2012/2013 Crop

ARGENTINE WHEAT

Institutional Quality Report

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- Bolsa de Comercio de Rosario.
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- Cámara Arbitral de Cereales de Entre Ríos.
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- Federación Argentina de la Industria Molinera.
  Argentine Federation of Milling Industry.
- Federación de Centros y Entidades Gremiales de Acopiadores de Cereales.
  Federation of Country Elevators Association.

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  Ministry of Agriculture, Livestock and Fishery.
- Instituto Nacional de Tecnología Agropecuaria (INTA).
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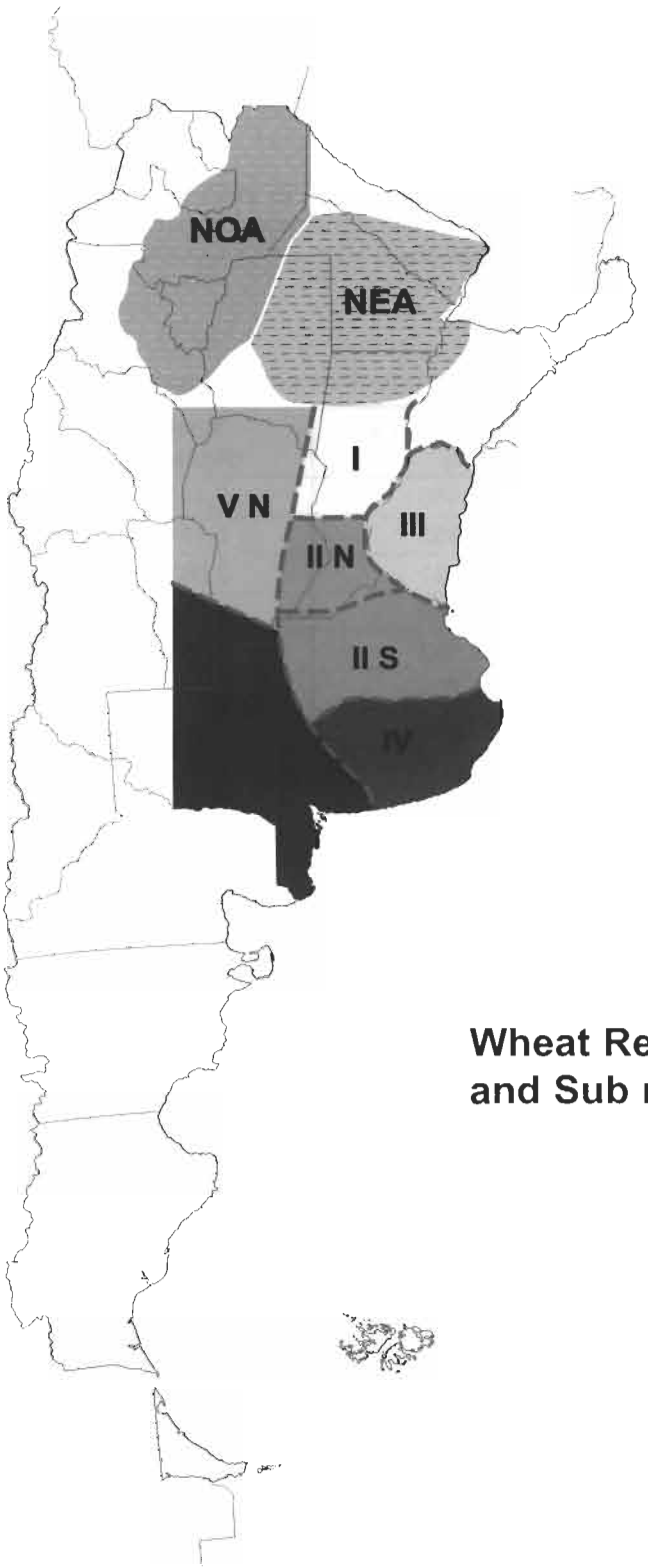


Wheat Region and Sub regions

BREAD WHEAT

Triticum aestivum

Introduction

Wheat crop 2012/13 was characterized by the strong effect of the 'El Niño' phenomenon, which was developed with strong winds, hail and abundant rain storms, significantly above historical values. The season was neither good for wheat nor for the alternative crops such as barley, chickpea and colza.

Sowed, harvested area, yields and production per sub region

Sub region	Sowed Area (ha)	Harvested Area (ha)	Yield (Kg/ha)	Production (tn)
I	340,980	340,980	2,440	831,950
II N	420,753	388,953	3,101	1,206,312
II S	369,851	328,231	2,983	979,012
III	218,290	215,990	2,718	586,958
IV	291,313	280,563	4,194	1,176,651
V N	293,801	292,701	2,795	818,130
V S	766,150	757,500	2,842	2,152,829
Northeast	119,770	102,870	1,513	155,615
Northwest	338,829	320,779	1,213	388,987
National	**3,159,737**	**3,028,567**	**2,739**	**8,296,444**

Based on data from the Ministery of Agriculture, Livestock and Fishery. Crop 2012 - 2013

In the central region there were founded leaf diseases and generalized presence of ear Fusarium, even in treated crops. As a result of cloudy days with low radiation, frosts and heat waves at the beginning of November, there was an incomplete grain filling, so there were small grains and grains with Fusarium in variable percentages. All of this affected yields, commercial and industrial quality of grains, and crop production was lesser than expected according to their appearance. In the main wheat region of Argentina, at the south of Buenos Aires province, there was good sanitary crop condition, except for the presence of Leaf Rust.

Yields across the national wheat area were variable, from 1500 to 4000 kg/ha in the central region and from 3500 to 6000 kg/ha in the southern region, with variations according to crops and sub-regions, allowing sustain national estimate performance of 2739 kg/ha, slightly lower to the 2011/2012 crop (2960 kg/ha).

In the central region, quality was highly affected, with low test weights and damages due to Fusarium. On the other hand, in the southern region of Buenos Aires province, grain filling was very good with high values of 1000 grain weight and high hectoliter weights.

The average test weight in the central region was of 75 kg/hl, 4 points below the previous season, also decreased by washing of grains due to rainfalls. The size of grains, given by the weight of 1000 grains, was of 29g, consistent of small and shrunken grains that did not complete their filling, which would affect flour production. In the south of the region, the average value of 1000 grains was 37g, and test weight reached 80 kg/hl.

Protein in the central region was higher than the two previous seasons, with an average of 12.3%, surpassing the trade base of 11% in 1.3%. In the southern region was lower, with an average of 10.7%.

Gluten, directly related to protein, in the central region averaged 29.6%, 5% higher than the previous season, which is a very good value for industry. In the southern region, average was 24.4%. In general, dough showed a moderate baking strength (average W = 256) and a tendency to extensible (average P/L = 0.80).

Organization and Methodology:

Sampling structure

It was agreed to obtain samples which represent about 4,000 tons each, reaching a total of 186 analysis to be performed.

The sampling was planned proportionally to the territorial division (district or department) sown area, and the average yield registered the last three years, according to the Ministry of Agriculture, Livestock and Fishery data. In accordance with the estimated production resulting, the composite sample number to be obtained by each district or department was determined to achieve a proportional representativeness of each locality.

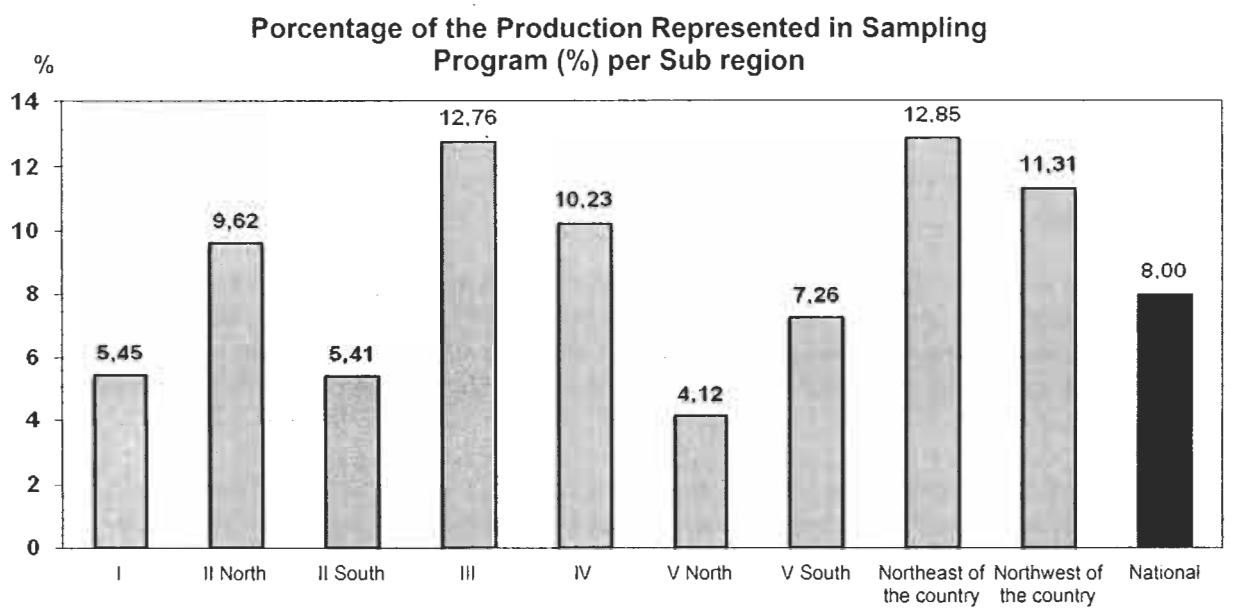
The Argentine Cooperatives Association, the Federation of Country Elevators Association, Argentine Federated Farmers and the Argentine Federation of Milling Industry, through the cooperatives, country elevators and mills selected for each locality, submitted the primary operations samples (trade samples of farmer deliveries) which were starting points to make the locality composite samples, according to instructions given to those in charge of the sampling.

Likewise the National Directorate for Processing and Marketing of Agricultural and Forestry Products. Ministry of Agriculture, Livestock and Fisheries of Argentina bring the support in the sampling

Sub region	Locality Composite	Sampling (tons)	Production (tons)	Production Sampled (%)
I	13	45,350	831,950	5.45
II North	29	116,000	1,206,312	9.62
II South	15	53,000	979,012	5.41
III	21	74,889	586,958	12.76
IV	36	120,345	1,176,651	10.23
V North	8	33,700	818,130	4.12
V South	48	156,191	2,152,829	7.26
NEA	5	20,000	155,615	12.85
NOA	11	44,000	388,987	11.31
TOTALS	**186**	**663,475**	**8,296,444**	**8.00**

Based on data from the Ministry of Agriculture, Livestock and Fishery. Crop 2012 / 2013

These primary samples had to represent between 100 and 250 ton, and be selected so they reflected the zone production conditions as well as possible, being 2.923 samples used for this sampling program, in such a way a sampled tonnage of 8% of the national wheat production, which amounted to 8.296.444 tons, was reached.



Procedure

The primary samples were sent to the respective Arbitration Chambers Laboratories according to the wheat sub region of origin. The Santa Fe Arbitration Chamber received samples from the Sub region I, the Rosario Chamber those from the Sub region II N, the Buenos Aires Chamber those from the Sub regions II S, IV, NW and the NE of the country, the Entre Ríos Chamber those from the Sub region III, the Bahía Blanca Chamber those from the Sub regions IV and V S, and the Córdoba Chamber those from the Sub region V N.

These Arbitration Chambers made **Locality Composite Samples** of 4 kg of wheat, representative of 4000 tons each one. These ones performed the commercial analysis (grade), weight of 1000 kernels, and ash .

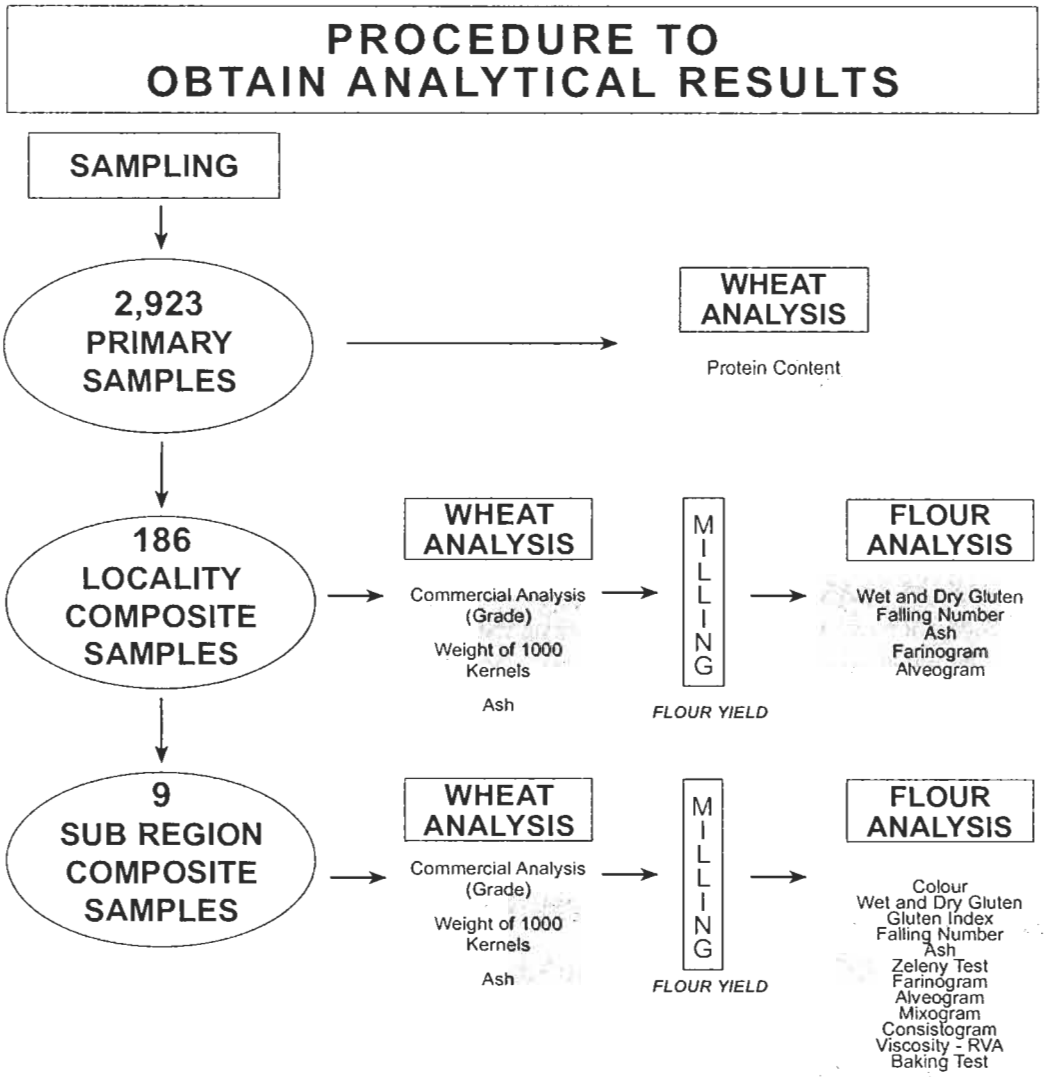
The composite samples were sent to the SENASA Laboratory to carry out the Bühler grinding, reserving a part in order to prepare the Sub region Composite Samples. It was decided to use only one mill for all the composite samples by locality, so as to minimize differences in the flour features due to the grinding.

With the flour resulting from the grinding, the Arbitration Chambers, in this case Buenos Aires, Bahía Blanca and Rosario, carried out the analyses of Falling Number, Gluten, Alveogram, Farinogram and Ash.

Prior to performing the analysis a ring test was carried out among the participating laboratories so that the results could be comparative.

On the other hand, with the locality composite samples portions kept apart, and in proportion to their representativeness, The Arbitration Chambers made the **Composite Sample of each Sub region**, 9 in total, weighing 4 kg each one, and performing Test Weight, Proteins, Ash and Weight of 1000 kernels in wheat. These samples were used by the SENASA to perform the grinding in Bühler mill and then, The Marcos Juarez Experimental Station of INTA carried out the following analyses in flour: Falling Number, Gluten, Ash, Zeleny Test, Alveogram, Farinogram, Mixogram and Baking Test.

The present report was coordinated by the Agrifood Quality Direction of the SENASA.



Methodologies for quality analysis

In order to evaluate the industrial quality of wheat, characteristics of grain, its behavior in milling, different analytical values, alveographic and farinographic curves, and bread quality, are taken into consideration. Agricultural and weather conditions can easily affect quality, and even the most remarkable varieties can present a questionable quality. Consequently any qualitative abnormality must be observed in different environments or periods of cultivation in order to assure that the result is due tothe variety.

Grain characteristics are prominent quality factors in wheat appraisal. To a low test weight corresponds an unsatisfactory milling, low flour yield and inferior quality.

Behavior in the milling is another important aspect in the quality criterion. Wheat of low extraction of flour or high ash content constitutes a real problem. While some areas are favorable for the highest amount of minerals, there are certain varieties which have lower ash content in the grain and, therefore, in the flour.

The quantity and quality of flour proteins are essential to determine the bread quality. Rheologic analysis include indirect determinations of quality such as alveographic, mixographic and farinographic curves which provide the necessary information to evaluate bread force, time for dough development, water absorption and stability or behavior during kneading.

Bread quality of wheat is determined by flour absorption of water, time of kneading, dough aspect, volume of bread, porosity and whiteness of the crumb. All those characteristics constitute the bread value of wheat, being some of them considered in a subjective way and others through equipement.

The volume of bread is one of the most important factors of flour potential force, since it demonstrates the gluten capacity of expansion through gas produced by the contact between yeast and sugars, and at the same time, the ability to hold the gas during the whole expansion.
Wheat with a low loaf volume, or with a high one, but with huge alveolus or holes inside, are not desired, as they are the evidence of weak flours. It is essential to know the flour protein content during baking, since at a low level there will be less expansion and final volume, which is not due to the quality but to the quantity of proteins.

WHEAT

Test Weight (SAGPyA 1262/04 Resolution)
It is an important quality factor around the world and it is influenced by grain shape, uniformity, density and size. The content of foreign material and broken kernels have also an influence on it. To a high Test weight in a certain wheat corresponds high flour yield. It is defined as the weight of 100 litres wheat volume, as is, expressed in kg/hl. It is determined by the use of a Schopper balance.

Moisture (IRAM* 15850)
This test is carried out by previous milling and then drying at 130° C +/- 3° C under normal pressure in an oven with forced air circulation, during an hour.

Foreign material (SAGPyA 1262/04 Resolution)
All kernels or pieces of kernels, other than wheat, and any other inert material.

Total damaged kernels (SAGPyA 1262/04 Resolution)
Kernels or pieces of wheat kernels that are substantially altered in their structure, such us: heat damaged, green, frozen, sprouted, calcinated and germ or insect chewed kernels.

Smutty kernels (SAGPyA 1262/04 Resolution)
Wheat kernels that have been changed into a black mass due to fungus (Tilletia spp.) attack. Kernel external appearance is often round and gray.

Shrunken and broken kernels (SAGPyA 1262/04 Resolution)
Kernels or pieces of kernels that have readily passed through a 1,6 x 9,5 mm oblong-hole sieve. This determination shall be done after separating foreign material, damaged and smutty kernels.

Yellow berry kernels (SAGPyA 1262/04 Resolution)
Kernels with starchy endosperm in more than a half of their structure, showing a yellowish appearance.

Protein Content - 13.5% moisture basis (SAGPyA 1262/04 Resolution - Chemist Method from ICC Nº 105 – IRAM* 15852)
Proteins are complex organic compounds containing nitrogen. Flour proteins are responsible for obtaining gluten, once this one and water were put in contact. Proteins were determined in flour by the Kjeldahl method, while they were quantified in grain by rapid methods based on reflectance and transmittance (NIR - NIRT).

Weight of 1000 kernels (IRAM* 15853)
Its value is related to the quantity of flour that is possible to obtain from a wheat. This analysis is carried out by the counting of kernels using an electronic seed counter, and weighing them. Broken kernels and foreing material are previously removed from the sample by hand-picking.

Ash (Method from ICC Nº 104 – IRAM* 15851)

Ash determination conforms one of the best methods to measure the milling process efficiency. The ash content of certain flour can give an idea about the percentage of bran or minerals that it has.
The mineral matter is found in the residue that remains when the flour is ignited. The organic matters, such as starch, proteins, sugars (carbon hydrates), etc., are ignited, but the mineral matter remains as ash.
Ash content is determined by ignition at 900º C +/- 25º C using furnace until a constant weight is reached.

MILLING (IRAM* 15854 - Part I and II)

Grain must be prepared to reach 15,5 % of moisture, which is the appropriated state to mill, in order to separate the bran from the endosperm. The milling is performed in an automatic experimental MLU–202 Bühler mill.

FLOUR

Moisture (IRAM* 15850)

This test is carried out by drying at 130º C +/- 3º C under normal pressure conditions in an oven with forced air circulation, during an hour.

Gluten (AACC 3812 - IRAM* 15864 3rd edition)

Gluten is a plastic - elastic substance with a yellowish colour wich is isolated by washing the dough with a solution of sodium chloride and subsequently centrifugation to remove the starch and the soluble proteins (albumins and globulins), remaining the insoluble (gliadins and glutenins), which constitute wet gluten and dry gluten. The result is expressed in percentage .
The gluten main characteristic is the coherence and the agglutination that it gives to starch cells. During baking gluten is the one that retains gases, which are originated during the fermentation due to yeast effect.
The methodology is carried out using the "Glutomatic" system.

Zeleny Test (AACC Nº 56-61-IRAM* 15875)

This is an orientation test on the quality of a protein, estimating the gluten strength. It is associated with the quantity and the quality of proteins. The isopropyl alcohol in a slightly acid media (lactic acid solution) acts on the gluten (proteins) producing a swelling. The bigger this swelling is, the more precipitate volume will be obtained, and consequently the volume of bread will be better.

Falling Number (Hagberg – Perten Method - AACC Nº 56-81-IRAM* 15862)

This test measures flour alpha amylase activity, from which depends the fermentative capacity of dough during baking. These enzymes activity in wheat is variable, being affected by climate harvest conditions.
Wet and hot conditions contribute to an increase in the enzymes activity, especially in germinated kernels, making the dough more liquid and obtaining sticky - crumbed breads. In order to know the alpha amylase activity, the Falling Number is used. A general idea of the enzyme activity is obtained through this method, according to the falling time in seconds. It is determinated on a 7g of flour with 15% of moisture.

Colorimeter (Minolta Chroma Meter CR-410)

It is used to determine the color of flour in an objective, easy and fast way since this is a very important parameter for the milling and bakery industry.
It is expressed through a tristimulus method, Hunter-Lab and measures:
L: brightness. L=100 white, L=0 black. The nearest to 100, the whiter the flour is.
a and b= express color values. +a: green, -a: red, +b: yellow, -b: blue. For white flour it should be between +/- 1 or 2 and b below 10. A value above 10 expresses a yellowish color.

RHEOLOGY

Farinogram (Brabender Farinograph - ICC N° 115 – IRAM* 15855)

It is used to prove dynamically dough properties in order to evaluate the quality of flour and the properties of dough process. The parameters recorded during the analysis show the behavior in the kneading, the water absorption capacity, the time that dough takes to get the best consistency and the stability or flour tolerance to mixing.

Mixogram (Swanson Mixograph - AACC N° 54-40)

It determines the time of mixing or development (DT), and stability through a graphic drawn by the equipment due to the resistance of dough. Low value of DT is evidence of a bad bakery quality.

Alveogram (Chopin Alveograph - ICC N° 121 – IRAM* 15857). Chopin Manufacturer's Method. Boulogne, France.

The alveograph test simulates graphically the dough behavior during the fermentation process, imitating the dough alveolus formation due to CO2 produced by yeast action in large scale. By air inflation, this test measures the resistance to deformation and extensibility of test pieces from the dough with a certain thickness, thus obtaining curves called alveograms, where the area under it suggests the bakery strength (W). The maximum over pressure, which is related to the resistance of dough to deformation (P) is the tenacity, and the abscissa at the rupture point expresses the curve length (L), extensibility or index of swelling (G). P/L or P/G curve configuration ratios designs the dough equilibrium.

Consistograph (Chopin Alveograph NG Consistograph)

The consistograph makes it possible to carry out consistograph measurements as well as alveograph with adapted hydration. In a first test at constant hydration, water absorption in flour is measured and then, the test is carried out at adapted hydration. In this way, the dough behavior is evaluated during mixing. The parameters measured are:

TPr Max: time to reach the peak of Maximum Pressure.
Tol: tolerance, time when pressure is superior to PrMax-20%.
D250: weakening of dough to 250 seconds.
D450: weakening of dough to 450 seconds.
WAC: hydration equivalent to 1700 mb based at 15% H2O.
HYDRA: hydration equivalent to 2200 mb based at 15% H2O.

Rapid Visco Analyser (RVA viscoanalyiser- Newport Scientific-Standard ICC 162)

It quantifies the viscosity, determines the resistance of dough with basic of starch when subjected to a constant stirring action, incorporating time and temperature conditions. The sample is subjected to a classical cooking cycle (preheating-heating-stand) where the viscosity records a behavior that depends mainly on the starch origin and properties. It measures the following:

Maximum viscosity: maximum level of water absorption of the granules which produce a peak of viscosity.
Medium viscosity: granules break down due to stirring and polymers leach giving a decrease in viscosity.
End viscosity: in this period of temperature decrece, starch retro gradation takes place, this phenomenon gives way to the formation of gel and the amylose is the main responsible. Here, a new increase of viscosity occurs, reaching the final point of the test.
Dough T°: increase of viscosity which corresponds to the beginning of gelatinization of starch granules.
Break down: difference between maximum and medium viscosity. It makes it possible to know the stability of the granule to cooking.
Set Back: difference between maximum and end viscosity, associated to dough retro gradation.

BAKING TEST (Official Method modified by EEA Marcos Juárez Laboratory) IRAM* 15858-1

Is the most representative test of wheat industrial quality since, in a small scale, is a direct testing in which the flour aptitude to make a bread with good characteristics is evaluated. It allows to value the different stages in dough manufacturing, noticing the time it takes to develop and gain consistence, its behavior during fermentation, the bread volume and its inner and outer appearance.

The outcoming values reflect the behaviour of the flour in an experimental method with short fermentation terms, while in industrial bread-making, with longer fermentation terms, such results can be different.

* References: IRAM: Instituto Argentino de Normalización y Certificación (Argentine Standards and Certification Institute).

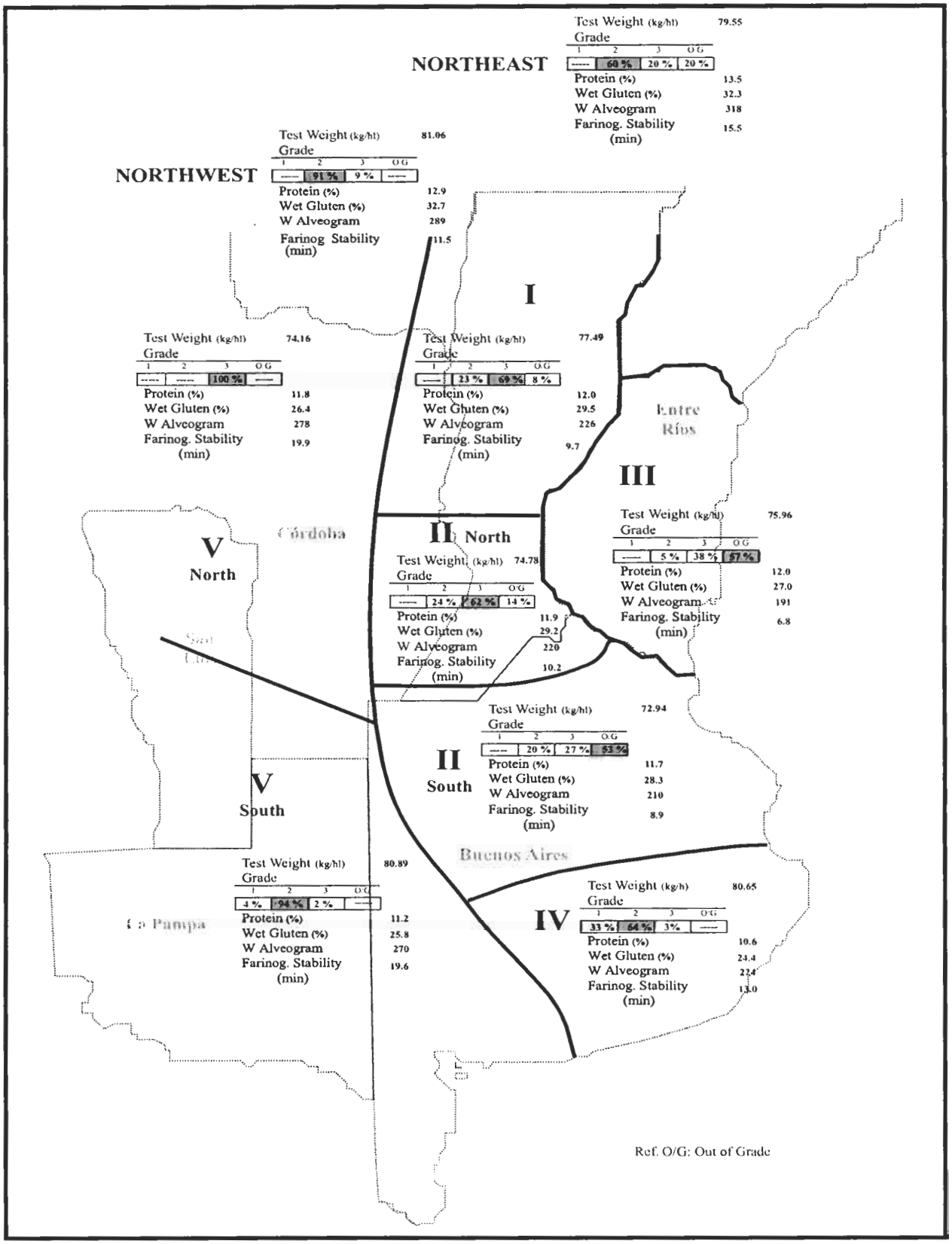
Ex-SAGPyA N° 1262 / 04
ARGENTINE STANDARD FOR WHEAT

GRADE	Bonus and Discounts per Grade %	Minimum Test Weight per hectolitre Kg/hl	PERCENTS MAXIMUM LIMITS OF						Insect Bored Kernels %	Sweet clover seeds (Melilotus sp.) Seeds/ 100 g	MOISTURE Max %	Live Insects and arachnids	PROTEIN CONTENT Bonus and Discounts (for each percentage or proportional fraction of the protein content)
			Foreign Material %	Damaged Kernels: Heat Damaged Kernels %	Damaged Kernels: Total %	Smutty Kernels %	Yellow Berry Kernels %	Shrunken and Broken Kernels % (1)					
1	+ 1.5	79.00	0.20	0.50	1.00	0.10	15.00	0.50					
2	-	76.00	0.80	1.00	2.00	0.20	25.00	1.20	0.50	8	14.0	FREE	More than 11.0 %: Bonus 2 % 11.0 %: - 10.0-10.9 %: Discount 2 % 9.0-9.9 %: Discount 3 % Less than 9.0 %: Discount 4 %
3	- 1.0	73.00	1.50	1.50	3.00	0.30	40.00	2.00					

(1) All Wheat kernels or pieces of them that pass through a sieve with 1,6 mm wide and 9,5 mm long holes, excluding damaged kernels.

Protein content: basis 11 % (moisture basis of 13,5 %)
According to protein content there will be bonus or discounts. Those lots which test weight is under 75 Kg/hl are excluded of bonus.

Argentine Wheat
Main Quality Parameters



Sub region I
Background for the crop

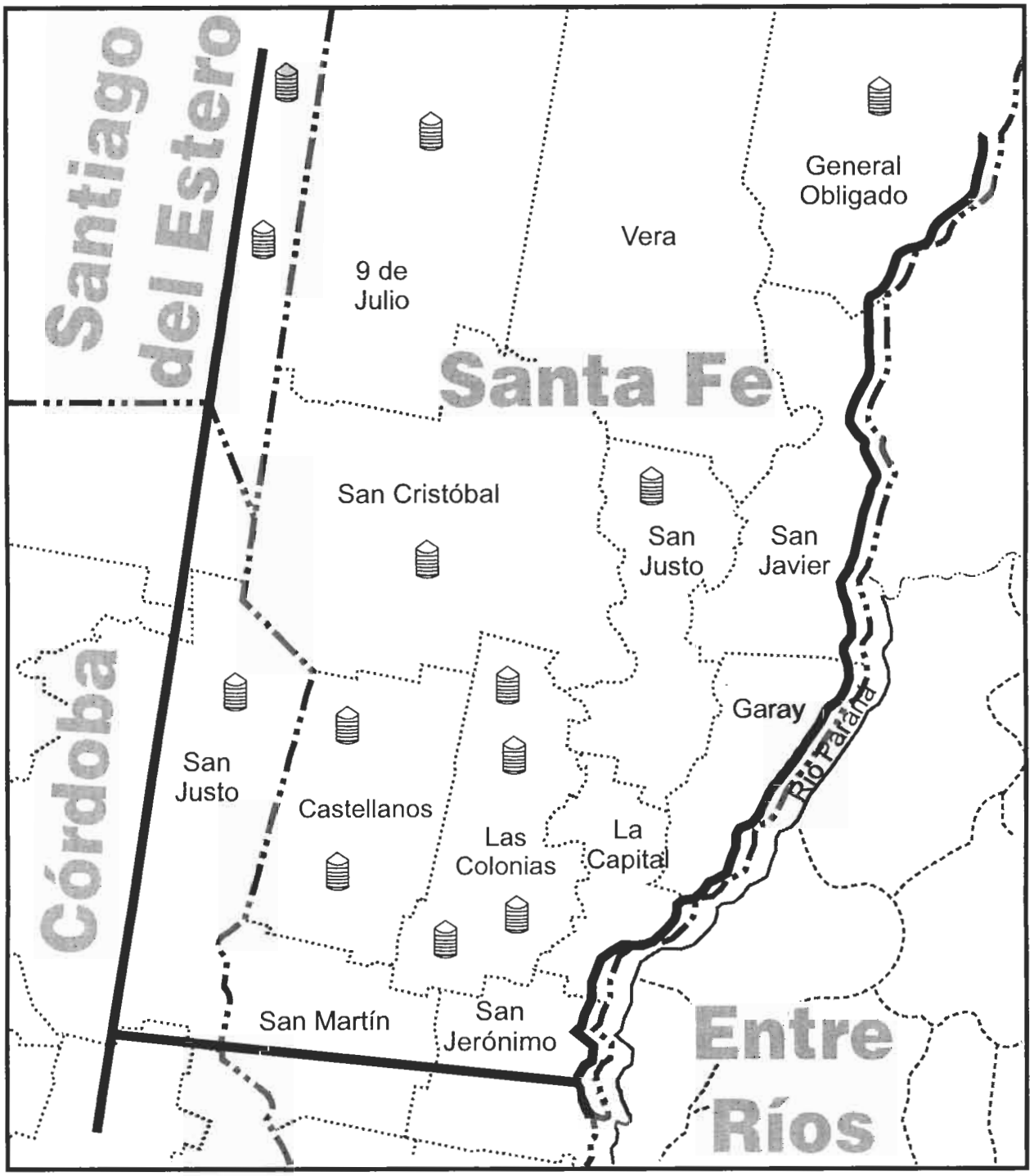
Wheat planted area was less than last season, being this surface partially covered by other winter crops. Sowing time was the normal one and with proper soil moisture reserves, which extended from May up to the first half of July.

At tillering stage weather was dry and cold with successive frosts. The rains registered in the second half of August resulted beneficial to allow a good crop recovery and the refill of the moisture reserves. There was a good evolution during the stages of tilling-stem elongation, with a good number of tillers, uniformity and proper leaf coverage. However, in the last week of September, late frosts were registered, which caused damages to ears. During October, accumulated rains ranged between 150 and 300 millimeters, surpassing in most localities normal values for that month, and in many cases doubling them.

Due to humidity excess conditions, there were diseases such as Fusarium, Yellow Spot, Septoriosis, Orange and Leaf Rust, and several degrees of affectation were verified both in leaf area and in grains per ear. Besides, during the mentioned period of rains, hail occurred in specific sectors partially affecting the crops.

Harvest was carried out mainly in November and yields were highly variable and below expectations, with minimum of 1000 kg/ha and maximum of 3000 kg/ha, with an average close of 2500 kg/ha.

Subregion I Wheat



Each reference represents near 250 to 4,000 tons sampled

Subregion I Wheat

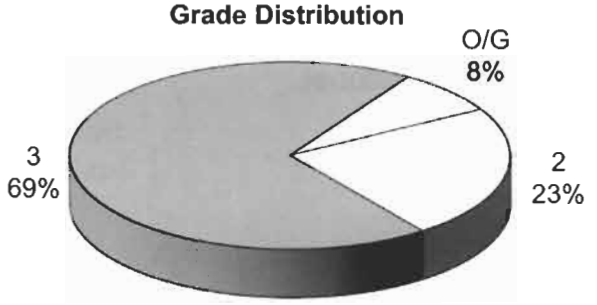
Results of the Analyses

Composite Samples by Locality. Averages were weighted by Tonnage.

Wheat Analysis	Minimum	Maximum	Average	Standard Deviation	Variation Coefficient
Test Weight (kg/hl)	74.50	80.50	77.49	1.86	2.40
Total Damaged Kernels (%)	0.36	3.46	1.70	0.99	58.24
Foreign Material (%)	0.10	1.00	0.36	0.25	69.44
Shrunken and Broken Kernels (%)	0.32	1.52	0.77	0.40	51.48
Yellow Berry Kernels (%)	0.00	8.80	1.56	2.33	149.58
Protein (13.5% Moisture) (%)	11.3	13.0	12.0	0.6	4.66
Weight of 1000 Kernels (gr.)	27.66	32.26	29.58	1.22	4.12
Ash (% dry basis)	1.787	2.214	2.009	0.125	6.23

Total damaged kernels includes 0.20% green kernels, 0.20% sprouted kernels, 0.20% insect chewed kernels and 1.10 % calcinated kernels.

Grade Distribution



O/G: Out of Grade

Flour Analysis		Minimum	Maximum	Average	Standard Deviation	Variation Coefficient
MILLING	Wet Gluten (%)	23.0	34.9	29.5	3.2	10.79
	Dry Gluten (%)	8.0	12.0	10.0	1.3	13.34
	Falling Number (sec.)	226	497	412	65	15.85
	Flour Yield (%)	67.5	74.9	71.3	1.8	2.57
	Ash (dry basis) (%)	0.605	0.885	0.775	0.089	11.51
FARINOGRAM	Water Absorption (14% H°) (%)	56.1	61.6	58.3	1.5	2.62
	Development Time (min.)	2.1	13.2	7.0	3.0	43.10
	Stability (min.)	3.4	20.9	9.7	4.8	49.57
	Degree of Softening (12 min.)	33	207	110	59	53.27
ALVEOGRAM	P (mm)	63	92	73	9	11.67
	L (mm)	74	119	97	12	12.00
	W Joules x 10^{-4}	158	303	226	34	15.26
	P / L	0.53	1.00	0.75	0.15	19.45

These results were elaborated with 13 composite samples prepared proportionally from 177 primary samples (farmer deliveries)

Sub region Data

In this sub region the wheat production was 831,950 tons., the 10% of the national total. Were sampled 45,350 tons., the 5,45 % of the sub region production.

Appendix of Locality Composite Samples.

SAMPLE IDENTIFICATION			WHEAT ANALYSIS								
Sample Number	Locality, district or department	Tonnage	Grade	Test Weight (Kg/hl)	Total Damaged Kernels (%)	Foreign Material (%)	Shrunken and Broken Kernels (%)	Yellow Berry Kernels (%)	Protein (13.5 % Moisture) (%)	Weight of 1000 Kernels (gr.)	Ash (dry basis) (%)
1	Gral. Obligado	2920	2	80.50	1.14	0.10	0.66	8.80	11.4	29.70	1.995
2	9 de Julio	2860	2	80.20	0.62	0.32	0.40	2.50	12.2	32.26	2.214
3	Las Colonias	3700	3	74.50	0.76	0.46	0.70	1.80	11.6	29.18	2.005
4	Las Colonias	3920	3	75.70	1.60	1.02	0.92	1.10	11.3	29.54	2.161
5	Las Colonias	4020	O/G	75.00	3.46	0.28	0.32	0.00	11.4	29.48	1.875
6	Las Colonias	3950	3	78.40	2.82	0.66	0.94	0.00	12.5	29.80	2.187
7	San Cristóbal	1130	3	76.70	1.02	0.06	1.40	0.00	12.0	27.72	1.988
8	San Justo	1980	3	75.20	2.64	0.40	1.00	0.00	13.0	32.20	1.873
9	Castellanos	4310	3	78.10	2.22	0.40	0.46	0.00	11.8	29.88	1.787
10	Castellanos	4800	3	76.90	2.40	0.24	0.32	0.00	11.9	28.68	1.975
11	San Justo (Córdoba)	3760	2	79.50	1.94	0.18	0.56	4.50	11.8	30.80	1.948
12	Selva	4000	3	77.90	0.36	0.10	1.52	0.26	12.9	27.66	2.002
13	Bandera	4000	3	78.60	0.40	0.26	1.34	2.24	12.8	28.60	2.099

SAMPLE IDENTIFICATION		FLOUR ANALYSIS												
						FARINOGRAM				ALVEOGRAM				
Sample Number	Locality, district or department	Wet Gluten (%)	Dry Gluten (%)	Falling Number (sec.)	Flour Yield (%)	% WA (14 % H°)	D. T. (min.)	Stability (min.)	Degree Softening (12 min.)	P	L	W	P/L	Ash (dry basis) (%)
1	Gral. Obligado	26.6	8.3	419	72.4	58.1	7.1	9.2	108	92	92	303	1.00	0.765
2	9 de Julio	26.4	9.0	398	73.4	59.6	6.9	7.2	99	79	102	263	0.77	0.885
3	Las Colonias	25.3	8.7	226	71.4	59.1	4.5	4.2	207	74	91	205	0.81	0.725
4	Las Colonias	25.4	8.2	435	74.9	60.1	4.1	3.4	196	71	74	158	0.96	0.885
5	Las Colonias	33.9	11.3	367	68.0	60.5	5.8	6.5	98	63	119	223	0.53	0.755
6	Las Colonias	28.5	9.3	429	70.6	56.8	4.5	8.4	71	67	108	219	0.62	0.625
7	San Cristóbal	23.0	8.0	420	71.0	57.4	2.1	9.0	77	87	91	264	0.96	0.605
8	San Justo	34.9	11.4	405	67.5	61.6	4.8	4.7	82	65	115	205	0.57	0.815
9	Castellanos	31.7	10.5	497	71.0	56.1	5.2	10.5	60	64	92	191	0.70	0.825
10	Castellanos	28.2	9.5	475	71.7	56.7	13.2	14.0	196	73	94	236	0.78	0.645
11	San Justo (Córdoba)	29.7	9.9	425	72.8	58.1	6.4	8.7	107	68	105	223	0.65	0.805
12	Selva	32.3	12.0	435	71.4	57.6	11.3	20.9	33	87	88	258	0.99	0.878
13	Bandera	32.0	11.9	399	70.4	58.2	8.8	13.5	53	73	98	233	0.74	0.812

Sub region II North
Background for the crop

Crop season 2012/13 was characterized by the marked effect of the 'El Niño' phenomenon developed with strong wind storms, hail and heavy rains with a pattern well above historical values. Overall yields were below normal and test weights were low. Although water availability did not limit crop yield expression, some diseases problems occurred.

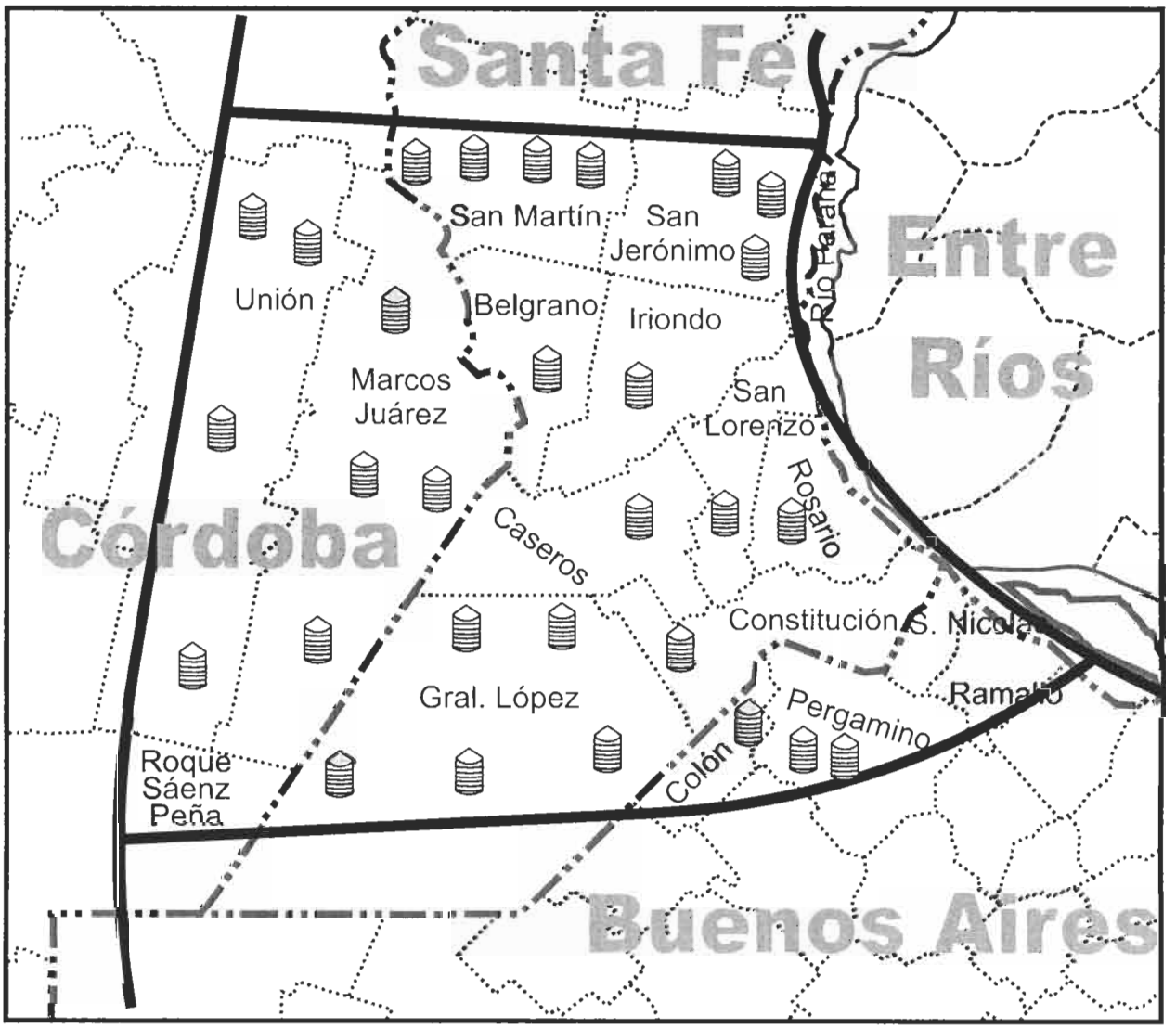
Total rainfall from May to November 2012 was 958 mm, exceeding by almost three times historical values between 1951 and 2011, and the 2010-11 season too. The water contribution for the crop started from early tillering to stem elongation (August), and heavy rains continued throughout all the critical period and grain filling. Crop health was the determining factor for the yields.

Quality was highly affected by the low test weight, due to the presence of diseases, even in treated crops. Leaf diseases were widespread, and the presence of rust and fusarium head blight (Fusarium graminearum) was significant, since predisposing conditions were given at the heading-antesis period in most of the varieties.

There were cloudy days with low radiation, frosts and heat stroke at the beginning of November, resulting in small grains that did not complete their filling. Moreover those conditions contribute to the presence of grains with Fusarium in variable percentages, some of them particularly high. Fusarium often causes yield losses of nearly 20%, mainly related to sterile flowers and the formation of underdeveloped, wrinkled and low weight grains. Furthermore, not only affect the yield and quality, but also it may affect human and animal health by action of micotoxins such as deoxinivalenol (DON), linked to the fungus.

All those conditions resulted in crops yields significantly less than the expectations, according to their appearance. In the central region, wheat yields ranged between 1500 and 4000 kg/ha, between 1951 and 2011 between 1951 and 2011 reaching an average of 3,000 kg / ha .

Sub region
II North
Wheat



Each reference represents near 4,000 tns sampled.

Results of the Analyses

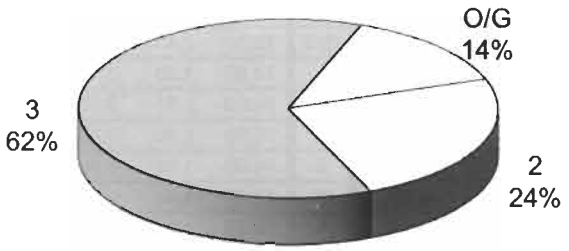
Composite Samples by Locality. Averages were weighted by Tonnage.

Sub region II North Wheat

Wheat Analysis	Minimum	Maximum	Average	Standard Deviation	Variation Coefficient
Test Weight (kg/hl)	70.50	77.20	74.78	1.63	2.18
Total Damaged Kernels (%)	1.10	2.90	1.78	0.46	25.81
Foreign Material (%)	0.10	1.80	0.52	0.43	82.12
Shrunken and Broken Kernels (%)	0.08	1.50	0.91	0.29	32.08
Yellow Berry Kernels (%)	0.00	0.80	0.24	0.21	84.18
Protein (13.5% Moisture) (%)	11.5	12.7	11.9	0.3	2.74
Weight of 1000 Kernels (gr.)	17.60	31.30	28.16	2.92	10.37
Ash (% dry basis)	1.745	2.065	1.953	0.067	3.42

Total damaged kernels includes 0.96% calcinated kernels. 0.16% insect chewed kernels and 0.66 % germ-chewed kernels.

Grade Distribution



O/G: Out of Grade

Flour Analysis		Minimum	Maximum	Average	Standard Deviation	Variation Coefficient
MILLING	Wet Gluten (%)	26,9	32,8	29,2	1,4	4,66
	Dry Gluten (%)	9,3	11,1	9,9	0,4	4,32
	Falling Number (sec.)	430	505	465	18	3,96
	Flour Yield (%)	68,1	74,8	72,0	1,7	2,37
	Ash (dry basis) (%)	0,645	0,865	0,749	0,059	7,87
FARINOGRAM	Water Absorption (14% H°) (%)	55,3	59,0	57,2	1,0	1,71
	Development Time (min.)	4,6	8,2	6,4	0,9	13,78
	Stability (min.)	5,9	14,8	10,2	2,4	23,24
	Degree of Softening (12 min.)	43	98	66	15	23,09
ALVEOGRAM	P (mm)	50	88	68	9	12,73
	L (mm)	91	129	105	9	8,76
	W Joules x 10^{-4}	146	285	220	32	14,71
	P / L	0,40	0,90	0,65	0,12	17,77

These results were elaborated with 29 composite samples prepared proportionally from 360 primary samples (farmer deliveries)

Sub region Data

In this subregion the wheat production was 1,206,312 tons., the 14.5% of the national total. Were sampled 116,000 tons., the 9.62 % of the subregion production.

Sub region II North Wheat

Appendix of Locality Composite Samples.

SAMPLE IDENTIFICATION			WHEAT ANALYSIS								
Sample Number	Locality, district or department	Tonnage	Grade	Test Weight (Kg/hl)	Total Damaged Kernels (%)	Foreign Material (%)	Shrunken and Broken Kernels (%)	Yellow Berry Kernels (%)	Protein (13.5 % Moisture) (%)	Weight of 1000 Kernels (gr.)	Ash (dry basis) (%)
101	San Martin	4000	3	75.10	2.00	0.10	0.80	0.30	12.5	28.60	2.055
102	San Martin	4000	3	73.80	2.20	0.90	0.90	0.30	12.0	28.60	1.935
103	San Martín	4000	O/G	70.50	2.70	0.40	1.10	0.20	11.9	17.60	2.055
104	San Martín	4000	2	76.20	1.10	0.10	0.90	0.20	11.7	29.90	1.865
105	San Jerónimo	4000	O/G	72.10	2.40	1.80	1.10	0.20	11.7	27.30	1.945
106	San Jerónimo	4000	3	74.80	1.20	0.40	1.20	0.00	11.9	27.70	2.005
107	San Jerónimo	4000	3	74.80	2.90	0.50	1.20	0.30	11.9	28.50	2.045
108	Caseros	4000	3	75.50	1.80	0.20	0.50	0.00	11.6	28.50	1.915
109	Belgrano	4000	3	74.00	1.60	0.20	0.90	0.20	11.5	27.60	1.965
110	Iriondo	4000	3	74.30	1.40	0.20	0.70	0.10	12.2	28.20	1.995
111	San Lorenzo	4000	3	75.20	1.90	0.80	1.00	0.60	12.1	27.70	1.985
112	Rosario	4000	3	74.50	2.00	0.30	1.50	0.00	11.6	27.30	1.985
113	Constitución	4000	O/G	72.10	1.60	0.50	1.50	0.40	11.7	24.60	1.745
114	Gral. López	4000	O/G	71.00	1.90	0.70	0.80	0.20	11.8	26.30	1.985
115	Gral. López	4000	3	74.40	1.40	0.40	1.00	0.00	11.6	28.50	1.945
116	Gral. López	4000	3	75.60	1.20	0.20	0.08	0.00	11.7	31.30	1.905
117	Gral. López	4000	3	75.50	1.30	1.60	0.60	0.00	11.7	20.34	1.875
118	Gral. López	4000	3	75.20	2.30	1.60	1.20	0.20	11.9	29.30	1.915
119	Marcos Juárez	4000	3	74.40	1.90	0.40	1.10	0.00	12.7	30.50	1.965
120	Marcos Juárez	4000	2	77.10	1.30	0.30	0.70	0.80	11.7	30.60	1.945
121	Marcos Juárez	4000	2	76.30	1.60	0.60	0.80	0.30	12.4	29.60	2.045
122	Marcos Juárez	4000	2	76.00	2.00	0.30	0.70	0.40	12.6	28.50	1.885
123	Unión	4000	2	76.00	1.70	0.50	0.70	0.20	12.2	31.00	1.925
124	Unión	4000	2	76.20	1.10	0.30	0.80	0.10	11.8	30.60	1.945
125	Unión	4000	3	75.10	1.80	0.30	1.20	0.20	12.2	28.40	1.925
126	Unión	4000	3	73.60	1.30	0.50	0.80	0.30	12.4	28.80	2.065
127	Colón	4000	3	77.20	2.30	0.40	0.60	0.50	11.7	30.10	1.905
128	Pergamino	4000	2	76.60	1.70	0.30	0.90	0.50	11.8	30.10	1.955
129	Pergamino	4000	3	75.60	1.90	0.40	1.00	0.60	11.9	30.50	1.955

Sub region II North Wheat

Appendix of Locality Composite Samples.

SAMPLE IDENTIFICATION		FLOUR ANALYSIS												
						FARINOGRAM				ALVEOGRAM				
Sample Number	Locality, district or department	Wet Gluten (%)	Dry Gluten (%)	Falling Number (sec.)	Flour Yield (%)	% WA (14 % H°)	D. T. (min.)	Stability (min.)	Degree Softening (12 min.)	P	L	W	P/L	Ash (dry basis) (%)
101	San Martin	31.7	10.5	474	70.5	57.5	6.0	9.4	60	69	96	214	0.72	0.715
102	San Martin	31.2	10.3	464	71.0	57.7	6.1	9.4	60	71	104	229	0.68	0.665
103	San Martin	28.2	9.5	493	73.2	56.9	5.8	8.8	81	60	99	182	0.61	0.795
104	San Martin	27.5	9.5	450	69.9	56.8	7.8	13.3	47	73	98	240	0.74	0.715
105	San Jeronimo	28.9	9.5	450	71.1	57.0	4.6	5.9	98	50	108	146	0.46	0.785
106	San Jeronimo	28.2	9.6	443	70.4	58.3	5.3	7.1	88	62	108	204	0.57	0.715
107	San Jeronimo	28.7	9.6	468	70.6	56.8	5.4	7.5	89	58	99	174	0.59	0.795
108	Caseros	28.0	9.6	483	72.5	57.7	5.8	9.1	68	64	105	210	0.61	0.655
109	Belgrano	28.3	9.5	505	68.8	56.0	5.4	8.3	73	57	108	177	0.53	0.725
110	Iriondo	29.7	9.9	499	72.3	58.1	5.2	6.8	81	60	125	203	0.48	0.645
111	San Lorenzo	29.3	10.3	485	71.3	57.6	6.8	10.5	59	70	111	237	0.63	0.805
112	Rosario	27.6	9.4	441	70.2	55.5	6.7	10.6	55	65	104	209	0.63	0.685
113	Constitucion	26.9	9.3	460	73.5	55.7	5.4	8.0	94	51	126	167	0.40	0.745
114	Gral. Lopez	27.7	9.6	444	71.8	56.1	6.9	12.5	53	69	98	217	0.70	0.655
115	Gral. Lopez	28.7	9.6	464	73.5	56.3	7.2	12.8	57	72	96	228	0.75	0.755
116	Gral. Lopez	29.1	9.9	482	73.9	57.9	7.2	11.7	54	80	106	266	0.75	0.865
117	Gral. Lopez	29.6	9.9	448	74.8	56.1	6.4	10.1	64	69	103	213	0.67	0.835
118	Gral. Lopez	29.0	9.8	464	74.0	59.0	6.3	9.7	66	82	91	240	0.90	0.745
119	Marcos Juarez	32.8	11.1	481	68.1	58.7	5.3	6.9	84	66	129	221	0.51	0.725
120	Marcos Juarez	28.3	9.8	459	73.1	58.1	8.2	14.2	50	88	100	285	0.88	0.755
121	Marcos Juarez	29.6	10.1	430	71.7	57.3	7.8	13.1	45	76	104	258	0.73	0.715
122	Marcos Juarez	29.7	10.2	458	74.7	56.9	6.3	10.3	65	68	99	210	0.69	0.845
123	Union	30.6	10.2	474	72.7	57.6	6.7	12.4	55	79	99	264	0.80	0.775
124	Union	31.1	10.7	470	72.9	57.1	7.5	12.4	54	77	95	244	0.81	0.815
125	Union	27.3	9.4	453	73.0	55.3	7.2	14.8	43	72	108	251	0.67	0.705
126	Union	30.1	10.2	480	69.6	56.6	6.9	12.7	52	68	113	239	0.60	0.805
127	Colon	29.2	9.9	439	73.2	58.5	6.0	7.8	81	71	93	197	0.76	0.815
128	Pergamino	30.1	10.4	468	73.0	57.1	6.3	9.5	68	61	103	197	0.59	0.765
129	Pergamino	29.1	9.8	451	73.0	58.6	6.7	11.4	57	74	108	263	0.69	0.705

Sub region II South
Background for the crop

The planted area had a significant decrease in relation to the historical average. Part of it was occupied by other winter crops, especially barley, or lands have been left fallow during winter for summer sowing.

The reasons for a significant decrease in the sown surface were mainly caused by internal trade limitations, low profitability of the producers and the unfavorable weather conditions, as a consequence of the "El Niño" phenomenon during the crop cycle, resulting in a lower production of wheat.

Sowing dates were in the months of June and July. Varieties of long and short cycle were used, although there was a slight trend towards the long cycles.

Phosphate fertilization was done during the sowing and nitrogen fertilization in the sowing or during the sowing-tillering period.

During winter, the wheat developed with excellent humidity conditions and in certain cases with significant hydric excesses. As from mid-September, beginning of stalking, there was adecquate hydric availability. Around the time of earing-flowering (first half of October) rains were abundant, with cloudy days and little heliophany, which influenced negatively in yields. The excessive humidity generated diseases such as Yellow Spot (Dreschlera tritici-repentis) and Leaf Septoriosis (Septoria tritici).

During stalking and earing, some attacks of Leaf Rust (Puccinia triticina) and Bacterian Spot (complex Pseudomona syringae and Xantonomas translucens) were observed.

At flowering, climate conditions were favorable for the attack of Ear Fusarium (Fusarium graminearum); a significant incidence and severity was observed in those materials with early flowering, and the severity diminished in relation to the delay in the stalking date.

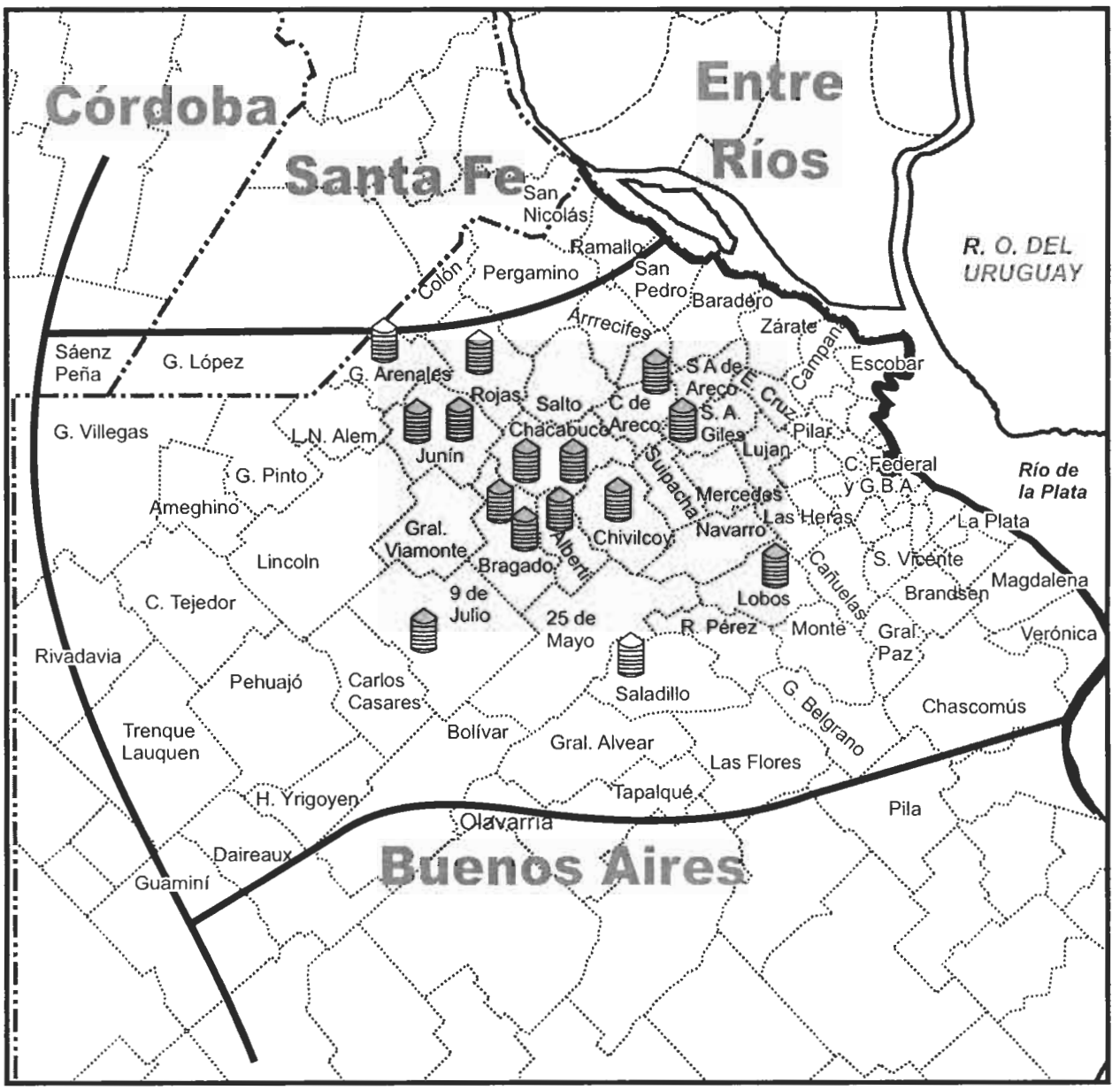
There was a presence of leaf and ear aphids, with intensity in some crops; and chemical treatments were done.

During November, at grain filling period, it also rained; and towards the end of the crop cycle, at the maturation and harvesting time, some occasional rains together with strong winds delayed the harvest. Shattering and washed grains by rains were observed.

The quality of grains was highly affected by Ear Fusarium and by the excess of rains during grain filling and harvest periods.

Test weights were medium to low, as well as the weight of thousand seeds. Yields were low, the average of the subregion was 3,000 kg/ha.

Sub region II South Wheat



Each reference represents near 4,000 tns sampled.

Results of the Analyses

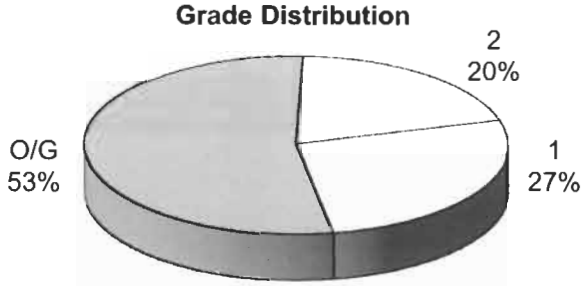
Composite Samples by Locality. Averages were weighted by Tonnage.

Sub region II South Wheat

Wheat Analysis	Minimum	Maximum	Average	Standard Deviation	Variation Coefficient
Test Weight (kg/hl)	67.8	76.35	72.94	2.63	3.61
Total Damaged Kernels (%)	0.58	1.7	1.07	0.32	30.07
Foreign Material (%)	0.1	0.50	0.32	0.11	34.04
Shrunken and Bróken Kernels (%)	0.46	1.64	0.75	0.35	46.28
Yellow Berry Kernels (%)	0.00	4.90	1.11	1.33	119.48
Protein (13,5% Moisture) (%)	10.6	13.6	11.7	1.0	8.39
Weight of 1000 Kernels (gr.)	27.72	34.26	30.91	1.95	6.30
Ash (% dry basis)	1.648	2.069	1.885	0.119	6.31

Total damaged kernels includes 0.01% green kernels and, 0.17% sprouted kernels, 0.72% calcinated kernels and 0.17% insect chewed kernels.

Grade Distribution



O/G: Out of Grade

Flour Analysis		Minimum	Maximum	Average	Standard Deviation	Variation Coefficient
MILLING	Wet Gluten (%)	23.8	35.1	28.3	3.2	11.37
	Dry Gluten (%)	8.8	13.0	10.5	1.2	11.47
	Falling Number (sec.)	373	489	426	34	7.92
	Flour Yield (%)	69.6	74.6	72.3	1.6	2.23
	Ash (dry basis) (%)	1.648	2.069	1.885	0.119	6.31
FARINOGRAM	Water Absorption (14% H°) (%)	54.4	60.7	57.2	1.9	3.33
	Development Time (min.)	1.6	10.0	5.2	2.6	49.48
	Stability (min.)	2.8	13.0	8.9	3.3	37.50
	Degree of Softening (12 min.)	58	116	75	15	20.06
ALVEOGRAM	P (mm)	58	92	73	10	13.37
	L (mm)	59	111	85	12	14.26
	W Joules x 10^{-4}	155	286	210	35	16.86
	P / L	0.60	1.41	0.86	0.21	23.44

These results were elaborated with 15 composite samples prepared proportionally from 156 primary samples (farmer deliveries)

Subregion Data

In this subregion the wheat production was 979,012 tons., the 11.8% of the national total. Were sampled 53,000 tons., the 5.41 % of the subregion production.

Sub region II South Wheat

Appendix of Locality Composite Samples.

SAMPLE IDENTIFICATION			WHEAT ANALYSIS								
Sample Number	Locality, district or department	Tonnage	Grade	Test Weight (Kg/hl)	Total Damaged Kernels (%)	Foreign Material (%)	Shrunken and Broken Kernels (%)	Yellow Berry Kernels (%)	Protein (13.5% Moisture) (%)	Weight of 1000 Kernels (gr.)	Ash (dry basis) (%)
200	Chacabuco	4000	O/G	71.20	0.94	0.10	0.60	2.18	11.3	31.26	1.863
201	Chacabuco	4000	O/G	69.60	0.98	0.28	1.20	1.34	11.1	29.32	1.929
202	Carmen de Areco	2000	O/G	67.80	0.70	0.34	0.58	0.00	12.2	27.74	1.943
203	Junín	4000	2	76.35	1.18	0.50	0.46	0.90	13.6	32.01	2.041
204	Junín	4000	2	76.35	0.68	0.28	0.70	0.42	12.1	31.67	2.069
205	Gral. Arenales	4000	3	73.65	1.40	0.46	1.64	1.60	11.8	27.72	1.905
206	San Andrés de Giles	4000	O/G	69.15	1.70	0.20	0.54	0.00	10.8	28.99	1.925
207	Rojas	4000	O/G	72.75	0.58	0.36	0.70	0.64	13.5	31.11	2.037
208	Alberti	4000	3	73.65	1.32	0.24	0.48	0.00	12.8	32.52	1.856
209	Bragado	4000	O/G	70.95	0.83	0.46	0.74	0.00	11.1	28.42	1.843
210	Bragado	2000	O/G	70.95	0.70	0.24	0.82	0.00	11.1	33.52	1.823
211	Chivilcoy	4000	O/G	72.75	1.20	0.32	0.64	0.00	11.2	30.76	1.839
212	9 de Julio	2000	3	75.20	1.58	0.26	1.46	1.70	11.1	32.83	1.742
213	Lobos	3000	3	75.65	1.20	0.42	0.52	4.90	10.6	34.26	1.648
214	Saladillo	4000	2	76.35	0.95	0.32	0.48	3.16	10.6	33.02	1.682

Appendix of Locality Composite Samples.

SAMPLE IDENTIFICATION		FLOUR ANALYSIS												
						FARINOGRAM				ALVEOGRAM				
Sample Number	Locality, district or department	Wet Gluten (%)	Dry Gluten (%)	Falling Number (sec.)	Flour Yield (%)	% WA (14 % H°)	D. T. (min.)	Stability (min.)	Degree Softening (12 min.)	P	L	W	P/L	Ash (dry basis) (%)
200	Chacabuco	27.4	10.1	420	73.7	57.0	1.6	3.1	73	61	86	174	0.71	1.863
201	Chacabuco	27.0	10.0	420	71.7	56.5	1.7	3.4	72	61	79	170	0.77	1.929
202	Carmen de Areco	25.6	9.5	489	72.4	59.0	4.9	10.5	58	72	111	260	0.65	1.943
203	Junín	35.1	13.0	474	71.9	60.7	7.8	13.0	62	86	100	286	0.86	2.041
204	Junín	34.0	12.6	413	72.0	60.1	10.0	11.0	116	92	80	248	1.15	2.069
205	Gral. Arenales	28.6	10.6	434	74.6	57.5	4.6	9.7	69	70	91	208	0.77	1.905
206	San Andrés de Giles	25.2	9.3	435	70.8	54.4	4.5	10.5	61	73	70	185	1.04	1.925
207	Rojas	31.5	11.7	392	70.0	58.8	7.5	11.0	91	72	98	240	0.73	2.037
208	Alberti	28.9	10.7	376	73.6	58.5	7.9	11.7	87	77	86	230	0.90	1.856
209	Bragado	27.3	10.1	407	70.6	54.4	5.1	9.9	74	58	96	180	0.60	1.843
210	Bragado	25.5	9.4	435	73.7	56.3	3.8	7.5	93	64	75	155	0.85	1.823
211	Chivilcoy	23.8	8.8	480	69.6	55.8	1.7	2.8	72	83	59	191	1.41	1.839
212	9 de Julio	25.6	9.5	447	73.3	57.6	3.4	8.4	62	83	78	224	1.06	1.742
213	Lobos	28.5	10.6	449	74.5	56.7	7.1	11.6	65	73	83	206	0.88	1.648
214	Saladillo	26.5	9.8	373	73.6	55.6	4.6	10.1	67	71	83	191	0.86	1.682

Sub region III
Background for the crop

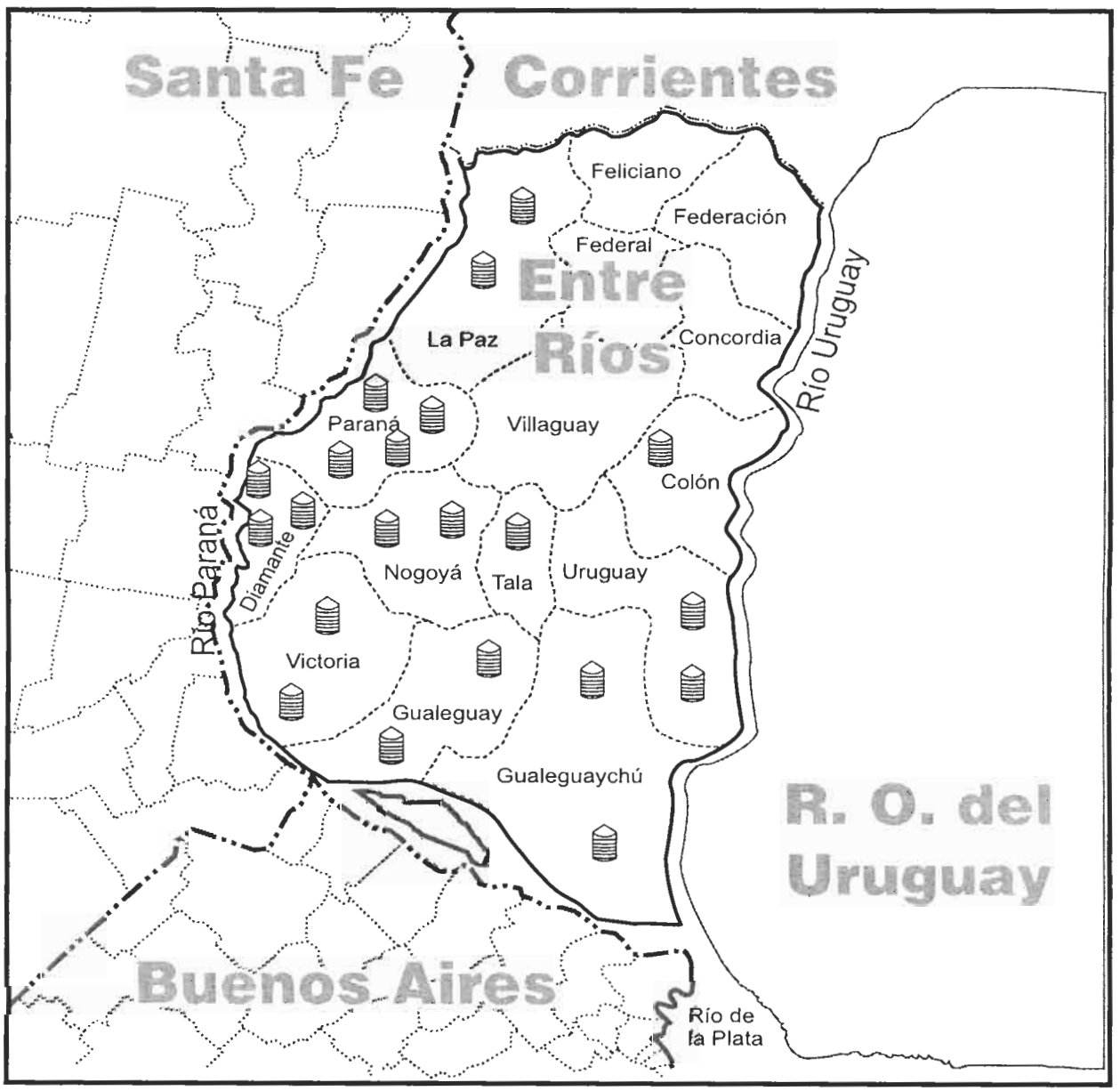
The 2012 wheat campaign initiated with scarce humidity in autumn, particularly in the months of March and April, with a deficit for the historical average of over 100 mm. Later, eventual rains in May improved the refill of the soil profile and, although June and July were dryer than expected, abundant rains in August refilled the profile, therefore, it was believed that this would be a good campaign. However, these rains continued in September and particularly in October casing a lower radiation and thus a decrease in the expected yield, and mainly, a strong incidence of Ear Fusarium (Fusarium spp), which brought about not only a decrease in the yield but also a bad industrial and commercial quality.

As regards the temperatures during the crop cycle, except for July that was colder than the historical average, the other months when the crop develops and grows were milder than the expected average, which also influenced in the potential yield.

As regards the leaf diseases, there were significant levels of Yellow Spot (Dreschslera tritici repentis), and some cases in highly susceptible crops, Leaf Rust (Puccinia triticina Erikss).

Therefore, obtained yields were low and harvested grains presented some quality problems.

Sub region III Wheat



Each reference represents near 4,000 tns sampled.

Sub region III Wheat

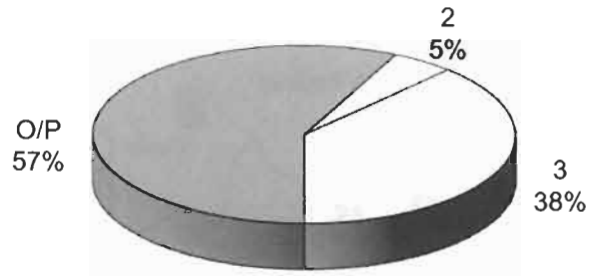
Results of the Analyses

Composite Samples by Locality. Averages were weighted by Tonnage.

Análisis de Grano	Mínimo	Máximo	Promedio	Desvío Estándar	Coeficiente Variación
Test Weight (kg/hl)	72.40	78.80	75.96	1.66	2.19
Total Damaged Kernels (%)	1.26	5.43	3.21	0.98	30.37
Foreign Material (%)	0.16	2.09	0.56	0.44	77.84
Shrunken and Broken Kernels (%)	0.41	1.48	0.88	0.23	25.46
Yellow Berry Kernels (%)	0.00	16.30	5.73	4.96	86.64
Protein (13,5% Moisture) (%)	11.0	12.8	12.0	0.4	3.63
Weight of 1000 Kernels (gr.)	29.36	34.90	32.59	1.51	4.63
Ash (% dry basis)	1.860	2.070	1.948	0.067	3.44

Total damaged kernels includes 0.19% green kernels, 2.06% calcinated kernels, 0.17% sprouted kernels and 0.17% insect chewed kernels.

Grade Distribution



O/G: Out of Grade

Flour Analysis		Minimum	Maximum	Average	Standard Deviation	Variation Coefficient
MILLING	Wet Gluten (%)	23,4	30,7	27,0	1,9	7,01
	Dry Gluten (%)	7,8	10,1	9,0	0,6	6,89
	Falling Number (sec.)	358	448	411	24	5,77
	Flour Yield (%)	69,1	74,8	71,8	1,6	2,26
	Ash (dry basis) (%)	0,565	0,835	0,704	0,066	9,42
FARINOGRAM	Water Absorption (14% H°) (%)	55,3	59,7	57,3	0,9	1,49
	Development Time (min.)	3,8	6,2	5,2	0,5	10,18
	Stability (min.)	3,7	9,1	6,8	1,4	20,32
	Degree of Softening (12 min.)	74	106	88	10	10,90
ALVEOGRAM	P (mm)	57	72	62	4	6,55
	L (mm)	84	125	109	11	10,16
	W Joules x 10^{-4}	151	230	191	22	11,47
	P / L	0,46	0,86	0,57	0,09	15,66

These results were elaborated with 21 composite samples prepared proportionally from 540 primary samples (farmer deliveries)

Sub region Data

In this subregion the wheat production was 586,958 tons., the 7.1% of the national total. Were sampled 74,889 tons., the 12.76 % of the subregion production.

Sub region III Wheat

Appendix of Locality Composite Samples.

SAMPLE IDENTIFICATION			WHEAT ANALYSIS								
Sample Number	Locality, district or department	Tonnage	Grade	Test Weight (Kg/hl)	Total Damaged Kernels (%)	Foreign Material (%)	Shrunken and Broken Kernels (%)	Yellow Berry Kernels (%)	Protein (13.5 % Moisture) (%)	Weight of 1000 Kernels (gr.)	Ash (dry basis) (%)
300	Paraná	4037	3	78.6	2.79	0.16	0.74	0.62	11.0	34.16	1.930
301	Paraná	4055	O/G	76.4	3.92	0.30	0.93	0.56	11.6	33.68	1.960
302	Paraná	4035	O/G	77.6	3.40	0.54	0.94	12.97	12.1	32.76	1.890
303	Paraná	4065	3	75.8	2.03	0.55	0.94	3.92	11.9	30.18	1.950
304	Villaguay	2036	3	76.1	2.97	0.61	1.31	6.12	12.3	31.58	1.970
305	Diamante	3987	O/G	77.4	3.34	1.44	0.78	16.30	11.6	34.70	1.950
306	Diamante	3838	O/G	77.3	3.10	0.23	0.77	9.00	11.5	33.56	1.960
307	Diamante	3879	O/G	76.4	4.44	0.42	0.92	4.20	11.8	32.30	2.050
308	La paz	3985	2	78.8	1.26	0.42	0.71	2.52	12.0	34.90	1.880
309	La paz	3960	3	74.7	1.35	0.95	0.73	0.86	12.1	33.84	1.880
310	Gualeguay	3805	O/G	75.3	3.66	0.52	0.87	5.59	12.7	33.42	1.920
311	Gualeguay	3916	O/G	74.8	4.00	0.33	0.77	0.67	11.9	30.76	2.070
312	Gualeguaychú	3903	O/G	74.5	5.43	0.39	0.85	1.94	12.3	29.84	2.070
313	Gualeguaychú	3879	O/G	72.4	3.28	1.43	1.48	0.00	12.8	32.32	2.040
314	Nogoyá	3674	O/G	77	3.91	0.31	0.86	13.79	12.0	33.26	1.880
315	Nogoyá	1898	3	73.4	2.88	2.09	0.54	0.84	12.3	31.94	2.020
316	C. del Uruguay	3979	3	77.4	2.76	0.44	1.02	6.12	12.7	31.54	1.900
317	C. del Uruguay	1983	3	74.9	2.59	0.31	1.03	4.49	12.5	29.36	1.870
318	Victoria	3917	O/G	74.7	3.28	0.43	1.01	8.27	12.3	33.62	1.900
319	Victoria	3984	3	74	2.99	0.20	0.41	12.24	12.0	31.70	1.860
320	Rosario del Tala	2074	O/G	75.6	4.08	0.18	1.24	7.66	12.1	32.38	1.980

Sub region III Wheat

Appendix of Locality Composite Samples.

SAMPLE IDENTIFICATION		FLOUR ANALYSIS												
						FARINOGRAM				ALVEOGRAM				
Sample Number	Locality, district or department	Wet Gluten (%)	Dry Gluten (%)	Falling Number (sec.)	Flour Yield (%)	% WA (14 % H°)	D. T. (min.)	Stability (min.)	Degree Softening (12 min.)	P	L	W	P/L	Ash (dry basis) (%)
300	Paraná	23.4	7.8	429	71.1	57.0	5.8	9.1	76	72	84	201	0.86	0.645
301	Paraná	25.8	8.8	380	70.97	58.0	4.9	6.8	85	68	94	194	0.72	0.745
302	Paraná	25.3	8.6	435	71.7	57.3	5.0	8.4	74	65	116	223	0.56	0.655
303	Paraná	27.6	9.5	358	72.7	55.3	5.8	9.0	75	58	125	214	0.46	0.745
304	Villaguay	29.2	10.0	431	74.2	57.4	4.7	6.4	86	64	109	201	0.59	0.765
305	Diamante	25.8	8.3	397	71.1	56.5	5.1	7.4	86	61	102	180	0.60	0.765
306	Diamante	28.6	9.9	434	72.9	56.7	5.1	6.5	88	62	111	202	0.56	0.655
307	Diamante	30.7	9.5	430	74.8	57.4	5.5	7.2	93	59	93	161	0.63	0.765
308	La paz	26.7	9.0	370	71.3	57.9	5.8	7.3	85	66	125	230	0.53	0.565
309	La paz	28.0	9.3	415	72.0	56.8	5.0	6.4	106	57	122	203	0.47	0.635
310	Gualeguay	28.0	9.5	448	70.2	59.7	3.8	3.7	100	58	104	152	0.56	0.755
311	Gualeguay	26.6	8.9	413	74.7	56.6	4.7	4.3	102	58	98	151	0.59	0.765
312	Gualeguaychú	25.2	8.5	422	71.1	56.9	4.9	6.1	80	62	119	202	0.52	0.645
313	Gualeguaychú	30.3	10.1	407	73.4	56.9	5.2	5.2	99	57	110	168	0.52	0.775
314	Nogoyá	24.7	8.4	416	70.2	57.2	6.2	7.9	83	59	117	196	0.50	0.645
315	Nogoyá	27.4	9.1	392	71.9	57.9	6.2	7.4	95	65	111	215	0.59	0.685
316	C. del Uruguay	28.8	9.6	436	69.1	57.7	5.1	6.4	80	61	111	195	0.55	0.765
317	C. del Uruguay	28.2	8.7	393	73.5	58.3	5.5	6.2	83	63	102	181	0.62	0.835
318	Victoria	24.8	8.5	412	69.7	57.6	4.9	6.1	102	58	115	179	0.50	0.675
319	Victoria	27.3	8.3	392	73.1	57.3	5.4	8.1	84	62	105	195	0.59	0.645
320	Rosario del Tala	26.5	8.8	421	69.4	56.6	5.4	6.8	89	58	105	166	0.55	0.785

Sub region IV
Background for the crop

Wheat sowing conditions were normal, with some moisture excesses. The emergence at all cycles was, in average, normal, but since mid-August there were intense rains, which in many locations surpassed 200 mm, producing floods in parts of the crops.

September and October presented few rains, which affected the growth of wheat crops sown in shallow soils, but very little in those growing in deep soils with good humidity reserves.

The first 8 days of November were dry and with high temperatures, which caused a drop in the number of grains and a reduction in the height of the plants, which in some cases was compensated by later abundant rains. The reduction in the number of grains and later good conditions during grain filling, made it possible for the weight of 1000 grains to have high values, surpassing the average of 40 g.

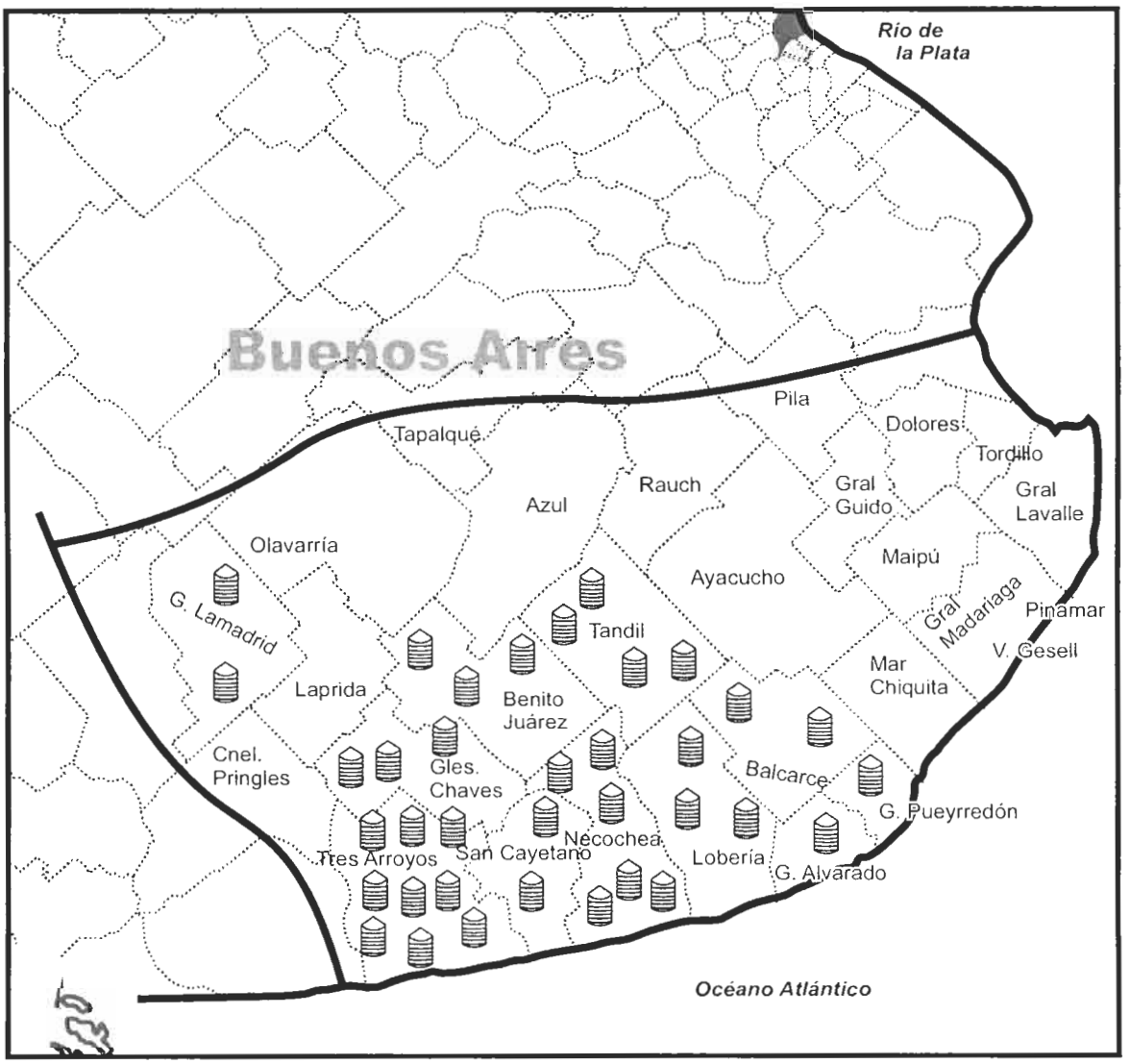
Leaf diseases were not significant, only the highly susceptible species presented Leaf Rust, which affected yields and commercial quality.

Good weather conditions during the grain filling, as from November 9 (130 mm) lengthened such period and, during December, atypical rains over the historical average (192 mm) delayed the harvest and increased the percentage of "washed grains" caused by rain effect.

In general, the conditions listed favored good yields due to proper rains and cool days in November, with high weights of 1000 grains and hectoliter weights, for the early harvested crops. Most of them suffered decreases in commercial quality due to "washing" and in some cases, yield losses due to hail storms and shattering.

Yields in the sub-region ranged between 3,500 and 6,000 kg/ha, due to very good climatic conditions during the grain filling.

Sub region IV Wheat



Each reference represents near 4,000 tns sampled.

Results of the Analyses

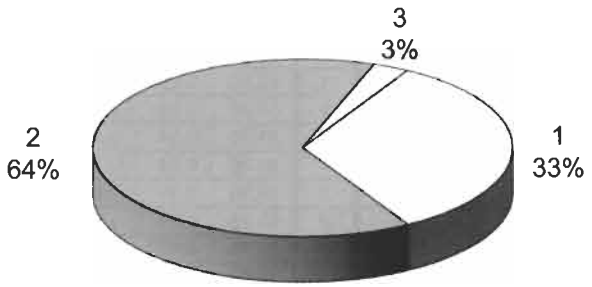
Composite Samples by Locality. Averages were weighted by Tonnage.

Sub region IV Wheat

Wheat Analysis	Minimum	Maximum	Average	Standard Deviation	Variation Coefficient
Test Weight (kg/hl)	73.65	82.60	80.65	1.37	1.70
Total Damaged Kernels (%)	0.00	0.84	0.25	0.15	61.44
Foreign Material (%)	0.04	0.8	0.26	0.14	55.35
Shrunken and Broken Kernels (%)	0.1	0.94	0.35	0.17	49.61
Yellow Berry Kernels (%)	0.19	5.40	1.53	1.32	86.29
Protein (13,5% Moisture) (%)	8.9	12.4	10.6	0.7	6.68
Weight of 1000 Kernels (gr.)	33.00	46.25	38.38	2.63	6.85
Ash (% dry basis)	1.481	1.839	1.664	0.084	5.05

Total damaged kernels includes 0.01% green kernels, 0.01% frosty kernels, 0.05% sprouted kernels, 0.06% insect chewed kernels, 0.09% calcinated kernels and 0.04% germ-chewed kernels.

Grade Distribution



Flour Analysis		Minimum	Maximum	Average	Standard Deviation	Variation Coefficient
MILLING	Wet Gluten (%)	19.4	27.1	24.4	1.7	7.09
	Dry Gluten (%)	7.0	12.7	8.9	0.9	9.84
	Falling Number (sec.)	374	458	412	20	4.87
	Flour Yield (%)	60.8	75.8	73.3	2.9	3.94
	Ash (dry basis) (%)	0.502	0.827	0.671	0.070	10.48
FARINOGRAM	Water Absorption (14% H°) (%)	51.1	59.5	57.3	1.2	2.17
	Development Time (min.)	1.9	17.7	6.4	2.4	37.08
	Stability (min.)	2.7	28.2	13.0	3.6	27.79
	Degree of Softening (12 min.)	13	69	42	11	24.97
ALVEOGRAM	P (mm)	62	111	90	10	10.75
	L (mm)	42	98	71	16	22.49
	W Joules x 10^{-4}	162	309	224	36	16.03
	P / L	0.67	2.31	1.28	0.42	30.99

These results were elaborated with 36 composite samples prepared proportionally from 660 primary samples (farmer deliveries)

Sub region Data

In this subregion the wheat production was 1,176,651 tons., the 14.2% of the national total. Were sampled 120,345 tons., the 10.23 % of the subregion production.

Sub region IV Wheat

Appendix of Locality Composite Samples.

SAMPLE IDENTIFICATION			WHEAT ANALYSIS								
Sample Number	Locality, district or department	Tonnage	Grade	Test Weight (Kg/hl)	Total Damaged Kernels (%)	Foreign Material (%)	Shrunken and Broken Kernels (%)	Yellow Berry Kernels (%)	Protein (13.5 % Moisture) (%)	Weight of 1000 Kernels (gr.)	Ash (dry basis) (%)
400	Benito Juarez	4000	1	81.70	0.25	0.15	0.33	0.69	10.0	38.54	1.708
401	Benito Juarez	4000	2	81.70	0.04	0.53	0.29	1.34	10.2	38.80	1.691
402	Necochea	4000	2	79.45	0.23	0.25	0.15	0.27	8.9	42.22	1.730
403	Necochea	4000	2	78.35	0.19	0.04	0.15	0.19	9.5	41.37	1.481
404	Balcarce	4000	1	79.45	0.34	0.17	0.41	1.01	10.3	36.69	1.764
405	Gral. Alvarado	4000	2	80.35	0.34	0.30	0.26	0.19	12.4	46.25	1.610
406	Tandil	4000	2	82.15	0.39	0.50	0.42	0.73	9.5	45.05	1.798
407	Lobería	4000	2	79.45	0.29	0.30	0.42	0.37	9.7	38.70	1.550
408	Lobería	4000	1	82.60	0.37	0.08	0.40	1.42	10.8	38.35	1.590
409	Lobería	4000	1	82.60	0.25	0.19	0.11	0.36	10.1	39.95	1.535
410	Tandil	4000	1	81.70	0.38	0.13	0.34	1.21	10.4	38.65	1.728
411	Necochea	4000	2	81.70	0.04	0.33	0.19	0.31	10.7	38.94	1.759
412	Necochea	4000	1	80.35	0.24	0.16	0.46	0.67	9.9	40.50	1.658
413	Necochea	4000	1	80.80	0.11	0.11	0.17	0.32	10.8	39.28	1.683
414	Balcarce	4000	2	80.35	0.29	0.34	0.26	1.19	10.1	38.47	1.655
415	Gral. Pueyrredón	4000	2	79.45	0.42	0.29	0.27	0.22	10.6	39.22	1.680
500	Benito Juárez	932	2	79.00	0.28	0.80	0.78	0.60	10.1	36.00	1.540
501	General Lamadrid	3755	2	79.90	0.16	0.30	0.40	1.20	10.8	37.00	1.530
502	General Lamadrid	2169	2	79.90	0.24	0.36	0.94	3.60	10.7	35.70	1.781
503	Gonzáles Cháves	4006	2	81.50	0.14	0.42	0.66	1.80	11.7	34.90	1.839
504	Gonzáles Cháves	3947	2	80.35	0.18	0.46	0.36	2.20	10.5	35.50	1.582
505	Gonzáles Cháves	2460	2	79.25	0.16	0.36	0.66	0.80	10.8	36.10	1.641
506	Necochea	480	2	79.00	0.28	0.40	0.54	5.40	10.7	38.10	1.612
507	San Cayetano	1000	2	79.90	0.84	0.36	0.50	1.60	11.1	37.00	1.665
508	San Cayetano	483	3	73.65	0.00	0.08	0.74	4.80	10.4	33.00	1.584
509	Tandil	2046	2	80.35	0.72	0.50	0.24	3.40	10.9	37.10	1.682
510	Tandil	1766	2	81.25	0.32	0.36	0.38	3.90	10.2	36.40	1.644
511	Tres Arroyos	4000	2	80.15	0.30	0.26	0.22	2.60	11.2	35.70	1.687
512	Tres Arroyos	4000	2	80.60	0.48	0.36	0.10	3.20	11.3	36.60	1.682
513	Tres Arroyos	2500	2	80.35	0.44	0.42	0.34	1.20	11.1	37.80	1.682
514	Tres Arroyos	4001	2	77.70	0.16	0.12	0.62	1.80	11.1	37.40	1.551
515	Tres Arroyos	2774	1	79.00	0.44	0.10	0.44	2.80	10.7	37.10	1.635
516	Tres Arroyos	4001	1	82.15	0.12	0.16	0.30	0.90	11.4	35.30	1.766
517	Tres Arroyos	3997	1	82.60	0.10	0.14	0.26	2.10	11.1	38.20	1.679
518	Tres Arroyos	4002	1	82.60	0.06	0.14	0.50	5.00	11.0	37.30	1.663
519	Tres Arroyos	4026	1	81.25	0.00	0.10	0.20	4.40	10.3	36.10	1.656

Sub region IV Wheat

Appendix of Locality Composite Samples.

SAMPLE IDENTIFICATION		FLOUR ANALYSIS												
						FARINOGRAM				ALVEOGRAM				
Sample Number	Locality, district or department	Wet Gluten (%)	Dry Gluten (%)	Falling Number (sec.)	Flour Yield (%)	% WA (14 % H°)	D. T. (min.)	Stability (min.)	Degree Softening (12 min.)	P	L	W	P/L	Ash (dry basis) (%)
400	Benito Juarez	22.7	8.4	423	60.8	57.7	8.5	16.5	38	85	74	219	1.15	0.592
401	Benito Juarez	22.8	8.4	444	74.5	57.9	4.2	15.4	24	104	47	191	2.21	0.720
402	Necochea	19.4	7.2	412	73.8	57.8	4.6	12.5	37	97	42	162	2.31	0.541
403	Necochea	24.4	9.0	405	75.1	53.9	3.9	10.5	46	62	92	177	0.67	0.607
404	Balcarce	25.3	12.7	426	74.4	57.6	3.8	9.1	49	81	60	169	1.35	0.816
405	Gral. Alvarado	24.8	9.2	404	75.6	56.8	5.0	15.4	27	91	60	191	1.52	0.701
406	Tandil	21.9	8.1	458	74.7	58.5	4.3	12.7	39	94	56	199	1.68	0.690
407	Lobería	23.0	8.5	374	75.5	57.8	5.1	12.4	43	90	59	201	1.53	0.675
408	Lobería	25.7	9.5	419	75.2	58.1	4.7	12.3	38	100	60	228	1.67	0.707
409	Lobería	23.3	8.6	434	74.8	58.0	2.0	4.3	63	95	62	216	1.53	0.617
410	Tandil	24.4	9.0	436	75.8	58.6	4.2	12.7	36	93	56	193	1.66	0.712
411	Necochea	26.2	9.7	396	73.4	57.2	8.9	16.6	37	92	69	225	1.33	0.682
412	Necochea	22.7	8.4	419	74.3	57.4	1.9	2.7	69	96	53	194	1.81	0.758
413	Necochea	24.2	9.0	426	73.9	57.8	5.1	15.1	31	107	62	249	1.73	0.625
414	Balcarce	23.1	8.6	375	74.6	55.4	4.5	9.6	52	86	58	181	1.48	0.714
415	Gral. Pueyrredón	23.5	8.7	402	74.3	58.6	10.8	19.5	30	111	50	219	2.22	0.727
500	Benito Juárez	21.1	7.4	413	71.6	52.9	9.3	23.1	13	75	83	226	0.90	0.502
501	General Lamadrid	24.6	8.7	426	72.5	56.2	9.4	14.6	37	82	82	238	1.00	0.625
502	General Lamadrid	25.0	8.7	433	73.6	57.6	6.2	10.0	60	89	84	258	1.06	0.827
503	Gonzáles Cháves	27.1	9.4	420	72.7	59.5	9.8	14.2	32	93	98	309	0.95	0.804
504	Gonzáles Cháves	24.1	8.3	415	73.3	56.3	7.3	16.0	34	90	67	225	1.34	0.699
505	Gonzáles Cháves	25.0	8.8	427	72.9	56.6	7.0	11.9	45	79	78	212	1.01	0.761
506	Necochea	22.1	7.7	398	71.0	55.3	9.8	16.7	34	82	72	224	1.14	0.559
507	San Cayetano	25.7	8.9	390	61.1	57.2	8.2	11.4	41	77	94	241	0.82	0.656
508	San Cayetano	20.0	7.0	431	69.4	51.1	17.7	28.2	23	85	44	162	1.93	0.539
509	Tandil	24.0	8.4	385	68.0	56.9	7.3	13.2	47	76	80	213	0.95	0.658
510	Tandil	23.2	8.2	416	72.9	56.6	8.3	16.9	31	97	62	229	1.56	0.715
511	Tres Arroyos	25.9	9.0	413	72.7	57.5	7.0	12.0	48	81	92	254	0.88	0.573
512	Tres Arroyos	26.7	9.2	429	73.0	57.6	7.9	13.4	50	90	91	284	0.99	0.672
513	Tres Arroyos	26.4	9.1	410	73.9	57.5	7.0	12.0	48	81	95	262	0.85	0.607
514	Tres Arroyos	26.3	9.2	384	73.5	55.7	6.8	12.4	47	78	91	242	0.86	0.677
515	Tres Arroyos	24.9	8.8	391	74.3	55.9	6.8	13.2	45	87	70	227	1.24	0.622
516	Tres Arroyos	26.7	9.3	383	72.3	58.2	9.2	15.3	47	96	82	284	1.17	0.649
517	Tres Arroyos	26.2	9.1	409	73.2	58.2	7.4	12.5	48	90	93	285	0.97	0.625
518	Tres Arroyos	25.9	9.0	392	74.4	57.6	7.3	12.2	54	85	80	235	1.06	0.666
519	Tres Arroyos	24.3	8.4	398	73.6	56.6	7.9	15.7	37	95	64	227	1.48	0.572

Climatology
2012 / 2013

Weather and Wheat Crop 2012 - 2013 in Argentina

José L. Aiello – Alfredo C. Elorriaga

Weather behavior during the wheat campaign 2012-2013 is described using a method to calculate the water reservoirs in the soil and its anomalies. These latter are named 'Classification of Soil Humidity' and were calculated as a monthly average during all the entire wheat cycle, but come from a daily analysis, and express the degree of deviation from the habitual conditions for each region and period of year. Moisture classification is a proper indicator since it summarizes the behavior of the most relevant climatic variables, such as the spatial-temporal distributions of rains and their interaction with the evapotranspiration, which in turns depends on temperature, solar radiation, winds and atmospheric humidity.

The maps, which are used operationally and for any period of time, in this case are monthly and contain a politic subdivision by department, which may be associated to the main wheat areas of the country, representing here only Pampean provinces. The presentation of map sequence that classify the soil moisture and a description of its behavior allow the reader to have a clear idea of which was the weather evolution of wheat crop, and agronomic considerations are described in another section of this report. We should clarify that the habitual or normal conditions are not always the best suited for the crop in all regions and periods of the year; therefore, during the winter and early spring, normal conditions might be hydric deficit in regions located at the west and northwest of the wheat region, such as the V North sub-region, however these same conditions could represent situations of some soil water excess in the east center and south east of the wheat region.

MAY 2012

The beginning of wheat crop presented moisture conditions with a very proper distribution in the Province of Buenos Aires, with a normal situation in the center north of La Pampa and Cordoba provinces, and below normal values in Entre Ríos province.

JUNE 2012

The most significant characteristic during this month was the identification of a dry pulse which resulted in drought conditions in the north of Entre Ríos province. In the rest of the region shown in the map, there were no major changes, and continued surface moisture conditions suitable for sowing, which allowed a normal crop timetable.

JULY 2012

July was characterized as the driest month of the season. To see this, we note that in the map there were no soil moisture conditions over the normal, with a dry pulse intensification in the north of Entre Ríos province. This situation of lack of rainfall and subsequent soil moisture losses had created a situation of concern among producers.

AUGUST 2012

The recomposition of rain systems produced a radical change in the moisture distribution, filling the profiles in all the Pampean region and bringing great relief and benefit for the crops. It is important to note the disappearance of drought conditions in the north of Entre Ríos province and the appearance of hydric excesses in the north of Buenos Aires province. It is also interesting to observe the limited dry pulse at the South of Santa Fe province.

SEPTEMBER 2012

Good rain conditions continued and it is notable to observe that all the center of the Pampean region had soil moisture conditions with excesses, and the dominant feature was a scenario of profiles that benefited the development of the crops. Wheat nucleus area at the south east of Buenos Aires had nearly normal conditions, which resulted favorable for the development of the crops, which was a very similar situation to the 2011-2012 crop season.

OCTOBER 2012

The situation during October was very interesting. By looking at the map, it can be noted that the reserves are in a 'dipole' situation, with excesses throughout at the center and dry conditions at the south of the province of Buenos Aires. There were conditions of higher atmospheric demand, and in those locations with no rains, moisture variations were rapidly detected.

NOVEMBER 2012

Very good conditions in almost all the Pampean region were registered, except for a strip comprising the eastern part of the region, where notwithstanding the conditions were normal. These conditions allowed a proper develop of wheat cycle stages, and therefore, a normal harvest was expected, which may be good in the south east of Buenos Aires, the last to harvest and which still holding to maintain good water reserves in the soil, reaching for the most demanding stages in that area.

DECEMBER 2012

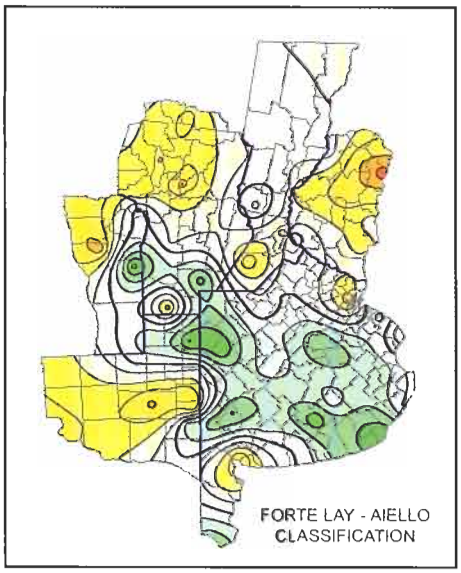
As a month of harvest in the center and north of the region, positive anomalies of moisture in the soil are in general not favorable for wheat, and these conditions as outlined in the map, produced difficulties during harvest.

JANUARY 2013

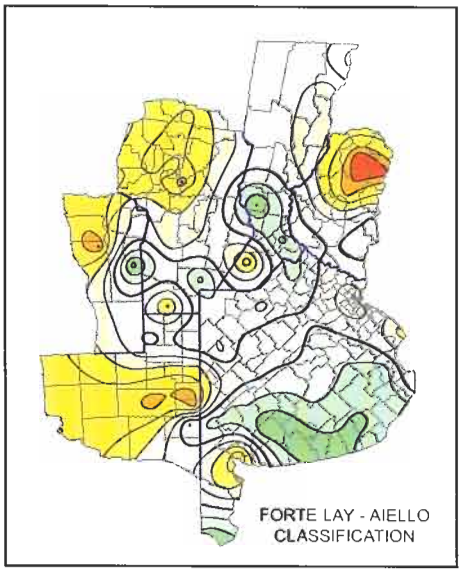
The map of the average hydric situation of this month is added, since it is still a harvest period in the south east extreme of wheat region. Soil moisture, slightly above normal did not influence harvest operations.

SOIL HUMIDITY CLASSIFICATION

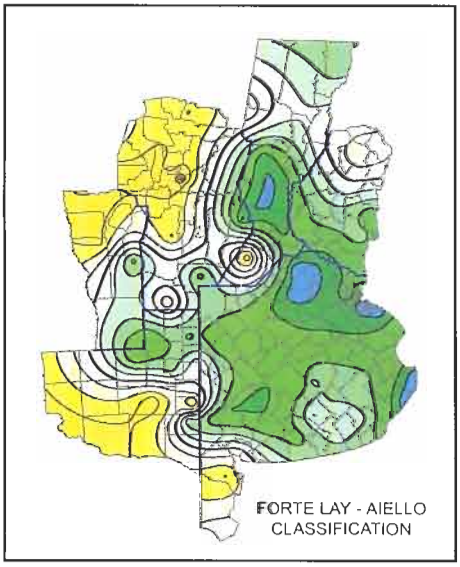
MAY 2012



JUNE 2012



AUGUST 2012



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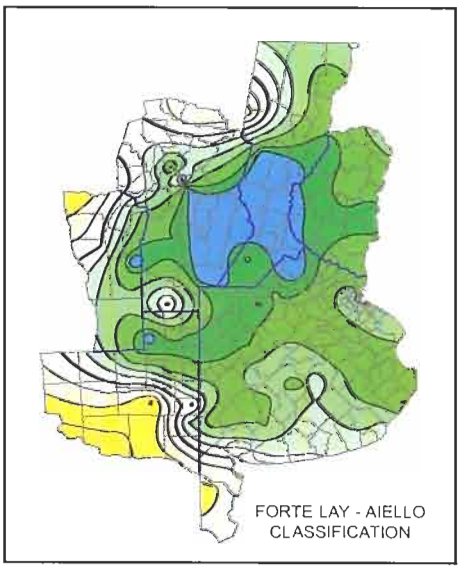

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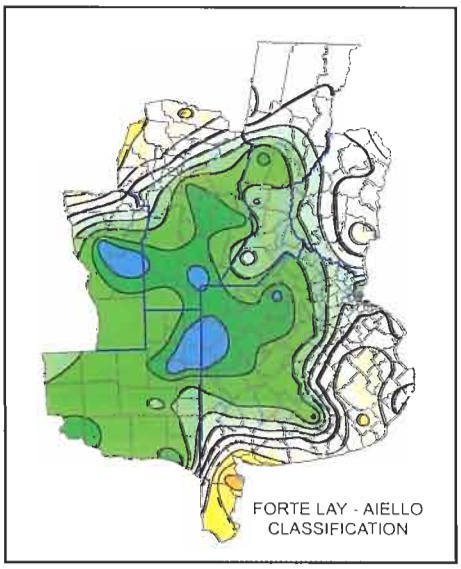
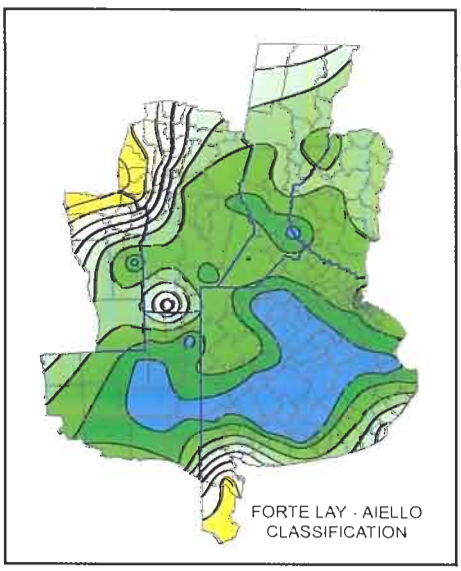
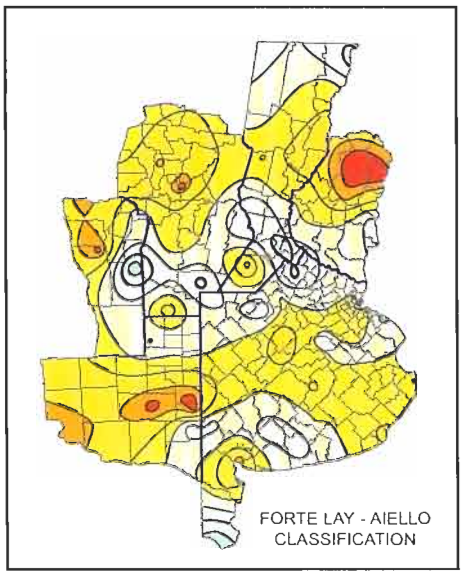


DECEMBER 2012

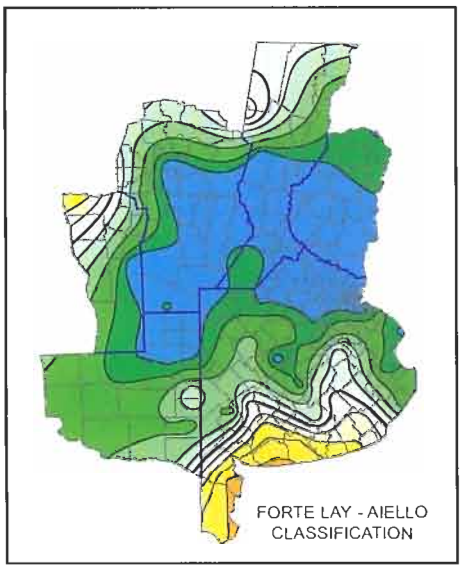


012 / 2013 WHEAT CROP

JULY 2012

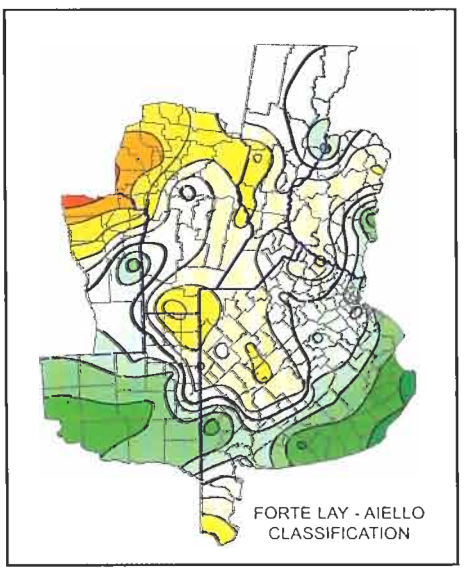


OCTOBER 2012



Extremely wetter than usual.
Much wetter than usual.
Wetter than usual.
Approximately normal for the season.
Drier than usual.
Much drier than usual.
Extremely drier than usual.

JANUARY 2013



Sub region V North
Background for the crop

Planting begun in late May, favored by occurrence of rains; and it extended until mid-June.

The sown area was significantly less than the previous season, reaching up to a 50 % decrease in some departments. The cause of such drop was mainly due to the lack of humidity in the soil profile during the sowing time.

The crop had a very good development, favored by rainfall, although it was not so in all the areas of this sub-region, where slow emergences and irregular height of plants were registered.

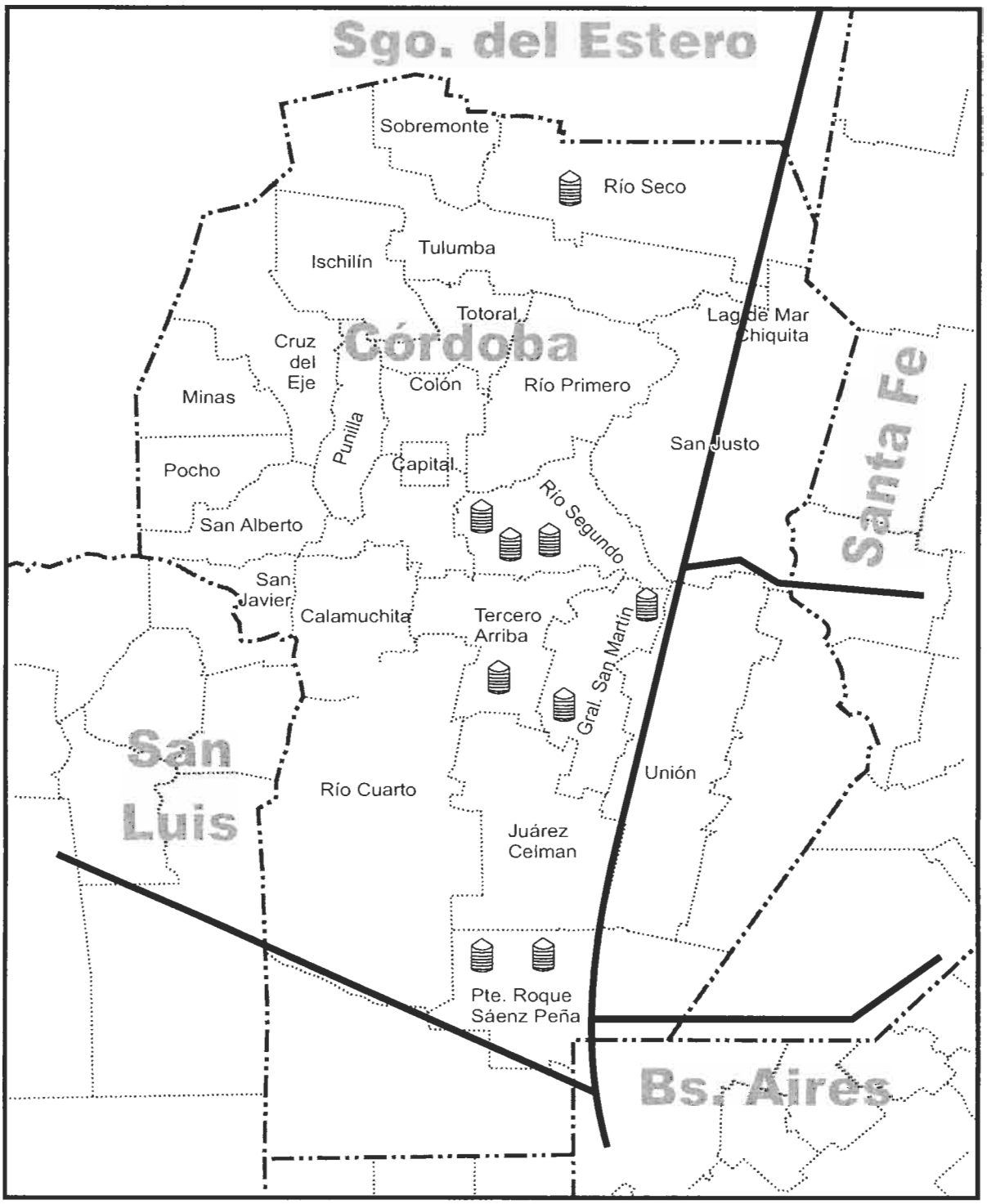
There was some presence of aphids during the cycle, but in general, this incidence did not required the application of pesticides.

With respect of diseases, there was presence of Leaf Rust or Orange Leaf (Puccinia recondita), Yellow Spot (Septoria tritici) and Fusarium (Fusarium graminearum), favored by climatic conditions, and it was necessary to apply the appropriate pesticides.

At the reproductive stage of the crop, occurrence of widespread rains, favored it significantly. By the beginning of October, when crops were entering the flowering stage, there were some frosts that at first seemed not to have caused damage to the crop. In addition, damages suffered by some crops due to high temperatures and the intensity of the sun, produced surprising yield falls.

In general, yields were between 1,700 and 2,600 kg/ha. Quality was not so good: low test weight, good gluten content and relative presence of Fusarium.

Sub region V North Wheat



Each reference represents near 4,000 tns sampled.

Sub region V North Wheat

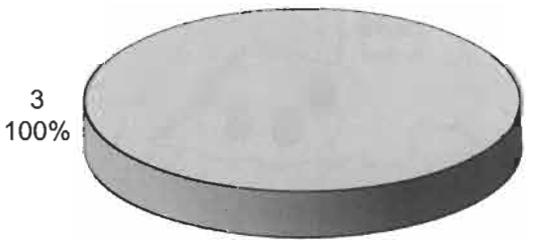
Results of the Analyses

Composite Samples by Locality. Averages were weighted by Tonnage.

Wheat Analysis	Minimum	Maximum	Average	Standard Deviation	Variation Coefficient
Test Weight (kg/hl)	73.20	77.00	74.16	1.00	1.35
Total Damaged Kernels (%)	0.74	2.57	1.35	0.64	47.57
Foreign Material (%)	0.19	1.07	0.44	0.27	61.30
Shrunken and Broken Kernels (%)	0.91	1.46	1.20	0.17	13.81
Yellow Berry Kernels (%)	0.00	0.70	0.30	0.22	75.32
Protein (13,5% Moisture) (%)	11.4	12.5	11.8	0.3	2.91
Weight of 1000 Kernels (gr.)	27.28	30.24	28.28	1.13	3.99
Ash (% dry basis)	1.990	2.200	2.081	0.076	3.64

Total damaged kernels includes 0.11% green kernels, 0.04% frosty kernels, 0.15% sprouted kernels, 0.23% insect chewed kernels, 0.68% calcinated kernels and 0.19% germ-chewed kernels.

Grade Distribution



Flour Analysis		Minimum	Maximum	Average	Standard Deviation	Variation Coefficient
MILLING	Wet Gluten (%)	24.1	28.7	26.4	1.6	5.91
	Dry Gluten (%)	8.2	9.6	8.9	0.5	5.24
	Falling Number (sec.)	398	449	428	13	3.09
	Flour Yield (%)	66.4	70.7	68.6	1.8	2.62
	Ash (dry basis) (%)	0.615	0.775	0.687	0.056	8.16
FARINOGRAM	Water Absorption (14% H°) (%)	54.6	56.9	55.7	0.7	1.25
	Development Time (min.)	6.3	10.5	8.9	1.1	12.68
	Stability (min.)	11.0	25.7	19.9	4.3	21.42
	Degree of Softening (12 min.)	25	66	35	10	29.13
ALVEOGRAM	P (mm)	70	99	76	6	8.22
	L (mm)	100	131	109	10	8.81
	W Joules x 10^{-4}	246	341	278	24	8.56
	P / L	0.59	0.85	0.70	0.08	10.69

These results were elaborated with 8 composite samples prepared proportionally from 57 primary samples (farmer deliveries)

Sub region Data

In this subregion the wheat production was 818,130 tons., the 9.9% of the national total. Were sampled 33,700 tons., the 4.12 % of the subregion production.

Appendix of Locality Composite Samples.

SAMPLE IDENTIFICATION			WHEAT ANALYSIS									
Sample Number	Locality, district or department	Tonnage	Grade	Test Weight (Kg/hl)	Total Damaged Kernels (%)	Foreign Material (%)	Shrunken and Broken Kernels (%)	Yellow Berry Kernels (%)	Protein (13.5 % Moisture) (%)	Weight of 1000 Kernels (gr.)	Ash (dry basis) (%)
600	Roque Sáenz Peña	4000	3	73.85	2.57	0.36	1.02	0.70	12.0	30.24	2.050
601	Roque Sáenz Peña	2000	3	77.00	2.33	0.29	0.91	0.20	11.8	30.11	1.990
602	Tercero Arriba	3200	3	74.10	0.76	0.24	1.46	0.20	11.8	29.81	2.180
603	Gral. San Martin	4000	3	73.65	1.34	1.07	1.17	0.00	12.5	27.30	2.060
604	Gral. San Martin	5000	3	73.20	1.76	0.32	1.27	0.50	11.6	28.14	2.000
605	Rio Segundo	4000	3	75.00	1.35	0.58	1.44	0.40	11.5	27.56	2.160
606	Río Segundo	7000	3	73.40	0.74	0.19	1.06	0.30	11.4	27.65	2.030
607	Río Segundo	4500	3	75.20	0.77	0.53	1.26	0.00	12.0	27.28	2.200

Sub region V North Wheat

Appendix of Locality Composite Samples.

SAMPLE IDENTIFICATION		FLOUR ANALYSIS												
						FARINOGRAM				ALVEOGRAM				
Sample Number	Locality, district or department	Wet Gluten (%)	Dry Gluten (%)	Falling Number (sec.)	Flour Yield (%)	% WA (14 % H°)	D. T. (min.)	Stability (min.)	Degree Softening (12 min.)	P	L	W	P/L	Ash (dry basis) (%)
600	Roque Sáenz Peña	27.1	9.2	410	69.8	55.4	8.1	16.0	40	70	116	271	0.60	0.615
601	Roque Sáenz Peña	28.3	9.3	398	67.6	56.9	6.3	11.0	66	99	117	246	0.85	0.725
602	Tercero Arriba	25.4	8.5	434	68.6	56.6	10.1	24.4	25	77	131	341	0.59	0.705
603	Gral. San Martín	28.7	9.6	430	66.4	56.2	8.4	16.4	39	76	115	292	0.66	0.745
604	Gral. San Martín	24.1	8.2	434	70.7	55.4	9.0	21.6	28	78	103	284	0.76	0.695
605	Río Segundo	25.0	8.5	449	66.6	55.9	8.1	17.3	38	77	100	262	0.77	0.775
606	Río Segundo	25.8	8.9	421	70.5	54.6	10.5	25.7	25	76	100	271	0.76	0.615
607	Río Segundo	28.0	9.4	437	66.6	56.0	8.5	18.9	38	71	107	258	0.66	0.695

Sub region V South
Background for the crop

Sub region V South Wheat

This season continued the hectareage reduction. In much of the subregion, during the first half of the year, remained a significant reduction from the historical average rainfall, but evenly distributed with a mild winter, which allowed a good crop establishment. From August rainfall improved water availability in soil profiles.

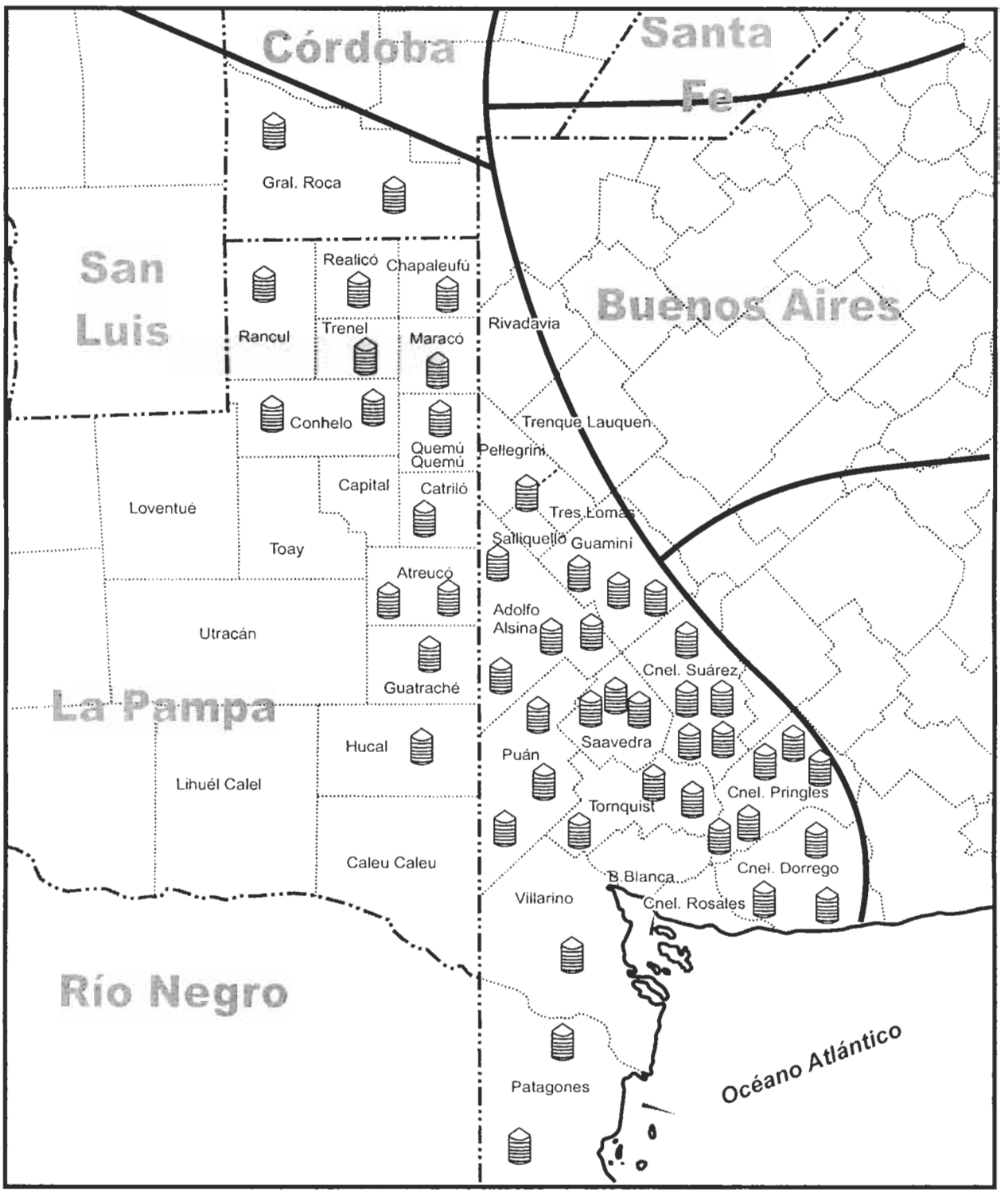
Fertilizers based on Phosphate (P) and Nitrogen (N) were used during the sowing stage, and given the good condition of the crops, in many cases, N was applied again during tillering.

There were no deseases problems related to fungus; but in some cases there were aphids and/or caterpillars attacks, that had to be controlled.

Rains at the last quarter of the year showed significant differences between environments, with extremes for example in Darragueira, that exceeded the annual 1000 mm, and Cabildo where it did not reach 530 mm. In the less favored environments, there was a dry period at the grain filling stage (ends of October/beginning of November) with very high temperatures between 6-8 November, which diminished yields.

As it is typical from the sub-region, yields was very good in many localities but regular in areas with less precipitations and with shallow soils.

Sub region V South Wheat



Each reference represents near 4,000 tns sampled.

Results of the Analyses

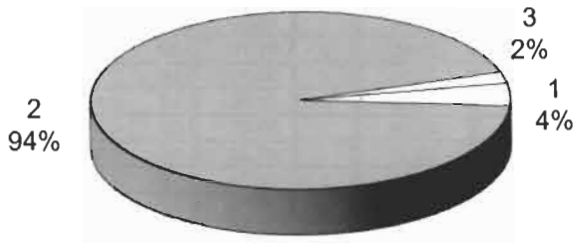
Composite Samples by Locality. Averages were weighted by Tonnage.

Sub region V South Wheat

Wheat Analysis	Minimum	Maximum	Average	Standard Deviation	Variation Coefficient
Test Weight (kg/hl)	76.10	84.85	80.89	1.68	2.08
Total Damaged Kernels (%)	0.00	1.50	0.27	0.27	101.81
Foreign Material (%)	0.20	0.92	0.46	0.18	39.61
Shrunken and Broken Kernels (%)	0.28	1.14	0.69	0.23	33.00
Yellow Berry Kernels (%)	0.30	13.40	1.97	1.82	92.51
Protein (13,5% Moisture) (%)	10.1	12.7	11.2	0.6	5.06
Weight of 1000 Kernels (gr.)	31.30	37.90	33.76	1.44	4.28
Ash (% dry basis)	1.623	1.972	1.800	0.080	4.43

Total damaged kernels includes 0.01% green kernels, 0.07% sprouted kernels, 0.07% insect chewed kernels and 0.04% germ-chewed kernels.

Grade Distribution



Flour Analysis		Minimum	Maximum	Average	Standard Deviation	Variation Coefficient
MILLING	Wet Gluten (%)	22.2	32.0	25.8	2.1	7.98
	Dry Gluten (%)	7.8	11.2	9.1	0.7	7.63
	Falling Number (sec.)	376	442	408	16	3.99
	Flour Yield (%)	64.5	74.2	70.2	2.2	3.15
	Ash (dry basis) (%)	0.532	0.814	0.661	0.069	10.50
FARINOGRAM	Water Absorption (14% H°) (%)	53.3	60.2	57.4	1.6	2.76
	Development Time (min.)	5.6	37.4	9.3	4.9	53.13
	Stability (min.)	8.8	51.7	19.6	10.6	54.00
	Degree of Softening (12 min.)	0	73	35	17	49.21
ALVEOGRAM	P (mm)	57	110	86	10	12.02
	L (mm)	61	123	90	13	14.52
	W Joules x 10^{-4}	206	344	270	30	11.20
	P / L	0.48	1.79	0.96	0.25	25.16

These results were elaborated with 48 composite samples prepared proportionally from 842 primary samples (farmer deliveries)

Sub region Data

In this subregion the wheat production was 2,152,829 tons., the 25.8% of the national total. Were sampled 156,191 tons., the 7.26 % of the subregion production.

Sub region V South Wheat

Appendix of Locality Composite Samples.

SAMPLE IDENTIFICATION			WHEAT ANALYSIS									
Sample Number	Locality, district or department	Tonnage	Grade	Test Weight (Kg/hl)	Total Damaged Kernels (%)	Foreign Material (%)	Shrunken and Broken Kernels (%)	Yellow Berry Kernels (%)	Protein (13.5 % Moisture) (%)	Weight of 1000 Kernels (gr.)	Ash (dry basis) (%)
700	Atreucó	4002	2	79.90	0.34	0.76	0.64	1.40	11.5	34.20	1.964
701	Atreucó	2062	2	79.45	1.00	0.42	1.00	1.80	11.3	32.70	1.779
702	Catriló	2030	2	80.80	0.32	0.32	1.00	1.30	10.8	32.90	1.858
703	Conhelo	3884	2	83.05	0.22	0.54	0.94	2.60	10.8	34.00	1.971
704	Conhelo	2000	2	84.60	0.00	0.24	0.94	6.20	10.3	35.30	1.882
705	Chapaleufú	2106	2	79.00	0.06	0.34	0.94	2.60	11.0	33.80	1.896
706	Guatraché	2004	2	81.05	0.16	0.46	0.80	2.40	12.7	33.80	1.718
707	Hucal	2012	2	81.70	0.12	0.38	0.70	2.50	11.3	33.30	1.623
708	Maracó	2006	2	80.60	0.52	0.48	0.92	5.60	10.5	33.30	1.972
709	Quemú - Quemú	2318	2	79.90	0.18	0.48	0.92	4.80	11.6	31.60	1.878
710	Rancul	2545	2	81.70	0.32	0.24	0.60	0.40	11.8	33.80	1.914
711	Realicó	2054	2	80.35	0.28	0.32	0.76	0.50	11.9	32.30	1.890
712	Trenel	2564	2	80.80	0.18	0.40	0.76	3.60	10.8	34.20	1.925
714	Adolfo Alsina	2611	2	80.80	0.00	0.44	0.48	1.20	11.2	34.00	1.888
715	Adolfo Alsina	4000	2	80.35	0.06	0.50	0.72	0.60	10.9	32.80	1.843
716	Adolfo Alsina	4002	2	77.70	0.12	0.58	0.56	0.30	11.3	32.20	1.745
717	Adolfo Alsina	4000	3	79.70	0.16	0.92	0.54	1.60	10.7	32.10	1.763
718	Coronel Dorrego	4007	2	81.70	0.18	0.26	0.44	1.20	12.1	33.90	1.785
719	Coronel Dorrego	3986	2	81.50	0.10	0.74	0.96	1.30	12.1	33.50	1.697
720	Coronel Dorrego	4005	2	82.40	0.22	0.34	0.46	3.40	12.1	34.50	1.688
721	Coronel Pringles	4006	2	80.80	0.36	0.36	0.48	1.60	11.7	34.60	1.806
722	Coronel Pringles	4017	2	81.50	0.34	0.32	0.56	2.40	11.8	35.40	1.842
723	Coronel Pringles	4002	2	80.80	0.56	0.34	0.28	1.50	11.4	36.20	1.777
725	Coronel Pringles	4011	1	80.15	0.24	0.20	0.32	1.00	11.1	36.20	1.725
726	Coronel Pringles	4000	2	84.60	0.08	0.30	0.72	2.40	11.3	34.10	1.773
727	Coronel Suárez	4000	1	81.50	0.22	0.20	0.44	0.40	10.9	35.10	1.894
728	Coronel Suárez	2001	2	80.80	0.26	0.60	0.58	2.80	10.5	34.70	1.799
730	Coronel Suárez	4016	2	80.80	0.30	0.24	0.38	2.80	10.7	35.40	1.743
731	Coronel Suárez	4000	2	81.25	0.26	0.32	0.62	3.20	10.4	32.20	1.684
732	Coronel Suárez	4002	2	79.25	0.16	0.32	0.54	3.20	10.1	31.30	1.730
733	Guaminí	4080	2	81.25	0.00	0.54	0.32	0.60	10.5	33.90	1.797
734	Guaminí	3733	2	79.90	0.80	0.54	0.56	0.60	10.5	33.20	1.837
735	Guaminí	4006	2	80.15	0.06	0.40	0.68	1.20	10.9	32.70	1.752
736	Patagones	3908	2	82.60	0.12	0.58	0.86	0.60	10.9	33.10	1.784
737	Patagones	1708	2	81.05	0.12	0.74	1.14	13.40	10.5	33.30	1.732
738	Pellegrini-Salliqueló-Tres Lomas	3761	2	78.15	0.44	0.34	0.46	0.90	11.3	32.30	1.682
739	Puán	4002	2	80.35	0.22	0.76	1.06	1.00	11.2	32.50	1.882
740	Puán	4000	2	82.60	0.22	0.70	0.80	1.20	11.4	33.30	1.811
742	Puán	4002	2	84.85	0.18	0.54	1.02	5.80	10.8	33.40	1.824
743	Saavedra	4007	2	81.25	0.54	0.68	0.82	1.10	11.3	33.70	1.759
744	Saavedra	4001	2	81.25	0.00	0.48	0.94	1.60	11.0	37.90	1.772
745	Saavedra	4013	2	81.25	0.24	0.38	0.80	0.40	10.5	36.50	1.733
746	Tornquist	3809	2	81.25	0.00	0.78	0.98	0.60	12.0	32.80	1.788
747	Tornquist	1910	2	79.70	0.16	0.46	0.94	1.20	11.4	34.70	1.743
748	Tornquist	2008	2	82.15	0.26	0.32	1.08	3.60	11.8	32.20	1.768
749	Villarino	1490	2	80.80	0.24	0.36	0.68	0.40	11.2	35.40	1.673
750	General Roca (Córdoba)	4000	2	76.10	1.50	0.32	0.50	2.60	11.9	31.70	1.888
751	General Roca (Córdoba)	1500	2	77.25	0.48	0.24	0.86	1.70	12.3	32.20	1.821

Sub region V South Wheat

Appendix of Locality Composite Samples.

SAMPLE IDENTIFICATION		FLOUR ANALYSIS												
						FARINOGRAM				ALVEOGRAM				
Sample Number	Locality, district or department	Wet Gluten (%)	Dry Gluten (%)	Falling Number (sec.)	Flour Yield (%)	% WA (14 % H°)	D. T. (min.)	Stability (min.)	Degree Softening (12 min.)	P	L	W	P/L	Ash (dry basis) (%)
700	Atreucó	25.7	9.1	416	70.6	57.2	11.2	26.7	20	86	96	296	0.90	0.642
701	Atreucó	27.2	9.4	391	72.0	58.1	6.1	11.8	47	86	79	239	1.09	0.722
702	Catriló	24.6	8.5	414	73.1	56.0	9.3	19.0	28	87	87	278	1.00	0.601
703	Conhelo	24.1	8.4	408	64.5	59.7	10.9	31.1	19	107	65	260	1.65	0.727
704	Conhelo	22.2	7.8	378	68.5	58.2	10.4	23.0	21	109	61	258	1.79	0.632
705	Chapaleufú	25.9	9.1	437	72.7	57.6	7.7	13.2	42	88	80	246	1.10	0.813
706	Guatraché	32.0	11.2	395	71.4	60.2	7.8	12.3	35	78	121	298	0.64	0.606
707	Hucal	24.4	8.8	442	68.1	56.1	9.0	20.6	23	81	92	277	0.88	0.660
708	Maracó	23.8	8.4	403	70.5	56.7	7.6	15.4	32	96	70	257	1.37	0.663
709	Quemú - Quemú	26.2	9.5	424	70.4	57.5	9.2	27.6	17	92	78	274	1.18	0.770
710	Rancul	27.9	9.7	420	67.0	59.0	10.9	20.2	32	95	87	304	1.09	0.709
711	Realicó	27.7	10.1	439	71.4	59.9	8.0	13.4	50	88	89	283	0.99	0.717
712	Trenel	25.9	9.4	398	69.7	58.9	8.3	15.7	39	101	62	236	1.63	0.709
714	Adolfo Alsina	23.6	8.6	416	70.6	56.2	16.1	50.5	12	97	84	311	1.15	0.607
715	Adolfo Alsina	23.7	8.6	421	64.7	55.5	11.9	26.7	23	79	95	265	0.83	0.714
716	Adolfo Alsina	24.8	8.8	399	71.2	55.1	9.6	51.7	6	82	98	300	0.84	0.601
717	Adolfo Alsina	24.0	8.6	401	66.9	54.7	8.8	31.9	16	87	85	273	1.02	0.643
718	Coronel Dorrego	26.7	9.5	412	68.7	59.4	37.4	41.1	29	110	80	335	1.38	0.551
719	Coronel Dorrego	28.0	9.9	399	68.7	57.3	12.0	19.3	25	86	102	316	0.84	0.604
720	Coronel Dorrego	29.7	10.6	401	71.0	58.9	10.9	15.7	43	92	109	344	0.84	0.630
721	Coronel Pringles	26.3	9.3	385	69.7	58.2	8.8	16.6	28	82	104	291	0.79	0.541
722	Coronel Pringles	28.1	9.8	412	71.8	59.5	6.8	9.8	46	83	88	247	0.94	0.811
723	Coronel Pringles	27.0	9.3	400	68.6	57.8	8.7	13.5	45	80	96	263	0.83	0.679
725	Coronel Pringles	25.0	8.8	386	70.0	58.2	7.9	12.3	29	81	98	269	0.83	0.556
726	Coronel Pringles	28.5	10.0	407	71.8	59.6	6.3	8.8	59	81	96	254	0.84	0.691
727	Coronel Suárez	24.6	8.7	407	67.8	58.0	7.8	14.5	36	88	89	264	0.99	0.744
728	Coronel Suárez	24.2	8.5	381	71.5	56.8	8.0	16.7	31	86	94	269	0.91	0.646
730	Coronel Suárez	29.0	10.1	407	65.5	58.5	6.7	8.9	67	67	103	225	0.65	0.814
731	Coronel Suárez	23.1	8.3	385	68.9	55.4	8.5	19.7	21	78	84	235	0.93	0.671
732	Coronel Suárez	23.0	8.1	400	71.7	54.7	6.5	24.1	14	81	71	216	1.14	0.596
733	Guaminí	24.2	8.7	392	71.8	56.3	7.4	19.0	23	87	82	259	1.06	0.680
734	Guaminí	24.2	8.6	396	72.1	56.5	9.0	20.3	26	85	82	250	1.04	0.609
735	Guaminí	25.0	8.8	407	72.3	56.3	7.4	19.3	21	89	80	270	1.11	0.620
736	Patagones	24.9	8.9	410	70.1	58.2	7.4	20.2	25	106	80	317	1.33	0.621
737	Patagones	24.6	8.6	421	72.1	56.7	7.8	13.3	51	78	90	233	0.87	0.687
738	Pellegrini-Salliqueló-Tres Lomas	23.4	8.5	411	72.1	53.3	10.9	44.6	0	84	73	255	1.15	0.532
739	Puán	26.7	9.4	425	71.0	58.2	7.4	13.2	48	91	94	296	0.97	0.687
740	Puán	27.6	9.7	402	70.6	59.4	7.0	11.3	56	91	99	303	0.92	0.654
742	Puán	25.3	8.9	437	69.1	58.4	7.3	11.4	54	88	84	255	1.05	0.729
743	Saavedra	25.2	8.8	392	71.8	57.6	9.0	15.1	46	86	91	274	0.95	0.629
744	Saavedra	24.6	8.6	438	71.8	57.3	8.0	11.4	53	83	93	263	0.89	0.703
745	Saavedra	22.8	7.9	394	71.3	56.6	9.8	22.6	25	96	77	270	1.25	0.610
746	Tornquist	29.3	10.3	436	72.0	58.6	7.0	9.2	50	78	105	263	0.74	0.702
747	Tornquist	26.0	9.2	376	70.8	57.4	7.3	11.7	57	76	107	266	0.71	0.565
748	Tornquist	28.0	9.8	424	71.9	58.0	6.3	10.6	55	79	103	273	0.77	0.683
749	Villarino	26.3	9.1	419	73.5	58.0	6.5	9.1	71	81	88	239	0.92	0.614
750	General Roca (Córdoba)	28.4	9.8	436	74.2	55.5	5.6	9.7	73	57	118	206	0.48	0.729
751	General Roca (Córdoba)	28.9	10.1	404	71.8	55.5	7.4	12.1	57	59	123	228	0.48	0.628

Nortwest of the Country (NOA)
Background for the crop

In this season, the producers had little incentives for sowing. As a result of the scarce water stored in soil profiles due to a strong and long draught during summer and a part of autumn, many producers decided not to sow wheat.

Although April presented rains, they were not enough for sowing; therefore, only nearly the half of the area was sown, according to the zones. Some departments virtually did not plant wheat. Many crops were lost due to lack of moisture and, in general, it was a very difficult season.

As a consequence of little incentives for sowing wheat, many producers looked for more profitable productions, and in this sense chickpea crop was selected and its area was significantly increased. The few wheat planted crops reached flowering with almost no water in soil, therefore yields were very low, erratic and in some cases with no harvest at all.

As every year, there were presence of diseases such as Yellow Spot (Drechslera tritici repentis) and little Leaf Rust (Puccinia triticina Erikss).

There were some aphids, thrips and mites, mainly due to drought environmental.

In general, only few crops reached yields around 1000 kg/ha; and coincided with the early planted ones, in late April. The rest had very erratic results, with very low yields. However, baking quality was good to very good, with very acceptable levels of gluten and test weights.

Northeast of the Country (NEA)
Background for the crop

Crops begun in mid-May with difficulties in the sowing of long-cycle wheat due to the lack of rains and low water reserves in soil profiles, since the previous season presented one of the most significant droughts in the agricultural history of the province; extending itself up to the first days of July, the sowing time for short-cycle crops. Therefore, planted area was significantly reduced, with respect to the two previous season.

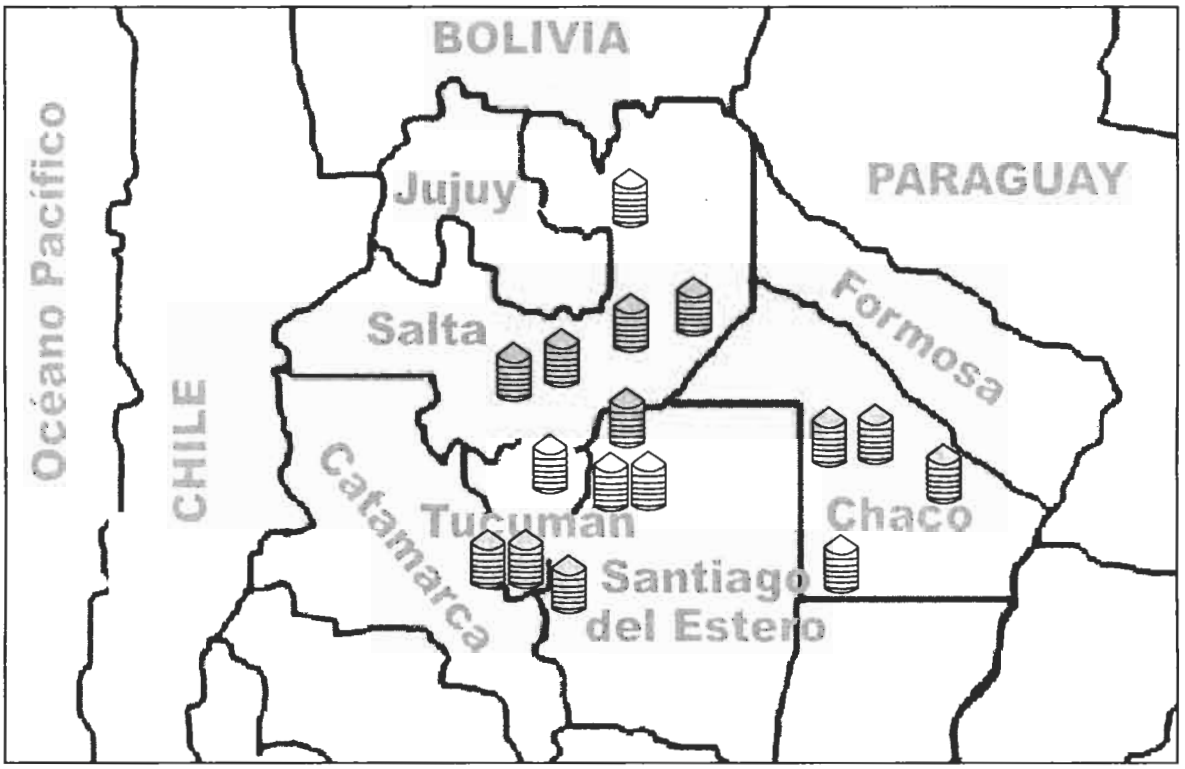
Tillering stage was developed with scarce moisture conditions due to the lack of rains to recharge the soil profile, that mainly affected long cycle cultivares. The first and practically only significant rainfall during the crop cycle were registered between late August and early September, being late for the long-cycle cultivares, that were at flag leaf to flowering stages; but they did allowed the short-cycle cultivars, that already were at tilling stages, to develop the reproductive stage with a moisture content in the soil profile that allowed in some cases acceptable yields.

Harvest begun in mid-October, with some long cycle crops, and there were some delays due to drizzles that persisted for several days. Labors extended until mid-November, with better weather conditions and more acceptable yields.

With respect to plagues, some prevalence was registered of aphids and thrips, severe in some cases. There was no record of leaf diseases with significant damages.

In Chaco, one of the two province of this region, only 31,170 ha were harvested on 48,270 ha planted, with a produce of 31,121 tons, and an average yield of 1000 kg/ha, with extremes of 300 to 2,200 kg/ha, which is not far from the normal parameters for the region. The 17,100 ha losed were mainly due to draught, and in some cases to hail and frosts.

North of the Country



Each reference represents near 4,000 tns sampled.

NOA Wheat

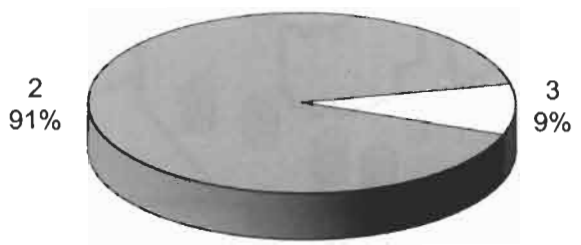
Results of the Analyses

Composite Samples by Locality. Averages were weighted by Tonnage.

Wheat Analysis	Minimum	Maximum	Average	Standard Deviation	Variation Coefficient
Test Weight (kg/hl)	78,15	83,05	81,06	1,22	1,51
Total Damaged Kernels (%)	0,02	0,44	0,16	0,11	70,03
Foreign Material (%)	0,57	0,82	0,72	0,08	11,50
Shrunken and Broken Kernels (%)	0,26	1,12	0,62	0,26	41,40
Yellow Berry Kernels (%)	0,00	3,22	1,17	0,86	73,81
Protein (13,5% Moisture) (%)	11,6	13,8	12,9	0,7	5,12
Weight of 1000 Kernels (gr.)	27,08	33,30	30,93	1,69	5,45
Ash (% dry basis)	1,846	2,029	1,944	0,067	3,42

Total damaged kernels includes 0.05% green kernels, 0.01% frosty kernels, 0.04% sprouted kernels and 0.05% insect chewed kernels.

Grade Distribution



Flour Analysis		Minimum	Maximum	Average	Standard Deviation	Variation Coefficient
MILLING	Wet Gluten (%)	26.9	37.9	32.7	3.0	9.05
	Dry Gluten (%)	10.0	14.0	12.1	1.1	8.95
	Falling Number (sec.)	393	451	421	15	3.60
	Flour Yield (%)	62.9	71.1	69.0	2.4	3.46
	Ash (dry basis) (%)	0.571	0.822	0.731	0.060	8.22
FARINOGRAM	Water Absorption (14% H°) (%)	61.2	64.0	62.1	0.8	1.24
	Development Time (min.)	6.2	12.9	9.5	1.9	20.08
	Stability (min.)	5.9	16.3	11.5	3.1	27.44
	Degree of Softening (12 min.)	50	101	66	15	22.30
ALVEOGRAM	P (mm)	78	109	94	10	10.19
	L (mm)	61	120	93	15	16.44
	W Joules x 10^{-4}	211	376	289	42	14.64
	P / L	0.69	1.67	1.01	0.28	26.51

These results were elaborated with 11 composite samples prepared proportionally from 93 primary samples (farmer deliveries)

Sub region Data

In this subregion the wheat production was 388,987 tons., the 4.7% of the national total. Were sampled 44,000 tons., the 11.31 % of the subregion production.

Appendix of Locality Composite Samples.

SAMPLE IDENTIFICATION			WHEAT ANALYSIS								
Sample Number	Locality, district or department	Tonnage	Grade	Test Weight (Kg/hl)	Total Damaged Kernels (%)	Foreign Material (%)	Shrunken and Broken Kernels (%)	Yellow Berry Kernels (%)	Protein (13.5 % Moisture) (%)	Weight of 1000 Kernels (gr.)	Ash (dry basis) (%)
1	Burruyacú/Cruz Alta/Leales	4000	2	81.25	0.44	0.62	0.50	1.42	12.8	31.48	1.857
2	La Cocha/Granero	4000	2	81.05	0.06	0.80	0.52	1.38	12.1	30.72	1.846
3	Dto. Jimenez	4000	2	80.60	0.20	0.76	0.70	0.56	13.5	29.32	1.990
4	Dto. Jimenez	4000	2	81.25	0.20	0.64	1.10	0.00	13.8	30.16	1.924
5	Dto. Pellegrini	4000	3	80.80	0.18	0.82	0.62	1.22	12.9	30.36	1.925
6	Robles/Guasayán	4000	2	78.15	0.10	0.68	1.12	1.42	12.8	27.08	1.996
7	Anta	4000	2	83.05	0.10	0.57	0.53	1.58	13.2	30.97	1.952
8	Anta	4000	2	80.60	0.23	0.67	0.38	0.53	12.3	31.31	2.011
9	Orán	4000	2	82.40	0.20	0.80	0.26	0.00	13.8	32.60	2.012
10	Metán	4000	2	82.15	0.04	0.80	0.58	1.53	13.0	32.93	2.029
11	Cerrillos	4000	2	80.35	0.02	0.76	0.50	3.22	11.6	33.30	1.846

SAMPLE IDENTIFICATION		FLOUR ANALYSIS												
						FARINOGRAM				ALVEOGRAM				
Sample Number	Locality, district or department	Wet Gluten (%)	Dry Gluten (%)	Falling Number (sec.)	Flour Yield (%)	% WA (14 % H°)	D. T. (min.)	Stability (min.)	Degree Softening (12 min.)	P	L	W	P/L	Ash (dry basis) (%)
1	Burruyacú/Cruz Alta/Leales	30.3	11.2	404	69.0	61.2	10.2	12.1	57	90	83	249	1.08	0.741
2	La Cocha/Granero	32.3	12.0	393	70.0	62.8	12.9	16.1	53	107	100	376	1.07	0.730
3	Dto. Jimenez	34.6	12.8	412	70.7	62.1	9.4	8.7	83	84	106	281	0.79	0.763
4	Dto. Jimenez	33.2	12.3	434	71.1	62.1	11.0	12.0	62	83	120	317	0.69	0.696
5	Dto. Pellegrini	34.4	12.7	415	69.8	62.0	7.7	9.4	68	78	97	242	0.80	0.745
6	Robles/Guasayán	32.2	11.9	425	70.2	61.9	10.7	13.0	60	96	91	298	1.05	0.772
7	Anta	37.9	14.0	451	70.3	61.4	8.8	11.4	67	100	92	306	1.09	0.701
8	Anta	26.9	10.0	415	70.0	61.5	6.2	7.7	78	102	61	211	1.67	0.571
9	Orán	33.0	12.2	423	62.9	62.7	7.5	5.9	101	90	97	291	0.93	0.743
10	Metán	35.8	13.3	425	69.5	64.0	8.3	13.4	50	96	100	321	0.96	0.753
11	Cerrillos	29.1	10.8	435	65.6	61.5	11.5	16.3	52	109	73	289	1.49	0.822

NEA Wheat

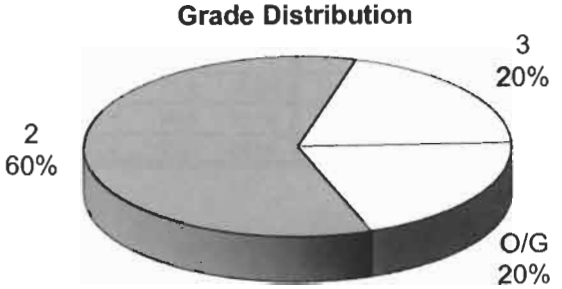
Results of the Analyses

Composite Samples by Locality. Averages were weighted by Tonnage.

Wheat Analysis	Minimum	Maximum	Average	Standard Deviation	Variation Coefficient
Test Weight (kg/hl)	78.35	80.80	79.55	1.10	1.38
Total Damaged Kernels (%)	0.04	0.3	0.16	0.11	66.07
Foreign Material (%)	0.44	1.00	0.69	0.21	30.85
Shrunken and Broken Kernels (%)	0.00	2.80	1.07	0.96	89.43
Yellow Berry Kernels (%)	0.00	2.54	1.26	0.96	76.24
Protein (13,5% Moisture) (%)	13.0	14.4	13.5	0.5	3.90
Weight of 1000 Kernels (gr.)	28.71	31.29	29.78	0.88	2.97
Ash (% dry basis)	1.943	2.265	2.162	0.117	5.39

Total damaged kernels includes 0.07% green kernels, 0.01% frosty kernels, 0.01% sprouted kernels and 0.07% insect chewed kernels.

Grade Distribution



O/G: Out of Grade

Flour Analysis		Minimum	Maximum	Average	Standard Deviation	Variation Coefficient
MILLING	Wet Gluten (%)	30.5	35.2	32.3	1.7	5.24
	Dry Gluten (%)	11.3	13.0	12.0	0.6	5.09
	Falling Number (sec.)	403	475	441	30	6.82
	Flour Yield (%)	68.2	71.3	70.1	1.3	1.86
	Ash (dry basis) (%)	0.775	0.950	0.841	0.059	6.99
FARINOGRAM	Water Absorption (14% H°) (%)	60.3	63.2	61.2	1.1	1.72
	Development Time (min.)	7.9	12.8	10.6	1.6	15.03
	Stability (min.)	7.7	19.4	15.5	4.1	26.23
	Degree of Softening (12 min.)	43	80	54	14	26.11
ALVEOGRAM	P (mm)	90	125	106	12	11.29
	L (mm)	78	99	85	8	9.82
	W Joules x 10^{-4}	293	354	318	23	7.19
	P / L	0.91	1.60	1.26	0.24	18.98

These results were elaborated with 5 composite samples prepared proportionally from 38 primary samples (farmer deliveries)

Sub region Data

In this subregion the wheat production was 155,615 tons., the 1.9% of the national total. Were sampled 20,000 tons., the 12.85 % of the subregion production.

Appendix of Locality Composite Samples.

SAMPLE IDENTIFICATION			WHEAT ANALYSIS								
Sample Number	Locality, district or department	Tonnage	Grade	Test Weight (Kg/hl)	Total Damaged Kernels (%)	Foreign Material (%)	Shrunken and Broken Kernels (%)	Yellow Berry Kernels (%)	Protein (13.5 % Moisture) (%)	Weight of 1000 Kernels (gr.)	Ash (dry basis) (%)
1	Pampa del Infierno	4000	2	80.80	0.30	0.68	0.42	2.54	13.5	31.29	2.173
2	Pampa del Infierno	4000	2	79.45	0.08	0.84	1.08	2.18	13.0	29.97	2.265
3	Roque Saenz Peña	4000	O/G	78.35	0.11	0.48	2.80	0.94	13.8	28.71	2.258
4	Hermoso Campo	4000	3	78.35	0.28	1.00	1.04	0.00	13.0	29.80	2.169
5	Dto. Alberdi	4000	2	80.80	0.04	0.44	0.00	0.62	14.4	29.11	1.943

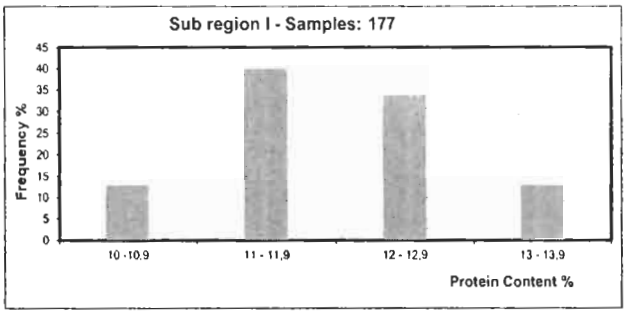
SAMPLE IDENTIFICATION		FLOUR ANALYSIS												
						FARINOGRAM				ALVEOGRAM				
Sample Number	Locality, district or department	Wet Gluten (%)	Dry Gluten (%)	Falling Number (sec.)	Flour Yield (%)	% WA (14 % H°)	D. T. (min.)	Stability (min.)	Degree Softening (12 min.)	P	L	W	P/L	Ash (dry basis) (%)
1	Pampa del Infierno	30.7	11.4	475	68.8	60.4	10.3	17.4	43	102	79	295	1.29	0.842
2	Pampa del Infierno	35.2	13.0	475	68.2	60.9	11.3	15.9	57	101	89	318	1.13	0.950
3	Roque Saenz Peña	32.5	12.0	403	71.1	61.2	12.8	19.4	45	114	78	331	1.46	0.819
4	Hermoso Campo	30.5	11.3	436	71.0	60.3	10.9	17.3	44	125	78	354	1.60	0.818
5	Dto. Alberdi	32.6	12.1	414	71.3	63.2	7.9	7.7	80	90	99	293	0.91	0.775

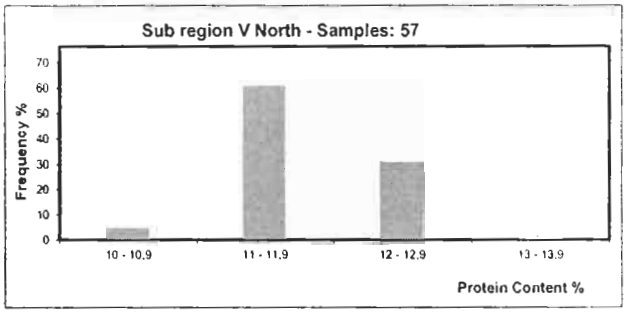
Protein Content Wheat

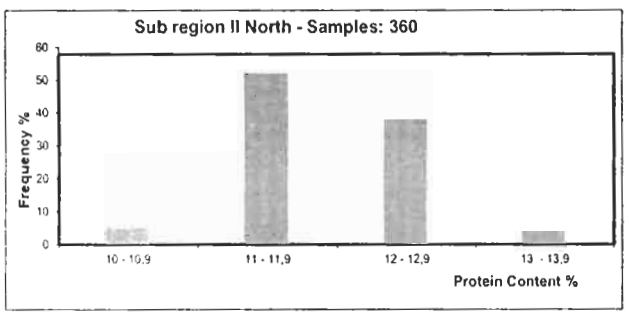
Protein Content

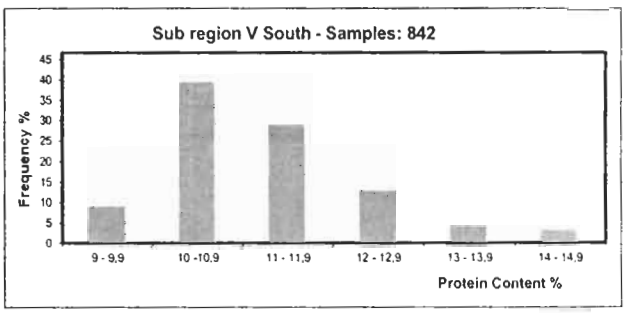
Distribution by ranges

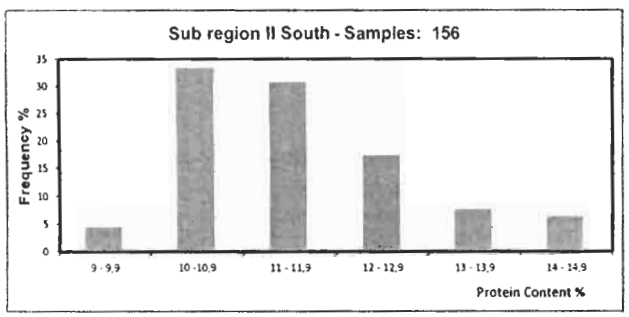
Results obtained on 2,923 Primary Samples

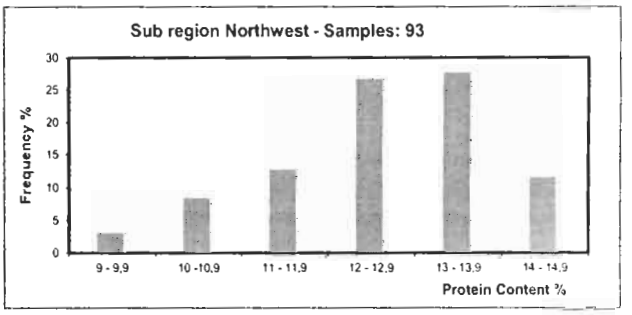


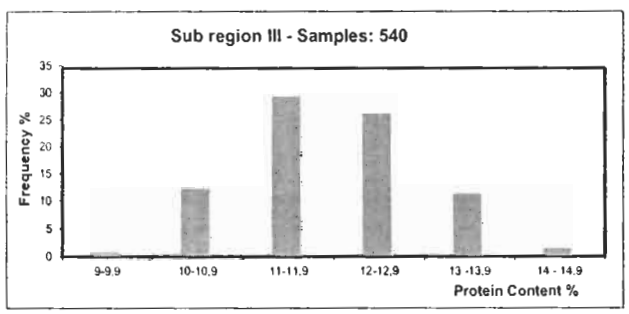


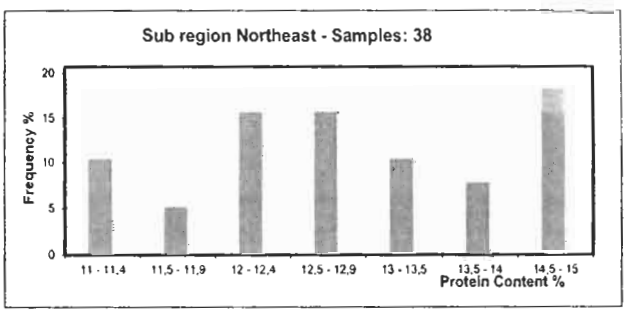


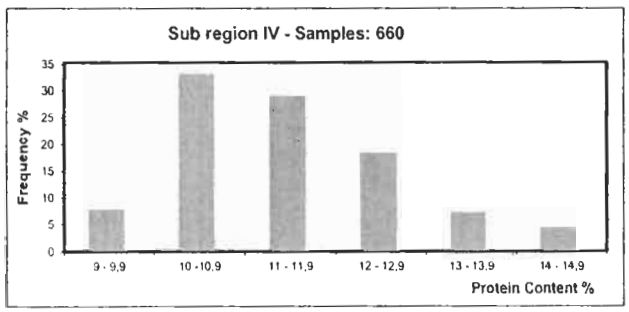


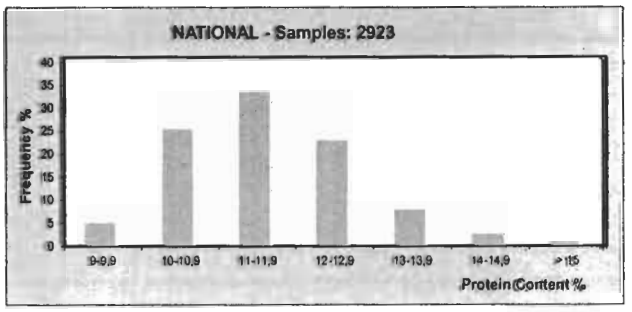












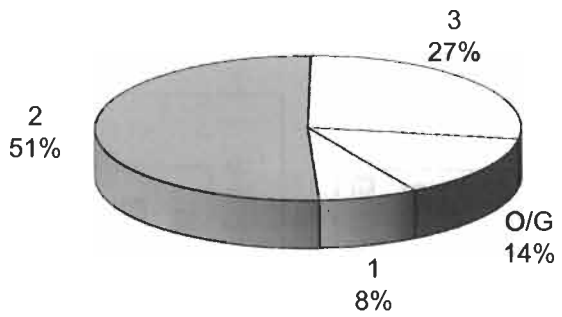
Wheat National Averages

Results of the Analyses

Composite Samples by Locality. Averages were weighted by Tonnage.

Wheat Analysis	Minimum	Maximum	Average	Standard Deviation	Variation Coefficient
Test Weight (kg/hl)	67.80	84.85	77.98	3.43	4.40
Total Damaged Kernels (%)	0.00	5.43	1.07	1.12	104.67
Foreign Material (%)	0.00	2.10	2.10	0.45	21.43
Shrunken and Broken Kernels (%)	0.08	2.80	0.73	0.37	50.87
Yellow Berry Kernels (%)	0.00	16.30	1.76	2.62	149.11
Protein (13.5% Moisture) (%)	8.9	14.4	11.6	0.9	7.98
Weight of 1000 Kernels (gr.)	17.60	46.25	32.39	4.02	12.42
Ash (% dry basis)	1.481	2.265	1.875	0.157	8.35

Grade Distribution



O/G: Out of Grade

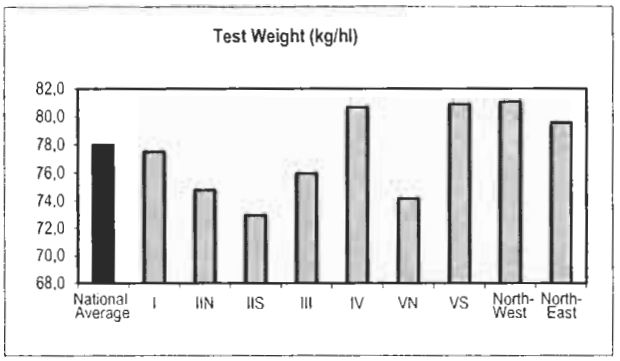
Flour Analysis		Minimum	Maximum	Average	Standard Deviation	Variation Coefficient
MILLING	Wet Gluten (%)	19.4	37.9	27.4	3.2	11.70
	Dry Gluten (%)	7.0	14.0	9.6	1.2	12.89
	Falling Number (sec.)	226	505	424	33	7.86
	Flour Yield (%)	60.8	75.8	71.4	2.5	3.56
	Ash (dry basis) (%)	0.502	2.069	0.800	0.331	41.36
FARINOGRAM	Water Absorption (14% H°) (%)	51.1	64.0	57.7	1.9	3.33
	Development Time (min.)	1.6	37.4	7.3	3.4	45.81
	Stability (min.)	2.7	51.7	13.1	7.4	56.50
	Degree of Softening (12 min.)	0	207	59	31	52.44
ALVEOGRAM	P (mm)	50	125	80	15	18.33
	L (mm)	42	131	92	18	19.53
	W Joules x 10^{-4}	146	376	239	46	19.30
	P / L	0.40	2.31	0.86	0.37	39.39

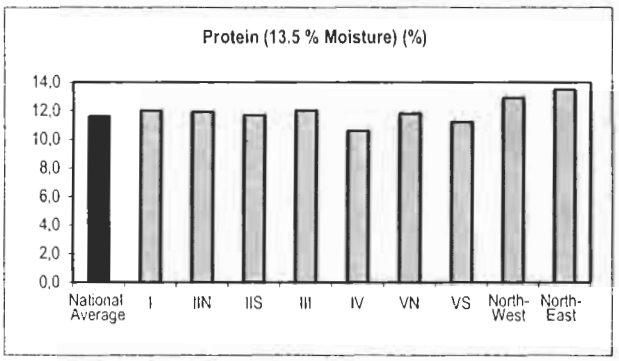
National Averages Wheat

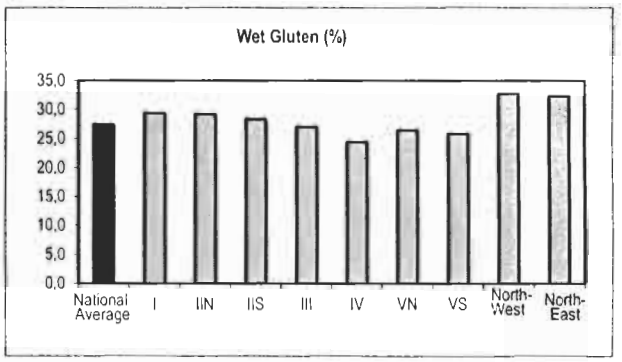
Wheat National and Sub regions Averages

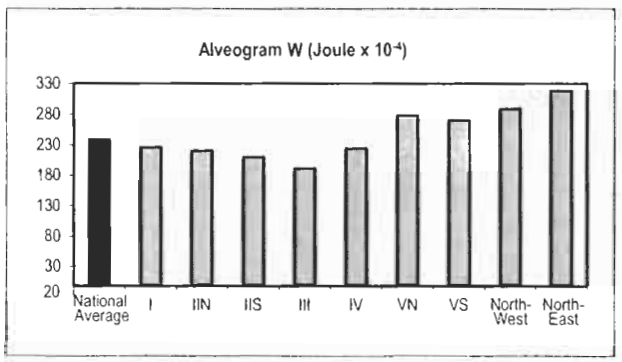
Comparative Graphics

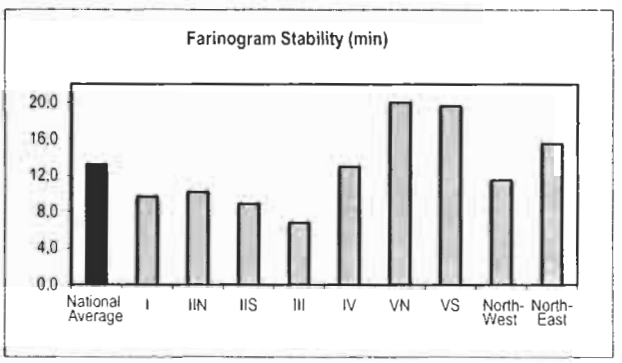
Composite Samples by Locality. Averages were weighted by Tonnage.











By Agr. Eng. (Ms.Sci.) Nelly Salomón, Agronomy Department, Universidad Nacional del Sur

Mean Comparison among Sub regions:

An analysis of the variation of the measured data was carried out (ANAVA) among the wheat sub regions. Taking into account that the amount of points of sampling was different in each sub region (unbalanced), a comparison test of means was applied that permits to compare them although they are based on different number of data.

The obtained results are reliable because we could demonstrate if there were differences among the sub regions with a very small experimental error. This was due to the fact that the averages were calculated with a high sampling intensity.

The interpretation of the results should be carried out observing the letters that figure to the right of each value in the variables. Those sub regions named with the same letter did not show any significant difference.

All the opposing difference have a probable error of 5 %. All the likeness was accepted with a level of confidence close to 50 %.

Sub region	N° Samples	Test Weight		Sub region	Total Damaged Kernels		Sub region	Foreign Material		Sub region	Shrunken and Broken Kernels	
Northwest	11	81,06	a	Northwest	0,16	a	IV	0,25	a	IV	0,33	a
V South	48	80,92	a	Northeast	0,16	a	II South	0,32	ab	Northwest	0,62	b
IV	36	80,73	a	IV	0,24	a	I	0,36	ab	V South	0,67	b
Northeast	5	79,55	a	V South	0,27	a	V North	0,41	abc	II South	0,75	bc
I	13	77,49	b	II South	1,07	b	V South	0,46	bc	I	0,77	bc
III	21	76,02	c	V North	1,26	bc	II North	0,52	cd	III	0,88	c
II North	29	74,78	c	I	1,70	c	III	0,55	cd	II North	0,91	c
V North	8	73,97	c	II North	1,78	c	Northeast	0,69	cd	Northeast	1,07	cd
II South	15	73,00	d	III	3,21	d	Northwest	0,72	d	V North	1,19	d

Sub region	Yellow Berry Kernels		Sub region	Protein		Sub region	Weight 1000 Kernels		Sub region	Ash	
II North	0,24	a	Northeast	13,5	a	IV	38,52	a	IV	1,665	a
V North	0,30	ab	Northwest	12,9	b	V South	33,79	b	V South	1,797	b
II South	1,09	abc	III	12,0	c	III	32,66	c	II South	1,892	c
Northwest	1,17	abc	I	12,0	cd	Northwest	30,93	d	Northwest	1,944	cd
Northeast	1,26	abc	II North	11,9	cd	II South	30,83	d	III	1,947	d
I	1,56	abc	II South	11,7	cd	Northeast	29,78	de	II North	1,953	d
IV	1,45	bc	V North	11,7	d	I	29,58	de	I	2,009	de
V South	1,83	c	V South	11,2	e	II North	28,16	e	V North	2,074	ef
III	5,75	d	IV	10,6	f	V North	28,10	e	Northeast	2,162	f

Sub region	Wet Gluten		Sub region	Dry Gluten		Sub region	Falling Number		Sub region	Flour Yield	
Northwest	32,7	a	Northwest	12,1	a	II North	465	a	IV	73,5	a
Northeast	32,3	a	Northeast	12,0	a	Northeast	441	ab	II South	72,2	ab
I	29,5	b	II South	10,5	b	V North	428	bc	II North	72,0	ab
II North	29,2	b	I	10,0	b	II South	424	bcd	III	71,8	ab
II South	28,5	bc	II North	9,9	b	Northwest	421	bcd	I	71,4	b
III	27,0	c	V South	9,1	c	I	416	cd	V South	70,2	bc
V North	26,2	cd	III	9,0	cd	IV	412	cd	Northeast	70,1	bcd
V South	25,8	d	IV	8,9	cd	III	411	cd	Northwest	69,0	cd
IV	24,5	e	V North	8,9	d	V South	408	d	V North	69,0	d

Sub region	Water Absorption (%)		Sub region	D.T. (min.)		Sub region	Stability (min.)		Sub region	Degree Softening	
Northwest	62,1	a	Northeast	10,6	a	V North	20,9	a	V North	33	a
Northeast	61,2	a	Northwest	9,5	a	V South	19,8	a	V South	35	a
I	58,2	b	V South	9,4	a	Northeast	15,5	ab	IV	42	a
V South	57,4	c	V North	9,2	ab	IV	12,9	b	Northeast	54	ab
IV	57,4	c	I	7,3	b	Northwest	11,5	bc	II North	66	bc
III	57,2	c	II North	6,4	bc	II North	10,2	bcd	Northwest	66	bc
II South	57,2	c	IV	6,3	bc	I	10,0	bcd	II South	76	cd
II North	57,2	cd	III	5,2	a	II South	8,9	cd	III	88	d
V North	55,5	d	II South	5,2	a	III	6,8	d	I	113	e

Statistical Analysis Wheat

Sub region	Water Absorption (%)		Sub region	D.T. (min.)		Sub region	Stability (min.)		Sub region	Degree Softening	
Northwest	62,1	a	Northeast	10,6	a	V North	20,9	a	V North	33	a
Northeast	61,2	a	Northwest	9,5	a	V South	19,8	a	V South	35	a
I	58,2	b	V South	9,4	a	Northeast	15,5	ab	IV	42	a
V South	57,4	c	V North	9,2	ab	IV	12,9	b	Northeast	54	ab
IV	57,4	c	I	7,3	b	Northwest	11,5	bc	II North	66	bc
III	57,2	c	II North	6,4	bc	II North	10,2	bcd	Northwest	66	bc
II South	57,2	c	IV	6,3	bc	I	10,0	bcd	II South	76	cd
II North	57,2	cd	III	5,2	a	II South	8,9	cd	III	88	d
V North	55,5	d	II South	5,2	a	III	6,8	d	I	113	e

Sub region	P		Sub region	L		Sub region	W		Sub region	P/L	
Northeast	106	a	III	109	a	Northeast	318	a	III	0,57	a
Northwest	94	b	V North	107	a	Northwest	289	ab	II North	0,66	ab
IV	90	bc	II North	105	ab	V North	277	b	V North	0,71	abc
V South	86	c	I	97	bc	V South	271	b	I	0,76	bc
V North	76	d	Northwest	93	c	IV	224	c	II South	0,89	cd
II South	73	de	V South	90	c	I	224	c	V South	0,99	d
I	72	de	Northeast	85	c	II North	220	c	Northwest	1,06	de
II North	68	e	II South	85	c	II South	209	cd	Northeast	1,28	ef
III	62	f	IV	70	d	III	191	d	IV	1,38	f

Sub region	Flour Ash	
V South	0,660	a
IV	0,672	a
V North	0,676	ab
III	0,701	b
Northwest	0,731	bc
II North	0,749	bc
I	0,773	cd
Northeast	0,841	d
II South	1,892	e

Analysis of Variables by Ranges

The charts show the summary of an analysis carried out to four variables: protein in grain, wet gluten, strength measured by Alvegraph and Farinograph stability.

Each variable was divided in ranges (first column), they were calculated the averages of each range corresponding to each one of the remaining variables (central column), the percentages are also shown from each range to national level.

PROTEIN RANGE	Average Gluten W Stability	% Country
9 - 9,9	22,3 187 10,2	2,69
10 - 10,4	24,3 233 16,6	23,12
10,5 - 10,9	**27,2 237 12,9**	**41,94**
11 - 11,9	28,8 238 11,2	25,27
12,0 - 12,9	33,7 295 12,1	6,99

WET GLUTEN RANGE	Average Protein W Stability	% Country
18 - 20,9	9,7 162 20,4	1,08
21 - 24,9	10,7 236 18,0	24,73
25 - 27,9	**11,4 239 12,3**	**34,41**
28 - 31,9	12,1 230 10,5	29,57
32 - 34,9	13,0 281 11,7	10,22

Alveograph W RANGE	Average Gluten Protein Stability	% Country
190 - 249	**27,0 11,4 10,3**	**59,14**
250 - 299	26,9 11,6 16,2	31,18
300 - 349	29,4 12,2 21,3	9,68
350 - 400	------	------
> 400	------	------

Farinograph STABILITY RANGE	Average Gluten Proteína W	% Country
1 - 9,9	**27,9 11,9 207**	**35,48**
10,0 - 14,9	**27,8 11,6 246**	**35,48**
15 - 19,9	26,4 11,4 267	17,20
20 - 29,9	24,6 11,1 267	8,60
30 - 30,9	24,4 11,2 289	3,23

Sub region Composite Samples Wheat

Composite Sample of each Sub region

Results of the Analyses

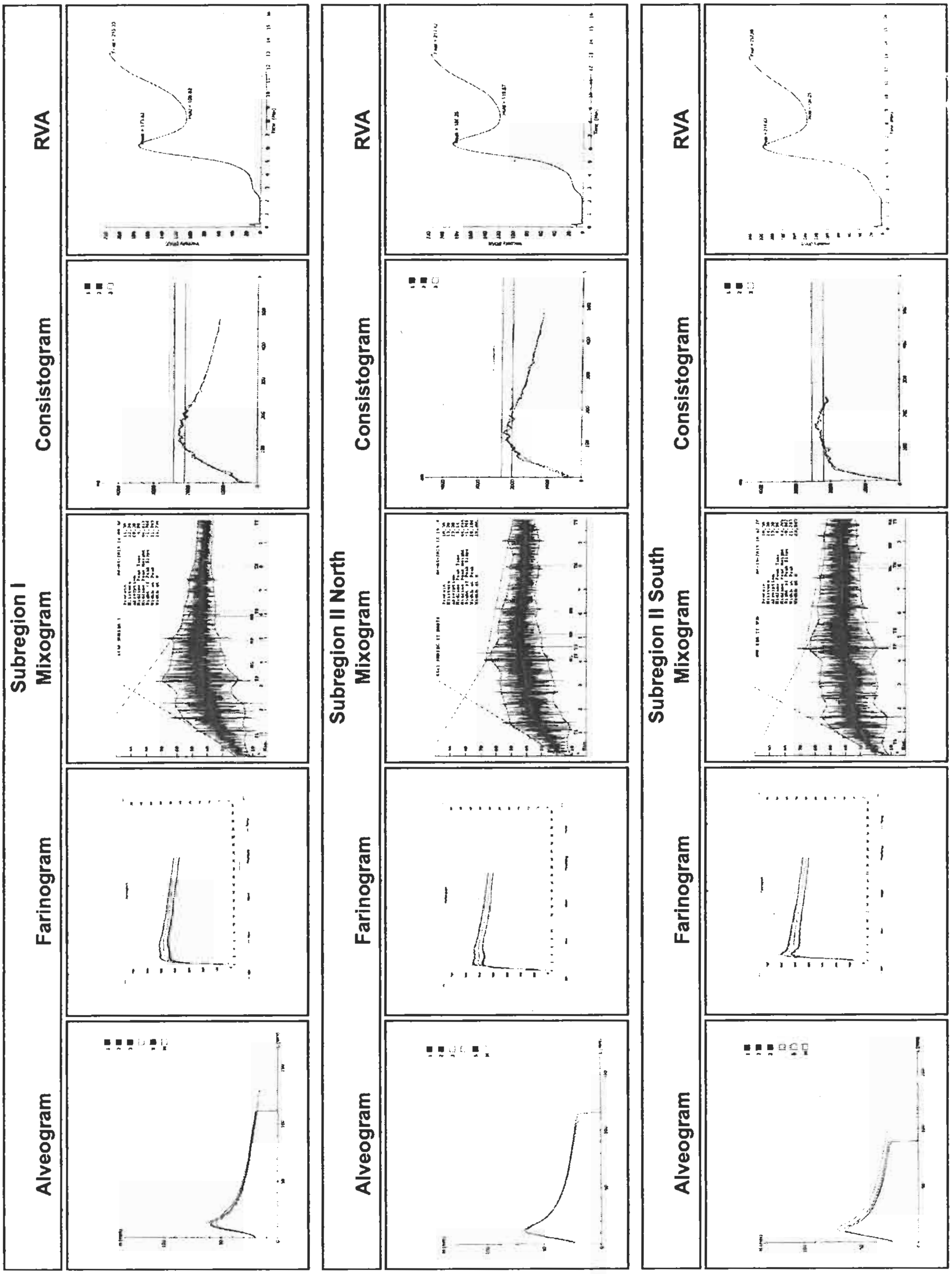
Along with the analisis of samples corresponding to different localities, a further evaluation was performed in order to analyze Composite Samples of each Sub region directly, which were made proportionally from the composite samples corresponding to each locality, such as it is detailed in Organization and Methodology.

		Sub regions									*Pondered Average	Average last Quinquenio	Average Decade
		I	II N	II S	III	IV	V N	V S	NEA	NOA			
WHEAT	Test Weight (kg/hl)	77,20	75,00	71,40	75,80	80,25	74,10	80,80	79,25	80,80	76,50	79,75	80,13
	Weight of 1000 Kernels (gr.)	29,28	28,40	31,22	32,42	38,41	27,80	33,40	28,71	30,96	31,25	32,89	33,74
	Ash (dry basis) (%)	2,156	1,900	1,856	1,920	1,678	2,020	1,797	2,210	1,949	1,912	1,783	1,784
	Protein (13,5% Moisture) (%)	12,5	12,2	12,0	12,3	10,6	12,5	11,4	13,4	13,1	12,1	11,6	11,4
MILLING	Flour Yield (%)	75,4	72,1	75,4	73,0	73,6	69,2	70,8	70,1	70,2	72,0	69,1	68,9
	Ash (dry basis) (%)	0,745	0,675	0,674	0,796	0,631	0,783	0,581	0,793	0,756	0,715	0,604	0,587
	Color												
	L	87,21	89,04	87,68	86,92	88,44	88,03	88,90	89,03	86,54	88,05	84,84	84,84
	a	-1,32	-1,53	-1,39	-1,25	-1,47	-1,40	-1,60	-1,28	-1,15	-1,40	-1,26	-1,26
	b	9,24	9,34	-9,06	9,63	8,77	8,79	8,51	8,29	8,93	7,56	8,49	8,49
FLOUR	Moisture (%)	11,89	13,46	14,51	14,33	13,91	13,86	13,4	13,29	13,06	13,52	13,52	13,71
	Proteins (%)	11,2	10,9	10,5	11,1	9,6	11 2	10,2	12,2	12,3	10,8	10,7	10,5
	Wet Gluten (%)	31,7	28,1	29,1	30,7	24,4	28,7	25,5	30,7	32,1	28,4	27,0	26,3
	Dry Gluten (%)	10,3	9,2	9,4	9,9	8,15	9,6	8,9	10,2	10,6	9,4	9,2	9,2
	Index Gluten (%)	90	97	98	85	98	98	99	96	93	95	97	98
	Falling Number (seg)	427	489	502	463	441	497	470	455	450	471	436	403
	Zeleny Test (cc)	29	35	34	29	33	33	38	36	29	33	39	38
	FARINOGRAM												
	Water Absorption (%)	58,4	58,5	55,6	59,4	57,8	57,2	58,1	61,5	61,0	58,2	58,6	58,7
	Development Time (min.)	5,6	6,1	5,0	4,8	6,0	7,1	8,9	8,5	7,3	6,3	9,6	9,1
	Stability (min.)	7,8	8,1	10,9	5,9	10,1	13,1	21,4	16,5	11,2	10.7	20,8	18,6
	Degree of Softening	98	62	52	91	41	37	23	28	44	53	30	32
	Quality Number	101	108	122	83	127	166	600	217	163	155	214	182
	MIXOGRAM												
	Development Time (min.)	4,90	5,14	8,86	4,48	6,63	5,53	6,30	5,72	4,82	5,76	5,60	5,26
	ALVEOGRAM												
	P (mm)	64	74	72	63	86	66	92	88	98	75	95	99
	L (mm)	110	114	87	102	95	123	100	99	88	106	76	79
	G	23	24	21	23	22	25	22	22	21	23	34	29
	W (Joules x 10^{-4})	223	252	219	185	263	251	306	310	301	249	293	297
	P/L	0,58	0,65	0,83	0,62	0,91	0,54	0,92	0,9	1,11	0,73	1,14	1,22
	Ie %	56,2	53,9	56,9	49,5	54,2	56,3	57,3	61,8	58,2	55,1	58,9	59,2
	W (40) (Joules x 10-4)	109	124	123	103	144	113	158	155	169	127	160	159,6
	CONSISTOGRAMAS												
	WA 1700 (%) (Base 15%)	57,4	56,6	54,3	57,7	55,9	57,4	56,2	58,9	58,1	56,8	56,4	56,4
	HYD2200 (%) (Base 15%	54,9	54,1	51,8	55,2	53,4	54,9	53,7	56,4	55,6	54,3	55,2	55,2
	PrMax (mb)	2 258	2.173	2.195	2.209	2 262	2.385	2.100	2.314	2.299	2.260	2.237	2.237
	PrMax Time (Sec)	149	133	116	106	129	121	147	218	126	129	152	152
	Tolerance (Sec)	174	191	279	170	226	201	304	280	223	214	258	258
	Weakening 250 (mb)	439	419	231	597	332	454	104	26	364	386	218	218
	Weakening 450 (mb)	1098	986	794	1108	919	943	684	654	936	941	821	821
	RVA												
	Maxim Viscosity (RVU)	173,83	186,25	214,83	176,75	213,67	215,50	202,00	160,00	167,25	197 22	191,76	191,76
	Minimum Viscosity (RVU)	106,83	119,67	134,25	105,67	128,17	133,92	122,42	100,00	109,67	122,16	124,06	124,06
	Final Viscosity (RVU)	215,33	217,42	237,50	206,50	230,50	236,08	222,92	194,00	191,92	222,30	278,44	278,44
	BAKING												
	Absorption (%)	61,0	62,0	61,0	60,0	62,0	62,0	62,5	63,0	62,5	61,7	62,0	62,2
	Development Time (min.)	3:30	3:30	3:00	2:30	3:30	3:30	4:00	4:00	4:00	3:25	3:10	3:31
	Fermentation Time (min.)	160	160	160	160	160	160	160	160	160	160	160	160
	Loaf Volume (cc)	645	700	710	685	640	710	650	625	665	680	647	667
	Specific Volume	4,6	5,1	5,3	5,1	4,4	5,1	4,7	4,5	4,8	4,9	5,0	5,0

(*) Weighting bassis: Tonnage of the production sampled by Sub region, according to chart data on page 7.

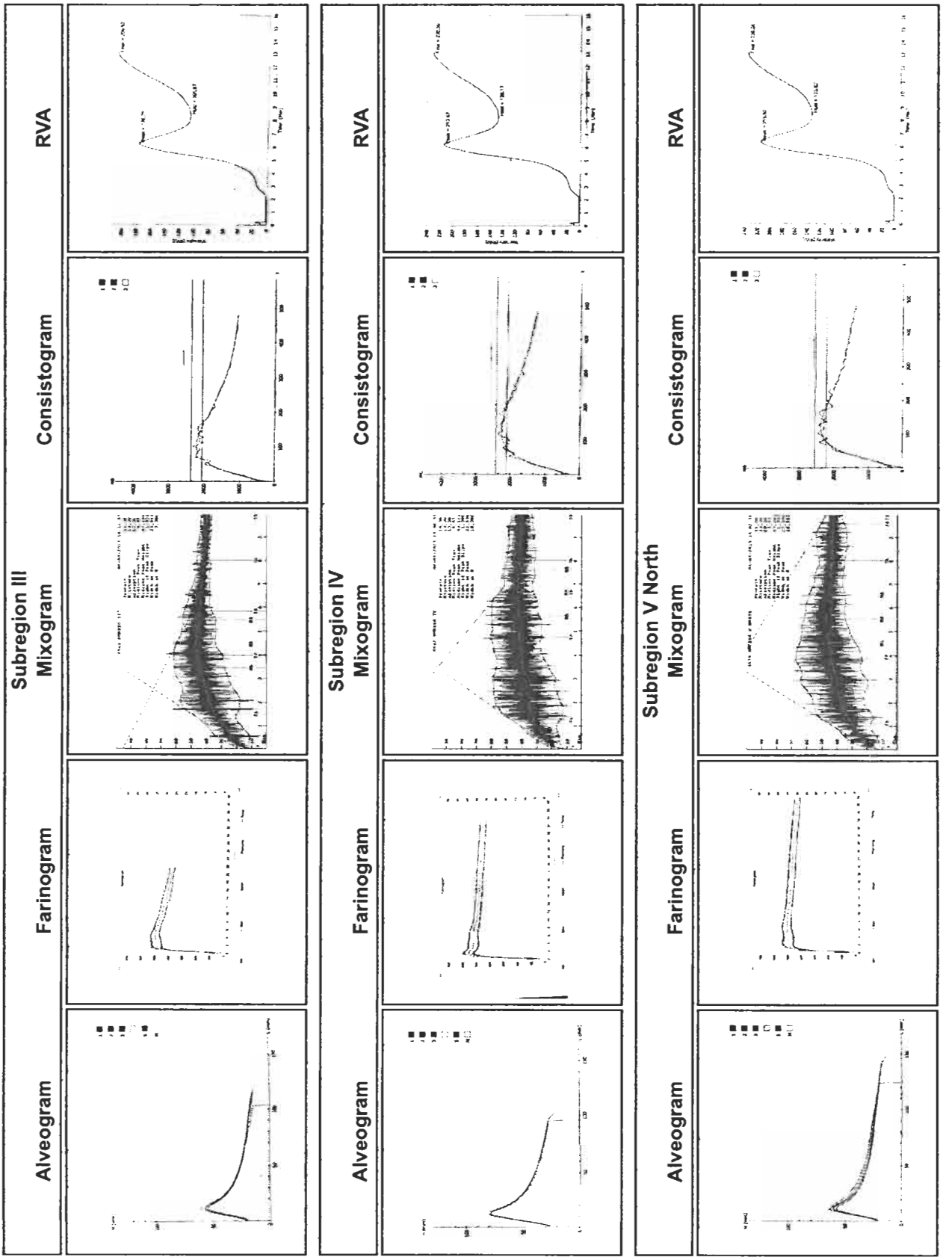
Sub region
Composite
Samples
Wheat

Results of the Analyses



Sub region Composite Samples Wheat

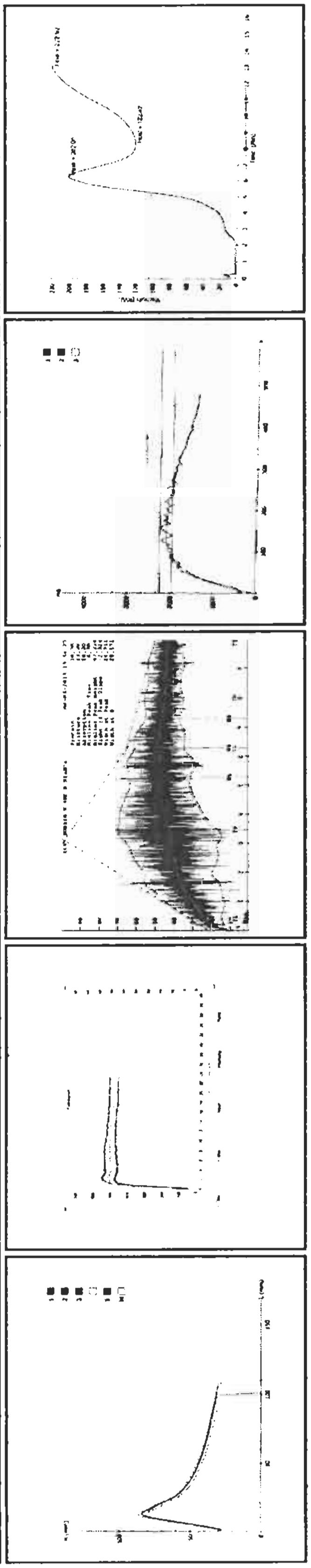
Results of the Analyses



Results of the Analyses

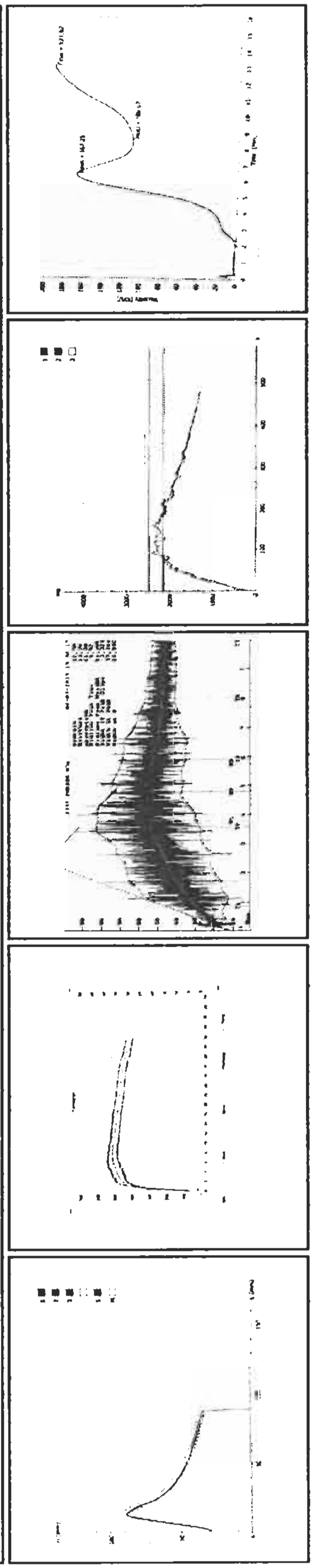
Subregion V South

RVA
Consistogram
Mixogram
Farinogram
Alveogram



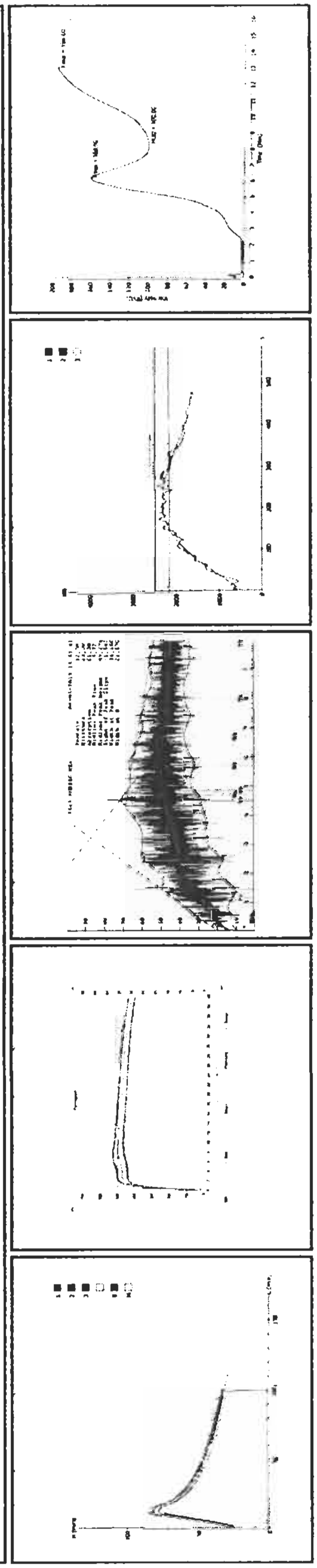
Northwest

RVA
Consistogram
Mixogram
Farinogram
Alveogram



Northeast

RVA
Consistogram
Mixogram
Farinogram
Alveogram



DURUM WHEAT

Triticum turgidum vd. Durum L.

Organization and Methodology

Although durum wheat production is minor compared with wheat (Triticum aestivum), and its area is very localized (the traditional region extending from the SE to the SW of the province of Buenos Aires), representing an attractive option for producers.

2012/2013 Crop

Sown Area (ha)	41,456
Harvested Area (ha)	40,196
Average Yield (Kg/ha)	2,670
Production (tn)	107,314

Source: MAGyP

Sampling Structure

Because of the specific conditions under which most durum wheat is produced, where farmers and industries agree on a contract, the samples were requested from the industries receivals, obtaining 27 composite samples.

They were organized according to theirs origin region, mainly in the Sub regions V, V South y NOA.

Procedure

Composite samples were sent to Bahía Blanca and Buenos Aires Arbitration Chamber Laboratories, where the commercial analysis (grade), ash and weight per 1000 kernels were performed.

Afterward, composite samples were referred to Grain Quality Laboratory of Chacra Experimental Integrada Barrow to carry out grinding in a Buhler 202 D mill. In the semolina obtained, Falling Number, Gluten, Color and Farinogram were analyzed.

Methodology

The evaluation of the industrial quality of durum wheat is based on grain characteristics, milling,behavior in milling, gluten quality, semolina color and rheological properties of dough.

Some traits like protein content and vitreous kernels percentage are affected by agricultural and weather conditions. Percentage of hard vitreous kernels is an important grading factor in durum wheat. Industry prefers vitreous kernels because of theirs high correlation with protein content, semolina yield and cooking quality.

On the other hand, gluten quality (measured as Gluten Index), semolina color and rheological characteristics, are strongly influenced by genotype.

The reasons why durum wheat produces good quality pasta are the following:
- Its yellow pigment content doubles the wheat (Triticum aestivum).
- Durum gluten is stronger and more cohesive than wheat (Triticum aestivum).
- Due to its kernel hardness,semolina yield is superior to other wheats. Durum semolina has many advantages with regard to wheat flour in the manufacturing of pasta: it requires less water to form a dough; consequently, drying cycle is cheaper.
- The main difference between durum and wheat (Triticum aestivum) is that pasta elaborated with durum semolina has more stability when cooked, doesn't disintegrate when boiling and stands overcooking.

Methodology for durum wheat includes some of the tests regularly used for wheat (Resolution SAGPyA 557/97) plus the following specific ones:

GRAIN

Vitreous Kernels Percentage (Resolution N° 1075/94 – Standard XXI - Ex. SAGyP)
Percent in weight of vitreous kernels present in the sample, being vitreous the ones that are completely translucid, without points, opaque stains or bleached grains.

MILLING (Experimental Milling Buhler 202-D)

Grain is dampered to 15.8 % humidity and tempered during 20 hours. Semolina yield (Particle size between 125- 355 microns) is reported.

SEMOLINA

Color (Minolta Chromameter CR-310, Manufacturer's Method)
Spaghetti color is due to a balance between pigment content (carotenes and xanthophylls) and lipoxigenasic activity which destroys color.
Lightness (L), redness (a) and yellowness (b) of Hunter data are determined using the tristimulus method, with Minolta CR-310 reflectance colorimeter.

Gluten Index (Glutomatic Perten 2200). Manufacturer's Registry.
Once the wet gluten test is done, the centrifuge forces the gluten to pass through a sieve that has been specially designed. The amount of gluten that goes through the sieve is a measure of gluten characteristics. This method is done as follows: both fractions, the one that passes through the sieve, and the one which is retained in it, are gathered and weighed, obtaining, thus, a percentage.

FARINOGRAM (Brabender's Farinograph)

The method in use is described by Irvine, Bradley and Martin's technique (Cereal Chemistry, Vol 38, N° 2, 1961), using fixed water absortion (45 %), fixed time of kneeding (8 min) and small stainless steel bowl (50 g). The following data are reported:

Dough development time (min)
Energy Level= Max Height (UF) / 20+ Area (cm2)
Tolerance Index (%)= Max Height - Final Height / Max Height.

Argentine Standard for Durum Wheat

(Resolution N°1075/94 - Standard XXI. Ex Secretariat of Agriculture, Livestock and Fishery)

GRADE	Test Weight Min (Kg/hl)	PERCENT MAXIMUM LIMITS OF: Foreign Material (%)	Damaged Kernels: Heat Damaged Kernels (%)	Damaged Kernels: Total (%)	Shrunken and Broken Kernels (1) (%)	Smutty Kernels (%)	Insect Bored Kernels Max. (%)	Sweet Clover Seeds Melilotus spp Seeds/ 100 g. Max.	MOISTURE Max. (%)	Wheat (Triticum aestivum) Max. (%)	Vitreous Kernels Min (%)
1	78	0.75	0.50	1.00	1.50	0.10					
2	76	1.50	1.00	2.00	3.00	0.20	0.50	8	14.0	3.00	40
3	72	3.00	1.50	3.00	5.00	0,30					

VITREOUS KERNELS

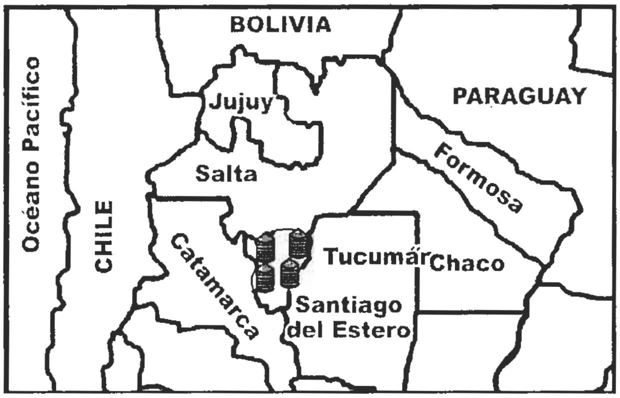
Bonifications		Discounts	
51 a 55%	0,5 %	46 a 49%	1,0%
56 a 60%	1,0%	41 a 45%	3,0%
61 a 65%	1,5%	36 a 40%	5,0%
66 a 70%	2,0%	31 a 35%	7,0%
71 a 75%	3,0%	26 a 30%	9,0%
76 a 80%	4,0%	21 a 25%	11,0%
81 a 85%	5,0%	16 a 20%	13,0%
86 a 90%	6,0%	11 a 15%	15,0%
91 a 95%	7,0%	6 a 10%	17,0%
96 a 100%	8,0%	0 a 5%	19,0%

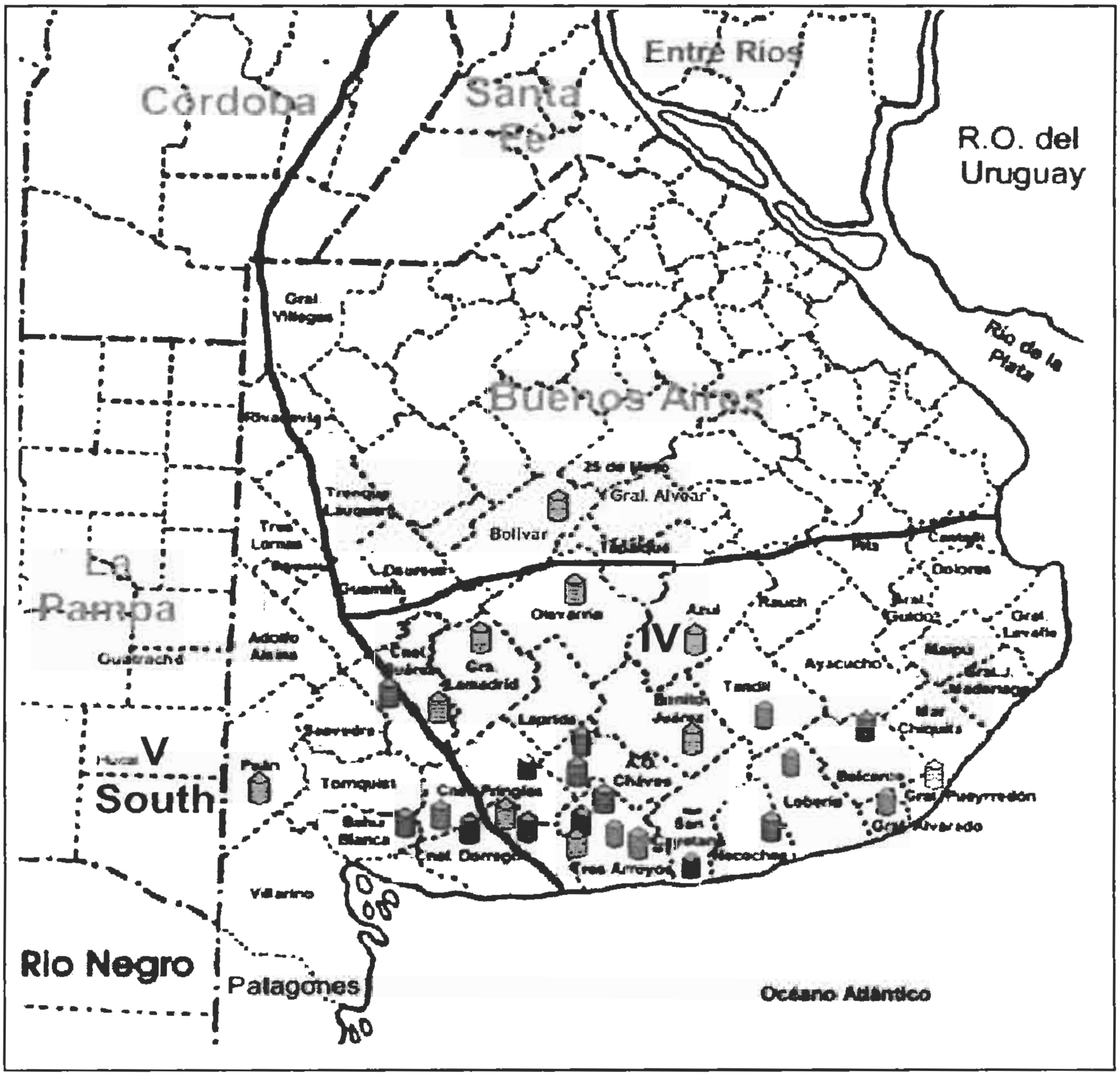
PROTEIN

More than 11% (moisture basis 13,5 %) there will be bonifications of 2 % for each % or fraction	Less than 10% (moisture basis 13,5 %) there will be discounts of 2 % for each % or fraction

LIVING INSECTS AND ARACHNIDS: FREE

(1) All Durum Wheat kernels or pieces of them that pass through a sieve with 1,6 mm wide and 9,5 mm long holes, excluding damaged kernels.


BOLIVIA
Océano Pacífico
CHILE
Jujuy
PARAGUAY
Salta
Formosa
Catamarca
Tucumán
Chaco
Santiago del Estero


Entre Ríos
Córdoba
Santa Fe
R.O. del Uruguay
Río de la Plata
Buenos Aires
La Pampa
Bolívar
Gral. Alvear
Olavarría
Azul
Rauch
Dolores
IV
Ayacucho
Tandil
V
South
Rio Negro
Patagones
Océano Atlántico

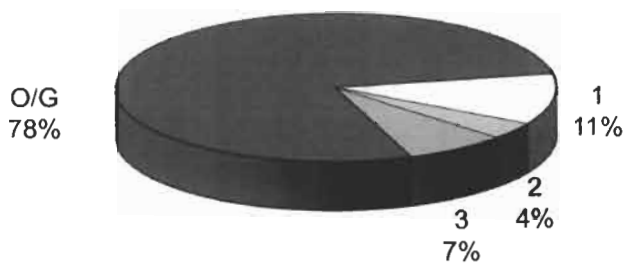
Durum Wheat Averages

Results of the Analysis

Wheat Analysis	Minimum	Maximum	Average	Standard Deviation	Variation Coefficient
Test Weight (kg/hl)	74.10	81.25	77.85	1.94	2.49
Total Damaged Kernels (%)	0.04	1.98	0.77	0.46	59.84
Foreign Material (%)	0.08	1.68	0.50	0.35	70.04
Shrunken and Broken Kernels (%)	0.06	2.00	0.50	0.53	104.88
Vitreous Kernels (%)	5	75	23	18	78.18
Wheat (Triticum aestivum) (%)	0.74	8.22	3.89	2.14	55.17
Proteins (13,5% Moisture) (%)	10.4	12.7	11.4	0.6	4.89
Weight of 1000 Kernels (gr.)	39.10	55.50	48.08	5.13	10.67
Ash (% dry basis)	1.680	2.089	1.853	0.093	5.02

Total damaged kernels includes 0.01% green kernels, 0.27% sprouted kernels, 0.07% insect chewed kernels, 0.10% germ-chewed kernels y 0.32% calcinated kernels.

Grade Distribution



O/G: Out of Grade

Semolin Analysis		Minimum	Maximum	Average	Standard Deviation	Variation Coefficient
MILLING	Falling Number (sec.)	382	556	470	44	9
	Color (b)	17.8	22.4	19.5	1.4	6.95
	Wet Gluten (%)	24.6	31.6	28.4	1.9	6.73
	Gluten Index (%)	31	73	53	12	22.66
FARINOGRAM	Energy Level	23.7	37.0	31.0	3.9	12.55
	Degree Softening (%)	26	37	32	3	8.63

These results were elaborated with 20 composite samples.

Appendix of Locality Composite Samples.

SAMPLE IDENTIFICATION		WHEAT ANALYSIS									
Sample Number	Locality, district or department	Grade	Test Weight (Kg/hl)	Total Damaged Kernels (%)	Foreign Materials Kernels (%)	Shrunken and Broken Kernels (%)	Vitreous Kernels (%)	Wheat (Triticum aestivum) (%)	Protein (13.5 % Moisture) (%)	Weight of 1000 Kernels (gr.)	Ash (dry basis) (%)
1	Azul	O/G	79,00	1,10	0,32	0,20	75	8,22	12,7	50,00	1,911
2	Balcarce	O/G	78,15	0,90	0,56	0,24	23	3,76	11,5	48,40	1,852
3	Benito Juárez	O/G	-----	1,44	0,74	0,28	35	4,94	10,8	45,70	1,897
4	Bolívar	O/G	74,10	1,70	0,88	0,06	16	8,04	11,1	40,70	2,089
5	Coronel Pringles	2	77,45	0,60	0,22	0,16	12	0,74	11,7	48,70	1,769
6	Coronel Suárez	3	74,30	0,48	0,84	0,38	28	2,44	11,3	43,30	1,908
7	De La Garma	O/G	-----	0,60	0,78	0,34	67	1,70	11,6	40,40	1,919
8	General Lamadrid	O/G	75,00	0,72	0,24	0,38	8	3,40	11,1	45,30	1,964
9	González Cháves	1	78,35	0,78	0,34	0,14	10	2,32	11,0	53,00	1,990
10	Lobería	O/G	79,45	1,16	0,32	0,34	5	4,30	11,3	54,50	1,801
11	Miramar	1	79,90	0,38	0,44	0,10	24	2,14	11,4	49,60	1,788
12	Necochea	O/G	78,35	0,42	0,26	0,20	11	3,80	10,4	50,70	1,830
13	Olavarría	O/G	77,90	1,14	1,10	0,58	24	3,44	10,6	45,00	1,923
14	Otamendi	O/G	77,70	0,28	0,20	0,16	5	3,20	11,5	53,80	1,764
15	Tandil	O/G	80,15	0,38	0,58	0,10	45	1,62	11,7	46,30	1,829
16	Tres Arroyos	1	81,25	0,64	0,26	0,22	37	2,80	11,8	49,00	1,884
17	Cruz Alta (Tucumán)	O/G	77,25	1,98	0,46	1,62	24	6,80	11,8	39,40	1,685
18	Graneros (Tucumán)	O/G	-----	0,32	0,34	1,14	17	6,22	12,7	42,50	1,909
19	Leales (Tucumán)	O/G	-----	0,74	1,68	1,66	11	6,32	11,7	42,30	1,952
20	La Cocha (Tucumán)	O/G	78,15	0,24	0,82	1,02	46	5,90	12,5	39,10	1,768
21	Tres Arroyos	O/G	76,35	0,52	0,38	0,18	8	4,52	11,0	52,30	1,777
22	Tres Arroyos	O/G	76,10	0,66	0,52	0,24	6	3,30	11,0	54,00	1,791
23	Tres Arroyos	3	75,20	1,28	0,16	0,28	8	2,24	11,2	53,30	1,820
24	San Cayetano	O/G	78,15	0,92	0,16	0,48	18	7,24	11,2	55,50	1,806
25	González Cháves	O/G	79,45	1,00	0,08	0,84	16	2,84	11,2	54,70	1,813
26	Coronel Dorrego	O/G	80,35	0,04	0,44	0,26	34	1,82	11,5	50,50	1,680
27	Coronel Suárez	O/G	78,60	0,44	0,36	2,00	14	0,92	11,1	50,10	1,914

Appendix of Locality Composite Samples.

SAMPLE IDENTIFICATION		SEMOLIN ANALYSIS					
Sample Number	Locality, district or department	Falling Number (sec.)	Color (b)	Wet Gluten (%)	Gluten Index (%)	Farinogram Energy Level	Farinogram Degree of Softening (12 min.)
1	Azul	382	18,7	31,2	71	37,0	35
2	Balcarce	453	19,4	29,5	54	34,5	34
5	Coronel Pringles	473	21,0	30,4	41	33,5	37
6	Coronel Suárez	488	22,4	28,8	65	34,3	27
9	González Cháves	476	18,6	25,7	47	30,4	29
10	Lobería	442	17,9	28,3	38	32,4	31
11	Miramar	447	20,3	28,9	51	34,3	33
12	Necochea	420	19,0	24,6	66	27,3	26
13	Olavarría	442	18,3	26,0	47	30,8	31
14	Otamendi	440	18,4	28,1	59	33,0	30
15	Tandil	450	19,7	29,4	67	35,2	33
16	Tres Arroyos	470	19,7	30,8	31	33,7	35
18	Graneros (Tucumán)	556	21,2	31,6	52	34,9	29
21	Tres Arroyos	485	19,4	27,2	60	30,5	33
22	Tres Arroyos	549	18,7	25,7	73	30,8	30
23	Tres Arroyos	519	19,9	27,6	55	27,6	33
24	Coronel Dorrego	481	17,8	27,8	44	23,7	30
25	San Cayetano	430	17,8	28,5	34	24,7	32
26	González Cháves	531	21,8	29,5	48	25,8	31
27	Coronel Suárez	473	21,0	27,9	58	26,5	32

Country elevators, Cooperatives and Mills that contributed in the sampling

LOCALITY	DENOMINATION
BUENOS AIRES PROVINCE	
Adolfo Alsina	Agropecuaria Millagro S.A
Adolfo Alsina	Ganadera Salliqueló S.A.
Adolfo Alsina	Unigran S.A.
Adolfo Alsina	Coop. Agrícola Ganadera Ltda. de San Miguel
Adolfo Alsina	Cooperativa Agrícola Ganadera de Maza S.A
Adolfo Alsina	Trabajadores Unidos de Rivera Coop. de Trab. Ltda.
Alberti	Eduardo Beraza SA
Arrecifes	Fransisco Sellart S.A.
Arrecifes	Agricultores Federados Argentinos S.C.L.
Ascensión	Coop. Agrícola Ganadera Ltda. de Ascensión
Azul	Cerealera Azul S.A.
Balcarce	Scorziello y Galella S.C.
Baradero	Julio Docampo
Benito Juárez	Campoamor Hnos. S.A.
Bordeu	Acopio A.C.A.
Bragado	Aibal Servicios Agropecuarios SA
Bragado	Eduardo Beraza S.A.
Bragado	C.D.C. A.C.A. Bragado
Cabildo	Cooperativa Agrícola Ganadera e Industrial Sombra de Toro Ltda.
Carhué	Agopecuaria Millagro S.A.
Carhué	Coop. Agrícola Ganadera Lda. de Adolfo Alsina
Carmén de Areco	Coop.Agrop.de Carmén de Areco Ltda.
Chacabuco	Coop. Agropecuaria Granjeros Unidos de Chacabuco Ltda.
Chacabuco	Rodolfo Ferrari e hijo S.A
Chacabuco	Coop.Agrop.Granjeros Unidos Ltda
Chivilcoy	Alagna Cereales SRL
Chivilcoy	Huergo Cereales SRL
Chivilcoy - Bragado	Compañía Argentina de Granos S.A.
Colón	Graneros y Elevadores Argentinos de Colón Soc. Coop. Ltda.
Coronel Dorrego	Alea & Cía. S.A.
Coronel Dorrego	Baya Casal S.A.
Coronel Dorrego	Bayer S.A
Coronel Dorrego	Casa Balda S.A.
Coronel Dorrego	Castell Hnos S.A
Coronel Dorrego	Don Ramón S.A.
Coronel Dorrego	Pelayo Agronomía S.A.
Coronel Dorrego	Agronomía Raúl Pérez S.A.
Coronel Dorrego	Sucesión Antonio Moreno S.A.C.A.I.F.I
Coronel Dorrego	Syngenta Agro S.A.
Coronel Dorrego	Acopio A.C.A.
Coronel Pringles	Gurena S.C.A.
Coronel Pringles	López y Ramos S.C.
Coronel Pringles	Pucará S.A.
Coronel Pringles	Kriger y Cía S.A.C.I.
Coronel Pringles	Matzkin Semillas
Coronel Pringles	Coop. Agricola Ganadera de Lartigau Ltda.
Coronel Suárez	Agro El Renacer S.A. de Kopelson
Coronel Suárez	Agronomía Álvarez S.R.L.
Coronel Suárez	Bertolami Cereales S.A.
Coronel Suárez	Cereales Pasman S.A.
Coronel Suárez	Ducós Juan Enrique
Coronel Suárez	Cooperativa Agrop. General San Martín de Coronel Suárez Ltda .

LOCALITY	DENOMINATION
BUENOS AIRES PROVINCE	
Cte. Otamendi	Grupo Ceres Tolvas
Darregueira	Torre Teodoro S.A.
Darregueira	La Emancipación Sociedad Coop. Mixta de Consumo Ltda .
Darregueira	Cooperativa Agropecuaria Darregueira Ltda.
Dudignac	Coop. Agr. Ganad. Ltda. de Dudignac Ltda.
General Alvarado	Rural Ceres S.A.
General Lamadrid	Enrique Baya Casal S.A.
General Lamadrid	Productores General Lamadrid S.A.
General Pueyredón	Coop. Agrop. Gral. Necochea Ltda.
Gonzáles Cháves	Compañía Argentina de Granos S.A.
Gral.Arenales	Coop.Agric.Ganadera Ltda.Ascensión
Guaminí	Ganadera Salliqueló S.A.
Guaminí	Lartirigoyen y Cía S.R.L
Guaminí	Los Grobo Agropecuaria S.A.
Guaminí	Coop. Agrícola Ganadera de Guaminí Ltda.
Guaminí	Cooperativa Agrícola Ganadera de Garré Ltda.
Huanguelén	Acopio A.C.A.
Junin	Liga Agrícola Ganadera Coop. Ltda.
Junin	Junarsa S.A
Junín	Oscar Sardi y Luís Vergani
Lartigau	Coop. Agrícola Ganadera de Lartigau Ltda.
Lobería	Barón y Cía. S.A.
Lobería	Enrique Baya Casal S.A.
Lobería	Cantabria S.A.
Lobería	Forner Hnos y Cía S.A.
Lobos	Agropack Insumos S.R.L.
Lobos	Grobocopatel Hnos. S.R.L.
Lobos	Molino Cañuelas S.A.
Mar del Plata	Héctor L. Villar
Mechongué	Coop. Agrícola Gral.Necochea Ltda.
Micaela Cascallares	Coop. Agrícola Ltda. de Micaela Cascallares
Necochea	Alea & Cía. S.A.
Necochea	Coop. Agrop. Gral. Necochea Ltda.
Necochea	Coop. Agrop. Gral. Necochea Ltda.
Necochea	Evasio Marmetto S.A.
Necochea	Iriberri Cereales S.C.A.
Necochea	Coop. Agropecuaria La Segunda Ltda La Dulce
Nueve de Julio	C.D.C. A.C.A. Naon
Nueve de Julio	Coop. Agrícola Ganadera de Dudignac Ltda.
Patagones	Fibiger S.R.L. Benito
Patagones	Novick y Cía. S.R.L.
Patagones	Sucesión de Ángel Martín Recondo Cereales
Patagones	Cooperativa Agr. Ganad. e Ind. de Patagones y Viedma Ltda.
Pellegrini	Ganadera Salliqueló S.A.
Pergamino	Fransisco Sellart S.A.
Pergamino	Agricultores Federados Argentinos S.C.L.
Pigüé	La Alianza Cooperativa Agrícola Ganadera Ltda.
Puan	Bertín y Cía. S.C.A.
Puan	Torre Hnos. S.A.
Puan	Cooperativa Agrícola Ganadera Ltda. de Puan
Quequén	H.J. Navas y Cía S.A.
Ramallo	Cooperativa Agrícola de Ramallo Ltda.
Rauch	Coop. Agrícola Ganadera de Rauch S.A.
Rivera	Ganadera Salliqueló S.A.
Rojas	Agricultores Federados Argentinos S.C.L.

LOCALITY	DENOMINATION
BUENOS AIRES PROVINCE	
Saavedra	Los Grobo Agropecuaria S.A.
Saavedra	Vázquez Roberto J.
Saavedra	Coop. Agrícola Ganadera Ltda. de Espartillar
Saladillo	Cargill S.A.
Saladillo	Molino Cañuelas S.A.
Salliqueló	Ganadera Salliqueló S.A.
Salliqueló	Morero Semillas y Cereales S.A.
Salliqueló	Vázquez Roberto J.
Salto	Ferias del Norte S.A.
San Agustín	Coop. Agrícola Gral. Necochea Ltda.
San Andrés de Giles	Cosechas Argentinas S.A.
San Antonio de Areco	Coop. Agrop. de San Antonio de Areco Ltda.
San Manuel	Cantabria S.A.
San Miguel Arcangel	Coop. Agrícola Ganadera Ltda. San Miguel
San Pedro	Ramon Rosa y Cía S.A.
Stroeder	Cooperativa Agr. Ganad. e Ind. de Patagones y Viedma Ltda.
Suipacha / Mercedes	Coincer S.A.
Tandil	Dos Caciques S.R.L.
Tandil	Rural Ceres Tolvas S.A.
Tandil	Usandizaga, Perrone y Juliarena S.A.
Tandil	Coop. Agric. Ganadera de Tandil y Vela Ltda.SA
Tandil	Coop. Agropecuaria de Tandil S.A.
Tornquist	Vittori Cereales S.R.L.
Tornquist	Los Vascos Cereales S.A.
Tornquist	Cooperativa Rural Limitada de Tronquist Ltda.
Tres Arroyos	Agarraberes Oscar Pedro
Tres Arroyos	Agro Cereales de Tres Arroyos S.A.
Tres Arroyos	Agro El Carretero S.A.
Tres Arroyos	Agro Roca S.R.L.
Tres Arroyos	Agrocereales Del Puerto S.A
Tres Arroyos	Agrooriente S.A.
Tres Arroyos	Agronomía Raúl Horacio Pérez S.A.
Tres Arroyos	Alea y Cía. S.A.
Tres Arroyos	Bellingieri e Hijos S.A
Tres Arroyos	Bioterra S.A.
Tres Arroyos	Cerealera Tres Arroyos S.A.
Tres Arroyos	Ciancaglini Germán
Tres Arroyos	Compañía Argentina de Granos S.A.
Tres Arroyos	Goñi, Jesús Héctor Cereales y Semillas
Tres Arroyos	Luis Blanco S.A
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Tres Arroyos	Sur Agropecuaria S.A.
Tres Arroyos	Taraborelli.Mario Jesús
Tres Arroyos	Cooperativa Agraria Tres Arroyos Ltda.
Tres Arroyos	Cooperativa Rural Ltda. Alfa
Tres Lomas	Ganadera Salliqueló S.A.
Tres Lomas	Morero Semillas y Cereales S.A.
Villarino	Criadero A.C.A. Cabildo
Villarino	Novick y Cía. S.R.L.
Villarino	Tomás Hnos. y Cía. S.A.
Villarino	Barraca Mitre S.R.L.
	Centro de Acopiadores de Cereales
	Centro de Acopiadores de la Zona Oeste de la Pcia. de Bs.As.

LOCALITY	DENOMINATION
BUENOS AIRES PROVINCE	
	Centro de Acopiadores de Daireaux
	Sociedad de Acopiadores del Norte de la Pcia. de Bs.As.
	Centro de Acopiadores de Cereales Zona Puerto Quequén
	Sociedad de Acopiadores de Cereales Zona Bahía Blanca
	Centro de Acopiadores de Cereales de Tres Arroyos
CÓRDOBA PROVINCE	
Arroyo Cabral	Coop. Arroyo Cabral Ltda.
Buchardo - Italó.-	Integral Agropecuaria S.C.C.
Carrilobo	Logrando Amigos S.A.
Colazo	Comercial Rossi S.A.
El Tío	Agricultores Federados Argentinos S.C.L.
Etruria	Etruria Cereales S.A.
Freyre	Coop.Gan.Agríc. y de Cons. Freyre Ltda.
Hernando	Coop. La Vencedora Ltda. de Hernando
Idiazabal	Ortega Hnos S.A.
Jovita - Mattaldi - Bruzone	Ambito Das
Justiniano Posse	Coop. Agríc. Ganadera Justiniano Posse Ltda.
La Laguna	Dosagro S.R.L.
Laboulaye	Cia. Argentina de Granos S.A.
Laboulaye	Caligran S.A.
Laboulaye	Molinos Florencia S.A.
Las Junturas	Molino Las Junturas S.A.
Leones	Coop. Agricola Ganadera de Leones Ltda.
Levalle - R. Guzmán	Suc. de Manuel Gimenez
Levalle - Riobamba	Mario Berra
Luque	Coop. Agr. Gan. de Luque Ltda.
Marcos Juárez	Cooperativa Agropecuaria General Paz Ltda.
Marcos Juárez	Agricultores Federados Argentinos S.C.L.
Matorrales	Agromatorrales S.A.
Mattaldi - Huinca	Martinez Hnos.
Melo - Serrano	Marcichelar S.R.L.
Monte Buey	Coop. Agricola Ganadera de Monte Buey Ltda.
Monte Maíz	Cooperativa Agricola de Monte Maiz Ltda.
Morteros	Coop. Agric.Gan. de Morteros Ltda.
Oliva	Coop. La Federación de Oliva Ltda.
Oliva	ACA Oliva
Porteña	Coop.Agric.Gan. y de Cons. Porteña Ltda
Tío Pujío	ACA Tío Pujío
Villa del Rosario	Molino Viada S.A.
Villa Maria	Hab S.A.
Villa Rosario	Teumaco Cereales S.A.
	Sociedad de Acopiadores de Granos de la Pcia. de Córdoba
CHACO PROVINCE	
Barranqueras	Colono S.A.
Charata	Pampa del Cielo S.R.L.
Corzuela	Cereacor S.R.L.
Las Breñas	Agroservicios Bru y Ka S.R.L.
Pampa del Infierno	Alfredo Brugnoli Cereales S.R.L.
Pcia. R. Sáenz Peña	Derka y Vargas Motors S.A.
Resistencia	Cargill S.A.

LOCALITY	DENOMINATION
ENTRE RÍOS PROVINCE	
Crespo	La Agricola Regional Coop. Ltda.
Diamante	Agromoya S.R.L.
General Galarza	Coop. La Protectora Ltda.
General Ramírez	Coop. La Ganadera Gral. Ramírez Ltda.
Gualeguay	Soragro S.A.
Gualeguaychú	Unión Cerealera S.R.L.
Hasenkamp	Ultragrain S.A.
Hasenkamp	León Rabey e Hijos S.A.
La Paz	Coop. La Paz Ltda.
Larroque	Tierra Greda S.A.
Lucas González	Coop. El Progreso Ltda.
María Luisa	Héctor Bolzan y Cía
Sauce Pinto	Dellizzotti Hnos. S.R.L.
Urdinarrain	Coop. Fed. Ag. Gan. de Urdinarrain Ltda.
Viale	Santiago D. Trocello S.A.
Victoria	Granero S.R.L.
Villa Fontana	Cereales Bolzan S.R.L.
Villaguay	Arroceros de Villaguay S.C.L.
	Centro de Acopiadores de Granos de Entre Ríos
JUJUY PROVINCE	
Palma Sola - Ledesma	Granexar S.A.
Pampa Blanca	Granexar S.A.
Perico	Granexar S.A.
San Vicente - El Carmen	Granexar S.A.
LA PAMPA PROVINCE	
Anguil	Trabajadores Unidos Cooperativa Mixta Ltda.
Atreucó	Sebastián Dalmasso e Hijos
Atreucó	Trimag S.A.
Atreucó	Atreucó Cooperativa Agropecuaria Ltda.
Atreucó	Cooperativa Agropecuaria de Doblas Ltda.
Capital	Cooperativa Agropecuaria de Anguil Ltda.
Castex	Acopio A.C.A.
Catriló	Trimag S.A.
Catriló	Lartirigoyen y Cía. S.A.
Catriló	Molisud S.A.
Chapaleufú	Sebastián Dalmasso e Hijos
Conhelo	Gómez y Cía. S.R.L
Conhelo	Cereales Quemú S.A.
General San Martín	Sociedad Cooperativa Agrícola Ganadera Ltda. de General San Martín
Guatraché	Molisud S.A.
Guatraché	Torre S.A.
Hucal	Molisud S.A.
Hucal	Sociedad Cooperativa Agrícola Ganadera Ltda. de General San Martín
Maracó	Granos del Oeste S.R.L.
Maracó	Cereales Del Centro S.A.
Miguel Riglos	Trimag S.A.
Quemú-Quemú	Comercial Mirasol S.R.L.
Quemú-Quemú	Nuevas Tierras S.R.L.
Rancul	Laboratorio Centro de Acopiadores
Santa Rosa	Pelayo Agronomía S.A.
Trenel	Cereales Del Centro S.A.
Winifreda	Acopio A.C.A.

LOCALITY	DENOMINATION
LA PAMPA PROVINCE	
	Centro de Acopiadores de Cereales de La Pampa y Limítrofes
SALTA PROVINCE	
Anta	Molino Panamericano S.A. y Molinos Cañuelas S.A.C.I.F.I.A.
Embarcación	Molino Pampa Blanca S.A.
Gaona - Anta	Granexar S.A.
Joaquín V. González	Granexar S.A.
La Junta	Granexar S.A.
Las Lajitas - Anta	Molino Pampa Blanca S.A.
Metán	Molino Panamericano S.A. y Molinos Cañuelas S.A.C.I.F.I.A.
Orán	Granexar S.A.
Río del Valle - Anta	Molino Pampa Blanca S.A.
Rosario de la Frontera	Molino Panamericano S.A. y Molinos Cañuelas S.A.C.I.F.I.A.
Tartagal	Molino Pampa Blanca S.A.
SANTA FE PROVINCE	
Alcorta	Jakas, Kokic, Ivancich y Cía. Ltda.
Angélica	Naciente Cereales SRL
Arroyo Ceibal	Quatrin S.A.
Avellaneda	Unión Agric. de Avellaneda Coop. Ltda.
Barrancas	Cooperativa Agrícola Ganadera La Union Ltda.
Bigand	AFA Bigand
Bombal	AFA Bombal
Cañada del Ucle	Coop. Agricola Ganadera de Cañada del Ucle
Capitán Bermúdez	Rocca Cereales SRL
Carlos Pellegrini	Coop. Agricola Ganadera de Carlos Pellegrini
Casilda	AFA Casilda
Centenario	Cereales Centenario SA
El Trébol	Cooperativa Agrícola Ganadera de El Trebol
Emilia	Coop. Agrop. "Santa Lucía" Ltda.
Fuentes	Fuentes Agricola
Gobernador Crespo	Coop. Agr.Gan. De Gob. Crespo Ltda.
Humberto Primo	Humberto Primo Cereales SRL
Humboldt	A.F.A. Agencia Humboldt
Humboldt	Agroservicios Humboldt S.A.
Irigoyen	Coop. Agropecuaria Mixta de Irigoyen Ltda.
Juan B. Molina	AFA J.B.Molina
Las Rosas	AFA Las Rosas
Llambi Campbell	Coop. Agr. Gan. "La Unión" Ltda.
López	Cooperativa Agropecuaria de Lopez Ltda.
Malabrigo	Coop. Malabrigo Ltda
María Juana	A.F.A. Agencia Ma. Juana
María Susana	Cooperativa Agrícola Ganadera Fed. de Maria Susana Ltda.
Máximo Paz	Cooperativa Agropecuaria de Maximo Paz
Monje	Cooperativa Agrícola Ganadera Tambera Ltda. de Monje
Pilar	Coop. Agr. Gan. Ltda Guillermo Lehmann
Pueblo Muñoz	AFA Pueblo Muñoz
Rafaela	Coop. Agr. Gan. Ltda. "Guillermo Lehmann"
Ramona	Cereales Ramona S.R.L.
Reconquista	Industrias Molineras y Afines de Norte (Molino IMAN)
Recreo - Santo Domingo	Cia. de Cereales S.R.L.
Roldán	Roberto Amsler S.A.C.
San Jerónimo Norte	Agro Cereales Las Colonias S.A.

LOCALITY	DENOMINATION
SANTA FE PROVINCE	
San José de la Esquina	CDC San Jose de la Esquina
San Justo	Coop. Federal Agrícola Gan. de San Justo Ltda.
San Martín de las Escobas	AFA San Martin de las Escobas
San Vicente	AFA Agencia San Martín de las Escobas - Of. San Vicente
Sancti Spiritu	Cooperativa Agricola Ganadera de Sancti Spiritu Ltda.
Santa Clara de Buena Vista	Coop.Agr.Gan. La Unión Ltda
Sauce	AFA Carmen del Sauce
Sunchales	Coop. Ltda. Agr. Gan. de Sunchales
Totoras	AFA Totoras
Videla	Coop. Agr.Gan. de Videla Ltda
Villa Cañás	MSU SA Villa Cañas
Villa Cañás	Cooperativa Agricola Ganadera Fed. de Villa Cañas Ltda.
Villada	Cooperativa Agropecuaria de Bombal Ltda.
Zavalla	ACA Zavalla
	Centro de Acopiadores de Cereales y Oleaginosas de Santa Fe
	Sociedad Gremial de Acopiadores de Granos - Rosario
SANTIAGO DEL ESTERO PROVINCE	
Departamento Jiménez	Molinos varios
Selva	Asociación de Cooperativas Argentinas
TUCUMÁN PROVINCE	
Banda del Río Salí	Molino Trigotuc S.A.
Banda del Río Salí	Industria del Trigo S.A.
Banda del Río Salí	Complejo Alimenticio San Salvador S.A.
	Centro de Acopiadores de Granos del NOA

LOCALITY	DENOMINATION
DURUM WHEAT	
Bahía Blanca	Manera Virgilio S.A.C.I.F.
	Molinos Río de la Plata S.A.(Acopios Olavarría y Tres Arroyos)
Tres Arroyos	Kraft Foods Argentina S.A.
	Cargill S.A.
Pcia. Tucumán	Complejo Alimenticio San Salvador S.A.

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Bahía Blanca Argentina

Cámara Arbitral de Cereales de Entre Ríos

faim
federación argentina de la industria molinera

Cámara Arbitral de Cereales
Bolsa de Comercio de Santa Fe

Asociación de Cooperativas Argentinas

Centro de Exportadores de Cereales

Bolsa de Cereales de Córdoba y
Cámara de Cereales y Afines de Córdoba
Tribunal Arbitral