño-Southern Oscillation (ENSO) is still in a neutral phase and is expected to rise towards an El Niño phase through the spring period. The likelihood of an El Niño event occurring is increasing as we move towards spring, when confidence in ENSO forecasts also starts increasing. It is still too early to determine the potential impact of the predicted El Niño event; however, the typical effects are drier and warmer conditions for the summer rainfall areas during summer.

The forecasting system indicates confident forecasts for above-normal rainfall over the western coastal regions during early spring (Aug-Sep-Oct). Rainfall totals for these regions are however substantially lower than the mid-winter (Jun-Jul-Aug) seasons. There is some concern for the southern coastal regions as there has been below-normal forecasts with confidence since last month for spring (Sep-Oct-Nov). This area usually still receives significant rainfall during spring and has also been affected by a drought the past few years.

Late spring (Oct-Nov-Dec) forecasts show confident forecasts for above-normal rainfall over the eastern coastal areas, which is also supported by the forecast for an increased number of rainfall days in the area.

Overall higher temperatures are still expected moving towards the spring period. There is a particularly confident forecast for above-normal temperatures over the northern parts of the country.

The South African Weather Service will continue to monitor and provide updates of any future assessments that may provide more clarity on the current expectations for the coming seasons.

2. South African Weather Service Prediction Systems

2.1. Ocean-Atmosphere Global Climate Model

The South African Weather Service (SAWS) is currently recognised by the World Meteorological Organization (WMO) as the Global Producing Centre (GPC) for Long-Range Forecasts (LRF). This is owing to its local numerical modelling efforts which involve coupling of both the atmosphere and ocean components to form a fully-interactive coupled modelling system, named the SAWS Coupled Model (SCM), the first of its kind in both South Africa and the region. Below are the first season (Aug-Sep-Oct) predictions for rainfall (Figure 1) and average temperature (Figure 2).

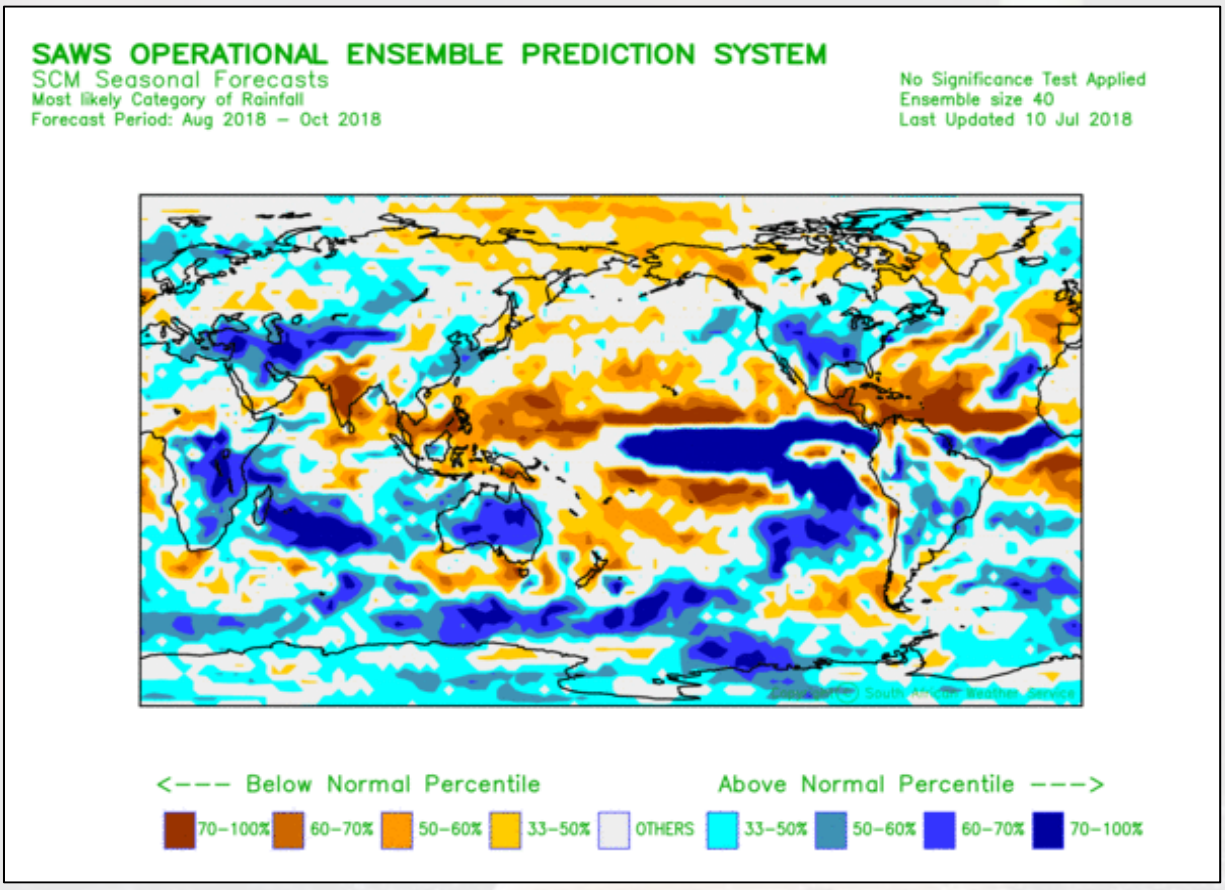


Figure 1: August-September-October global prediction for total rainfall probabilities.

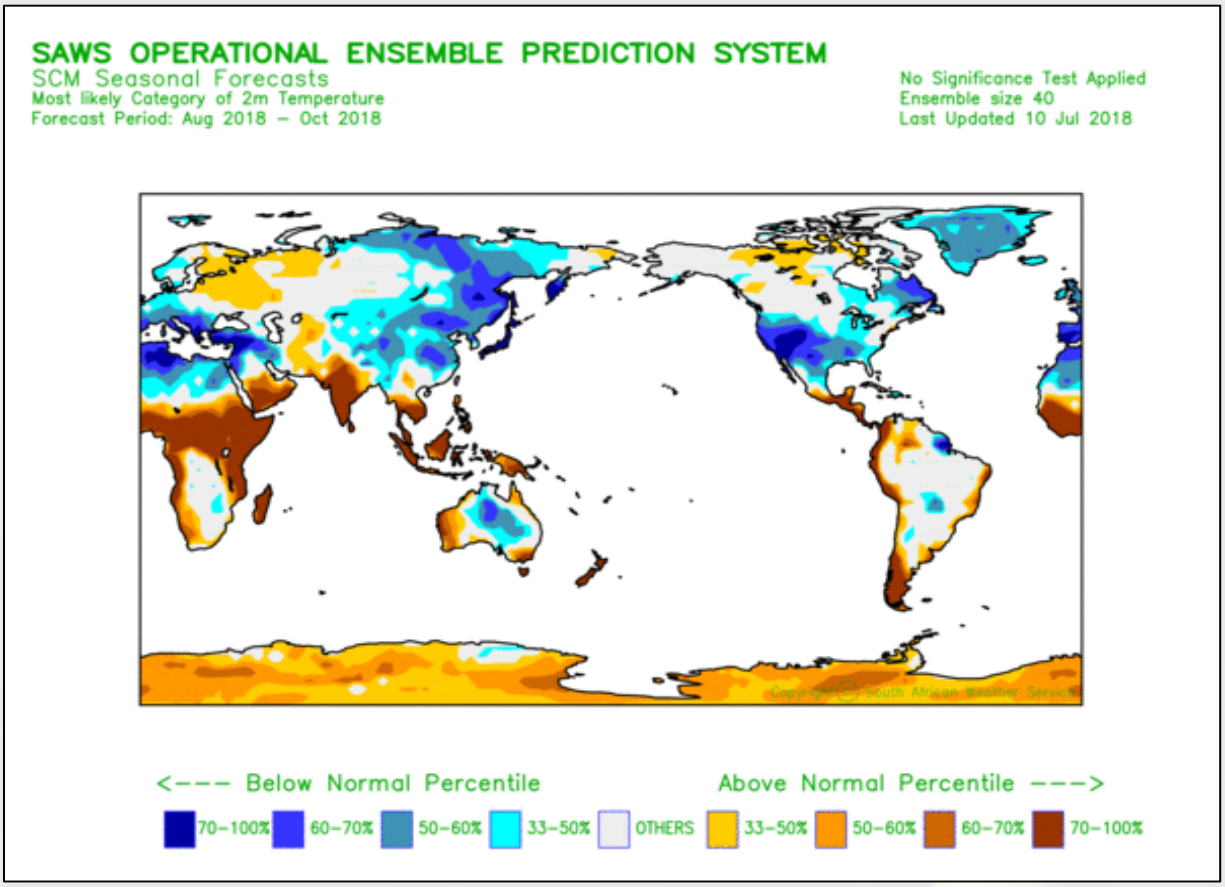


Figure 2: August-September-October global prediction for average temperature probabilities.

It is worth mentioning that the SCM levels of skill for the Niño 3.4 region (where ENSO information is sourced) are very much comparable to other state-of-the-art coupled models which are administered by other international centres. Therefore, the following Sea-Surface Temperature (SST) forecast (Figure 3) emanates from the SST Prediction System which is purely based on the SCM.

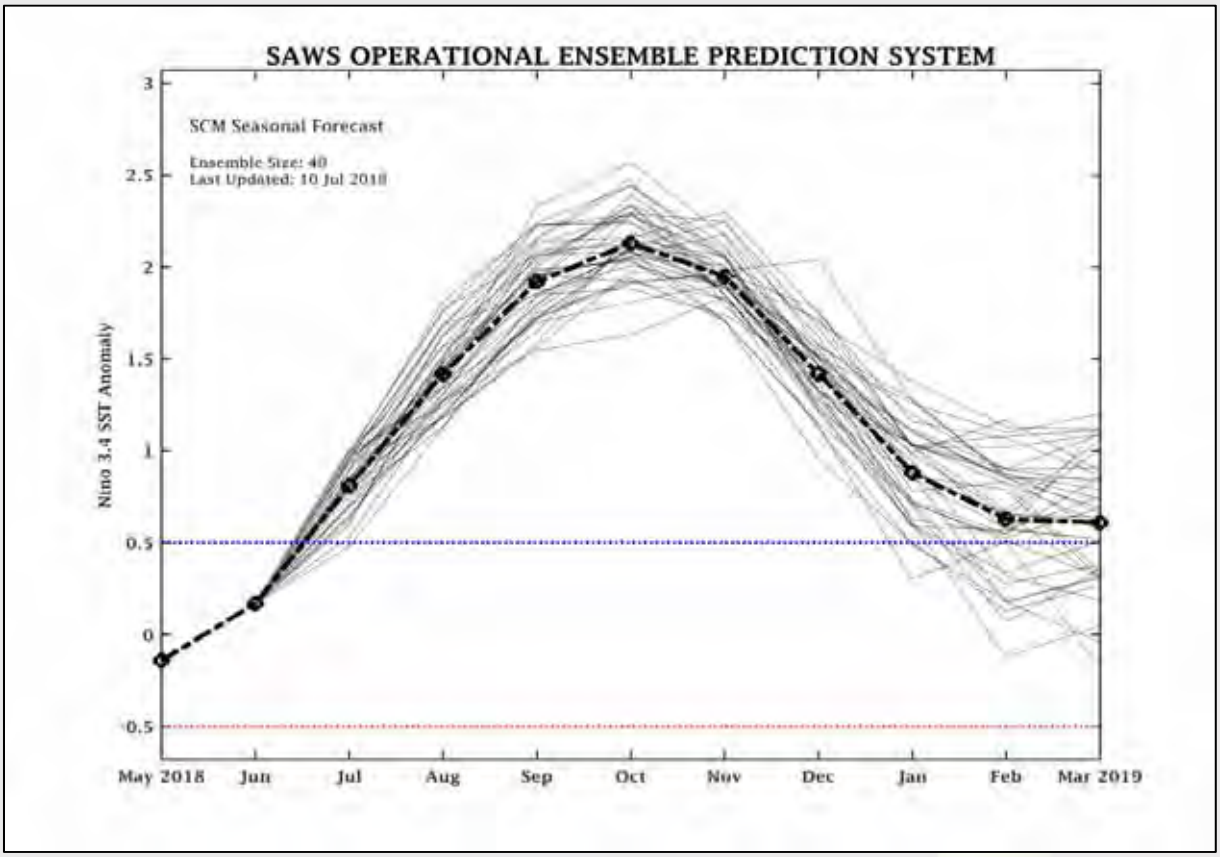


Figure 3: Niño3.4 SST anomaly forecasts produced by the SST forecast system administered by the SAWS. It comprises 40 ensemble members (marked in grey colour). The mean of the ensemble is marked in black.

2.2. Multi-Model Statistical Downscaling System

2.2.1. Seasonal Totals and Averages

In an effort to improve the predictions made by the SCM, which struggles to produce reliable rainfall and temperature forecasts at a local scale, the Multi-Model System (MMS) has been implemented to statistically downscale various global forecasts, including the SCM and the Climate Forecasting System version 2 (CFSv2) administered by the National Oceanographic and Atmospheric Administration (NOAA).

Below are the current three-season forecasts issued in July 2018. Three maps are shown for each season which include the raw MMS probabilistic prediction (left), the probabilistic prediction with skill masked out (middle) and the climatological average (right) for the specific season. *The user is advised to consider the skill masked map (middle) as the official SAWS forecast, however, the two additional maps may be used as tools in such a case where skill for a specific area is deemed insufficient.*

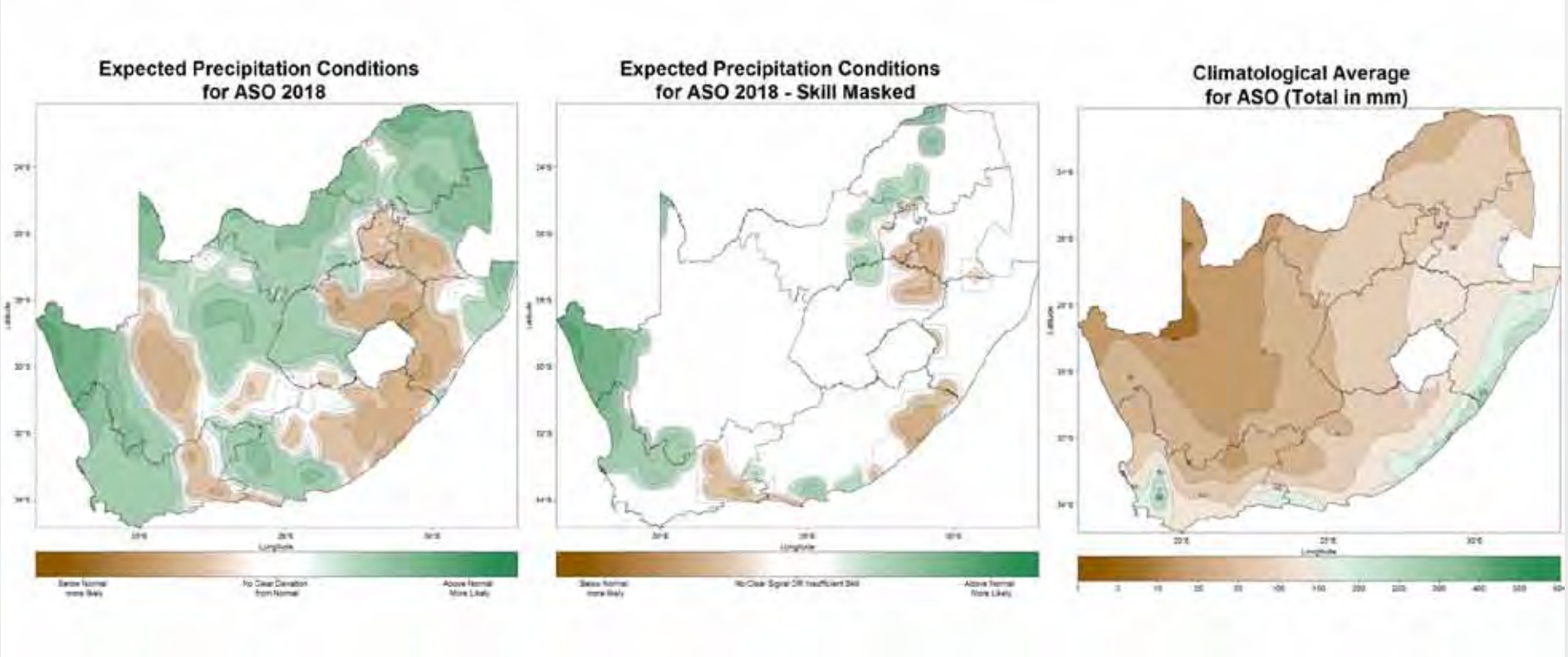


Figure 4: *August-September-October (ASO) 2018 seasonal precipitation prediction without skill taken into account (left), as well as skill masked out (middle). Also included is the climatological average for ASO (right, in mm) calculated over the period 1979-2009.*

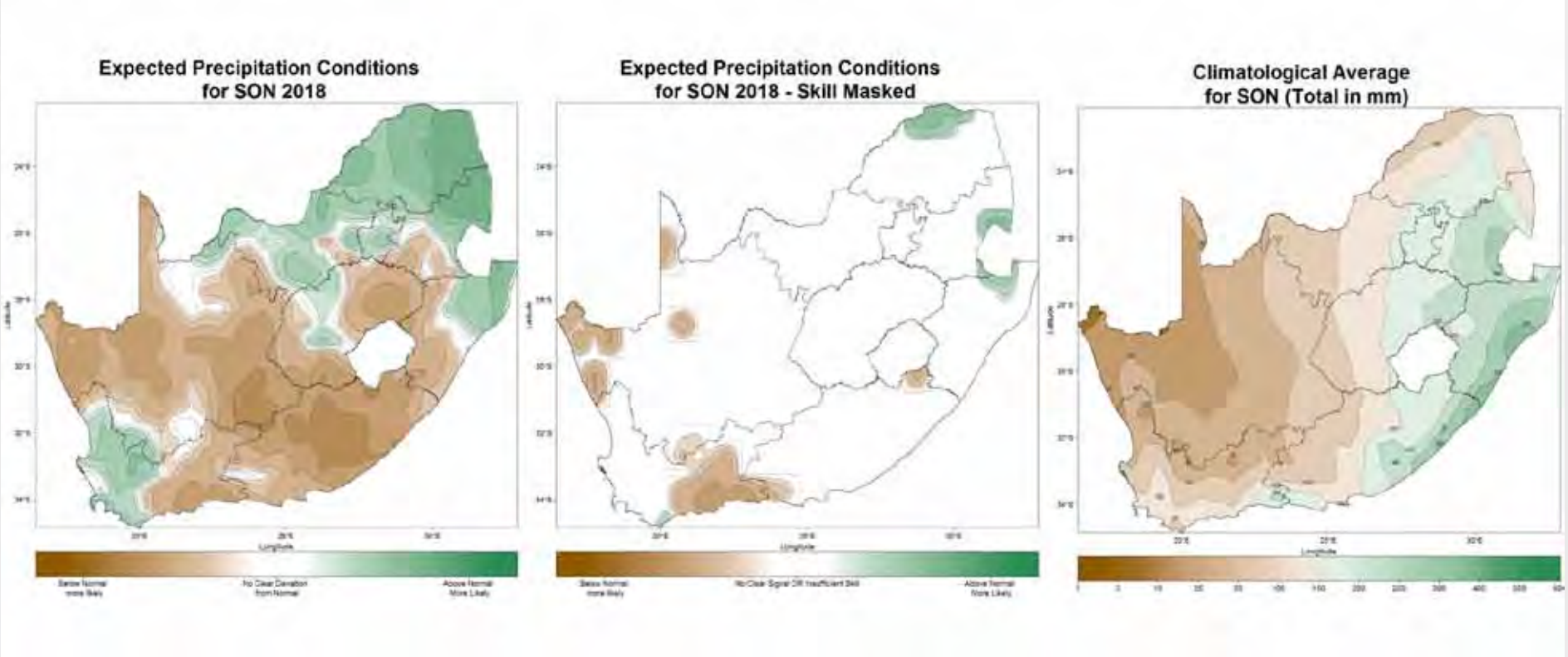


Figure 5: *September-October-November (SON) 2018 seasonal precipitation prediction without skill taken into account (left), as well as skill masked out (middle). Also included is the climatological average for SON (right, in mm) calculated over the period 1979-2009.*

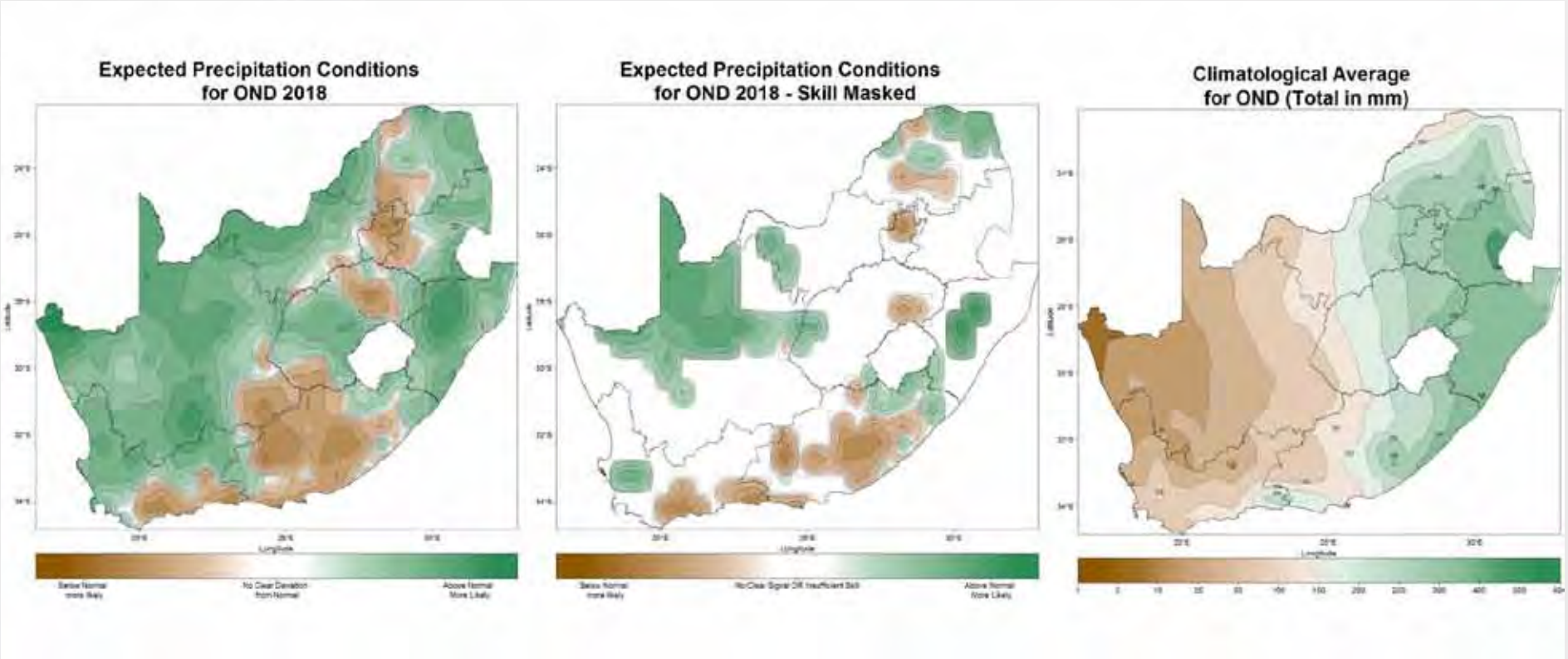


Figure 6: *October-November-December (OND) 2018 seasonal precipitation prediction without skill taken into account (left), as well as skill masked out (middle). Also included is the climatological average for OND (right, in mm) calculated over the period 1979-2009.*

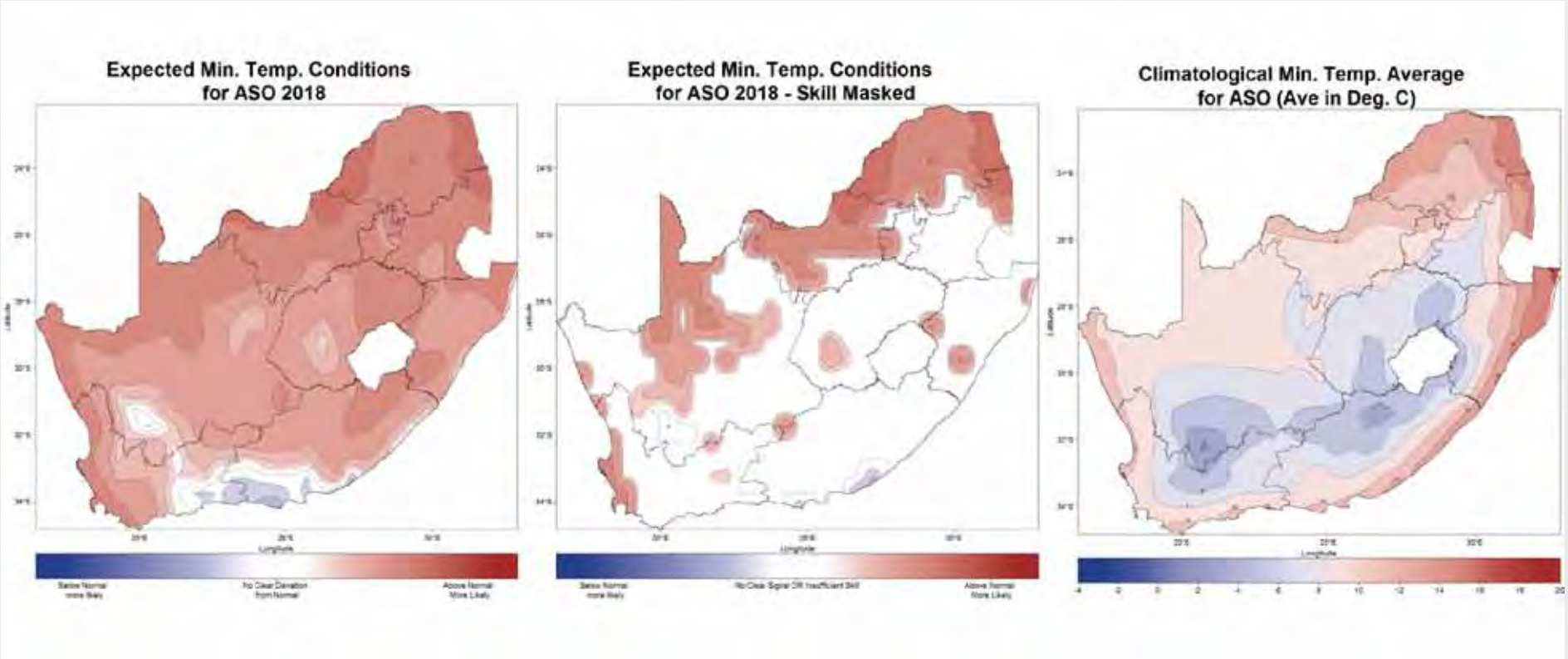


Figure 7: *August-September-October (ASO) 2018 seasonal minimum-temperature prediction without skill taken into account (left), as well as skill masked out (middle). Also included is the climatological average for ASO (right) calculated over the period 1979-2009.*

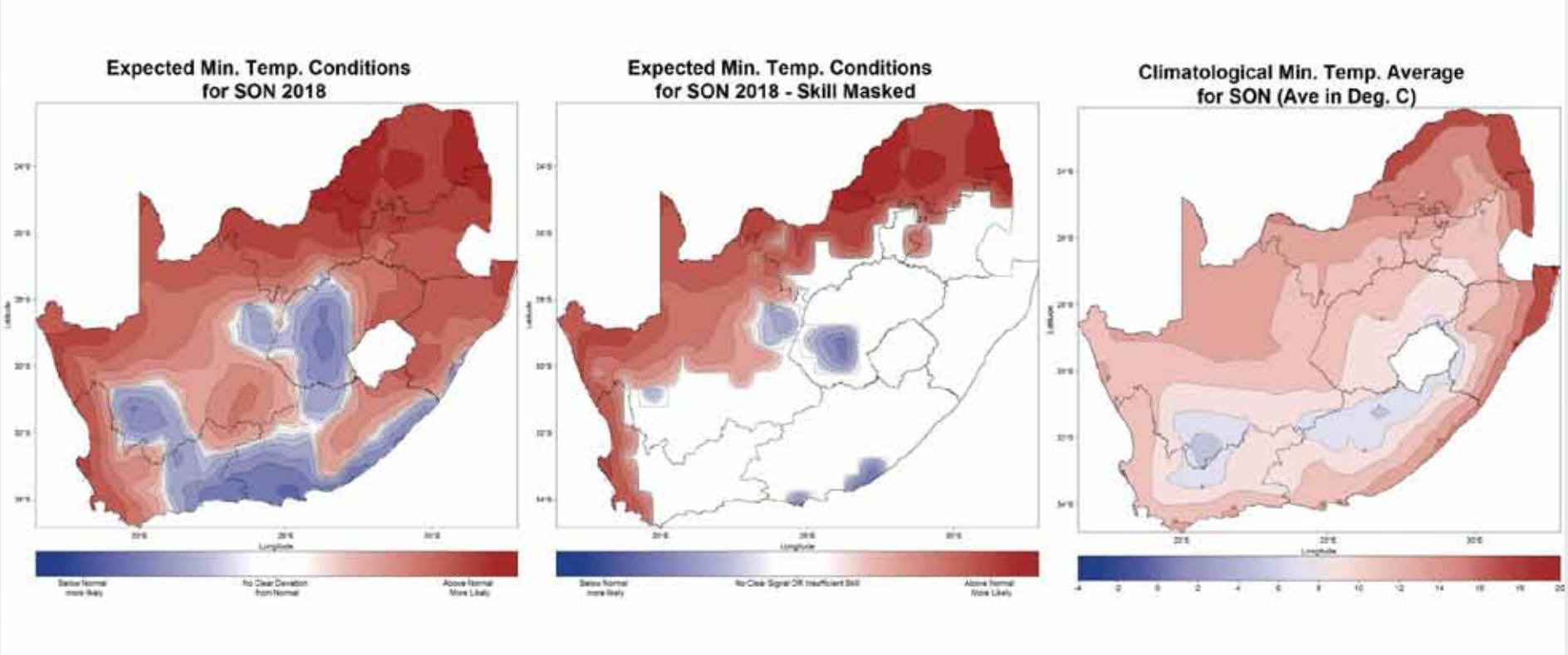


Figure 8: *September-October-November (SON) 2018 seasonal minimum-temperature prediction without skill taken into account (left), as well as skill masked out (middle). Also included is the climatological average for SON (right) calculated over the period 1979-2009.*

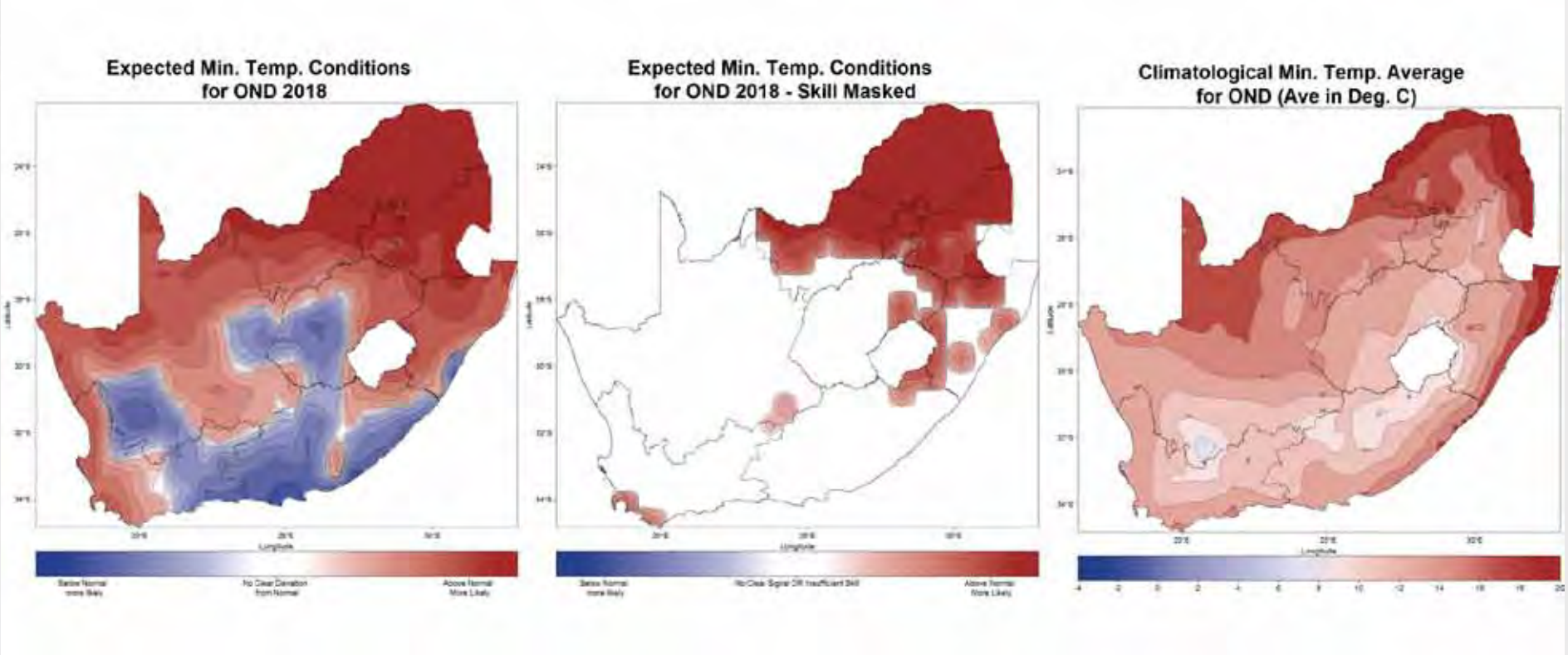


Figure 9: *October-November-December (OND) 2018 seasonal minimum-temperature prediction without skill taken into account (left), as well as skill masked out (middle). Also included is the climatological average for OND (right) calculated over the period 1979-2009.*

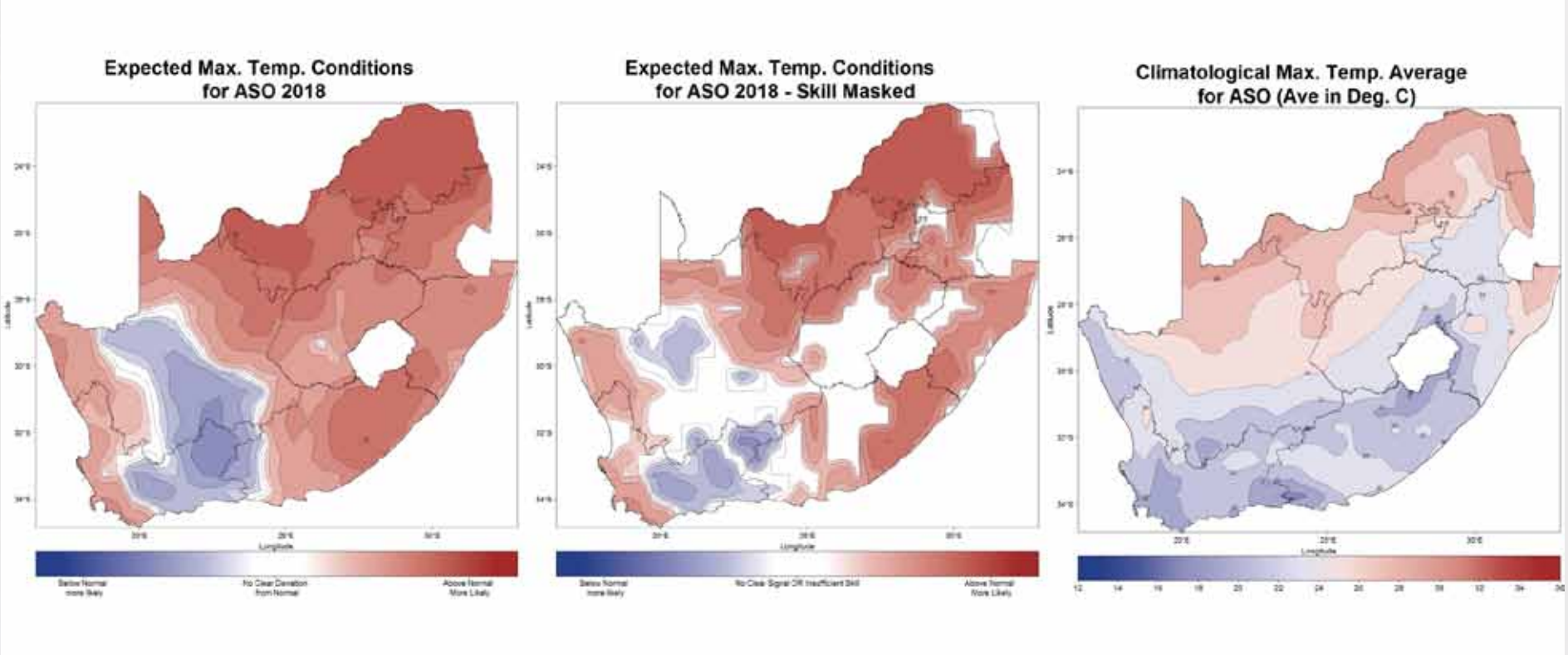


Figure 10: *August-September-October (ASO) 2018 seasonal maximum-temperature prediction without skill taken into account (left), as well as skill masked out (middle). Also included is the climatological average for ASO (right) calculated over the period 1979-2009.*

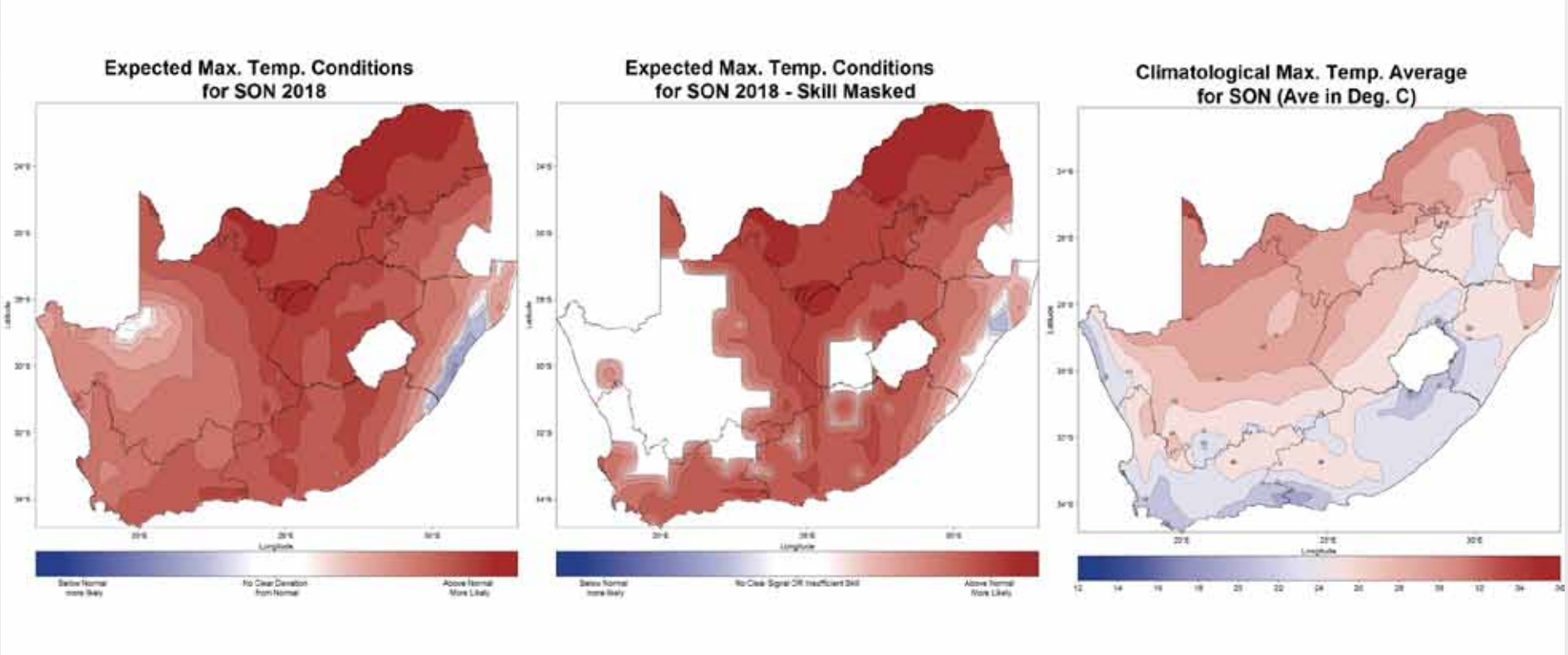


Figure 11: *September-October-November (SON) 2018 seasonal maximum-temperature prediction without skill taken into account (left), as well as skill masked out (middle). Also included is the climatological average for SON (right) calculated over the period 1979-2009.*

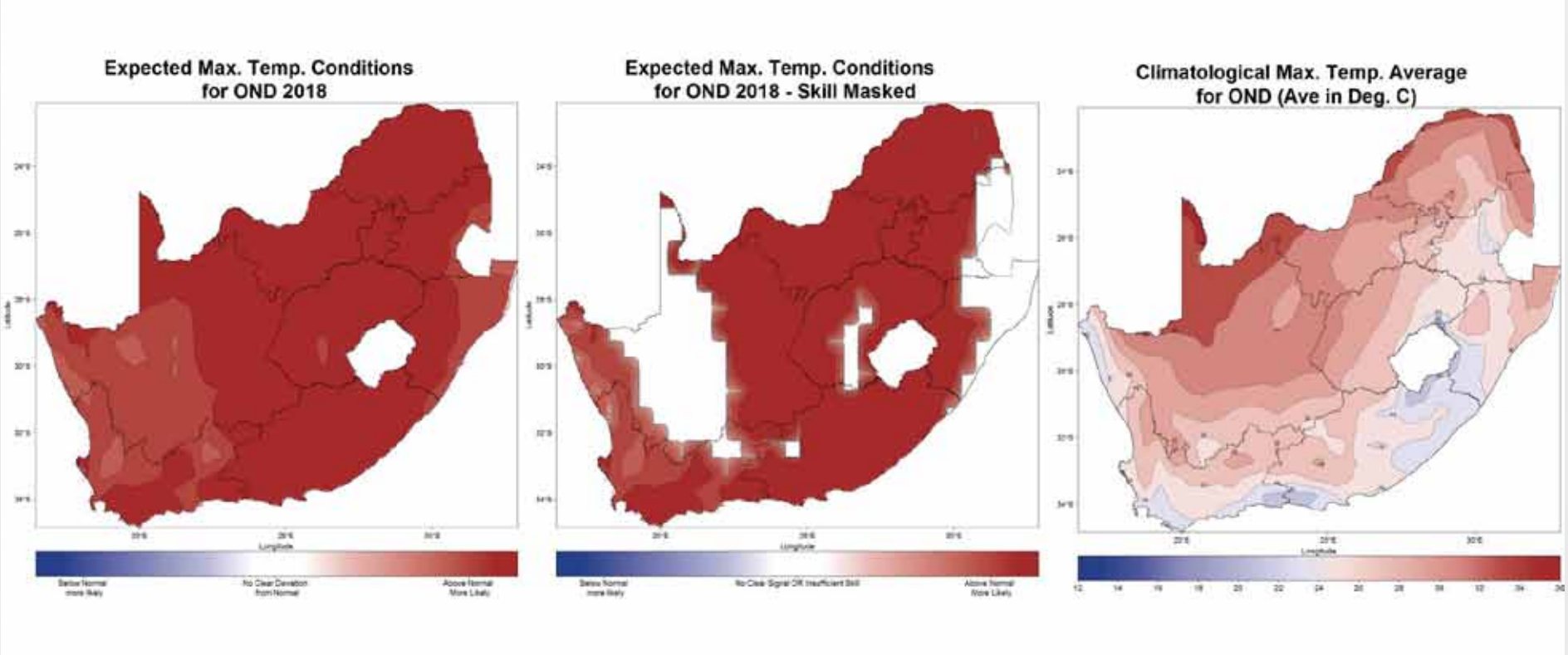


Figure 12: *October-November-December (OND) 2018 seasonal maximum-temperature prediction without skill taken into account (left), as well as skill masked out (middle). Also included is the climatological average for OND (right) calculated over the period 1979-2009.*

2.2.2. Rainfall Frequency Predictions

This product is a result of the SAWS operational multi-model system (MMS) where the 850-hPa geopotential heights hindcast outputs are first statistically recalibrated and downscaled to observed number of rainfall days exceeding desired thresholds (derived from high resolution 0.1 X 0.1 degree (ARCv2) African Rainfall Climatology version 2 rainfall dataset) within seasons of interest over southern Africa by using model output statistics (MOS). The 850-hPa geopotential heights are used here because they are found to be the best predictor of rainfall over southern Africa.

These forecasts can be used together with the traditional seasonal rainfall total forecasts in that it can indicate the frequency of rainfall days where seasonal rainfall forecast areas expect below- or above-normal conditions.

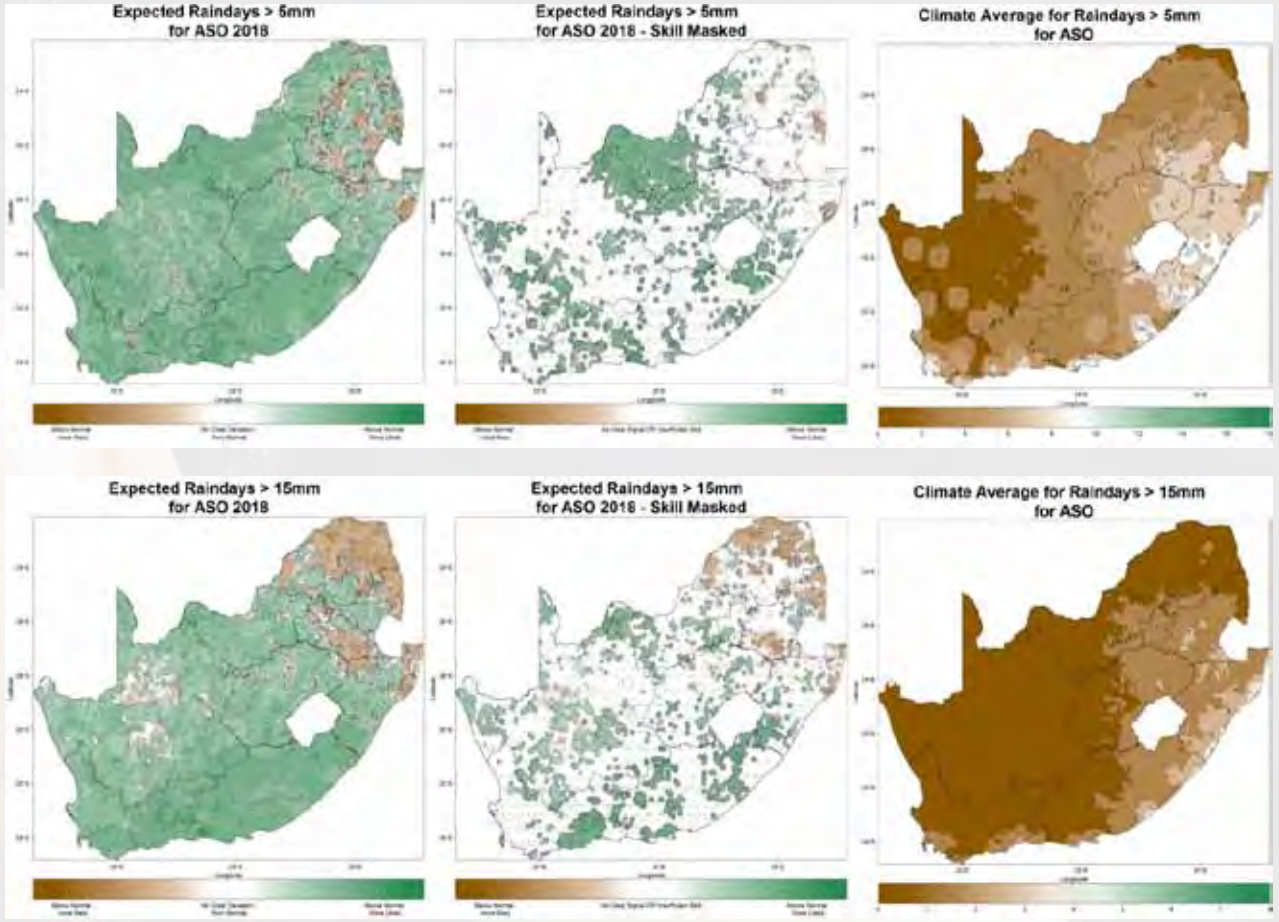


Figure 13: August-September-October 2018 rainfall-days forecast. Forecast for high and low number of rainfall days exceeding 5 and 15mm without skill taken into account (left) and with skill taken into account (middle). Also included is the climatology for rainfall days (right) exceeding 5 and 15mm calculated over the period 1983-2009.

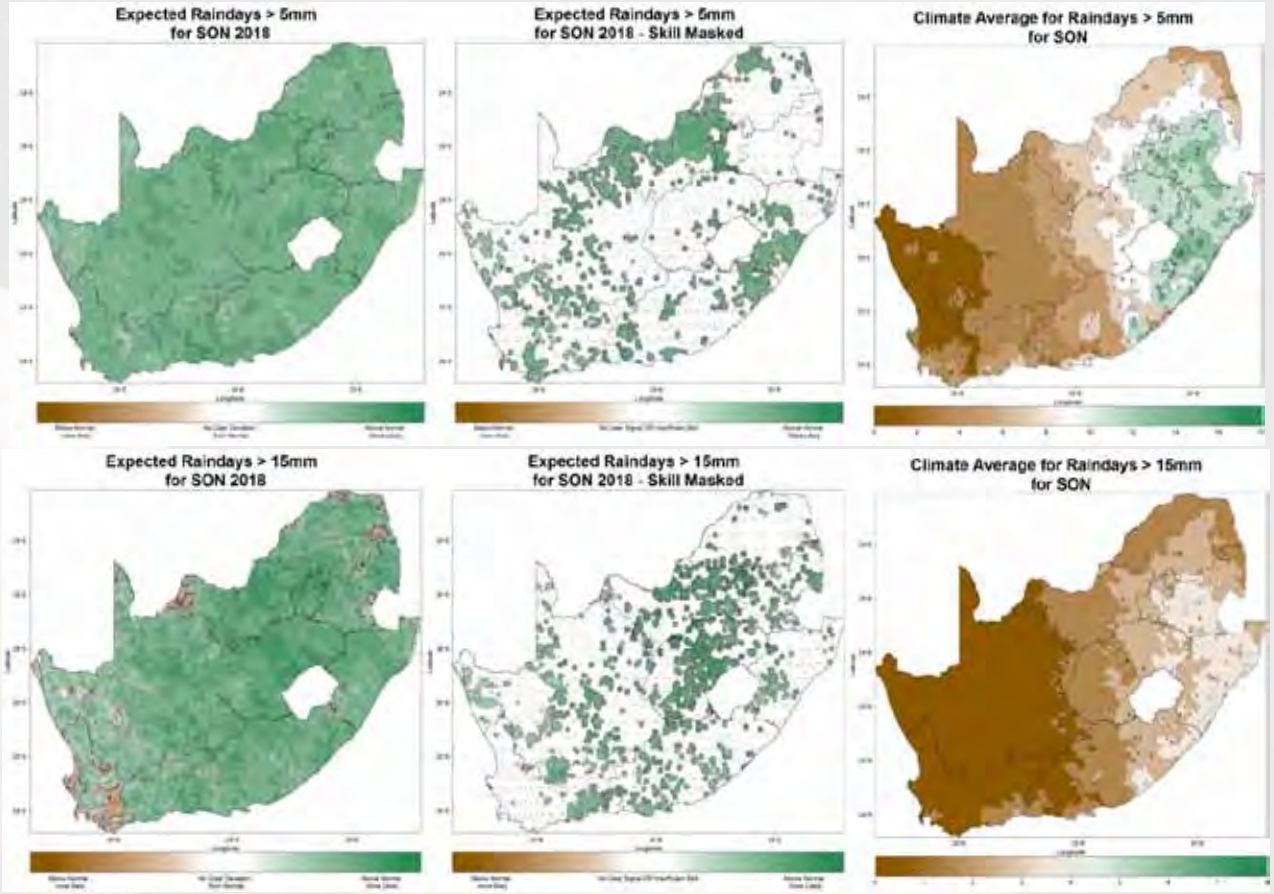


Figure 14: *September-October-November 2018 rainfall-days forecast. Forecast for high and low number of rainfall days exceeding 5 and 15mm without skill taken into account (left) and with skill taken into account (middle). Also included is the climatology for rainfall days (right) exceeding 5 and 15mm calculated over the period 1983-2009.*

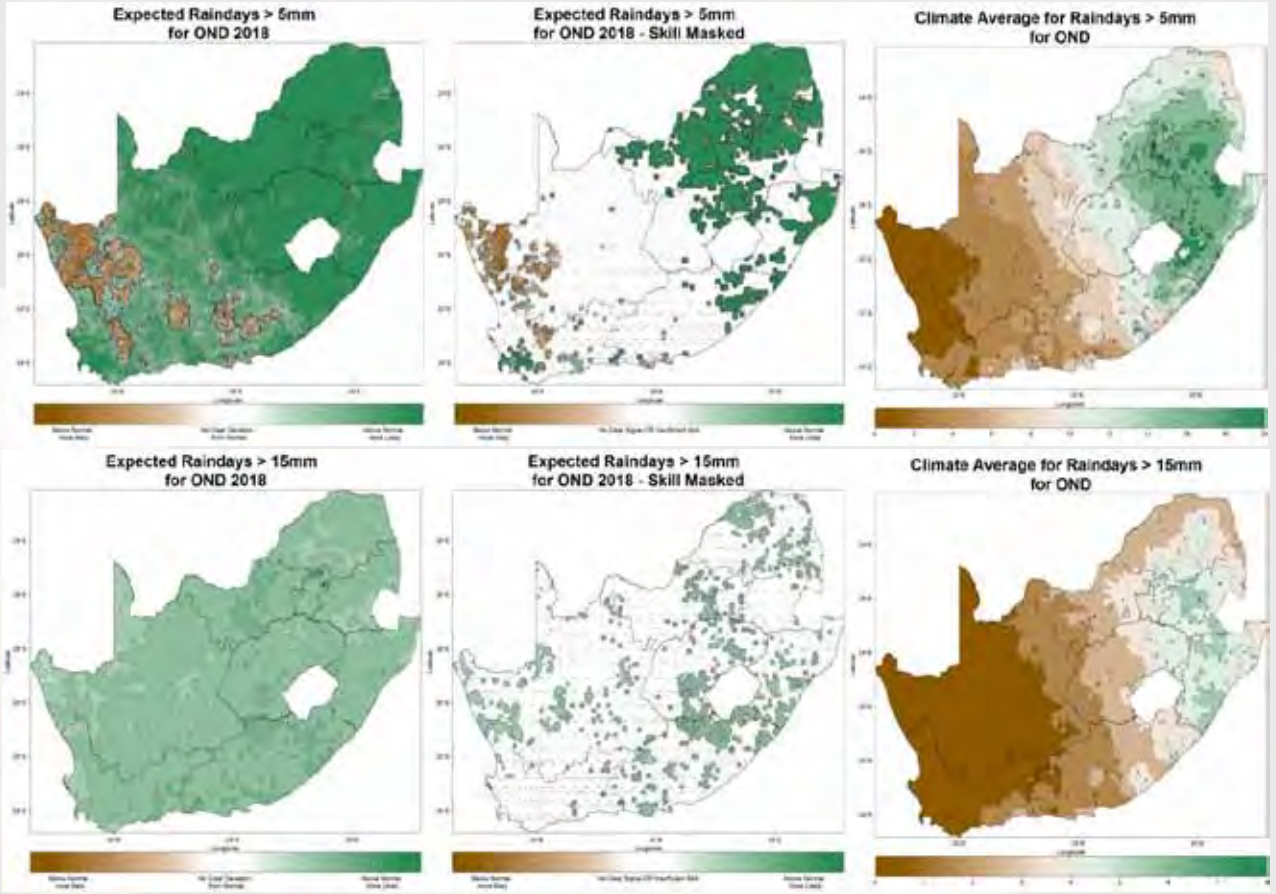


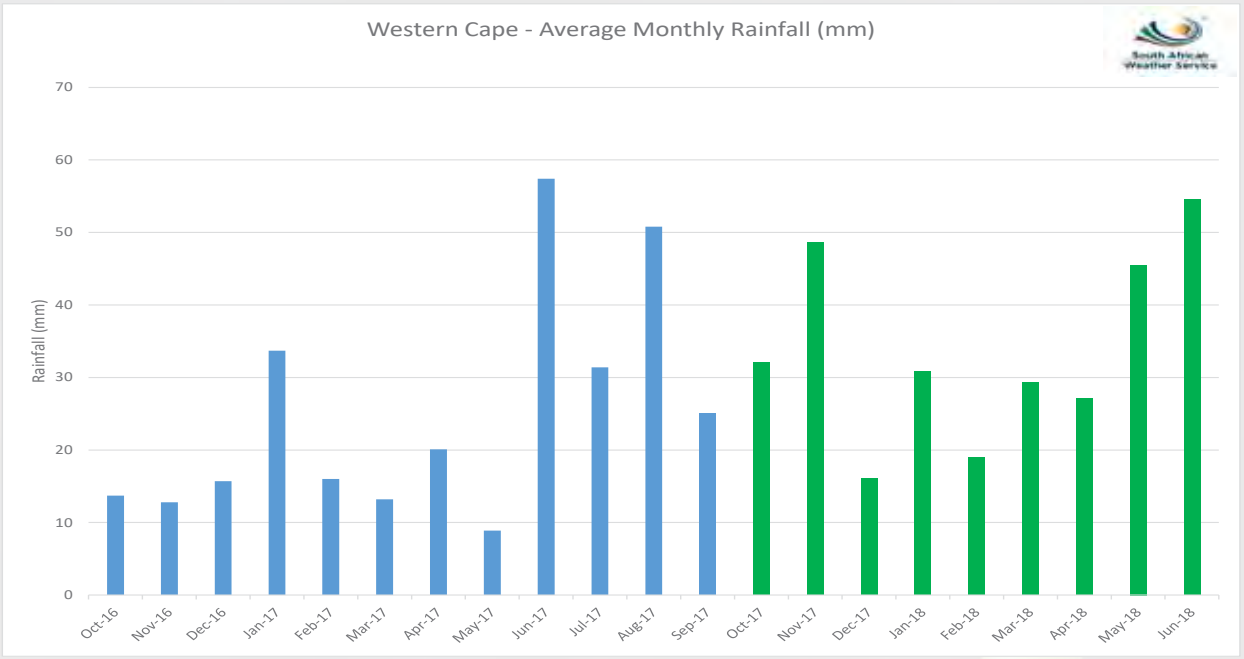
Figure 15: *October-November-December 2018 rainfall-days forecast. Forecast for high and low number of rainfall days exceeding 5 and 15mm without skill taken into account (left) and with skill taken into account (middle). Also included is the climatology for rainfall days (right) exceeding 5 and 15mm calculated over the period 1983-2009.*

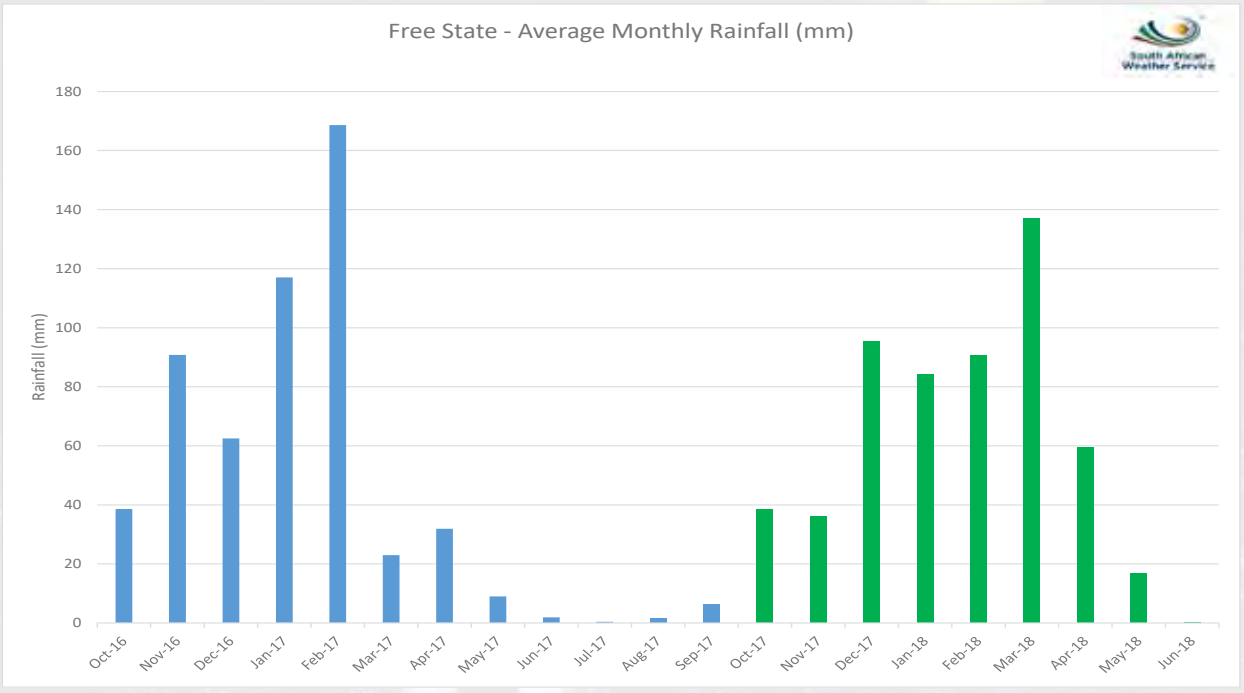
3. Contributing Institutions and Useful links

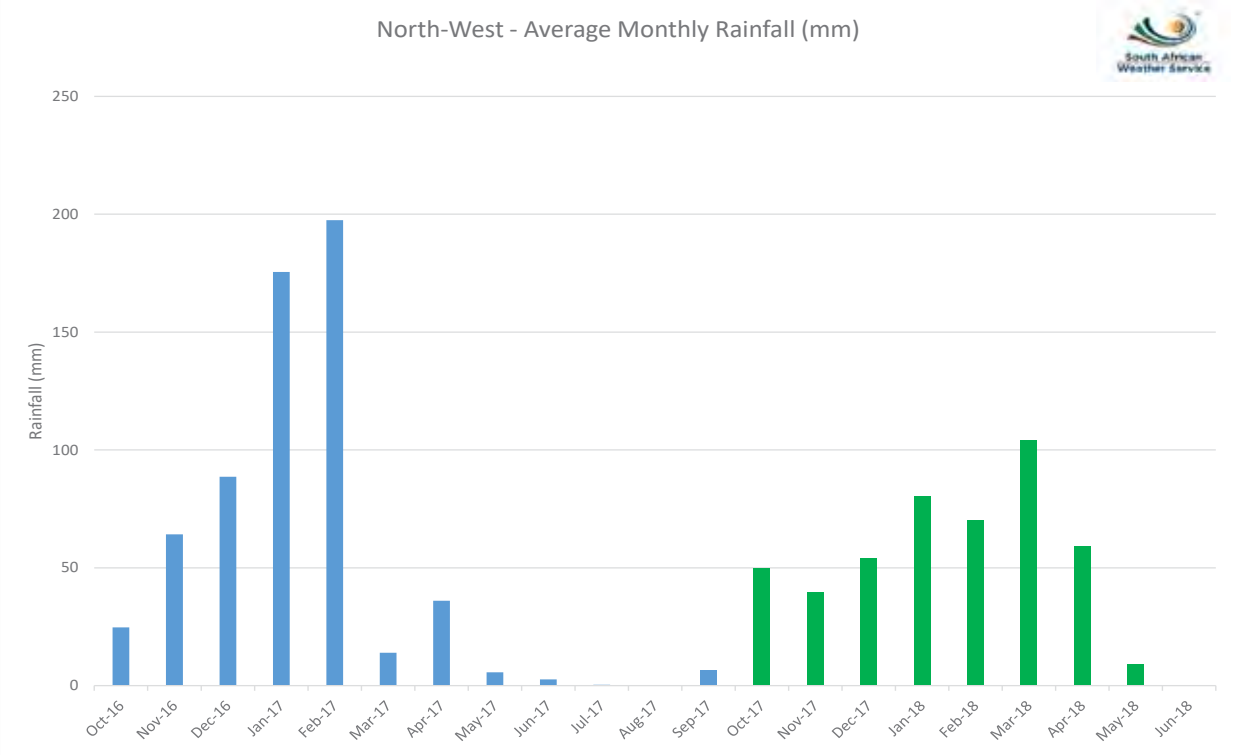
All the forecasts are a result of an objective multi-model prediction system developed at the South African Weather Service. This system consists of long-range forecasts produced by the following institutions:

http://www.weathersa.co.za/home/seasonal (Latest predictions including maps for the whole of SADC)

https://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/ (ENSO predictions from various centres)


Western Cape - Average Monthly Rainfall (mm)
Rainfall (mm)
0
10
20
30
40
50
60
70
Oct-16
Nov-16
Dec-16
Jan-17
Feb-17
Mar-17
Apr-17
May-17
Jun-17
Jul-17
Aug-17
Sep-17
Oct-17
Nov-17
Dec-17
Jan-18
Feb-18
Mar-18
Apr-18
May-18
Jun-18


Free State - Average Monthly Rainfall (mm)
Rainfall (mm)
0
20
40
60
80
100
120
140
160
180
Oct-16
Nov-16
Dec-16
Jan-17
Feb-17
Mar-17
Apr-17
May-17
Jun-17
Jul-17
Aug-17
Sep-17
Oct-17
Nov-17
Dec-17
Jan-18
Feb-18
Mar-18
Apr-18
May-18
Jun-18



General Information
Average Monthly Rainfall

Compiled by:
Elsa de Jager
Manager: National Climate Center
Date: 20 July 2018

DEPARTMENT OF AGRICULTURE, FORESTRY AND FISHERIES

NO. R. 64 **29 JANUARY 2016**

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

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

The Minister of Agriculture, Forestry and Fisheries, acting under section 15 of the Agricultural Product Standards Act 119 of 1990, has

(a) made the regulations in the Schedule;

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

(c) read together with section 3(1) of the said Act, repealed the Regulations published by Government Notice No. R1186 of December 2010.

SCHEDULE

Definitions

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

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

"bag" means a bag manufactured from --

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

(b) polypropylene that complies with SANS specification CKS632 1246:2012;

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

"**consignment**" means --

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

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

"container" means a bag or bulk container;

"**damaged wheat**" means wheat--

(a) which have been damaged by insects;

(b) which have been distinctly discoloured (orange-brown, dark brown or black) by external heat or as a result of heating caused by internal fermentation in wheat with an excessive moisture content, excluding wheat kernels in respect of which the discolouration is confined to the germ end;

(c) which are immature and have a distinctly green colour; and

(d) in which germination has proceeded to such an extent that the skin covering the embryo has been broken or the developing sprouts and/or rootlets are clearly visible.

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

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

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

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

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

"**foreign matter**" means all matter excluding wheat, other grain and unthreshed ears. Coal, dung, glass and metal shall not be present in the consignment concerned;

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

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

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

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

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

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

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

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

"**poisonous seeds**" means the seeds or bits of seeds of plant species that may in terms of the Foodstuffs, Cosmetics and Disinfectants Act 54 of 1972 represent a hazard to human or animal health when consumed, including seeds of *Argemone mexicana, Convolvulus spp.*, *Crotalaria spp., Datura spp., Ipomoea purpurea, Lolium temulentum, Ricinus communis* or *Xanthium spp.*;

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

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

"standard sieve" means a slotted sieve --

(a) with a flat bottom of metal sheet of 1,0 mm thickness with apertures 12,7 mm long and 1,8 mm wide with rounded ends. The spacing between the slots in the same row must be 2, 43 mm wide and the spacing between the rows of slots must be 2,0 mm wide. The slots must be alternately orientated with a slot always opposite the solid inter segment of the next row of slots;

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

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

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

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

(a) an unmistakable stinking smut odour; or

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

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

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

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

(b) visible mould beneath the bran.

"**the Act**" means the Agricultural Product Standards Act 119 of 1990;

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

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

Restrictions on sale of wheat

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

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

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

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

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

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

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

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

PART I

QUALITY STANDARDS

Classes of wheat

3. The classes of wheat are --

(a) Bread Wheat; and

(b) Other Wheat.

Standards for classes

4. (1) Notwithstanding the provisions of sub-regulations (2) and (3), a consignment of wheat shall --

(a) be free from any toxin, chemical or any other substance that renders it unsuitable for human consumption or for processing into or utilisation thereof as food or feed and may not exceed the permissible deviations regarding aflatoxin in terms of the Foodstuffs, Cosmetics and Disinfectants Act 54 of 1972;

(b) not contain more poisonous seeds or ergot sclerotia than permitted in terms of the Foodstuffs, Cosmetics and Disinfectants Act 54 of 1972;

(c) be free from organisms of phytosanitary importance as determined in terms of the Agricultural Pest Act 36 of 1983;

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

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

(f) be free from animal filth;

(g) be free from stones, glass, metal, coal or dung;

(h) with the exception of Class Other Wheat, be free from grain insects;

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

(j) with the exception of Class Other Wheat, have a moisture content not exceeding 13 percent**.**

(2) A consignment shall be classified as Bread Wheat if --

(a) the wheat in the consignment consists of at least 95 percent (m/m) of one or more of the bread wheat seeds; and

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

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

Grades of wheat

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

(a) Grade 1.

(b) Grade 2.

(c) Grade 3.

(d) Grade 4; and

(e) Utility grade.

(2) No grades are determined for Class Other Wheat.

Standards for grades of wheat

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

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

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

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

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

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

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

(a) Grade 1 - 77 kg.

(b) Grade 2 - 76 kg.

(c) Grade 3 - 74 kg.

(d) Grade 4 - 72 kg; and

(e) Utility Grade - 70 kg.

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

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

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

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

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

(a) Grade 1 - 12 percent.

(b) Grade 2 - 11 percent.

(c) Grade 3 - 10 percent.

(d) Grade 4 - 9 percent; and

(e) Utility Grade - 8 percent.

PART II

PACKING AND MARKING REQUIREMENTS

Packing requirements

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

Marking requirements

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

(a) the class of the wheat; and

(b) the grade.

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

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

(a) classes shall be --
(i) B in the case of Bread Wheat; and

(ii) O in the case of Other Wheat.

(b) grades shall be --

(i) 1 in the case of Grade 1;

(ii) 2 in the case of Grade 2;

(iii) 3 in the case of Grade 3;

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

(v) UT in the case of Utility Grade.

PART III

SAMPLING

Taking of sample

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

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

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

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

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

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

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

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

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

Sampling if contents differ

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

(a) the bags concerned shall be placed separately;

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

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

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

Working sample

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

PART IV

DETERMINATION OF OTHER SUBSTANCES

Determination of undesirable odours and harmful substances

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

(a) it contains a substance that renders the wheat unfit for human consumption or for processing into or for utilisation as food or feed such as poisonous seeds, stones, glass, metal, coal or dung; and

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

PART V

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

Determination of class

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

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

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

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

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

(e) Such percentage represents the percentage of all the cultivars that belong to the same class in the consignment.

Determination of the hectolitre mass

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

Determination of moisture content

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

Determination of protein content

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

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

(b) the results thus obtained are in accordance (± 0,3 percent) with the results obtained by the Dumas Combustion Analysis Method [the latest revision of the AACCI (American Association of Cereal Chemists International) Method 46-30].

Determination of falling number in wheat

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

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

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

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

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

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

PART VI

DETERMINATION OF PERCENTAGE DEVIATIONS

Determination of percentage screenings

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

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

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

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

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

Determination of the percentage heavily frost-damaged wheat

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

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

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

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

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

Determination of the percentages other grain and unthreshed ears

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

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

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

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

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

Determination of the percentage foreign matter

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

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

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

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

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

Determination of the percentage damaged wheat

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

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

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

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

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

Determination of the percentage heat-damaged wheat

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

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

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

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

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

Determination of percentage field fungi infected wheat

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

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

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

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

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

Determination of percentage storage fungi infected wheat

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

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

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

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

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

PART VII

Offence and penalties

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

ANNEXURE

TABLE 1

STANDARDS FOR GRADES OF BREAD WHEAT

Nature of deviation	**Maximum percentage permissible deviation (m/m)**				
	Grade 1	**Grade 2**	**Grade 3**	**Grade 4**	**Utility Grade**
1	**3**	**4**	**5**	**6**	**7**
(a) Heavily frost-damaged kernel	5	5	5	5	10
(b) Field fungi infected kernels	2	2	2	2	2
(c) Storage fungi infected kernels	0,5	0,5	0,5	0,5	0,5
(d) Screenings	3	3	3	4	10
(e) Other grain and unthreshed ears	1	1	1	1	4
(f) Gravel, stones and turf.	0,5	0,5	0,5	0,5	0,5
(g) Foreign matter including gravel, stones and turf: Provided that such deviations are individually within the limits specified in item (f).	1	1	1	1	3
(h) Heat-damaged kernels	0,5	0,5	0,5	0,5	0,5
(i) Damaged kernels, including heat-damaged kernels: Provided that such deviations are individually within the limit specified in item (h) and provided further that the minimum falling number value prescribed in regulation 6(3) for the grade concerned is at least complied with.	2	2	2	2	5
(j) Deviations in items (d), (e), (g) and (i) collectively: Provided that such deviations are individually within the limits of the said items.	5	5	5	5	10

DEPARTMENT OF AGRICULTURE, FORESTRY AND FISHERIES

NO. 1218 **07 OCTOBER 2016**

AGRICULTURAL PRODUCT STANDARDS ACT 1990

(ACT No. 119 OF 1990)

AMENDMENT: REGULATIONS REGARDING THE GRADING, PACKING AND MARKING OF BREAD WHEAT INTENDED FOR SALE IN THE REPUBLIC OF SOUTH AFRICA

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

(a) made the regulations in the Schedule; and

(b) determined that the said regulations shall come into operation on the date of publication thereof.

SCHEDULE

In this Schedule "the Regulations" means the regulations published by Government Gazette No. 39627 Notice No.R 64 of 29 January 2016.

1. Amendment of regulation 4 of the Regulations

Regulation 4 of the Regulations is hereby amended by the substitution for paragraph (g) of subregulation (1) of the following paragraph:

"(g) be free from glass, metal, coal or dung;"