

Annexe 6 du rapport d'évaluation

SET ASIDE COMUNITARY MESURES EVALUATION

REGIONAL REPORT

Aragón

SPAIN



**DEPARTAMENTO DE PROYECTOS Y
PLANIFICACIÓN RURAL
ESCUELA TÉCNICA SUPERIOR DE
INGENIEROS AGRÓNOMOS
UNIVERSIDAD POLITÉCNICA DE MADRID**



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2. REGIONAL CONTEXT

2.1. Synthetic description of the region at the agricultural level

Aragón is located in the north east of Spain covering 476838 has which represents 15'7 per cent of the total national surface. About 38% of the land is between 200 and 600 metres altitude and 30 % between 1000 and 2000 metres altitude. A map of the Region location appears in annex 1.

2.1.1. Climate

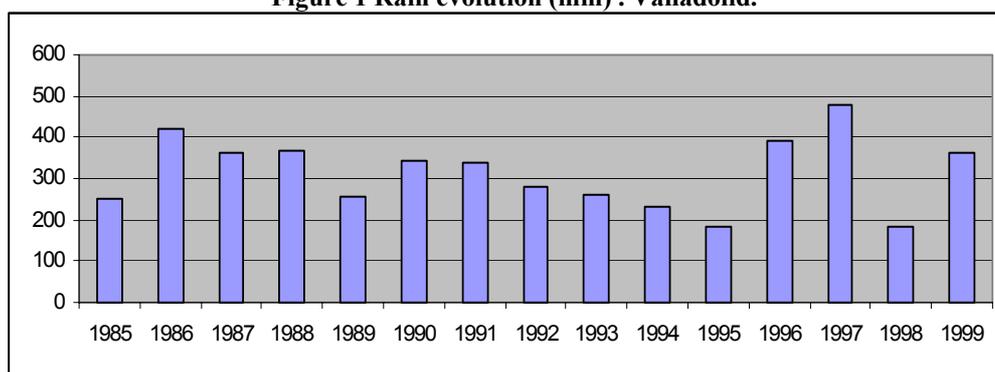
Climatological data detailed in table 1 is the mean value registered in the observatories existing in the region during the period 1961-1990. Figure 1 shows annual rain registered in Zaragoza from 1984 to 1999.

Table 1 Climatological data. Aragón. Average 1961-1990

	Rain (mm)	Rain days	Mean temperature	Frost days
Huesca	587	86,4	13,4	38,5
Zaragoza	314	74,2	14,6	27,5
Teruel	382	82,2	11,7	59,8

Source: INM Spain. (National Meteorological Institute)

Figure 1 Rain evolution (mm) . Valladolid.



Source: INM Spain.

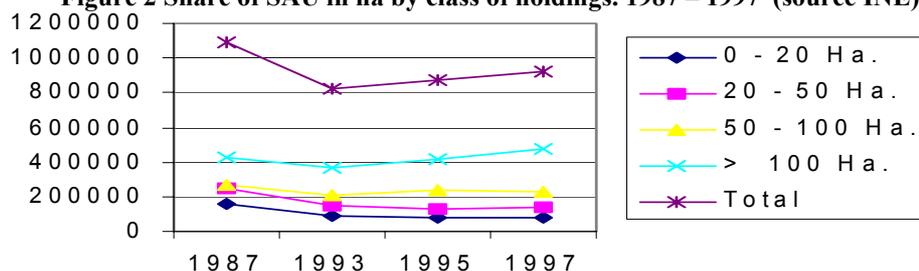
2.1.2. Population

Aragón population has increased from 1,044,337 inhabitants in 1960 to 1,205,663 in 1996. The population density is under 25 persons per km². Agriculture employed over 7.25 % of the active population in 2000.

2.1.3. Types of holdings

Figure 2 shows that the majority of the lands are included in the biggest holdings. And this majority increases from 1933. Holding medium size also increases during the period 1987-1997 (see Figure 3).

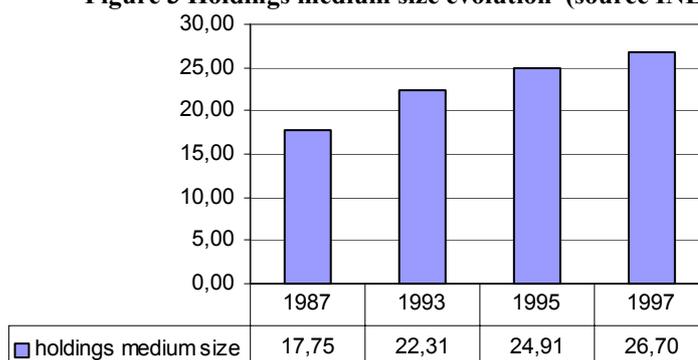
Figure 2 Share of SAU in ha by class of holdings. 1987 – 1997 (source INE)



Source: INE



Figure 3 Holdings medium size evolution (source INE)

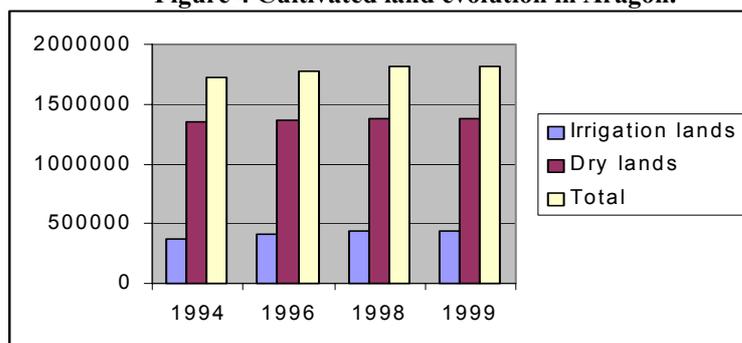


Source: INE

2.1.4. Irrigation and dry land evolution

The figure bellow shows cultivated irrigation land evolution during the period 93-99 in comparison with dry and total cultivated land.

Figure 4 Cultivated land evolution in Aragón.

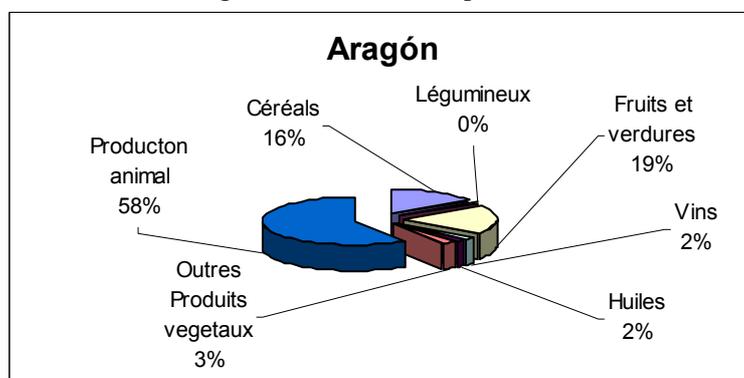


Source: INE

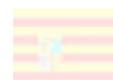
Cultivated land increases all through the period 93-99. The share of irrigation land over total cultivated land increases while the share of dry land decreases

2.1.5. Main regional farm productions

Figure 5 Share of farm production

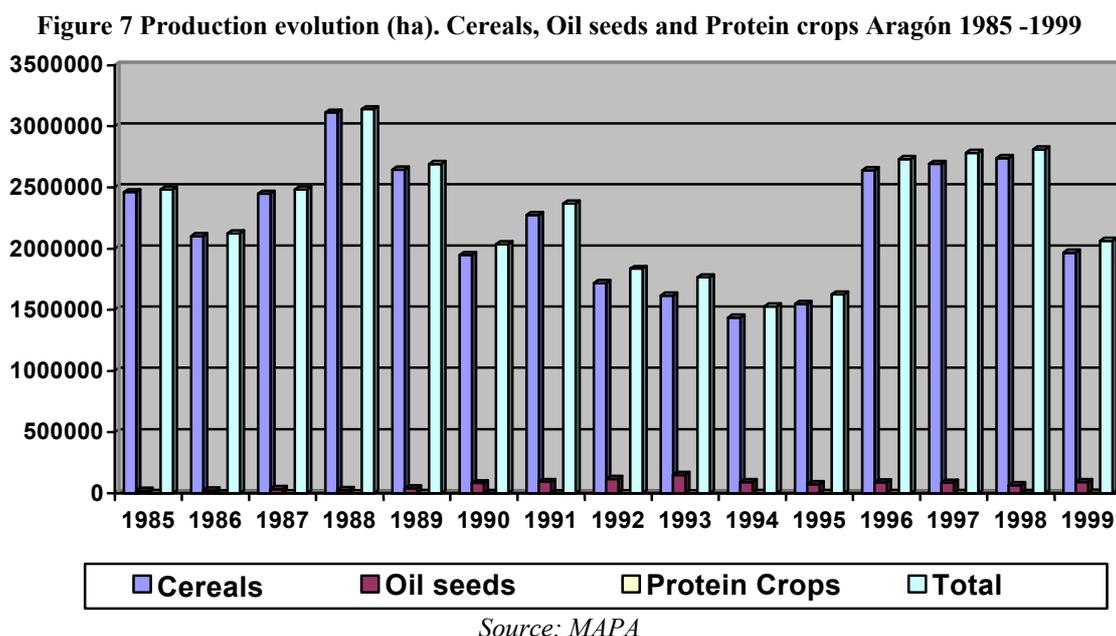
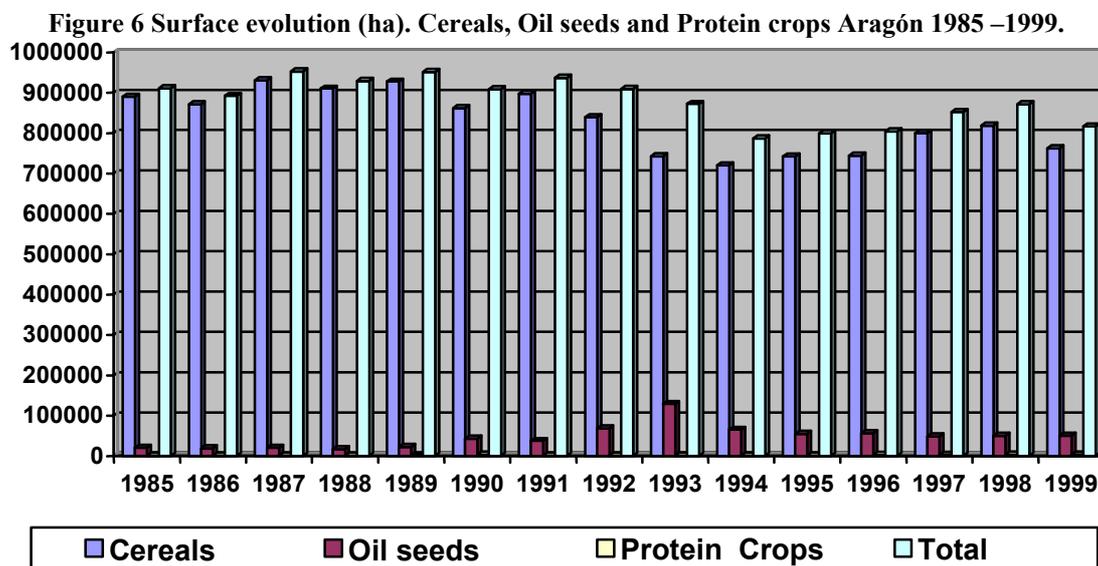


Source MAPA



2.1.6. Place of the COP over the period 1985 – 1999

The figures below show surface and production evolution (by group of crops) in Aragón. Detailed data appears in annex 2.



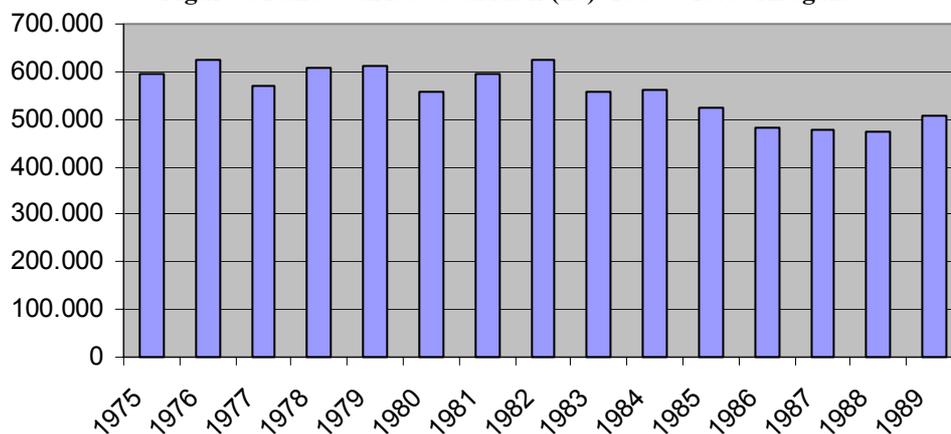
2.1.7. Fallow

Fallow data available includes other no occupied lands, that is to say, abandoned lands and temporarily out of use lands. So these surfaces are influenced by different factors and it is difficult to find a relationship between them and set-aside rates. Nevertheless in the case of Aragón no occupied lands decreases from 1993. This leads us to think that because of the compensatory payments there is temporarily out of use lands that is cultivated again.

Table 2 Fallow surface and compulsory set aside rate in the period 1985 to 1999

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Surface (ha)	594500	623200	570741	608085	612394	558933	593350	624660	559372	560174	525071	481984	477058	475414	508387
Compulsory set-aside ratio									15%	15%	12%	10%	5%	5%	10%

Source: MAPA

Figure 8 Fallow surface evolution (ha) 1980 – 1999. Aragón.

Source: MAPA

2.2. Set Aside implementation context

2.2.1. Implementation data

The following tables contains the implementation data for Aragón.

Table 3 Set aside implementation data. Aragón. Dry land.

	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00						
Compulsory set aside rate	15%	15%	12%	10%	5%	5%	10%						
COP applicants number (professional scheme)	n.d.	13568	16123	n.d.	18222	n.d.	n.d.						
SCOP (ha) all producers (COP + set-aside)	724078	735629	767657	724185	731731	736110	730923						
SCOP (ha) professional scheme (COP + set-aside)	431628	535946	582286	586253	607525	626941	610058						
SCOP (ha) simplified scheme	292450	208835	179064	133228	121916	109169	120865						
Real set-aside scheme (set-aside/SCOP all producers)	15,34%	20,46%	18,67%	15,73%	13,00%	13,40%	15,30%						
Professional set-aside rate (set-aside/SCOP professional scheme)	16,27%	25,15%	22,78%	19,43%	15,66%	15,73%	18,33%						
Total set-aside (ha)	111087	150525	143298	113927	95112	98646	111819						
Rotational set-aside (ha)	70211	78674	95707										
Total set-aside (ha) (apart from extraordinary)	111087	150525	143298	113927	95112	98646	111819						
Compulsory set-aside	70211	119084	79%	120793	84%	80948	71%	52945	56%	54924	56%	79828	71%
Voluntary set-aside		31441	21%	22505	16%	32979	29%	42167	44%	43722	44%	31991	29%



	1993/94	1994/95		1995/96		1996/97		1997/98		1998/99		1999/00	
Paid at 48'3 ecus set-aside						1286	1,1%	2781	3%				
No paid set-aside													
No food set-aside		15	0,01 %	309	0,2%	137	0,1%	29	0,03 %				
Five year set-aside (R.2328/91)	40876	30622		20416		13285		5645	5,94 %				
Extraordinary set-aside													

Source CE DG Agriculture (MAPA)

Table 4 Set aside implementation data. Aragón. Irrigation land.

	1993/94	1994/95		1995/96		1996/97		1997/98		1998/99		1999/00	
Compulsory set aside rate	15%	15%		12%		10%		5%		5%		10%	
COP applicants number (professional scheme)		9996		12182		n.d.		11097		n.d.		n.d.	
SCOP (ha) all producers (COP + set-aside)	202304	167497		157238		112133		131724		143092		168266	
SCOP (ha) professional scheme (COP + set-aside)	135934	131168		127648		91890		112058		117973		141271	
SCOP (ha) simplified scheme	66370	35246		28875		19528		19579		25119		26995	
Real set-aside scheme (set-aside/SCOP all producers)	10,57%	19,77%		17,11%		10,32%		7,67%		6,51%		16,30%	
Professional set-aside rate (set-aside/SCOP professional scheme)	15,72%	24,16%		20,35%		12,59%		10,32%		8,57%		6,60%	
Total set-aside (ha)	21375	33110		26911		11569		10105		9319		27431	
Rotational set-aside (ha)	21375	14871		17157									
Total set-aside (ha) (apart from extraordinary)	21375	33110		26911		11569		10105		9319		27431	
Compulsory set-aside	21375	24734	75%	22020	82%	10105	87%	9622	95%	9050	97%	19729	72%
Voluntary set-aside		8376	25%	4891	18%	1464	13%	483	5%	269	3%	7702	28%
Paid at 48'3 ecus set-aside									0%				
No paid set-aside									0%				
No food set-aside		350	1,1%	361	1,3%	137	1,2%	47	0,5%				
Five year set-aside (R.2328/91)		3065		2021		1665		472					
Extraordinary set-aside													

Source CE DG Agriculture (MAPA)

2.2.2. Characteristics of the Regionalisation plan. Aragón

Table 5 Base Area Aragón (has)

CCAA	1994			1997		
	Dry land	Irrigation land		Dry land	Irrigation land	
		Total	Maize		Total	Maize
ARAGÓN	724029			1.184.853	260.000	36.250
ESPAÑA	8.096.192	1.123.521	720.360	7.848.624	1.371.089	403.360

Source: MAPA

COP base area in Aragón represents 15 % in dry land and 19 % in irrigation land over total national COP.

Table 6 Yield cereals distribution. Mean value. Aragón.

1994				1997			
Dry land		Irrigation land		Dry land		Irrigation land	
Mean yield Tm/Ha	Mean yield. Tm/Ha	Maize yield Tm/Ha	Other cereals yield Tm/Ha	Mean yield Tm/Ha	Mean yield. Tm/Ha	Maize yield Tm/Ha	Other cereals yield Tm/Ha
1'8	5'4	7'7	4'3	1'9	4'2	6'4	3'1

Source: MAPA

The table above shows mean values in the region as a whole. The region is made up of rural areas each one being assigned different yields. Every rural area yields are detailed in annex 3 as well as a map showing homogeneous areas in relation to regionalisation plans.

Table 7 Regionalisation plan bases. Aragón. 1.

Professional Scheme. Dry Land												
Years	Cereals			Oil seeds			Protein Crops			Set-Aside		
	€/t.	t./ha.	€/ha.	€/t.	t./ha.	€/ha.	€/t.	t./ha.	€/ha.	€/t.	t./ha.	€/ha.
93	25	1,8	45	163,9	1,8	295	78,49	1,8	141,28	68,83	1,8	123,894
94	35	1,8	63	172,8	1,8	311	78,49	1,8	141,28	68,83	1,8	123,894
95	54,34	1,8	97,812	0	1,8		78,49	1,8	141,28	68,83	1,8	123,894
96	54,34	1,9	103,246	94,24	1,9	179,056	78,49	1,9	149,13	68,83	1,9	130,777
97	54,34	1,9	103,246	83,87	1,9	159,353	78,49	1,9	149,13	68,83	1,9	130,777
98	54,34	1,9	103,246	94,23	1,9	179,037	78,49	1,9	149,13	68,83	1,9	130,777
99	58,67	2	117,34	81,74	2	163,48	72,5	2	145	58,67	2	117,34

Source: MAPA , FEAGA

Table 8 Regionalisation plan bases. Aragón. .2

Simplified Scheme – Dry Land									
Years	Cereals			Oil seeds			Protein crops		
	€/t.	t./ha.	€/ha.	€/t.	t./ha.	€/ha.	€/t.	t./ha.	€/ha.
93	25	1,8	45	25	1,8	45	25	1,8	45
94	35	1,8	63	35	1,8	63	35	1,8	63
95	54,34	1,8	97,812	54,34	1,8	97,812	54,34	1,8	97,812
96	54,34	1,9	103,246	54,34	1,9	103,246	54,34	1,9	103,25
97	54,34	1,9	103,246	54,34	1,9	103,246	54,34	1,9	103,25
98	54,34	1,9	103,246	54,34	1,9	103,246	54,34	1,9	103,25
99									

Source: MAPA , FEAGA

Table 9 Regionalisation plan bases. Aragón. 3.

Professional Scheme- Irrigation land						
Year	Other Cereals			Maize		
	€/t.	t./ha.	€/ha.	€/t.	t./ha.	€/ha.
93	25	4,3	107,5	25	7,7	192,5
94	35	4,3	150,5	35	7,7	269,5
95	54,34	4,3	233,662	54,34	7,7	418,418
96	54,34	3,1	168,454	54,34	6,4	347,776
97	54,34	3,1	168,454	54,34	6,4	347,776
98	54,34	3,1	168,454	54,34	6,4	347,776
99	58,67	3,7	217,079	58,67	7,4	434,158



	Oil seeds			Protein crops			Set-Aside		
	€/t.	t./ha.	€/ha.	€/t.	t./ha.	€/ha.	€/t.	t./ha.	€/ha.
93	54,6296	5,4	295	78,49	5,4	423,846	68,83	5,4	371,682
94	57,5926	5,4	311	78,49	5,4	423,846	68,83	5,4	371,682
95	0	5,4		78,49	5,4	423,846	68,83	5,4	371,682
96	94,24	4,2	395,81	78,49	4,2	329,658	68,83	4,2	289,086
97	83,87	4,2	352,25	78,49	4,2	329,658	68,83	4,2	289,086
98	94,23	4,2	395,77	78,49	4,2	329,658	68,83	4,2	289,086
99	81,74	5	408,7	72,5	5	362,5	58,67	5	293,35

Source: MAPA , FEGA

Table 10 Regionalisation plan bases. Aragón. 4.

Simplified Scheme – Irrigation land												
Year	Other Cereals			Maize			Oil seeds			Protein crops		
	€/t.	t./ha.	€/ha.	€/t.	t./ha.	€/ha.	€/t.	t./ha.	€/ha.	€/t.	t./ha.	€/ha.
93	25	5,4	135	25	5,4	135	25	5,4	135	25	5,4	135
94	35	5,4	189	35	5,4	189	35	5,4	189	35	5,4	189
95	54,34	5,4	293,436	54,34	5,4	293,436	54,34	5,4	293,44	54,34	5,4	293,436
96	54,34	4,2	228,228	54,34	4,2	228,228	54,34	4,2	228,23	54,34	4,2	228,228
97	54,34	4,2	228,228	54,34	4,2	228,228	54,34	4,2	228,23	54,34	4,2	228,228
98	54,34	4,2	228,228	54,34	4,2	228,228	54,34	4,2	228,23	54,34	4,2	228,228
99												

Source: MAPA y FEGA

2.2.3. Traditional fallow Rate

Traditional fallow rates are specific for each rural area. The detail is in annex 3



3. ANSWER TO QUESTIONS 411 TO 421

To answer these evaluation questions we have performed a **quantitative analysis** of official data¹, finished off with a **qualitative analysis** taken from surveys made to farmers² and interviews performed to managers and experts³ familiarised with this sector or with some specific aspects of the implementation of the set aside of land.

To analyse surface area, production and yield of COP crops official data and the set aside and fallow, we have taken a reference period before the implementation of land set aside and we have extracted the trend of this period to compare it with the data obtained during the period of implementation of the set aside of land. The outcomes of this analysis were compared and finished off with the data obtained from the surveys made to farmers and the answers of managers and experts. Finally, we have summarised quantitative and qualitative information to give a synthetic answer to the evaluation questions

3.1. Question 4.1.1:

Have voluntary and compulsory set aside of land measures significantly contributed to control the production of arable crops? What is its particular contribution to reduce cereal surplus production?

- **Sinthetic answer**

The set aside of land has contributed to control arable crops in Aragón because from its implementation the cultivated surface decreases and the total COP surface area remains in an average of a 11 % below the surface that might be expected with the trend of the previous period.

Nevertheless, the set aside surface area represents a 14'25 % of total surface along the implementation period, a percentage three points above the reduction of deducted cultivated surface (11 %). Consequently we can say that marginal land is recovered to locate a part of set aside.

Annual average production in the period 93-99 decreases in a 8'7 % regarding the annual average production in the period 85-92. The decrease of production is lower than the decrease of surface due to the fact that the set aside effect is opposed by a slight increase of yields in cultivated lands.

The analysis let us estimate that in absence of set aside of land measure, but keeping the compensatory payments, the production would be a 12 % higher. This increase of production does not correspond with the set aside surface area (a 14'25% of the total) because part of this set aside is located in marginal land.

All reduction of COP production is attributable to cereals because their production represents above the 92 % of COP production.

- **Detail of answer**

¹ VID Anex 2 Production and Surface COP data

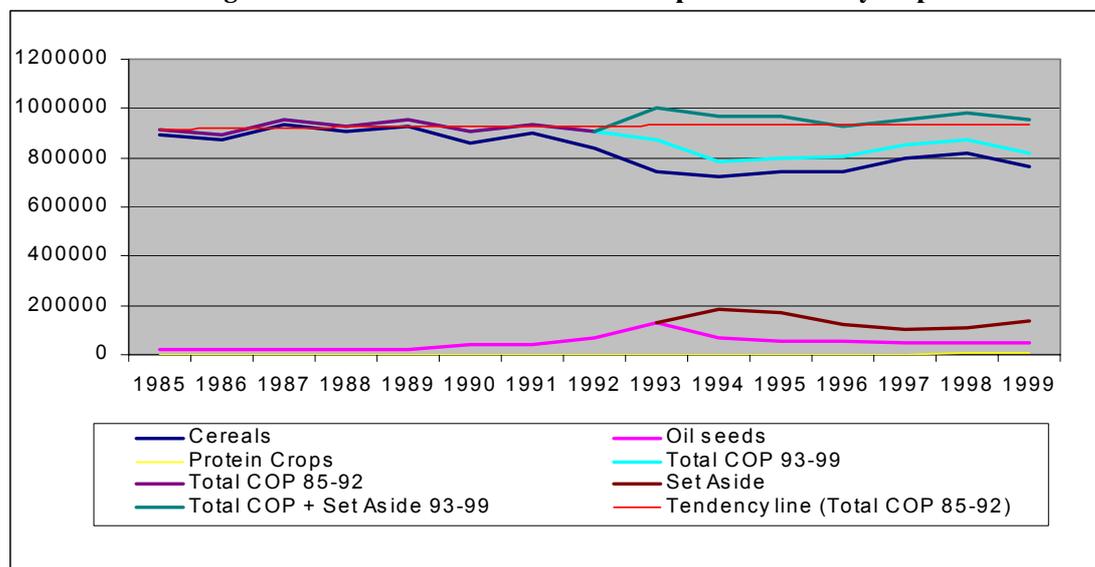
² VID Anex 6 Survey results

³ VID Anex 4 Managers and experts interviewed



COP surface area in Aragón has a constant trend along the period 85-92. From the implementation of set aside of land it experiences a significant decrease in the period 94 – 96. The annual average cultivated surface area in the period 93-99 is lower in 95.000 has. (regarding the annual average surface area of previous period).

Figure 9 Evolution and distribution of Cop surface area by crop.



Source: Data taken from MAPA

Figure 9 shows that the total COP surface area for the period 93-99 (Light blue line) remains in an average of a **11%** below the surface area that would be expected for the same period as indicated by the trend line extracted for the previous period (red line).

Consequently, we can deduce that **the reform of CAP in 1992, and specifically the set aside of land measure, has contributed to control the COP production surface area.** Nevertheless, the **total set aside of land have meant a 14'25 % of COP surface**, a percentage three points higher the reduction of cultivation surface area (11 %). So, excepting 1996, **the total surface area (COP + set aside)** is above the trend line of period 85-92.

The difference between the contribution to production control of compulsory and voluntary set aside is shown in question 4.1.2.

By crops, cereals represent globally during the whole period more than the 94% of COP surface area, corresponding a 5% of it to oil seeds and protein crops scarcely reach a 0'2 %.

The evolution of COP surface by crop groups is as follows:

- Cereals, representing a majority along the whole period, from 1993 on give part of their surface area to oil seeds and move from a 96% to 92% of COP surface area.
- Oil seeds that had a slightly downward trend in the period 85-92 double their surface in 1993, decreasing again in the next period. They represent the 8 % of surface area in the period 93-99 and a 6% in the last ones.
- Protein seed surface area is not taken into account for this analysis because, unless it increases from 1993, is set in this period in a 0'3 %.

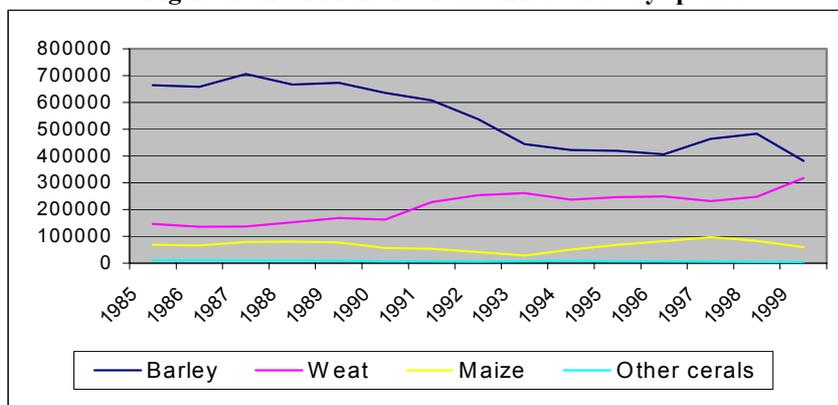


- **Set aside surface area represents a 14'25 % of the total surface area (COP + set aside)** while cultivated surface area decreases in a 11% with respect to the expected surface area in absence of the measure.

By crops, cereals indicate the surface decreasing trend, being the principal crop.

Evolution and distribution of COP surface area by species.

Figure 10 Evolution of cereal surface area by species

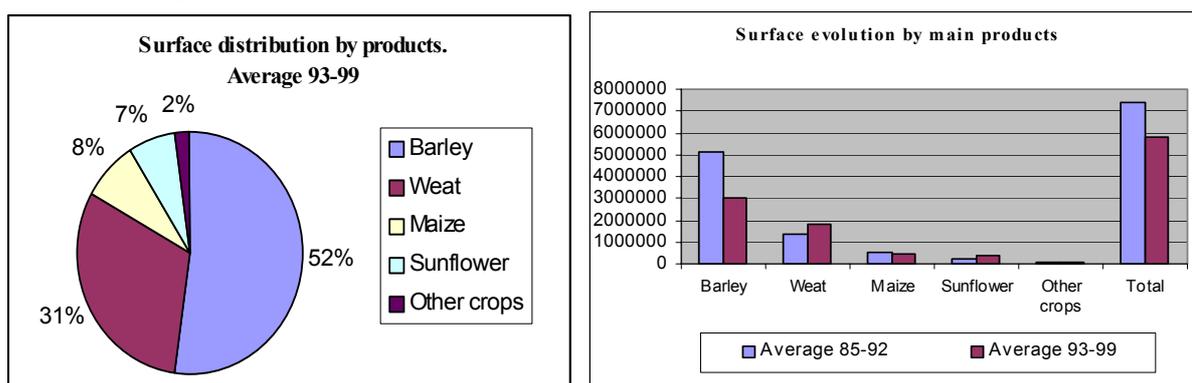


Source: MAPA

- Barley, which represented a 73% of surface during the period 85-92, occupies a 57% in the period 93-99. At the same time, wheat changes from a 20 to a 34%. Nevertheless, the substitution of wheat surface for barley happened in the previous period, keeping these surface areas during the period 93-99, until the last year, where surface areas of wheat and barley become again convergent. Maize has a 9% of surface.
- Sunflower represents a 99 % of oil seeds surface area

Globally barley, wheat, maize and sunflower have the 98 % of COP surface area. The decrease of cultivation surface in the period 93-99 is due to barley surface and very slightly to maize. Wheat and sunflower surface areas increase.

Figure 11 Evolution and distribution of COP surface area by major species.

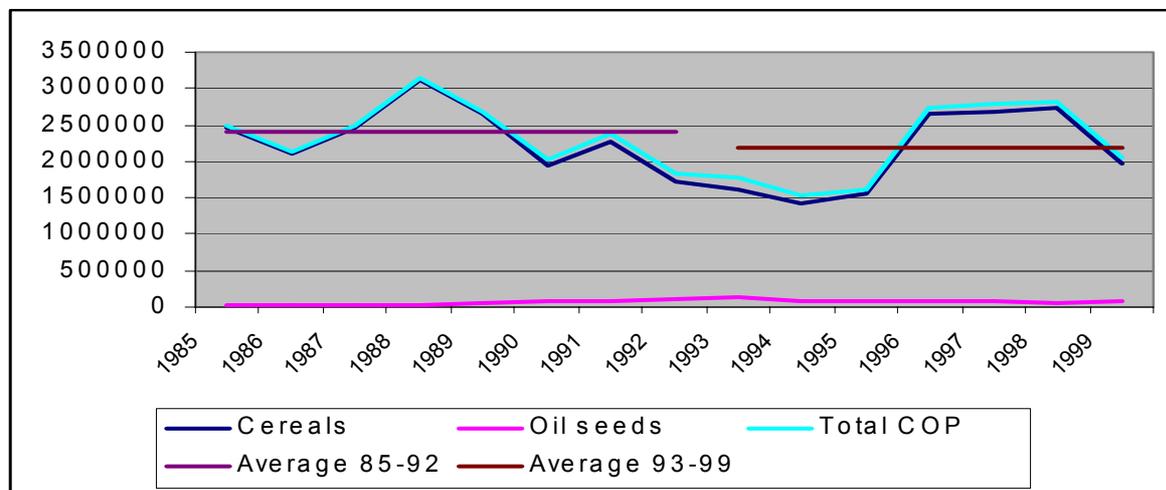


Source: Data taken from MAPA

Evolution and distribution of COP production

The production curve along the period 1985-1997 is very irregular due to the fact that yields vary a lot year by year. Nevertheless, it is noted that **the annual average production in the period 1993- 99 decreases an 8'7 % with respect to the annual average production in the previous period** (Figure 12).

Figure 12 Evolution and distribution of COP production



Source: Data taken from MAPA

The reduction in the production (8'7 %) is smaller than the reduction of surface. This is due to a decrease of surface that is opposed with an enhancement of yields, which increase a 1'65 %, from 2'59 to 2'63 t/ha. This increase of yields is a result of technological development.

Reduction of production attributable to the set aside of land

To estimate the production that would exist in case of absence of set aside of land policy; we may do the following:

- The area appeared below the trend line of cultivated surface area for the period 85-92 and above total COP 93-99 line as shown in Figure 9 (a total of 700.000 has. approx.) would be non-marginal land and would have average yields equivalent to the rest of cultivated surface area (2'63 t/ha).
- The surface area above the trend line and below Total COP + Set Aside 93-99 line (a total of 200.000 has approx.). we assume that it corresponds to marginal land and it would have minimum yields. (1'2 t/ha.)⁴.

$$Pr = (700.000 * 2'35) + (200.000 * 1'2) = 2081000 \text{ t. Approx. } 300.000 \text{ t by period.}$$

According to these estimations, as a result of the set aside of land the total production is reduced in a 12 % with respect to the production that would have been expected in absence of the measure while the set aside area represents a 14'25 % of the total surface area.

Set aside of land influences in a decrease of production, but this decrease is lowered by the location of part of the set aside in marginal land.

The **data from the survey** regarding rotation and situation of the set aside are:

- a 42'4 % of them perform rotational set aside
- a 12'1 % perform fixed set aside
- a 45'5 % rotate part of the set aside and fix the other part.

⁴ 1'2 t/ha is the minimum yield appearing at the Regionalization Plan

A 63'3 % locate part of the set aside in small, extended, not very rich or non-watered, sloped, or rarely cultivated plots along water courses.

Particular contribution to the reduction of production of surplus cereals

All the reduction of COP production is attributable to cereals. As indicated by the Figure 12, the cereal production curve is coincident with the total production curve. Cereal production represents more than the 92 % of the total production.

- **Limits**

To answer the particular contribution of COP crops reduction to the production of surplus cereals it is supposed that the distribution of COP cultivation groups in set aside is the same as the one for the rest of surface area.

3.2. Question 4.1.2:

In what proportions has the remuneration of the voluntary set-aside strengthened the effectiveness of the set-aside instrument? Estimate the share of the voluntary set-aside areas that would have been unproductive in the event of absence of the measure.

The estimation of set aside surface areas that would have been in the event of absence of the measure will be done under two assumptions: in absence of the set aside of land measure and in absence of compensatory payments policy and continuation of the previous system.

- **Synthetic answer**

We can estimate that the proportion in which voluntary set aside payment reinforces the instrument of set aside of land is smaller than the proportion which affects its surface area (23'6 %) due to the voluntary set aside is distributed spatially in less productive holdings

In absence of this measure, the whole surface area will be sowed to get all compensatory payments.

In absence of compensatory payment policy and continuation of the previous system, we can estimate that the total set aside of land (compulsory and voluntary) would be non-productive and there will exist a non-productive additional surface area equivalent to 85.000 has. by period.

- **Detail of answer**

The proportion of voluntary set aside which reinforces set aside of land is:

$$S = S_V / (S_V + S_O) = 227990 / (227990 + 736244) * 100 = 23'64 \%$$

Farmers do not distinguish in the land between compulsory and voluntary set aside. Nevertheless, a study performed about the set aside process and its distribution in Aragón⁵ concludes that the biggest surface areas in Aragón are located in areas with dry and half-dry climatic conditions and poor soils with few organic material. In this case, the profitability of holdings is very low, so the choice of set aside is very positive, in economic terms. Holdings that only perform compulsory set aside are the

⁵ Errea et al. (en prensa)

richer ones. So, the proportion in which voluntary set aside reinforces the instrument of set aside is lower than the proportion in which it reinforces its surface area.

The **outcomes of the survey** indicate that a 60'6 % have performed voluntary set aside. The reasons given are the following:

- Preventive measures for not to have penalties in case of being under the maximum set aside rate: 48'5 %
- Economic reasons (payments for the best set aside in relation with the crop): 30'3 %
- Reduction of the on-going activity: 21'2 %
- Chance to enlarge the lifetime of the machine: 12'1 %

The share of the voluntary set-aside areas that would have been unproductive in the event of absence of the measure.

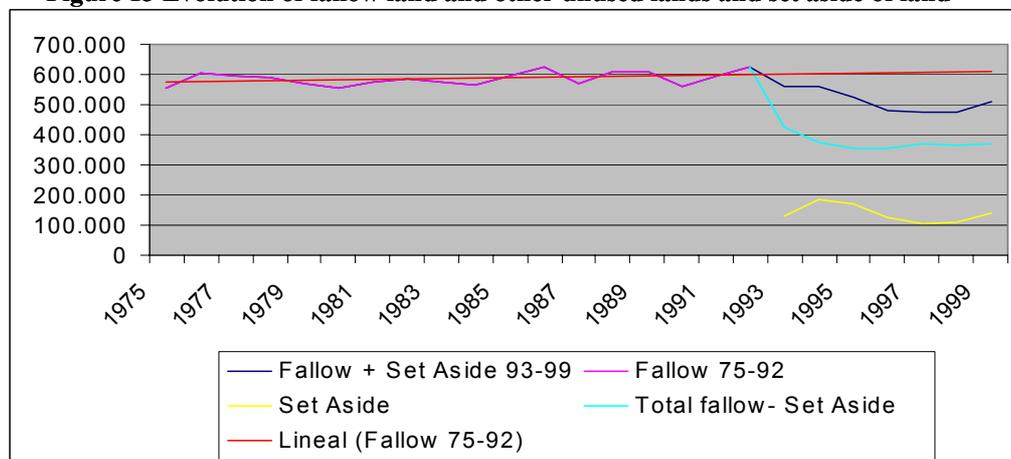
As shown before, marginal land is recovered and the set aside is located there. In opinion of all people asked, **if the possibility of set aside a part of the surface area would not exist, the land would be recovered anyway and sown to get the compensatory payments.** This happened in 1993 where most of sunflower seeds were sown in marginal land and the increase of surface area does not correspond with an increase of production. See Figure 9 and Figure 13.

If compensatory payments policy does not exist and the system of previous period is still on going there will be non-productive land. To estimate the surface area of set aside that would be non-productive we have to look at the trend followed by total fallow land and other lands not used during the previous period and compare them with the period of implementation of set aside of land. Statistical data do not include categories separated from abandoned lands and include temporarily out-of-use land as well as fallow surface lands.

Total fallow surface area and other non-occupied lands remain more or less constant during the period before the implementation of set aside of land policy. From 1993 this surface area decreases despite the implementation of set aside of land. (Figure 13).

Statistical data do not include categories separated from abandoned lands and include temporarily out-of-use land as well as fallow surface lands. Agronomic fallow coming in the choice of crops has a temporal downward trend as a result of technological development (it decreases as the mechanisation, use of fertilisers and change from dry lands to irrigation lands increase). So we can conclude that temporarily out-of-use lands are increasing at the same time as agronomic fallow decreases remaining constant non-occupied lands. (pink line, Figure 13).

Figure 13 Evolution of fallow land and other unused lands and set aside of land



Source: Data taken from MAPA and FEAGA

The decrease of non-occupied lands happened from 1993 on can be explained because as a result of CAP reform in 1993 out-of-use lands are recovered due to the fact that this new policy make them profitable. The principal use of this lands is non-COP crops (mainly leguminous and forage to computation of cattle density) as notified by the managers surveyed. We can not say that a part of traditional agronomic fallow is computing as set aside of land, because there are some traditional fallow indexes of compulsory fulfilment.

Analysing the information given by Figure 13 we can conclude that if the policy previous to the reform of 1993 continues, the whole set aside land will remain non-productive. There would be even an additional non-cultivated surface area equivalent to approximately 85.000 has. as deduced from the graphic (difference between dark blue line and red line)

Nevertheless this estimation is under different **limitations**:

- The fallow data and other unused lands (pink line), and fallow and other unused lands + set aside (dark blue line) came from the same historical series in the yearbook of Ministerio de Agricultura, Pesca y Alimentación. It had some methodological changes when obtaining the data, precisely during the years when the 1992 reform came into force.
- The set aside of land data (yellow line) came from declarations of crops presented to the payer organisms, so this source is different from the fallow data, although both are official data.

3.3. Question 4.1.3:

To what extent was the set-aside instrument determining in the no-food crop production trend?

The existing data and the opinion of experts confirm that the production of non-food crops was almost non-existent until the beginning of the set aside policy. Consequently, **The instrument of the measure of set aside land was determinant in the development of non-food crop cultivation**, but it had a slight influence, and these crops have evolved very discreetly.

Table 11 Percentage of no food production at set aside land. Aragón

	1993	1994	1995	1996	1997	1998	1999
Total Set Aside	132462	183635	170209	125496	105217	107965	139250
Total No Food		365	670	274	76	198	1726
%	0,00%	0,20%	0,39%	0,22%	0,07%	0,18%	1,24%

Source: Data taken from MAPA and FEAGA

The measure had poor influence, it does not reach a one per cent in 96-98. In the opinion of managers this is due to:

- Risk of penalty for irregularity: the regulations are very demanding, too many contractual requirements and penalty risk to all the file.
- It requires an industry to formalise the contract
- Absence of tradition in this type of products: the crops intended to implement are:
 - *Ipéricum*, it was not adapted due to the fact that it is an unknown crop and producers were not advised
 - *Cinara*, it was not adapted because the transport is too expensive (very light weight) and the price of product is not worth.

The reasons given by producers for not to perform set aside with non-food crops are the following::

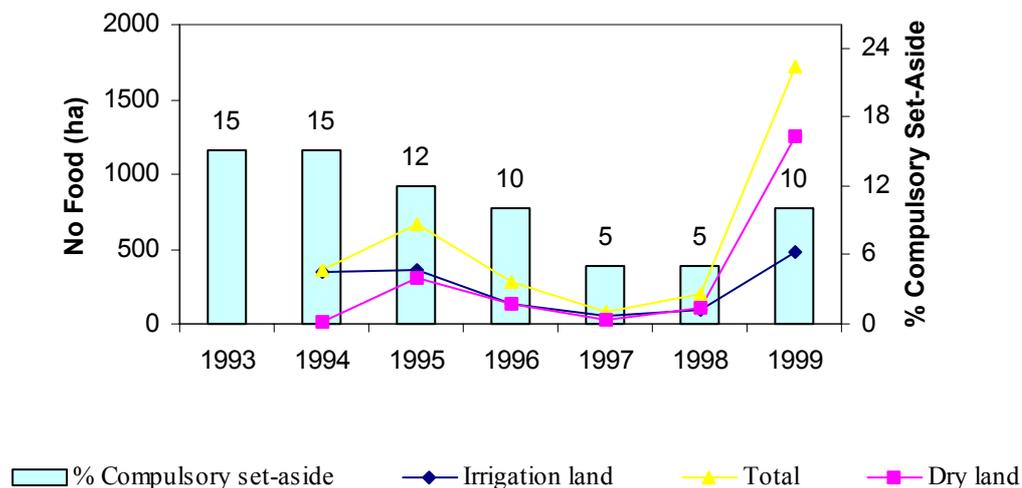
- Not profitable: 56'7%



- So many contractual requirements: 27'3 %
- Others: 9'1 %

Two of the producers asked have performed set aside with non-food crops. The reason given was profitability and one of them also indicated agronomic interest in rotation and that it allow for a cheaper soil maintenance.

Figure 14 Evolution of no food surface compared compulsory set aside rate



Fuente: elaboración propia. Datos FEGA.

The increase of the non food production in the last period (as shown in Figure 14) is due to the entry of cereals as a result of the opening of an ecofuel transformer.



4. ANSWER TO QUESTIONS 422 TO 434

There is a double criterion to answer these questions.

In one hand, we used the set of indicators used to answer the previous questions, as well as the conclusions, to establish the practical impact of the implementation of set aside of land on surface areas and productions.

Also, we have made other specific indicators regarding to yields of crops and market conditions. To make this we took a reference period previous to the implementation of the set aside of land.

In the other hand, we have analysed the behaviour of farmers and the opinion of managers and experts was required. This second element has more significance in this second set of questions than in the other, because we have evaluated in a direct way the criteria followed by farmers of this region for the set aside implementation. The surveys to managers and experts were used as a validation element for the surveys to farmers, to use them as generalised of the whole region.

Finally, the analysis of information shown by the answer is summarised in a synthetic answer following every question..

- **Limits**

The sample size for the area where surveys were performed is very small and is not representative enough. Also the farmers can give their opinions with the intention of giving the image of being good producers.

So it is important to compare the outcomes of the analysis with the global image of managers and regional experts.

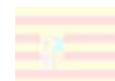
4.1. Question 4.2.2:

Is the impact of the compulsory set-aside rate and of the payment level on the large producer's income likely to amend their crop choice so as to answer better the requests of the market? This question will be analysed at the level of the selected production regions for the question 411. The consultant will carry out then a synthesis at the Community level of the main conclusions.

- **Synthetic answer**

Set-aside rates and associated compensation have had a moderate impact on the choice of crop alternatives in the region: 55% of farmers surveyed admit that they have modified their alternatives.

52% of farmers surveyed declare that they have not experienced any reduction in income. A similar number declare that the current system is unfavourable. The percentage is higher in the case of large producers (56%) versus small (50%). Variations in percentages are due to the fact that farmers have considered other factors in their answers, in addition to the economic aspect, e.g. that land-linked aids create a feeling of dependency that did not exist in the previous practice of price subsidies.



In Aragón farming conditions, and in consequence the crop rotation, vary widely depending on local geography, therefore the impact of set-aside also varies from one location to another.

The impact of set-aside can be estimated as inversely proportional to the habit of practicing traditional fallow.

From the business perspective, the farmer must maximise the profitability of his holding, especially if productive area is reduced. However, in the current aid context, set-aside represents a profitable activity in holdings located in the region's less productive areas, therefore there is no economic need to increase the profitability of the rest of the holding to compensate a hypothetical fall in income.

Interest in diversifying crops and the search for alternatives to COP crops increase in locations with a higher average yield.

- **Method**

The evolution of the surfaces of the different crops along the periods 85-92 and 93-99, (see Figure 9 and Figure 10), states the global effect of the possible modifications experienced by the individual crop alternatives of producers. These surveys were used to estimate how much these estimations are influenced by the implementation of set aside or other reasons.

The claims of the market are estimated across the evolution of prices for the main COP products along this period. The other elements that influence the determination of crop rotation must be established to differentiate the effects of set aside of land.

- **Detail of answer**

The average yields of Comunidad autónoma de Aragón are 2 t./ha. for dry land and 5 t./ha. for irrigated land. Given these values, the limit to be considered great producer is 46 ha. of dry land or 18,4 ha. of irrigated land. Classifying like this, more than the 80% of the region taken into account are a part of big holdings, so we can assume that the behaviour of the variables at regional level is representative of the reality of big holdings.

Yield of holdings

Among the farmers surveyed, the 46 affirm having a decrease in their global yields due to CAP, while a 52 % did not have a decrease in their incomes.

With regard to compensation for set-aside, 57% of farmers indicate that it effectively helps maintain income, and 39 % further state that the aids are used to cover the cost of maintenance of set-aside plots. 30% believe that compensation serves other functions, e.g. to reduce surplus production or to maintain activity in rural areas.

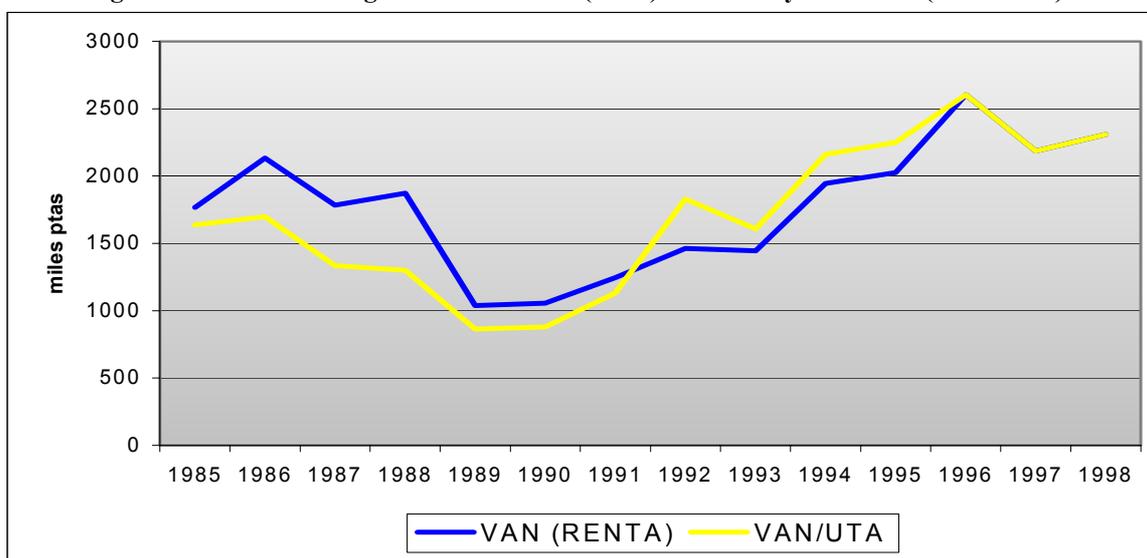
The average maintenance cost of set-aside plots declared by farmers surveyed is 93,8 €, lower than the amount of aid assigned, which averages between 130.37 € and 323.90 € per hectare for Aragón. The figures obtained show that aid amply covers the cost of maintenance of set-aside plots and offers an additional margin of compensation for the loss of income due to improductivity of the set-aside lands.

30 % of farmers surveyed believe that compensation for set-aside is better than the income from crops. This ties in with the 33 % of farmers who showed interest in exceeding the set-aside limit.



Set-aside is more beneficial for large producers, judging from the fact that this collective considers the current system as negative in 44% of cases, versus 50% of small producers. These percentages tie in with the fact that 46% of farmers surveyed claim to have experienced loss of income. The following figure shows the evolution of agricultural income in Aragón:

Figure 15 Evolution of agricultural income (VAN) and rent by work unit (VAN/UTA)



Source: MAPA

Evolution of income is closely linked to market conditions because, as shown in Figure 16, product prices have not fallen as much as might have been expected, due to the fact that production at national level is low. Thus, the years constituting the first half of the period under study were highly profitable for COP producers in the region.

The start of application of the CAP and of set-aside measures represented a reversal in the evolution of average agricultural income in Aragón.

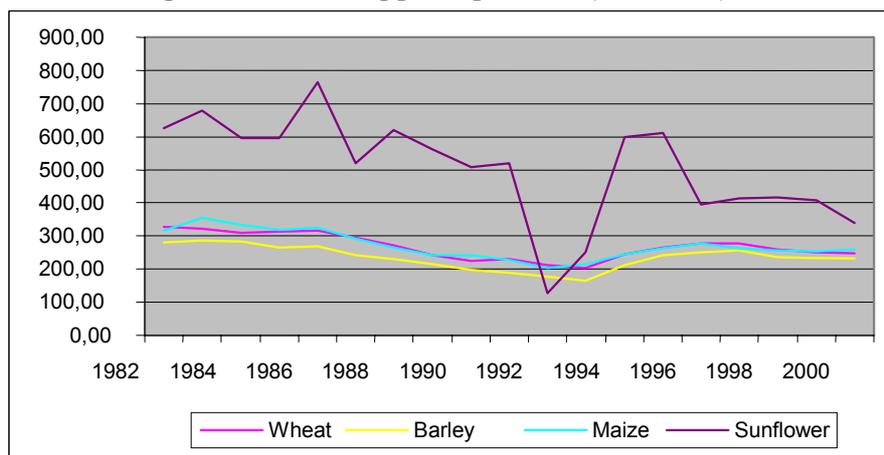
The downward trend came to a halt and average income increased as a result of application of the new measures.

Cultivation choices and market claims

36,4% of producers surveyed stated that they had modified their crop rotation in order to maintain income, while the remaining two-thirds have not made any significant changes. Despite this low rate of substantial change, on the regional level the effect of set-aside on crop rotation is apparent. As shown in Figure 9, application of set-aside caused a reduction in cereal surface in inverse order of importance.

Figure 10 shows that barley is the crop most affected by set-aside, leading to the conclusion that the position currently occupied by set-aside in terms of crop rotation has been achieved at the cost of barley farming. Also, the significant growth in surface dedicated to wheat is due in part to the positive agricultural impact of set-aside, which has made it possible to increase the surface dedicated to more demanding crops such as wheat.

These modifications in the choice of crops are not only due to the reduction in farming area resulting from compulsory set-aside, but also to a general search for increased efficiency of operations to face market demands. These demands are established in Figure 16 as the sum of aids plus sale price charged by the farmer.

**Figure 16 COP selling prices plus aids. (Real terms) €/t.**

Source: Data taken from INE.

Market conditions in the period 92-99 have not been more unfavourable than those in the period 85-99; except for oilseed crops, the average of the previous period was maintained.

Market conditions have improved in comparison with the campaigns immediately prior to the launch of the CAP, but not in comparison with preceding years.

100% of farmers believe that set-aside is necessary, however, they do not refer to it in isolation but rather as an essential condition to access the remainder of CAP aids. **The majority of producers do not consider set-aside to have significantly impacted their income, and tend to evaluate the effects of CAP in an overall context.**

On the other hand, a direct relationship cannot be established between land set-aside and the transformation in crop rotation, since **agricultural production in Aragón is determined principally by environmental factors** (a dry, cold climate and poor soils); further, set-aside has not caused significant changes in crops or practices because farmers have traditionally let land lie fallow and were therefore already familiar with this practice.

On a detailed level, areas where the impact has been more significant can be identified. In more productive areas (see Annex 3: Regionalisation Plan) set-aside has had more impact, because fallow practice was not customary.

Relation with surplus productions

With regard to the modifications in crop rotation, practically all changes have remained within the context of COP crops. As shown in the following table, 100% of producers have either increased or reduced the significance of COP crops in their crop rotation. Also, a net increase in the importance of non-COP crops has been observed in 22% of the survey, and in other farming activity in 20% of cases.

An effort to regain balance is the trend most clearly observed, by means of the **optimisation of relations of significance within the context of COP crops** based on the campaign conditions of each product, and a slower rate of diversification through the introduction of new non-COP crops and the development of other non-agricultural activities.

Table 12 Percentage of activity variation at surveyed holdings due to set aside

	Variation of activity	Developed activities	Reduced activities
COP crops	100%	83 %	89 %
Non-COP crops	39%	33 %	11 %
Other activities	34%	37 %	17 %

Source: Data taken from surveys to producers.



Regarding the principal criteria for choice of crops, reflected in the following table, it is observed that the main factor is profitability and the consequent need to minimise risk. For this reason, crops that receive aid are the main option for production in extensive operations in Aragón, since they represent a minimum guaranteed income.

Table 13 Base criteria to manage surveyed holdings

Main criterion	Agronomic	Profitability	Easiness
	23,3%	73,7%	3%

Source: Data taken from surveys to producers.

4.2. Question 4.3.1:

Did the existence of a remunerated set-aside encourage good crop rotation and which were the alternative crops in the plots where a set-aside was established?

- **Synthetic answer**

Voluntary remunerated set-aside has contributed significantly to good crop rotation - 46% of the survey. Its effects have been neutral in 42% of the survey, and negative in only 12% of cases. Set-aside has encouraged moderate crop rotation, and has significantly contributed to maintain pre-existing rotation practices.

88% of farmers regularly rotate all or part of their set-aside plots.

Non-food farming of set-aside land has been minimal (6% of surveyed producers), therefore the effect of set-aside on rotation has not been diminished.

Voluntary remunerated set-aside introduces an element of flexibility and guaranteed profitability of holdings in locations with climatic limitations affecting crop rotation. Thus, 61% of farmers regularly practice voluntary set-aside.

Set-aside has become an alternative to principal COP crops but has not displaced minority crops, and has therefore increased the relative importance of these minority crops in the mix, and consequently the importance of rotation.

The tradition of fallow in the region has signified that from the first year of application, set-aside plots have received optimum treatment. Only 9% of the survey said they experienced difficulties to maintain set-aside land at the start of the measure, and 12% currently.

- **Detail of answer**

The existence of set-aside lands, both voluntary and compulsory, and current legislation governing the management of these areas, have caused an increase in the application of certain farming practices and the development of new techniques.

Set-aside has affected the traditional crop rotation, generating a new balance between land and farming practices.

Remuneration of set-aside has introduced a new economic factor lacking in previous traditional practice, which has influenced the balance of the new mix of crops.



Figure 13 shows that, starting in 1992, the amount of fallow surface in Aragón fell sharply, even taken into account the joint context of fallow and set-aside. As explained earlier, this indicates the recovery of abandoned lands.

Fallow practice has been fundamental in crop rotations prior to 1992 in the driest parts of Aragón, but not in high-yield areas (see Annex 3). Given the special climatic conditions in Aragón (wide variation of farming conditions based on geography) fallow practice was essential to guarantee maximum productivity in the central and southern areas where it allowed improvement of soil structure, organic content and capacity for water retention (J.M. Mateo Box, 1985), but not in the north nor in mountain areas.

52% of farmers surveyed already practiced fallow before the introduction of compulsory set-aside. Of the remaining 48% all, without exception, farm irrigated land.

Despite the fact that fallow was not a customary practice in half the holdings surveyed, it is noteworthy **that 88% of the farmers surveyed indicated that they had not experienced difficulties in managing set-aside lands**. It can therefore be said that a tradition of fallow practice exists in the region, but that application of the practice had decreased due mainly to technological improvements.

Since the introduction of remunerated set-aside, 61% of surveyed producers have in all cases opted for voluntary set-aside. Among the reasons given, 48% indicated that they chose this option as a precautionary measure to ensure compliance with aid regulations. Other reasons were direct economy (30%) and indirect economy, such as reduction in activity (21%) or the prolongation of the life cycle of machinery to optimise amortisation (12%).

From the criteria established to study the effects of set-aside on crop rotations by surveyed producers, the following analysis matrix has been developed:

Table 14 Matrix to analyse the effect of set aside in the rotation system

Type of effect of set aside in the rotation system	Rotation disfavoured by set aside	Neutral effect of set aside on the rotation	Rotation favoured by set aside
Cross-sections of cultivation practices regarding rotation system that allows for a classification (to be validated by interviewer according to the features of the region)	<ul style="list-style-type: none"> High percentage of fixed set aside Protrude of a crop from the rotation as a result of set aside Increase of single crop farming trend Not sowing of plants that enhance fertility (e.g. Leguminous plants in set aside) 	<ul style="list-style-type: none"> Continue with the same crops and rotations before and after set aside Cultivation of set aside lands with the same species but devoted to non-food cultivation 	<ul style="list-style-type: none"> Mainly rotational set aside Use of set aside with vegetable cover to enhance fertility Cultivation of set aside with new species (for production or not)

Source: Self made criteria regarding main regional features

The classification obtained from the survey analysis matrix reveals that the effect of set-aside on good crop rotation has largely been non-negative:

Table 15 Effect of set aside on crop rotation

Type of effect taken into account	Rotation disfavoured by set aside	Neutral effect of set aside on the rotation	Rotation favoured by set aside
Classification of holdings according prevalent practices	12 %	42 %	46 %

Source: Data taken from surveys to producers.



The majority of interviews show that set-aside has not displaced minority crops from the crop rotation, on the contrary these have increased, occupying part of the land previously dedicated to majority crops. Figure 9 and Figure 10 show that set-aside surface has been obtained by sacrificing barley, the majority COP crop. Parallel to the increase in set-aside and the benefits to soil and crops, an increase has been observed in the production of other minority COP crops, more demanding of water and soil conditions, such as wheat and, to a minor degree, protein crops.

These conclusions are reinforced by the fact that 88% of farmers practice rotation in all or part of their set-aside lands:

Table 16 Percentage of set aside rotation at surveyed holdings

Type of set aside rotation	100% of rotational set aside	Mixed system of set aside rotation	100 % fixed set aside
Farms classification according to set aside rotation	42 %	46 %	12 %

Source: Data taken from surveys to producers.

As indicated in the previous question, product mix undergoes modification in 100% of cases of COP crops, while the mix of non-COP crops is modified in only 33% of cases.

Non-food farming of set-aside land does not encourage rotation because the main crop is barley, the principal species in the region, and the trend is towards one-crop farming. Only 6% of surveyed farmers produce non-food crops on 59% of set-aside surface.

4.3. Question 4.3.2:

Did the location of the plots set-aside in use encourage better cultivation methods?

- **Synthetic answer**

It is not possible to establish a direct relationship between the location of set-aside plots and the evolution of farming techniques, although it is possible to affirm that set-aside has helped to consolidate and recover a series of good traditional farming practices.

Set-aside plots are rotated whenever this does not represent added difficulties in farm work, in which case they are usually left fixed.

Set-aside has represented the recovery of the role of fallow in crop rotation, as well as the specialisation in different rotation management techniques.

Where possible, set-aside has been applied in the locations most difficult to farm, which has helped to increase the overall efficiency of farming practices.

- **Detail of answer**

The remuneration of set-aside, and the mandatory nature of the measure, have introduced new criteria for the location of set-aside plots, which did not count for the practice of traditional fallow.

In the context of the mandatory nature of set-aside, the tendency has been to maximise the potential benefits deriving from the new situation rather than to minimise the losses generated with regard to the previous situation.

In terms of territory, where fallow practice was not customary in the years prior to 1992 since only 52% of farmers regularly applied the practice, the locations selected for set-aside are the following:

Table 17 Location of set aside lands at surveyed holdings

	Opción	%
Retirada rotacional	Use of rotational set aside	79%
Retirada Fija o libre	Location of set aside along water courses	6%
	Location of set aside in very small plots	42%
	Location of set aside in little rich or non-watered plots	51%
	Location of set aside in too far plots	12%
	Location of set aside in slope plots	6%
	Location of set aside in few grown plots	3%
	Location of set aside in plots specially bought to that	3%

Source: Data taken from surveys to producers.

In absolute terms, 77 % of set-aside surface in the region is regularly rotated.

By holding, 42% of them exclusively practice rotational set-aside, 45% practice both rotation and fixed set-aside, and 12% of the remaining holdings do not rotate set-aside plots.

In general the tendency has been to use set-aside in the same way as traditional fallow, so that benefits to the soil can generally be used for the following crop.

This practice has also been made compatible with fixed set-aside on plots presenting particular difficulties, therefore set-aside has also served to optimise holdings, retiring less efficient areas from cultivation.

To evaluate the agricultural impact of set-aside, the information obtained in the surveys has been analysed based on the degree of compliance with the following criteria:

Table 18 Main criteria to evaluate the agronomic effect of set aside of land

Positive agronomic effects	Negative agronomic effects
- Increase of average yield of holding.	- Abandonment of rich soils.
- Benefits for cultivation of next crop.	- Fragmentation of crop units

Source: Self made criteria regarding main regional features

The classification obtained based on the degree of fulfilment of these criteria by the surveyed producers, shows a non-negative effect of set-aside on farming practices, and a positive effect in one-third of cases:

Table 19 Agronomic effects of set aside on surveyed holdings

Type of effect taken into account	Positive agronomic effect	Neutral agronomic effect	Negative agronomic effect
Classification of holdings according to agronomic effect of set aside	55 %	39 %	6 %

Source: Data taken from surveys to producers.

The effect of rotation of set-aside lands has also been considered positive, observing that a significant percentage of set-aside is rotated regularly, as indicated in Table 15.

A double trend is observed: on the one hand there is an interest in maximising the benefits to soil derived from the rotation of set-aside plots, and on the other hand, fixed usage is applied to increase productive surface and optimise the holding.

It is clear that set-aside is rotated as long as it does not involve additional complications to farm work on the operation.

To evaluate the economic effect of set aside of land, we have analysed the information taken from the surveys according to the degree of fulfilment of the following criteria:

Table 20 Main criteria to evaluate the economic effect of set aside of land

Positive economic effects	Negative economic effects
- Increase of productiveness of the next crop - Increase of average yield of holding.	- Abandonment of rich agronomic soils. - Fragmentation of crop management units.

Source: Self made criteria regarding main regional features

The classification obtained according to the degree of fulfilment of the criteria by surveyed farmers, reveals a not negative effect of set aside according to economic results of holdings.

Table 21 Economic effects of set aside on surveyed holdings

Type of effect taken into account	Positive economic effect	Neutral economic effect	Negative economic effect
Classification of holdings according to economic effect of set aside	52 %	24 %	24 %

Source: Data taken from surveys to producers.

There must be considered as a limit the fact that at selected area, property structure is good and plots have a considerable size and farms are concentrated, being unusual dispersed farms and little plots. There the agronomic use of set aside is favoured by the land concentration, thus rotational set aside use is high. At other areas of region, where property is more divided, fixed set aside is more used, because little, far and hard to reach plots are more usual.

4.4. Question 4.3.3:

Did the existence of the remunerated compulsory set-aside cause production intensification in the other plots?

- Synthetic answer

Except in the case of maize, where a significant increase in yield has been observed, average yield increase is less than might have been expected if the conditions of the preceding period had been maintained.

The reduction in average yield growth is mainly due to the fact that payments associated with land (with payments for set-aside being inseparable from payments for farm land) do not incentivate production. This phenomenon occurs especially in arid, low-yield areas where profit growth is achieved through cost reductions and not by increasing production (60 % of producers state they have reduced production costs).

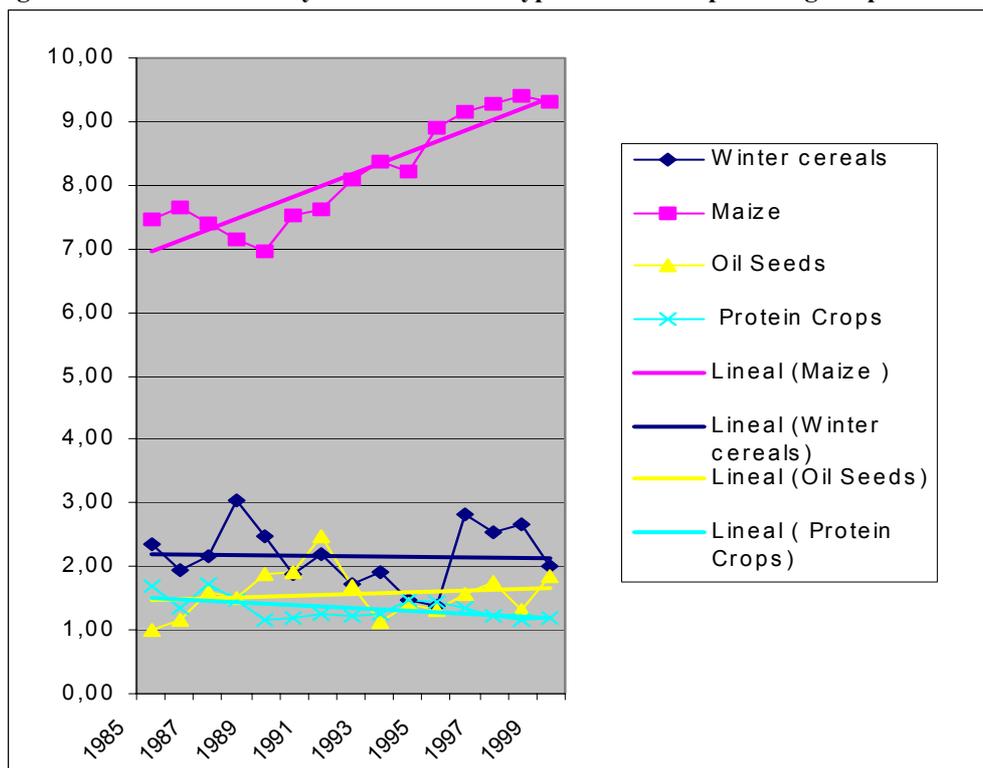
On the contrary, when yield is high, in irrigated land and specifically in maize farming, profit growth is achieved through increased production. This occurs in the area of the survey, where 90% of producers farm in irrigated lands and 54% state that their income has increased.

- **Detail of answer**

Observation of the evolution of average yields allows us to deduce if these vary in a different manner in the period 93-99 than in the period 85-92. Producer surveys and interviews with administrators have been used to estimate the degree to which this difference is influenced by the application of set-aside or by other causes.

Figure 17 shows the evolution in the yields of winter cereals (maize not included), spring cereals (maize), oilseeds and protein crops in the period 85-99.

Figure 17 The evolution of yields of the three types of COP crops during the period 85-99.



Source: Data taken from MAPA.

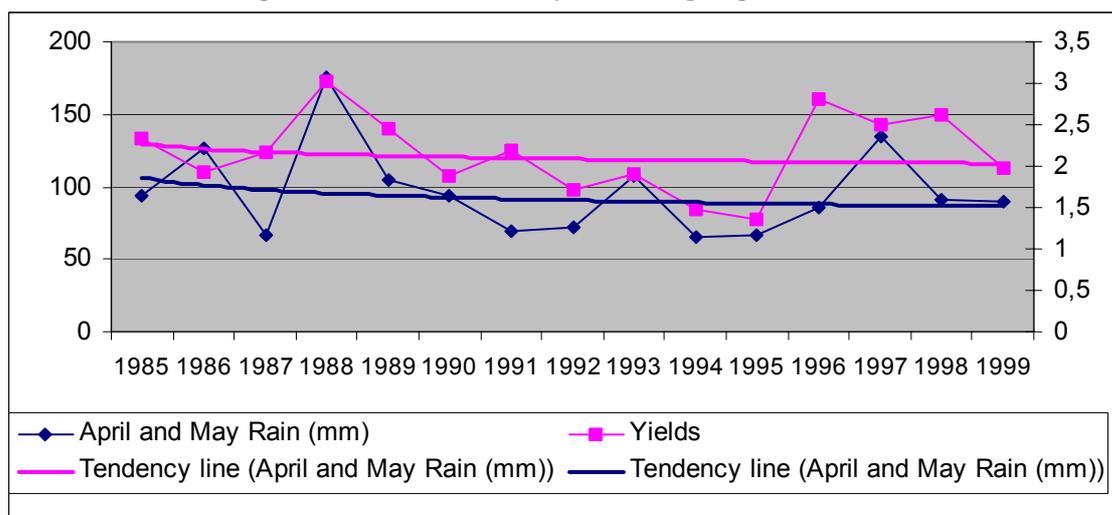
Average yield is constant in winter cereals, increased in maize and oilseeds and decreased in protein crops.

The growth in maize yield is constant throughout the period, and three times that of other cereals. As an irrigated crop, producers can more directly influence yield.

The yield of oilseeds, despite overall growth in the given period due to a bumper crop in 1991, is lower in the period 93-99 than in the period 85-92.

Yield is also influenced by climate, and depends on the quantity and quality of rain, temperature, frost, etc. According to agricultural engineers experts in climatology⁶, the best indicator of the influence of the climate on yield is observed by crossing spring rains (April and May) with yield. Figure 18 shows the relationship between rainfall in April and May and yield. The parallelism of figures for these two factors is notable.

⁶ VID Annex 4, People Surveyed

**Figure 18 Relation between yields and spring rain. 1985-1999**

Fuente: Elaboración propia. Datos MAPA e INE

Yield is also highly influenced by technological development. If we observe the evolution of yield over a long period during which the climate follows a constant tendency, we will see that yield increases as a result of technological development.

Cereals, being the major crop, indicate the global trend of Cop crops. The evolution of yield in winter cereals is compared using a reference period. To analyse if the yields are influenced by reasons different from technological development and climate, the reference period must be long enough to correct climate effects. Table 22 details the optimum period of years that the data series to perform climate studies must have, according to the World Meteorological Organisation. Following the W.M.O. guidelines, and to correct climatic effects affecting the evolution of yield, a reference period of forty years is taken. Within this period happened drought years, and years of much water, due to the fact that climatic incidences are cyclic

Table 22 Minimum number of survey years to climatological study (O.M.M.)

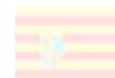
ELEMENTS	ISLANDS	COASTS	PLAINS	MOUNTAINS
Temperatures	10	15	15	25
Humidity	3	6	5	10
Cloudiness	4	4	8	12
Rainfall	25	30	40	50

Source: Landsberg y Jacobs, 1951

Figure 19 shows the evolution of winter cereal yields⁷ and their trend. Observing the historical evolution of yield over 40 years (53-92), extrapolating the tendency from said period to the period of application of set-aside measures (red line) and comparing it to the trend line for the entire period (53-99) (green line), we deduce that the increase in average yield is less that might be expected if the conditions of the preceding period had been maintained.

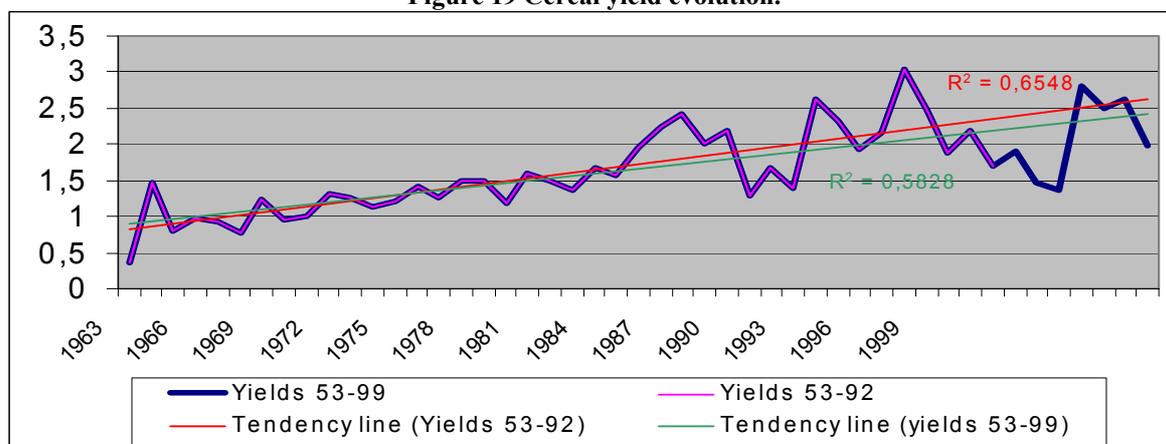
In the opinion of the interviewed administrators, this fall in yield growth is due to the fact that compensation associated with land does not incentivate production. It is estimated that farming costs are covered by a yield of 2 t/ha. In the areas where this yield is guaranteed, producers will try to increase production in order to obtain higher profits. This is the case of irrigated maize, with a yield

⁷ Evolution of winter cereals has been observed because these represent 86.6% of COP surface and 72.3% of COP production.



of over 7 t/ha. In dryer zones where in numerous years this yield rate is not achieved, which is the case in many areas of Aragón, profit growth is not obtained through increased production but rather by reducing farming costs.

Figure 19 Cereal yield evolution.



Source: Data taken from MAPA

The drop in yield of winter cereals is not influenced exclusively by land set-aside, but also by compensation payments and the drop in product prices, which do not incentivate production.

Survey to producers

54.5% of farmers state that they have adapted to set-aside by increasing yields. 60% state that they have reduced costs and labour. These data match with the reasoning we have been following, since 90% of the producers farm partly on irrigated land (with higher yields) and partly on non-irrigated land where yields are lower and costs are reduced.

4.5. Question 4.3.4:

To what extent has the existence of the compulsory set-aside modified the farm competitiveness by an adaptation of the productive structures? (e.g. farm size, farming prices, land prices, etc.)

- **Synthetic answer**

Starting in 1993, changes are observed in the size and number of holdings and in the purchase and lease price of farmland, all of which affect competitiveness. These changes are not attributable to land set-aside but to land-linked compensation payments.

Although the average size of cereal holdings grew at a faster rate in the period 93-99 (1 ha./ year) than in the period 87-93 (0.75 ha./ year), in 93-99 this increase was due to the recovery of surface and not to a reduction in the number of holdings, which remained constant. As of 1993, the increase in the size of holdings and the fact that the downward trend in the number of holdings (especially the smaller farms) stopped, indicate an improvement in the competitiveness of herbaceous crop holdings after the 1992 reform.

The evolution in the price of land changed after 1993, which was the start of a slightly upward tendency. The opinion of administrators is that lease prices have evolved in a similar fashion.

Size of holdings

Figure 20 shows the influence of the CAP on the distribution of cereal area. In the period 87-93 a reduction occurred in cereal surface in all types of holdings to the extent that total surface decreased by 25%. After 1993 cereal area in holdings of less than 100 has, which was tending downwards,

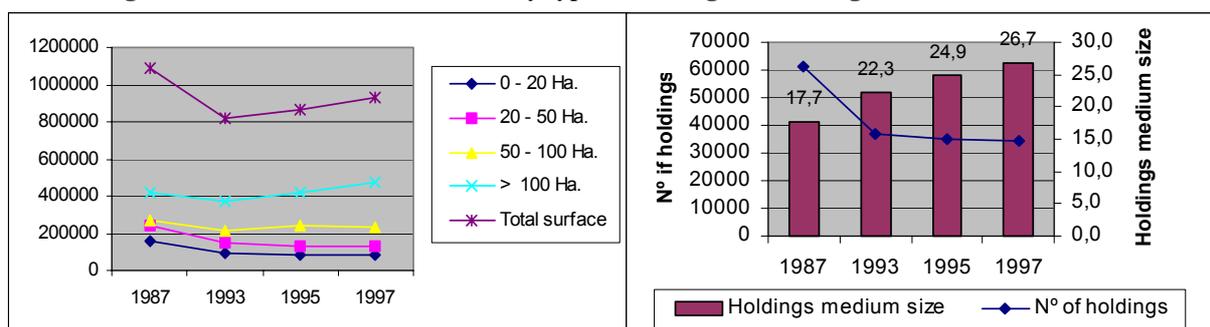
stabilised. Holdings of over 100 has. recovered part of the total surface lost in the period 86-93, and have shown a growth tendency during the period 93-99.

The **average size** of cereal holdings grew at a faster rate in the period 93-99 (1 ha. per season) than in the period 87-93 (0.75 ha. per season), but for different reasons.

- In the period 87-93, despite the reduction in surface, the average size of holdings grew due to a higher reduction in number.
- In the period 93-99, the number of holdings remained stable and the growth in average size is a result of increased surface.

This indicates that the 1992 reform achieved feasibility for small holdings that were tending to disappear. Further, large holdings became larger and consequently more competitive.

Figure 20 Cereals surface evolution by type of holding and holding medium size evolution.



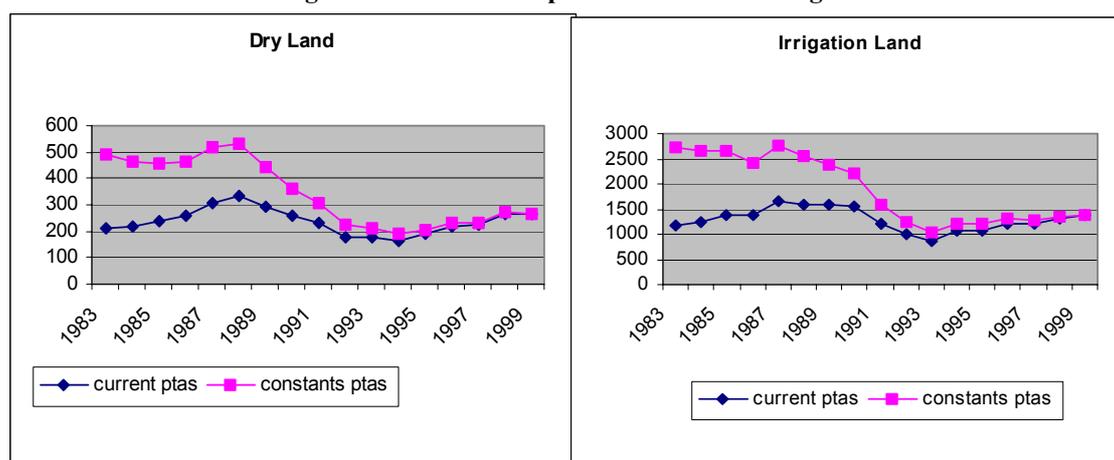
Source: Data taken from INE

Eligible lands market

The data from the survey to farmers are the following:

- A 42 % have increased their holding during the period 87-92, in an average rate of 21'4 has.
- A 19 % have increased their holding during the period 92-99, in an average rate of 35'7 has.
- A 40 % said that they have difficulties when purchasing or renting cultivable land from 1992, and a 18 % think that set aside of land may be one of the reasons.
- A 58 % think that there is a land market susceptible of subvention as a result of CAP reform.

Figure 21 Labour land prices evolution at Aragón.



Source: Data taken from MAPA and INE

The data from the *survey of land prices of MAPA* (Figure 21) show that the price of land has a downward trend until 1994 in dry land and until 1993 in irrigated land. From then on, it begins a light upward trend. Price increasing is under the historical maximum. Price evolution is the same at irrigated and dry lands.



Managers opinion is that this evolution of labour land prices is not influenced by set aside but is directly influenced by compensatory payments.

There are not statistical data about renting prices but surveyed managers and farmers agree that there has been a price increase, not because of set aside measure but because of compensatory payments.

5. ANSWER TO QUESTIONS 441 – 444 REGARDING ENVIRONMENTAL IMPACT

To answer these questions we have used a qualitative focus, due to the fact that environmental impacts are very difficult to quantify without making mistakes or vagueness. So, the behaviour of farmers surveyed is analysed, and the criteria for this analysis are supported by interviews with experts and managers⁸, as well as in the existing bibliography⁹.

5.1. Question 4.4.1:

Did the adoption of the set-aside have a significant impact on the improvement of the soil management (erosion, fertility, structure, etc)?

- **Synthetic answer**

In the area of the survey, application of set-aside has not changed soil management in relation to the previous situation in a 58% of the survey and has been positive in a 24% of the survey.

On the regional level, the impact is different depending on area.

In more humid areas in the north, where traditional fallow was scarcely practiced, the application of set-aside has had a double impact: on the one hand bare set-aside, a considerable percentage, has a negative impact because it favours run-off and erosion; on the other hand, set-aside policy has encouraged the recovery of previously abandoned lands, which helps to reduce the negative effect of abandoned lands.

In arid and semi-arid zones (over three-quarters of the region) where fallow is a traditional practice, set-aside is mainly rotational and has become part of the product mix; for this reason, set-aside has not caused change with regard to the previous situation.

- **Detail of answer**

Existing research

T. Lasanta; M.C. Pérez Rontomé y J.M. García Ruíz have performed a study on *The hydromorphological effects of different types of set-aside in semi-arid environments of the Ebro depression*. The study concludes that the abandonment of land in semi-arid areas leads to a heavy increase in run-off, given the difficulties for plants to take root and the poor soil structure which in the long term can cause problems of soil preservation; farming appears to help water penetrate the soil more deeply; and agricultural fallow contributes larger amounts of sediment.

Another study, performed by ITAGA (Instituto Técnico, Agrícola y Ganadero de Aragón) and entitled *Environmental Reasons to Relaunch Productive Farming*, contradicts the opinion defended by many other authors that the extensive agriculture is good for the environment. One of the conclusions of this study is that to prevent run-off that cause both erosion and the formation of crusts requires the application of advanced agrarian techniques as well as a good plant cover. Consequently, with regard to protection from soil erosion, set-aside is generally considered highly negative.

⁸ VID annexe 4 managers and experts met.

⁹ VID annexe 7 bibliography.



Erosion, fertility and structure

We can conclude that fixed set-aside is negative for soil erosion.

When set-aside is rotational, in the form of ploughed fallow incorporated into the product mix, it is negative in terms of erosion but positively favours water filtration and soil fertility.

Table 23 shows that the percentage of land affected by erosion is significant.

Table 23 Percentage of land affected by erosion according to its degree

	Severe	Moderate	Mild	Inappreciable
Aragón	28'8	29'1	8'9	33'1

Source: MOPU, 1989

On the other hand, a large part of the region is classified as arid or semi-arid (less than 10 on the Turc Index) with low yields (local yield of less than 2 t/ha), therefore ploughed fallow is recommendable to achieve some agricultural advantage from this land. Good farming improves soil structure and permeability. Additionally, wild plants consume large amounts of soil-based water. Maintaining soil free of vegetation is highly beneficial in this aspect (R. Dihel, J.M. mateo Box (1989)).

In this sense, bare fallow, well ploughed and free of all type of vegetation is what is traditionally understood to be good fallow management. This practice is closely linked to farmers' thinking, who consider fields containing vegetable remains or wild plants as a sign of laziness on the part of the land owner. (Almorox, J.; Diaz Alvarez M.C. (1997)).

The risk of erosion is higher in more humid zones where fallow is not a traditional practice. Set-aside with a plant cover is therefore recommendable here. However, according to the administrators interviewed, these plots are frequently cultivated because certain pluri-annual grasses are not allowed. In these zones, as a result of compensation policies and set-aside, marginal land has been recovered on which to locate set-aside and in some cases for farming¹⁰, alleviating the effect of erosion of abandoned lands.

Survey Results

Regarding **type of set-aside**, the survey shows that 12 % practice fixed set-aside, 42 % practice rotational set-aside, and 45 % a combination of the two (part rotational, part fixed). It is important to note that use of set-aside land is free, i.e., fixed or rotational set-aside is not a result of a commitment on the part of the producer, who is free to decide to rotate the set aside or maintain it in the same plots.

Relative to **coverage of set-aside lands**, 51% practice bare set-aside, 30 % wild plants, and 9 % sow plants for agronomic purposes.

30 % of farmers participate in an environmental programme, 30% of which are related with soil protection.

The above data lead us to adapt the criteria in the matrix analysing the relationship between agricultural practice on fallow land and soil management (Table 24) and to consider bare set-aside as a good alternative in set-aside management, since it is also a traditional practice in fallow soil management. It is only considered negative when farming is excessive (several times per year) or when it is not rotated.

¹⁰ VID answer to question 4.1.2.

Table 24 Matrix to analyse relation between agricultural practices at fallow lands and soil management

Type of behaviour	Negative changes: behaviour that does not drive to a better management of soil in set aside	Invariable behaviour in the management of land with respect to the preceding situation	Mainly positive change: behaviour that drives to an enhancement in the management of soil in set aside lands
Types of practices linked to soil management that allow for a classification:	<ul style="list-style-type: none"> Bare set aside or with a poor cubierta in areas of erosion risk Usage of weedkiller (non-innocuous) in non-cultivated set aside lands Fixed set aside in areas with erosion risk 	<ul style="list-style-type: none"> Cultivation of set aside land to non-food use Proper management of set aside Fixed set aside in areas without erosion risks 	<ul style="list-style-type: none"> Sowing of plants that will enrich set aside lands Non-usage of pesticides Long duration Plantations (forestation) Farmer takes part in any type of agroenvironmental measure to protect soils
Classification of holding according to prevalent practices.	18 %	58 %	24 %

Source: Self made criteria regarding main regional features

5.2. Question 4.4.2:

Did the adoption of the set-aside of land have a significant impact on the improvement of the water management (pollution, water resources maintenance including ground waters, floods etc)?

- Sinthetic answer**

The impact of set-aside on water management is largely positive in irrigated land because it allows for a more rational use of irrigation water which in turn produces better yields in farmland. The impact is largely neutral in non-irrigated land where no change is observed with regard to the previous situation.

At the national level, use of nitrogenous fertilisers is higher which could increase nitrate levels in surface and underground waters. However, we can not state that this rate of fertiliser usage is a result of the set-aside policy.

- Detail of answer**

Management of a scarce source

The opinion of administrators interviewed is that the impact of set-aside on water management is positive: in dry years, more farmers resort to set-aside which allows better usage of water resources in non-irrigated land and the possibility of rationalising usage in irrigated land.

However, change with respect to the previous situation is only observed in irrigated lands, since agronomic fallow was already a customary practice in non-irrigated land.

In irrigated land, non-irrigation of set-aside plots leaves more water for farmed land. This could be one of the reasons behind the impressive increase in maize yield¹¹

30% of farmers participate in an environmental programme, of which 20% are related to the protection of water resources.

¹¹ See Figure 17 under question 4.3.3.



100% of the farmers surveyed do not irrigate set-aside lands. Only 10% apply chemicals to weeds.

For this reason, and based on the criteria established in the matrix analysing the relationship between fallow management and water usage (Table 25), impact is positive in 12 % and neutral in 85 %.

Table 25 Matrix to analyse relation between agricultural practices at fallow lands and water use (excluding water erosion considered at soil question)

Type of behaviour	Negative changes: behaviour that does not drive to a better management of water in set aside	Changes: Invariable behaviour in the management of land with respect to the preceding situation	Mainly positive change: behaviour that drives to an enhancement in the management of water in set aside lands
Types of practices linked to water management that allow for a classification (to be validated by the surveyor according to the agricultural characteristics prevalent in the region)	Usage of pesticides or nitrates in non-cultivated set aside lands. Irrigation of set aside land	Cultivation of set aside land for non-food use Proper management of set aside land	Fixed set aside in humid areas along water courses Sowing of plants that will enrich soil in set aside lands Non-irrigation in set aside lands Non-usage of pesticides Farmer takes part in any type of agroenvironmental measure to protect water.
Classification of holding according to prevalent practices (only one category)	3 %	85 %	12 %

Source: Self made criteria regarding main regional features

Water contamination due to the usage of nitrogenous fertilisers

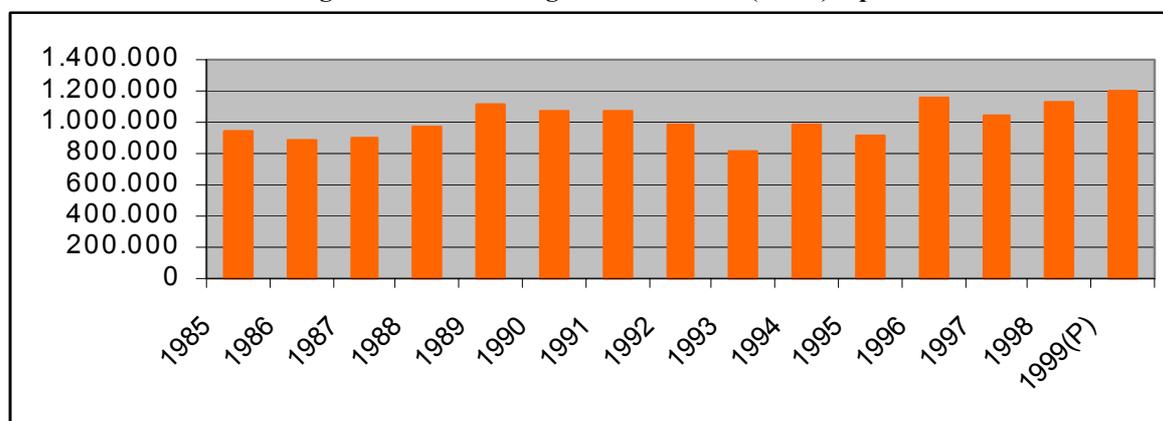
The main environmental problem generated by the use of fertilisers in agriculture is water contamination by nitrates. Regarding the use of nitrogenous fertilisers there are no data available at regional level. National data show that from 1993 the downward consumption trend is reverted (Figure 22).

Spain does not stand out by an extreme use of chemical fertilisers, according to data of 1988, as shown in the following table.

Table 26 Units of macronutrients used by hectares (FAO , 1988)

	N	P ₂ O ₅	K ₂ O	TOTAL
España	56,2	26,3	16,4	98,9
Europe (mean)	111,7	55,7	59,9	227,3

Figure 22 Use of nitrogenous fertilizers (t of N) Spain



Source: INE

With respect to 1988 the consumption at national level have increased, but we can not say that this trend is a result of the implementation of set aside of land policy.

5.3. Question 4.4.3:

Did the adoption of the set-aside of land have a significant impact on the improvement of the landscape management ?

Given the subjective nature of this question, to estimate the impact of set-aside we have described the traditional landscape in the region and observed the changes that have occurred as a result of application of set-aside measures.

- **Synthetic answer**

Set-aside plots have not significantly impacted the landscape. In arid and semi-arid cereal zones, set-aside fits in to the patchwork of browns (bare set-aside and fallow) and greens (crops) which constitute the traditional landscape. As a result of the CAP reform, land was recovered to locate subsidised crops (mainly non-COP), altering the ratio of farmed and unfarmed land, with no significant impact on the landscape.

In mountain areas where fallow was not a traditional practice, farmland occupies less of the total surface; additionally, land has been recovered on which to locate set-aside, therefore the impact on landscape is not significant.

- **Detail of answer**

Traditional landscape

Although Aragón is a large region with a varied landscape, we refer here only to cereal lands. The landscape of cereal lands varies depending on location in arid or semi-arid zones or in more humid areas.

In arid and semi-arid areas, which represent a significant proportion of the cereal lands in Aragón, poor soil has made crop rotation necessary, and the landscape is characteristically dominated by a patchwork of cereals, leguminous crops, pasture and fallow. Extensive cereal fields, with a low consumption of fertilisers and agrochemicals, provide food and shelter to highly interesting bird species which are unique to the area or scarce in the rest of Europe. This productive agrarian environment complies with the multi-functional character encouraged by the E.C. in the Agenda 2000 reform.

Humid and sub-humid areas in this region are located in the mountains. For centuries, farming in these zones was characterised by the overall use of resources, resulting in a highly diverse environment (farmland, woods, pasture and untilled land).

Threatens to landscape

The main threat to these types of landscape is rural abandonment and agricultural intensification. Preservation of the landscape and bio-diversity requires the maintenance of extensive agricultural systems and therefore, maintenance of farmed landscapes (Dolores Manteiga López (1997))

In mountain areas, abandonment occurred intensively after the fifties. The major cause was the integration of mountain areas into the market economy, which accelerated emigration to the cities and demonstrated the deficiencies of production on slopes.



Influence of set aside in the landscape

The visual effect is apparent in areas where fallow was not previously practiced. Where fallow is traditional, impact on the landscape is null.

The policy of compensation payments has resulted in the recovery of abandoned lands on which to locate set-aside and to farm other crops (mainly subsidised non-COP crops). The total area of fallow land and other non-occupied land has decreased as a result of the CAP reform¹². In mountain areas, less productive plots on the slopes, which had been abandoned in recent years, have been recovered for partial location of set-aside. This is corroborated by the results of the survey: more than 60% of farmers surveyed stated that they locate set-aside in marginal lands.

Land set-aside has not significantly impacted landscape because it has not caused an increase in the abandonment of land - on the contrary, abandonment has decreased (see the conclusions of question 4.1.2.).

The study conducted by ITAGA, *Environmental Reasons to Re-launch Productive Farming* concludes that the abandonment of land does not improve the landscape or the environment. Further, the natural landscape that everyone wants to preserve historically features the presence of farmed plots.

In this regard we can conclude that in Aragón, set-aside has not had a negative effect on the landscape because it is linked to the policy of compensation payments, which has encouraged the recovery of abandoned lands.

Survey data are the following:

- 90% say they have not heard comments on the state of abandonment of the land.
- 60% state that maintenance of set-aside land makes these plots stand out in the landscape.
- 21% state that they concentrate set-aside plots a single area, and 9% say that other holdings also locate set-aside in the same area.

30% of farmers participate in an environmental programme, of which 20% are related to landscape protection.

Based on survey data and the criteria established in Table 27, in 79% of cases set-aside does not impact the landscape.

Table 27 Matrix to analyse the relationship between agricultural practices for fallow land and their impacts on the landscape¹³

Type of behaviour	Uses of set aside land with a change of practices that have negative impact on landscape	Usage of set aside lands with practices that have not effect on the landscape
Types of practices linked to landscape that allow for a classification (to be validated by the surveyor according to the agricultural characteristics prevalent in the region)	Poor management of set aside High concentration of set aside lands in a single area	Good management of set aside Cultivated set aside
Classification of holding according to prevalent practices (only one category)	21 %	79 %

Source: Self made criteria regarding main regional features

Although 21% of farmers say that they concentrate set-aside in a single location and this has been considered negative, we can estimate that these plots are the most marginal and would have been equally non-productive if compensation payments had not existed, therefore no change to the landscape has occurred.

¹² See Figure 13. under question 4.1.2.

¹³ This matrix examines the impacts of set aside in comparison to the impacts if the land had been cultivated



5.4. Question 4.4.4:

Did the adoption of the set-aside have a significant impact on the bio-diversity maintenance?

Considering that species management is closely related to the preservation of related habitats (María Dolores Fernández Guillén; Rob H. G. Jongman (1994)), the influence of set-aside on the preservation of bio-diversity will be estimated based on how much the measure contributes to preserving habitat.

- **Synthetic answer**

Land set-aside does not negatively impact bio-diversity because it does not distort traditional habitats. On the contrary, the effect has been positive to a certain extent because, due to the link with compensation payments, the measure has encouraged recovery of abandoned lands and as shown in various studies, abandonment does not improve bio-diversity, while farming activity encourages the spread of animal species suited to open spaces and human activity.

- **Detail of answer**

Statistical data indicate that as of the CAP reform¹⁴ the volume of unfarmed land has decreased, therefore agriculture has not extensified in Aragón.

Research conducted by T. Lasanta shows that in abandoned land, plant colonisation is extremely slow; therefore, unless these plots are treated (e.g. with fertilisers), bio-diversity does not benefit.

The integration of abandoned lands into farming favours the recovery of the species best suited to open spaces and human activity, such as certain types of partridge and eagle.

On the other hand, in non-irrigated cereal lands, set-aside maintained as farmed fallow fits in to the traditional system of farming which provides food and shelter for highly interesting species which are unique or very scarce in other parts of Europe. This is therefore a productive eco-system which complies with the multi-functional character recommended by the E.C. in the Agenda 2000 reform.

30% of farmers participate in an environmental programme, of which 60% are related to the protection of bio-diversity.

¹⁴ See figure 13 under question 4.1.2.



6. ANSWER TO QUESTIONS 451 AND 452. COMPLEXITY OF REGULATION AND ITS SETTING IN PLACE

To answer this block of questions we have used the analysis of application regulations, interviews with national and regional administrators and professional associations, and farmer surveys.

6.1. Question 4.5.2:

What effect did numerous regulatory adaptations and the existence of numerous individual cases and did possibilities of transfer have cause on the effectiveness of the set-aside instrument?

- **Sinthetic answer**

National and regional regulations are an adaptation of Community regulations to regional specifications, without any further development of previous regulations.

The majority of complaints from farmers regarding administrative problems refer to: information on set-aside rates arrives too late (79%); subsidies are received late (82%); complexity of administrative procedures (60%); lack of integration of the different subsidies deriving from the CAP, especially agro-environmental aids (67%).

For this question we will focus on regulations applied at the regional level, since the effect of national legislation will be addressed in the national report.

Dispositions regarding compensatory payments policy and set aside of land

The Department of Agriculture of the Autonomous Community of Aragón publishes two types of dispositions in the Official Bulletin of Aragón:

- Orders regulating the procedures for application, processing and granting of aids to the producers of certain herbaceous crops.
- Resolutions announcing waivers from certain obligations for farmers whose holdings are located in irrigated land in municipalites affected by drought.

Other dispositions

- Orders related with measures supporting the promotion of farming methods compatible with the requirements of environmental protection and the preservation of natural areas.

Survey data referring to regulation effectiveness

The administrative problems associated with implementation and control of set-aside encountered by surveyed farmers are:

- Errors in the area declared : 54%
- Failure to reach the minimum plot size (surface or width): 30%
- Failure or difficulty to reach the minimum yield of non-food crops: 3%
- Opening and closing dates of set-aside difficult to fit in with customary farming practice: 27%
- Information on set-aside rates arrives too late: 79%
- Complexity of administrative procedure: 60%
- Lack of integration of the different aids available under the CAP, especially agro-environmental aids: 67%
- Subsidies received late: 82%



21% of farmers surveyed stated that they were fully aware of regulations governing maintenance and preservation of the environment in fallow land, and 49% stated that they were somewhat aware. 54% apply the regulations, information on which has reached them through:

- Information annexed to CAP documentation: 17 %
- Information send by a professional association to which they belong: 74%
- Information seen in the press: 30%
- Formal notification from their local authority: 4%
- Other: 13%