
Annexe 18 du rapport d'évaluation

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

Case Study Niedersachsen

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1. Regional Context

1.1 General Information about Niedersachsen

Niedersachsen is situated in the north-west of Germany. With a size of 47.600 km² the Land comprises 13 % of the German surface with 10 % of the entire population.

Table 1: Surface and Population in Niedersachsen and Germany¹

Indicator		Niedersachsen		Germany	
			%		%
Surface	(1000 km ²)	47.6	13	357	100
Population 1999	(Mio. Inh.)	7.8	10	82.2	100
Population density 1999	(Inh./km ²)	165	72	230	100
Change of population 1992-98	(1000 Inh.)	380.1	22	1.762.5	100

The population in Niedersachsen amounted to 6.6 mill people in 1961. Until 1999 the number of inhabitants increased to more than 7.8 mill. In the 90s, the annual growth amounted to 0.7%/year.

Approx. 41% of the population live in rural areas on 65% of the total surface. There, the population density merely achieves 108 inhabitants per km². Particularly in regions along the previous eastern boarder the population density is quite low.

The unemployment rate of approx. 13% (1998) underlines significant problems on the regional labour markets.

1.2 Natural Conditions for Agriculture

Niedersachsen shows very different natural conditions for agriculture. That concerns temperature, rainfall, topography and geological origin, for example. Therefore the Land was divided into 10 sub-regions according to the realization of the set aside programme and the commitment of compensation premia for COP-crops. All in all approx. 62% of the total area is agriculturally used (UAA), additional 21% are woodland.

Table 2: Selected Data about Climatic Conditions at Different Sites in Niedersachsen 1999²

Station/Site	Temperature	Rainfall	Summer days	Frost days	Duration of sunshine
	°C	mm/year	days	days	h/year
Bremen ³	10.4	563	41	50	1.693
Hannover	10.6	571	45	56	1.994

¹ See Statistisches Jahrbuch für die Bundesrepublik Deutschland, different volumes; own calculations.

² See Deutscher Wetterdienst, Frankfurt am Main 2001.

³ Bremen is one of the German Laenders, surrounded from Niedersachsen.

Figure 1: Niedersachsen by Administrative Districts⁴



⁴ See www.niedersachsen.de, May 2001.

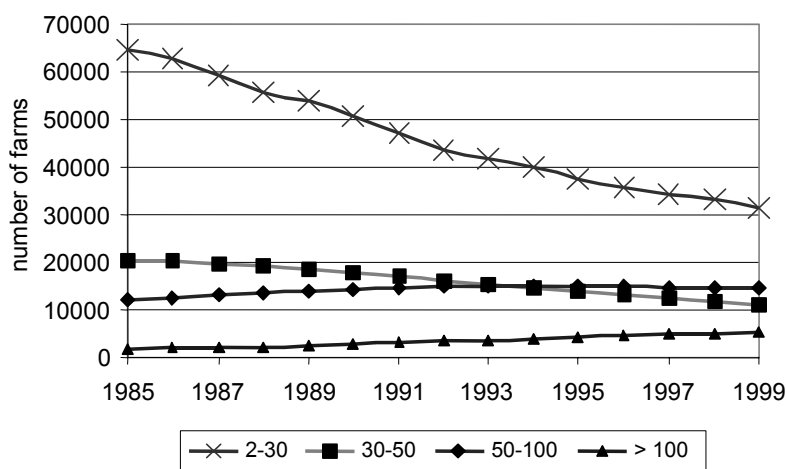
2. Structure and Potential of the Agricultural Sector in Niedersachsen

2.1 Farm Structure

In 1999 about 62.600 farms with approx. 2.7 mill. ha UAA were operated in Niedersachsen. Their total number decreased by 3.4% per year over the last decade. Particularly smaller farms with less than 50 ha were affected by this structural change. Only in the size class above 100 ha UAA the number of enterprises is further increasing (cf. figure 2). In total, the average farm size rose during the 1990s from 28 ha up to 41 ha/farm (national average: 39 ha).

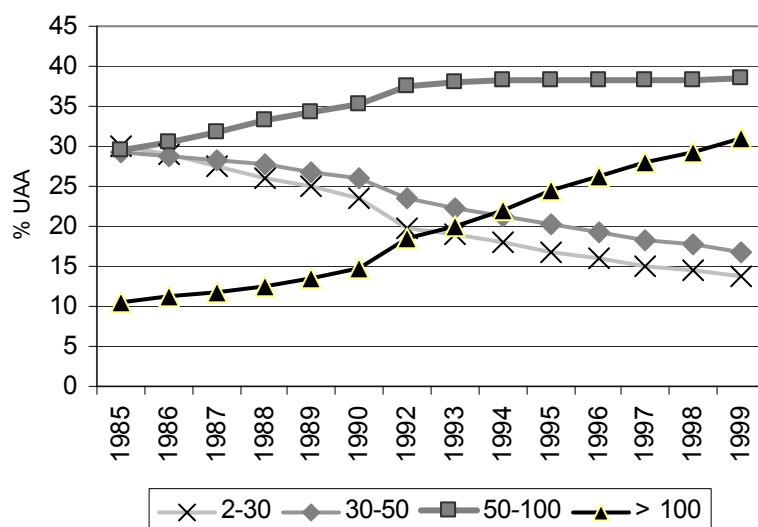
The variations between the farm size classes strongly changed the socio-economic structure of the farming sector. Particularly the share of full-time farms decreased.

Figure 2: Number of Farms by Size Classes in Niedersachsen 1985 – 1999 ⁵



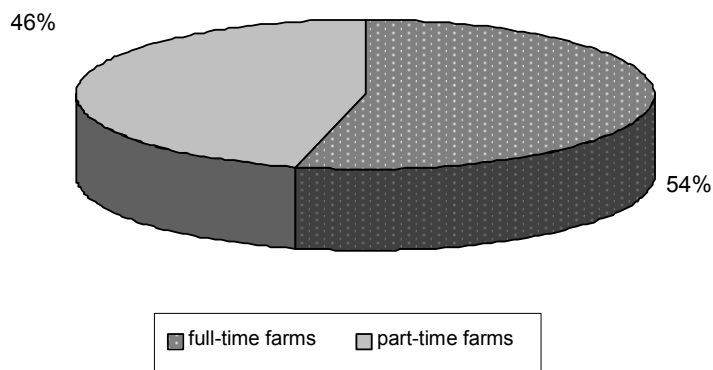
According to the farm size growth, actually 8% of farms with at least 100 ha UAA cultivate approx. 31% of the entire UAA (cf. figure 3).

Figure 3: Agricultural Utilized Area by Farm Size Classes in Niedersachsen 1985 - 1999 ⁴



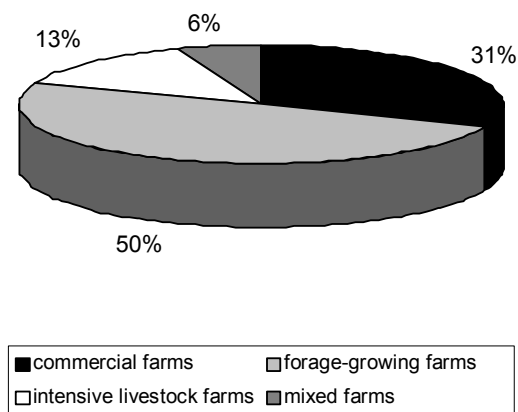
⁵ See Statistisches Jahrbuch für die Bundesrepublik Deutschland, different volumes; own calculations.

Figure 4: Share of Full-Time and Part-Time Farms in Niedersachsen 1999 ⁶



Due to the natural conditions, forage-growing farms dominate. Only about 31% of all farms count among the commercial farms. The share of intensive livestock farms amounts to 13% and exceeds the national average by far.

Figure 5: Farming Systems in Niedersachsen 1999 in % ⁴



⁶ See Deutscher Bauernverband: Argumente 2001, Trend und Fakten zur wirtschaftlichen Lage der deutschen Landwirtschaft, Bonn, 2001.

2.2 Manpower in Agriculture

Caused by the structural change in agriculture, the share of employees in this sector sank constantly by about 4% per year. The decline between 1985 and 1999 amounts to 43 %. In regions with commercial farming the reduction turned out to be larger than in regions with intense animal husbandry. The number of hired labourers stayed rather constant at 8 to 10% of the labour force during the 1990s.

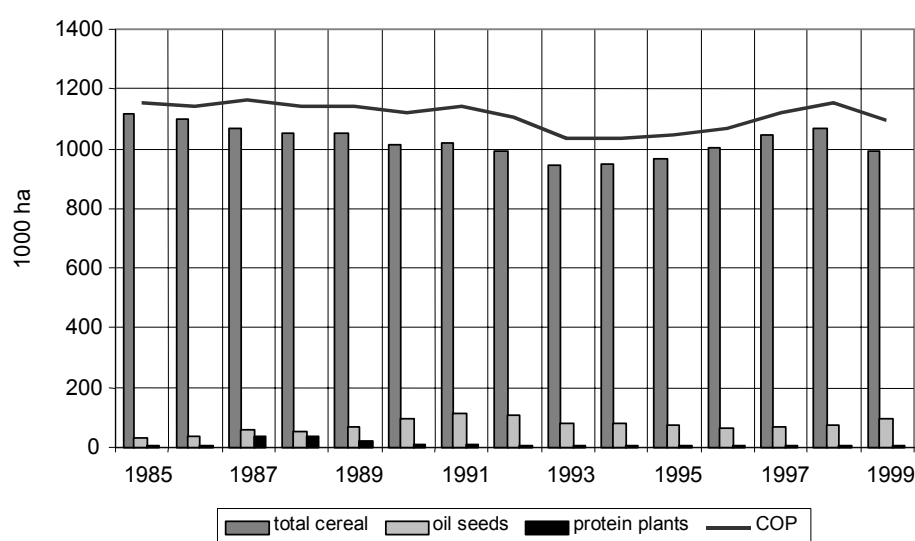
Figure 6: Development of Employees in Agriculture in Niedersachsen 1985 - 1997⁷



2.3 Land Utilization

In 1999 73 % of the entire UAA was used as arable area. The highest share of arable land could be found in the sites with the most favourable natural conditions for production. There the agricultural equivalent⁸ partly achieves its peak value of 100 (in particular Hildesheimer Boerde). Figure 7 indicates a significant drop of COP-area immediately after introduction of set aside. During the programme period the previous extent was only touched again in 1998.

Figure 7: Cultivated Area of Selected COP-Crops⁹ in Niedersachsen 1985 –1999¹⁰



⁷ See Statistisches Jahrbuch für die Bundesrepublik Deutschland, different volumes.

⁸ The agricultural equivalent indicates the relative value of production conditions; the figure amounts between 0 (extremely unfavourable) and 100 (extremely favourable).

⁹ COP-Crops= total cereal + oil seeds + protein plants, without maize silage and set aside.

¹⁰ See Statistisches Jahrbuch für die Bundesrepublik Deutschland, different volumes; own calculations.

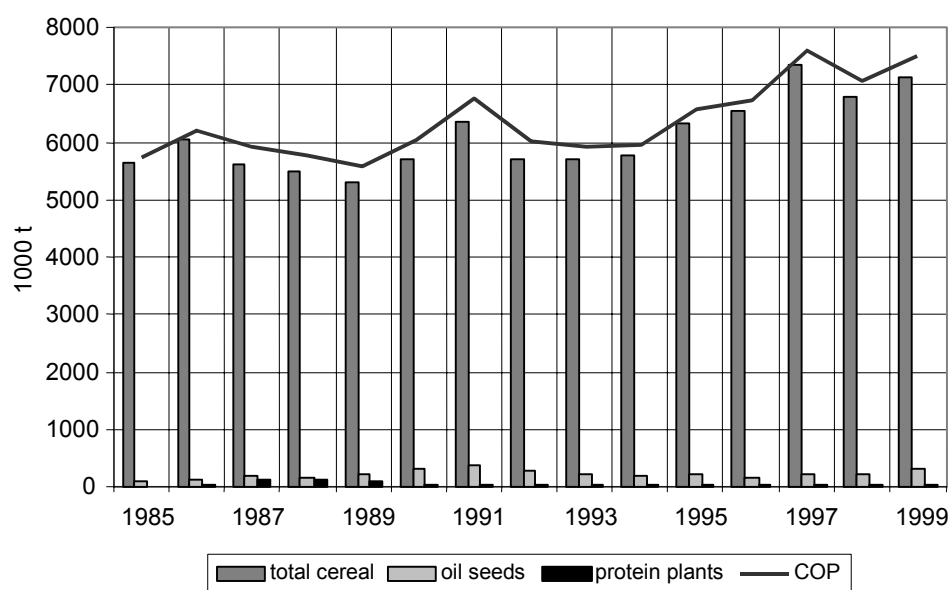
2.4 Yields and Outputs in Crop Production ¹¹

CAP-reform and land set aside prevented a further increase of production only between 1992 and 1994. In the following years a clear upward trend in production can be seen (cf. figure 8). In 1999 the total output of COP-production was by 1.558.000 tons higher than at the beginning of the obligatory set aside policy.

In particular the production of cereals has increased and comprised about 7 mill tons (1999), while the production of oil seeds remained constant in the course of the last years. The production of protein plants (beans, peas) does not play a significant role in the entire agricultural output.

The raise of production can be explained primarily with a considerable increase of yields in cereal production. The average yields of e.g. winter wheat rose continuously up to 88.4 dt per ha.

Figure 8: Production of Selected Crops in Niedersachsen 1985-1999 ¹²



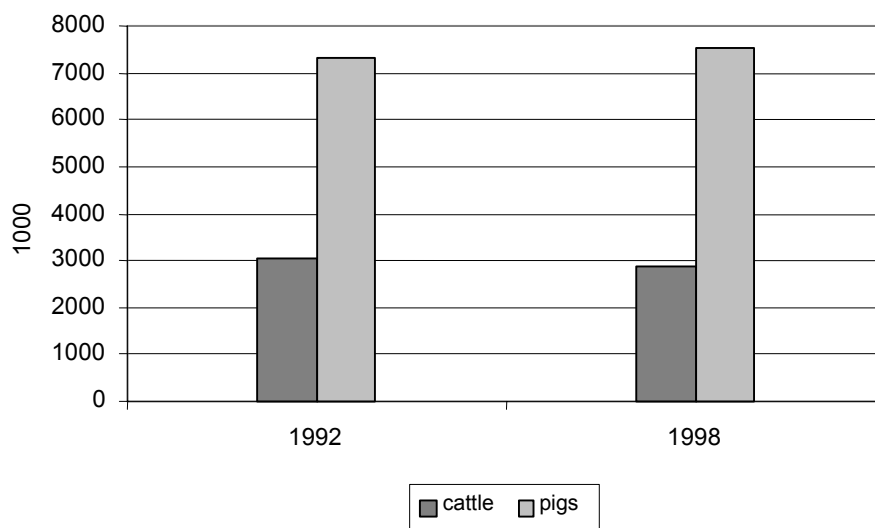
¹¹ Information given about the level of yields and outputs also include the production of non-food crops.

¹² See Statistisches Jahrbuch für die Bundesrepublik Deutschland, different volumes; own calculations.

2.5 Animal Production

Particularly the south-west of Niedersachsen is characterised by intensive animal production (rural districts Vechta, Osnabrück, Cloppenburg). In total, the stocks stayed rather constant during the last years. However, the pig raising expanded slightly to the disadvantage of cattle keeping. The intensive husbandry with its large slurry output is of specific influence on land utilization, crop rotation, the intensity of area based production and, not at least, on the environmental situation of the affected regions.

Figure 9: Stocks of Cattle and Pigs in Niedersachsen 1992 and 1998¹³



¹³ See Statistisches Jahrbuch für die Bundesrepublik Deutschland, different volumes.

3. Realization of Land Set aside in Niedersachsen

3.1 Guidelines and Regulations

The main regulations of the set aside programme were nation-wide applied homogeneously. Differing from the national regulation, the premia, however, were regionally differentiated. In 1993 Niedersachsen was divided into 10 subregions according to natural criteria. For each region the premium was calculated individually depending on the average yields.

The regulation for land planting, inter-cultivation and the possibilities of its economical use was formulated homogeneously in Germany (cf. national report). Also the technical regulations for the implementation of the set aside scheme were nation-wide identical:

Cultivation period: January 15th to August 31st (all years);
 Set aside-rates: At least 5 to 15 % (EU-regulations); maximum 33% of COP area;
 Minimum size of plots: 0,3 ha; with Ø 20 metres (all years).

Table 3: Realization of the Land Set aside Programme in Niedersachsen ¹⁴

		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	122025	175107	169179	140140			101268			100564		147495
Number of applications for premia (COP)	No	16902	20752	20641	20658			21377			22135		22860
Premium-carrying COP-area in total	ha	1387822	1427883	1421082	1409934			1417928			1432589		1433550
- thereof premium-carrying COP-area – professional scheme	ha	873956	1004864	1016073	1028968			1070683			1107097		1136432
- thereof Premium-carrying COP-area – simplified scheme	ha	513866	423019	405009	380966			347245			325492		297118
Set aside-rate (real) (set aside/ total COP-area)	%	8.8%	12.3%	11.9%	9.9%			7.1%			7.0%		10.3%
Set aside-rate (professional scheme) (set aside/ profess. scheme COP-area)	%	14.0%	17.4%	16.7%	13.6%			9.5%			9.1%		13.0%
Set aside land in total	ha	122025	175107	169179									
- thereof rotational set aside area	ha	122025	82424	52828									
Set aside area in total (other than extraordinary)	ha	122025	175107	169179	140140	5.42		101268	5.41		100564	5.41	147495
- thereof obligatory set aside area	ha	122025	175107	169179	83573	5.41		50710	5.4		52452	5.41	107590
- thereof voluntary set aside area	ha				56567	5.44		50558	5.42		48112	5.41	39905
- thereof set aside area without premia	ha				169	5.03		413	5.47		60	5.41	52
- thereof non-food production	ha	3678	9518	23413	15334	5.27		6733	5.26		7597	5.30	19240
Five-year set aside area (R.2328/91)	ha	70411	33664	24385	11729	5.65							
Extraordinary Set aside	ha												

¹⁴ See Bundesministerium für Verbraucherschutz, Ernährung und Landwirtschaft: Tabelle der statistischen Angaben, different volumes; own calculations. See EU DG Agriculture and Agreste /ONIC/ONIOL (information given by Oréade-Brèche).

3.2 Compensatory Payments in Niedersachsen

Table 4: Compensatory Payments for COP-Crops¹⁵

	Ave- rage yield	Cereals							Land Set aside						
		Compensation premia €/ha							Compensation premia €/ha						
	dt/ha	1993	1994	1995	1996	1997	1998	1999	1993	1994	1995	1996	1997	1998	1999
Region 1	58.7	176	247	318	318	318	318	318	318	403	403	403	403	403	403
Region 2	71.9	216	303	390	390	390	390	390	390	493	493	493	493	493	493
Region 3	61.3	185	258	332	332	332	332	332	332	421	421	421	421	421	421
Region 4	47.3	142	199	256	256	256	256	256	256	325	325	325	325	325	325
Region 5	41.8	126	176	227	227	227	227	227	227	287	287	287	287	287	287
Region 6	56.0	169	236	303	303	303	303	303	303	384	384	384	384	384	384
Region 7	47.0	142	198	255	255	255	255	255	255	323	323	323	323	323	323
Region 8	42.2	127	178	229	229	229	229	229	229	289	289	289	289	289	289
Region 9	50.7	152	214	275	275	275	275	275	275	348	348	348	348	348	348
Region 10	54.5	x	230	295	295	295	295	295	x	374	374	374	374	374	374

	Protein plants Compensation premia €/ha							Ave- rage yield	Oilseeds Compensation premia €/ha						
	1993	1994	1995	1996	1997	1998	1999		1993	1994	1995	1996	1997	1998	1999
Region 1	459	459	459	459	459	459	459	30.6	560	560	560	560	560	560	560
Region 2	562	562	562	562	562	562	562	30.6	560	560	560	560	560	560	560
Region 3	480	480	480	480	480	480	480	30.6	560	560	560	560	560	560	560
Region 4	370	370	370	370	370	370	370	30.6	560	560	560	560	560	560	560
Region 5	327	327	327	327	327	327	327	30.6	560	560	560	560	560	560	560
Region 6	438	438	438	438	438	438	438	30.6	560	560	560	560	560	560	560
Region 7	368	368	368	368	368	368	368	30.6	560	560	560	560	560	560	560
Region 8	330	330	330	330	330	330	330	30.6	560	560	560	560	560	560	560
Region 9	397	397	397	397	397	397	397	30.6	560	560	560	560	560	560	560
Region 10	x	426	426	426	426	426	426	34.4	x	630	630	630	630	630	630

x: Regionalization started with 1993/94; in 1993 the premia of the respective neighboured regions were paid.

The subregions contain the following cities and districts (see figure 1):

- Region 1: Göttingen, Northeim, Osterode am Harz, Holzminden
- Region 2: Salzgitter, Goslar, Wolfenbüttel, Hildesheim
- Region 3: city of Braunschweig, Helmstedt, Peine, city of Hannover, Hameln-Pyrmont, district of Hannover, Schaumburg
- Region 4: city of Wolfsburg, Gifhorn, Celle, Harburg, Lüchow-Dannenberg, Lüneburg
- Region 5: Rotenburg (Wümme), Soltau-Fallingb.ostel
- Region 6: Stade, Ulzen, city of Emden, City of Wilhelmshaven, Aurich, Friesland, Wesermarsch, Wittmund
- Region 7: Cuxhaven, Osterholz, city of Delmenhorst, city of Oldenburg, Ammerland, Cloppenburg, Leer, district of Oldenburg
- Region 8: Emsland, Grafschaft Bentheim
- Region 9: Diepholz, Nienburg (Weser), Verden, city of Osnabrück, district of Osnabrück, Vechta
- Region 10: Area of the previous administration of Neuhaus: Villages Dellien, Haar, Kaarßen, Neuhaus (Elbe), Stapel, Sückau, Sumte and Tripkau and, in addition, parts of the village Teldau as well as parts of the forest area Bohldamm in the village of Garlitz.

¹⁵ See Bundesministerium für Ernährung Landwirtschaft und Forsten, Die europäische Agrarreform - Pflanzlicher Bereich, different volumes.

4 Central Questions of the Evaluation

Elements of Answers to Questions 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:

During the set aside programme 9,6% of the COP-area were set aside on average. About 40% of the are were taken voluntarily out of production (1996-99). Nevertheless, the introduction of land set aside measure only prevented an even stronger growth of grain production; a drop could not be achieved. The reduction of grain cultivated areas was over-compensated by increases in yields by approx. 26% between 1992 and 1999. Without land set aside the outputs would have been larger at about 545.000 tons (8.5%) per year.

Within grain production only the cultivation of spring barley was expanded. Even high productive crops like wheat or winter barley were reduced due to the set aside measure. As a consequence of the partially enlarged animal husbandry arable areas were increasingly used for forage growing. As an effect of the different set aside-rates especially the wheat production was adapted to the respective set aside-rates.

Unexpectedly the cropping of rape did not grew in total. Only approx. 13% (1999) of the set aside areas were cultivated with non-food rape.

Details of the Answer:

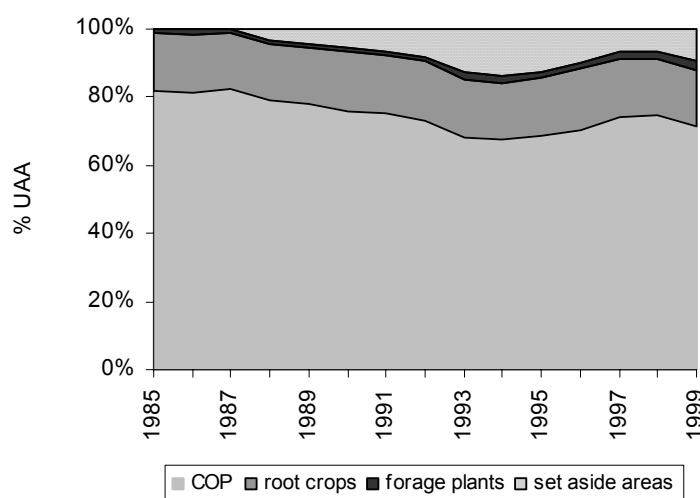
On average about 9.6 % of the COP-area (7 % up to 12.3 %) were set aside in Niedersachsen since 1992¹⁶. In all the years between 2.8 % and 4 % of those areas were voluntarily set aside (see table 2). On average 8.6% of the set aside area were cultivated with non-food crops (1993 – 1999).

Due to the great extent of set aside areas, the cultivation of COP-crops clearly decreased at first. However, as a considerable part of the arable land had already been set aside voluntarily before 1992,¹⁷ the effects on the extent of cultivation were reduced after introduction of the obligatory set aside. In addition, resulting from changed farm prices and profitability of crop production, the COP-area increased again since 1994. The entire extent of root crop cultivation was not affected by the set aside measure on account of the fully used sugar beet quotas, the relative favourable marketing conditions for potatoes and the necessary forage growing for the enlarged animal production in some subregions.

¹⁶ On about 21% of the COP-area the simplified scheme was applied. That explains the little percentage of set aside areas in relation to the total COP-area.

¹⁷ In the frame of the regional programme for „green-fallow“.

Figure 10: Utilization of Agricultural Area in Niedersachsen 1985-1999¹⁸



In the beginning the modification of the set aside-rate had consequences on the extent of grain production: in the case of lower set aside-rates the grain cultivated area increased and it decreased respectively when higher rates were requested. However, the average crop ratio generally changed relatively little since 1992. A slight reduction of extensive grain crops (e.g. oat) and an expansion of potato cultivation could be observed (at the expense of the sugar beet area). Unexpectedly the rape production sank a little. Food rape was replaced partly by non-food rape, but in total the share of rape in cultivation decreased because of crop rotation reasons.

Table 5: Changes in the Cultivation of Selected Crops in Niedersachsen, 1985-1999¹⁹

	Changes 1985-1992			Changes 1992-1999		
	Total		% per year	Total		% per year
	In 1.000 ha	%		In 1.000 ha	%	
Wheat	62.7	24	3	-27.6	-8	-1
Rye	-49.2	-28	-4	-3.7	-3	0
Winter barley	-54.8	-20	-3	-26.3	-12	-2
Spring barley	-73.1	-42	-6	61.1	61	9
Oat	-88.9	-65	-9	-12.1	-26	-4
Grain maize	37.6	91	13	-1.5	-2	0
Grain total	-124.2	-11	-2	-3.6	0	0
Potatoes	41.9	54	8	12.5	10	1
Sugar-beets	-14.8	-10	-1	-12.8	-9	-1
Rape	70.6	208	30	-8.8	-8	-1
Leguminosae	4.1	114	16	0.3	4	1
Forage growing	2	12	2	17.9	96	14
COP area in total	-49.5	-4	-1	-12.1	-1	0

¹⁸ See Statistisches Jahrbuch für die Bundesrepublik Deutschland, different volumes.

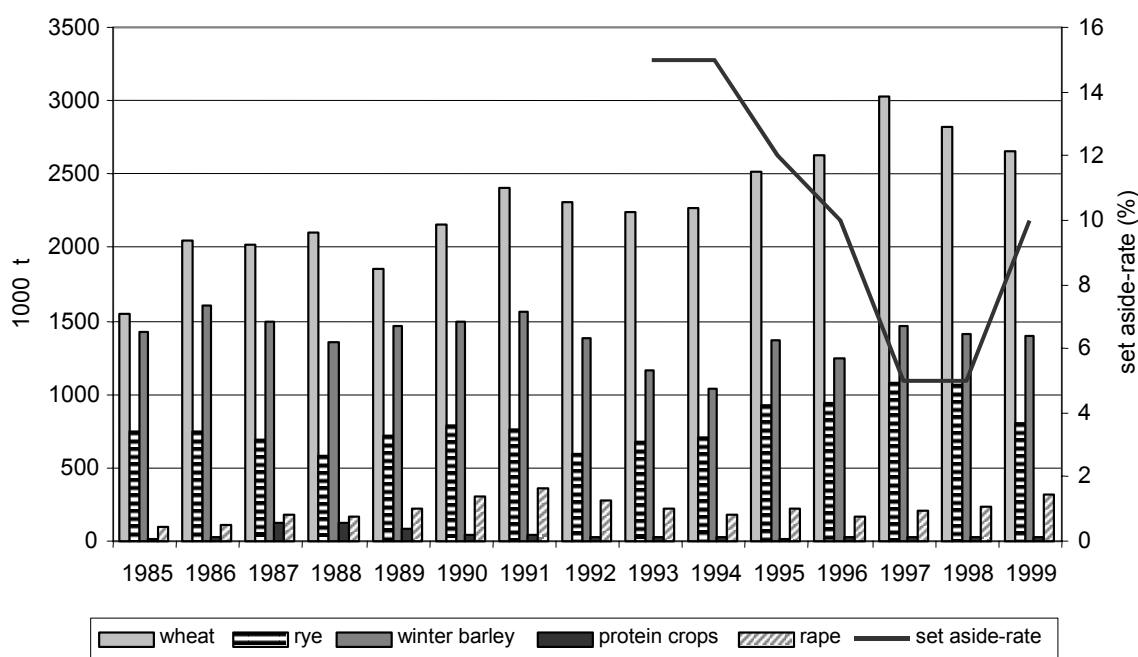
¹⁹ See Statistisches Jahrbuch für die Bundesrepublik Deutschland, different volumes; own calculations.

In the development of cultivation regional differences appear:

- On sites with high soil quality (e.g. districts of Hildesheim, Salzgitter, Helmstedt) the share of root crops in crop rotation decreased for the benefit of grain. This trend is based on the increased yields of sugar beets per ha and the simultaneous limitation of sugar beet production by quotas.
- In the plain areas of the north (e.g. Rottenburg, Lueneburg) with mainly sandy soils, an extension of potato cultivation and forage growing (in connection with dairy farming) could be observed.

The slight decrease of production immediately after introduction of the compulsory set aside programme (because of less area under crop) could rapidly be compensated by rising yields. Since 1992 the production of COP-crops increased by approx. 4% each year (cf. table 6). Thus, a reduction of grain production could not be achieved by land set aside. In this context it also plays a role that predominantly less productive areas were set aside.

Figure 11: Production of Selected Crops in Niedersachsen ²⁰



At the appraisal of the regional administration, the increase of total output can be explained by the following factors:

- Improved farm management (e.g. more efficient and demand-related input of fertilizers);
- Changes of crop rotation to the benefit of more productive crops;
- Further specialization of the commercial farms;
- General effects of (biological) technical progresses.

All in all, the structure of production on arable areas changed in the past:

²⁰ See Statistisches Jahrbuch für die Bundesrepublik Deutschland, different volumes; own calculations.

Table 6: Changes in Production of Selected Crops in Niedersachsen from 1985-1992¹⁶

	Changes 1985-1992			Changes 1992-1999		
	Total		% per year	Total		% per year
	1000 t	%		1000 t	%	
Wheat	762	49	7	349	15	2
Rye	-146	-20	-3	210	35	5
Winter barley	-46	-3	0	20	1	0
Spring barley	-417	-54	-8	533	149	21
Oat	-529	-78	-11	28	19	3
Grain maize	236	89	13	143	29	4
Grain total	66	1	0	1.441	25	4
Potatoes	827	27	4	1.618	41	6
Sugar-beets	-528	-7	-1	261	4	1
Total Rape	187	194	28	41	14	2
Leguminosae	10	76	11	10	39	6
Forage growing	-14	-8	-1	254	161	23
COP production	263	5	1	1.491	25	4

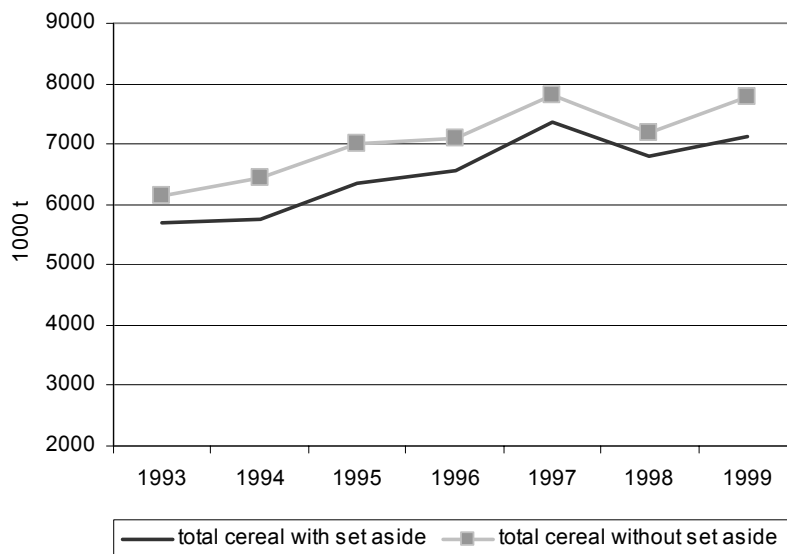
The most important effect of set aside must be seen in the prevention of an even higher grain production. It can be assumed that without the set aside measure the average grain production would have been higher at about 545.000 t annually (8.5 % of the average grain output). Depended from the set aside-rate and the annual yields, the extent of prevented output ranges from 463.000 tons (8%, 1993) up to 636.000 t (9 %, 1999). This additional output would have been exceptionally high within the subregions with favourable natural conditions (subregions 2, 3).

The estimation of the impact of set aside on grain production is based on the individual regional yields of the analysed years and the following assumptions:²¹

- Predominantly less productive plots have been set aside (information of the interviewed farmers); the average yield of those areas is estimated 20 % below the regional average.
- In the case of absence of the set aside programme, maximally 80 % of the additional area would have been cultivated with grain (of crop rotation reasons).
- Only the half of the set aside area cultivated with non-food crops would have been cropped with grain in the absence of set aside (supposing that a certain part of rape production would remain even without the set aside programme).

²¹ See Niedersächsisches Ministerium für Ernährung, Landwirtschaft und Forsten, personal information, May 2001.

Figure 12: Development Trend of Grain Production with and without Land Set aside in Niedersachsen ²²



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:

Primarily for agronomic and economic reasons, approx. 3,4 % of the entire COP-area were set aside voluntarily. This corresponds to a production equivalent of approx. 201.000²³ tons of grain per year (1996: 224.000 t; 1999: 172.000 t), which additionally to the effects of the obligatory set aside did not strain the market.

Generally, the voluntary set aside increased the profitability of production, since primarily less productive areas were set aside which often provided less income contribution than premia and cost savings. The extent of voluntary set aside varied significantly within Niedersachsen with the highest amount in the less productive areas, and the lowest rate in the particular fertile arable sites and the subregions with intensive livestock husbandry. However, in all years the voluntary set aside in total turned out to be a rather stable element within the structure of land use (about 49.000 ha/year). It is to be expected that without set aside premia maximally a quarter to a third of the voluntary set aside areas would have been become fallow land.

Details of the Answer:

Already before the start of the compulsory set aside measure (1992), numerous farms especially in the less fertile sites took part in the voluntary five-year and one-year set aside programme. On the one hand, the motives for taking land out of production were the relatively attractive premia, on the other hand, the existence of many areas with bad soil quality, sandy soils or bogs (e.g. Lüneburger Heide).

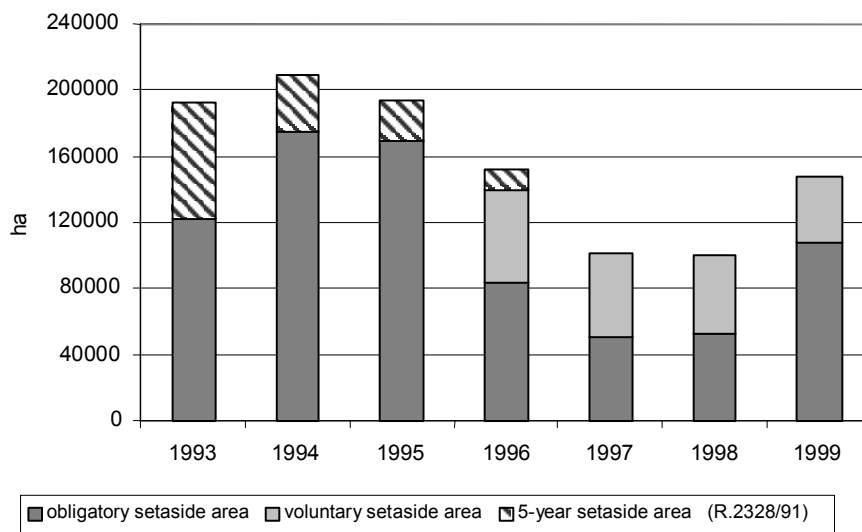
It is quite sure that a considerable part of those areas, which were set aside voluntarily between 1988 and 1992 already, remained further set aside (voluntarily) after 1992.

As figure 14 shows, the extent of the voluntary set aside areas stayed relatively constant at about 49.000 ha each year. This corresponds to about 3,4 % of the COP-area.

²² See Statistisches Jahrbuch für die Bundesrepublik Deutschland, different volumes; own calculation.

²³ Average comprises the years 1996 to 1999.

Figure 13: Development of Set aside Areas in Niedersachsen 1993 – 1999 ²⁴



The participation of the (larger) farms with obligatory set aside in the voluntary programme was quite different in the subregions of Niedersachsen:

- In regions with intensive livestock husbandry farmers only rarely took part in the voluntary set aside, because these farms required the areas for the disposal of liquid manure (because of high livestock densities).
- In addition, a small acceptance of the voluntary set aside was also found in the most fertile sites (e.g. Hildesheimer Boerde), where the productivity of the arable areas obviously appeared higher than the set aside premia (including cost savings by set aside).
- Especially areas in regions with average and lower natural conditions were voluntarily set aside.

All in all, the voluntary set aside turned out to be a relatively stable element within the farmers decision making. This becomes evident by the fact that 82 % of the interviewed farmers who set land aside voluntarily in 1999, did that in previous years as well. The maximum limit of 33% set aside was not considered to be an obstacle for farm development.

Out of the sample of 30 farms, 18 farmers (60 %) set aside more than 10.5 % of their COP-area. Thereof 10 farms took at least 12 % of their COP-area out of production. In total, the farmers stated the following reasons for voluntary set aside:

- Primarily agronomic aspects (size and location of plots; 94% of the interviewed farmers);
- Economic arguments (yields of the plots, cost savings etc; 22%);
- Precaution measure to avoid the loss of premia in the case of imprecise calculation of the size of set aside areas (83 % of the interviewed farms);
- Possibility to reduce the individual labour input in the farm (6% of the interviewed farmers).

At the statement of the farmers, without the payment of premia only very few areas would have been set aside voluntarily. With regard to information of regional representatives maximally a quarter to a third of the voluntary set aside areas (with wide ranges between the different locations) would have become fallow land without set aside premium.

In 1999 in Niedersachsen 21 % of the COP-area were cultivated by “small producers” (applying the simplified scheme), of which no farm participated in the voluntary set aside programme.

²⁴See ZMP Bilanz Getreide Ölsaaten und Futtermittel, different volumes and Bundesministerium für Verbraucherschutz, Ernährung und Landwirtschaft.

In the years 1992 – 1994 compulsory and voluntary set aside have not been differentiated in the available statistics.

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

Synthetic Answer:

In Niedersachsen only between 3 % (1993) and 13 % (1999) of the set aside area were cultivated with non-food crops. This small part is above all a result of the favourable soil conditions and the high proportion of leaf crops in crop rotation. The least volume of non-food crops could therefore be found in the most fertile sites. On the other hand, non-food crops were cultivated in subregions with intensive animal husbandry in order to be able to put liquid manure on those plots.

In Niedersachsen, only rape played a role in non-food cultivation (95 %). The amount of non-food production went parallel to the set aside-rate. As the entire production of rape not increased since 1992, food rape has obviously be replaced by non-food rape on set aside areas. By this way grain cultivation could be expanded on areas previously cultivated with food rape.

Farmer who decided against the cultivation of non-food, predominantly justified this with economic reasons, crop rotation restrictions and technical obstacles.

Details of the Answer:

In 1999 about 13 % of the set aside area were cultivated with non-food crops, predominantly with rape (95 % of the non-food area). This relatively small volume of non-food production is primarily connected with soil conditions and climatic factors:

- In the subregions with favourable conditions, the cultivation of non-food crops remained limited because a high share of leaf crops within crop rotation was already cultivated there.
- On the other hand, the cultivation of rape offered advantages within crop rotation for farms of average to less fertile sites.

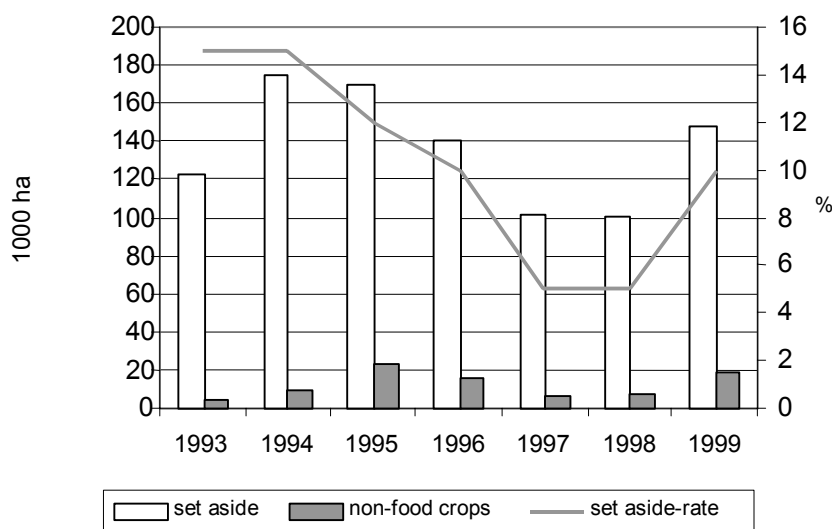
The total rape production did not increase in the course of the set aside policy. Due to the crop rotation restrictions farmers replaced to a larger extent food rape by non food rape. This provided the opportunity to enlarge grain production on the previous food-rape areas.

Table 7: Land Set Aside and Cultivation of Non-Food Crops in Niedersachsen 1993 - 1999²⁵

Year	Set aside-rate	Land Set aside ha	Non-food crops	
	%		ha	% of set aside
1993	15	122.025	3.678	3.0
1994	15	175.107	9.518	5.4
1995	12	169.179	23.403	13.8
1996	10	140.140	15.334	10.9
1997	5	101.268	6.733	6.6
1998	5	100.564	7.597	7.6
1999	10	147.547	19.240	13.0

²⁵ See Bundesministerium für Verbraucherschutz, Ernährung und Landwirtschaft, Bonn 2001; own calculations. The figures in table 7 do not include the five-year voluntary set aside measure (R. 2328/91).

Figure 14: Development of Land Set Aside, Non-Food Production and Set Aside-Rate in Niedersachsen 1993-1999 (without five-year voluntary set aside R 2328/91)



10 out of the interviewed farmers (33 %) cultivated non-food crops with approx. 8 ha each. As main reasons for the cultivation were quoted: profitability (80 %), lower costs for the maintenance of the plots (50 %) and positive effects resulting from crop rotation (20 %).

In several subregions the cultivation of non-food crops was profitable due to the high livestock density (e.g. in the district Vechta). Since the spread of liquid manure was allowed on set aside areas cultivated with non-food crops, an exceeding of the permissible livestock numbers per ha could be avoided.

20 out of the 30 farmers (67 %) decided against non-food production on set aside areas, mainly mentioning the following arguments:

- Not enough profitable/competitive (45 %);
- Labour related restrictions (20%), e.g. seasonal labour peaks;
- Crop rotation factors (30 %); due to the often high share of root plants a further increase of rape did not fit into crop ratio;
- Necessary mechanization for rape cultivation not available (10%).

In the meantime only four farmers (13%) changed their opinion in favour of non-food crops.

Elements of the Answers to Questions 422 to 444

Questions concerning Efficiency

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:

Obviously the majority of the larger commercial farms could hardly increase their income since 1992. The effects of dropped farm prices and the reduction of arable land could not be compensated fully by premia. On the other hand the adaptation of farm organization, modifications in the intensity of farming, and in particular farm expansion were also decisive for the development of farm income.

43 % of the farmers with larger farms changed their crop ratios, extended the volume of animal production, started with diversification of on-farm activities (e.g. direct marketing) or invested capital outside agriculture (e.g. rental houses). In particular the large-scale farms improved the quality of their products and/or tried to adapt themselves more closely to the market conditions.

All in all, a large variety of adaptations was realized to reduce the impact of land set aside on farm income. This impact was rather little in general.

Details of the Answer:

Actually, in Niedersachsen only the number of farms with at least 65 ha UAA is growing. For this reason farms from 65 ha onwards are counted among the "larger farms". In 1999 about a quarter of all farms were by this definition larger farms, which cultivated approx. 60 % of the entire UAA. Out of the 30 interviewed farms 21 belonged to that group.

Farm income:

57 % of the 21 farmers with larger farms assumed that a decrease of farm income since 1992 had happened primarily because of raised production costs and reduced farm prices following the CAP-reform. This appraisal went along with the opinion of nearly half of the interviewed farmers that the compensation premia did not completely compensate the price losses.²⁶ However, the set aside programme was not explicitly mentioned as a major cause for the dropped income.

Only 8 farmers with larger farms reported about a rather stable income, in one case an increase of farm income was stated. In any case, it may be assumed that the influence of set aside on farm income was rather low.

To reduce the income losses resulting from CAP reform, 4 out of the 21 larger farms expanded animal production (1 farms: pigs; 3 farms: cattle). Other farmers enlarged the cultivation of potatoes (1 case), intensified their engagement within the local machinery syndicate (1 farmer) or decided in favour of commercial investments (rental houses, 1 farmer).

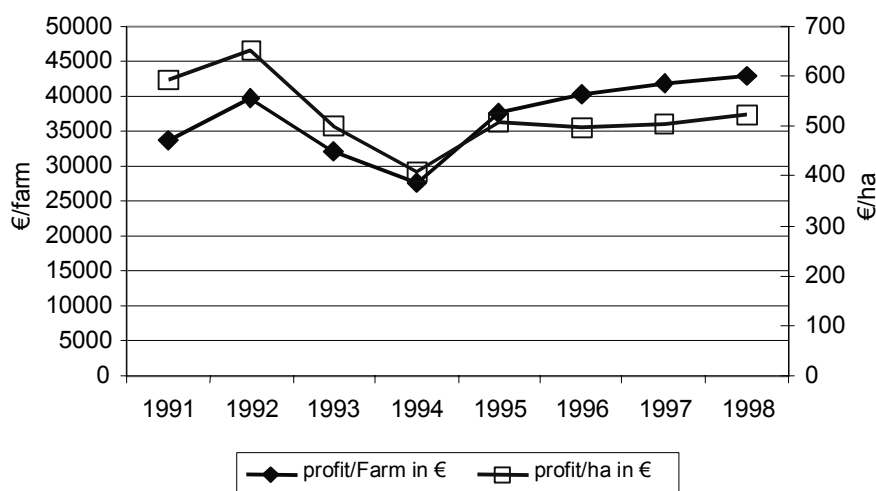
As farm account analyses show, the profits of full-time commercial farms sank noticeably in Niedersachsen from 1992 on (see figure 15). The main reasons were the reform of the agricultural price policy and the reduction of arable areas by the set aside scheme.

The slight increase in farm income since 1995 resulted among other factors from the improved profitability of commercial farming, on-farm adaptations and not at least from the enlargement of farm size. As the official statistics show, between 1992 and 1999 the average farm size in the farms with at least 50 ha grew by 11 % at 92 ha/farms, whereas in the same period the size of the smaller farms (< 50 ha) sank by 4 % at 16 ha/farms in Niedersachsen.²⁷ As a consequence of the growing farm sizes, the profit per ha UAA (in current terms) was in 1999 by approx. 20 % lower than in 1992 (cf. Figure 15).

²⁶ 14 of the 30 interviewed farmers expressed that view. They assumed that compensation premia had been granted for the following reasons: Maintenance of farm income (63 %), reduction of surpluses (30 %), sharing the costs for the cultivation of set aside areas (7 %), facilitation of CAP-policy (3 %), and improvement of the transparency of agricultural techniques (3 %).

²⁷ See Statistisches Jahrbuch für die Bundesrepublik Deutschland, different volumes; own calculations.

Figure 15: Development of Farm Profit (full time commercial farms) in Niedersachsen 1991 – 1998 ²⁸



Changes of crop ratio:

Since 1992, 62% of the larger farms realized no major changes in crop ratio. On the other side 9 operators (43 %) with larger farms reported about modifications of their production structure and farm organization for economic reasons mainly.²⁹ The consequences were:

- Expansion of oilseed production to the disadvantage of other crops (4 farms);
- Increase of the share of grain in crop rotation (4 farms);
- Specialization in non-COP-crops (without premia, e.g. potatoes; 4 farms);
- Continuous shifting from crop production to animal production (4 farms); consequently the proportion of forage growing within crop rotation grew.

In total, grain cultivation raised, because 19 % of the larger farms expanded their grain area, whereas no farmer reduced it (cf. table 9).

Table 8: Development of COP-Production in the Larger Farms in Niedersachsen (multiple responses)

	Expansion of COP-production	No significant change of COP-production	Expanded activities outside COP-production
Share of Farms (total: 30 farms)	33 %	62 %	38 %

Table 9: Development of Grain Cultivation Area in the Larger Farms in Niedersachsen

	Reduction of grain cultivation area	No significant change of grain cultivation area	Expansion of grain cultivation area
Share of Farms (total: 30 Farms)	0 %	81 %	19 %

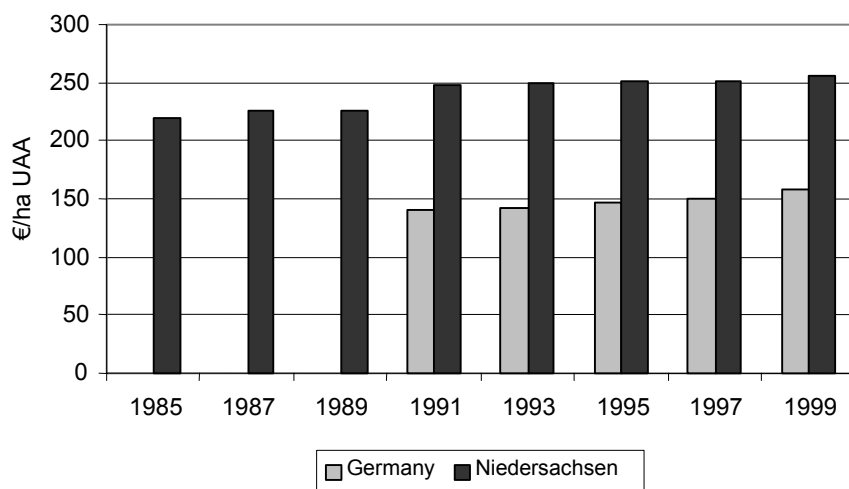
To some extent, the set aside programme offered a higher degree of flexibility in order to improve the crop ratio, as

- less productive areas could be taken out of production,
 - those areas could partially be cultivated with non-food rape,
 - and the grain production on the remaining areas could be extended at the expense of food rape.
- On the other hand, the increased demand for arable land kept the rents on a high level (cf. figure 16).

²⁸ See Buchführungsergebnisse aus dem Agrarbericht der Bundesregierung, different volumes; own calculations.

²⁹ The improvement of production efficiency and farm organisation was named on second place; ecological aspects only played a marginal role.

Figure 16: Development of Rents (€/ha) for Agricultural Areas in Niedersachsen 1985 – 1999 ³⁰



According to their own appraisal, 11 of the 21 larger farmers (52 %) improved the quality of their products since 1992 - most frequently in accordance with quality requirements (e.g. brewing barley, wheat). Above all the large-scale enterprises specialised in the cultivation of high-quality grain and reacted in this way to the market demands.

All in all it can be assumed, that the larger farms were in the position to compensate income losses resulting from set aside by various adaptations of their on-farm and off-farm activities. Particularly the raised yields were helpful. As the survey demonstrates, the farmers in Niedersachsen showed a rather little flexibility in their decisions about shifting of farm resources to off-farm businesses.

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:

The crop rotation was influenced positively by set aside in 40 % of the interviewed farms. In half of the cases its impact was neutral. Positive effects could be estimated above all in the most productive arable sites, because in those places a rotational set aside was chosen and the cultivation of soil improving plants provided significant benefits.

In the less productive regions, where the majority of voluntary set aside could be found, the influence of the measure on crop rotation was rather little, because a fixed set aside was common there. In few cases a negative reduction of crop rotation was noticed on farming sites with average natural conditions.

To remain a high profitability of land use, grain (and rape) were expanded in crop rotation – to the expense of root plants.

³⁰ See Statistisches Jahrbuch für die Bundesrepublik Deutschland, different volumes; own calculations.

Details of the Answer:

40% of all interviewed farmers changed their crop rotation since 1992 clearly. The main reason was the integration of set aside areas into crop planning. 43% of the farmers chose a rotational set aside exclusively. Another 37 % decided for a combination of rotational and fixed set aside. 20 % of the farmers took the same plots out of production each year.

The areas set aside were cultivated in the following manner (multiple responses):

- Non-food products: 10 % of the farmers cultivated completely non-food crops;
- Fallow land with vegetation cover: 23 % of the farmers practised a natural regrazing;
- Soil improvement: 77 % cultivated specific crops for the improvement of soil fertility (e.g. oil radish, phacelia, clover);
- Land use for environmental purposes: 13 % of the farmers decided for other crops (e.g. specific seeds for game or bees).

In regions with the most fertile soils, the land set aside had partially positive effects on crop rotation. There the rotational set aside often extended the usually narrow crop rotation systems, comprising sugar beets and grain (wheat) only. On the set aside plots mainly soil improving plants were cultivated. That provided two advantages: the control of plant diseases (e.g. nematodes) and positive yield effects on the subsequent crop (often sugar beets).

Adaptations on the compulsory set aside measure resulted in modifications of crop rotations which regionally give a different picture:

- On naturally favoured sites, the cultivation of root plants was reduced to the benefit of grain;
- On less fertile/rather marginal sites, the cultivation of potatoes was enlarged little to the expense of forage growing (maize) and grain production.

As far as rotational set aside was applied, the plots were integrated into crop rotation in the majority of the interviewed farms. That was true for areas cultivated with rape as well as for areas with natural regrazing of other seeds.

The influence of set aside on crop rotation was to be classified neutral in half of the cases. Nevertheless, in 40% of the interviewed farms the crop rotation became improved from an agronomical point of view (see table 10):

Table 10: Modifications in Crop Rotations (estimated by the interviewers)

	Degradation of crop rotation	Neutral effects on crop rotation	Improvement of crop rotation
Share of farms (total: 30 farms)	10%	50%	40%

Especially at the beginning of the programme, the plots set aside partly remained uncultivated for several years with vegetation cover only. This cost minimizing practice was given up, when weed infestation became a problem. For a better weed control, farmers cultivated specific crops for the improvement of soil fertility and non-food rape increasingly. In subregions with a higher importance of cattle, forage growing seeds were sowed for harvesting in the following year

In few of the interviewed farms however (10 %), the shortage of the arable area resulted in a narrowing of crop rotation. In these cases, extensive crops were replaced by higher productive and input intense crops.

The crop rotation was adapted to the set aside-rate: In the case of a low set aside-rate the share of grain increased in crop rotation (at the expense of rape); in the case of higher set aside-rates the share of rape increased.

Due to the effects on crop rotation, the compulsory set aside distinguished from the voluntary set aside. A larger part of the voluntary set aside plots were completely taken out of production; on the other hand the vast majority of the obligatory set aside areas were cultivated.

Since in the less favoured regions a relatively higher share of areas was transformed into a fixed set aside, there the effects of set aside on crop rotation were less insignificant.

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

Synthetic Answer:

All in all, the implementation of land set aside resulted in an improvement of cultivation methods. The longer-term set aside of "problematic" plots led to cost savings (reduced input) and facilitated the optimization of production on the remaining areas.

By this way, positive effects on soil fertility were achieved through the extensive rotational set aside. The possibility to apply direct drilling reduced the efforts of soil management for subsequent crops. Not at least the set aside of particular areas was used against flooding.

According to the appraisal of the interviewers, the set aside of land provided considerable agronomical advantages; from an economic point of view its effects may be estimated as neutral in most of the cases.

Details of the Answer.

According to the appraisal of the interviewers, the influences of set aside on the economic balance were predominantly neutral to positive, onto the agronomical balance predominantly positive.

With the exception of the most fertile subregions, economic advantages resulted from the possibility to take less productive areas out of production. In the sites with natural conditions below the average, the set aside premia compensated the profit loss to a large extent. Only in the best sites, in which also high productive plots had to be set aside, the programme regarded as an economic disadvantage. There, the income losses due to set aside exceeded the premia paid. However, the interviewers got the impression that the farmers obviously tended towards an over-estimation of short-term income effects, whereas long-term effects of changed crop rotations were underestimated.

Table 11: Effects of Land Set aside on the Economic and Agronomical Balance of the Interviewed Farms (estimated by the interviewers)

Farms (in total: 30)	Disadvantage	Neutral	Advantage
Economic balance	23.3 %	53.3 %	23.3 %
Agronomic balance	0 %	43.3 %	56.7 %

From an agronomical point of view, positive modifications of farming techniques can be stated:

- Less productive areas could be set aside even for a longer term;
- Simultaneously cost savings resulted from taking smaller and peripheral located plots out of production;
- The cultivation of soil improving plants provided the advantage of direct drilling of the subsequent crop (e.g. sugar beets);
- In few cases areas were also set aside as a prevention against flooding and/or to minimize the risks of water damages.

Table 12: Selection of Areas for Set aside (30 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 ex- tensively 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 (%)	60	13.3	43.3	16.7	46.7	13.3	33.3	0	0	3.3

Answers related to the entire period of the set aside program (1992-99)

In total, 43 % of the interviewed farmers applied rotational set aside exclusively or in combination with fixed set aside (37 %). 20 % of the farmers chose only the fixed alternative.

Related to area, on 60 % of the set aside area a rotational system was applied. As a consequence, positive effects onto soil fertility could be determined, particularly by the cultivation of soil improving plants and rape.

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

Synthetic Answer:

In general, the set aside scheme supported the intensification of production on the remaining areas, as predominantly less productive areas were taken from production and the remaining areas have been cultivated more intensively since 1992.

The yield increases gained on the remaining areas resulted primarily from an improved management and technical progress. However, the yield growth did not correspond with a higher level of yield increasing inputs.

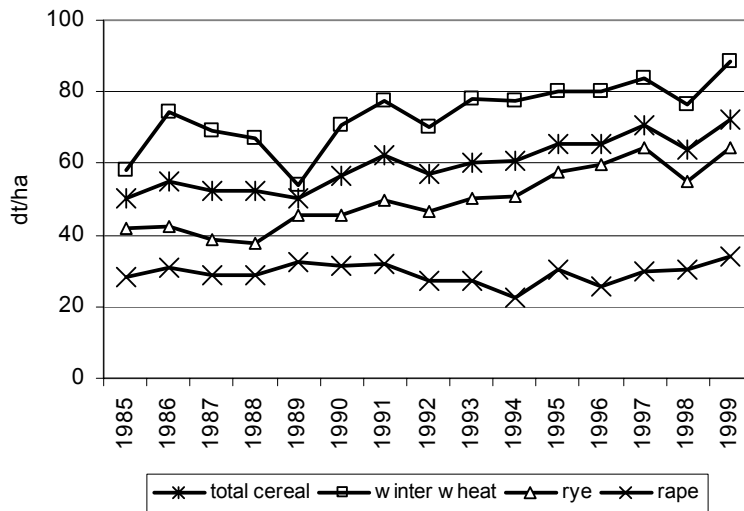
Details of the Answer:

In Niedersachsen, COP production increased between 1992 and 1999 by 25% (cf. table 6). This growth resulted primarily from yield increases (cf. figure 17). The rise in yields were achieved by:³¹

- Improved management (e.g. demand oriented input of fertilizers and plant protection means);
- Reduction of crop rotations to the benefit of high productive crops;
- Specialization of farm organization;
- General technical progresses.

³¹ Information gathered from the interviewed farmers, agricultural administrations and official statistics.

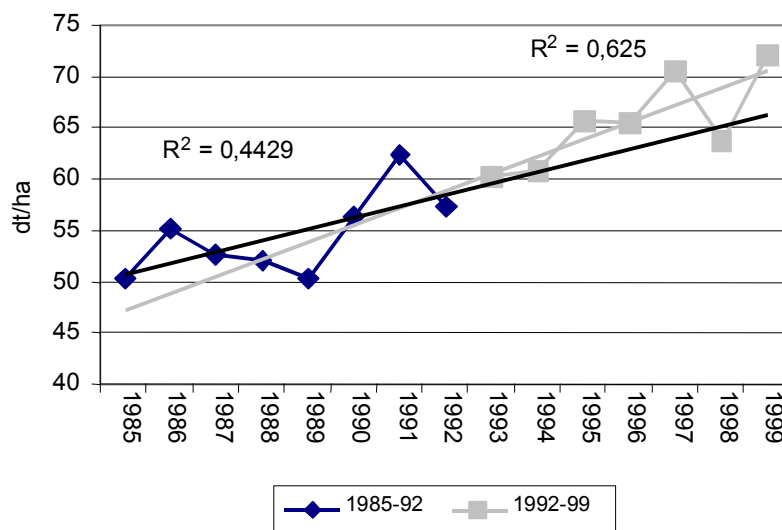
Figure 17: Yields of Selected Crops in Niedersachsen (dt/ha) ³²



The 30 interviewed farmers reacted on the set aside programme as follows:

- 33 % increased the intensity of cultivation by using higher amounts of variable inputs;
- 40 % changed their crop ratio to the benefit of more profitable crops;
- several farmers could not report about significant changes.

Figure 18: Development Trend of Total Cereal Yield in Niedersachsen 1985 – 1999 (dt/ha) ³³



As figure 18 demonstrates, since 1992 the average grain yields grew faster than in the period before the introduction of the set aside programme. The average growth between 1992 and 1999 amounted to 3,6% per year.

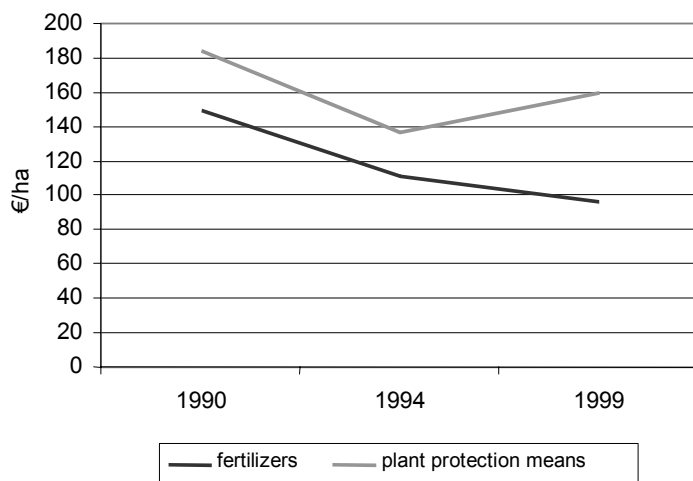
Despite this trend, the corresponding input of yield increasing means dropped at the same time. Figure 19 indicates that particularly the real input of fertilizers per ha was clearly reduced. Immediately after the introduction of the set aside measure, the input of plant protection means showed a similar trend; but in the last years this input has been re-enforced again in order to be able to meet the higher quality standards in crop production. All in all, the CAP-reform including set aside measure obviously initi-

³² See: Statistisches Jahrbuch für die Bundesrepublik Deutschland, different volumes.

³³ See: Statistisches Jahrbuch für die Bundesrepublik Deutschland, different volumes; own calculations.

ated great efforts to optimize previous farming techniques to the benefit of the farm profits and the environment as well.

Figure 19: Input of Fertilizers and Plant Protection Means in Full-time Commercial Farms in Niedersachsen per ha UAA (constant prices, 1991 = 100).³⁴



A reduction of crop rotation occurred above all on favourable sites. There the part of wheat in crop rotation grew. In the majority of the cases, former fallow land was not taken into cultivation again; it was set aside voluntarily even in case of lower set aside-rates (5%).

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:

To both influences - CAP-reform and set aside - the farmers reacted by size growth, specialization, modification of the intensity of farming, and the diversification of gainful activities. The compulsion for adaptation stimulated the rationalization of production and improved fundamentally the productivity of the farm inputs and by this way their competitiveness. It can be assumed that particularly in the larger farms previous income losses could be compensated to a large extent.

The average rents for arable land remained rather constant on a relatively high level during the last decade. Since the rents in the less favourable sites decreased, it grew in the regions with intense animal production and with the most fertile soils.

Half of the interviewed farmers changed their activities. Thereof 12 farmers intensified their COP-production, 13 shifted resources and activities into other gainful fields: expansion of livestock, on-farm diversification, commercial off-farm investments.

Details of the Answer:

One single advantage can be exclusively ascribed to the set aside scheme: the possibility to take lower productive and/or hardly manageable plots from production by receiving premia for those areas and thus compensating the income losses from set aside to a large part.

Other reactions of the farmers on the set aside policy can hardly be distinguished from their reactions on the CAP-price reform. To improve the competitiveness of the farms, the following adaptations on CAP-reform and set aside have been realized within the farming sector of Niedersachsen:³⁵

³⁴ See: Niedersächsisches Ministerium für Ernährung, Landwirtschaft und Forsten: Farm Account Results, different years; own calculations.

- Farm expansion: Above all the larger farms rented additional land in order to stabilize their farm income.
- Specialization: Orientation of production structure towards products with favourable marketing potentials; in this way the farms reacted faster to modifications of market conditions. To some extent production capacities were shifted into animal production.
- Intensity of cultivation: Immediately after the CAP reform the input level of yield increasing means was partly reduced clearly. All in all, a more efficient input of those means was prompted (cf. Q. 4.3.2).
- Diversification of farm activities by shifting farm resources (including labour force) partly to new established farm-related activities like direct marketing of farm tourism.

However, by the adaptation of the agricultural production (without diversification) an improvement in the competitiveness of the enterprises could only partly be achieved by the measures mentioned. Particularly on very fertile sites with high yields, the income losses resulting from price reduction and land set aside were not fully compensated by premia and on-farm adaptations (cf. figure 15). In the larger farms, the necessity of adaptations resulted above all from the obligatory set aside measure.

Development of Farm Size:

In Niedersachsen, 35 % of all farms with approx. 80 % of the UAA were affected by that policy. On the other hand, about 40 % of the farms could choose the simplified scheme and were at least not obliged to reduce their agricultural area.³⁶

Figure 20: Development of Average Farm Sizes of all Farms and of COP-Area of Farms Applying Compensation Premia in Niedersachsen³⁷

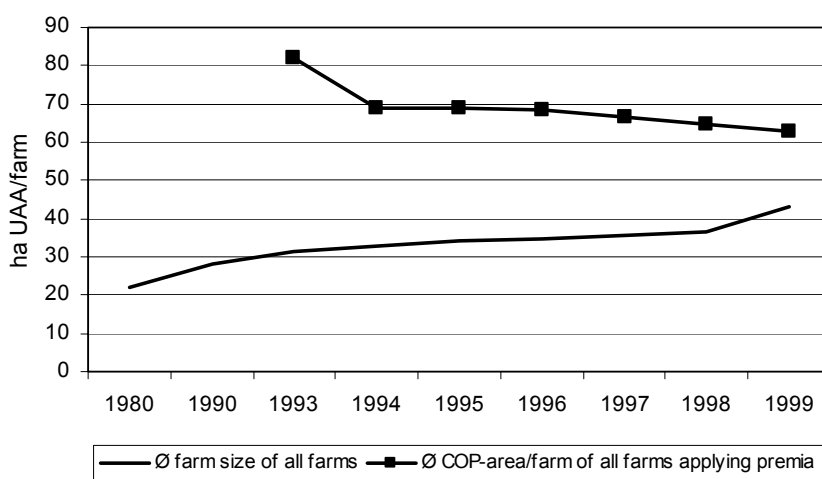


Figure 20 shows how strongly on average the farms expanded in the last years. The fact that the average COP-area of the (larger) enterprises under the obligatory scheme decreased after 1992 associates with the increasing number of smaller farms, which during the programme period became also obliged to set land aside due to their size growth.

Within the group of the 30 interviewed farms, farm size growth took a different course:

- Between 1985 and 1992, 63 % of the 30 farms enlarged their farm size by 20.5 ha UAA/farm on average. That is equivalent to an increase of 2.9 ha/year.

³⁵ See Niedersächsisches Ministerium für Ernährung, Landwirtschaft und Forsten, personal information.

³⁶ The difference comprises very small farms without the ability to ask for premia and farms without arable areas.

³⁷ See Bundesministerium für Verbraucherschutz, Ernährung und Landwirtschaft, internal statistics, Bonn 2001.

- In the period after the CAP reform (1992-1999), the farms grew by additional 61.5 ha on average; That corresponds with an annual growth rate of 8.8 ha /year.
- The 21 larger farms showed the largest growth: Since 1992 their farm size increased by around 82 ha on average.

Those data illustrate that the farms obviously were not prevented from size growth by the set aside measure. On the contrary: It can be assumed that a clear reduction of the average production costs could just be achieved by the enlargement of the farm land. The competitiveness of the enterprises in this case was above all corrected through the reduction of fixed costs and labour input. These advantages did not become compensated through increasing rents for farm land (cf. figure 17).

Market for Arable Land:

Although the average rents for arable land remained relatively constant on an Land-wide level, perceptible shifts between the subregions happened: A lowering of rents could be recognized in the regions with lesser favourable conditions (e.g. Lueneburger Heide); on the other hand, a clear increase resulted

- firstly in the most fertile regions on account of the intense demand of larger commercial farms for arable areas;
- Secondly in the regions with intense animal husbandry, where, due to the rising stocks, the area for the disposition of liquid manure became short.

Despite of the level of rents, 80 % of the 30 interviewed farmers reported about problems of renting or buying additional land, as a consequence of the raised demand for arable land. However, this was primarily ascribed to the general trend of an adaptation to the CAP-reform, and less to the set aside scheme. Correspondingly only 20% of the interviewed farmers had the impression, that a specific market for land with the right for receiving premia had developed.

Adaptation to Set aside:³⁸

The 30 interviewed farmers reacted onto the set aside measure with the following – partly diverging - adaptations:

- Expansion of higher productive crops in crop rotation: 40% ;
- Renting additional land: 33%;
- Increased intensity of cultivation on the remaining areas: 33%;
- Reduction of yield increasing means of the remaining areas: 17%; the reduction of those inputs obviously went parallel to improved management techniques and the specialization in farm production;
- Purchasing of additional arable land: 10 %.

All in all, 15 farms (50%) changed their crop rotation and/or farm organization noticeably; those changes comprised:

- Expansion of oilseeds (33 % of farms) and grain production (53 %);
- Diversification of production by (enlarged) cultivation of others than COP-crops (33 %);
- Diversification of employment by the establishment/enlargement of gainful off-farm activities (27 %);
- Other activities, e.g. enlargement of pig or milk production (47 %).

All in all it can be supposed that the competitiveness of the commercial farms was not considerably influenced by the set aside programme on average. On the contrary: Particularly larger commercial farms often perceived the set aside measure as an incentive for comprehensive rationalization of farm organization and production. This assessment does not exclude that single farms aiming at farm expansion were faced with considerable restrictions resulting from set aside.

Questions concerning the Environmental Impact

³⁸ The question was about the adaptation on the set aside measure only, excluding the entire effects of CAP-reform. Therefore the answers differ from the presentation of the overall farm adaptations mentioned above.

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:

Set aside had predominantly neutral effects on the management of soils (73%); in 23% of the farms improvements could be noticed, at the assessment of the interviewers. On 60 % of the set aside area a rotational system was applied, 40 % were taken out of production for longer term.

The majority of the farms (77%) cultivated their set aside areas with specific crops for soil improvement and/or made use of the positive effects of rape as preceding crop within rotational set aside. Due to the cultivation of soil improving plants and the possibility of using minimum drilling, the soil structure could be influenced positively.

Details of the Answer:

At the appraisal of the interviewers, land set aside showed no significant impacts on soil management in 73 % of the interviewed farms. In 23 % of the cases positive effects were achieved.

Table 13: Effects of Set aside on Land Management in Niedersachsen (estimated by the interviewers)

	Negative effects	Neutral effects	Positive effects
Share of farms (total: 30 farms)	3.3%	73.3 %	23.3 %

Erosion on set aside plots was not a significant problem in Niedersachsen, since land planting was realized on the majority of the set aside areas. In addition, to leave fallow land without green cover was not allowed by national regulations. The cultivation of soil improving plants and in this way the possibility to apply minimum drilling for the preparation of the following crop, resulted in reduced risks of erosion.

17 % of the interviewed farms participated in national or regional programmes for soil protection. More than three quarters of the farms (77 %) improved the fertility of their soils by sowing specific seeds for loosening the ground or for the accumulation of nutrients.

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

Synthetic Answer:

Land set aside affected the waters predominantly neutrally (73%). Positive effects resulted through the set aside of environmental sensitive areas. In very few cases raised inputs of plant protection means possibly increased water pollution. Due to the expansion of livestock, which partly was enforced through the set aside measure, the output of liquid manure raised in certain subregions.

6 out of the 30 farms participated within agro-environmental programmes also aiming at the improvement of water protection.

Details of the Answer:

In 73% of the interviewed farms no significant modifications concerning water management were found. In 5 enterprises (17%) improvements through set aside were realized, particularly through the set aside of

- plots within protected water collection areas,
- bog areas,
- flood areas.

At the estimation of the interviewers,³⁹ the application rates of fertilizers have not increased during the set aside period – on the contrary: Immediately after the introduction of the set aside programme clear reductions could be counted on national level which might also be occurred in Niedersachsen (cf. figure 23 in Annex). On the other side, the enlarged production of high quality grain particularly within already narrow crop rotations possibly raised the respective application. This assumption is based on the development of plant protection input on national level (cf. figure 24 in Annex).⁴⁰ Within the survey sample, on 3 of the 30 farms (10 %) negative effects on water management became clear, because the use of plant protection means was increased on previous set aside areas after the end of the set aside obligation.

The environmental effects of modifications in livestock are hardly to estimate. In Niedersachsen, the total extent of animal production remained rather constant since 1992 on average, but a further shifting from less favoured areas (e.g. Lüneburger Heide) into subregions with the almost highest livestock density (e.g. Vechta) was to be recognized. As far as livestock density in sites with intensive animal production caused problems with the maximum allowed disposal rate for liquid manure, the farmers tried to cultivate non-food crops on their set aside areas in order to enlarge the area for manure disposal. It is to be expected that this procedure did not reduce the possibly already existing problems of water pollution in those areas. To avoid the breaking of upper disposal limits partially the export of liquid manure to other farms is practiced.

Table 14: Effects of Set aside on Water Management in Niedersachsen (estimated by the interviewers)

	Negative effects	Neutral effects	Positive effects
Share of farms (total: 30 farms)	10 %	73.3 %	16.7 %

Irrigation of set aside areas was not practiced in Niedersachsen. As far as remaining areas were irrigated, their management was not changed on account of set aside in the interviewed farms.

Several agro-environmental programmes aim nation-wide at an improvement of water quality and water protection. 6 out of the 30 interviewed farmers participated in those programmes. As far as an improvement in water quality and water protection was achieved on regional level, this was less a result of set aside, but was largely effected by specific national programmes.

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

Synthetic Answer:

No negative effects of set aside on the landscape could be recognized in general. An extensive local concentration of set aside areas occurred only sporadically as 60 % of the areas were set aside rotationally. Provided that problems arose, they were associated with incorrect cultivation.

³⁹ Based on the farm interviews.

⁴⁰ Regional data about those inputs were not available.

Details of the Answer:

13 of the interviewed farmers (40 %) indicated that their set aside areas differed from the surroundings. However, not even one farmer stated negative impacts on landscaping. In particular on long-term set aside plots a natural regrowth could be noticed. If those areas were managed properly, no major optical differences could be found in cultivated plots.

As far as negative impacts on landscape occurred, they were the consequence of incorrect cultivation (e.g. a high weed infestation due to a too late mowing) or insufficient land planting. This was reported sporadically from less productive sites (e.g. Lueneburger Heide), but it played no role in the interviewed farms.

On account of the high share of soil improving crops (phacelia, oil radish, clover), the landscape became enriched during the blossom of the plant. This positive impression increased by the fact that the majority of the farmers (83 %) did not concentrate their set aside areas in specific parts of their farms.

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

	Negative effects	Neutral effects
Share of farms (total: 30 farms)	0 %	100 %

The interviewed farmers calculated the expenses for the maintenance of their set aside areas at about 102 €/ha on average – with a wide range until up to 500 €/ha, which might be an unrealistic figure.

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

Synthetic Answer:

From an ecological point of view, land set aside had only little influence on bio-diversity. Slightly positive effects predominated particularly on long-term set aside areas and on those plots, which were cultivated with specific seeds for ecological purposes.

Partially an early mowing of the set aside areas led to conflicts with the protection of birds and other animals during their breeding time.

Details of the Answer:

Due to the high part of specific regrowth the effects of set aside on bio-diversity were small in total. Positive effects have been achieved in particular

- by setting aside plots for a longer term; 20% of the interviewed farms chose fixed set-aside exclusively;
- by sowing of specific seeds for game and bees (5 out of 30 farms).

According to farmers point of view, bio-diversity comprises also the development of weeds and diseases: In this context 53% of the interviewees reported about problems at the beginning of the measure: Animal pests (3 farms, 10 %) and increasing weed infestation (13 farms, 43 %). Until 1999 the number of farms with respective problems decreased (at 37 %). Plant diseases never appeared as a problem caused by the set aside measure.

Environmental associations and hunters organizations mentioned the fixed and homogeneously applied regulations of inter-cultivation as a risk against a better development of bio-diversity. The operations in spring time and early summer endanger especially young animals (broodings on meadow and young mammals). This praxis works also at the expense of late blowing plants.

According to research results, it can be assumed that fallow land above all within large-scaled agricultural areas (e.g. central German dry areas with black earth soils) contribute to the improvement of biodiversity.⁴¹ Since the crops on nutrient rich set aside plots mostly consist of rather few species only, a specific cultivation can be expedient in order to give competition-weak species a chance, too. From that point of view the environmental administration requests specific locally based regulations for the management of set aside areas.

Asked about the management techniques the 30 interviewed farmers reported as follows

- Land planting :
 - 77 % sowed plants for agronomical purposes;
 - 13% sowed plants for other purposes (e.g. for bees);
 - 23 % applied natural regrazing.
- Management of the set aside areas :
 - 93% mowed the growth of the set aside plots;
 - 15% used chemical means to clean the area;
 - 11% applied other techniques (rotary cultivator; no inter-cultivation allowed, because the area belonged to a bird protection area).

The cultivation period comprised the entire set aside period (see table 16), with the top between July and September. At least 11 farms operated on their set aside areas exactly during the most sensible time for birds and young wild animals (April – June). Actually this procedure must be accepted as more concrete definitions of the "optimal timing" of cultivation (and the so-called "good practices of cultivation" are missing).

Table 16: Time of operation on the Set aside Areas in Niedersachsen (without non-food production)

	April	May	June	July	August	September	October
Number of Farms	2	1	8	10	10	8	3
Share of farms (total: 27)	7%	4%	30%	37%	37%	30%	11%

Elements of Answers for Questions 451 to 452

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

These questions have been answered in the German national report more in detail.

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?

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

The 30 interviewed farmers mentioned the following institutional problems with the regional administration concerned:

- 40% of the interviewed farmers referred to problems with the measurement of the set aside plots at least once;
- The minimum size of the set aside areas represented a problem for 43% of the farmers;
- 13% of the farms had already problems with the realization of the minimum yield of non food crops;

⁴¹ See Schmiedeknecht, A.: Untersuchungen zur Auswirkung von Flächenstilllegungen auf die Vegetationsentwicklung von Acker- und Grünlandbrachen im Mitteldeutschen Trockengebiet. Berlin, 1995.

- 30% of the interviewed farmers mentioned the starting time and the end time of set aside as an obstacle for cultivation;
- 40% complained about a too late announcement of the respective set aside-rate;
- 30% of the farms emphasized that set aside caused laborious and/or complicated administrative procedures;
- One single farmer regretted the inadequate co-ordination with other programmes;
- For 47 % of the farmers the late date of payment was an annoyance.

Asked about improvements of the set aside policy, the 30 farmers gave the following recommendations:

- Abolition of the measure;
- Abolition of minimum size for set aside areas;
- Shortage of the set aside period;
- Only voluntary set aside;
- Possibility to set grassland aside;
- Obligation to set aside humid and flood areas;
- Permittance to dispose organical fertilizers on all set aside areas;
- Immediate set aside of rented areas;
- Long-term set aside of less productive areas;
- Permittance to use the set aside areas for grazing or forage production;
- Intensified support of non-food production;
- Abolition of the simplified scheme.