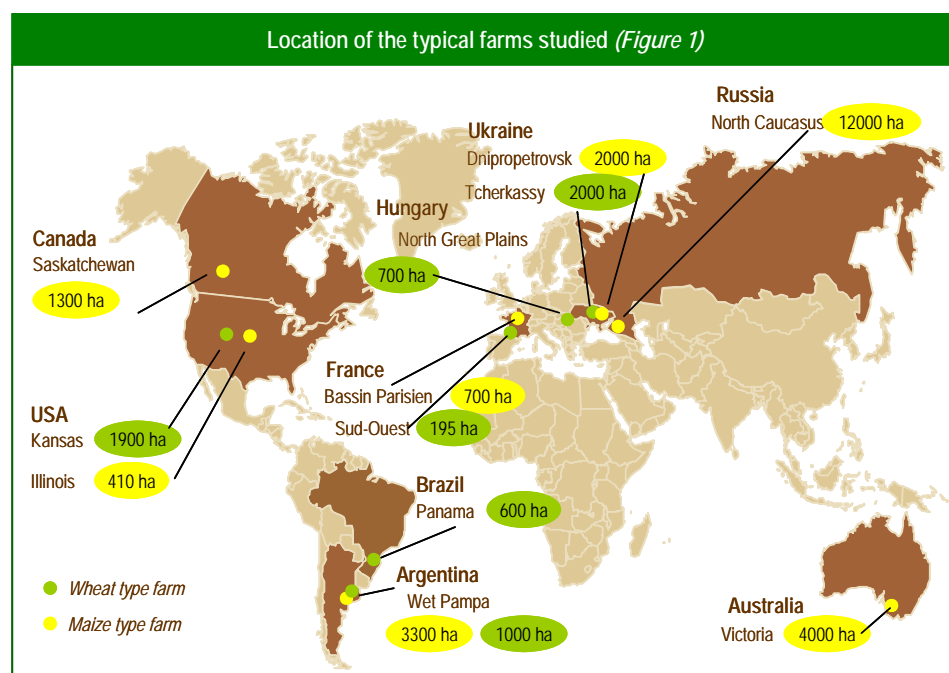


On the farm scale

A call to arms on the international markets

Faced with « low cost » countries like Russia, the Ukraine or Argentina for wheat, or Hungary and Brazil for maize, France must exploit its advantages such as the reliability and quality of its crops, the efficiency of its logistics, and its capacity for innovation to strengthen its exporting position.



The latest survey of ARVALIS' economic studies department allowed us to update the economic production costs for wheat and maize in the main production zones of countries competing with France (figure 1 and box 1).

The typical farms of our competitors on the wheat market (table 1) differ greatly according to the country, notably by the presence of livestock in Argentina (cattle) and in Australia (sheep).

Farm sizes are 3-28 x larger than in France and there is double cropping in Argentina (two crops per year) on 1/3 of the area. The yields allow three groups to be distinguished:

- Australia, Canada and the USA, with yields of 2-3 t/ha,
- Argentina, Russia and the Ukraine, with yields of 4- 5.5 t/ha
- France, with more than 8 t/ha.

Contrary to what one might expect, the systems with less than 3 t/ha are not « extensive ». They reflect the potential of the soil and climate.

Higher wheat production costs in France, but better stability of production.

This map shows the main areas producing wheat and maize for export

A little about the method



Selection of farm types

The results presented come from surveys carried out on farms considered to be successful. The surveys were designed by experts from each country in response to the following question « Give us the name of a farmer you consider to be successful today and who, in your opinion, will still be here in the 5-10 years to come ». This means that the question of representativeness of the country or region of production does not arise. For example the yields are higher than the average for the survey zone.

Definition of the total production cost

The economic production cost pays for all the production factors used during growth, including those not yet paid for. It includes all the costs observed, such as inputs, paid labour, insurance etc., and calculated costs including payment for the land, family labour and the farmer's own capital.

The economic cost of production should be distinguished from the net cost, which is the sum of all expenditure. The latter does not allow one to estimate the sustainability of production, as only a fraction of the structural costs is taken into account.

Table 1 : Typology of successful farms in the main wheat growing regions

	France	Argentina	Australia	Canada	USA	Russia	Ukraine
farm type	Arable crops	Mixed	Mixed	Arable crops	Arable crops	Arable crops	Arable crops
Area of arable crops (ha)	420	3300**	4000	1300	1900	12000	2000
Average yield for the last 5 years (t/ha)	8.4	4.8	2.0	2.7	2.7	5.5	4.0
Yield variability	(7.5 – 9.5)	(3.2 – 5.4)	(0.7 – 2.5)	(2.0 – 3.0)	(2.5 – 3.7)	(4.5 – 7.0)	(2.0 – 6.0)

A 3 300 ha farm with double cropping (e.g. wheat+soya) : area farmed : 4 400 ha

The mean yields observed for our competitors show that the French cereal systems are the most productive and the most stable.



For several years the Argentines have developed their storage capacity, thanks to inflatable silos called « silos bolsas ».

2008: drought has affected production costs of Argentine and Australian wheat

In 2008, costs varied from 180 €/ha in Australia to 1 150 €/ha in France. Depending on the zone, the increase in fertilizer prices made itself felt in 2008 (e.g. in Argentina) or in 2009 (e.g. France and Russia).

The breakdown of these costs is very different from one country to another: inputs represent about 40% of the costs in Argentina and the Ukraine, compared with about 25% in Australia. In countries like Argentina and the USA, because of the short-term land leasing contracts (1-3 years), the ratio of crop sale prices to land rent is much higher than in others. Land rent in 2008, which was related to the crop selling prices of 2007, was higher than usual. The drought which plagued Argentina and our study zone in Australia greatly affected yields. In spite of low costs per hectare, Australia has the highest production cost (235 €/t). Conversely, above-average yields in Russia and the Ukraine have allowed them to reduce their production cost even more (68 €/t).

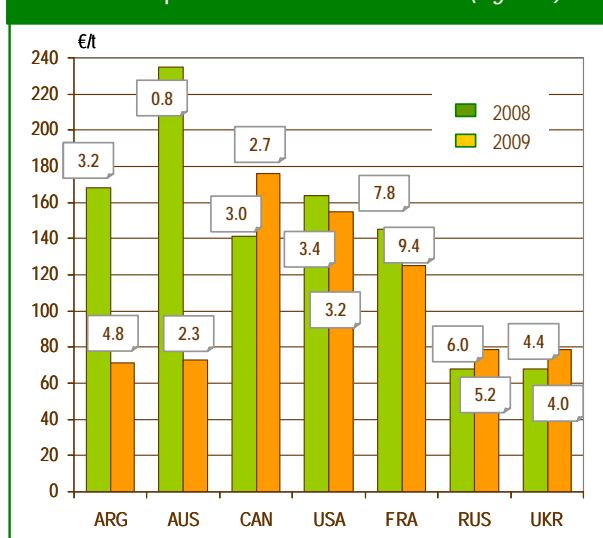
2009: return to more « normal » wheat production costs

The 2009 yields in Argentina and Australia take us back to a more normal production cost (70-75 €/t). Conversely, the lower yields in Russia and the Ukraine increase the production costs.

However they are still very low (80 €/t). More generally, one can classify the different countries into two groups: Argentina (apart from the exceptional case of 2008), Russia and the Ukraine, with production costs below 80 €/t, and Canada, USA and France with production costs above 140 €/t (figure 2). As for Australia, it falls into one or the other group according to the season's weather. The causes of the differences in competitiveness, already identified in earlier studies, are found in:

- The cost of inputs, machinery and labour. For example, in autumn 2009, 100 units of nitrogen cost the same as 700 kg of wheat in France as against 400 kg in Russia. The price of a Russian tractor is half that of a European or American one and the annual labour cost is equivalent to 40 tonnes of wheat in the Ukraine compared with 235 tonnes in France.
- The weakness of the dollar against the euro and the devaluation of the Russian rouble and the Ukrainian grivna following the economic crisis, which accentuates the differences and penalises France.
- But the two most significant factors remain, as in the past: - the size of the production units and the investment in machinery per hectare, which penalise the French farms. In fact the smaller size of the farms makes it impossible to dilute the costs as much as for all our competitors
 - the labour productivity, in tonnes of wheat produced per full-time employee, which is highest in Argentina, Australia and Canada.

Total wheat production cost in 2008 and 2009 (Figure 2)



Climatic uncertainty contributes heavily to Australian production costs



To evaluate the competition, ARVALIS – Institut du végétal has created an international economic research unit. Agronomy and production techniques are the door-keys for measuring competitiveness, more so than the accounting data. Here, a meeting with a Canadian farmer.



Russian machinery costs half as much as imported machinery and attracts subsidised loans.



The practice of double cropping in Brazil increases the maize surplus available for export.

The race to cut production costs

Since the beginning of the 2000s, to maintain their competitiveness, our competitors have continued to increase the size of their production units, have invested in machinery and improved their work productivity. Australian, Canadian and Argentine farmers, like those of Kansas, have invested in no till machinery and are increasingly adopting precision agriculture. The Australians have reduced their manpower to the minimum while the Argentines have developed custom farming. In this country, new structures (siembra pools) have developed. These are farms financed by investment funds. The objective is « to produce at minimal cost to maximise profit by taking advantage of economies of scale ». The size of the siembra pools can exceed 100 000 ha, spread over several provinces or even countries. In Russia and the Ukraine, the facts are less easy to establish, as the adaptations are linked to the financial health of the farm.

From an agronomic point of view one sees everywhere a tendency to simplify soil tillage. This means direct sowing in Argentina, Australia, Canada and the USA, and abandoning ploughing where possible in the Black Sea countries.

The Argentines have developed double cropping, i.e. two crops per year. Russia and the Ukraine have diversified their crop rotations (increasing the oilseed rape area in the Ukraine, for example). On the other hand, we see the opposite phenomenon in Australia: the recent drought years have led to a significant fall in oil and protein crop areas, causing technical and economic problems.

For the years to come the main source of concern in Argentina and the United States is the evolution and volatility of the cost of land leasing, while the Canadians are especially worried about the availability of seasonal labour. As for Australia, the room for manoeuvre in the short term is nothing compared with the farmers' worries about drought and climate change. Conversely, in Russia and the Ukraine, there seems to be plenty of scope for manoeuvre, but this will depend on the cash available to farms and land management.

Maize: similar yields among our competitors

The same type of study was made in the principal maize-producing regions of the world. The area of typical maize farms varies from 200 ha in France to 1 800 ha in Ukraine (table 2). In Brazil, the 600 ha are being double-cropped, so the area developed is 1 200 ha. Thus there is the « safra » maize (the main crop from September to March) and the « safrinha » maize (during winter after a soya crop, for example).

It is the results for « safra » maize which are presented below. In Argentina, 250 ha of the 1 000 are being double-cropped. For the typical French farm, the maize is irrigated (like 45 % of the French maize area), unlike other countries where it is rainfed.

The total costs per hectare vary up to threefold between competitors. France has the highest (1 900 €/ha) and the lowest are found in Ukraine, Argentina and Brazil (600-800 €/ha). The South American countries have low machinery and labour costs associated with optimised no till systems. As for wheat, the French farm has, on the contrary, the highest machinery and labour costs. The use of irrigation amplifies this difference.

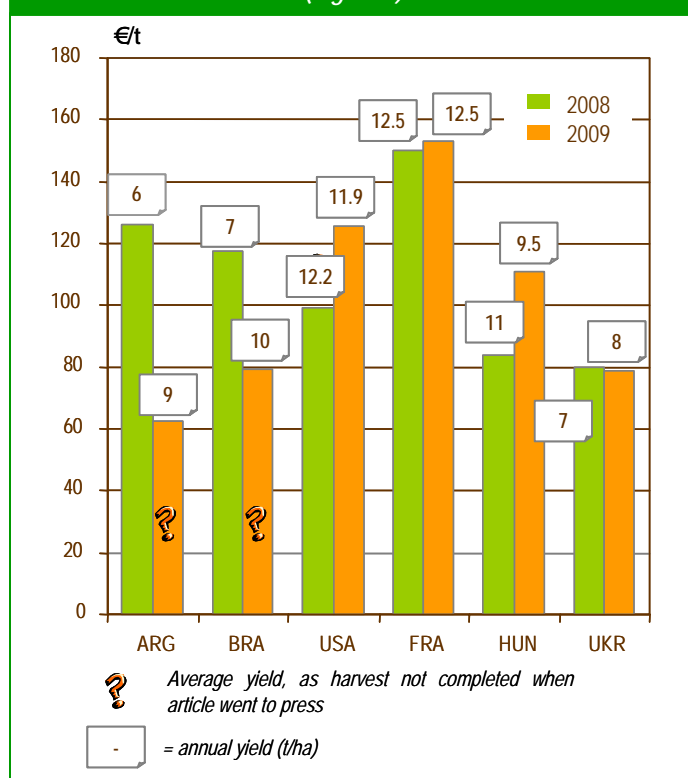
Table 2 : Typology of successful farms in the main maize-growing regions

	France	Argentina	Brazil	USA	Hungary	Ukraine
farm type	Arable crops	Arable crops	Mixed	Arable crops	Arable crops	Arable crops
Farm area (ha)	195	1000**	600**	820	700	1800
Irrigation	Yes	No	No	No	No	No
Average yield for the last 5 years (t/ha)	12.5	9	10	11.9	9.3	7
Yield variability	(12 – 13)	(6 – 10.5)	(7 – 11.5)	(9.5 – 15.3)	(7 – 11)	(6 – 8.5)
Moisture content at harvest time (%)	23 - 28	15 – 18	20 – 25	20 – 25	18 20	22 - 25

Presence of double cropping on the whole of the Brazilian farm (farmed area : 1 200 ha) and on 250 ha in Argentina (farmed area : 1 250 ha)

Yield differences are less marked between countries than for wheat.

Total production cost of maize in 2008 and 2009
(Figure 3)



Drought, cost of inputs and rent explain most of the year to year variation in production costs

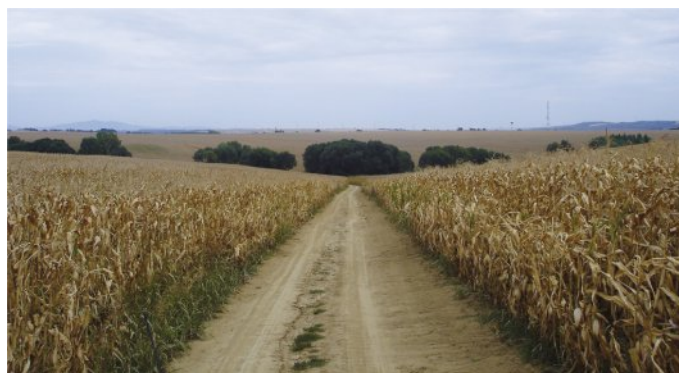
...but the production costs vary by up to twofold

Despite similar yields, the differences in machinery and labour costs, greater in the case of double cropping, result in production costs which differ by anything up to twofold between countries (from below 80 €/t up to 150 €/t for 2009). Drying costs also influence the differences in production costs: they are about 5 €/t in Argentina, Brazil and the USA and up to 20 €/t in France. They are linked to the price of energy, but also to the moisture content at harvest (15-18 % for the typical Argentine farm, 23-28 % for the typical French farm).

The variability in total production costs between 2008 and 2009 was wide in certain countries (*figure 3*). It is of course explained by changes in input costs (especially fertiliser) and of land rent (Argentina). However it is mainly the variation in yields which most influences the level of production costs. The drought conditions of 2008-9 in Argentina and Brazil led to below-average yields and hence an increase in production costs.

Between distortion and opportunities

The comparison of French results with the big wheat and maize exporters shows both the sensitivity of the hierarchy in the face of climatic uncertainty but also the extent of distortion of competition. Of course, France and the United States support their production but Argentina, Brazil and the Black Sea countries benefit from distortions linked to their social environment, to the fluctuation of their currencies and to a relaxed environmental policy. These factors, which are very influential, are unfortunately not taken into account during international negotiations.



In the farms in the west and south-west of Hungary, maize occupies more than half of the cultivated land.



Apart from the production cost of cereals, the cost of transport and the organisation of the supply chain play an important part in evaluating competitiveness.

In spite of everything, there still exist solutions to counter the challenge of competition. First of all, sharing the means of production to optimise the machinery and labour costs remains one way, albeit not easy to implement.

France can count on its operational logistics facilities to get its crops onto the market quickly.

Next, the use of biotechnology (other than transgenesis) can accelerate genetic progress and open up prospects for overcoming yield stagnation. Finally, although the lack of competitiveness of French wheat and maize at the farm gate compared with « low cost » countries is a reality, France has advantages to exploit, like the reliability and quality of its crop and the efficiency of its logistics.

One should not forget that competitiveness is measured from the point of view of the end-user. The costs of marketing and organisation of the supply chain are therefore very important.

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The Americans and Canadians have a limited and often high tech machinery pool