



ARGENTINE WHEAT

INSTITUTIONAL QUALITY REPORT

2015 | 2016 CROP

trigoargentino.com.ar

WHEAT (TRITICUM AESTIVUM)

2015/2016 GROWING SEASON

FINAL CONSIDERATIONS AND SAMPLING STRUCTURE

In the 2015-2016 growing season, wheat grain yields were good but protein contents were unprecedentedly low. There have never been such low protein levels in Argentina.

National production is estimated at 11.26 million tons; down 12.3% from the 2014/2015 season's 13.79 million tons. 4.35 million hectares were planted and 3.93 were harvested. Average national yield was 2.864 kg/h, down 51 kg/h from the national average of recent growing seasons.

It was a warmer year with very little frost, when compared to historical statistics.

Diseases were reported in the center and north, but not in the south of the wheat growing area. Pests spread thanks to

favorable humidity and temperatures, which added to cultivars' lack of genetic resistance. Pest infestation occurred early and continued along the cycle. There were severe cases of leaf rust (*Puccinia triticina*) and of stem rust (*Puccinia graminis*) and some yellow spot and wheat fusarium head blight. Infestation negatively impacted on yields and on the grain commercial quality.

Little technology was applied resulting in large differences of minimum and maximum yields in the same region. Protein and gluten contents were also affected: high percentages of white belly (low protein index) due to little or no N fertilization, bleaching or N washing. Nitrogen level was below average due to heavy rains produced by El Niño, high water tables, cloudy and cool days when grain was filling.

The central area of the country suffered heavy rains that negatively affected harvest, reduced grain weight and, in some cases, hail led to total loss of the crop.

PLANTED ACREAGE, HARVESTED ACREAGE, PRODUCTION AND YIELD, BY SUB-REGIONS

Based on data from Ministerio de Agroindustria de la Nación. 2015-2016 Crop

SUBREGION	PLANTED (HA) AREA	HARVESTED (HA) AREA	YIELD (KG/HA)	PRODUCTION (TN)
I	456.673	420.343	2.649	1.113.655
II North	551.108	468.745	3.644	1.707.883
II South	496.285	437.969	3.803	1.665.706
III	234.050	225.750	3.132	707.051
IV	352.821	341.359	4.015	1.370.586
V North	673.780	578.640	2.319	1.341.850
V South	961.125	887.125	2.729	2.420.891
NEA	236.755	211.505	1.748	369.720
NOA	390.002	359.642	1.566	563.140
NATIONAL	4.352.598	3.931.077	2.864	11.260.482

SAMPLING

3.137 PRIMARY SAMPLES

WHEAT ANALYSIS

230 LOCALITY COMPOSITE SAMPLES

WHEAT ANALYSIS

FLOUR ANALYSIS

9 SUBREGION COMPOSITE SAMPLES

WHEAT ANALYSIS

FLOUR ANALYSIS

SAMPLING STRUCTURE

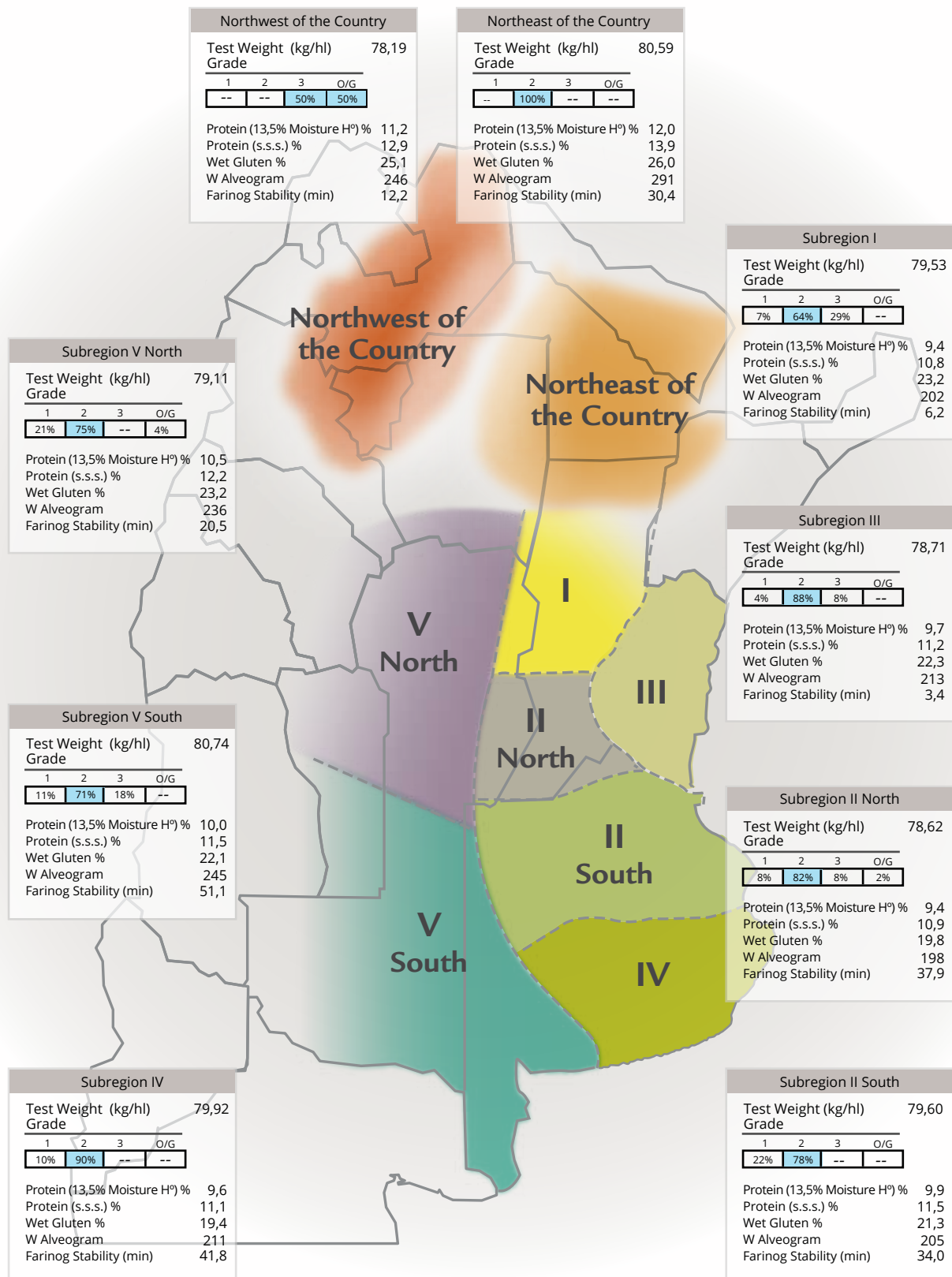
SUBREGION	LOCALITY COMPOSITE	SAMPLING (TONS)	PRODUCTION (TONS)	PRODUCTION SAMPLED (%)
I	14	49.000	1.113.655	4,40
II North	61	246.010	1.707.883	14,40
II South	23	79.000	1.665.706	4,74
III	25	82.760	707.051	11,70
IV	21	81.332	1.370.586	5,93
V North	24	111.141	1.341.850	8,28
V South	55	181.135	2.420.891	7,48
NEA	3	10.000	369.720	2,70
NOA	4	14.000	563.140	2,49
TOTALS	230	854.378	11.260.482	6,90

ARGENTINE WHEAT

Main Quality Parameters

Main Quality Parameters

Wheat



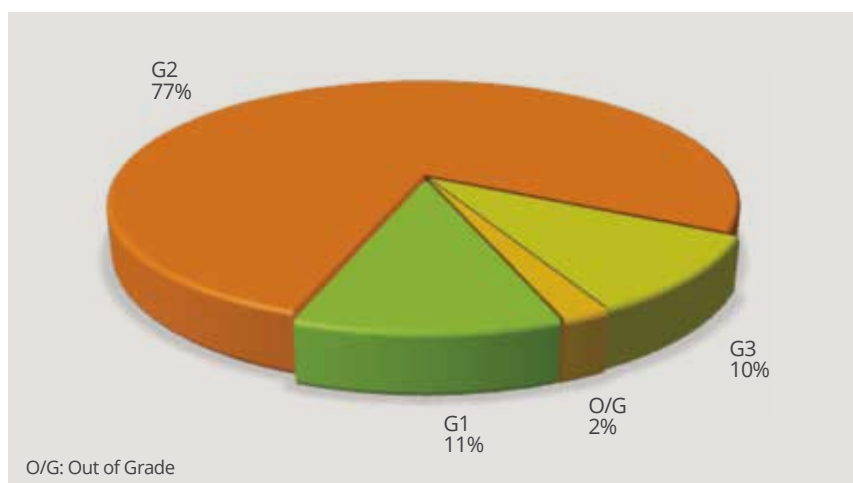
NATIONAL AVERAGES

*Weighted averages by tons
produced in each region*

*National Averages
Wheat*

WHEAT ANALYSIS	Minimum	Maximum	Average
Test Weight (kg/hl)	78,61	80,74	79,63
Total Damaged Kernels (%)	0,13	4,94	0,56
Foreign Material (%)	0,19	0,58	0,37
Shrunken and Broken Kernels (%)	0,32	0,74	0,46
Yellow Berry Kernels (%)	2,74	22,23	7,97
Protein (13,5% Moisture) (%)	9,4	12,0	9,9
Protein (s.s.s.) (%)	10,8	13,9	11,5
Weight of 1000 Kernels (gr.)	30,28	37,03	34,08
Ash (% dry basis)	1,604	2,042	1,758

GRADE DISTRIBUTION



FLOUR ANALYSIS		Minimum	Maximum	Average
MILLING	Wet Gluten (%)	19,4	26,0	21,8
	Dry Gluten (%)	7,0	9,7	7,9
	Falling Number (sec.)	224	439	400
	Flour Yield (%)	41,4	63,0	55,9
	Ash (dry basis) (%)	0,519	0,681	0,567
FARINOGRAM	Water Absorption (14% H°) (%)	52,7	56,7	54,6
	Development Time (min.)	2,3	23,6	13,2
	Stability (min.)	3,4	51,1	31,7
	Degree of Softening (12 min.)	7	77	29
ALVEOGRAM	P (mm)	75	104	92
	L (mm)	52	97	66
	W Joules x 10-4	198	291	222
	P / L	0,81	2,03	1,39

SUBREGION I – ANALYSIS RESULTS

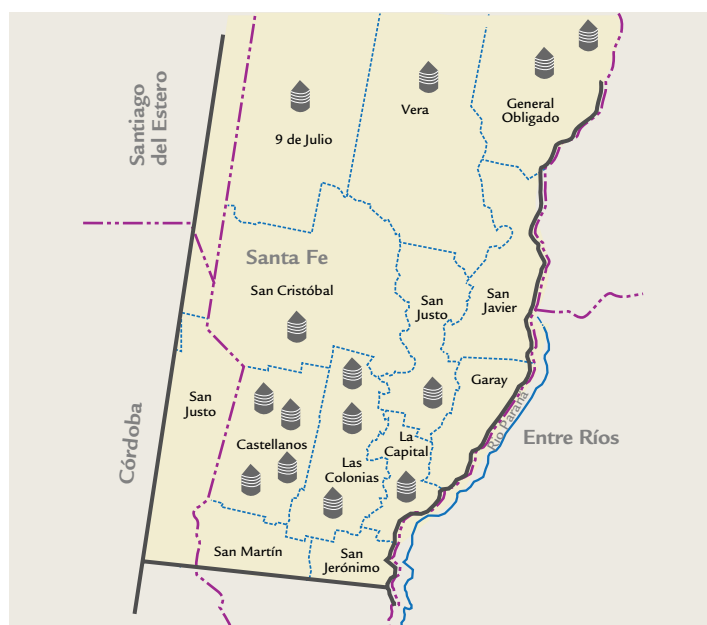
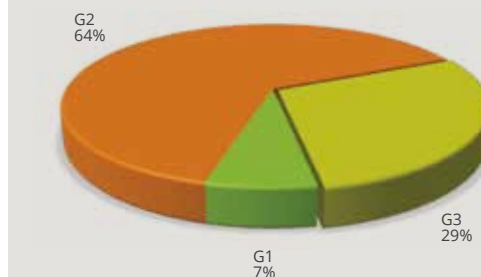
Weighted averages by tons of sample sets per location

Wheat

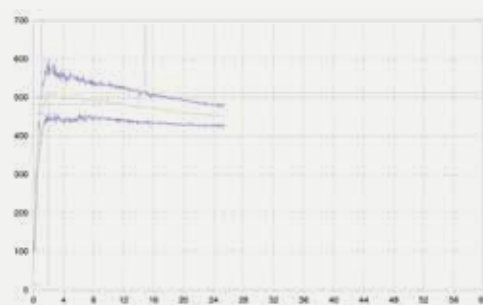
WHEAT ANALYSIS	Minimum	Maximum	Average
Test Weight (kg/hl)	76,10	81,20	79,53
Total Damaged Kernels (%)	0,18	0,88	0,47
Foreign Material (%)	0,10	0,32	0,19
Shrunken and Broken Kernels (%)	0,16	0,86	0,40
Yellow Berry Kernels (%)	11,60	32,00	22,23
Protein (13,5% Moisture) (%)	8,8	10,3	9,4
Protein (s.s.s.) (%)	10,2	11,9	10,8
Weight of 1000 Kernels (gr.)	29,75	40,30	33,65
Ash (% dry basis)	1,605	1,965	1,807

Total damaged kernels includes 0,07 % green kernels, 0,11 % frosty kernels, 0,03% sprouted kernels, 0,05% insect chewed kernels and 0,21% calcinated kernels.

GRADE DISTRIBUTION

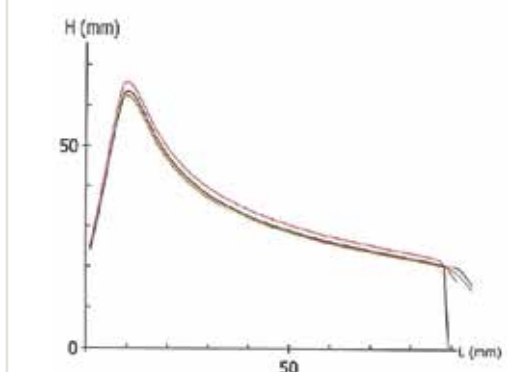


FARINOGRAM



FLOUR ANALYSIS		Minimum	Maximum	Average
MILLING	Wet Gluten (%)	21,5	26,1	23,2
	Dry Gluten (%)	7,5	9,6	8,3
	Falling Number (sec.)	217	462	407
	Flour Yield (%)	47,0	51,0	48,6
	Ash (dry basis) (%)	0,575	0,645	0,615
FARINOGRAM	Water Absorption (14% H°) (%)	53,4	57,3	56,0
	Development Time (min.)	1,5	11,6	4,4
	Stability (min.)	1,8	15,1	6,2
	Degree of Softening (12 min.)	49	134	77
ALVEOGRAM	P (mm)	58	81	75
	L (mm)	69	110	83
	W Joules x 10-4	130	261	202
	P / L	0,70	1,16	0,92

ALVEOGRAM



These results were elaborated with 14 composite samples prepared proportionally from 323 primary samples (farmer deliveries).

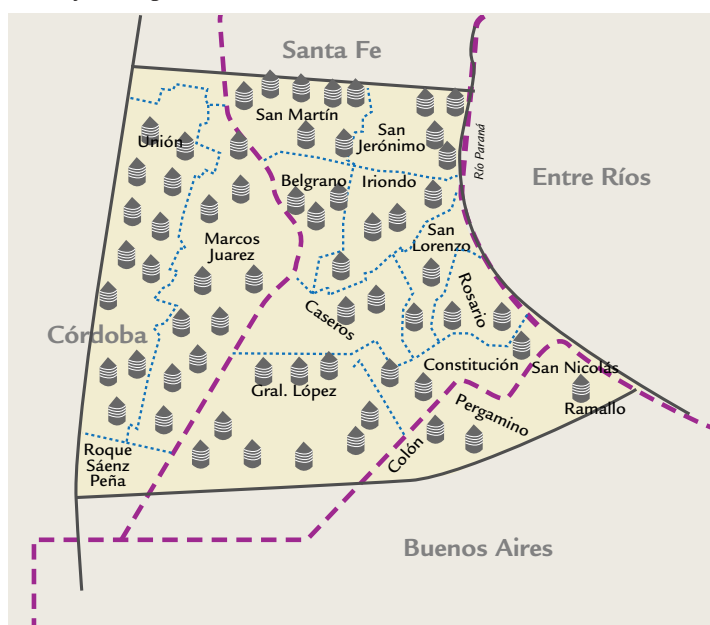
SUBREGION II NORTH – ANALYSIS RESULTS

Weighted averages by tons of sample sets per location

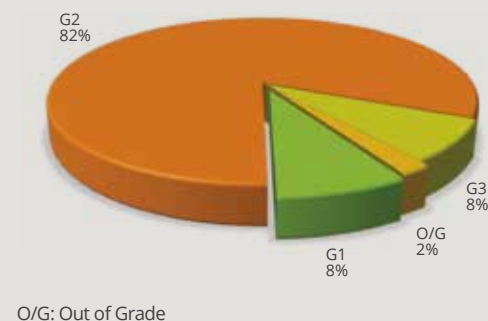
Wheat

WHEAT ANALYSIS	Minimum	Maximum	Average
Test Weight (kg/hl)	76,50	81,10	78,62
Total Damaged Kernels (%)	0,00	3,60	0,46
Foreign Material (%)	0,10	1,30	0,29
Shrunken and Broken Kernels (%)	0,00	1,20	0,46
Yellow Berry Kernels (%)	0,60	33,80	12,38
Protein (13,5% Moisture) (%)	8,4	10,5	9,4
Protein (s.s.s.) (%)	9,7	12,1	10,9
Weight of 1000 Kernels (gr.)	26,50	35,30	32,30
Ash (% dry basis)	1,585	1,945	1,775

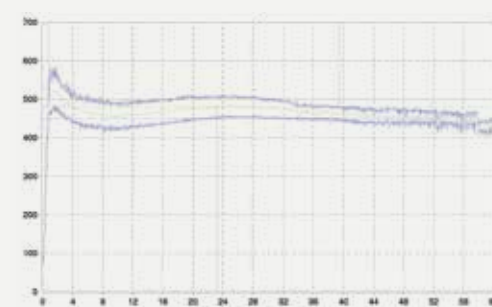
Total damaged kernels includes 0,21% germ-chewed kernel, 0,11% sprouted kernels, 0,05% insect chewed kernels, 0,04% calcinated kernels, 0,03% frosty kernels y 0,02% green kernels.



GRADE DISTRIBUTION

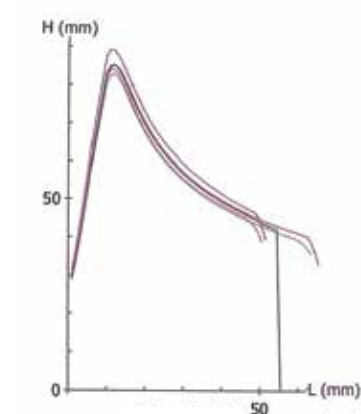


FARINOGRAM



FLOUR ANALYSIS		Minimum	Maximum	Average
MILLING	Wet Gluten (%)	15,1	25,1	19,8
	Dry Gluten (%)	5,3	9,2	7,2
	Falling Number (sec.)	269	451	401
	Flour Yield (%)	47,0	63,9	56,2
	Ash (dry basis) (%)	0,445	0,585	0,531
FARINOGRAM	Water Absorption (14% H°) (%)	50,6	55,2	52,7
	Development Time (min.)	1,2	39,0	18,9
	Stability (min.)	1,5	59,4	37,9
	Degree of Softening (12 min.)	0	91	22
ALVEOGRAM	P (mm)	74	118	93
	L (mm)	27	91	54
	W Joules x 10-4	120	296	198
	P / L	1,00	3,63	1,86

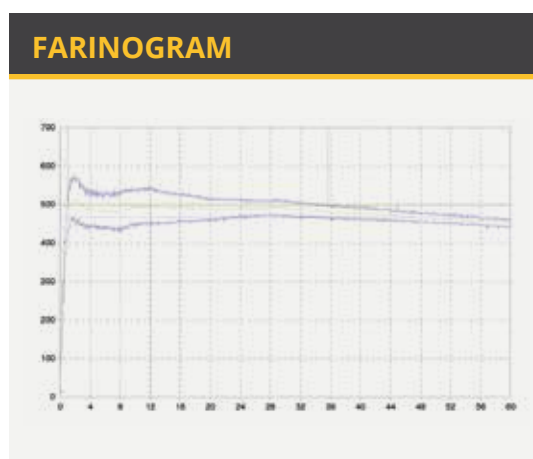
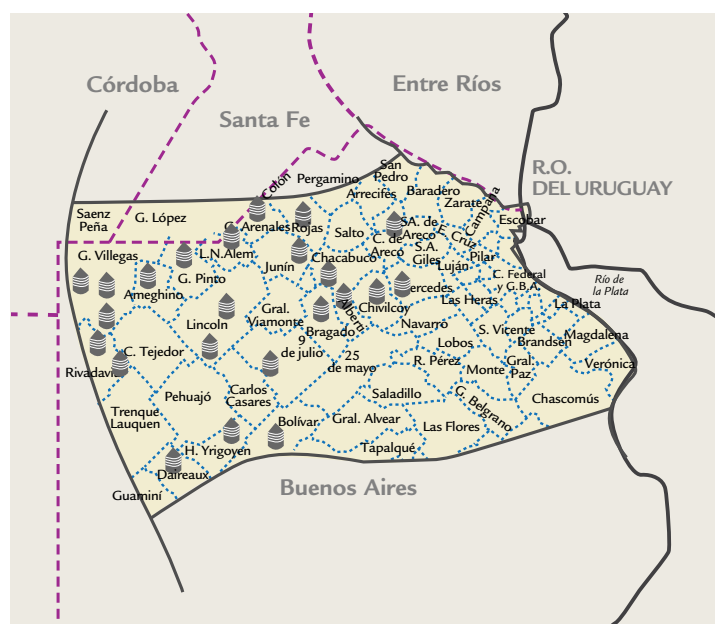
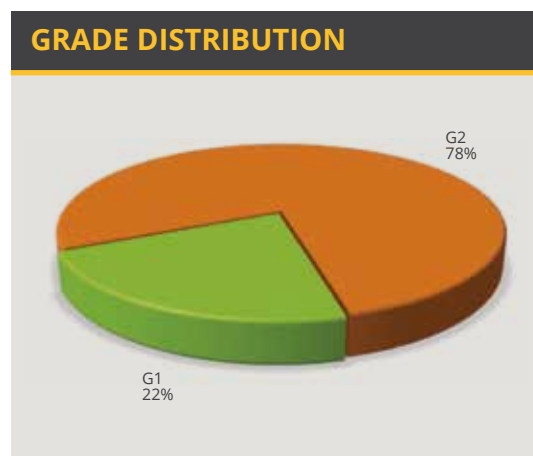
ALVEOGRAM



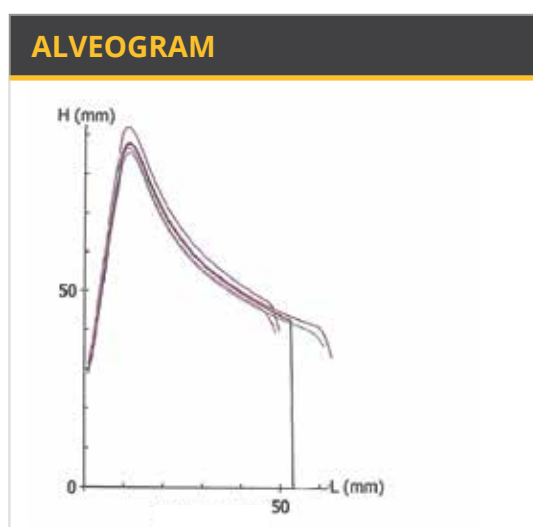
These results were elaborated with 61 composite samples prepared proportionally from 461 primary samples (farmer deliveries).

WHEAT ANALYSIS	Minimum	Maximum	Average
Test Weight (kg/hl)	76,35	82,40	79,60
Total Damaged Kernels (%)	0,07	0,64	0,26
Foreign Material (%)	0,06	0,70	0,30
Shrunken and Broken Kernels (%)	0,10	0,62	0,32
Yellow Berry Kernels (%)	0,00	6,34	2,99
Protein (13,5% Moisture) (%)	8,5	11,0	9,9
Protein (s.s.s.) (%)	9,8	12,7	11,5
Weight of 1000 Kernels (gr.)	28,54	37,06	33,73
Ash (% dry basis)	1,539	1,864	1,689

Total damaged kernels includes, 0,04% green kernels, 0,01% frosty kernels, 0,03% sprouted kernels, 0,07% calcinated and 0,11 % insect chewed kernels.



FLOUR ANALYSIS		Minimum	Maximum	Average
MILLING	Wet Gluten (%)	16,7	24,9	21,3
	Dry Gluten (%)	6,2	9,2	7,9
	Falling Number (sec.)	346	559	417
	Flour Yield (%)	63,0	63,0	63,0
	Ash (dry basis) (%)	0,509	0,646	0,557
FARINOGRAM	Water Absorption (14% H ² O) (%)	50,8	56,3	53,9
	Development Time (min.)	2,8	20,0	12,4
	Stability (min.)	5,5	59,2	34,0
	Degree of Softening (12 min.)	0	53	19
ALVEOGRAM	P (mm)	63	120	97
	L (mm)	33	75	52
	W Joules x 10-4	138	266	205
	P / L	0,84	3,64	2,03



These results were elaborated with 23 composite samples prepared proportionally from 300 primary samples (farmer deliveries).

SUBREGION III – ANALYSIS RESULTS

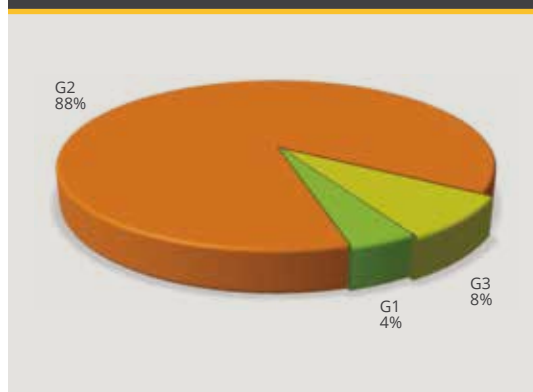
Weighted averages by tons of sample sets per location

Wheat

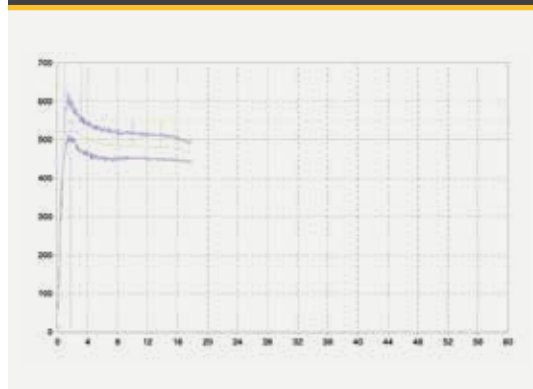
WHEAT ANALYSIS	Minimum	Maximum	Average
Test Weight (kg/hl)	75,70	80,40	78,71
Total Damaged Kernels (%)	0,09	1,07	0,53
Foreign Material (%)	0,09	0,72	0,40
Shrunken and Broken Kernels (%)	0,20	0,94	0,53
Yellow Berry Kernels (%)	9,30	20,70	15,25
Protein (13,5% Moisture) (%)	8,8	10,5	9,7
Protein (s.s.s.) (%)	10,2	12,1	11,2
Weight of 1000 Kernels (gr.)	33,20	38,00	35,31
Ash (% dry basis)	1,370	1,950	1,644

Total damaged kernels includes, green kernels 0,04%, sprouted kernels 0,31%, calcinated kernels 0,09%, and germ-chewed kernels 0,09%.

GRADE DISTRIBUTION

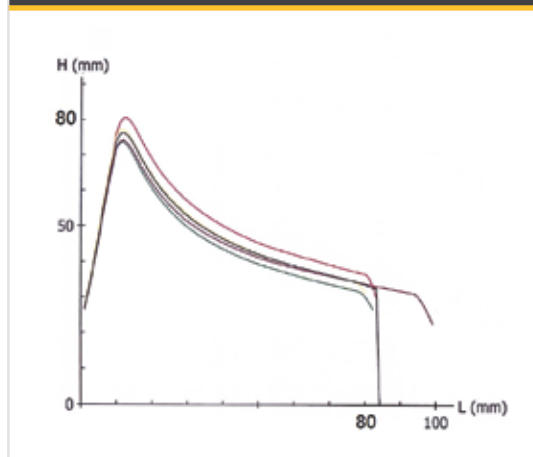


FARINOGRAM



FLOUR ANALYSIS		Minimum	Maximum	Average
MILLING	Wet Gluten (%)	19,0	25,4	22,3
	Dry Gluten (%)	7,0	9,2	8,1
	Falling Number (sec.)	371	471	431
	Flour Yield (%)	46,0	50,0	47,5
	Ash (dry basis) (%)	0,495	0,745	0,588
FARINOGRAM	Water Absorption (14% H ^o) (%)	53,1	57,2	55,5
	Development Time (min.)	1,4	9,8	2,3
	Stability (min.)	1,8	16,5	3,4
	Degree of Softening (12 min.)	47	96	67
ALVEOGRAM	P (mm)	67	101	78
	L (mm)	59	110	82
	W Joules x 10-4	174	251	213
	P / L	0,61	1,71	0,98

ALVEOGRAM



These results were elaborated with 25 composite samples prepared proportionally from 484 primary samples (farmer deliveries).

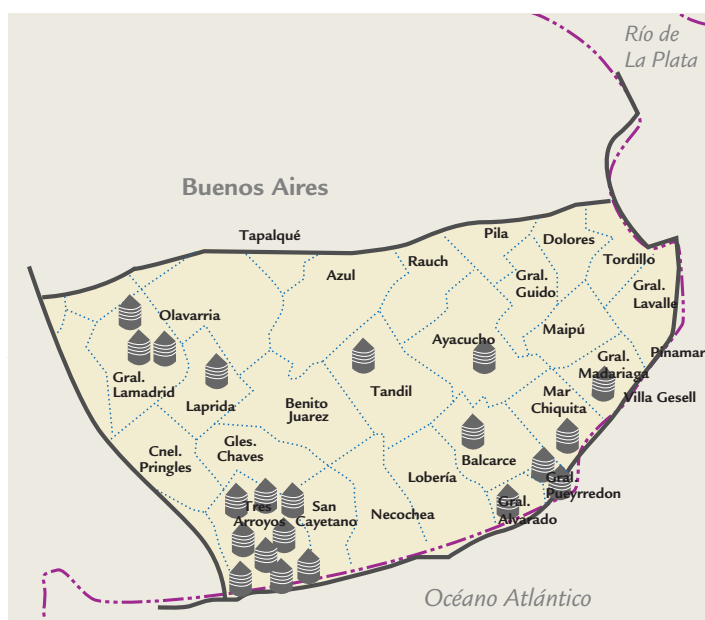
SUBREGION IV – ANALYSIS RESULTS

Weighted averages by tons of sample sets per location

Wheat

WHEAT ANALYSIS	Minimum	Maximum	Average
Test Weight (kg/hl)	76,10	83,95	79,92
Total Damaged Kernels (%)	0,00	0,38	0,13
Foreign Material (%)	0,06	0,60	0,32
Shrunken and Broken Kernels (%)	0,06	0,86	0,41
Yellow Berry Kernels (%)	0,00	12,80	4,35
Protein (13,5% Moisture) (%)	8,80	10,70	9,6
Protein (s.s.s.) (%)	10,20	12,40	11,1
Weight of 1000 Kernels (gr.)	33,00	44,30	37,03
Ash (% dry basis)	1,328	1,807	1,604

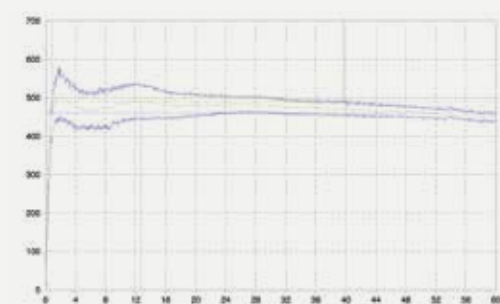
Total damaged kernels includes, germ-chewed kernels 0,07 %, sprouted kernels 0,02%, insect chewed kernels 0,02, green kernels 0,01 %, and heat damaged 0,01%.



GRADE DISTRIBUTION

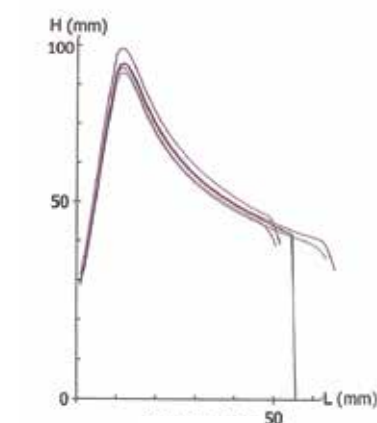


FARINOGRAM



FLOUR ANALYSIS		Minimum	Maximum	Average
MILLING	Wet Gluten (%)	17,80	23,10	19,4
	Dry Gluten (%)	6,40	8,30	7,0
	Falling Number (sec.)	345,00	439,00	393
	Flour Yield (%)	58,80	56,60	41,4
	Ash (dry basis) (%)	0,482	0,644	0,519
FARINOGRAM	Water Absorption (14% H°) (%)	51,90	56,60	54,0
	Development Time (min.)	2,90	34,70	12,7
	Stability (min.)	7,00	59,30	41,8
	Degree of Softening (12 min.)	0,00	67,00	16
ALVEOGRAM	P (mm)	83,00	127,00	100
	L (mm)	37,00	67,00	52
	W Joules x 10-4	175,00	243,00	211
	P / L	1,27	2,84	1,97

ALVEOGRAM



These results were elaborated with 21 composite samples prepared proportionally from 375 primary samples (farmer deliveries).

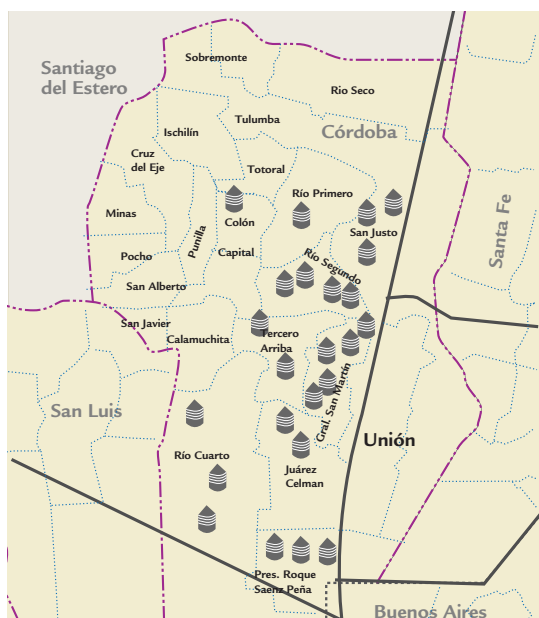
SUBREGION V NORTH – ANALYSIS RESULTS

Weighted averages by tons of sample sets per location

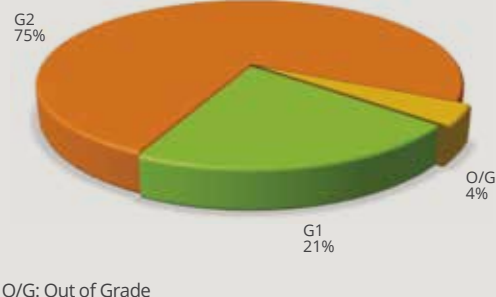
Wheat

WHEAT ANALYSIS	Minimum	Maximum	Average
Test Weight (kg/hl)	76,80	80,80	79,11
Total Damaged Kernels (%)	0,13	1,56	0,51
Foreign Material (%)	0,09	1,60	0,29
Shrunken and Broken Kernels (%)	0,07	0,84	0,53
Yellow Berry Kernels (%)	0,40	13,50	3,57
Protein (13,5% Moisture) (%)	8,6	11,7	10,5
Protein (s.s.s.) (%)	9,9	13,5	12,2
Weight of 1000 Kernels (gr.)	30,03	41,27	33,24
Ash (% dry basis)	1,466	2,282	1,813

Total damaged kernels includes 0,05% green kernels, 0,03% frosty kernels, 0,13% sprouted kernels, 0,10% calcinated kernels, 0,10% insect chewed kernels and 0,10% germ-chewed kernel.

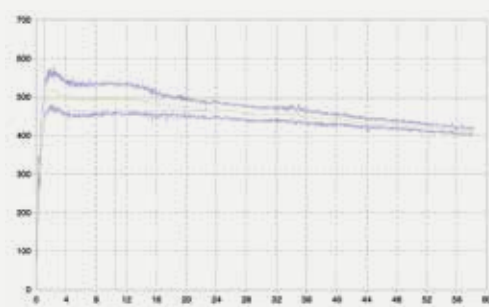


GRADE DISTRIBUTION



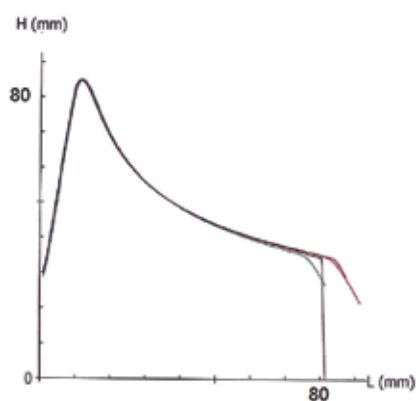
O/G: Out of Grade

FARINOGRAM



FLOUR ANALYSIS		Minimum	Maximum	Average
MILLING	Wet Gluten (%)	16,4	27,9	23,2
	Dry Gluten (%)	6,7	10,0	8,5
	Falling Number (sec.)	380	497	439
	Flour Yield (%)	55,0	67,0	58,7
	Ash (dry basis) (%)	0,548	0,675	0,614
FARINOGRAM	Water Absorption (14% H°) (%)	50,0	59,0	54,2
	Development Time (min.)	1,2	24,0	10,4
	Stability (min.)	2,1	45,6	20,5
	Degree of Softening (12 min.)	6	84	33
ALVEOGRAM	P (mm)	66	118	81
	L (mm)	43	109	83
	W Joules x 10-4	156	297	236
	P / L	0,65	2,57	1,05

ALVEOGRAM



These results were elaborated with 24 composite samples prepared proportionally from 146 primary samples (farmer deliveries).

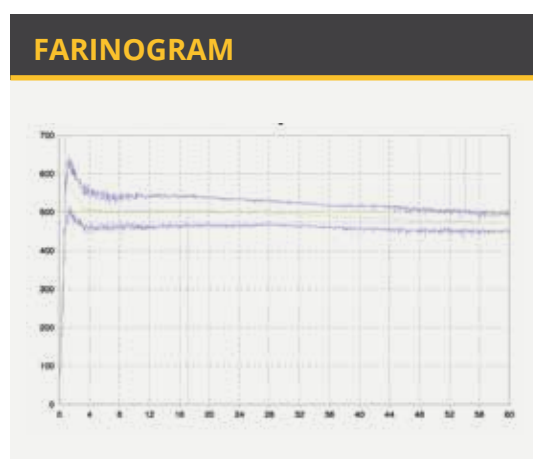
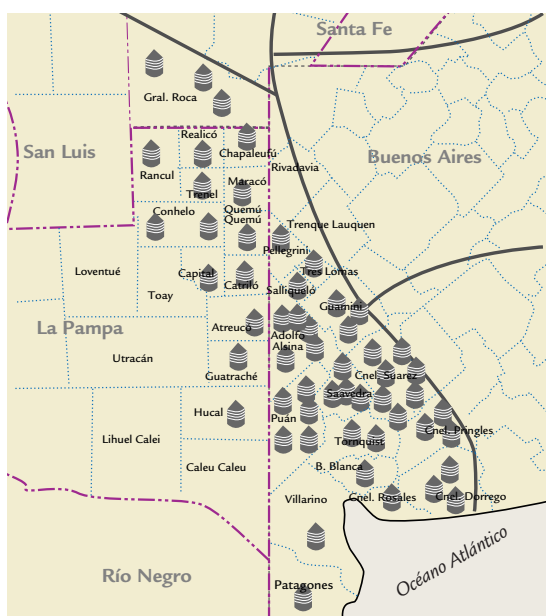
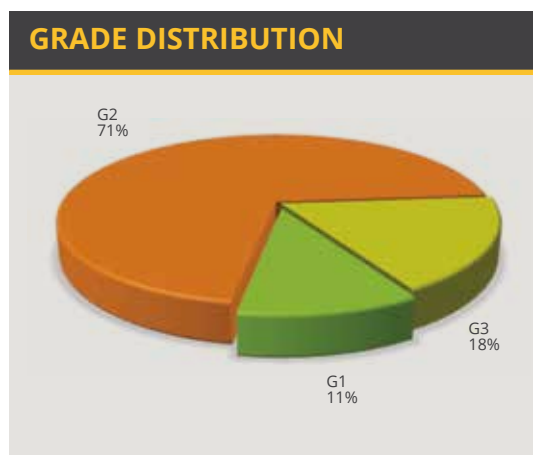
SUBREGION V SOUTH – ANALYSIS RESULTS

Weighted averages by tons of sample sets per location

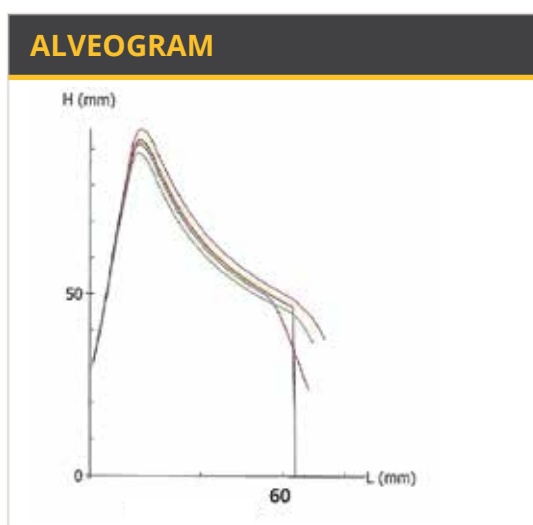
Wheat

WHEAT ANALYSIS	Minimum	Maximum	Average
Test Weight (kg/hl)	76,40	83,50	80,74
Total Damaged Kernels (%)	0,00	1,16	0,18
Foreign Material (%)	0,12	1,58	0,58
Shrunken and Broken Kernels (%)	0,08	1,12	0,49
Yellow Berry Kernels (%)	0,40	15,80	5,75
Protein (13,5% Moisture) (%)	9,0	12,0	10,0
Protein (s.s.s.) (%)	10,4	13,9	11,5
Weight of 1000 Kernels (gr.)	29,90	38,30	35,27
Ash (% dry basis)	1,549	2,002	1,809

Total damaged kernels includes, 0,09% sprouted kernels, 0,06 % germ-chewed kernels, 0,02 % insect chewed kernels and 0,01% calcinated.



FLOUR ANALYSIS		Minimum	Maximum	Average
MILLING	Wet Gluten (%)	17,0	29,0	22,1
	Dry Gluten (%)	6,0	10,4	7,9
	Falling Number (sec.)	349	465	408
	Flour Yield (%)	57,5	65,2	60,8
	Ash (dry basis) (%)	0,449	0,642	0,533
FARINOGRAM	Water Absorption (14% H°) (%)	52,3	59,0	55,1
	Development Time (min.)	6,0	44,8	17,0
	Stability (min.)	15,8	59,3	51,1
	Degree of Softening (12 min.)	0	44	7
ALVEOGRAM	P (mm)	78	127	104
	L (mm)	33	112	61
	W Joules x 10-4	159	328	245
	P / L	0,81	3,24	1,81



These results were elaborated with 55 composite samples prepared proportionally from 971 primary samples (farmer deliveries).

NORTH OF THE COUNTRY – ANALYSIS RESULTS

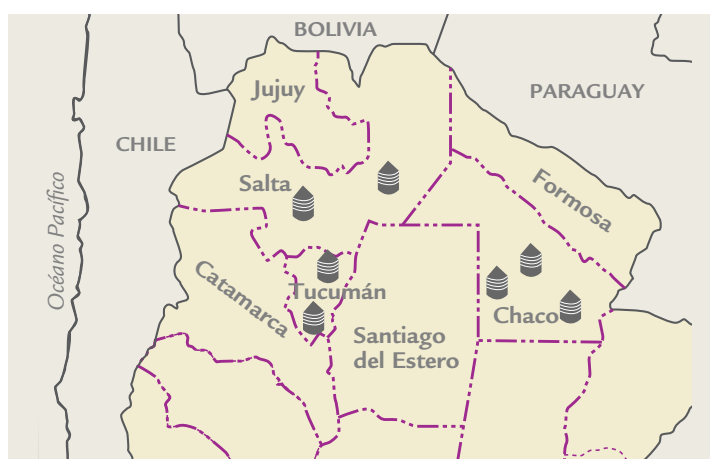
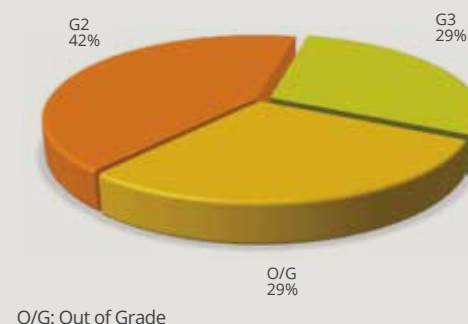
Weighted averages by tons of sample sets per location

Wheat

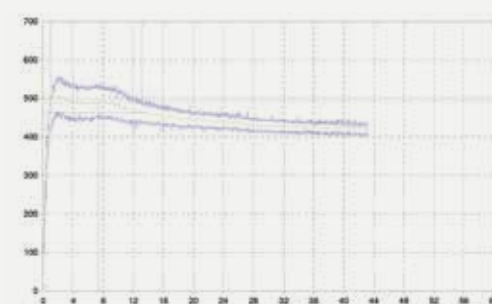
WHEAT ANALYSIS	Minimum	Maximum	Average
Test Weight (kg/hl)	77,90	81,25	79,78
Total Damaged Kernels (%)	0,06	9,62	3,02
Foreign Material (%)	0,11	0,94	0,41
Shrunken and Broken Kernels (%)	0,28	0,92	0,58
Yellow Berry Kernels (%)	1,10	6,96	2,88
Protein (13,5% Moisture) (%)	10,7	12,3	11,5
Protein (s.s.s.) (%)	12,4	14,2	13,3
Weight of 1000 Kernels (gr.)	29,20	33,30	31,25
Ash (% dry basis)	1,732	2,064	1,903

Total damaged kernels includes 2,91%, sprouted kernels 0,04 %, green kernels 0,03% frosty kernels, and 0,04 % insect chewed kernels.

GRADE DISTRIBUTION

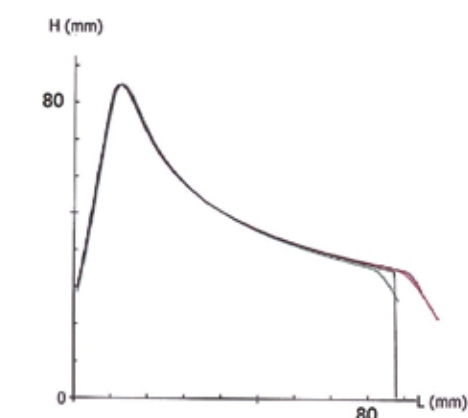


FARINOGRAM



FLOUR ANALYSIS	Minimum	Maximum	Average
MILLING	Wet Gluten (%)		
	24,0	26,9	25,5
	Dry Gluten (%)		
	8,9	10,0	9,5
	Falling Number (sec.)		
FARINOGRAM	170	432	283
	Flour Yield (%)		
	63,0	63,0	63,0
	Ash (dry basis) (%)		
	0,612	0,695	0,673
ALVEOGRAM	Water Absorption (14% H ^o) (%)		
	54,9	57,3	56,5
	Development Time (min.)		
	3,8	20,0	9,1
	Stability (min.)		
ALVEOGRAM	11,0	48,9	19,8
	Degree of Softening (12 min.)		
	3	82	41
	P (mm)		
	70	97	85
ALVEOGRAM	L (mm)		
	66	108	89
	W Joules x 10 ⁻⁴		
	233	315	265
	P / L		
	0,66	1,47	1,00

ALVEOGRAM



These results were elaborated with 7 composite samples prepared proportionally from 77 primary samples (farmer deliveries).

DURUM WHEAT – NATIONAL AVERAGES

Analysis Results

Averages
Durum Wheat

WHEAT ANALYSIS	Minimum	Maximum	Average
Test Weight (kg/hl)	71,40	84,15	79,90
Total Damaged Kernels (%)	0,00	14,82	1,52
Foreign Material (%)	0,18	2,24	0,64
Shrunken and Broken Kernels (%)	0,06	1,10	0,39
Vitreous Kernels (%)	2,00	81,00	37,10
Wheat (Triticum aestivum) (%)	0,18	13,92	2,64
Protein (13,5% Moisture) (%)	8,80	13,10	10,93
Protein (s.s.s.) (%)	10,2	15,1	12,6
Weight of 1000 Kernels (gr.)	38,40	56,00	45,71
Ash (% dry basis)	1,463	1,936	1,737

Total damaged kernels includes 0,97 % sprouted kernels, 0,05 % insect chewed kernels, 0,47 % germ-chewed and 0,04 calcinated kernels.

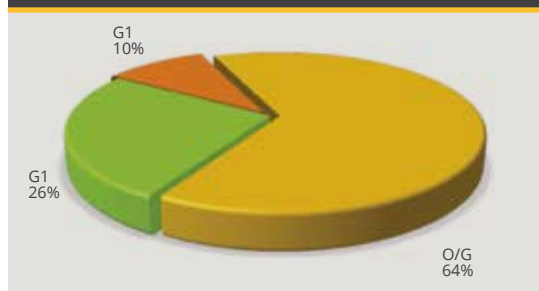
2015 / 2016 CROP

Planted Area (ha)	74.640
Harvested Area (ha)	74.365
Average Yeld (kg/ha)	3.440
Production (tn)	256.276

Source: Ministerio de Agroindustria de la Nación.

O/G: Out of Grade
Observation: O/S (Out Standard) for condition:
G1: 45%; G2: 25%; G3: 30%

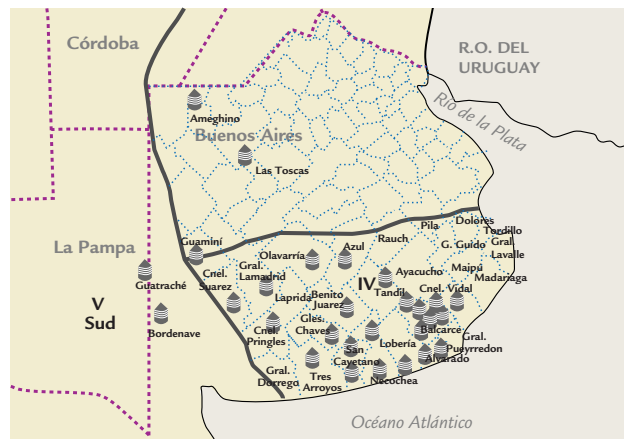
GRADE DISTRIBUTION



SEMOLIN ANALYSIS

	Minimum	Maximum	Average
Falling Number (sec.)	216	610	450
Color (b)	18,9	24,0	21,2
Wet Gluten (%)	24,2	29,3	26,6
Gluten Index (%)	49	94	73
Farinogram Energy Level	26,2	34,1	28,8
Farinogram Degree Softening (%)	23	32	27

These results were elaborated with 31 composite samples.



NATIONAL SUMMARY BY SUBREGIONS

Results of all the analyzed variables

Wheat

SUBREGIONS										*PONDERED AVERAGE
I	II N	II S	III	IV	V N	V S	NEA	NOA		
Test Weight (kg/hl)	79,53	78,62	79,60	78,71	79,92	79,11	80,74	80,59	79,19	79,63
Weight of 1000 Kernels (gr.)	33,65	32,30	33,73	35,31	37,03	33,24	35,27	30,28	31,94	34,08
Ash (dry basis) (%)	1,807	1,775	1,689	1,644	1,604	1,813	1,809	2,042	1,804	1,758
Protein (13.5% Moisture) (%)	9,4	9,4	9,9	9,7	9,6	10,5	10,0	12,0	11,2	9,9
Protein (s.s.s.) (%)	10,8	10,9	11,5	11,2	11,1	12,2	11,5	13,9	12,9	11,5
Ash (dry basis) (%)	0,615	0,531	0,557	0,588	0,519	0,614	0,533	0,681	0,668	0,567
Color										
L	85,84	87,02	87,68	87,95	87,74	85,85	87,95	86,83	86,24	87,16
a	-1,35	-1,58	-1,5	-1,78	-1,70	-1,25	-1,77	-1,25	-1,38	-1,55
b	10,07	9,89	8,78	9,60	9,45	9,00	9,51	8,59	8,69	9,38
Moisture (%)	13,39	14,89	15,33	15,01	15,12	15,32	14,89	15,12	14,94	14,90
Protein (%)	9,0	8,4	8,6	8,6	8,3	9,4	8,8	10,6	9,9	8,8
Wet Gluten (%)	23,2	19,8	21,3	22,3	19,4	23,2	22,1	26,0	25,1	21,8
Dry Gluten (%)	8,3	7,2	7,9	8,1	7,0	8,5	7,9	9,7	9,3	7,9
Index Gluten (%)	98	100	99	98	99	99	98	98	98	99
Falling Number (sec.)	407	401	417	431	393	439	408	364	224	400
Zeleny Test (cc)	24	25	29	27	27	28	26	30	32	27
FARINOGRAM										
Water Absorption (%)	56,0	52,7	53,9	55,5	54,0	54,2	55,1	56,1	56,7	54,6
Development Time (min.)	4,4	18,9	12,4	2,3	12,7	10,4	17,0	13,7	5,7	13,2
Stability (min.)	6,2	37,9	34,0	3,4	41,8	20,5	51,1	30,4	12,2	31,7
Degree of Softening	77	22	19	67	16	33	7	20	55	29
Quality Number	100	421	360	136	389	191	256	310	125	277
MIXOGRAM										
Development Time (min.)	5,83	5,65	5,42	5,01	5,38	5,16	5,26	6,00	5,96	5,45
ALVEOGRAM										
P (mm)	75	93	97	78	100	81	104	95	77	92
L (mm)	83	54	52	82	52	83	61	77	97	66
G	19,5	16,7	17,4	20,4	17,0	20,0	20,2	19,9	22,9	18,9
W (Joules x 10-4)	202	198	205	213	211	236	245	291	246	222
P/L	0,92	1,86	2,03	0,98	1,97	1,05	1,81	1,26	0,81	1,39
Ie %	52,7	57,7	60,8	55,3	58,1	56,7	58,6	63,2	56,2	57,7
W (40) (Joules x 10-4)	128	166	151	140	171	141	176	170	139	157
CONSISTOGRAM										
WA 1700 (%) (Base 15%)	55,9	52,8	52,3	54,6	53,5	55,5	54,9	56,2	55,5	54,2
HYD2200 (%) (Base 15%)	53,4	50,3	49,8	52,1	51,0	53,0	52,4	53,7	53,0	52,0
PrMax (mb)	2.226	2.111	2.412	2.134	2.284	2.274	2.042	2.284	2.263	2.207
PrMax Time (sec.)	93	96	76	111	170	96	106	229	105	110
Tolerance (sec.)	204	422	251	276	289	252	352	401	240	305
Weakening 250 (mb)	488	12	396	183	74	289	25	7	340	186
Weakening 450 (mb)	1104	380	1017	800	709	790	432	479	910	702
RVA										
Maxim Viscosity (RVU)	161,5	214,75	242,08	198,92	244,71	213,25	264,50	194,00	125,42	221,55
Minimum Viscosity (RVU)	82,75	121,42	150,25	129,50	152,29	125,08	174,58	170,08	19,17	134,47
Final Viscosity (RVU)	172,42	226,08	263,42	228,58	268,96	222,08	291,17	207,95	59,50	236,30
BAKING										
Absorption (%)	61	61	61	61	61	61	62	62	62	61
Development Time (min.)	03:00	03:00	03:00	03:00	03:00	03:00	03:30	03:30	03:30	03:08
Fermentation Time (min.)	160	160	160	160	160	160	160	160	160	160
Loaf Volume (cc)	640	580	640	670	608	650	655	650	745	639
Specific Volume	4,8	4,4	4,8	5,0	4,6	5,0	4,9	4,9	5,7	4,8

*Weighted averages by tons produced in each region.

ANALYSIS OF VARIABLES, BY RANGES

Wheat

Tables summarize the analysis of four variables: protein in grain, wet gluten, strength determined by alveograph measurement and farinographic stability.

Each variable was separated in ranges (first column). Averages were estimated for each range for each remaining variables (center column). This last column shows the percentage that corresponds to each range nationwide.

PROTEIN RANGE	Gluten W Stability	Percentage Country
8,0 - 8,9	17,8 158 20,6	5,20
9,0 - 9,9	20,3 203 32,7	59,48
10,0 - 10,9	23,1 240 33,3	26,29
11,0 - 11,9	26,0 276 25,9	6,47
12,0 - 12,9	24,4 264 40,7	2,59

W RANGE	Gluten Protein Stability	Percentage Country
120 - 189	19,0 9,2 32,7	21,21
190 - 249	21,5 9,7 30,9	57,14
250 - 299	23,8 10,5 36,1	19,05
300 - 349	25,8 11,1 46,5	2,60

GLUTEN RANGE	Protein W Stability	Percentage Country
15 - 17,9	8,8 168 36,8	6,96
18,0 - 20,9	9,4 200 36,3	33,48
21,0 - 24,9	9,9 230 31,4	49,57
25,0 - 27,9	11,1 267 22,1	9,57
28,0 - 31,9	11,9 328 38,9	0,43

STABILITY RANGE	Gluten Protein W	Percentage Country
1,0 - 9,9	21,2 9,5 199	24,45
10,0 - 14,9	22,9 10,1 216	5,68
15,0 - 19,9	23,8 10,3 230	3,93
20,0 - 29,9	23,3 10,5 243	10,48
30,0 - 39,9	21,9 10,1 232	10,04
40 - 49,9	21,5 9,9 231	13,10
50 - 59,9	20,6 9,6 217	32,31





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