
Annexe 24 du rapport d'évaluation

Evaluation of the Impacts of the Community Measures on Land Set aside

National Report

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1 Structure and Potential of the Agricultural Sector in Germany ¹

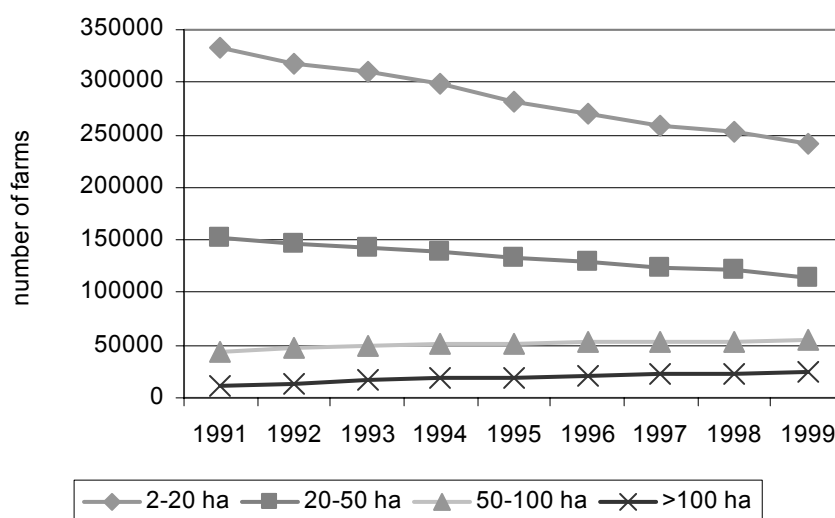
1.1 Farm Structure

The German agricultural sector was exposed to a strong structural change over the last 15 years. In addition to the effects of the CAP, the German reunification and the regional labour market conditions also led to strong modifications. With the decrease of smaller farms (currently the number of farms with less than 50 ha declines) production was concentrated on enterprises with more than 100 ha of land. Simultaneously, the share of farms with income combination significantly increased.

All in all, a considerable structural slope exists between the rather small-scale farm structure in the west (40 ha/farm on average) and the large-scale farming sector in the New German Laender (168 ha/farm on average).

The development of the structural change differed regionally. Since 1992, the CAP-reform led to significant modifications predominantly in areas with extensive commercial farming. In forage growing regions a different and more moderate development took place – particularly effected by the market regulations for milk and beef.

Figure 1: Number of Farms by Size Classes in Germany 1991-1999 ²



From 1992 to 1999, the number of farms decreased by 92.000 in total. That corresponds to an annual decrease of approx. 2 %. The number of agricultural employees even declined stronger (- 4 %/year) as particularly smaller enterprises with higher labour intensity gave up farming.

¹ The presentation of the structural development of the German agricultural sector is hampered through the integration of the former DDR in 1990. All data related to the time previous to 1990 inform about West Germany only (without the New German Laenders).

² See Statistisches Jahrbuch über Ernährung Landwirtschaft und Forsten, different volumes.

1.2 Land Utilization

Germany all in all comprises 357.000 km². Thereof 54 % are used for agriculture. The share of arable area amounted to 68 % (11.9 mill ha) of the utilized agricultural area (UAA) in 1999. 8.1 mill ha (68%) of arable area were cultivated with COP-crops.³

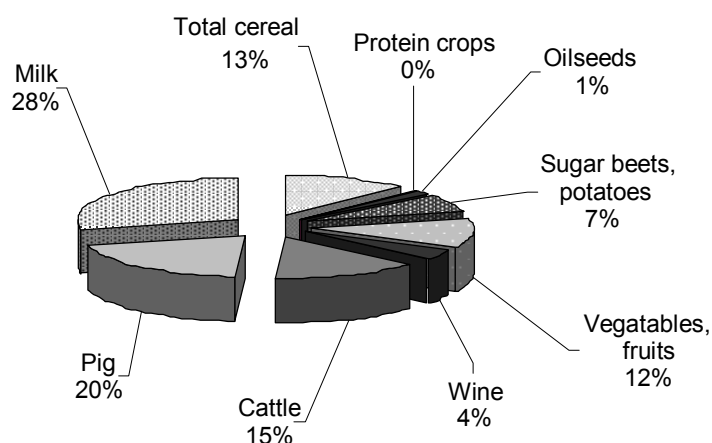
Figure 2: Proportion of Arable Area and Grassland in Germany 1999 ⁴



1.3 Structure of Agricultural Production

The share of plant production at the total agricultural output rose from 38 % to 42 % between 1992 and 1998 as particularly the demand for fruits, vegetables and wine grew. On the other hand, the share of COP-crops stayed relatively constant (+ 0.2 %). Due to the farm price reform the total agricultural output (in current terms) decreased between 1993 and 1998 by 5 % (down to 32.5 mill. €). In real terms (base 1995), the growth of plant production output amounted to 9 % (1993 - 1998).⁵

Figure 3: Production Output of Selected Agricultural Products in Germany 1992 ⁶



³ COP-crops: Cereal, oilseeds, protein plants.

⁴ See Statistisches Jahrbuch über Ernährung Landwirtschaft und Forsten 1999.

⁵ See Statistisches Jahrbuch über Ernährung Landwirtschaft und Forsten 1999, p. 156, table 167.

⁶ See Statistisches Jahrbuch über Ernährung Landwirtschaft und Forsten 1996 and 1999.

Figure 4: Production Output of Selected Agricultural Products in Germany 1993 ⁴

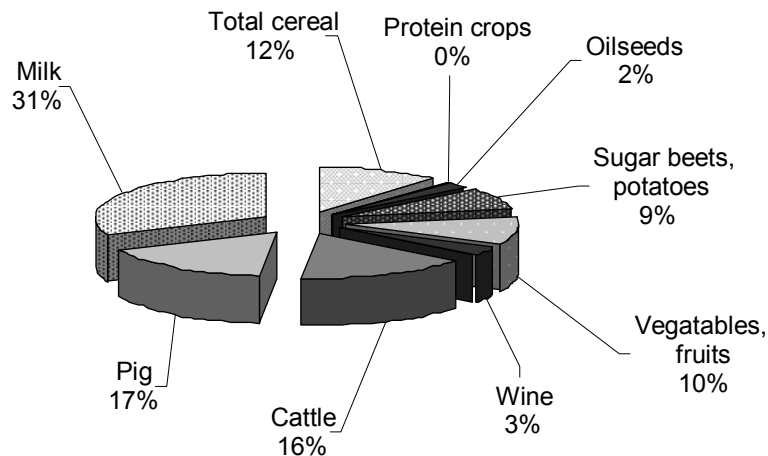
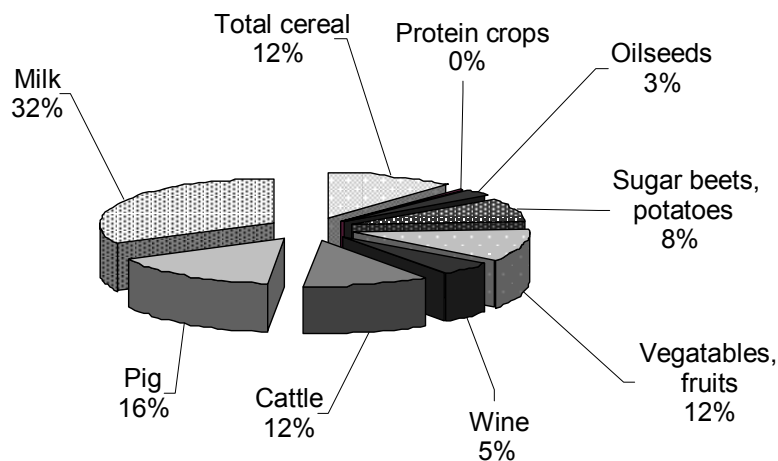


Figure 5: Production Output of Selected Agricultural Products in Germany 1998 ⁴



Development of COP-area and COP-production between 1990 and 1999

As figures 3 to 5 indicate, grain occupied the largest share of the COP-crops. After a small decline in 1993, production rose again (cf. Annex 4.2). Differing from this trend, the decrease of grain production in 1999 was mainly caused by the raise of the set aside-rate from 5 to 10 % and the low yield level due to natural influences, too.

Figure 6: Cultivated Area of COP-Crops in Germany 1990-1999 ⁷

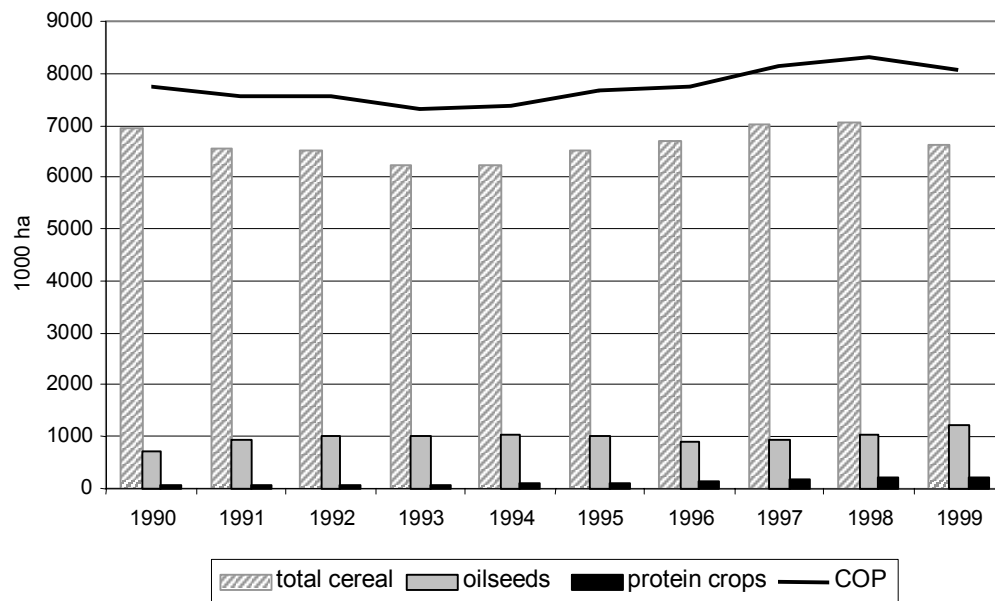
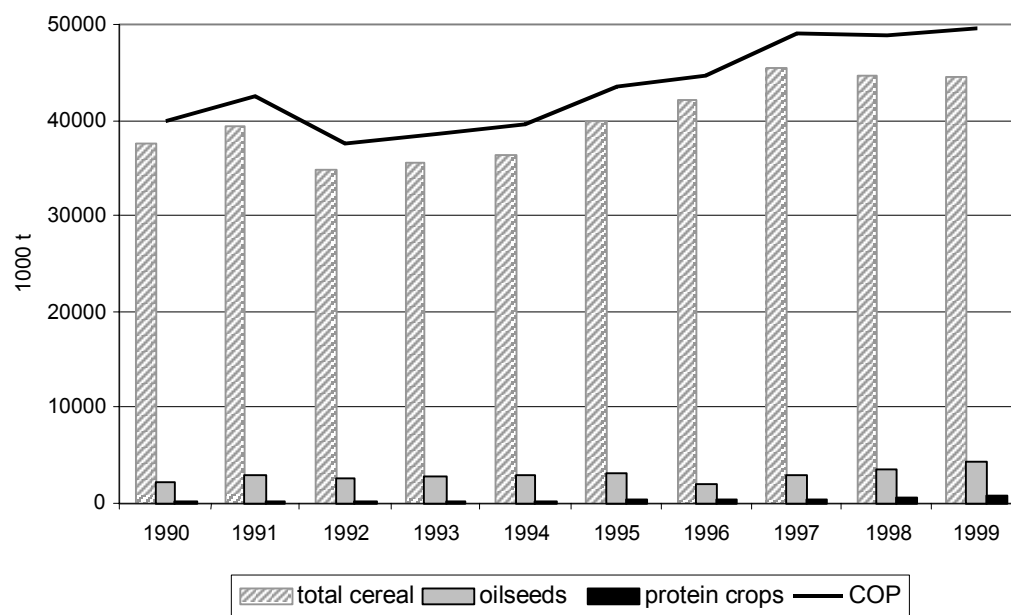


Figure 7: Production of COP-Crops in Germany 1990-1999 ⁵

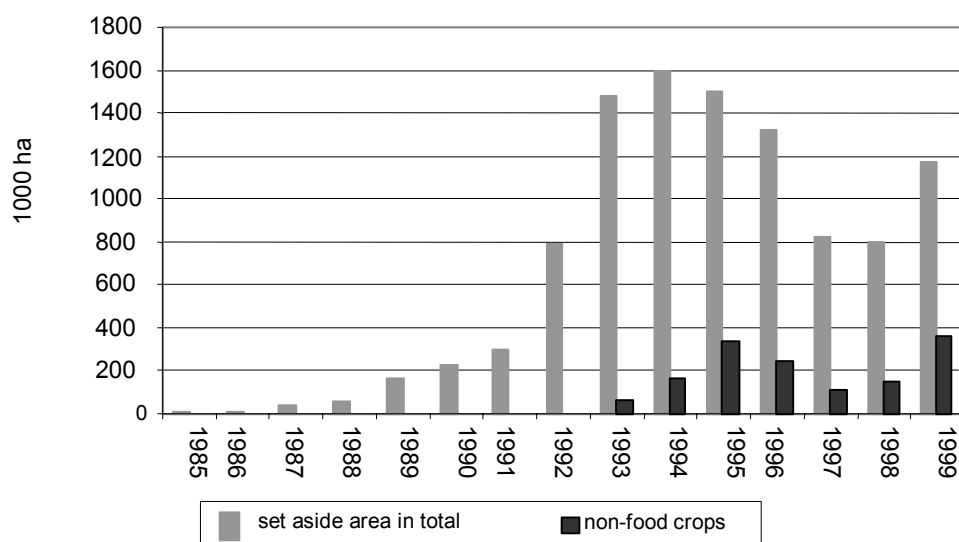


⁷ See Statistisches Jahrbuch über Ernährung Landwirtschaft und Forsten, different volumes; own calculations.

1.4 Development of Set aside Areas in Germany between 1985 and 1999

The extent of areas set aside was only marginal before the introduction of the voluntary five-year set aside scheme (1988). With the transition to the compulsory set aside programme in 1992, the extent rose up to a maximum of 1.6 mill ha (1994). Currently the share of set aside areas varies between 807.000 ha (1998) and 1.175.000 ha (1999).

Figure 8: Development of Set aside Areas in Germany 1985-1999 ⁸



⁸ 1985 until 1992 Western Germany only; see Statistisches Jahrbuch 1999, table 90.

2 Realization of Land Set aside in Germany

Table 1 contains essential statistic information concerning the realization of the set aside programme in Germany since 1993/94. The data were based on information out of the national Ministry for Agriculture, the official national statistics as well as EuroStat-sources.

Table 1: Realization of the Set aside-Programme in Germany ⁹

		1993/94	1994/95	1995/96	1996/97		1997/98		1998/99		1999/2000	
Set aside-rate (obligatory)	%	15%	15%	12%	10%		5%		5%		10%	
Real set aside area in total	ha	1050400	1335759	1319110	1206644		820539		806632		1175425	
Number of applications for premia (COP)	No	96156	113639	120066	126497		131833		131306		141348	
Premium-carrying COP-area in total	ha	9210970	9666864	9565145	9801401		9957359		9994440		10008570	
- thereof premium-carrying COP-area – professional scheme	ha	6903037	7642565	7679929	8074837		8380650		8532373		8670140	
- thereof premium-carrying COP-area – simplified scheme	ha	2307933	2024299	1885216	1726564		1576709		1462067		1338430	
Set aside-rate (real) (set aside/ total COP-area)	%	11	13	13	12		8		8		12	
Set aside-rate (professional scheme) (set aside/ profess. Scheme COP-area)	%	14	17	17	15		10		9		14	
Set aside land in total	ha	1050400	1335759	1319110								
- thereof rotational set aside area	ha	1050400	682562	457864								
Set aside area in total (other than extraordinary)	ha	1050400	1335759	1319110	1206644	5.59	820539	5.57	806632	5.58	1175425	5.60
- thereof obligatory set aside area	ha	1050400	1335759	1319110	758304	5.63	408469	5.64	415931	5.64	833542	5.62
- thereof voluntary set aside area	ha				448340	5.52	412070	5.49	390701	5.51	341883	5.54
---thereof set aside area without a premia	ha				259	5.37	607	5.69	318	5.97	499	6.09
- thereof non-food production	ha	64114	161955	330178	244008	5.77	111367	5.74	147699	5.48	367792	5.72
Five-year set aside(R.2328/91)	ha	294768	158633	115955	49749	5,59						
Extraordinary set aside	ha											

Only three German Laenders implemented a regionalization of the set aside premia: Brandenburg, Niedersachsen and Rheinland-Pfalz (cf. table 2). The corresponding decisions have been based primarily on the considerable differences in the natural conditions within these Laenders.

Two other Laenders (Baden-Wuerttemberg, Bavaria) chose different regulations for grain and maize premia. In both regions forage growing farms with cattle were of considerable importance.

A differentiation of premia between irrigated and not irrigated areas did not occur in Germany.

⁹ See Bundesministerium für Verbraucherschutz, Ernährung und Landwirtschaft, internal information; Statistisches Jahrbuch über Ernährung Landwirtschaft und Forsten, different volumes; own calculations; EU DG Agriculture and Agreste/ONIC/ONIOL (information given by Oréade-Brèche).

Table 2: Regionalization of the German Laenders for the Calculation of Premia ¹⁰

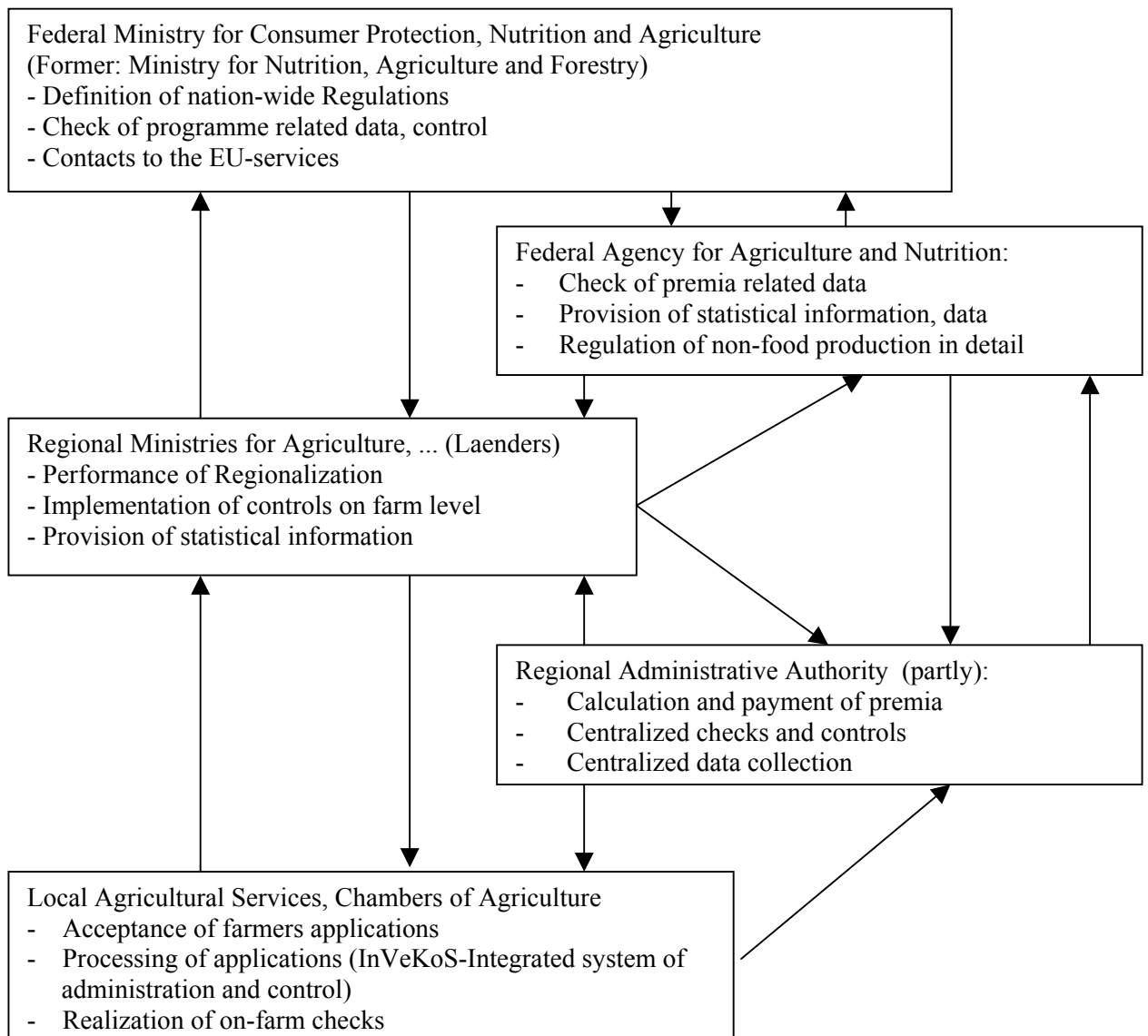
Regions	Average yield dt/ha ¹¹		Upper limit of COP-area until which the simplified scheme could be applied (ha/farm)
	Cereals, protein crops, oil flax and set aside areas in total	Oilseeds	
Baden- Wuerttemberg	(52,9)	29,7	17,39
a) maize	72,8		
b) without maize	51,4		
Bavaria	(56,1)	31,8	16,39
a) maize	75,2		
b) without maize	55,3		
Berlin	45,2	26,8	20,35
Brandenburg			
a) Region 1	54,5	34,4	16,88
b) Region 2	45,2	26,8	20,35
Bremen	53,4	31,3	17,22
Hamburg	60,1	30,7	15,3
Hessen	55	31	16,72
Mecklenburg-Vorpommern	54,5	34,4	16,88
Niedersachsen	(53,3)		
a) Region 1	58,7	30,6	15,67
b) Region 2	71,9	30,6	12,79
c) Region 3	61,3	30,6	15
d) Region 4	47,3	30,6	19,45
e) Region 5	41,8	30,6	22
f) Region 6	56	30,6	16,42
g) Region 7	47	30,6	19,57
h) Region 8	42,2	30,6	21,8
i) Region 9	50,7	30,6	18,14
k) Region 10	54,5	34,4	16,88
Nordrhein-Westfalen	58,1	31,1	15,83
Rheinland-Pfalz	(47,8)	28,5	
a) less favoured areas	45		20,44
b) other (favoured) areas	51,5		17,86
Saarland	43,8	27	21
Sachsen	62,3	29,6	14,76
Sachsen-Anhalt	61,4	26,7	14,98
Schleswig-Holstein	68,1	33,8	13,5
Thuringen	61,3	28,7	15

¹⁰ See Bundesministerium für Ernährung, Landwirtschaft und Forsten: Die europäische Agrarreform – Pflanzlicher Bereich, different volumes.

¹¹ Arithmetic mean of the average yields/ha in the years 1986 until 1990, excluding the year with the highest and with the lowest yield.

3 Regulation Concerning the Implementation of the Set aside Programme

3.1 Administrative Responsibilities



3.2 Implementation of the EU-Regulation on National Level

The following regulations for land set aside were nation-wide prescribed homogeneously. A differentiation of the premia happened correspondingly to the regional yield levels. The Laenders were in charge of the implementation and control of the regulations.

(1) Regionalization, Calculation of Average Yields

The regionalization of the premia took place for the Laenders on the basis of the average yields in the years 1986 - 1990 (cf. table 2). Only in Brandenburg, Niedersachsen and Rheinland-Pfalz a further differentiation for subregions was carried out in order to take the different natural conditions for agricultural production into consideration. This politically motivated differentiation can, however, not be

seen as an indication for exceptional natural differences within these regions (compared to other German Laenders).

In two Laenders (Baden Wuerttemberg and Bayern) not a uniform average yield for grain, protein plants and flax was calculated; there, a differentiation was made between

- maize yields,
- yields of the other cereals, including protein plants and flax.

Correspondingly, Baden-Wuerttemberg and Bavaria allowed two different premia.

(2) Formal Regulations Concerning the Implementation of Land Set aside

Minimum and maximum extent of land set aside

In all years the set aside-rate was equivalent to the rate decided by the EU-authorities. Between 1992 and 1995 farmers had the possibility to chose from the following options:

- Six-year rotational set aside (a plot was allowed to be set aside again after six years at the earliest; set aside-rate 12 – 16.9 %);
- Simple set aside (set aside-rate 17 – 33 %);
- Guaranteed long-term fallow (fixed set aside with a guaranteed premium for five years, set aside-rate 17 %).

Since 1996 only obligatory or voluntary set aside could be chosen. The maximum extent of the set aside-rate was defined at 33 % of the premium carrying COP-area. If the real set aside area exceeded this limit, no further premia (above 33 % of COP-area) were paid.

Set aside period:

The obligation to set land aside always commenced on the 15th of January and ended – the guaranteed long-term fallow excepted - on the 31st of August of the same year.

Early cultivation of set aside areas:

On set aside areas (exception: guaranteed long-term fallow) the sowing of crops determined to be harvested during the following harvest could be prepared since the 15th of July. This permission was restricted onto crops which for agronomical reasons could not be cultivated at a later stage. The spread of fertilizers and the application of plant protection means were permitted in those cases from the 15th of July onwards.

Starting with the 15th of July, grazing of the set aside areas (until 1996: including guaranteed long-term fallow) was permitted in the form of traditional migratory herding systems. Other legal duties based on set aside areas remained unchanged from the set aside measure. Above all this concerned obligations resulting from

- nature conservation programmes,
- water protection programmes,
- legislation on neighbourhood, e.g. the obligation for mowing set aside areas, if the cultivation of neighbouring plots became hindered (e.g. through weed infestation).

Minimum time of own cultivation:

Principally, farmers must have cultivated their set aside plots for at least two years before they were allowed to set the land aside for premia. Exceptions from that scheme were possible under the following circumstances:

- Acquisition of land through bequest;
- Start up with farming (young farmers, re-establishment of farms in the New German Laenders);
- Re-structuring of farm organization, e.g. adjustment of co-operative farms in the New German Laenders.

Under national law further exceptions from the obligation for a two-year lasting cultivation were possible, e.g. in the following cases:

- Purchase of land;
- Establishment of a farm;
- Return of rented plots to the owner;
- First utilization of plots after a land consolidation measure;
- Renting in land under specific preconditions (by renting more than 40 % of the former UAA);
- Renting in land which had been set aside under the five-year set aside programme.

Transfer of the obligation to set aside land:

Farms could transfer the obligation to set land aside partly or fully to other enterprises if they had been forced to reduce their livestock (resulting from set aside) in order to be able to meet environmental regulations (e.g. slurry regulation). A transfer was only allowed within the same Land (region) but not used often.

Minimum size of set aside plots:

The minimum size of an area for set aside was 0.3 ha, with a minimum width of 20 meters. Until 1997 an isolated set aside of smaller plots (< 0.3 ha) was permitted even if the area was identical with an entire plot. This possibility was cancelled since 1997 at the request of the EU-Commission.

Five-year set aside:

If plots were set aside corresponding to the former five-year set aside programme (1988 – 92) or corresponding to regional set aside programmes (e.g. green-fallow programme in Niedersachsen), they could not be credited on the obligatory set aside. During 1995 and 1996 only the possibility of notice of those former set aside programmes (for single plots) was offered.

(3) Regulations Concerning the Management of Set Aside Areas

Land planting:

A complete fallow during the period of set aside was not permitted because of ecological reasons. On the set aside areas a land planting (at least a natural regrowth) had to be organized in order to prevent erosion and washing out of nitrates. However, land planting with grain, oilseeds, protein plants or flax was prohibited excepted for non-food purposes.

Fertilization:

The application of mineral or organic fertilizers, sewage, faecal matters and other substances listed in the national law on refuse disposal was not allowed on set aside areas. In only two cases exceptions from this regulation were allowed:

- cultivation of non-food products,
- early cultivation of set aside areas since the 15th of July.

Plant protection means:

The application of plant protection means was generally prohibited; again, two exceptions were allowed:

- cultivation of non-food products,
- early cultivation of set aside areas since the 15th of July.

Economic use of set aside areas:

Any economic use of the set aside areas was principally not allowed (e.g. utilization as parking place or for camping against payment), with exception of the cultivation of non-food crops. The growth from the set aside plots could be cut, but it was not allowed to remove and utilize it.

The generation of seeds was also prohibited during the period of set aside and in the year after, too.

Prohibition of the cultivation of market crops after the set aside expiry:

After the end of the set aside period any marketing of plants produced on set aside areas was prohibited until the 15th of January of the following year. Only forage growing for the utilization on ones own farm was admitted. However, the sale of forage to other enterprises was forbidden.

Maintenance of set aside areas:

The areas set aside had to be maintained in order to keep them in a suitable agronomical condition.

(4) Non-food Production

Set aside areas could be used for the cultivation of renewable raw materials (one-year or several years crops). For the cultivation of non-food crops specific requirements had to be fulfilled (e.g. purchase contract, variety choice).

(5) Supplementary Environmental Regulations

The regulations concerning the treatment of set aside areas from an environmental point of view were stated in the previous paragraphs. The environmental effects of set aside were complemented through several national and regional agro-environmental programmes, e.g.:

National agro-environmental programmes:

- Law on water resources management,
- Federal nature protection programme,
- National law of fertilizers, fertilizing regulation.

Agro-environmental programmes of the Laenders:

- Aid scheme for the upkeep of land,
- Field margin programmes,
- Partridge programmes,
- Contractual nature protection programmes;

The national programmes sometimes seemed to be more restrictive than the environmental regulations of the set aside scheme. Therefore, they facilitated the realization of environmental targets within the set aside programme.

4 Summery of the German Case Studies (Bavaria, Brandenburg, Niedersachsen, Schleswig-Holstein, Thuringen)

The following presentation is related to the results of five regional case studies. The selection of the five Laenders within Germany followed a European research methodology. Although the five Laenders represent the German agricultural sector to a large extent, the interpretation of the results is limited under national aspects. On no account the results should be interpreted as “national results”.

Elements of Answers for Question 411 to 413

Questions concerning Effectiveness

Q. 4.1.1: Did compulsory set aside and voluntary set aside measures contribute significantly to the arable crop supply control? What was their contribution to the reduction of cereal surpluses?

Synthetic Answer:

In Germany, between 1992 and 1999 approx. 11 % of the total COP-area were set aside on average. The farmers affected from the set aside policy took about 14 % of their COP-area out of production annually.

However, no decrease but an even stronger increase in grain production was achieved. Between 1993 and 1999, the national grain production rose by 28 %, primarily because of increased yields per ha, the enlargement of COP-area and improved farming techniques, too. As a result of set aside, on average approx. 3.4 mill tons per annum (7.7 % of average annual production) were produced less.

As predominantly less productive areas were taken out of production, the relative cut in output was below the relative decrease in the extent of arable area. In sites with fair to less favourable conditions, the premia could compensate the income losses through set aside of areas to a large extent. Therefore, in those regions partially extensive areas were set aside voluntarily. On the other hand, income losses through land set aside originated in more favourable sites. Although the losses could be limited by various on-farm adaptations, in those regions voluntary set aside was to be found not often.

Details of the Answer:

During the set aside programme, approx. 11 % of the total COP-area (respectively 9 % of the total arable area) were set aside on average in Germany (variation from 8 % in 1998 to 14 % in 1994/95, cf. table 1). The farmers participating in the measure took about 14 % of their COP-area out of production annually.

Despite the set aside of arable area, the production of COP-crops rose by 28 % between 1993 and 1999 (cf. table 4). A strong production increase was particularly realized in the New German Laenders. In the western part of Germany less increases of output could be noticed, sometimes the output even stayed constant (e.g. Bavaria). On national level, the extension of grain production resulted primarily from increased yields per ha (+ 25 %, cf. figure 13) and the enlargement of COP-area by approx. 6.7 % between 1992 and 1999.

The following facts contributed to the increase of grain yields per ha:

- The set aside of less productive plots resulted in raised average yields per ha;
- The economic pressure of the CAP-reform obviously led to an improvement of farm management (particularly in the New German Laenders);

- Farm enterprises partly specialized their production towards commercial farming; this occurred more frequently in the New German Laenders and within the part-time farming sector;
- Modifications of crop rotations within the commercial farms resulted in an expansion of high productive grain crops and the partial replacement of less intensively cultivated cereals (e.g. oat, see table 3);
- Biological technical progresses led to increased yields per ha;
- The re-structuring of the farming sector in the New German Laenders and the adjustment of farm organization on the CAP led to high gains in productivity.

Table 3: Changes in Cultivation of Selected Crops in Germany 1992-1999 ¹²

	Change 1992-1999		
	Total		% per year
	1000 ha	%	
Wheat	3	0	0
Rye	133	22	3
Winter barley	-129	-9	-1
Spring barley	-68	-7	-1
Oat	-90	-25	-4
Grain maize	65	31	4
Grain total	121	2	0
Potatoes	-52	-14	-2
Sugar-beets	-45	-8	-1
Rape	229	25	4
Leguminous crops	155	272	39
Forage growing	-66	-13	-2
COP-area in total	506	7	1

Table 4: Changes in Production Output of Selected Crops in Germany 1992-1999 ¹³

	Change 1992-1999		
	Total		% per year
	1000 t	%	
Wheat	4073	26	4
Rye	1907	79	11
Winter barley	441	5	1
Spring barley	664	18	3
Oat	25	2	0
Grain maize	1118	52	7
Grain total	9694	28	4
Potatoes	671	6	1
Sugar-beet	419	2	0
Rape	1658	66	9
Leguminosae	576	443	63
Forage growing	-131	-3	0
COP-production	12022	32	5

¹² See Statistisches Jahrbuch über Ernährung Landwirtschaft und Forsten, different volumes; own calculations.

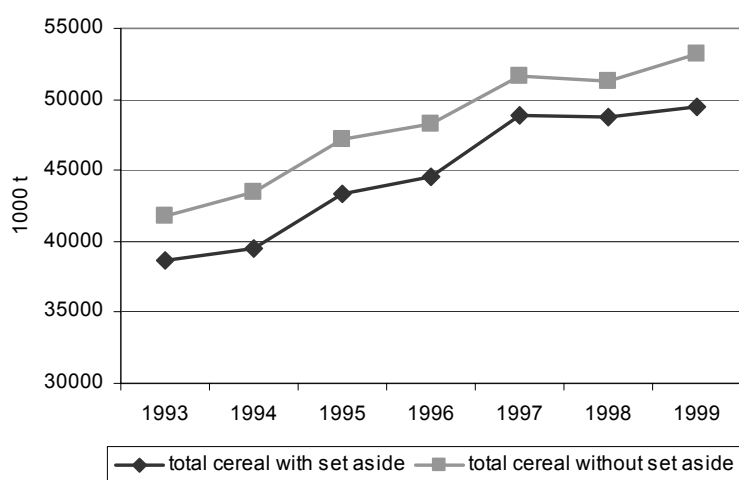
¹³ See Statistisches Jahrbuch Über Ernährung Landwirtschaft und Forsten, different volumes; own calculations.

Supposed that the set aside scheme would not have been applied, production output would have increased even stronger. To estimate the prospective production without land set aside, the following assumptions were preceded:¹⁴

- The average yield of the compulsory set aside areas is 25 % below the national average;
- The average yield of the voluntary set aside areas is 30 % below the national average;
- 75% of the areas set aside would be cultivated with COP-crops;
- Of crop rotation reasons the share of grain cultivation is restricted at 75 % of the arable area;
- In case of absence of the set aside measure 50 % of the non-food area would be cultivated with grain maximally.

As figure 9 indicates, without land set aside the average national production output of COP-crops would have been higher by approx. 3.369.000 ton per year (1992-1999). This corresponds to an average annual surplus production of 7.7 % (1994: 10 % ; 1998: 5 %).

Figure 9: Development Trend of Cereal Production with and without Land Set aside in Germany¹⁵



Assessment of the Set aside Measure from the Point of View of Single Farms and the EU-Budget:

From the point of view of **single farmers** the economic effects of the set aside programme predominantly depended from the natural conditions for production:

- On sites with fair production conditions, income losses resulting from lowered COP-production could be compensated through set aside premia as well as cost and labour savings to a large extent. A marginal loss remained on account of the efforts made for the maintenance of set aside areas.
- On less productive areas, income losses were compensated fully or even over-compensated. This was particular true for the set aside of large plots (e.g. in Brandenburg), as far as a fundamentally re-structuring of the farms was facilitated by this way.
- On favourable production sites, the income losses resulting from land set aside could not be compensated in full. However, on-farm adaptations reduced the income losses significantly (e.g. modifications of crop rotations and of the intensity of land use, improvement of product quality).

¹⁴ The assumptions reflect the average situations within the five German Laenders researched.

¹⁵ Own calculations.

As a result, on rather favourable sites more or less only obligatory set aside was applied (e.g. in Schleswig-Holstein, Niedersachsen). On the other hand, in regions with rather unfavourable natural conditions large areas were set aside voluntarily (e.g. Brandenburg), even the possibility to use those areas for non-food production was not given.

The **relief of budgetary burdens** resulting from the reduction of grain production depends on the prospective utilization of the additionally produced grain. In this respect the Federal Ministry for Agriculture generated calculations based on the year 2001. They were related to the entire EU and can not be transferred in full to German circumstances. Nonetheless, general relations between the decrease of production output and the saving of budgetary costs are indicated.

The calculations were based on the following **assumptions**:¹⁶

Table 5: Assumptions for the calculations

	EU	D ¹⁷
Set aside-rate (obligatory)	10 %	
Real set aside (incl. Simplified scheme):	0.77 % per 1 % set aside	
Area cultivated with grain	36.7 mill ha	6.6 mill ha
Area cultivated with oilseeds	4.6 mill ha	1.2 mill ha
Area cultivated with protein crops	1.2 mill ha	0.2 mill ha
Average grain yield	5.5 t/ha	6.7 t/ha
Grain yield on set aside areas	4.7 t/ha (85 %)	5.4 t/ha (70-75 %)
Costs of market intervention for grain	55 €/t	
Export subsidies for grain	35 €/t	

According to these assumptions, **1% set aside** would cause the following **reduction of cultivated area in the EU**:

- Reduction of grain area: - 0.28 mill ha
- Reduction of oilseeds area: - 0.04 mill ha
- Reduction of protein plants area: - 0.01 mill ha.

The **decline of EU-grain production** was calculated with approx. 1.32 mill tons.

The **relief of the EU-budget** per 1 % set aside includes the following savings:

- in case of grain intervention: - 73 mill €,
- in case of export of surplus grain (export subsidies): - 46 mill €,
- reduction of subsidies for oilseeds and protein plants: - 1.9 mill €.

According to that, the budgetary relief for the entire EU amounts between 48 and 75 mill € per 1 % set aside for the year 2001.

As this calculation was based on the year 2001, differences in premia for utilized and set aside areas do not play a role.

¹⁶ See Bundesministerium für Verbraucherschutz, Ernährung und Landwirtschaft: Auswirkung einer 1%igen Flächenstilllegung auf den EU-Haushalt 2001/02; Referat 413, Az. 413-1201 vom 7.3.2000. Effects of a 1 % set aside on the EU-Budget 2001/02; internal calculations.

¹⁷ Data for Germany related to the year 1999

Q. 4.1.2: In what proportion did the remuneration of voluntary set aside strengthen the effectiveness of the set aside instrument? Estimate the share of the voluntary set aside areas which would have been unproductive in the event of absence of the measure.

Synthetic Answer:

On average, 4.0 % of the national COP-area were set aside voluntarily every year. This resulted in a further reduction of grain output by 1.2 mill tons per annum (2.5 % of annual output). In this respect, the voluntary set aside measure supported the compulsory scheme generally; however, since primarily less fertile areas were taken out of production, the (additional) market reduction remained rather low.

Due to the selection of less productive areas for set aside, the voluntary set aside instrument was intensively demanded particularly in regions with a higher proportion of less favoured areas (e.g. Brandenburg). On the other hand farmers in regions with favourable natural conditions participated less in voluntary set aside.

Without premia, only very few areas would have been set aside voluntarily. Probably only in the least productive sites plots would have been taken out of production at a small extent.

Details of the Answer:

On national average, approx. 4.0 % of the premium carrying COP-areas were set aside voluntarily. This corresponds to 41 % of the average set aside area (1996-99).

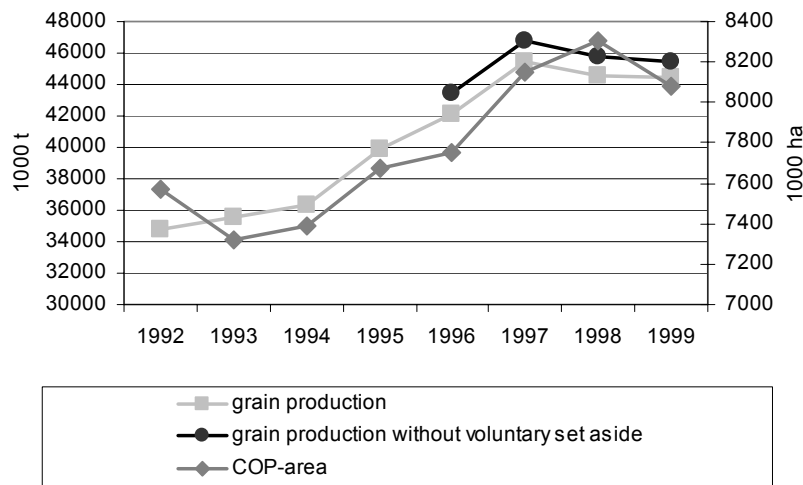
Between 1996 and 1999, voluntary set aside led to a reduction of COP-production by 1.206.000 tons per annum, corresponding to 2.5 % of the respective average output. The option to set land voluntarily aside was predominantly applied in areas with low soil qualities. The following reasons in favour of voluntary set aside were mentioned:

- Agronomical reasons (size of plots, distances); that has been the most important argument for 45 % of the 150 interviewed farmers;
- Precaution measure in order to avoid premia reductions, eventually resulting from a too small calculation of set aside areas (33 % of the interviewed farmers);
- Economic reasons, as the premium was estimated higher than the income contribution of the areas (17 % of the interviewed farms);
- Expanded cultivation of non-food crops (rape); that particularly played a role in areas in which the cultivation of food-rape was limited by regional regulations (cut-off limit, see Thuringen case study).

In Germany, no areas were set aside voluntarily before 1985.¹⁸ Voluntary set aside just started with the implementation of the five-year programme in 1988. As a result of the one-year set aside in 1992, a considerable share of less productive areas was voluntarily excluded from production for economic reasons. It becomes obvious that with a high set aside-rate less areas were set aside voluntarily. Farmers obviously calculated with a relatively fixed share of set aside areas in their crop ratio; therefore, they used voluntary set aside to keep this share relatively constant.

¹⁸ Excepted the effects of few regional programmes aiming at piloting the set aside instrument (e.g. green-fallow set aside in Niedersachsen).

Figure 10: Development of COP-Area and Grain Production with and without Voluntary Set aside in Germany 1992 - 1999



All in all, the effects of voluntary set aside on the extent of grain output were rather little. Figure 10 demonstrates that the reduction in grain production due to voluntary set aside (difference between the two production lines) was compensated by the expansion of COP-area by far. That underlines the impression that voluntary set aside has been applied by the farmers mainly for agronomical reasons (renunciation of the cultivation of less productive areas or plots with handicaps); simultaneously the cultivation on the remaining (more productive) areas has been enlarged.

Without the payment of premia, almost no plots within favourable areas would have been excluded voluntarily from production in Germany. On the other hand it can be assumed that in less favoured areas plots would have been set aside to a small extent even without financial compensation (especially in the New German Laenders). However, the extent of voluntary set aside land in case of no remuneration is hardly to estimate. It is influenced not only by the development of farm prices (particularly grain prices), but also by the re-structuring of the large-scale farms in the New German Laenders.

Q. 4.1.3: To what extent has the set aside instrument determined the non-food production trend?

Synthetic Answer:

As a result of land set aside, the cultivation of non-food crops was strongly extended. The additional output through land set aside is estimated at approx. 204.000 ha per year, corresponding with an annual production of 648.000 t (average 1995 –1999).

The extent of non-food crop cultivation varied regionally. Besides soil fertility also crop rotation, livestock density, as well as regionally specific regulations for rape cultivation has been relevant.

The option to cultivate non-food crops on set aside areas was almost exclusively used for the cultivation of rape (97 %).

Details of the Answer:

On national average, 18 % of the set aside areas were cultivated with non-food crops between 1992 and 1999. 97 % thereof were used for the production of rape.

Respecting the cultivation of non-food crops, the following regulations had to be considered:

- Purchase contract signed even before seeding;
- Delivery of the entire production; in order to guarantee that obligation, the regional administration defined a representative average yield (related to the regional conditions for production);
- Only varieties listed in a „positive list“ were allowed to cultivate as non-food crops.

The cultivation of non-food crops differed regionally considerably. The extension of cultivation corresponded with the below listed factors. With numerous exceptions, the following general trends can be recognized:

Set aside-rate: The higher the set aside-rate the more areas were cultivated with rape for non-food purposes, especially since 1995 (see figure 11).

Quality of soils: With increasing soil quality the cultivation of rape rose generally; exceptions from this tendency could be noticed e.g.

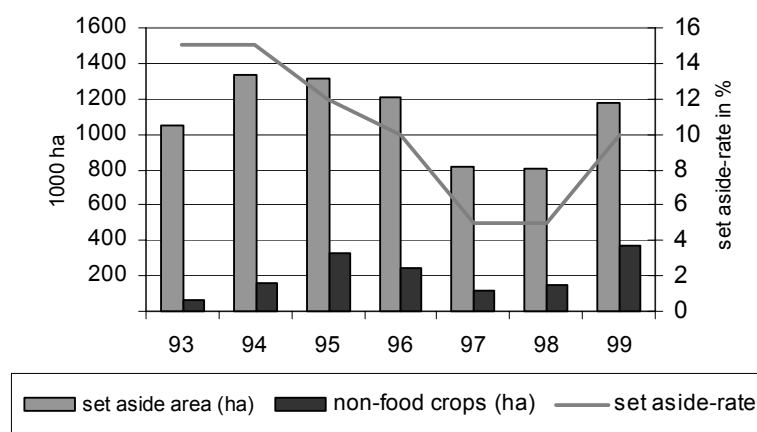
- in regions with a large proportion of sugar beets in crop rotation (see below),
- in sites with high productivity of grain production (e.g. Schleswig-Holstein).

Sugar beet quota: The higher the quota per ha the less rape was cultivated. The simultaneous cultivation of sugar beets and rape within crop rotation is problematic for agronomical reasons; furthermore, the cultivation of sugar beets achieved a higher productivity of the arable area than the cultivation of rape.

Crop rotation reasons: The higher the share of grain within crop-rotation the more rape was cultivated on set aside areas.

Regional regulations: The limitation of rape production for food-purposes by the cut-off limit in several Laender (e.g. Thuringen) led to an intensified cultivation of rape for non-food purposes on set aside areas. So, crop rotations containing a relatively high share of grain could be widened. Furthermore, the cultivation of rape facilitated the maintenance of the set aside areas (reduction of weeds).

Figure 11: Development of Land Set aside, Non-Food Production and Set aside-Rate in Germany (1993-1999) (see table 1)



Livestock density: The higher the livestock density per ha the more plots were cultivated with non-food crops because organic fertilizers could be spread on those plots. By this it was possible to meet the limits of the national fertilizers regulation.

Rape processing capacities: In regions without sufficient industrial capacities for the production of rape oil the farm prices for rape were generally lower (e.g. Thuringen, Brandenburg) than in regions with developed processing facilities. This influenced the profitability and therewith the extension of rape production.

Table 6: Cultivation of Non-Food Crops on Set aside Areas in Germany 1993 – 1999 (1000 ha) ¹⁹

	1993	1995	1996	1997	1998	1999
Starch (potatoes)	n.a.	2.7	0.1	n.a.	n.a.	n.a.
Sugar (sugar beets)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Rape-seed oil	60.4	330.5	226.9	106.1	143.3	359.8
Sunflower oil	0.3	17.2	6.7	3.1	3.1	7
Flaxseed oil	1.9	3.3	1.3	0.7	0,4	1
Fibrous plants	0	0.3	0	0	0	0
Medicinal plants	0.7	0.9	0.6	0.8	0.9	0.9
Other crops	2.4	5.9	1.1	0.2	0.3	0.7
n.a.: information not available/not provided (too little volume);						

On account of land set aside new production methods has not been initiated broadly (cf. table 6), although non-food production on set aside areas generally offered the opportunity to integrate typical "niche crops" into crop rotation again, which are not subject to EU-market organisations and do not have any market protection (e.g. medicinal plants, flax).²⁰

On the other hand, the development of new processing alternatives for non-food products was strongly intensified, predominantly for the production of bio-diesel from rape. In Germany, the following outputs of non-food crops were achieved:

Table 7: Production of Non-food Crops for Industrial Purposes in Germany 1995-1999 (tons) ²¹

	1995	%	1996	%	1997	%	1998	%	1999	%
Bavaria	132698	14	65781	11	30769	11	42923	15	127652	11
Brandenburg	76930	8	14394	8	22662	9	33997	3	100855	8
Niedersachsen	59148	6	33774	6	15984	6	19272	7	63858	5
Schleswig-Holstein	55371	6	28921	5	13942	5	19638	6	58359	5
Thuringen	129207	14	60925	12	33967	13	69540	13	155945	17
Germany in total	945685	100	451981	100	275805	100	407045	100	1156863	100

Elements of Answers for Question 421 to 444

Questions concerning Efficiency

Q. 4.2.1 What is the budgetary cost of the instrument justified in relation to the noted effects? Estimate what would be if the set aside of land would not be remunerated.

Synthetic answer:

Whether the budgetary costs for the set aside programme corresponded positively with the market relief through set aside can be answered on European level only. A comprehensive evaluation of land set aside on the basis of an economic and social cost-benefit-analysis must include further direct and indirect impacts of set aside besides the market relief.

The implementation of the original MacSharry-proposal (output reduction without compensation through premia) would have had drastic disadvantages for German agriculture compared to the CAP-reform of 1992. In this case it is to be supposed that many plots in less favoured areas would have become fallow land. On the other hand, production would have been concentrated on favour-

¹⁹ See Statistisches Jahrbuch über Ernährung Landwirtschaft und Forsten 2000, table 90; own calculations.

²⁰ Statement of representatives from the National Ministry for Agriculture, June 2001.

²¹ See UFOP (Union zu Förderung von Oel- und Proteinpflanzen) Bericht 1999/2000, Bonn 2000; own calculations.

able sites. As a result high income losses, a strong decline of the number of farms, negative impacts on the environment, and obstacles for the development of rural areas would have arisen. Furthermore, it can not be excluded that animal production would have increased and led to additional market strains.

Details of the Answer:

At the sight of the Common European Market, the national agricultural outputs are not identic with the national extent of agricultural commerce. Thus, the relation between the restriction of production and the expenditures for the set aside measure can only be discussed EU-wide. Furthermore, just a comparison between budgetary costs and market relief can not provide a comprehensive evaluation of the set aside instrument. The impacts on farm incomes, social and environmental effects, and not at least the influences on the development of rural areas must also be taken into consideration.

According to the MacSharry-proposal, the farm prices for grain would have been lowered in relation to the growing grain production – but without compensatory payments. Consequently that would have required far less public means, but negative impacts on single farm and regional level would have to be expected.²²

- Reduction of grain production in less productive regions; concentration on areas with favourable natural conditions;
- Prospectively set aside of less productive plots; especially parts of the New German Laenders (e.g. Brandenburg) as well as highland regions would have been concerned;
- Replacement of less profitable varieties out of crop rotation; narrowing of crop rotations with negative environmental impacts (e.g. increase of plant diseases, raised input of plant protection means, leaching of soils, degradation of soil structure etc.);
- Negative impacts on landscape resulting from large-scale set aside predominantly in less productive but nonetheless areas of scenic attractiveness;
- Restricted possibilities to use landscape and regional agriculture as potentials for the increase of regional value added (e.g. through farm and rural tourism, marketing of farm produce etc.);
- Risk of migration losses particularly in regions with low population density;
- Raising cost for the upkeep of countryside and nature protection in areas in which a long-term fallow with secondary succession is to be avoided;
- On plots with fair and/or low profitability eventually losses in grain quality could be expected since the expense of yield increasing means would have been reduced due to the reduced farm prices;
- Significantly lower increase in the production of non-food products: from an economic point of view, the cultivation of rape only became interesting because of set aside with compensatory premia;
- Orientation of farm production partly on other markets; it can be assumed that the intensive livestock production would have increased even stronger on account of the lowered grain prices, too.

²² Answers are based on own research as well as on interviews with representatives of the national and regional authorities and agricultural scientists.

- Strongly rising expenditures for the regulation of market surpluses resulting from animal production;
- Significant acceleration of the agricultural structural change: Heavy decrease of the number of farms in total and an increasing share of part-time farms;
- High income losses in the commercial crop sector; potentially income gains in the farms with animal husbandry;
- Reduction of average rents per ha; better opportunities for growing farms to rent in additional land;
- Less undeliberate redistribution effects of public transfers: increased share of transfers to the benefit of the farmers, less share to the benefit of the land owner.

Q. 4.2.2: Is the impact of compulsory set aside-rate and the payment level on the large producers' income likely to amend their crop choice so as to answer better the requests of the market?

Synthetic Answer:

The larger commercial farms (> 100 ha) were affected the most from the CAP-reform including land set aside. Particularly in favoured regions the premia could not compensate the income losses in full. So, the farm income per ha of the larger farm enterprises fell clearly since 1992.

On the other hand larger farms adapted their production and organization under the economic pressure faster to the changed context than smaller farms. They broadly took opportunities to limit income losses, particularly through farm-enlargement, modification of crop rotation, correction of intensity of cultivation, improvement of product quality and general rationalization of farm organization. All in all, the competitiveness of the larger farms – from a long-term point of view – became stronger.

Details of the Answer:

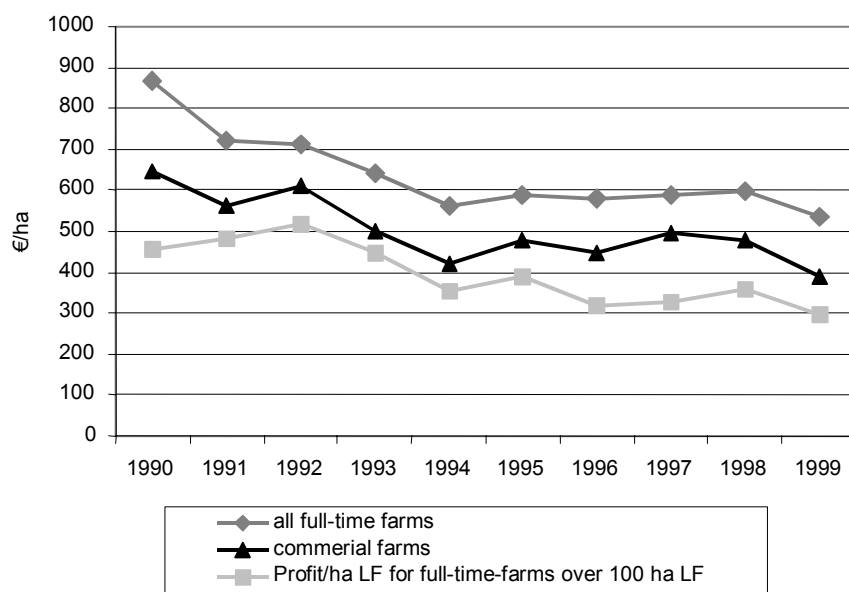
The farms with the highest extent of farm land are predominantly commercial farms. They were strongly affected by the CAP-reform as

- particularly the prices for COP-products dropped,
- a compensation of income losses through (intensified) animal husbandry could only partly be realized.

On national average, all commercial farms with at least 100 ha UAA were counted among “larger farms”.²³ In this group, the average profit per ha UAA sank by 40 % between 1992 and 1999, whereas all full-time farms suffered from lower decrease of profits per ha on a generally higher level (cf. figure 12).

²³ On regional level, the differentiation between larger and smaller farms was done in relation to the specific regional circumstances (see regional reports).

Figure 12: Development of Farm Profit/ha UAA in the Large Commercial Full-time Farms Compared to all Commercial Full-time Farms in Germany²⁴



The larger farms realized extensive adaptations under the economic pressure of the CAP-reform. The following presentation refers to the interviewed farms with more than 100 ha UAA (80 out of 150 farms or 53 % respectively).²⁵

Farm enlargement: Out of the 80 larger farms 44 % enlarged the extent of farm land by 166 ha on average between 1992 and 1999; the strongest expansion was noticed on the large farms in the New German Laenders; the increase of land on larger farms (>100 ha UAA) was by 101 % higher than the average increase on smaller farms (< 100 ha UAA).

Corresponding with the extension of farm size, COP-area (in 60 % of the larger farms) and grain cultivated area (33 %) were enlarged clearly (cf. tables 8,9).

Table 8: Development of COP-Production in the Larger Farms (> 100 ha UAA) in the 5 Case Study Regions in Germany (multiple responses possible)

	Expansion of COP-production	No significant change of COP-production	Expanded activities outside COP-production
Share of Farms (Total: 80 Farms)	60 %	26 %	35 %

Table 9: Development of Grain Cultivation Area in the Larger Farms (> 100 ha UAA) in the 5 Case Study Regions in Germany

	Reduction of grain cultivation area	No significant change of grain cultivation area	Expansion of grain cultivation area
Larger farms (Total: 80 Farms)	6 %	61 %	33 %

Intensification of cultivation on the areas not set aside: In 40 % out of the 80 larger farms the intensity of cultivation was raised on the remaining areas. This was realized on one hand through the selection of more productive crops and the narrowing of crop rotations simultaneously (see tables 8, 9), on the other hand by slightly raised inputs of fertilizers and plant protection means since 1995 (see figures 14, 15):

²⁴ See Agrarbericht der Bundesregierung: Buchführungsergebnisse der Testbetriebe, different volumes.

²⁵ Detailed results out of the five German case studies.

Production of high-quality grain: Modifications in the choice of varieties and a stronger orientation of fertilizers and plant protection application on requirement enabled the farmers to increase the quality of grain. By this way higher farm prices could be achieved.

Narrowing of crop rotation: On regional level, the modified selection of grain varieties and the intensification of cultivation led to narrower crop rotations. Although the share of grain in cultivation was not raised in total, within cereal production especially the proportion of wheat (above all in the most favourable sites) or rye (primarily on sandy soils) increased.

General rationalization of farm organization: The economic pressure through changed farm prices and land set aside enforced efforts for saving production costs and for the optimization of production in all regions. This pressure was the highest in the commercial farms (without animal husbandry) and in the larger farms in the New German Laenders. As a result, the input of farm employees per 100 ha (labour intensity) in the enterprises with at least 100 ha UAA sank by 29 % between 1992 and 1999. On average of the smaller farms (below 100 ha) the respective reduction amounted to approx. 20 % only.

Within the large-scale operations in the New German Laenders however, the adaptation of farm organization was influenced less by the CAP-reform than by the necessary restructuring of the entire agricultural sector in the former DDR. This restructuring in particular contained:

- Choice of new legal forms for the enterprises;
- Orientation of farm organization towards the market conditions;
- Adaptation of the existing production factors (in particular farm labourers) to the varied context, including the return of land to the former proprietors;
- Regulation of the indebtedness of the companies.

Questions concerning Agronomical Practices

Q. 4.3.1: Did the existence of a remunerated set aside encourage good crop rotation and which were the alternative crops in the plots set aside?

Synthetic Answer:

In the majority of the interviewed companies, the set aside measure did not cause perceptible changes of crop rotation. In 38 % of the cases however, positive effects were stated.

Modifications of crop rotation were noticed more frequently in favourable sites and in specialized commercial farms than in less favoured areas and within forage growing farms. Those positive effects resulted in the first place from the extended cultivation of rape and (other) soil improving plants. The predominant application of rotational set aside was also an advantage.

Only in few cases (5%) the crop rotation was influenced negatively by the set aside measure. As main cause for this the strong narrowing onto especially productive crops was discovered.

Details of the Answer:

In general, crop rotations were influenced by the set aside measure. However, their effects were different on regional and farm level.

46 % out of the 150 interviewed farmers changed their crop rotation since 1992. For that the integration of set aside within crop rotation was mentioned as a central argument. 56 % of the farmers decided in favour of a rotational system exclusively; 17 % chose the fixed set aside; further 26 % combined both types of taking farm land out of production.

The farmers' reactions among other influences depended on the following factors: quality of soils, annual rainfalls, extent of animal husbandry, availability of sugar beet quotas, farm mechanization, farm prices and area based premia.

All in all, the following relations could be found:

- On worse sites, the influence of land set aside on crop rotation was very small, because primarily the least fertile plots were taken from production completely without modifying the crop rotation fundamentally.
- On more fertile sites, partly positive modifications of crop rotation were noticed, as there rotational set aside was chosen frequently and non-food crops or soil improving plants were cultivated on set aside areas. On the other hand, the set aside measure partly enforced the specialization trend (narrowing of crop rotation).
- In total, the commercial farms implemented the most extensive modifications of crop rotations. On the other hand, in forage growing farms (with animal husbandry) the effects on crop rotation were rather small because of the necessity of forage production.
- Differences between compulsory and voluntary set aside concerning the effects on crop rotation were hardly detectable.

Provided that alternative crops were cultivated on set aside areas, this above all concerned rape for non-food purposes as well as soil improving plants (phacelia, clover).

According to the appraisal of the interviewers, the set aside measure mainly had no distinct effects on the crop rotation of the 150 interviewed enterprises. In more than one third of the cases however, an improvement in crop rotation became evident (see table 10).

Table 10: Modifications in Crop Rotations in the 5 Surveyed Regions in Germany
(estimated by the interviewers)

	Degradation Of crop rotation	Neutral effects On crop rotation	Improvement of crop rotation
Share of farms (total: 150 farms)	4.7 %	57.3 %	38.0 %

Q. 4.3.2: Did the location of the plots set aside encourage better cultivation methods?

Synthetic Answer:

In about half of the analysed companies each the economic and agronomical effects of land set aside were estimated as rather small (neutral). This above all concerned farms with rotational set aside.

Positive effects on the cultivation methods were estimated in approx. 35 - 40% of the cases. Economic and agronomical advantages above all resulted from fixed set aside and the set aside of problematic plots. As a result, the expenditures for cultivation could be reduced without (major) income losses. All in all, the utilization of the remaining areas was optimized.

Details of the Answer:

Approx. 44 % of the interviewed farmers chose exclusively or partially the fixed set aside scheme (cf. Q. 431). They took primarily less fertile areas, peripheral located plots, areas with natural handicaps for cultivation, and those with management restrictions permanently out of production (cf. table 11).

This procedure allowed them to improve the cultivation on the remaining areas. Provided that rotational set aside was chosen, the effects on the cultivation techniques were smaller.

Table 11: Selection of Areas for Set aside in the 5 Case Study Regions in Germany (150 farmers interviewed, multiple responses)

	Rota- tional set aside	Fixed set aside								
		Along water courses	On small plots with cultivation handicaps	On pe- ripheral or isolated areas	On less productive and mar- ginal areas	On slopes	On exten- sively cultivated fields or margins	Acquisi- tion of plots to be set aside	Transfer set aside obligation to another farm	Another reason (edge of the forest)
Answers (%)	74.7	6.0	26.7	16.0	38.7	8.0	20.7	2.0	0	2.0

Answers related to the entire period of the set aside programme (1992-1999)

All in all, in 34 % of the farms economic advantages originated from taking less favourably manageable areas out of production. However, in the majority of the cases economic influences were hardly to be found (see table 10; neutral: 50.7%). Provided that areas were set aside fixed, this developed simultaneously to be an ecological advantage for the evolution of flora and fauna.

Unless 43 % of the interviewed farmers took plots for longer time out of production, in not any of the five case study regions the farmers complained about a „neglected impression“ of the set aside areas. Mostly the set aside plots were not concentrated on a single part of the farms (cf. Q. 443).

Table 12: Effects of Land Set aside on the Economic and Agronomical Balance of the Interviewed Farms in the 5 Surveyed Regions in Germany (estimated by the interviewers)

Farms (in total: 150)	Disadvantage	Neutral	Advantage
Economic balance	15.3 %	50.7 %	34.0 %
Agronomical balance	6.0 %	52.0 %	42.0 %

The option to refrain from the cultivation of problematic plots was estimated as an agronomical advantage in 42 % of the cases. Negative effects of the set aside measure on cultivation could hardly be found. In half of the cases, the agronomical effects were rather small (neutral). This above all concerned the farms with rotational set aside.

Q. 4.3.3 Did the existence of the remunerated compulsory set aside cause production intensification in the other plots?

Synthetic Answer:

The set aside programme, the general growth of yields and the improvement of product quality supported the intensification of cultivation on the remaining areas. On average, the input of synthetic N-fertilizers was raised by 14 %; the input of plant protection means increased, too. This evolution was supported by price reductions on the markets for yield increasing means during the 90th.

The intensification of cultivation mainly occurred in more favourable regions with higher yield potentials. On less productive sites, the input of yield increasing means might have remained rather constant.

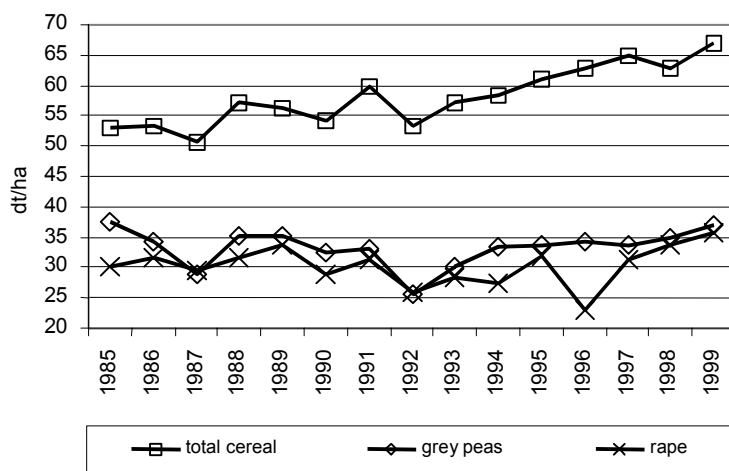
Details of the Answer:

The average grain yields rose continuously during the set aside programme. Reasons for that were (see Q. 411):

- Specialisation of farm organization;
- Improved farm management (particularly in the large eastern farms);
- Intensification of farm production on the remaining areas;

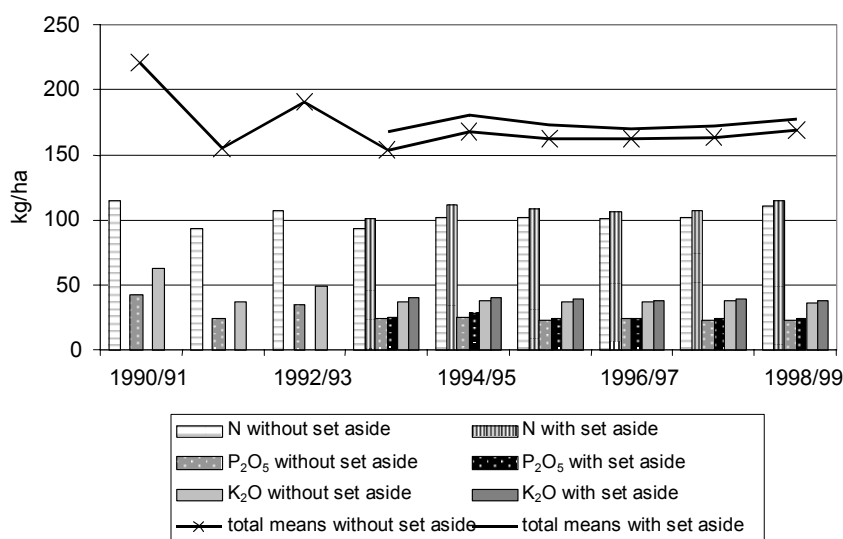
- Cultivation of higher productive crops, technical progresses.

Figure 13: Development of Yields of Selected Crops in Germany²⁶



In Germany, about 9 % of the entire arable area were taken out of production through the set aside measure on average. The total input of synthetic yield increasing means rose a little simultaneously (see figure 14). The application of organic fertilizers remained relatively unchanged. All in all, it can therefore be stated that the application of fertilizers and plant protection means on The (reduced) areas not set aside has been increased. This evolution was favoured by the price cut for fertilizers in the 90th (see annex 5).

Figure 14: Input of Fertilizers in Germany 1990/91 – 1998/99²⁷



Depended from the natural conditions for farming and the farm structures, the input of means of production developed differently within Germany:

- Between 1993/94 and 1998/99, the input of synthetic N-fertilizers increased by 14 % per ha of the areas not set aside (arable areas plus grassland). Only the inputs of potash and phosphorus fertilizers were reduced by 6 %.²⁸

²⁶ See Statistisches Jahrbuch über Ernährung Landwirtschaft und Forsten, different volumes

²⁷ See Bundesministerium für Verbraucherschutz, Ernährung und Landwirtschaft: Agrarbericht der Bundesregierung, different volumes.

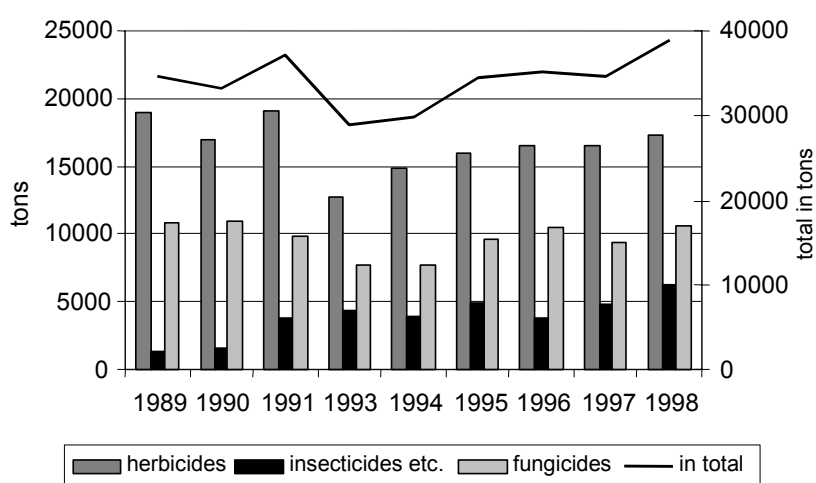
²⁸ See Statistisches Jahrbuch über Ernährung, Landwirtschaft und Forsten 1999, table 74; own calculations.

- In regions with more favourable natural conditions, the input of fertilizers grew more strongly than in the less productive sites. This above all correlates with the height and development of grain yields.

As already mentioned in Q. 431, the number of single plants/varieties within crop rotation decreased during the set aside programme. Corresponding with that, above all lower profitable crops (e.g. oat) were replaced through wheat and non-food crops. This among other influences resulted in an increased input of plant protection means.

Figure 15 shows the total input of plant protection means in Germany, counted in tons. Because the concentration of the single means is unknown, the particular input per ha can hardly be estimated. Nonetheless, based on the figure it can be supposed that the intensity of plant protection has been increased on average. This trend would also correspond with the improved product qualities (in particular grain qualities).

Figure 15: Input of Plant Protection Means in Germany 1989 – 1998 (tons) ²⁹



Q. 4.3.4: To what extent did the existence of the compulsory set aside modify the farm competitiveness by an adaptation of the productive structures?

Synthetic Answer:

Immediately after introduction of the set aside programme, farm incomes dropped clearly. Improvements of the income situation during the following years resulted primarily from farm extension, growing yields, an expansion of animal husbandry and progresses in rationalization of farm organization. However, the profits remained far below the farmers expectations. Therefore, among other adjustments, off-farm employment opportunities were developed increasingly.

The profit per ha UAA sank continuously because farmland grew faster than incomes. The general rise of rents also had a negative effect on profits. This increase was strongest in areas with intensive animal husbandry. Nevertheless, in particular the larger farms and those operating in favoured sites might have been successful in stabilizing their competitiveness. However, it remains an open question whether they could correct their competitiveness on a long-term basis.

About half of the interviewed farmers mentioned that the brief offer of land for lease limited their farm expansion. About one third of the farmers had the opinion that the set aside measure was one (among others) cause for this evolution.

²⁹ See Statistisches Jahrbuch über Ernährung, Landwirtschaft und Forsten, Münster, different volumes; own calculations.

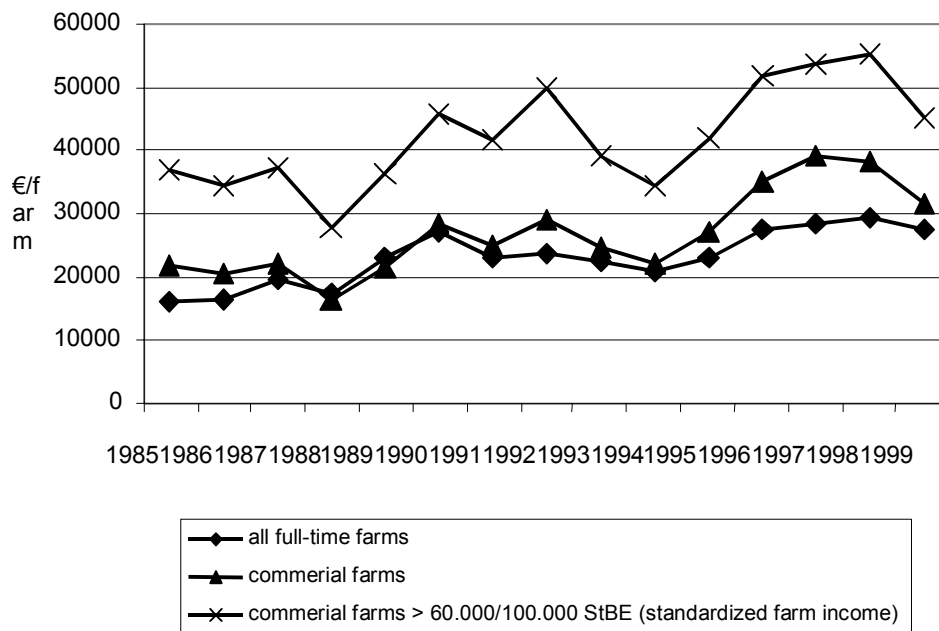
Details of the Answer:

The introduction of land set aside firstly led to income losses, particularly in the commercial farming sector (cf. figure 16). Since 1995, the income situation of those enterprises could be improved by

- farm expansion,
- growth of yields per ha,
- extension of animal husbandry,
- corrected farm prices for oilseeds,
- rationalization of farm organization

Nevertheless, the profits per farm remained on a rather low level (see figure 16). This may explain why some of the 150 interviewed farmers decided for the establishment/enlargement of supplementary gainful on-farm and/or off-farm activities (e.g. energy plants, farm tourism, rented houses); those decisions mostly went parallel to a partly shift of farm resources into new (commercial) businesses.

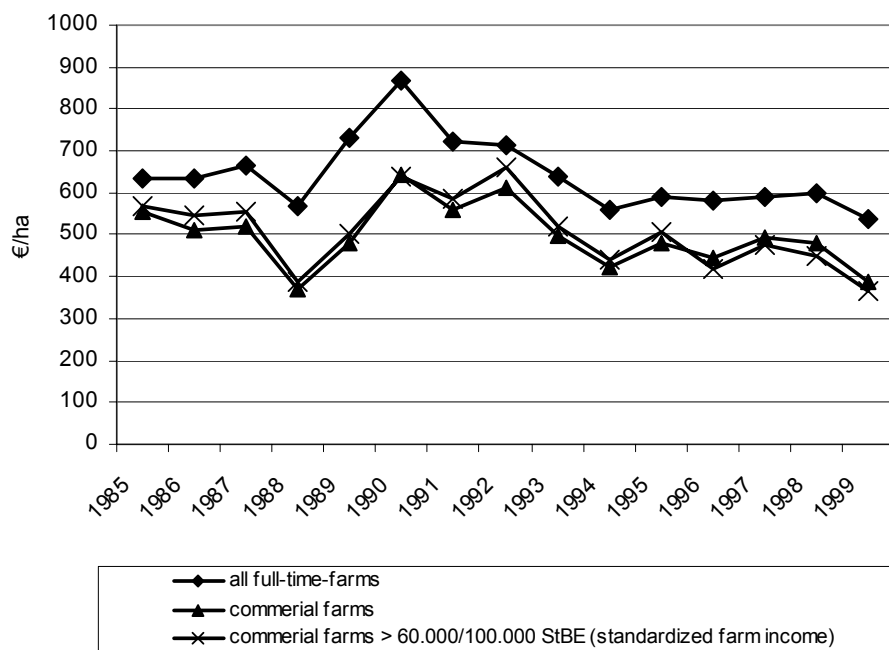
Figure 16: Development of Profits per Farm in Full-time Farms in Germany³⁰
(StBE = standardized farm income)



The profit per ha dropped continuously since the implementation of the set aside programme, because the average farm size increased faster than farm profits (see figure 17).

³⁰ See Agrarbericht der Bundesregierung; Buchführungsergebnisse der Testbetriebe; Bundesministerium für Verbraucherschutz, Ernährung und Landwirtschaft, different volumes; current prices; since 1996: Entire Germany; 1996 the farm classification by standardized income changed; the previous limit (>60.000 StBE) was raised up to > 100.000 StBE for the classification of larger farms.

Figure 17: Development of Profits per ha UAA in Full-time Farms in Germany³¹
(StBE = standardized farm income)



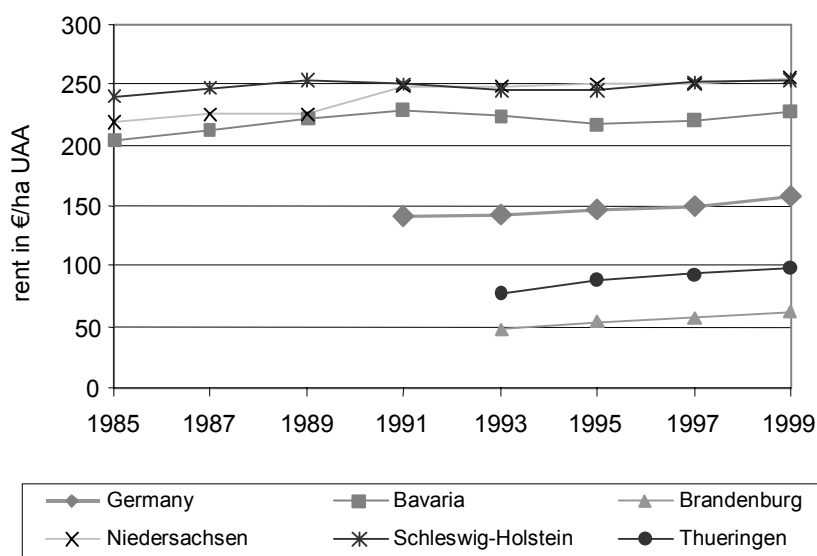
Between 1992 and 1999, about half of the 150 interviewed farmers enlarged their farmland by 43 ha on average. Some farmers would gladly have expanded their area even further; because 59 % of the interviewed operators reported about difficulties to find arable areas for renting or buying. Out of these 88 farms, 31% of the farmers believed that the set aside measure was one cause of this problem. Correspondingly, 36 % of the farmers stated that a special market for premium carrying areas has developed since the introduction of the set aside measure.

With regard to Germany it is to be accepted that the competitiveness of the farms got more influenced through the general farm price development than by the set aside programme. In particular larger enterprises and those operating in better sites obviously found possibilities for the stabilization of competitiveness via growth and rationalization. This can be recognized by the modification of the number of farms within the different size classes (see figure 1). Accordingly, the number of farms with more than 100 ha UAA grew by around 49 % between 1993 and 1999, whereas the number of farms with less than 50 ha on the other hand was reduced by 22 %.

The strong demand for additional farm land was expressed in a raise of rents by 10 % on average. However, the differences in the level of rents between the western and the eastern parts of Germany remained unchanged (see figure 18). In areas with intensive animal husbandry the rents also increased due to the expansion of animal production. There, additional land had to be procured in order to be able to meet environmental restrictions concerning the application of organic fertilizers (e.g. parts of Niedersachsen).

³¹ See Agrarbericht der Bundesregierung; Buchführungsergebnisse der Testbetriebe; Bundesministerium für Verbraucherschutz, Ernährung und Landwirtschaft, different volumes; current prices, since 1996: total Germany and changes of the limits for standardized farm income (StBE) (>60.000 to >100.000 StBE).

Figure 18: Development of Rents for Farm Land (€/ha UAA) in Germany³²



Questions Concerning the Environmental Impacts

Q. 4.4.1: Did the adoption of set aside have a significant impact on the improvement of soil management (erosion, fertility, structure, etc.)?

Synthetic Answer:

In two thirds of the interviewed farms, the set aside measure had no perceptible effects on soil management. This was above all result of the high share of rotational set aside. In 29 % of the cases, the soil management was corrected because of the extended cultivation of rape and soil improving plants on set aside areas.

Problems with erosion resulting from set aside did not occur. This associates with the fact that complete fallow (without vegetation cover) was not allowed and set aside areas were not irrigated.

The effects of particular programmes aiming at soil protection had a greater influence on soil management than the set aside measure. 20 % of the interviewed farmers participated in such programmes.

During the set aside programme, the regulations concerning the impacts of land set aside on soil management have not been modified. Neither existing regulations were changed nor new rules established. Irrespective from set aside, the national and regional regulations regarding soil protection were enforced.

Details of the Answer:

Since complete fallow land without vegetation cover was forbidden in Germany, no (additional) erosion problems occurred as a consequence of the set aside measure. In 66 % of the 150 interviewed farms significant modifications in the management of soils were not to be proved. That above all can be explained with the high share of rotational set aside (56 % exclusively and 26 % as combination between rotational and fixed set aside in the interviewed farms).

³² See Statistisches Jahrbuch der Bundesrepublik Deutschland, different volumes.

In 29 % of the enterprises the set aside measure influenced the cultivation of soils positively. The main cause for that was the cultivation of soil improving plants and the extensive cultivation of rape. Particularly the cultivation of rape was aimed at the improvement of soil structure and lowering of crop rotations.

20 % of the interviewed farmers participated in national or regional agro-environmental programmes, which targets were (also) oriented on the improvement of soil protection. Partly the effects of those programmes on cultivation were stronger than the effects of land set aside. Generally the intensity of regulation of soil protection has been increased nation-wide.

Table 13: Effects of Land Set aside on Land Management in the five Case Study Regions in Germany (estimated by the interviewers)

	Negative effects	Neutral effects	Positive effects
Share of farms (total: 150 farms)	4.7%	66.7 %	28.7 %

Irrigation of COP-areas was almost unimportant in Germany. An irrigation of arable areas above all occurred in special crop farms. Before the German reunification, in the former DDR large parts of the arable land were irrigated. However, these irrigation equipments are mainly out of use today. Set aside areas have never been irrigated.

Q. 4.4.2: Did the adoption of set aside have a significant impact on the improvement of water management?

Synthetic Answer:

The set aside measure had neutral effects on water quality in the majority of the interviewed enterprises. Partially improvements could be realized resulting from taking environmentally sensitive areas out of production; positive effects were also provided from the reduction of fertilizing and plant protection.

15 % of the farmers participated in national/regional programmes for the protection of waters. Those programmes showed more influence on water quality and water management than the set aside instrument.

During the set aside programme, the regulations concerning the impacts of land set aside on water management have not been modified. Neither existing regulations were changed nor new rules established. Irrespective from set aside, the national and regional regulations regarding the protection of waters were enforced.

Details of the Answer:

According to the appraisal of the interviewers, the influence of land set aside on the quality of waters was predominantly neutral. That can be explained with the following arguments:

- Prohibition of fertilizing and the application of plant protection means, provided that the areas were not used for non-food production;
- Renunciation of irrigation of set aside areas;
- The relatively high extent of rape cultivation on set aside areas (a third approx.); as a result, the cultivation was hardly modified;
- Obligation for land planting of all set aside areas without cultivation.

Positive effects on the quality of waters were registered in 15 % of the interviewed farms. They above all could be achieved through setting aside especially sensitive areas (e.g. flood areas, bogs).

Negative effects (5 % of the interviewed farms) were mainly the result of

- erosion of N-fertilizers; according to statements of environmental associations this is relevant particularly in the case of re-cultivation of long-term set aside areas;
- concentrated application of plant protection means (herbicides) on set aside areas to prepare those areas for further cultivation.

In addition, with the view on water protection it was also relevant that the intensity of cultivation has been increased generally on the areas not set aside (see Q. 433).

The expansion of protected water collection areas as well as the corresponding restrictions for cultivation had more influence on water management and water protection than the set aside regulations. The programmes aiming at water protection generally demand low input cultivation methods and/or the renunciation of certain means which potentially might have negative effects on the environment. In total, 15 % of the interviewed farmers participated in those programmes.

Table 14: Effects of Land Set aside on Water Management in the 5 Case Study Regions in Germany (estimated by the interviewers)

	Negative effects	Neutral effects	Positive effect
Share of farms (total: 150 farms)	4.7 %	80 %	15.3 %

Q. 4.4.3: Did the adoption of the set aside have a significant impact on the improvement of landscape management?

Synthetic Answer:

At the analysis of the interviewers, in 95 % of the interviewed farms no perceptible effects of land set aside on landscape management could be identified. Only 14 % of the interviewed farm operators noticed that an abandoned subarea has developed due to set aside. However, indications could be found that a higher proportion of the entire regional population complained with the appearance of the set aside areas.

Provided that negative effects on landscape management resulted, they above all occurred in less favoured areas. There more often especially less fertile plots were taken permanently out of production and partially not sufficiently maintained.

The extensive cultivation of rape and soil improving plants on the other hand, provided a clear enrichment of landscape, particularly during the flowering-period.

During the set aside programme, specific regulations concerning the impacts of land set aside on landscape have not been modified. Irrespective from set aside, several regional programmes aiming at the maintenance of landscape or particular parts of it have been established or enforced.

Details of the Answer:

At the appraisal of the interviewers, no negative effects on landscape management were to be proved in approx. 95 % of the farms. That faces that nevertheless 14 % of the interviewed farmers expressed that due to the set aside measure subareas with an optically abandoned appearance would have resulted.

As ZICHE analysed, a considerably higher share of the non-agricultural population (about 60 %) believed that land set aside would cause negative effects on landscape esthetics. Merely 17 % of the interviewed persons living in villages expected advantages from the set aside instrument (enlarged crop rotations, improved nature conservation, natural cultivation methods etc.) 23 % mentioned the opinion,

land set aside would not affect the landscape (neutral).³³ This research was carried out at the beginning of the set aside programme in Bavaria. It can be assumed that today, after a ten-year experience with set aside, the negative appraisal has become considerably smaller.

Provided that set aside areas with a neglected appearance could be found, this mainly occurred on less productive sites. There, larger parts of the COP-area were taken out of production permanently and were partially not sufficiently managed. As a result, particularly weed infestation became a considerable problem, at the statements of the interviewed farmers.

The extensive cultivation particularly of rape and phacelia on set aside areas provided a positive optical impression. As a result, the keeping of bees was supported at the same time.

Table 15: Effects of Set aside on the Landscape (estimated by the interviewers)

	Negative effects	Neutral effects
Share of farms (total: 150 farms)	5.3%	94.7%

Particular in the southern part of Germany the efforts concerning the maintenance of the landscape have been enforced. Those activities were often related to rural development programmes utilizing landscape as an important development potential. In particular the Aid Scheme for the Uptake of Land has found broad acceptance. In Bavaria 73 % of all farmers participated in this programme in 1997.

Q. 4.4.4: Did the adoption of set aside have a significant impact on the bio-diversity maintenance?

Synthetic Answer:

The effects of land set aside on bio-diversity depend from the conditions of location as well as from the cultivation methods, the type of land set aside and the particular species concerned.

It can be assumed that the fixed set aside influenced bio-diversity more positive than rotational set aside. On long-term set aside areas endangered species could breed more easily than on permanently managed areas. On the other hand, within the rotational system the breeding of weeds was prevented by an early mowing. Animal species can hardly settle during the short set aside period.

Since fixed set aside was chosen primarily in lesser favoured sites, there the effects of set aside on bio-diversity were more positive than in the most fertile sites (with a higher extent of rape cultivation). Enlarged positive effects on species diversity would be expected by a stronger regional adaptation of the regulations concerning the maintenance of set aside areas and from an increased share of long-term set aside, too. To maintain the positive effects of long-term set aside on bio-diversity, a regular cultivation of even those areas can be necessary.

During the programme period, the regulations concerning the impacts of land set aside on bio-diversity have not been modified. Neither existing regulations were changed nor new rules established. Nevertheless the environmental associations demand for enlarged and more precise descriptions of operations on set aside areas. Those regulations should be adapted more narrowly to the regional and local context.

³³ See Ziche, J.: Beurteilung von landwirtschaftlichen Extensivierungsprogrammen durch die Wohnbevölkerung auf dem Lande. In: Land, Agrarwirtschaft und Gesellschaft, Zeitschrift für Land- und Agrarsoziologie, Jahrgang 9/1/1992, Gießen.

Details of the Answer:

All in all, the land set aside measure had no strong influence on the preservation of species. However, the effects depend in detail from the cultivation methods (time of mowing, use of plant protection means etc.), the natural conditions of location (weather, soil, ...), and from the kind of set aside, too. As mentioned already above, the set aside measure provided the opportunity to cultivate “exotic plants” outside the market regulations as non-food crops (e.g. medical herbs). This advantage can be described exclusively the land set aside programme. On the other hand, this option was not very intensively used (cf. Q. 411).

On areas permanently set aside the effects on species diversity were in total more distinct than on areas with rotational set aside. This is proved by several research studies.³⁴ According to that primarily the following advantages of permanent fallow can be expected:

- evolution of additional (new) species,
- breeding of endangered species,
- formation of new plant communities.

On areas with rotational set aside further species could not settle and endangered species could not expand their stocks because of the cultivation of non-food crops and other plants. Additionally, in the case of land planting the early mowing prevented the breeding of endangered species.

At the beginning of the set aside programme, 41 % of the interviewed farmers mentioned problems with a too strong weed infestation on the set aside plots. This part halved until 1999 (21 %), which was among other factors a result of the extensive cultivation of non-food crops. Only 8 % of the farmers complained with the occurrence of animal pests on the set aside areas.

14 % out of the 150 interviewed farmers specified that they cultivated their set aside areas with plants which show positive effects on bio-diversity (e.g. specific seeds for game). The farmers partly complained that

- the regulations concerning cultivation and up-keeping of the areas were not sufficiently adapted to the conditions of location,
- agreements with hunters concerning the use of set aside areas were applied only in a few cases.

The environmental associations required,

- to offer land set aside primarily as a longer-term measure,
- to expand the EU-extensification programmes and in particular the field margin programme.

From the point of view of the environmental administration, a longer term set aside should be supported more intensely since it affects flora and fauna more favourably. On the other hand, on areas with average natural conditions the ecological advantages of set aside obviously are the highest if areas are taken out of production for 2 until 5 years. An extremely long-term set aside (> 5 years) of those areas can not produce further benefits for bio-diversity, as specific wild plants (especially grass) drive other (annual) plants out of the plant community.³⁵ Therefore, provided that specific wild animals particularly demand for annual weeds, a regular cultivation of those areas (e.g. mulching) should be organized. Dependend on the particular species, a rotational set aside possibly offers more advantages for the evolution than a long term set aside.

³⁴ See Poggensee, Kay: Die Flächenstilllegung der Europäischen Gemeinschaft: Analyse und Beurteilung; Pinneberg-Waldenau, 1993; and Stahr, K., Jahn, R., Billen, N., Lehmann, A., Sommer, M. (1993): Veränderung des Nährstoffhaushalts landwirtschaftlich genutzter Böden durch die Flächenstilllegung. Mitteilungen der Deutschen Bodenkundlichen Gesellschaft., 72/II, 1459-1462.

³⁵ See Landesumweltamt Brandenburg, personal information (Dr. Schoknecht).

The maintenance of the ecological advantages of long-term set aside areas requires a cultivation of those areas at least after about 5 years (e.g. mulching); see Landesanstalt für Pflanzenbau und Bodenkultur – Agrarfauna und Vogelwelt, personal information (H. Ranftl).

Since the ecological effects of set aside corresponds considerably with the specific conditions of location, cultivation/management of the set aside areas should be defined more precisely in order to achieve higher ecological effects. Consequently, the management of set aside areas should be adapted more narrowly to the regional and local context.

Elements of the Answers for Question 451 to 452

Question relating to the Complexity of Regulation and of its Setting in Place

Q. 4.5.1: What effects did numerous regulatory adaptations and the existence of numerous individual cases have on the effectiveness of the set aside instrument?

The realization of the land set aside programme became at the beginning strongly complicated because of the distinction between rotational and fixed set aside. Considerably high efforts for administration and control arose. Less the implementation of the set aside measure itself but the regulation of non-food production on set aside areas created bureaucratic problems.

In the course of implementation of the programme, the cultivation of rape caused the least efforts, because potential manipulations were limited by the determination of a reference yield. In the contrast to this, "exotic crops" such as silage maize for the production of biogas or grain for the use as a heating material led to immense high control efforts.

The increasing number of special cases, the narrowness of the regulations, and the intense controls diminished generally the farmers' acceptance of the set aside programme and the non-food production.

Q. 4.5.2: What effects did national or regional application legislations have on the effectiveness of the set aside instrument?

59 % of the interviewed farmers stated that the actually realized set aside measure forms an essential part of the CAP. However, only 11 % of the farmers agreed generally with the Common Agricultural Policy. This proportion was slightly higher in the larger farms (14 %) than in the smaller ones (9 %).

As typical administrative problems were mentioned by the farmers:

- Measurement of the set aside plots (19.3 %);
- Minimum size of set aside areas (15.3 %);
- Realization of the minimum yield of non-food crops (16 %);
- Starting time and end time of set aside (20%);
- Too late information about set aside-rate and premia (27.3 %);
- Laborious and/or complicated administrative procedures (32.7 %);
- Insufficient co-ordination with other programmes (8 %);
- Too late payments (32 %).

Problems resulting from regional specific regulations

The basic regulations of the implementation of the programme were nation-wide formulated identically. Regional deviations concerned less important details, e.g., the possibility of transfer of set aside areas on other farms. Therefore, no major problems arose as consequence of regionally different rules.

In the Laenders with a regionalization of the measure, some farmers complained with the assignment of their farm to the respective region, as expected (particularly in Niedersachsen).

Non-food crops

For the cultivation of non-food crops, a reference yield was determined every year. At least this yield had to be achieved on the set aside areas. If the real yield was below the reference yield, farmers had to buy additional rape and to sell it as non-food rape. As an alternative to that procedure, the farmers could also ask local experts (agricultural administration) for an estimation of the expected yield.

Areas which had already fallen fallow before the set aside programme, partly were not or only with difficulties accepted as "obligatory set aside areas". This procedure reduced the farmers' acceptance of the programme significantly in the cases concerned.

Farmers' proposals for the improvement of the measure :

The interviewed farmers quoted the following suggestions, which partly relate to the entire CAP:

- Complete abolition of land set aside (22 farmers);
- Simplification of the measure and less bureaucratic requirements (25 farmers);
- Modifications of the amount of premium (13 farmers); thereof 8 farmers demanded an increase of the premium; additional requests: payment of the premium by instalments; earlier transfer of the payment; differentiation of the premia depended on soil quality;
- Abolition of the simplified scheme; identic treatment of all farms (5 farms);
- Long-term constant set aside-rate; early information about the rate to come;
- Set aside of grassland and less productive arable areas only;
- Only voluntary set aside of arable areas;
- Immediate set aside of rented land;
- Permission to produce protein crops as well as forage for ones own husbandry on set aside areas;
- No longer permission of natural regrazing on set aside areas (but professional management);
- Abolition of the minimum size of set aside plots (11 farmers);
- Abolition of the obligation for the maintenance of set aside areas;
- Entire regionalization of the measure (premia, land management, ..);
- Expanded economic utilization possibilities of the set aside areas;
- Obligation to cultivate non-food crops on all set aside areas;
- Identic farm prices for food and non-food crops/rape (5 farmers);
- Cancellation of the minimum yield-regulation for the cultivation of non-food crops;
- Limitation of premia per farm; premia to pay for 100 ha maximally;
- Financial support of low intensive cultivation methods (against abolition of set aside);
- Conjunction between land set aside and livestock density/intensity of organic fertilizing;
- Increase of farm prices.