

When prices drop Play the “low input” varieties card

Nowadays, the best margins per hectare are achieved with “low input” varieties and an emphasis on low production costs. Provided the choice of variety is sound and nitrogen fertilization is delayed, quality levels can be maintained. Trials and witness accounts support this.

When prices drop, the input level required to achieve the best possible margin also drops. This is an economic reality that farmers have had to face since the 1992 CAP Reform. It is still relevant today.

Unless useless treatments were dreamt up, lower input levels, necessarily result in lower yields. In order to preserve high margins, the drop in yield must be limited and controlled: this is where varietal choice comes into it. A “low input” variety satisfies several criteria: good resistance to disease and, if possible, to lodging, good processing of nitrogen, high protein content and good response to low sowing density.

Taking advantage of genetic progress through integrated crop management helps slow down margin reductions without affecting the quality.



Taking advantage of genetic progress

In 2000, some members of the seed sector, under the banner of the “Club des Cinq” EIG, and ARVALIS- Institut du végétal started establishing a trial network aiming to identify “low input” varieties and assess in which conditions reduced cost crop management combined with those varieties could help increase net production margins. The results obtained over three years (2000 to 2002), 13 sites and 30 trials in this network helped reach sound conclusions.

Why do we mention the importance of integrated cropping techniques?

The strength of reduced cost crop management lies entirely in the decision mix which will help reduce risk: choice of variety, lower sowing density and zero nitrogen fertilization at the tillering stage, make it possible to reduce fungicide applications and to stop using growth regulators. A counter-example was highlighted in one of the trials in 2004. In that trial, reduced cost crop management did not include reducing the sowing density or doing without nitrogen fertilization at the tillering stage. As a result, this was the only trial in the whole network where Apache suffered lodging in a reduced cost system, with serious consequences for the margin. If density and nitrogen fertilization are not reduced upstream, the farmer cannot afford to do without the growth regulator!

	Combining economic performance and "low input" variety						
	Yield (quintals/ha)		Semi net margin(1) (€/ha)			Protein (%)	Total production cost (3) (€/quintal)
			140 €/t (2)	100 e/t (2)	80 €/t (2)		
Isengrain with traditional crop management	95.3	-11.9 q	912	531	340	10.8	12.9
Isengrain with reduced cost management	83.4		866	532	365	10.7	13.2
Oratorio with traditional crop management	93.5	-7.1q	910	536	348	11.7	13.1
Oratorio with reduced cost management	86.4		930	583	410	11.5	12.8

Combination of variety x economical crop management, safe within a large price range, competitive and more environmentally friendly. 30 trials on 13 sites of the INRA, Club des Cinq EIG and ARVALIS-Institut du végétal network, 2000 to 2002.

(1): semi net margin, including operational and application costs.

(2): base price per tonne; this base price is adjusted to take into account the specific weight and protein content of the grain.

(3): based on costs of 920 €/ha excl. operational costs, including all fixed costs, return on invested capital and farmer's remuneration, with an adjustment depending on the number of applications generated by the type of crop management methods used, and excluding support payment or payment rights.

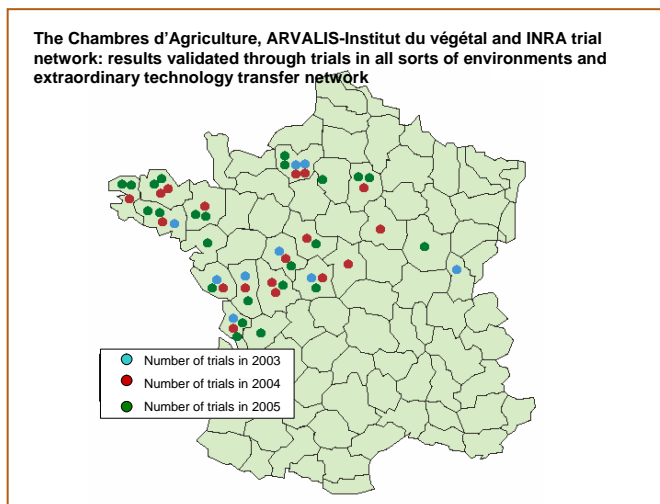
- With wheat at 100 euros per tonne, paid according to its specific weight and protein content, the farmer gains an average of 50 euros per hectare by choosing a “low input” variety (Oratorio) and implementing reduced cost crop management methods, compared to growing a variety more susceptible to disease (Isengrain) and implementing the cropping techniques recommended in the region. The gap widens in favour of the “low input” variety when wheat prices drop.

- Isengrain grown with low inputs does not produce the same gain. Yield and quality loss are too significant with this variety, which is more susceptible to disease and has a lower protein content. Therefore, choosing the right variety is a strategic choice which must be made ahead of the sowing season.

- The key to success lies in a judicious combination of input reductions: lower sowing density means less biomass to feed at the tillering stage. As a result, nitrogen fertilization can be cut out without too much damage at that stage. The combination of those two decisions leads to less competition between the plants and an environment which does not encourage so much disease. As a result the growth regulator is not needed and the pressure from disease is reduced: in all cases, from the North to the South of France, all that is required is a fungicide application at the flag leaf stage. The nitrogen saved at the tillering stage is not transferred to later stages but truly saved: nitrogen fertilization consists of one single dose, around thirty units lower than the normal dose (dose X-30 of nitrogen balance), spread from the beginning of the stem elongation period to the boot swelling stage.

- Provided the above nitrogen split is respected, protein content is stable or drops very slightly compared to when traditional crop management methods are implemented. The choice of variety remains far more crucial than the choice of crop management style.

- Total wheat production costs are similar for Isengrain grown traditionally and Oratorio grown implementing reduced cost methods.



This network included 11 sites in 2003, 20 in 2004 and 30 in 2005 (see map).

This time, the “contest” is between Apache, more widely grown in the last few years, and Caphorn, a “hardier” variety.

Calculations are based on identical price hypotheses: a base price of 100 euros per tonne, adjusted according to specific weight and protein content.

Results of the Chambres d'Agriculture, ARVALIS-Institut du végétal and INRA network in 2003 (9 trials) and 2004 (14 trials): Caphorn with reduced cost crop management is consistently ahead, even in very dry conditions

	2003		2004	
	margin (€/ha) (1)	protein (%)	margin (€/ha) (1)	protein (%)
Apache with traditional crop management	448	12.0	370	11.2
Apache with reduced cost management	473	12.1	413	10.9
Caphorn with traditional crop management	465	12.4	396	11.3
Caphorn with reduced cost management	499	12.3	442	11.0

(1) grain base price of 100 €/t, adjusted according to specific weight and protein content

On the ground

The level of interest shown by farmers and advisors for this first set of results led to setting up a second network of simplified trials led jointly by the Chambres d'Agriculture, ARVALIS – Institut du végétal and INRA from the 2003 harvest.

Its objectives are as follows: disseminate knowledge previously acquired, through trials, presentation of information at events and developmental work, and validate previous conclusions in the widest range of environments.

On the 9 sites that could be cropped in 2003 Caphorn grown following reduced cost methods produced on average an extra 47 euros per hectare compared with Apache grown according to traditional crop management methods, and an extra 31 euros compared with Caphorn grown according to traditional crop management methods. Out of the 14 sites that could be cropped in 2004, the difference is respectively 72 and 46 euros. Results vary greatly, but the benefit of growing Caphorn according to reduced cost crop management methods is rarely lost: only once out of 9 trials in 2003 and once out of 14 trials in 2004!

How can we explain such a difference? It comes down to yield! Caphorn is capable of producing more tonnes than Apache when it is fed and protected less. That's why it is competitive. The objective of this approach is clear: it is not a case of producing less but producing better economic results.

Let's also remind ourselves of the particular circumstances of the 2002/2003 season: even with an exceptionally dry spring, the decision to cut out nitrogen fertilization at the tillering stage was supported in almost all the trials, except one. In extremely critical cases needing early nitrogen fertilization, revealed for instance by double density rows, nitrogen fertilization at the tillering stage can possibly be justified in a reduced cost system. But beware, those cases must be clearly identified and limited or there will be consequences to face in terms of protein content.

Indeed, the protein challenge must be addressed. Comparing Apache (medium protein content) to Caphorn rather than Isengrain (low protein content) to Oratorio constitutes a first handicap! In spite of this, 2003 results showed a 0.5 point gain when growing Caphorn with reduced costs rather than Apache with traditional crop management

methods. The choice of variety is the prime factor. However, 2004 registered a 0.2 point loss in protein. But over the two years, the outcome is stable.

What if the straw is sold?

Reduced cost methods reduce the formation of biomass early in the season. What impact can this have on straw yields? Based on some measurements taken from the trials, we have tried to estimate the amount of straw yielded by each variety and each crop management style. By assigning to straw a value of 31.5 euros/tonne, based on the market price in Brittany, reduced cost methods can still be implemented, even though, like for the grain, they result in lower straw yields.

	2003				2004			
	grain tonnage (weighed)	grain margin (€/ha) (1)	straw tonnage (calculated)	grain margin + straw (calculated)	grain tonnage (weighed)	grain margin (€/ha) (1)	straw tonnage (calculated)	grain margin + straw (calculated)
Apache with traditional crop management	78	448	3.8	550	85	370	4.2	504
Apache with reduced cost methods	71	473	3.1	541	78	413	3.6	525
Caphorn with traditional crop management	79	465	3.5	549	87	396	4.0	522
Caphorn with reduced cost methods	73	499	2.9	554	81	442	3.4	549

(1): grain base price of 100 €/t, adjusted according to specific weight and protein content.

(2): straw sold 31.5 €/t.

Calculations are based on the following hypotheses:

- Ratio between grain weight and straw weight,
- 50% of the straw is actually harvested and baled.

	Ratio between grain weight and straw weight
Apache with traditional crop management	1
Apache with reduced cost methods	1.1
Caphorn with traditional crop management	1.1
Caphorn with reduced cost methods	1.2



Example of crop management: Louroux trial (capped silt in Indre-et-Loire, Loire region) in 2004

	Seed density/m ²	Nitrogen				Regulator	Fungicide	
		17/2	17/3	30/4	Total		18/3	16/4
Recommended (1)	250	40	80	40	160	Mondium 1.9	Opus 0.5	Ogam 0.5
Reduced costs	150	0	70	60	130			Ogam 0.5

(1): crop management methods usually recommended in that region for a variety like Apache.

This probably means assessing varieties grown with low input levels.

Fungicide protection has changed in the 2004/2005 network.

To take into account resistance to strobilurins, we agreed not to use more than one strobilurin when implementing "traditional" crop management methods, and always combine it with at least a half dose of a good triazole. With reduced cost crop management methods, we decided to completely cut out strobilurin and only use a "top of the range" triazole in a single treatment. This reduces the number and quantity of products applied.

When, looking for the best margin, becomes compatible with reducing the environmental impact of farming, it would be a shame not to make the most of it!

This report is based on two successive trial networks. Jean-Marc Meynard (INRA) and Philippe Lonnet (Florimond-Desprez) were involved in presenting and interpreting the findings of the 1999-2002 network. The 2003-2004 network benefited from the involvement of Robert Blondel (Chambre Régionale d'Agriculture of Brittany), Myriam Laurent (Agrotransfert Poitou-Charentes) and Bertrand Omon (Chambre d'Agriculture de l'Eure). We should like to thank most sincerely all the trialists and advisors who took part in this work.

It has to be seen to be believed

Besides confirming previous results, the trial network of the last few years also serves as a training aid for the farmers and advisors that have put it in place. It is important to be able to see the wheat, especially Caphorn: sown with 100 to 150 seeds per square metre, with no nitrogen fertilization at the tillering stage, it looks rather sad, then it picks up... and at the end of the season the sums convince you that it was worth putting up with the sight of such a crop! This experience, confirmed by all the network members, justifies pursuing this line of work.

And then?

Now we know for a fact that there is money to be made in growing low input varieties according to reduced cost crop management methods. But we have to admit that there is a lack of varieties we can recommend for use with these methods. The following have been identified: Oratorio, except in shallow soils, Cézanne, always competitive with reduced cost methods in shallow soils (Centre of France), Caphorn, for various soil types, Farandole in soils not too shallow, grown for markets such as the animal feed sector. The range needs to be widened.

A network of trial plots to serve “low input” wheat varieties

Making a living from being a farmer, whilst practising environmentally-friendly farming methods: this is what motivates two groups (32 farmers) in the cereal production areas north and east of the Charente-Maritime region (Centre West).

In 2004, those farmers put 19 soft wheat plots at our disposal to compare traditional cropping techniques (ITK2) and integrated methods (ITK3). Here are the impressions of Jean-Claude Dubois and Olivier Guérin, two agricultural advisors with the Chambre d'Agriculture of Charente-Maritime.

Who initiated this process?

“Let's prove that we are capable of anticipating directives and of implementing more input efficient strategies and practices, benefiting both the environment and margins.” This describes the position adopted by several people in charge of agricultural development when faced with the strong public demand for environmental protection and falling cereal prices.

What was the driving force of this process?

The IDEA project and a meeting with Philippe Viaux (ARVALIS- Institut du végétal) helped highlight all the weaknesses of businesses in that sector. In most cases, the cropping techniques used “consumed” large amounts of inputs in the case of wheat and oilseed rape, and of power and water in the case of maize.

The IDEA diagnosis (sustainability indicator for farming businesses) was used by each group member for his/her own farm. Each farmer could integrate the concept of sustainability and the measures to adopt in order to maintain this sustainability.

On that basis, the groups put together a working programme focusing on establishing and monitoring a network of soft wheat trial plots.

Why a network of trial plots rather than an experiment?

In a network, each participant is involved and provides a useful link with his neighbours. This method was tried and tested in the early 1980s, at the time when wheat farming was intensifying. A network comprising a large number of plots provides data complementing results obtained from an experiment. “Failures” are often more informative than successes. They show how far we can go without compromising the farm's economic balance.

In economic terms, can the risk be sustained?

In the 19 plot network, traditional crop management produces on average 3.8 quintals/ha (0.38 tonne/ha) more than integrated farming methods. However, the gross margin of the integrated system wins by 15 €/ha over traditional methods. The financial risk linked to the integrated farming system is therefore very limited.

Are those low input methods developing?

The results of the trial plot network are disseminated at demonstration and information events to which all the farmers in the area are invited. These activities are supported by the Chambre d'Agriculture, responsible for promoting them.

Some of the farmers in the groups have applied those economical methods to their entire wheat production. Others prefer repeating the experiment and we are all looking forward to seeing how those different crop management styles fare in a year where pressure from diseases is a big problem.

What is this wheat trial network based on?

The trigger was the publication of the results of the “low input wheat varieties” trials led by INRA, the club des cinq EIG and ARVALIS-Institut du végétal. Those results spoke for themselves and helped us alleviate farmers' concerns.

On the same plot, the farmer compares two crop management systems applied to the same variety, one “traditional”, corresponding to his usual cropping techniques and one “integrated” with reduced input levels.

The main varieties are Caphorn and Aubusson. With the “integrated” methods, the farmer implements the following factors:

- 20 to 40% reduction in sowing density (180 to 220 seeds/m²),
- 30 U reduction of total nitrogen dose (absence of nitrogen fertilization at the tillering stage in half of the cases),
- the first fungicide application at the 1-2 node stage is cut out,
- the dose of fungicide used at the flag leaf stage is adjusted according to the level of risk from disease.

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