Argentine Wheat

Institutional Quality Report

2009/2010 Crop

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Elaborated by:

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  Entre Ríos Grain Arbitration Chamber.
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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.**
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- **Ministerio de Agricultura, Ganadería y Pesca (MAGyP).**
  Ministry of Agriculture, Livestock and Fishery.
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- **Chacra Experimental Integrada Barrow (Convenio INTA – MAA, Bs. As.)**
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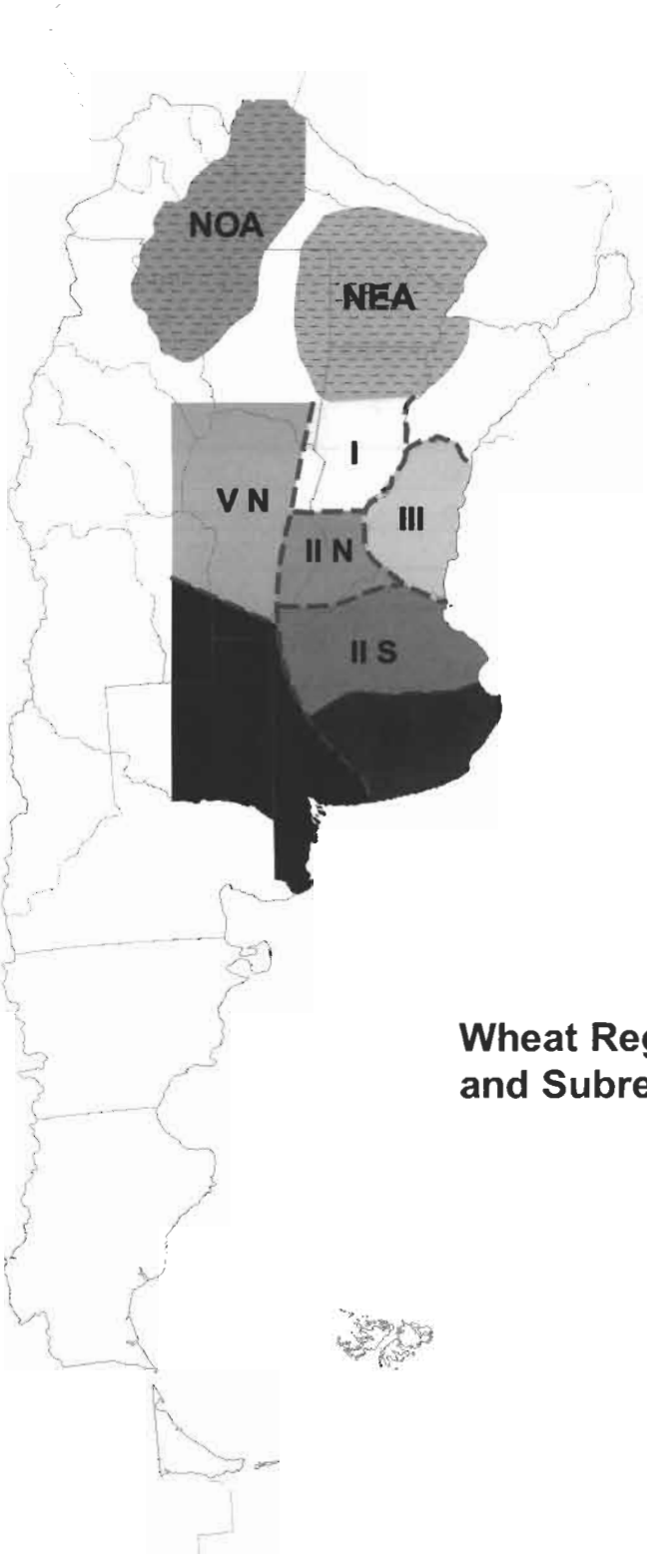
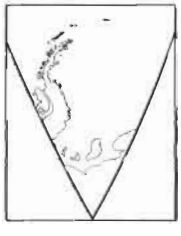


Wheat Region and Subregions



BREAD WHEAT

Triticum aestivum

Introduction

Estimates for the national wheat production would be in the order of 7,37 million tons (against 8,36 in the previous year and 16,18 in 07/08 campaign) for a cultivated surface of 2,94 million hectares, showing an important reduction compared to 4,27 million in the previous year. The average yield would be around 2,51 ton/ha (compared to 1,96 in the previous year). Yields showed a decreasing tendency from east to west, with maximum values of around 60 ql/ha and minimum ones of 4 ql/ha.

Sowed, harvested area, yields and production per sub-region

Subregion	Sowed Area (ha)	Harvested area (ha)	Yield (Kg/ha)	Production (tn)
I	138,700	138,700	1,965	258,290
II North	256,100	235,100	3,139	738,149
II South	514,150	514,060	3,231	1,661,210
III	335,500	326,950	3,774	1,234,006
IV	782,140	762,480	3,153	2,404,482
V North	124,100	111,850	1,139	127,410
V South	842,102	491,982	1,183	582,145
NOA	411,730	362,385	995	360,800
NEA	3,700	3,700	1,050	3,900
National	**3,408,222**	**2,947,207**	**2,510**	**7,370,392**

Based on data from the Ministry of Agriculture, Livestock and Fishery. Crop 2009 - 2010

The final wheat production in the core-central zone of the country is expected to be around 1 million tons versus 1,5 million tons in the previous harvest and much lower than 2,8 million tons obtained in 07/08 campaign.

Environmental conditions were variable between regions even inside the same sub region, giving way to a great deal of scattered yields.

In the center-south of the province of Santa Fe and Entre Rios and north of Buenos Aires yields were good compared to the poor yields obtained in Cordoba, north of Santa Fe and in the northern provinces. In some areas of the wheat sub regions II North and V North, due to accumulated effects caused by drought, damages by frost, hail and grain scorching because of high temperatures and windy weather in grain fill, electrolytic weight and thousand- grain weight were affected with direct consequences on yield and commercial quality.

There was a low incidence of foliar diseases and insects as well as fusarium head blight; since they were not severe it was not necessary to use chemical treatments.

In general, environmental conditions during harvest were good except in sub region III, in Entre Rios area, where abundant rainfall affected the industrial quality and due to high yields obtained, there was a fall in protein and gluten content.

Organization and Methodology:

Sampling structure

It was agreed to obtain samples which represent about 4,000 tons each, reaching a total of 156 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 ex-Secretariat 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.

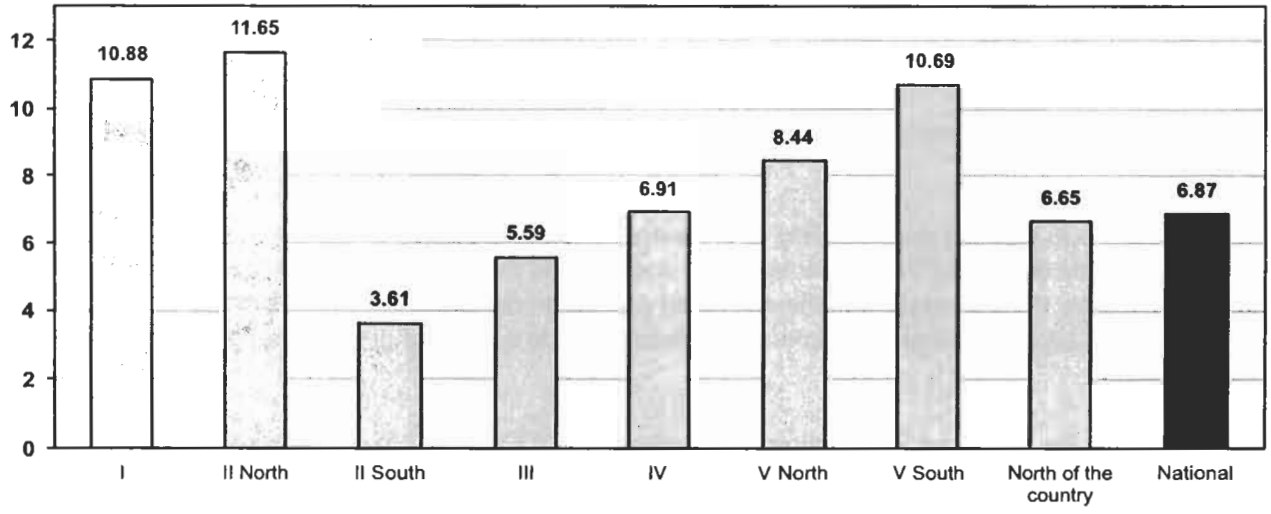
Likewise the Coordination of Offices in the interior of the country of MAGyP bring the support in the sampling.

Subregion	Locality Composite	Sampling (tn)	Production (tn)	Production Sampled (%)
I	10	28,110	258,290	10.9
II North	24	86,000	738,149	11.7
II South	15	60,000	1,661,210	3.6
III	19	69,008	1,234,006	5.6
IV	44	166,035	2,404,482	6.9
V North	8	10,752	127,410	8.4
V South	30	62,242	582,145	10.7
North of the country	6	24,000	364,700	6.6
TOTALS	**156**	**506,147**	**7,370,392**	**6.87**

Based on data from the Ministry of Agriculture, Livestock and Fishery. Crop 2009 - 2010

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 2,435 samples used for this sampling program, in such a way a sampled tonnage of 6.87% of the national wheat production, which amounted to 7,370,392 tons, was reached.

% Porcentage of the Production Represented in Sampling Program (%) per subregion



Procedure

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

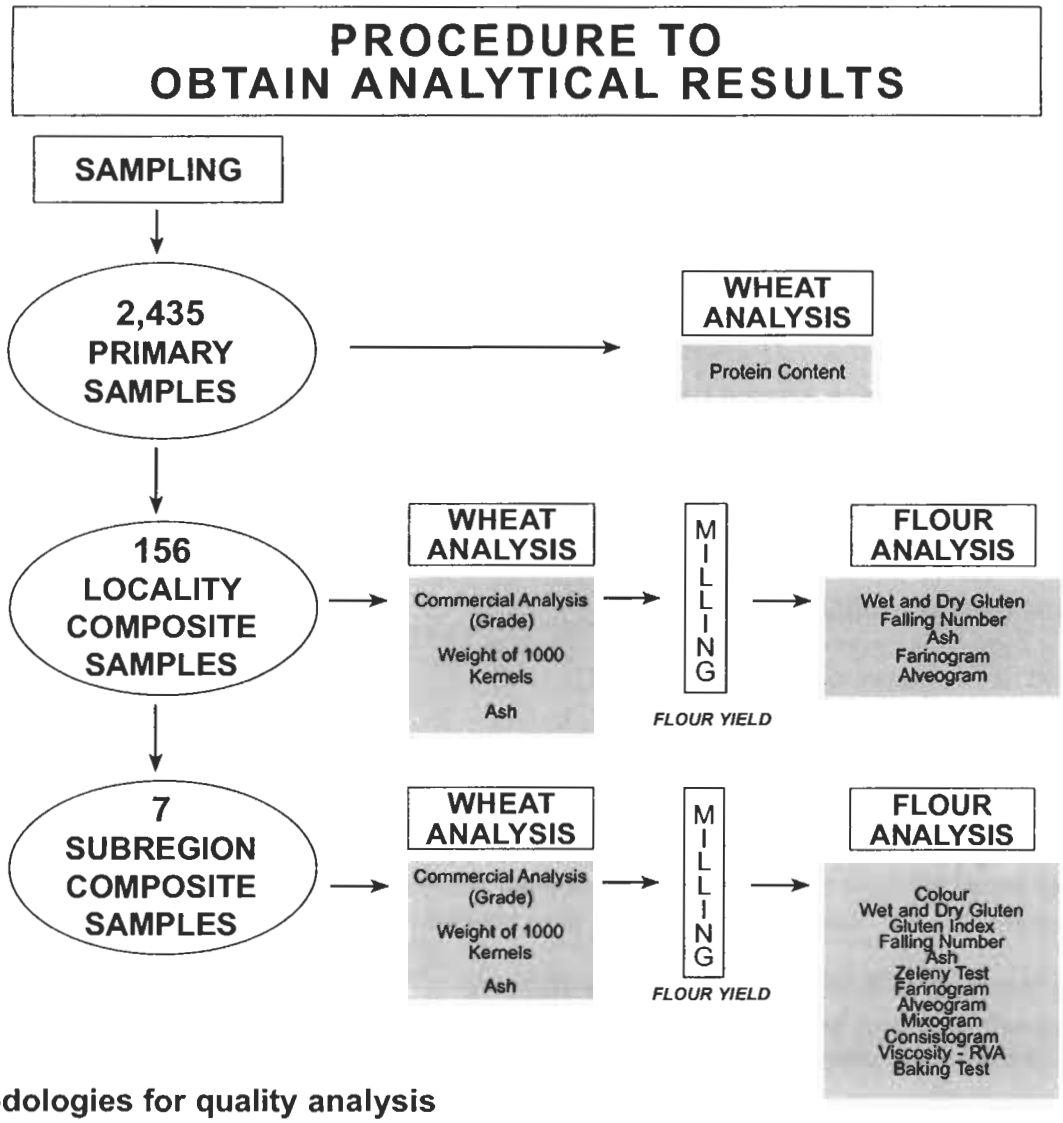
The composite samples were sent to the SENASA Laboratory to carry out the Bühler grinding, reserving a part in order to prepare the Subregion Composite Samples. It was decided to use only one mill for all the composite samples by locality, so as to minimize differences in the flour features due to the 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 Subregion**, 7 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 N° 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 900° C +/- 25° 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 130° C +/- 3° 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 N° 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 N° 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 Nº 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 Nº 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 Nº 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 Tº: 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).

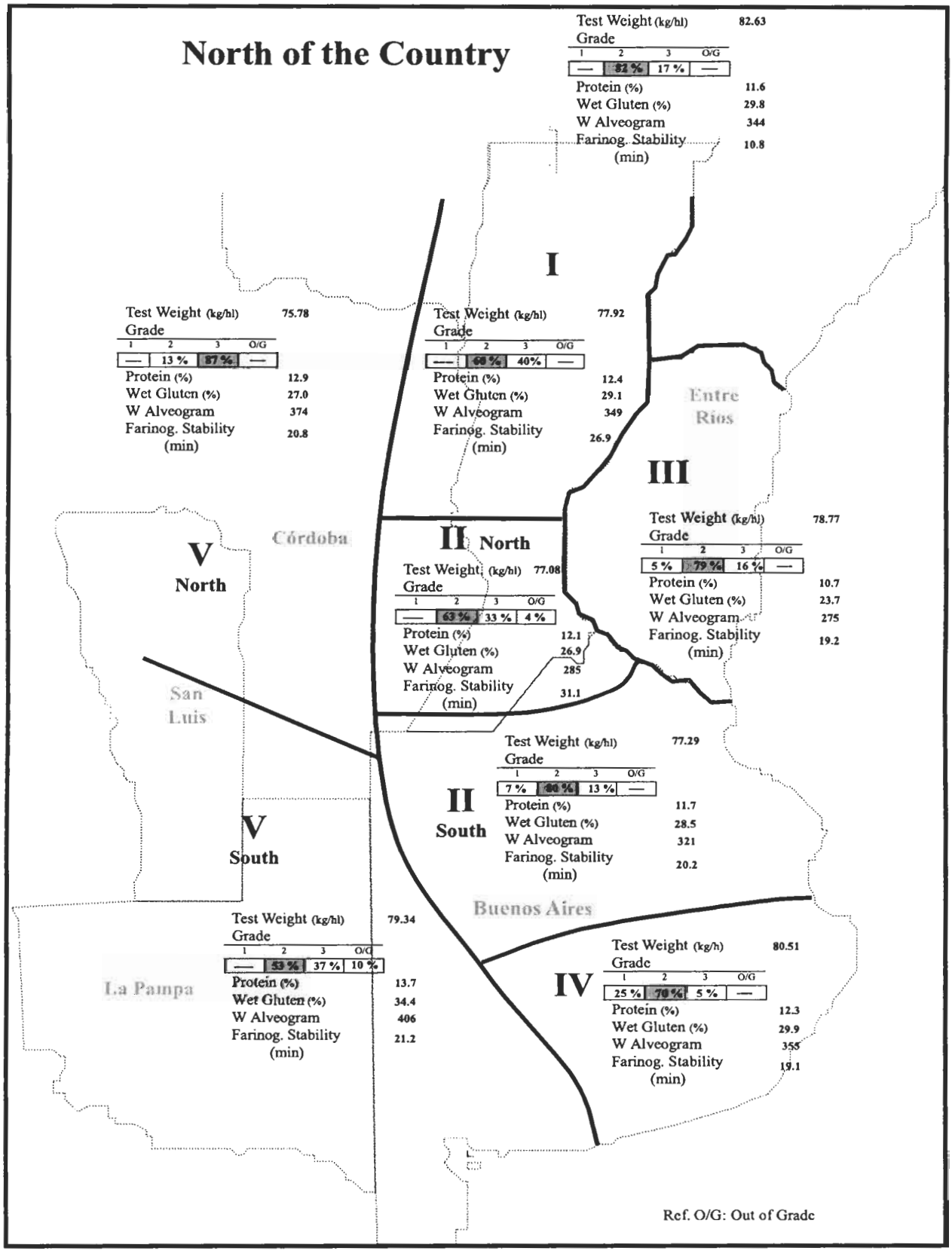
SAGPyA N° 1262 / 04
ARGENTINE STANDARD FOR WHEAT

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		Smutty Kernels %	Yellow Berry Kernels %	Shrunken and Broken Kernels % (1)						
					Heat Damaged Kernels %	Total %									
1		+ 1.5	79.00	0.20	0.50	1.00	0.10	15.00	0.50		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 %
2		-	76.00	0.80	1.00	2.00	0.20	25.00	1.20						
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



Subregion I
Background for the crop

In subregion I there was lack of humidity for the sowing of long and intermediate cycle wheat (low content of humidity in the profile). Many hectares were cultivated towards the end of July- beginning of August due to rainfalls of 50 mm. Intermediate and short cycle wheat were late sown with little rain in July. They started with scarce water in the soil profile (80 mm in the best lots).

Tillering was good in long cycle wheat grown on time. Short cycle wheat sown late did not tiller and compensated with a higher sowing density.

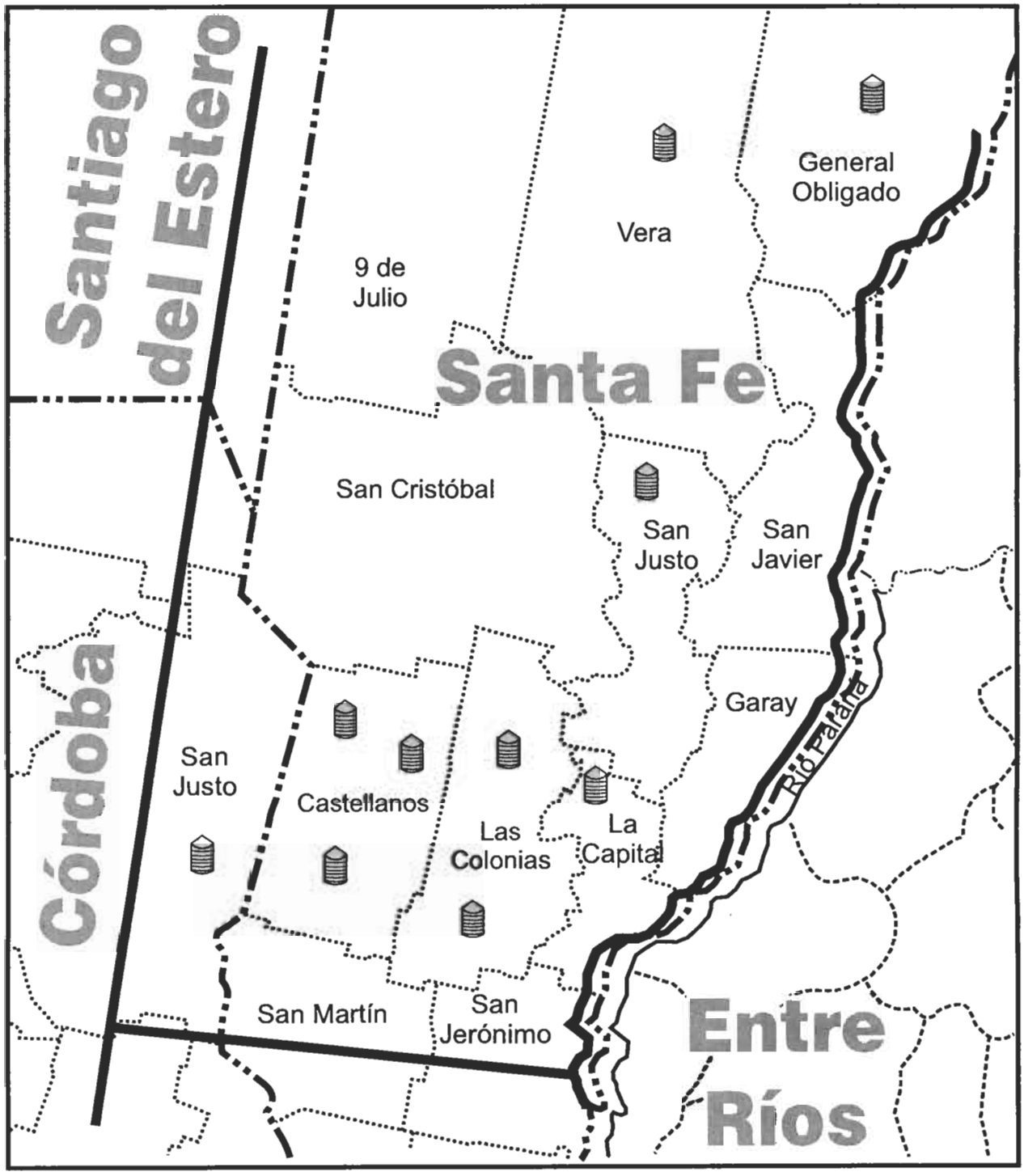
In early sown wheat earing was affected by late freeze mainly in low parts of lots. Late sown wheat, towards the end of July-beginning of August, was scorched by heat towards the end of October (5 running days with temperatures of 35 ° C).

Rainfalls began during earing but tillers were lost due to stress and towards the end of October, at grain fill, important stress was again present which resulted in few grains with ears and low electrolytic weight due to sun scorching, which favored the level of proteins.

Harvest was normal without rainfall problems from Route 19 to the south and with difficulties from Route 19 to the north, which caused an important delay by rainfalls in this period. Lots with high content of humidity were harvested (16-18%). Habitually wheat is harvested dry and driers do not have to be used in the whole wheat campaign. In this campaign there was an important delay due to rainfalls in this period. Lots with high content of humidity were harvested (16-18%). Most of the products were wet.

There was scarce presence of foliar diseases such as rust and yellow spot. There was an important aphid attack in the wheat ears which made fumigation necessary in many lots.

Yields were between 700 and 3.500 kg/ha according to lots and areas.



Each reference represents near 4,000 tns sampled.

Subregion I Wheat

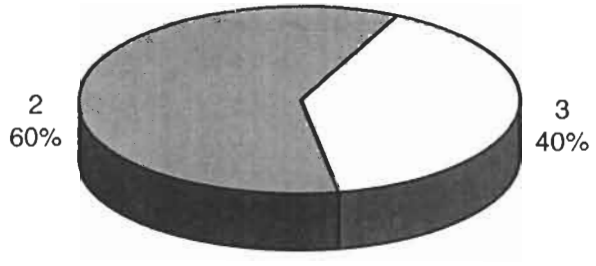
Results of the Analyses

Composite Samples by Locality. Averages were weighted by Tonnage.

Wheat Analysis	Minimum	Maximum	Average	Standard Deviation	Variation Coefficient
Test Weight (kg/hl)	74.80	81.90	77.92	2.03	0.03
Total Damaged Kernels (%)	0.10	0.60	0.32	0.16	0.49
Foreign Material (%)	0.08	0.84	0.30	0.20	0.67
Shrunken and Broken Kernels (%)	0.52	2.30	1.14	0.55	0.48
Yellow Berry Kernels (%)	0.60	9.40	4.63	2.96	0.64
Protein (13,5% Moisture) (%)	10.5	14.3	12.4	1.1	0.09
Weight of 1000 Kernels (gr.)	24.90	37.70	29.48	4.08	0.14
Ash (% dry basis)	1.780	2.420	1.978	0.189	0.10

Total damaged kernels includes 0,06% green kernels, 0,03% sprouted kernels, 0,15% insect chewed kernels and 0,04% calcinated kernels.

Grade Distribution



Flour Analysis		Minimum	Maximum	Average	Standard Deviation	Variation Coefficient
MILLING	Wet Gluten (%)	23.5	35.7	29.1	3.4	0.12
	Dry Gluten (%)	8.2	12.8	10.4	1.1	0.11
	Falling Number (sec.)	354	436	400	24	0.06
	Flour Yield (%)	61.6	70.1	66.9	2.4	0.04
	Ash (dry basis) (%)	0.581	0.892	0.691	0.080	0.12
FARINOGRAM	Water Absorption (14% H°) (%)	56.3	63.2	59.9	1.8	0.03
	Development Time (min.)	9.4	24.0	18.0	4.6	0.25
	Stability (min.)	12.7	34.9	26.9	5.4	0.20
	Degree of Softening (12 min.)	19	46	29	9	0.31
ALVEOGRAM	P (mm)	98	125	111	7	0.06
	L (mm)	52	100	80	15	0.19
	W Joules x 10-4	232	418	349	51	0.15
	P / L	1.05	2.40	1.39	0.37	0.26

These results were elaborated with 10 composite samples prepared proportionally from 64 primary samples (farmer deliveries)

Subregion Data

In this subregion the wheat production was 258,290 tons., the 3.5% of the national total. Were sampled 28,110 tons., the 10.9 % 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	Gral. Obligado	2320	2	81.90	0.60	0.08	0.64	0.00	11.9	35.8	1.780
2	Castellanos	2870	3	77.90	0.40	0.18	1.42	2.50	12.3	26.6	2.080
3	Castellanos	3020	2	80.00	0.36	0.10	1.16	0.00	12.5	27.3	1.960
4	Castellanos	2980	3	77.30	0.22	0.28	1.54	0.60	12.4	25.7	2.140
5	Las Colonias	3780	2	78.70	0.16	0.22	0.54	5.20	12.6	29.9	1.790
6	Las Colonias	3620	3	75.80	0.10	0.38	1.52	0.00	13.8	24.9	2.010
7	San Justo (Sta Fe)	2550	2	76.00	0.56	0.28	0.84	9.40	10.5	32.2	1.940
8	La Capital	2300	2	77.80	0.26	0.28	0.62	6.30	10.9	34.0	1.820
9	Vera	1990	2	80.20	0.28	0.38	0.52	0.00	12.2	37.7	1.780
10	San Justo (Córdoba)	2680	3	74.80	0.42	0.84	2.30	0.00	14.3	26.9	2.420

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	32.1	11.1	389	68.2	63.2	9.5	26.2	46	104	99	359	1.05	0.581
2	Castellanos	29.2	10.7	420	68.0	60.0	16.8	25.3	28	115	75	354	1.53	0.632
3	Castellanos	29.7	10.4	413	70.1	59.7	20.9	30.5	19	106	100	418	1.06	0.602
4	Castellanos	30.4	11.0	371	69.0	59.7	24.0	34.9	21	105	90	373	1.17	0.707
5	Las Colonias	29.5	10.2	436	66.9	59.0	20.5	29.8	20	113	67	322	1.69	0.716
6	Las Colonias	23.7	9.4	389	65.6	59.3	20.1	29.3	28	112	82	366	1.37	0.726
7	San Justo (Sta Fe)	28.4	9.5	354	66.3	58.5	16.9	24.1	36	125	52	285	2.40	0.687
8	La Capital	23.5	8.2	396	64.3	56.3	13.1	20.0	31	98	59	232	1.66	0.661
9	Vera	30.4	10.5	401	69.2	61.7	9.4	12.7	46	108	92	338	1.17	0.672
10	San Justo (Córdoba)	35.7	12.8	413	61.6	62.6	21.8	28.5	24	117	85	414	1.38	0.892

Subregion II North
Background for the crop

The total rainfall recorded in the crop period was 410 mm, 115% higher than 2008 and 6% lower than the historic values in 1951–2007.

Crops cultivated at the end of May and beginning of June presented poor initial development due mainly to scarce rainfalls occurred from beginning of June to mid July with a total of 5,3 mm added to the fact that in the first 100 cm depth there was only 71 mm.

Due to this situation an important proportion of lots intended to wheat were sown alter the rainfalls of July (58,4 mm), with a predominance of intermediate to short cycle cultivars.

Temperatures (minimum and maximum) in average, from emergence to tiller period and in the grain fill period were lower than 2008. Such thermal conditions together with greater hydric availability determined the increase of yields in some areas compared to the previous campaign.

Solar radiation and specifically photo synthetically active radiation (PAR) is a necessary source of energy for crops to grow and produce, however it was not the most important element in yield determination.

During this campaign the percentage of severity of foliar diseases was very low and in average lower than 5%. Yellow spot was the disease with highest incidence.

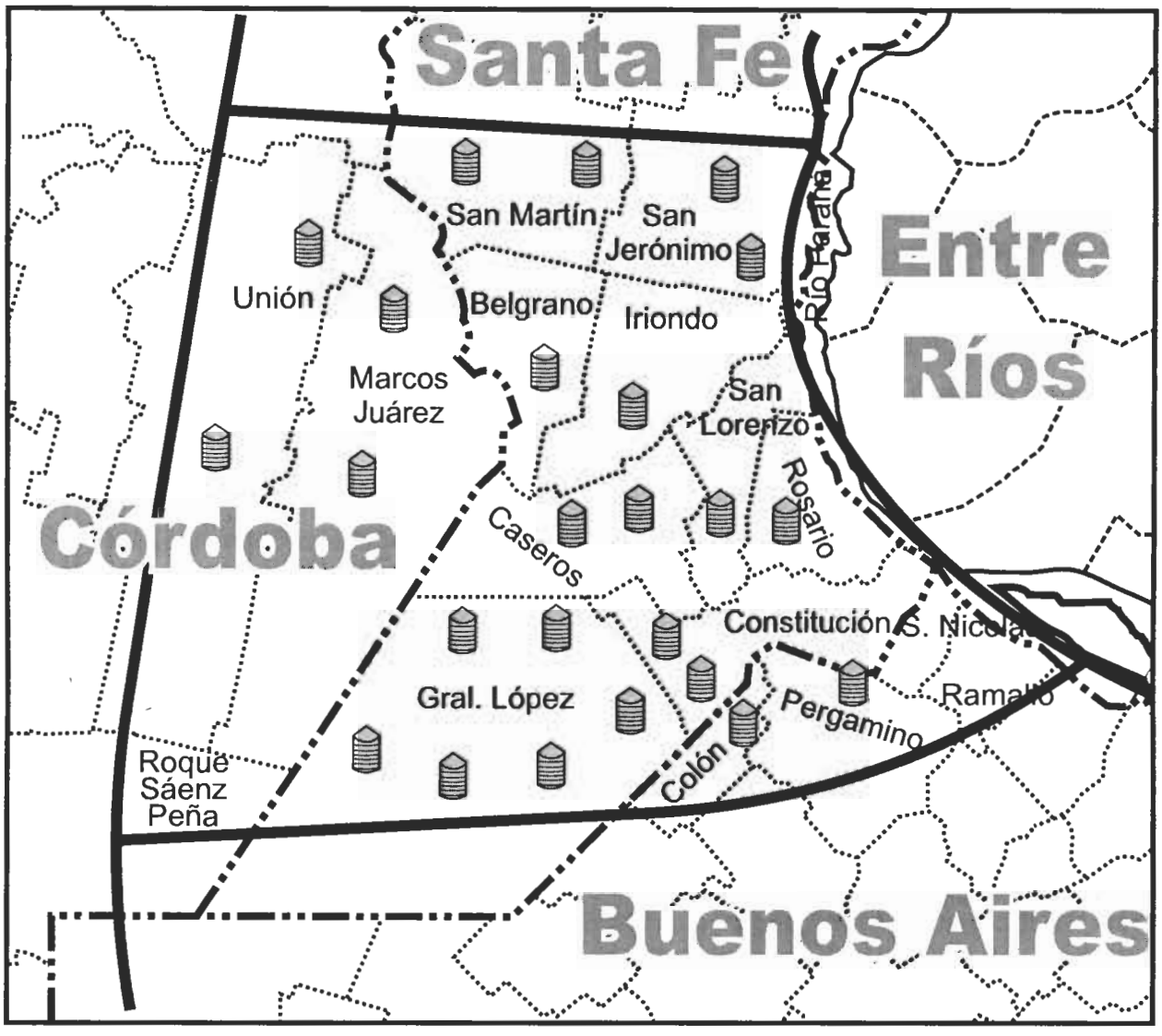
Wheat crop yield was good in the district area of EEA Oliveros, mainly in those genotypes of short cycle. This was mainly due to important rainfalls recorded during the period known as critical for the crop and favorable temperatures during tillering and grain fill, as well as the low incidence and severity of foliar diseases.

In some areas of the wheat subregion II North due to accumulated effects caused by drought, damages by freeze, hail and scorching of the grain by high temperatures and windy weather during grain fill, electrolytic weight and the weight of thousand grains were affected as direct consequences on yield and commercial quality.

In the departments of Marcos Juárez and Unión, yields were between 4 a 16 ql/ha in many lots and they were only higher in the town of Marcos Juárez with 20 to 25 ql/ha and Corral de Bustos with some lots up to 35-40 ql/ha.

The final wheat production in the core area was of 1 million ton versus 1, 5 million ton in the previous harvest and below the 2, 8 million ton produced in 07/08 campaigns.

Subregion
II North
Wheat



Each reference represents near 4,000 tns sampled.

Results of the Analyses

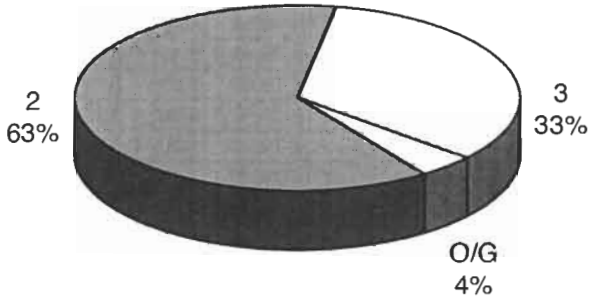
Composite Samples by Locality. Averages were weighted by Tonnage.

Subregion II North Wheat

Wheat Analysis	Minimum	Maximum	Average	Standard Deviation	Variation Coefficient
Test Weight (kg/hl)	73.00	80.90	77.08	1.96	0.03
Total Damaged Kernels (%)	0.40	4.20	1.17	0.83	0.71
Foreign Material (%)	0.10	1.00	0.24	0.18	0.75
Shrunken and Broken Kernels (%)	0.20	1.30	0.60	0.24	0.41
Yellow Berry Kernels (%)	0.00	0.70	0.05	0.16	3.09
Protein (13,5% Moisture) (%)	11.0	13.7	12.1	0.7	0.06
Weight of 1000 Kernels (gr.)	28.60	34.79	31.72	1.42	0.04
Ash (% dry basis)	1.782	2.114	1.915	0.092	0.05

Total damaged kernels includes 0.77% sprouted kernels, 0.14% calcinated kernels and 0.25% insect chewed kernels.

Grade Distribution



O/G: Out of Grade

Flour Analysis		Minimum	Maximum	Average	Standard Deviation	Variation Coefficient
MILLING	Wet Gluten (%)	23.4	32.3	26.9	2.7	0.10
	Dry Gluten (%)	7.9	10.8	9.1	0.9	0.10
	Falling Number (sec.)	251	473	408	42	0.10
	Flour Yield (%)	65.1	73.3	69.5	2.3	0.03
	Ash (dry basis) (%)	0.529	0.720	0.609	0.044	0.07
FARINOGRAM	Water Absorption (14% H°) (%)	53.6	59.7	56.4	1.6	0.03
	Development Time (min.)	10.0	26.8	17.2	4.0	0.23
	Stability (min.)	14.9	59.3	31.1	9.4	0.30
	Degree of Softening (12 min.)	1	60	21	11	0.54
ALVEOGRAM	P (mm)	67	129	94	16	0.17
	L (mm)	42	109	83	19	0.23
	W Joules x 10-4	216	429	285	53	0.19
	P / L	0.63	2.86	1.13	0.53	0.42

These results were elaborated with 24 composite samples prepared proportionally from 285 primary samples (farmer deliveries)

Subregion Data

In this subregion the wheat production was 738,149 tons., the 10% of the national total. Were sampled 86,000 tons., the 11.7% of the subregion production.

Subregion 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	3000	3	80.20	0.70	0.30	1.30	0.00	12.5	30.21	2.047
102	San Martin	3000	2	80.30	0.50	0.30	0.50	0.30	11.2	32.40	1.913
103	San Jerónimo	3000	2	78.40	0.40	0.10	0.40	0.00	11.5	32.24	1.879
104	San Jerónimo	3000	2	80.90	0.40	0.10	0.60	0.00	11.0	32.30	1.870
105	Caseros	3000	2	78.50	1.40	0.10	0.70	0.50	11.0	33.92	1.901
106	Caseros	3000	3	75.40	1.30	0.10	0.40	0.70	11.3	32.06	1.931
107	Belgrano	4000	O/G	78.60	4.20	0.20	0.40	0.00	12.6	30.95	1.988
108	Iriondo	4000	2	76.10	0.50	0.10	0.40	0.00	11.7	30.28	1.901
109	San Lorenzo	4000	3	74.70	1.20	0.20	0.40	0.00	12.3	30.84	1.887
110	Rosario	4000	2	76.20	1.70	0.10	0.20	0.00	11.4	31.03	1.851
111	Constitución	3000	3	74.10	2.20	1.00	0.90	0.00	13.7	29.88	2.114
112	Constitución	3000	3	73.00	0.40	0.30	0.30	0.00	11.8	32.11	1.927
113	General López	4000	3	74.50	0.50	0.10	0.60	0.00	12.1	34.24	1.881
114	General López	4000	2	78.70	0.50	0.20	0.80	0.00	11.4	31.73	1.882
115	General López	4000	2	78.50	1.90	0.20	0.60	0.00	12.5	33.97	2.039
116	General López	4000	2	77.30	1.00	0.20	0.50	0.00	12.6	30.91	1.782
117	General López	4000	3	74.80	0.80	0.20	0.40	0.00	11.8	32.57	1.810
118	General López	4000	2	77.20	0.80	0.10	0.70	0.00	12.0	32.08	1.798
119	Marcos Juárez	4000	3	75.70	0.90	0.30	0.80	0.00	12.9	28.60	1.981
120	Marcos Juárez	4000	2	76.10	1.00	0.50	0.60	0.00	12.8	29.97	2.042
121	Unión	4000	2	78.00	0.90	0.40	0.70	0.00	13.2	32.13	2.055
122	Unión	4000	2	77.70	1.50	0.30	1.10	0.00	13.2	32.05	1.899
123	Pergamino	4000	2	78.40	1.70	0.30	0.60	0.00	11.6	31.92	1.786
124	Colon	2000	2	78.20	1.00	0.10	0.40	0.00	11.1	34.79	1.787

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 Martín	29.8	10.2	451	67.4	57.4	24.3	51.4	2	100	78	318	1.28	0.558
102	San Martín	23.8	8.3	428	65.5	55.3	24.9	46.0	10	106	67	292	1.58	0.533
103	San Jerónimo	23.9	8.0	471	67.6	55.9	24.6	59.3	1	102	71	288	1.44	0.617
104	San Jerónimo	23.4	7.9	444	67.4	57.8	26.8	47.0	11	120	42	216	2.86	0.668
105	Caseros	24.4	8.3	400	69.4	56.2	20.1	36.4	13	105	73	288	1.44	0.529
106	Caseros	24.5	8.5	409	69.1	57.7	20.2	34.6	15	106	70	281	1.51	0.606
107	Belgrano	28.6	9.5	391	69.3	57.7	18.1	30.7	20	96	101	359	0.95	0.594
108	Iriondo	24.4	8.5	423	68.9	57.6	20.1	33.3	16	111	47	220	2.36	0.588
109	San Lorenzo	28.3	9.6	421	69.0	57.3	13.5	22.7	31	84	105	310	0.80	0.563
110	Rosario	23.9	8.2	473	71.5	53.6	20.0	34.9	15	101	53	225	1.91	0.575
111	Constitución	31.6	10.6	405	65.1	58.7	12.1	19.4	41	96	93	320	1.03	0.651
112	Constitución	27.5	8.9	251	69.5	55.4	10.0	14.9	60	67	107	238	0.63	0.581
113	General López	24.5	8.3	388	73.3	56.1	13.8	26.8	21	94	71	243	1.32	0.612
114	General López	26.3	8.6	398	72.0	53.7	17.2	28.9	28	87	75	237	1.16	0.601
115	General López	27.6	9.4	390	71.2	56.2	16.3	28.2	22	94	83	288	1.13	0.720
116	General López	26.8	8.9	406	71.7	55.4	13.6	24.9	22	79	90	259	0.88	0.589
117	General López	24.7	8.4	381	73.1	55.0	14.8	26.9	26	77	84	233	0.92	0.648
118	General López	25.9	8.6	366	71.3	54.3	14.6	26.2	25	73	103	262	0.71	0.576
119	Marcos Juárez	30.0	10.4	462	67.6	56.4	16.5	33.0	18	84	109	313	0.77	0.632
120	Marcos Juárez	30.6	10.5	404	68.4	57.1	16.5	28.3	24	85	106	327	0.80	0.604
121	Unión	32.3	10.8	429	66.6	59.7	15.0	28.9	16	129	87	429	1.48	0.650
122	Unión	30.0	10.2	424	67.2	59.0	14.9	24.3	27	120	80	362	1.50	0.672
123	Pergamino	26.2	8.9	375	72.4	55.9	15.5	25.3	29	70	104	251	0.67	0.604
124	Colon	25.1	8.4	374	71.5	54.3	15.1	26.8	2	76	90	241	0.84	0.626

Subregion II South
Background for the crop

In Sub region II South, which comprises centre-north of Buenos Aires province, the decrease of planted surface was similar to the one at national level. This loss was in part compensated by the high yields obtained per hectare, with an approximate average of 4000 kg./ ha; with exceptional lots of 7000 – 7500 kg./ha.

Sowings were carried out at the beginning of June favored by a timely rainfall towards the end of May and in those lots with a good stubble cover during July and first half of August with the sowing of short cycle varieties. Rainfalls in July were higher than the historic average. Accumulated humidity enabled the normal germination of short cycle wheat in late sowing and it also enabled that long cycle wheat with early sowing dates, in June, could initiate a good tillering.

August was in general dry but in September it rained around 100 millimeters which favored a good tillering and spiking. Rainfalls were very abundant in October but at an appropriate time for the crop, in this way we arrived at November with abundant and well distributed rainfalls which resulted in a good grain formation and fill.

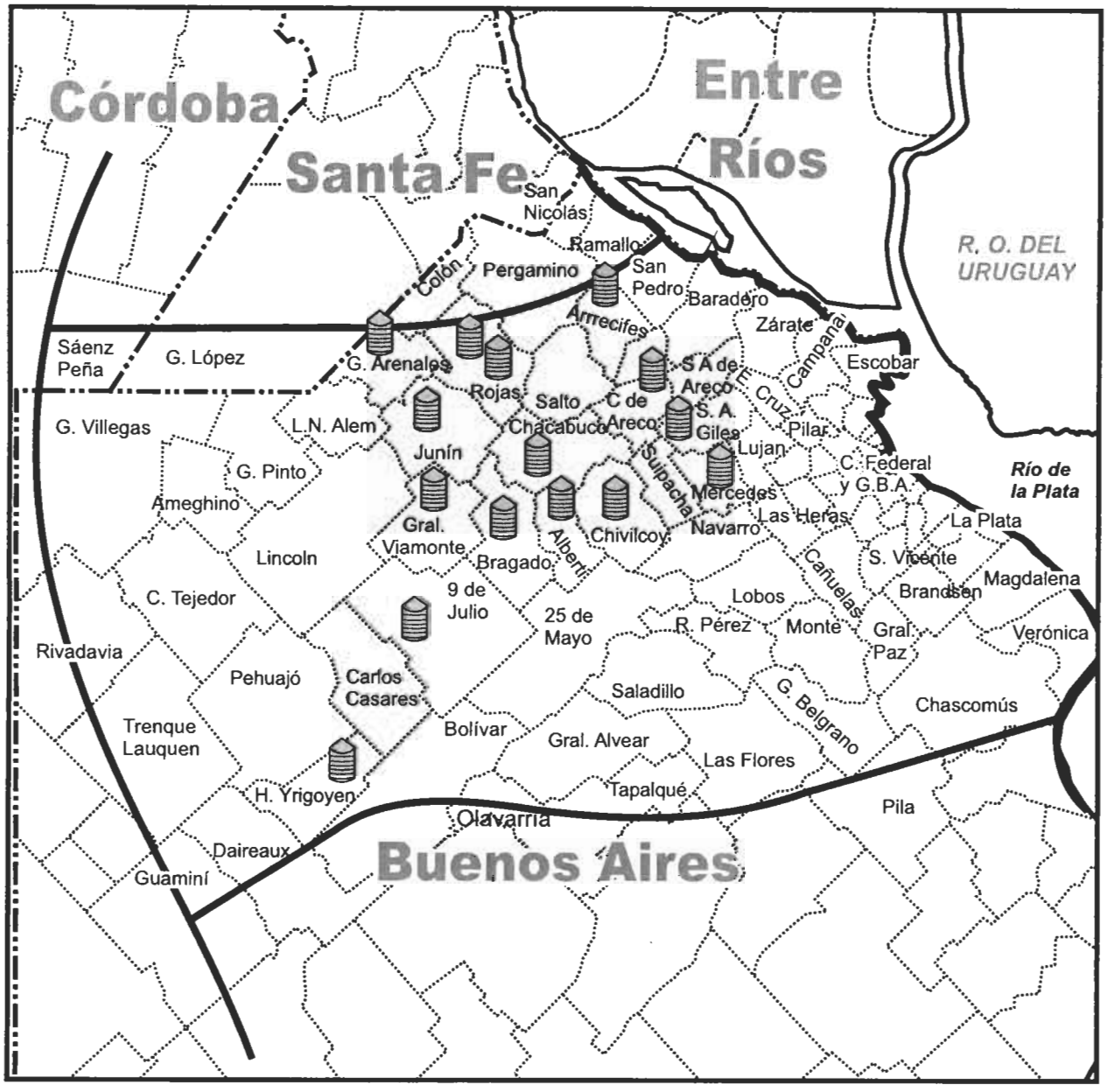
Low temperatures recorded during days 7, 8 and 15 of October and heat stress with temperatures over 30°C in days 25, 26 and 27 of October affected the flower and spike formation and grain fill.

Very low incidence of diseases and insects was observed and towards the end of the crop cycle it the presence of "Fusarium of the ear" could be observed. Chemical treatments were carried out in many lots which were considered unnecessary due to the little seriousness of the diseases.

In December it rained 343 millimeters which caused the lengthening of the reproductive cycle in some lots, delay in harvest date and grain washing.

Harvest was delayed between 8 and 10 days and was carried out with some difficulties due to continuous and intense rainfalls affecting the commercial quality with a decrease of the Electrolytic Weight and the Weight of 1000 grains compared to the previous campaign. It was observed grain washing and sprouting in some lots.

Subregion
II South
Wheat



Each reference represents near 4,000 tns sampled.

Results of the Analyses

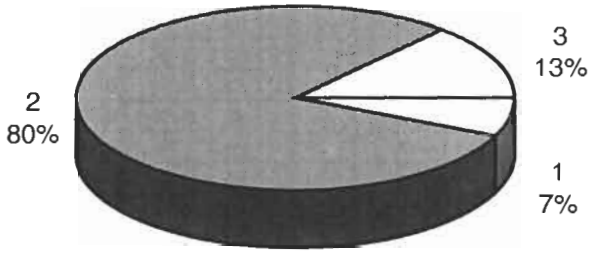
Composite Samples by Locality. Averages were weighted by Tonnage.

Subregion II South Wheat

Wheat Analysis	Minimum	Maximum	Average	Standard Deviation	Variation Coefficient
Test Weight (kg/hl)	73.65	79.45	77.29	1.33	0.02
Total Damaged Kernels (%)	0.28	1.81	0.93	0.45	0.49
Foreign Material (%)	0.12	0.84	0.38	0.22	0.59
Shrunken and Broken Kernels (%)	0.28	0.76	0.49	0.16	0.32
Yellow Berry Kernels (%)	0.00	5.36	2.24	1.78	0.80
Protein (13,5% Moisture) (%)	10.8	13.0	11.7	0.6	0.06
Weight of 1000 Kernels (gr.)	30.43	36.16	32.93	1.60	0.05
Ash (% dry basis)	1.531	2.025	1.745	0.105	0.06

Total damaged kernels includes 0.01% green kernels, 0.01% frosty kernels, 0.30% sprouted kernels, 0.24% calcinated kernels, 0.32% insect chewed kernels and 0.05% germ-chewed kernels.

Grade Distribution



Flour Analysis		Minimum	Maximum	Average	Standard Deviation	Variation Coefficient
MILLING	Wet Gluten (%)	25.4	33.2	28.5	1.9	0.07
	Dry Gluten (%)	9.4	12.3	10.5	0.7	0.07
	Falling Number (sec.)	338	493	400	35	0.09
	Flour Yield (%)	68.9	72.87	71.3	1.2	0.02
	Ash (dry basis) (%)	0.568	0.685	0.627	0.039	0.06
FARINOGRAM	Water Absorption (14% H°) (%)	55.1	62.9	57.9	1.7	0.03
	Development Time (min.)	4.4	20.0	8.6	4.6	0.53
	Stability (min.)	15.0	32.9	20.2	4.0	0.20
	Degree of Softening (12 min.)	16	40	26	7	0.26
ALVEOGRAM	P (mm)	80	115	93	10	0.11
	L (mm)	79	145	106	17	0.16
	W Joules x 10-4	257	400	321	36	0.11
	P / L	0.56	1.38	0.88	0.21	0.24

These results were elaborated with 15 composite samples prepared proportionally from 378 primary samples (farmer deliveries)

Subregion Data

In this subregion the wheat production was 1,661,210 tons., the 22.6% of the national total. Were sampled 60,000 tons., the 3,6% 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) (%)
200	Rojas	4000	2	77.00	1.12	0.16	0.60	4.4	11.3	33.73	1.887
201	Rojas	4000	2	76.35	1.24	0.36	0.64	1.4	12.0	33.10	1.714
202	Chacabuco	4000	2	77.45	0.48	0.20	0.36	1.2	11.6	33.10	1.650
203	Gral. Arenales	4000	2	76.10	1.24	0.76	0.68	3.5	10.8	32.60	1.734
204	Junín	4000	2	77.90	1.81	0.36	0.52	4.1	11.1	31.20	1.720
205	Gral. Viamonte	4000	3	77.45	1.52	0.84	0.76	0.0	12.1	31.20	1.704
206	Arrecifes	4000	2	77.70	0.84	0.32	0.28	3.0	10.9	30.43	1.793
207	Alberti	4000	2	76.80	0.28	0.28	0.32	0.8	12.2	31.48	1.762
208	9 de Julio	4000	2	77.25	1.18	0.16	0.36	1.1	13.0	32.68	1.764
209	Chivilcoy	4000	2	79.45	0.50	0.28	0.74	4.4	11.4	35.32	1.753
210	Bragado	4000	2	78.15	1.40	0.12	0.40	5.4	11.5	34.20	1.752
211	San Andrés de Giles	4000	2	77.25	0.84	0.60	0.32	0.0	11.0	36.16	1.699
212	Carmen de Areco	4000	3	73.65	0.44	0.64	0.52	0.0	12.3	32.98	2.025
213	Mercedes / Suipacha	4000	1	79.45	0.52	0.16	0.48	3.4	11.8	31.20	1.693
214	Hipólito Yrigoyen	4000	2	77.45	0.48	0.44	0.36	1.0	12.7	34.56	1.531

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	Rojas	26.4	9.8	371	70.9	56.4	15.1	23.6	29	109	79	319	1.38	0.587
201	Rojas	28.4	10.5	374	70.5	57.9	13.6	20.9	35	95	108	350	0.88	0.646
202	Chacabuco	28.4	10.5	425	72.0	57.4	5.0	19.5	16	88	111	308	0.79	0.599
203	Gral. Arenales	26.6	9.9	356	72.3	62.9	5.0	15.0	31	94	95	299	0.99	0.652
204	Junín	26.9	10.0	493	72.3	56.4	4.4	16.8	24	81	107	284	0.76	0.568
205	Gral. Viamonte	29.8	11.0	338	72.1	56.9	4.7	21.2	16	80	131	331	0.61	0.663
206	Arrecifes	25.4	9.4	426	72.0	55.1	20.0	32.9	22	92	86	296	1.07	0.583
207	Alberti	28.8	10.7	389	69.3	58.4	11.3	20.4	32	98	108	344	0.91	0.681
208	9 de Julio	33.2	12.3	392	71.8	58.3	8.0	21.2	23	81	145	359	0.56	0.685
209	Chivilcoy	29.1	10.8	423	72.7	58.0	8.4	18.3	30	89	94	270	0.95	0.664
210	Bragado	27.4	10.1	390	71.7	57.7	5.3	20.1	20	115	92	351	1.25	0.652
211	San Andrés de Giles	27.5	10.2	401	72.9	57.3	5.0	16.5	24	90	86	257	1.05	0.635
212	Carmen de Areco	29.7	11.0	401	70.9	58.2	5.2	17.6	26	91	105	313	0.87	0.633
213	Mercedes / Suipacha	28.8	10.7	400	69.4	57.5	11.3	19.0	40	84	121	333	0.69	0.579
214	Hipólito Yrigoyen	30.5	11.3	416	68.9	59.4	6.3	19.6	18	103	117	400	0.88	0.576

Subregion III
Background for the crop

Climatic conditions in 2009 were favorable regarding rainfalls as well as radiation and temperature.

With reference to rainfalls, although they were not abundant they occurred with a good frequency and at adequate moments for the crop cycle. Average temperatures in critical period, where the number of grains and yield are defined, were lower than the historic mean especially in the last ten days of September. Radiation, during the above mentioned period, was in general above average. Photo thermal ratio, which is directly proportional to radiation and inversely proportional to temperature and an indicator of potential yield of the crop, showed excellent values in the critical period, mainly in the last ten days of September where they were above the corresponding historic average.

Cool temperature conditions in spring with moderate humidity levels avoided the development of important diseases, therefore, only specific cases of low intensity were recorded for the common diseases of the area such as rust and yellow spot.

The level of fertilization used was low compared to previous years, most between 30 and 70 kg/ha of diamonic phosphate and 100-110 kg/ha of nitrogen fertilizers in vegetative state according to the data from Entre Rios Grain Exchange. However, drought conditions in the previous campaign enabled the companies to use fertilizers incorporated in the previous campaign.

The surface used by cultivars according to their cycle was 27% for long cycles, 18% for intermediate and 55% for short cycles (Entre Rios Grain Exchange).

Average yields of the region were excellent with an average of 3.643 kg/ha for the Subregion III of 3.643 kg/ha, level which has never been reached before.

Abundant rainfall conditions during harvest together with the high yields reached resulted in protein and gluten fall, therefore the industrial quality was lower than expected.

Each reference represents near 4,000 tns sampled.

Subregion III Wheat

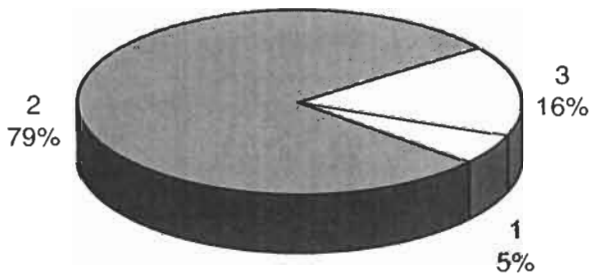
Results of the Analyses

Composite Samples by Locality. Averages were weighted by Tonnage.

Análisis de Grano	Mínimo	Máximo	Promedio	Desvío Estándar	Coeficiente Variación
Test Weight (kg/hl)	76.60	80.90	78.77	1.16	0.01
Total Damaged Kernels (%)	0.04	2.90	0.92	0.77	0.83
Foreign Material (%)	0.04	0.48	0.24	0.14	0.58
Shrunken and Broken Kernels (%)	0.11	1.24	0.39	0.20	0.51
Yellow Berry Kernels (%)	5.37	22.80	16.88	5.17	0.31
Protein (13,5% Moisture) (%)	10.0	11.8	10.7	0.4	0.04
Weight of 1000 Kernels (gr.)	34.80	39.00	36.84	1.21	0.03
Ash (% dry basis)	1.290	1.580	1.427	0.065	0.05

Total damaged kernels includes 0.01% green kernels, 0.68% sprouted kernels, 0.15% insect chewed kernels, 0.05% germ-chewed kernels and 0.03% calcinated kernels.

Grade Distribution



Flour Analysis		Minimum	Maximum	Average	Standard Deviation	Variation Coefficient
MILLING	Wet Gluten (%)	20.3	27.6	23.7	2.2	0.09
	Dry Gluten (%)	7.0	10.5	8.5	1.1	0.12
	Falling Number (sec.)	228	443	380	59	0.16
	Flour Yield (%)	67.0	71.6	70.7	1.0	0.01
	Ash (dry basis) (%)	0.486	0.735	0.584	0.054	0.09
FARINOGRAM	Water Absorption (14% H°) (%)	56.1	59.8	57.9	1.1	0.02
	Development Time (min.)	9.6	35.0	15.7	7.4	0.47
	Stability (min.)	12.1	30.2	19.2	4.3	0.22
	Degree of Softening (12 min.)	19	61	40	11	0.27
ALVEOGRAM	P (mm)	106	129	116	7	0.06
	L (mm)	42	73	60	7	0.12
	W Joules x 10-4	239	319	275	19	0.07
	P / L	1.45	3.00	1.93	0.36	0.18

These results were elaborated with 19 composite samples prepared proportionally from 398 primary samples (farmer deliveries)

Subregion Data

In this subregion the wheat production was 1,234,006 tons., the 16.8% of the national total. Were sampled 69,008 tons., the 5.6% 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) (%)
300	Paraná	3980	2	80.20	0.68	0.28	0.16	14.40	10.7	38.00	1.380
301	Paraná	4010	2	80.90	0.37	0.29	0.35	14.50	10.3	38.00	1.290
302	Paraná	2110	1	79.60	0.48	0.07	0.45	9.69	11.0	37.50	1.340
303	Diamante	4020	2	78.50	0.67	0.04	0.30	16.07	10.6	36.40	1.480
304	Diamante	4180	2	79.90	1.00	0.36	0.61	22.80	10.7	35.20	1.470
305	Diamante	2175	3	78.80	0.28	0.24	1.24	10.00	11.3	34.80	1.380
306	La Paz	3970	2	77.70	0.81	0.26	0.26	5.37	11.1	39.00	1.480
307	La Paz	4005	3	76.60	2.90	0.07	0.30	12.30	11.8	36.20	1.500
308	Gualeguay	4000	2	78.30	0.83	0.45	0.23	22.50	10.0	37.00	1.490
309	Gualeguay	4145	2	79.20	0.60	0.48	0.56	21.50	10.7	37.20	1.410
310	Nogoyá	4000	2	78.20	0.04	0.13	0.52	18.50	10.7	37.40	1.370
311	Nogoyá	3960	2	80.30	1.70	0.10	0.40	20.10	11.0	37.40	1.390
312	Gualeguaychú	3910	2	77.80	0.23	0.16	0.53	21.00	11.0	35.20	1.400
313	Gualeguaychú	3995	3	77.80	2.52	0.40	0.32	19.30	10.3	35.40	1.400
314	C. del Uruguay	4120	2	77.10	0.92	0.04	0.32	21.50	10.6	35.00	1.400
315	R. del Tala	4030	2	78.50	0.17	0.34	0.38	8.24	11.0	38.20	1.480
316	San Salvador	2198	2	79.10	0.82	0.36	0.11	20.30	10.1	38.20	1.350
317	Victoria	4200	2	79.50	1.29	0.21	0.36	20.40	10.2	37.00	1.490
318	Victoria	2000	2	79.60	0.32	0.18	0.27	16.40	10.5	37.00	1.580

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	27.6	10.5	353	67.0	56.9	10.5	14.9	48	117	59	265	1.98	0.585
301	Paraná	26.4	10.1	420	71.1	58.0	14.6	21.0	42	123	57	287	2.16	0.558
302	Paraná	25.6	8.8	428	71.6	58.5	11.7	16.4	47	115	65	296	1.77	0.735
303	Diamante	24.7	9.3	441	71.5	58.9	14.0	18.8	47	129	51	272	2.53	0.626
304	Diamante	22.5	7.4	443	70.9	56.1	20.2	30.2	22	107	52	239	2.06	0.716
305	Diamante	24.4	9.2	428	70.4	57.7	20.6	28.5	29	126	42	239	3.00	0.631
306	La Paz	25.8	9.6	287	71.0	58.7	10.0	15.1	61	106	73	293	1.45	0.576
307	La Paz	26.9	9.5	228	70.0	57.5	9.6	16.9	49	108	66	290	1.64	0.573
308	Gualeguay	23.7	8.6	288	71.6	56.8	35.0	22.4	30	128	48	267	2.67	0.551
309	Gualeguay	25.6	9.5	342	71.5	59.6	34.0	12.1	19	119	56	264	2.13	0.583
310	Nogoyá	21.0	7.4	418	70.6	56.8	14.1	19.2	51	110	62	277	1.77	0.486
311	Nogoyá	22.4	7.8	414	70.9	58.2	13.3	18.9	46	122	66	319	1.85	0.580
312	Gualeuaychú	23.6	8.2	392	70.8	58.1	12.2	20.1	32	107	72	284	1.49	0.576
313	Gualeguaychú	21.1	7.5	383	70.0	58.1	13.6	19.9	36	119	62	282	1.92	0.582
314	C. del Uruguay	20.3	7.0	415	70.8	56.2	15.3	22.9	32	111	57	255	1.95	0.575
315	R. del Tala	23.5	8.1	399	71.3	59.8	10.5	16.0	45	116	65	289	1.78	0.560
316	San Salvador	22.3	7.6	382	70.5	57.2	13.9	19.0	43	115	57	269	2.02	0.494
317	Victoria	21.1	7.4	398	71.0	58.9	10.4	16.6	38	110	63	264	1.75	0.590
318	Victoria	22.7	7.8	434	70.6	57.7	12.2	18.0	38	110	62	265	1.77	0.558

Subregion IV
Background for the crop

As it happened in previous years, the environmental conditions were again a variable among areas inside this sub region, giving place to different yield values which can be considered from acceptable to very good, mainly determined by quantity and distribution of rainfalls received by crops.

In the south of the subregion, composed by the districts of Tres Arroyos, Gonzales Chaves, San Cayetano and Necochea, there was in general lack of humidity during the whole cycle, since the monthly rainfalls recorded were lower than their respective historic averages, except in November which were near to the average.

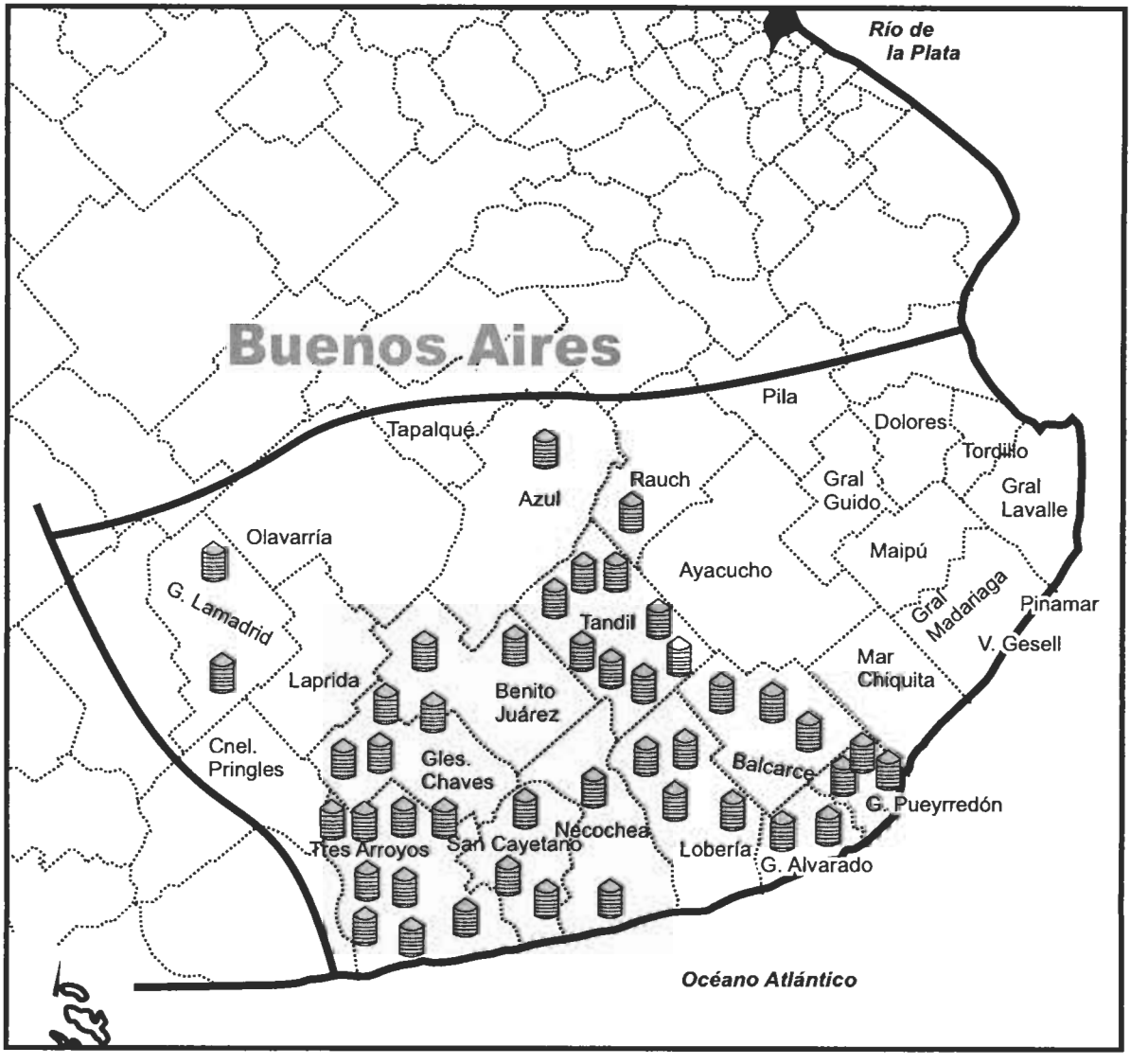
Temperatures from June to October were lower than the average, except in August where days with higher temperatures than expected were present, reaching 2,4° C above the historic average. However, the predictable effect of bringing forward the vegetative cycle was counteracted by cool temperatures in September and October which delayed the earing to its most adequate period, counteracting also, the tendency to shorten the cycle produced by scarce rainfalls. Lots sown in appropriate period for each cycle reached a full earing towards the end of October and beginning of November.

The mean temperature was adequate in November, with few windy days, so that little humidity available was well used and yields suffered less than in previous cycles. Yields were from normal to good in this part of the subregion, with adequate electrolytic weight values.

In the rest of the subregion crops developed better throughout their cycle due to better humidity levels because of more abundant and frequent rains.

Within this context, an intermediate situation with good to very good yields took place in the area of Balcarce and Lobería, while in the rest of the subregion, in the districts of Tandil, Azul, Olavarría and the ones towards the north, yields were in general from very good to excellent.

Subregion IV Wheat



Each reference represents near 4,000 tns sampled.

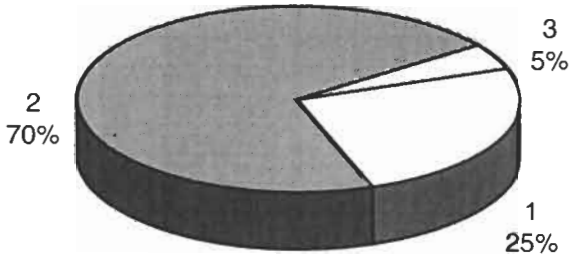
Results of the Analyses

Composite Samples by Locality. Averages were weighted by Tonnage.

Wheat Analysis	Minimum	Maximum	Average	Standard Deviation	Variation Coefficient
Test Weight (kg/hl)	74.55	85.05	80.51	1.57	0.02
Total Damaged Kernels (%)	0.10	1.42	0.36	0.25	0.71
Foreign Material (%)	0.06	0.70	0.28	0.18	0.64
Shrunken and Broken Kernels (%)	0.16	1.22	0.50	0.22	0.44
Yellow Berry Kernels (%)	0.00	7.60	1.11	1.35	1.22
Protein (13,5% Moisture) (%)	10.9	13.6	12.3	0.7	0.05
Weight of 1000 Kernels (gr.)	30.90	37.61	34.35	1.68	0.05
Ash (% dry basis)	1.433	1.829	1.616	0.100	0.06

Total damaged kernels includes 0.12% sprouted kernels and 0.24% insect chewed kernels.

Grade Distribution



Flour Analysis		Minimum	Maximum	Average	Standard Deviation	Variation Coefficient
MILLING	Wet Gluten (%)	25.6	34.6	29.9	2.3	0.08
	Dry Gluten (%)	8.9	11.7	10.6	0.6	0.06
	Falling Number (sec.)	287	491	419	33	0.08
	Flour Yield (%)	58.6	73.1	68.3	3.7	0.05
	Ash (dry basis) (%)	0.468	1.606	0.661	0.182	
FARINOGRAM	Water Absorption (14% H°) (%)	54.6	61.1	58.9	1.3	0.02
	Development Time (min.)	5.2	21.7	10.6	4.2	0.40
	Stability (min.)	7.7	41.5	19.1	6.8	0.36
	Degree of Softening (12 min.)	9	67	32	13	0.41
ALVEOGRAM	P (mm)	72	135	97	15	0.15
	L (mm)	66	129	109	13	0.12
	W Joules x 10-4	244	459	355	45	0.13
	P / L	0.59	1.61	0.89	0.24	0.26

These results were elaborated with 44 composite samples prepared proportionally from 819 primary samples (farmer deliveries)

Subregion Data

In this subregion the wheat production was 2,404,482 tons., the 32.6% of the national total. Were sampled 166.035 tons., the 6.9% 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) (%)
400	Balcarce	4000	2	81.70	0.46	0.34	0.30	3.30	12.2	36.36	1.569
401	Lobería	4000	2	80.80	0.29	0.12	0.64	0.00	12.5	33.91	1.518
402	Gral. Alvarado	4000	1	81.25	0.40	0.10	0.18	1.60	11.1	35.64	1.433
403	Balcarce	4000	2	81.05	0.40	0.14	0.54	0.00	12.4	33.57	1.606
404	Tandil	4000	2	80.60	0.48	0.38	0.64	1.36	11.4	35.24	1.573
405	Tandil	4000	1	80.60	0.46	0.08	0.26	3.72	11.5	35.93	1.608
406	Tandil	4000	2	79.45	0.78	0.26	0.60	0.00	12.4	33.88	1.644
407	Gral. Pueyrredón	4000	2	79.90	0.58	0.46	0.30	0.84	11.8	34.93	1.480
408	Gral. Alvarado	4000	1	81.25	0.18	0.10	0.34	0.88	12.0	33.73	1.571
409	Tandil	4000	2	82.40	0.48	0.66	0.32	3.00	11.3	35.83	1.572
410	Lobería	4000	1	79.90	0.18	0.06	0.44	0.72	11.7	36.23	1.529
411	Balcarce	4000	1	79.90	0.36	0.06	0.26	2.90	11.9	34.82	1.550
412	Lobería	4000	2	79.25	0.32	0.38	0.42	0.00	12.9	33.27	1.607
413	Azul	4000	1	80.15	0.42	0.08	0.26	1.68	11.3	37.05	1.543
414	Gral. Pueyrredón	4000	1	81.70	0.10	0.06	0.16	3.78	10.9	36.41	1.482
415	Necochea	4000	1	81.05	0.12	0.18	0.24	3.28	12.3	36.06	1.446
416	Tandil	4000	2	85.05	0.26	0.26	0.34	2.64	11.9	35.30	1.588
417	Rauch	4000	2	83.95	0.34	0.26	0.20	0.00	12.1	37.61	1.574
421	Gral. Pueyrredón	4000	1	81.95	0.30	0.18	0.46	0.00	12.3	35.09	1.505
422	Lobería	4000	2	81.05	0.18	0.24	0.45	2.18	11.5	34.40	1.509
500	Benito Juarez	4000	2	79.00	0.24	0.30	0.40	0.60	12.9	36.20	1.537
501	Benito Juarez	3996	2	78.15	0.88	0.58	0.72	0.40	13.2	34.40	1.595
502	General Lamadrid	4000	2	79.00	1.42	0.46	0.92	0.40	13.4	31.00	1.629
503	General Lamadrid	3425	3	74.55	0.90	0.22	0.88	1.80	12.6	31.60	1.687
504	Gonzales Chaves	4000	2	80.35	0.52	0.38	0.68	0.80	12.9	31.00	1.756
505	Gonzales Chaves	3500	2	81.25	0.18	0.28	0.54	0.30	13.2	30.90	1.804
506	Gonzales Chaves	5100	2	79.90	0.36	0.12	0.76	0.20	13.1	31.00	1.757
507	Gonzales Chaves	1631	3	80.15	0.20	0.32	1.22	1.40	13.5	30.90	1.789
509	Necochea	4500	2	81.50	0.22	0.26	0.40	0.40	12.5	35.30	1.582
510	San Cayetano	4373	2	81.25	0.52	0.08	0.62	0.60	12.5	34.30	1.656
511	San Cayetano	4000	2	81.05	0.14	0.70	0.32	0.20	12.6	35.30	1.685
512	San Cayetano	750	2	80.15	0.24	0.26	0.54	1.20	12.5	35.00	1.607
515	Tandil	4005	2	81.05	0.20	0.70	0.62	0.30	12.1	33.70	1.487
516	Tandil	2107	2	79.45	0.30	0.42	0.38	7.60	11.3	34.50	1.651
517	Tandil	4000	2	81.25	0.22	0.46	0.66	0.20	11.8	33.00	1.708
518	Tres Arroyos	3929	2	80.80	0.12	0.36	0.38	0.30	12.5	32.90	1.795
519	Tres Arroyos	3510	2	79.90	0.24	0.40	0.74	0.30	12.9	34.50	1.706
520	Tres Arroyos	4000	1	81.25	0.20	0.14	0.48	0.00	13.6	34.30	1.829
521	Tres Arroyos	3800	2	79.25	0.12	0.28	0.30	0.70	12.6	34.00	1.594
522	Tres Arroyos	4007	2	78.15	0.24	0.18	0.76	0.80	12.2	35.10	1.642
523	Tres Arroyos	2152	2	79.00	0.24	0.38	0.98	0.60	13.2	31.90	1.736
524	Tres Arroyos	4000	2	79.45	0.20	0.20	0.76	0.00	12.6	33.60	1.729
525	Tres Arroyos	4000	2	81.05	0.22	0.64	0.62	0.60	12.9	34.40	1.730
526	Tres Arroyos	3250	1	79.90	0.20	0.12	0.48	0.30	12.6	34.90	1.700

Climatology 2009/2010

Climate and Wheat crop 2009 - 2010 in Argentina

Juan A. Forte Lay – José L. Aiello.

The climatic behavior during the 2009-2010 wheat campaign is described once again resorting to the use of a method to calculate the water reserves in the soil and its anomalies. These, which we call "Soil Moisture Classification", were calculated as a monthly average during the whole wheat cycle, although they come from a daily analysis and express the degree of separation from the habitual conditions for each region and period of the year. Moisture classification is an adequate climatic indicator because it summarizes the behavior of the most relevant climatic variables, such as spatial and temporal distribution of rainfalls and its interaction with the evapotranspiration which in turn depends on the environmental temperature, solar radiation, wind and atmospheric humidity.

Maps, which are used in an operational way and for any period of time, in this case are monthly and con-tain the political subdivision by districts, which can be associated to the known wheat regions of the country showing here only the pampeana provinces. The sequence of maps of soil moisture classifica-tion and a description of its behavior give the reader the possibility to have a clear idea of the climatic evolution of the wheat campaign, since the agronomic considerations are described in another section of this document. It is important to clarify that not always habitual or normal conditions are the most adequate for the crop in all the regions and periods of the year; so that in winter and beginning of spring, normal conditions could result in hydric deficit in regions located towards the west and northwest of the area such as North V wheat area, while these same conditions could result in situations of soil water excess in the central east and southeast of the wheat region.

MAY 2009

At the beginning of the wheat campaign, it can be observed, as in the previous year, a highly deficient panorama regarding edaphic humidity availability. The northeast and central southeast of the wheat re-gion were the most affected and detrimental to early first sowings which in general are not carried out. It has rained more in Entre Rios and central-southeast of Buenos Aires, without normalizing the soil situa-tion, in the rest of the wheat region; rainfalls have been poor and insufficient

JUNE 2009

Conditions improved in Entre Rios and especially on the northeast and central-southeast of Buenos Aires province where water reserves in soil were increased, although they did not reach normality it was enough to face up to the next sowings with success. The situation got worse towards the west, especially in Cordoba, La Pampa and west of Buenos Aires where rainfalls have been practically none. Wheat sowings have been carried out leaving the northeast of the wheat region aside due to the advanced season, resulting in one of the poorest wheat campaigns in the last decades.

JULY 2009

Rainfalls were abundant in the east of pampeana region and practically null in the west extreme, edaphic humidity continued to be in bad conditions in the central-west of Cordoba, in La Pampa and west of Buenos Aires provinces. In the east strip, where there was more cultivation, the last rainfalls benefited the crops, but in Cordoba deficit conditions prevailed specially towards the southeast and some damages were recorded due to frost on leaves. The situation continued to be highly deficient in La Pampa as well as in the west of Buenos Aires, there was improvement towards the southern extremes of both prov-inces thanks to snowfall which allowed some sowings.

AUGUST 2009

The situation remained similar to previous years though some moderate rainfall recorded from the last day of the month, which reached regions on the west, improved superficial moisture so necessary for the affected wheat of those areas that was starting to shoot with few tillers and scarce development. However little wheat was sown in the west half of the region and it is probable that many crops have suffered irreparable loss. The situation in the east wheat region continues to be reasonable.