Cereals and oilseeds supply within the EU, under AGENDA 2000: a Positive Mathematical Programming application

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Abstract

In this study we simulate the impact of the Common Agricultural Policy (CAP) reform of «Agenda 2000» on the field crop sector supply in 2005. The methodology we used is the Positive Mathematical Programming applied at a regional level in twelve European Union Member-States. Simulations are based on the 1994 community Farm Accounts Data Network (FADN) database. According to the simulations, cereal production will increase sharply and oilseed production will decrease in the period 1995-2005. These results will have considerable effects on the grains market balance sheet.

Keywords: *CAP reform, Agenda 2000, Positive Mathematical Programming*

Introduction

In July 1997, the European Commission proposed a new reform of the CAP and of the rural development policy, called "Agenda 2000". This project of reform, amended in March 1998, has been adopted by the European Council at the Berlin summit in March 1999 after a final revision. For the agricultural market policy, it proposes deepening and extending the 1992 reform through further shifts from price support to direct payments. The main objectives of the reform are: 1) to increase the competitiveness of European Union agriculture on both domestic and world markets. 2) to respect the Marrakech agreement by reducing internal support and export subsidies. 3) to prepare the next round of international negotiations by adopting more "decoupled" instruments. For the crop sector, this policy consists of a drop in the cereal intervention price as well as the establishment of a non-specific area payment (same subsidy level for cereals and oilseeds).

These measures will have important effects on the crop sector. Theoretically, the profitability of oilseeds should decline with the fall of the subsidy even though the European Union (EU) is showing a large deficit. At the same time, the cereal production should increase while the EU is already a major exporter. This implies that the EU will therefore be able to produce at the world price to avoid subsidised exports and that its support to agriculture will be accepted in the future international trade negotiations. This study aims to study the effects of Agenda 2000 on cereal and oilseed EU supply and then on balance trade of these products.

In this paper, a mathematical programming model is applied to FADN data (1994). This approach is not new, but the paper uses recent methodological developments, known under

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the term "Positive Mathematical Programming" (PMP), published by Howitt (1995; 1998) and Paris and Arfini (1995). The basic hypothesis of this approach is to consider that observed land allocations are optimal given the current state of technology, prices and policy constraints. PMP approach uses shadow prices from a standard linear program to somehow cover the hidden information explaining this optimum. The model we used brings about a modification with regard to the Howitt (1995) propositions.

In the first part of this paper, we expose the PMP method and the adopted version. The second part presents the FADN data and the applied methodology to build the models. We distinguish 36 EU regions and develop for each a mathematical programming model. By introducing simple yield functions (Cobb-Douglas), we endogeneise the yields to take account of price and technical progress effects. In the third part, we analyse the impacts on cereals and oil seeds supply of the 1999 Berlin agreement and the incidence on the evolution of the market balance sheet for these products.

Methodology

A new version of PMP

We propose a simulation of Europe's field crop sector supply by using the Positive Mathematical Programming approach at a regional level. The implementation of this approach has been improved in some ways. We first consider a Cobb-Douglas production function and allow the yields and the variable inputs to adapt to a price decrease and to technical progress. Secondly, we consider a more flexible objective function by stating that variable cost per hectare for each crop is a quadratic function of the cultivated area (see below).

Linear or mathematical models are widely used for agricultural economic policy analysis. The PMP is somehow a new methodology intended to deal with the classic problems met in mathematical programming: these problems are principally the flexibility in the response to policy changes and calibration, which requires reproducing the base-year state by the model. While it was first used in some empirical works, this methodology was formulated precisely in recent papers (Howitt 1995 ; Paris and Arfini 1995 ; Paris and Howitt 1998).

The method is based on a non-linear optimisation where some parameters are issued from the observed land allocation decisions by farmers. Two important advantages arise for applied analysis. The non-linear objective function allows a smooth response to a perturbation analysis instead of linear programming where the solution jumps from one corner to another of the polygon formed by the constraints. By using inferences from the base-year observed land allocation, it will be possible to build the model with less statistical information, which is sometimes hidden or not available, and to automatically calibrate the model on the base-year.

According to Howitt, the PMP can be implemented in three stages: (I)- The construction of a linear program with calibration constraints, (II)- The use of the resulting dual values to construct a non linear program that reproduces the base-year solution without calibration constraints, (III) -The simulation of the agricultural policy changes.

In step (I), we consider the following linear program (LP):

$$\max f(x) = \sum_i (p_i R_i - w_i C_i + SUB_i)\, x_i$$

subject to (1)

$$A x \leq b \qquad (\gamma)$$
$$x \leq x^0 - \varepsilon \qquad (\lambda)$$
$$x \geq 0$$

where for each activity i, x_i is the acreage (hectares), R_i the yield, C_i the volume per hectare of variable inputs, SUB_i the direct payment per hectare, p_i the product price and w_i the price of the variable inputs.

The first constraint equation represents the general constraints where A is the matrix of technical coefficients and b the vector of resource limits. Let γ be the vector of dual values associated with them. The second equation represents the calibration constraints where x^0 is the vector of observed land allocation. Let λ be the vector of associated dual values.
In his paper, Howitt (1995) shows that there exists a vector of small positive numbers ε such that the dual values γ remain unchanged if we take off the calibration constraints from the LP. The first-order Kuhn-Tucker conditions of the LP are:

$$\nabla f(x^0) - A'\gamma - \lambda = 0 \qquad (2)$$

where $\nabla f(x)$ is the gradient vector of first derivatives of f(x).

Step (II) uses the results of step (I) to construct a calibrated non-linear objective function model without the calibration constraints. The idea is to suppose that the margin per hectare of each crop decreases with the acreage. This hypothesis can be defended if we consider the farmer's aversion to agronomic or economic risk. At the optimum, margins of last hectares planted in each crop are equal. In his presentation of the approach, Howitt considers that farmers keep the variable cost per hectare constant and that the yield decreases as a linear function of the acreage planted. The experience of the 1993 CAP reform shows that farmers tend to keep yields and adapt the variable inputs. In our approach we let yields be constant and suppose that the variable input is a function of the acreage harvested.

In a first version of this approach, we supposed a linear function between variable costs per hectare and the level of the harvested acreage. Some problems occur then in the simulations for the small activities (high deviations; negative costs). The present version introduces more flexibility and avoids these drawbacks by considering a quadratic function instead of a linear one ($C_i = a_i + b_i x_i^2$). The parameter a_i stands for the minimum variable costs to start producing and the parameter b_i permits us to adjust these costs when the producer allows for the surfaces to take into account the risk factors. We can note that the variable costs of a supplementary hectare are no longer constant but depend on the planted acreage. The objective function of the non-linear model, which is a polynom of degree three, is then:

$$\max f_1(x) = \sum_i [p_i R_i - w_i (a_i + b_i x_i^2) + SUB_i]\, x_i$$

subject to: (3)

$$A x \leq b$$
$$x \geq 0$$

Parameters a_i and b_i are determined in such a way that the observed harvested area x^0 in the base year is an optimum and that the calculated costs per hectare are equal to the observed costs.
By noting that objective functions in the two models verify:

$$f_1(x) = f(x) - w_i (a_i + b_i x_i^2) x_i + w_i C_i x_I \quad (4)$$

we can see, using equation (2), that the first order Kuhn-Tucker conditions for the optimum of the non linear program at x^0:

$$\nabla f_1(x^0) - A'\gamma = 0 \quad (5)$$

are assured if we impose the relation :

$$w_i (a_i + 3 b_i x_i^{0^2}) - w_i C_i^0 - \lambda_i = 0 \quad (6)$$

Finally, we use the condition that the observed variable costs per hectare are equal to calculated costs at x^0:

$$C_i^0 = a_i + b_i x_i^{0^2}, \quad (7)$$

To determine a second equation and calculate the parameters a_i and b_i as:

$$\begin{cases} a_i = C_i^0 - \dfrac{\lambda_i}{2 w_i} \\ b_i = \dfrac{\lambda_i}{2 w_i x_i^{0^2}} \end{cases} \quad (8)$$

In the last step, the non-linear model of step (II) is used in the policy analysis by perturbing the parameters or by adding the constraints of specific policy measures. One difficulty arises when a contingent constraint exists in the base-year model and the policy measure is to remove it as is the case for the set-aside bond. The risk is that the model can fail to reflect the real opportunity cost of the crops. The problem of the set-aside was resolved by assuming that the land liberated is proportionally allocated to all crops.

Introduction of a yield function

In a classic LP model, input and output prices determine only the choice of crops allocation, but not the technology for each activity. The models are generally built on a short time basis and the effects of technical progress are not included. In these LP models, we can easily introduce a yield function to integrate these prices and the effects of technical progress. Nevertheless, it is necessary to assume separability between the choice of technology for each activity and the choice of crops allocation. The producer maximises the gross margin in two steps. In the first step he maximises the margin per hectare for each activity and in the second step he maximises the crops allocation.

In the first step, R_i and C_i are determined by a specific yield function by activity. For simplicity, we consider a Cobb-Douglas yield function type:

$$R_i = A_i \ e^{\delta_i t} C_i^{\alpha_i} \quad (9)$$

where A_i is a constant, δ_i the temporal trend of technical progress, t the time and α_i the part of the variable cost in the product. For each crop i the farmer maximises the margin ($p_i R_i$-

w_iC_i+SUB_i). The first order conditions determine the maximum levels of variables costs and yields according to prices:

$$C_i^* = \left(\frac{w_i}{p_i \alpha_i A_i e^{\delta_i t}} \right)^{\frac{1}{\alpha_i - 1}} \quad \text{and} \quad R_i^* = A_i\, e^{\delta_i t} (C_i^*)^{\alpha_i} \qquad (10)$$

In the second step, R_i^* and C_i^* are used in the LP model to determine the crops allocation.

The introduction of a yield function in the PMP approach is more complicated because the choice of crops allocation influences the yield or the cost per hectare. In our proposition, we consider three hypotheses:

- to simplify, the yield function has a Cobb-Douglas form.
- this function determines, for each activity, the yield in formula (10).
- the coefficients a_i and b_i are corrected according to the observed cost and the results of the yield function.

The data and the regional modelling

EC FADN

This model is based on the European Community Farm Accountancy Data Network (FADN) database. Established by an EEC council regulation in 1965, FADN is a network that collects yearly farm accounts data from the Member States farms, using the same return form. The survey covers about 60 000 commercial farms, i.e. with income from agricultural activity that is sufficient to support the household. Although the field represents only 59% of the holdings of twelve community states in 1994, it covers 96% of the Standard Gross Margin (SGM) and 92% of Utilised Agriculture Area (UAA).

For each farm in the FADN sample, the file registration contains returns on general information (farm type, economic size, region) type of occupation (proportion of owned, rented and sharecropped farm area), labour (quantity and type of labour), number and value of livestock, livestock purchase and sales, costs (costs of labour and machinery upkeep, feeding stuffs, crop variable costs, overheads, land charges and interest paid), land and buildings, dead stock and circulating capital, debts, value added tax, grants and subsidies, production of crops and animal products (area, quantity and value of all crops, animal products and other activities).

Though the database contains a large quantity of information on the functioning of the farms, it is not directly usable in a programming model approach. For the field crop sector in particular, margins per product are not directly available because FADN accounts are not analytical. One important part of this work is to estimate the variable costs per product by using an econometric model. Some other calculations are necessary to derive the direct payments in the different crop activities.

The model of the field crop sector in the European regions

The aim of this work is to better simulate the effects of Agenda 2000 on the European field crop supply by taking into account the specificity of regional agriculture. For this purpose we built programming models for 36 regional average farms in the twelve Member States. These regions are larger than in the FADN and are constituted by considering similarities in yields and type of crops (see the map in the appendix).

Horticulture, wine growing and permanent crop types of farms were excluded from the studied field. The characteristics of the sample are shown in table 1.

Table 1: Characteristics of the FADN field used in the study.

Country	Number of farms in the used FADN field		UAA[(1)]	COPCA[(2)]	cereal	oil seed	set-aside
	Weighted	n. weighted	(mio ha)	(% of UAA)	(% of UAA)	(% of UAA)	(% of UAA)
D	275 744	4 595	5.501	95.6	68.0	7.8	19.2
F	360 164	6 271	12.190	96.5	60.2	13.5	17.9
I	544 636	11 392	4.660	71.8	60.7	5.3	5.4
B	38 878	998	0.512	62.0	54.4	3.3	4.4
L	1 524	239	0.026	97.5	86.1	4.2	6.9
NL	69 305	1 067	0.651	38.8	27.9	0.6	9.5
DK	55 926	1 807	2.017	96.4	67.5	7.9	16.3
IRL	130 406	1 198	0.365	91.1	73.6	1.7	15.2
UK	126 799	3 107	5.133	93.7	61.2	9.1	18.5
GR	271 373	3 734	1.881	59.4	57.3	1.3	0.5
ES	296 811	4 758	7.408	82.4	57.1	14.2	9.7
P	256 654	2 180	2.719	27.1	21.8	2.4	2.2
EUR 12	2 428 221	41 346	43.063	83.7	58.2	9.6	13.3

(1) UAA out of forage area.
(2) Cereal, oilseed and protein crops area including the set-aside

Crop activities considered in this model are: soft wheat, durum wheat, rye, barley, oats, rice, rape seed, sunflower, soya bean, protein crops, potatoes, sugar beet, hops, tobacco and fresh vegetables. Margins per hectare for all these crop activities are needed to construct the mathematical programming models. As the variable input costs in FADN returns are only total farm costs by type of input (seeds, fertilisers, plant protection products, others), we first have to estimate variable costs for each activity by using an econometric approach. Let c_j be the total cost of type j (j=1,...J). By assuming that the part of c_j used for the crop i (i=1,...I) is proportional to the acreage harvested, we can write:

$$c_j = \sum a_{ij} \; x_i \; + \; \mu_j \quad \text{for} \quad j = 1, ..., J \tag{11}$$

where a_{ij} are unknown parameters and μ_j a random term. The parameters are estimated in a simultaneous equation model formed by J equation (11) plus an equation for all other costs. The variable cost specific to the activity i and the input j is then: $c_{ij} = \hat{a}_{ij} \, x_i$. These costs are then individually adjusted to sum up the observed costs.

Yield and variable cost adaptation

As we said earlier, we adopted a Cobb-Douglas function. This choice was made to simplify the model. It is difficult for instance to estimate translog functions for all cereals and oilseeds in all regions. We assume, however, a constant share of the cost in the value of output. This fact is observed, on a long period, for cereals, in the French FADN database, but not for oilseeds. For our simulations, the impact on this hypothesis is not important because the price of oilseeds is constant.

The coefficients α_i are deducted from formula (11) and the observed yields and prices. The coefficients of technical progress δ_i are calculated from Eurostat data (New Cronos) on the evolution of yield and prices of input and output for each product, within each country, between 1975 and 1995. We use the following formula:

$$\delta_i = (1-\alpha_i)\frac{1}{t}\log\left(\frac{R_i^t}{R_i^0}\right)+\alpha_i\frac{1}{t}\log\left(\frac{w_i^t}{w_i^0}\right)-\alpha_i\frac{1}{t}\log\left(\frac{p_i^t}{p_i^0}\right) \quad (12)$$

which is derived from (10). Here the exponents stand for time (t=0 at 1975 in the estimation of δ and t=0 at 1994 in the model).

Model simulations

In this section, the regional results from the simulations are aggregated at the national and European level. After a recall of the Berlin agreement, we will discuss the results of the simulation by the year 2005.

Agenda 2000

As we saw in the introduction, a PAC reform compromise was found by the fifteen EU Member States for the 2000-2006 period. The compromise consists of :
- a decrease in the cereal intervention price by 15% according to 1997 i.e. 21.4% according to 1994 (table 2).
- an alignment of the cereals and oil seeds hectare premiums.
- an increase of the hectare premium by 16%.
- a compulsory set-aside rate of 10% (this rate was stated at 15% in 1994).

Table 2: Principal measures of the central scenario

	central scenario
Cereal intervention price	1013.1 Ecu/tonne (-21.4 % according to 1994)
Direct payments	- unique hectare premium : 63 Ecu/tonne * RYR[(1)] - additional oilseed premium: 9.5 Ecu/tonne x RYR - maintain of the additional durum wheat premium.
Rate of compulsory set-aside	10 %

[(1)] RYR : regional yield reference (tonne/hectare).

In this central scenario we consider that the fall of the intervention price is to be totally transmitted to the market price. We have also kept oilseeds price at the same level as in 1994. Some variants of the central scenario on cereal and oilseeds prices and on compulsory set-aside rate are then analysed.

Results of the central scenario

The year 2005 corresponds to the date set by the Commission for the balance sheets projection. Note that our simulation only takes into account the field crop sector and leaves aside the interactions with other activities, in particular with animal farming through fodder acreage which we assumed fixed. The formation of margins per hectare in the regions is the principal factor of evolution in land allocation and supply. The estimations for 2005 of

Table 3: Cereal supply simulations by Member state (central scenario).

Country	1994			2005			2005/1994		
	Area (000 ha)	**Yield** (t/ha)	**Quantity** (mio t)	**Area** (000 ha)	**Yield** (t/ha)	**Quantity** (mio t)	**Area** (%)	**Yield** (%)	**Quantity** (%)
D	3696	6.0	22.0	4121	6,9	28,3	11,5	15,3	28,5
F	6938	6.7	46.3	8095	7,9	63,7	16,0	18,1	37,0
I	2782	5.3	14.8	2791	6,2	17,3	0,3	16,4	16,8
B	269	7.6	2.0	273	9,5	2,6	1,6	24,5	26,5
L	22	5.0	0.1	22	6,7	0,2	3,7	34,5	39,4
NL	180	7.6	1.4	190	9,3	1,8	5,4	21,5	28,0
DK	1361	5.9	8.1	1672	6,7	11,2	22,9	13,3	39,2
IRL	268	6.0	1.6	291	6,8	2,0	8,3	12,3	21,7
UK	3137	6.8	21.4	3556	8,2	29,2	13,4	20,8	36,9
GR	1078	3.6	3.9	982	4,4	4,3	-8,9	23,4	12,4
ES	4220	2.8	11.9	4514	3,0	13,4	7,0	4,8	12,1
P	591	2.3	1.3	600	2,6	1,6	1,6	13,8	15,6
EUR 12	**24541**	**5.5**	**134.8**	**27107**	**6,5**	**175,5**	**10,3**	**17,9**	**30,0**

Table 4: Oilseeds supply simulations by Member-state (central scenario).

Country	1994			2005			2005/1994		
	Area (000 ha)	**Yield** (t/ha)	**Quantity** (mio t)	**Area** (000 ha)	**Yield** (t/ha)	**Quantity** (mio t)	**Area** (%)	**Yield** (%)	**Quantity** (%)
D	429,4	2,99	1.28	271,1	3,84	1,04	-36,9	28,6	-18,9
F	1529,8	2,45	3.71	1076,0	3,38	3,63	-29,7	37,9	-3,0
I	247,3	2,95	0.73	159,9	3,08	0,49	-35,3	4,4	-32,5
B	10,4	2,78	0.03	6,3	3,84	0,02	-39,3	37,9	-16,3
L	1,1	2,57	0.00	0,0	-	0,00	-100,0	-	-100,0
NL	0,1	1,16	0.00	0,0	-	0,00	-100,0	-	-100,0
DK	159,9	1,76	0.28	38,3	1,76	0,07	-76,0	0,0	-76,0
IRL	5,2	2,33	0.01	3,4	2,33	0,01	-35,2	0,0	-35,2
UK	403,2	2,66	1.07	333,9	3,38	1,13	-17,2	26,9	5,1
GR	21,4	1,45	0.03	16,0	1,44	0,02	-25,4	-0,5	-25,8
ES	1052,0	1,17	1.23	839,0	1,49	1,25	-20,2	27,4	1,6
P	65,0	0,83	0.05	34,2	0,83	0,03	-47,5	0,0	-47,5
EUR 12	**3924,9**	**2,16**	**8.43**	**2778,1**	**2,77**	**7,69**	**-29,2**	**28,3**	**-9,2**

land allocation are influenced by regional and national conditions, but the evolution tendency is comparable. At the European level, the projection shows a 21% progression of cereals land and a 16% decrease in oilseeds land (tables 3 and 4). Despite the price cut of cereals, the alignment of premiums damages the profitability of oilseeds in comparison to the profitability of cereals. In other words, cereals (mainly corn, soft wheat and barley) not only benefit from the decrease of compulsory set-aside rate, but also take areas initially reserved to oilseeds.

Cereal yields should increase by 18% on average between 1994 and 2005. This rate only represents half the projection of the yield curves trend over twenty years. Technological progress for oilseeds is of 28% over the projection period in the two scenarios. It corresponds to the yield curves trends, i.e. high for rape seeds (41%) and moderate for sunflower (7%).

Overall, cereals production in the twelve member states would increase by 30% on average whereas oilseeds production would decrease by 9%. Sunflower in particular would suffer from the reform, showing a 29% fall. Due to a better rate of technical progress, rape seed would increase by 7% (see table 5).

Table 5: Europe (Eur12) supply simulation by activity

	1994			2005			2005/1994		
	Area (000 ha)	**Yield** (t/ha)	**Quantity** (mio t)	**Area** (000 ha)	**Yield** (t/ha)	**Quantity** (mio t)	**Area** (%)	**Yield** (%)	**Quantity** (%)
Soft wheat	9984	6,3	62,96	11744	7,5	87,92	17,6	18,7	39,6
Durum w.	2128	2,9	6,25	2135	3,0	6,47	0,4	3,3	3,6
Rye	795	4,3	3,38	823	5,3	4,34	3,5	23,9	28,2
Barley	7908	4,3	33,72	8301	4,6	37,76	5,0	6,7	12,0
Oats	857	3,7	3,14	650	4,4	2,88	-24,1	20,7	-8,4
Maize	2912	8,8	25,59	3455	10,5	36,15	18,7	19,1	41,3
Rape seed	1677	2,7	4,6	1274	3,9	4,94	-24,0	41,3	7,3
Sunflower	2056	1,6	3,25	1372	1,7	2,32	-33,3	7,1	-28,6
Soya beans	192	3,2	0,62	132	3,3	0,43	-31,1	1,8	-29,8

Table 6: Projection of total cereals balance sheet and oilseed production (Eur 15).

	1996	**2005**	**2005**
		Commission Projection (without reform)	**Scenario Central Projection**
Cereals: (millions of tonnes)		**212.5**	
Production	202.1	212.5	222.2
Imports	4.8	5.0	5.0
Consumption	172.8	180.2	180.2
Balance	34.1	37.3	47.0
Oilseed: (millions of tonnes)			
Production	12.4	14.7	10.7

These movements would have a considerable impact on balance sheets. The Commission has established balance sheets by extending the 1992 Reform and by strictly respecting the Gatt agreements on exports. According to these balance sheets, export and/or stock balance for cereals amounts to 37 millions tonnes (mt) in 2005 (see table 6). With our simulation, the balance sheets projection would lead to an export and/or stock balance of 47 mt. As for oilseeds the Commission projection predicts a production of 14.7 mt in 2005, whereas our projection predicts only 10.7 mt even though the market shows a strong deficit.

Variants

In the central scenario the fall of the intervention price of cereals is supposed to be integrally transmitted to market price. Yet cereal prices depend on the evolution of the world market: a decrease of 15% of the intervention price will only have a total effect on the market price if the word price decreases by 15% or more. To see the variation of supply be

haviours for different price hypothesis, we have simulated around the central scenario some other scenarios by crossing different rates of cereals price decrease (15%, 10%, 5% in comparison with 1997) (see table 7). The outstanding result is the high supply sensibility to the price.

Table 7: Price variants.

	Cereals price		
	-15%	**-10%**	**-5%**
Cereals (2005/1994)	30,0	35,5	40,9
Oilseeds (2005/1994)	-9,2	-16,4	-21,6

The compulsory set-aside rate is also an important parameter in the CAP reform. Different variants for this rate were simulated around the central scenario (15%, 5%, 0%) (table 8). As the set-aside rate grows, the oilseed supply falls down sharply. From this point of view, to maintain the set-aside rate is justified only if the intervention price is higher than the world price. In the opposite case (situation that corresponds necessarily to –10% and –15% in table 7), the EU can export its cereal surplus production but with an increase in its oilseeds import if the set-aside rate is held at 10%.

Table 8: Compulsory set-aside rate variants.

	Set-aside rate			
	15%	**10%**	**5%**	**0%**
Cereals (2005/1994)	24,4	30,0	35,6	41,4
Oilseeds (2005/1994)	-16,3	-9,2	-3,1	2,7

Conclusion and remarks

We have shown that measures provided for by Agenda 2000 would have a considerable impact on respective balance sheets for cereals and oilseeds, with a jump in cereals production and a drop in oilseeds production. Important changes should therefore be anticipated in the animal feed sector.

The maintenance of a compulsory set-aside rate stresses the oilseed deficit. It reduces the cereal excess for export but with the risk that the European price could be higher than the word price. So we can ask for the logic behind the maintenance of the compulsory set-aside.

However, this situation is only possible if the intervention price for cereals is set below or close to the world market price. In the opposite case, export is only possible with subsidy and its volume will not respect Marrakech agreement constraints.

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