EVALUATION DE L'IMPACT ENVIRONNEMENTAL DE L'ORGANISATION COMMUNE DE MARCHE DES CULTURES PERMANENTES

ANNEXE 5 : OCM FRUITS
ETUDE NATIONALE ALLEMAGNE et
ETUDE DE CAS BADEN-WÜRTTEMBERG

Novembre 2005

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OCM FRUITS
ETUDE NATIONALE ALLEMAGNE

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GLOSSARY

BMVEL = Bundesministerium für Verbraucherschutz, Ernährung und Landwirtschaft

BW = Baden-Württemberg

BY = Bayern

CR = Council Regulation

EAGGF = European Agricultural Guidance and Guarantee Fund

EO = Erzeugerorganisationen / Producer organisations

EU = European Union

€ = euros

FUL = Förderung Umweltgerechter Landbewirtschaftung

GAP = good agricultural practices

GFP = gute fachliche Praxis / good agricultural practices

Ha = hectare (10.000 m^2)

IP = integrierte Produktion / integrated production

Kulap = Kulturlandschaftsprogramm

LEH = Lebensmitteleinzelhandel / food retail

MEKA = Marktentlastungs- und Kulturausgleichsprogramm

NAU = Niedersächsisches Agrar-Umweltprogramm

NS = Niedersachsen

OP = operational programmes

PG = producer group

PGs = producer groups

PO = producer organisation

POs = producer organisations

Streuobst = Traditional orchards; very extensive, traditional way of producing fruits; grassland with just a few trees

QS = Qualitäts-Standards / quality standards

RLP = Rheinland-Pfalz

ZMP = Zentrale Markt- und Preisberichtstelle für Erzeugnisse der Land-, Forst- und Ernährungswirtschaft

1. CONTEXT OF FRUITS PRODUCTION IN GERMANY

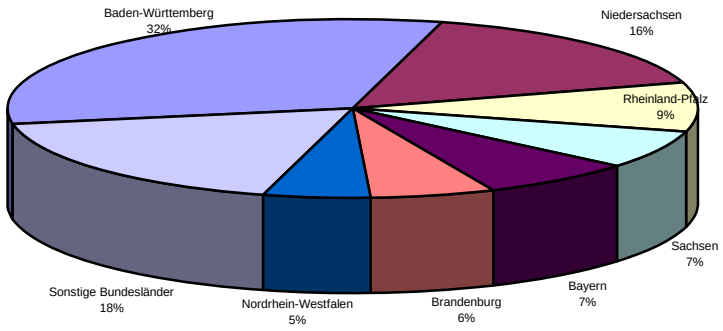
1.1 Main characteristics of fruits production in Germany

The present work describes only the impact of the CMO measures on the apples and pears cultivation in Germany from the four different sectors named in the investigation. The other three sectors (citrus-fruit, peaches-nectarines and nuts) have no significant meaning for the German fruit production. As statistical data source serves the survey of the German "Statistisches Bundesamt" (federal statistic board) in the years 1992, 1997, and 2002. The survey is carried out every five years, being the last one in 2002. A comparison between data sampled before and after the year 1997 is difficult, since the limit of the investigated area increased from 0.15 hectare (ha) to 0.3 ha.

1.1.1 Evolution of the apples and pears orchards between 1990 to 2003

The fruit cultivation in Germany is mainly concentrated in regions, where the climate is favourable and another land use is not effective. The main fruit cultivation is distributed in the Laender of Baden-Württemberg (32% of the cultivation area), followed by Niedersachsen (16%), Rheinland-Pfalz (9%), Sachsen and Bayern (both with 7%), Brandenburg (6%), and Nordrhein-Westfalen (5%) (figure 1).
The regions of the Niederelbe (Northern Germany) and the Lake of Konstanz (Southern German, in Baden-Württemberg) correspond to the largest areas of cultivation of pome dessert fruits.
In 2002, the total area of orchards in Germany occupied on 48 093 ha. In 1992, 59 184 ha of orchards were cultivated for fruit production. Thus, the cultivation area has decreased in about 20% (figure 2). This situation differs between the regions and is related to alternative land management. For example, the most important regions for fruit cultivation in Germany, Baden-Württemberg, showed a significant increase of 10% in area since 1991, which means that other regions in Germany presented reductions higher than the average.

Figure 1: Distribution of orchards in Germany 2002 (in percent)



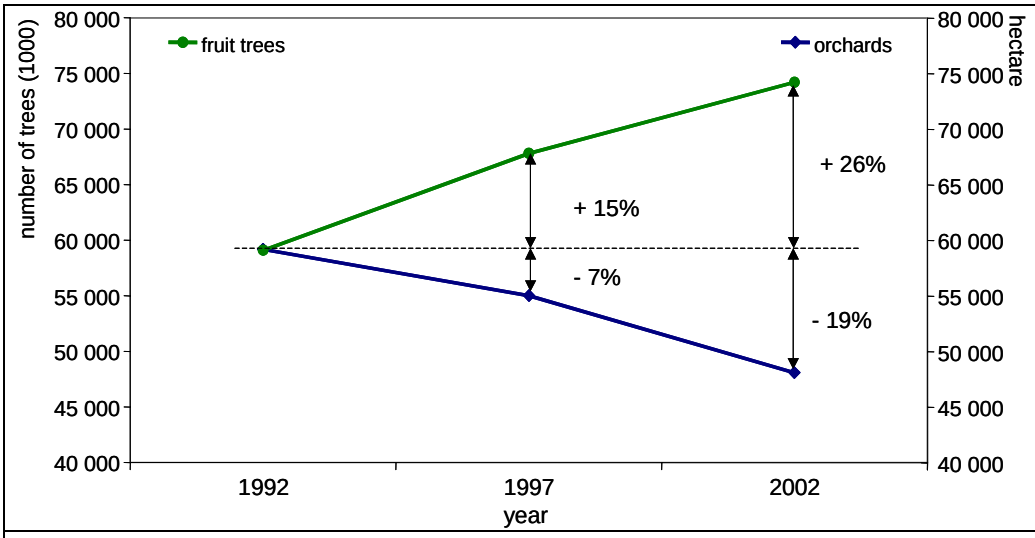
Laender	**percentage of total orchard acreage**
Baden-Württemberg	32
Niedersachsen	16
Rheinland-Pfalz	9
Sachsen	7
Bayern	7
Brandenburg	6
Nordrhein-Westfalen	5
other Laender	18
In total	100

Source: BMVEL: Statistisches Jahrbuch über Ernährung, Landwirtschaft und Forsten 2003, S. 109

However, a more intensive use of the existing surface by new cultivation forms faces the decreased development of the surface, as shown in figure 2. In 1992, about 60 million fruit trees for cultivation were planted (990/ha) and in 2002, this number increased to 74 million trees (1 540/ha), which corresponds to an increase of almost 55% per ha of fruit trees cultivation area. The cultivation of small trees makes the intensification of the land use possible.

The areas, which are not used anymore, are mostly left for the natural succession, since these soils are usually too poor for other land management (Rueß, 2004).

Figure 2: Development of orchards and fruit trees in 1992, 1997, and 2002.

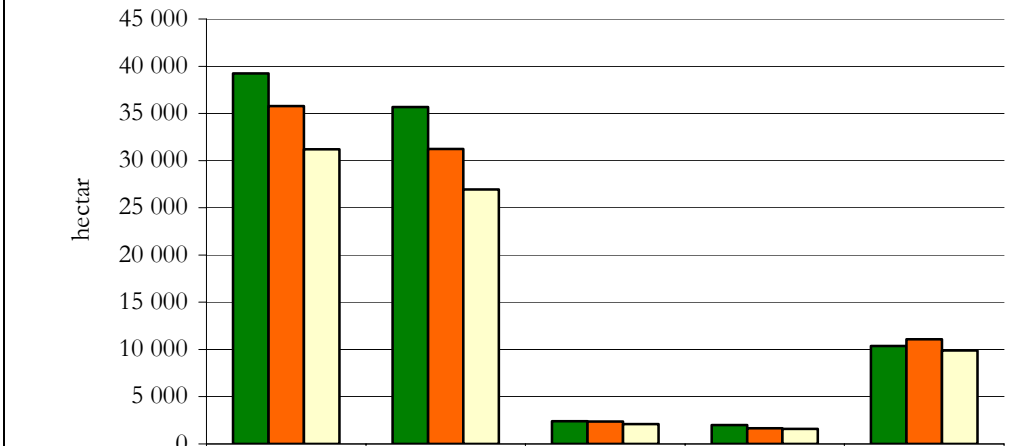


	fruit trees (1.000)		orchards (ha)	
1992	59.106		59.184	
1997	67.811	15%	55.018	- 7%
2002	74.213	26%	48.093	- 19%

Source: BMVEL: Statistisches Jahrbuch über Ernährung, Landwirtschaft und Forsten 1993 - 2003

Apple is the most important cultivated fruit in Germany, being about 87% of total tree fruit cultivation and 65% of the German orchards (31 220 ha) (figure 3). The pear production has in Germany a secondary role, with about 2 090 ha. In addition, cherry and plums production have also an important share on the fruit cultivation market, with 5 400 ha and 4 500 ha.
The apple and pear production for dessert fruit corresponds to 90% and 80% from the total apple and pear production surface.

Figure 3: Development of the major orchards in Germany between 1992 and 2002.



	apple	apple dessert fruit	pear	pear dessert fruit	others
year 1992	39 223	35 697	2 399	1 992	10 373
year 1997	35 793	31 259	2 372	1 671	11 074
year 2002	31 219	26 926	2 090	1 594	9 885

others: sweet cherries, plums, prunes

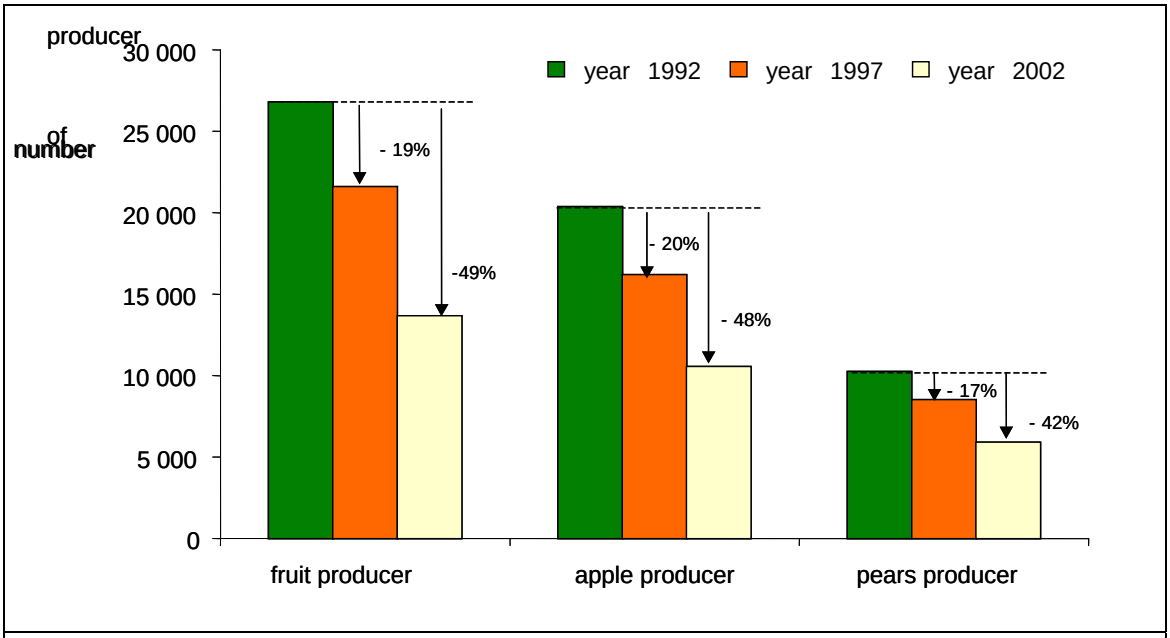
Source: BMVEL: Statistisches Jahrbuch über Ernährung, Landwirtschaft und Forsten 1993 - 2003

1.1.2 Evolution of the number of fruit producers in Germany - 1992 to 2002

In 1992, the number of fruit producers was about 26 810. Until 2002, this number decreased to 13 671, which means a structural change of approximately 50%. As shown in figure 4, this structural change was almost the same for apple and pear producers.

Moreover, figure 4 shows that more than three quarters of the fruit producers produced apple and about 40% pear.
The average area of orchards per producer increased from 2.2 ha (1992) to approximately 3.5 ha (2002). However, many of them are part-time-farmers. Depending on the specialisation in fruit cultivation, the cultivated area of full-time-farmers varies between 5 and 40 ha. In 2002, about 3 000 fruit producers have 3 ha and 1 016 producers own more than 10 ha of orchards (BMVEL 2003, S.109).

Figure 4: Development of fruit producers from 1992 to 2002.



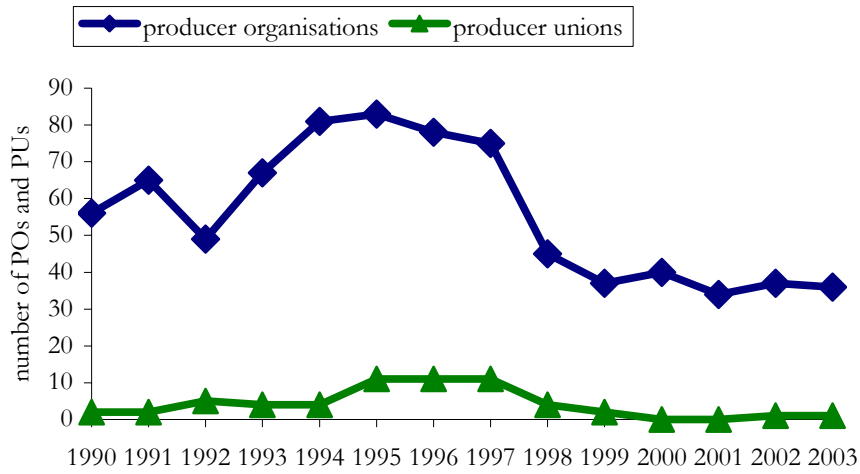
1992	26.810		20.373		10.262	
1997	21.611	-19%	16.210	-20%	8.520	-17%
2002	13.671	-49%	10.561	-48%	5.901	-42%

Source: BMVEL: Statistisches Jahrbuch über Ernährung, Landwirtschaft und Forsten 1993 - 2003

1.1.3 Evolution of the number of producer organisations (PO) and producer groups (PG) in Germany - 1992 to 2002

In this sequence, the approved producer organisations (PO) will be specified according to the EU-Legislation (Regulation (EWG) No. 1035/72 from the council regulation and VO (EG) 1493/96 from the council). In Germany, there is generally no separation between the producer organisation for vegetables and for fruits. Fruits and vegetable producers are organised in one PO, because they usually produce both. Furthermore, most regions can afford only one producer organisation for fruits, due to the small volume of fruit production.
The strong structural change in the number of fruit producers could also be observed among the producer organisations, as shown in the figure 5. In 1992, there were 65 POs. Ten years later, the numbers of organisations have decreased to 40, which means a structural change of –25%, although the number of POs increased until 1996 (figure 5). The reunification of Germany is one of the major reasons for the temporary increase of POs, since they were supported by German legislation and subsidies via the “market structure law”. The recovering of the agricultural production in the middle of the nineties lead to a clear increase in the production (figure 6).

Figure 5: Evolution of the number of producers organisations (POs) and producer groups (PGs) - 1990 to 2003



year	producer organisations	producer groups
1990	56	2
1991	65	2
1992	49	5
1993	67	4
1994	81	4
1995	83	11
1996	78	11
1997	75	11
1998	45	4
1999	37	2
2000	40	0
2001	34	0
2002	37	1
2003	36	1

Sources: BMVEL Statistisches Jahrbuch über Landwirtschaft und Forsten, 1993 -2003; BMVEL-Agrarbericht 1996 - 2004

At the end of the eighties, the number of POs reduced strongly, stabilising in the last years in 37 POs (BMVEL, Agrarbericht 2004). In 1997, some of the POs could not fulfil the requirements of the operational programme in the council regulation 2200/96, consequently many of them were not recognised anymore.

Since the council regulation (EC)2200/96 of market in fruit and vegetables (implemented in 1997), about 11 000 producers became member of POs, commercialising approximately one third of the German fruit and vegetable production (BMVEL, Agrarbericht 2004, S.64). Nowadays, there is only one producer group (PG) for fruit and vegetables. After the council regulation 2200/96, there were 11 PGs. Because of the strong structural change in the number of fruit producers, the PGs also showed a decline in number as observed by the POs.

The PO members cultivate approximately 1/3 of the entire surface (some 15 000 to 20 000 ha of orchards).

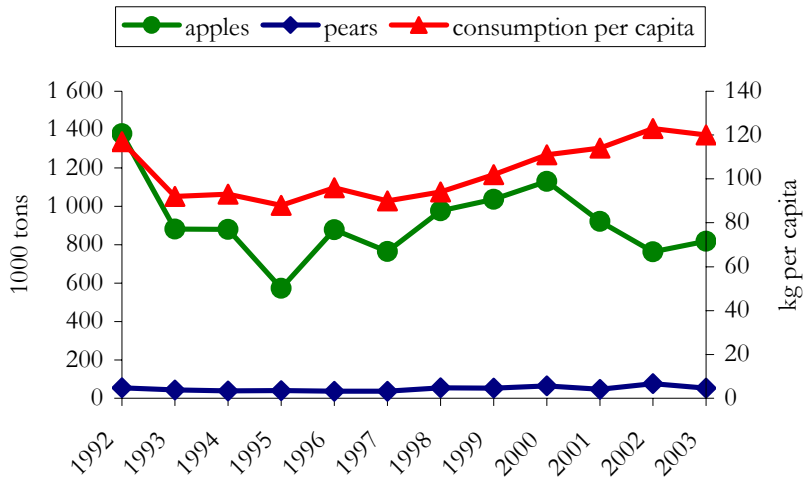
1.1.4 Evolution of the fresh fruits for apple and pears production - 1992 to 2002

In the last five years, the fresh fruit supply from the German population corresponded to one quarter of the national production. The degree of self-sufficiency can strongly vary, due to highly variable yields. In the last ten years, a degree of self-sufficiency of 17,5% was reached on the average. Therefore it is evident, that Germany is an extensive netto importer of fruits. The production of fruit tree can be divided in two different production processes: the intensive sector of fruit cultivation and the extensive cultivation of stone fruits. Contrary to other EU-countries, the cultivation of stone fruits in Germany has a great importance for the pome fruit demand. The cultivation of stone fruits in organic fruit cultivation plays a certain role. Because of the less

intensive cultivation of these areas, there is a strong yield variation (LFL, Agrarmärkte 2004). There are no exact data for the amount produced in stone fruits cultivation. The volume is yearly estimated by the Institute ZMP (LfL, Agrarmärkte 2004). The harvest of 2003 was estimated in 530 000 t. Due to the lack of data, the production of apple and pear is presented in figure 6 (for the intensive sector of fruit cultivation).
The total production in apple cultivation varied from 1992 to 2003 between 600 000 t and 1 370 000 t. The considerable fluctuations are attributed mainly to climatic conditions in the vegetation period. Spring frost, hot weather in the cell division phase of the fruits, water stress in summer, and other factors caused regularly yield break-downs in fruit cultivation.
As shown in the figure 6, fruit becomes more popular for German consumers. There was an increase in the per capita consumption of fruit in the last ten years from 90 kg/year to 120 kg/year, which corresponds to a relative increase of almost 30%. From the 120 kg/year per capita consumption of fruit, 32 kg/year accounted for apple (LfL, Agrarbericht 2004). According to estimations from the cultivation of stone fruits, about 25 kg/year are added to the per capita consumption. The importance of apple to the German consumers is easily recognised in the figure 6. The apple yield followed the increase in consumption until 2000. Because of climatic influences, there was a yield loss since 2000, which explains the drop of the apple yield curve.

Besides, the decrease in demand of classical German apple varieties through changes in consumer demand plays an important role on the supply of native apples. The producers reacted to the demand with new tree varieties, in such a way that a slight rise in the harvest quantity could be observed (figure 6). One can observe a similar situation for the pear harvest. In this case, the yield varied from 37 000 t to 76 000 t between 1992 and 2002, showing a slight increase in the production of native pear.
In Germany, about 50% - 80% of the national market of fruit cultivation are for commercial purposes, about one third of it is mainly commercialised by the producer organisations. However, the direct marketing of fruits from producers to consumers also plays an important role: One quarter of the fruit farmers sell their fresh fruit on the weekly market or at the farm gate.

Figure 6: Evolution of fruit production and consumption- 1992 to 2003



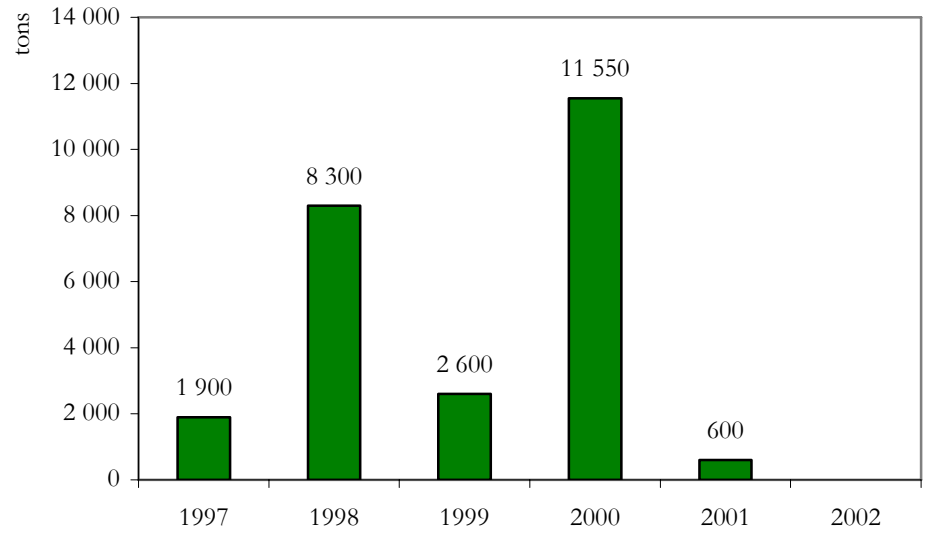
year	apples (1.000t)	pears (1.000t)	per capita consumption (kg)
1992	1.378	55	117
1993	882	43	92
1994	880	39	93
1995	573	40	88
1996	878	37	96
1997	765	37	90
1998	977	55	94
1999	1.036	54	102
2000	1.131	65	111
2001	922	47	114
2002	763	76	123
2003	818	54	120
average	917	50	

Source: BMVEL: Statistisches Jahrbuch über Ernährung, Landwirtschaft und Forsten 1993 - 2003

1.1.5 Evolution of the apple withdrawals since implementation of the CR 2200/96

The fruit withdrawals are accomplished by the POs in Germany, applying the intervention arrangements from the Article 23 of CR 2200/96 implemented in the national legislation of fruit. Since the implementation of the EU-Legislation in 1997, essentially apple withdrawals were carried out in Germany. The quantities of apple withdrawals since 1997 are shown in figure 7. Compared to the total apple production with over 917 000 tons on average p.a., the importance of withdrawals in Germany (between 0 an 11 500 tons p.a.) is very limited (less than 1 %). The year 2000 was a very good harvest year. Therefore the POs started withdrawals for market discharge. But the 11 500 t are still a small amount of withdrawal and had no significant market effect. In former years there weren't any withdrawals of apple and pears.

Figure 7: Apple withdrawals since implementation of the CR 2200/96

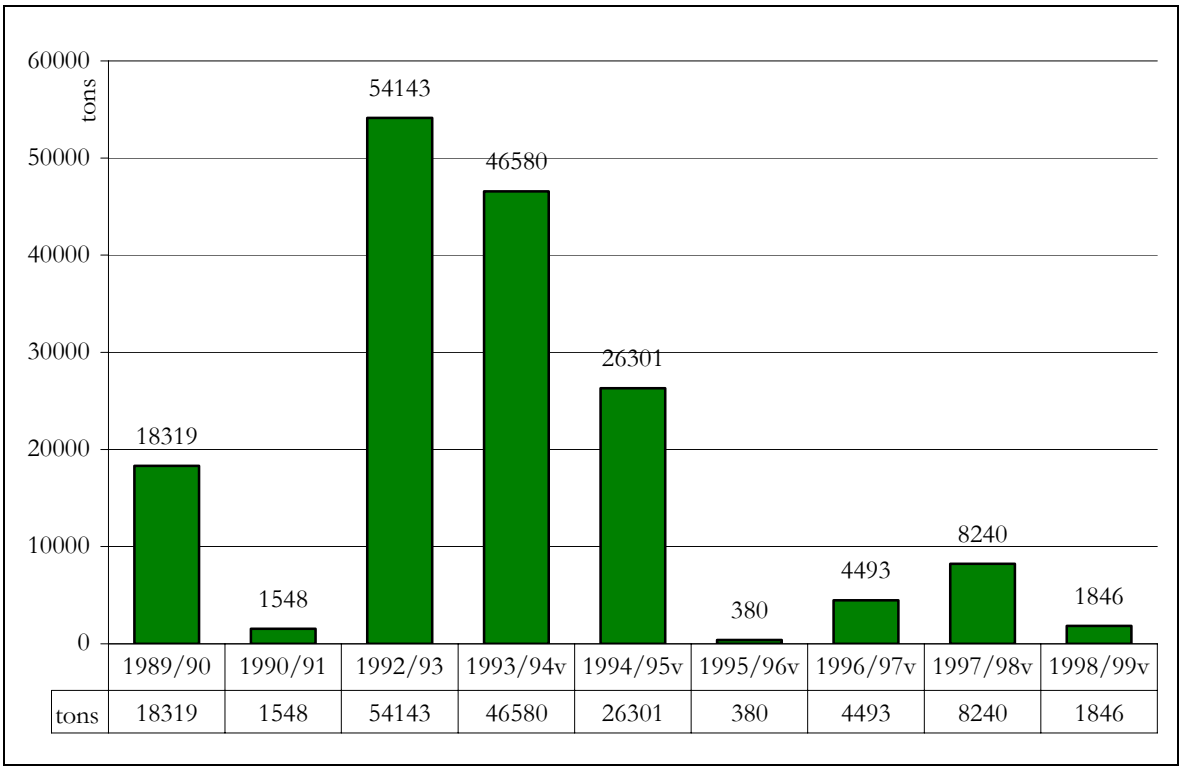


* Data on Apple withdrawal before 1997 was not available

year	apple withdrawals	percentage of apple production
1997	1.900	0,25%
1998	8.300	0,85%
1999	2.600	0,25%
2000	11.550	1,02%
2001	600	0,07%
2002	data not available	

Source: BMVEL, Agrarbericht 1998 – 2004

Figure 8: Apple intervention in Germany in the 1990s*



Source: ZMP Marktbilanz Obst 1997 and 1999

The amount of apple withdrawals is influenced by different factors, which are the German and European fruit yields, as well as the demand of consumers for proposed varieties. The influence of

apple yields was very significant in 2000 (figure 7). As shown in figure 7, a great quantity was removed from the market in comparison to the preceding years, due to the excess in offer.

1.2 Level of implementation of the various measures of the CMO in Germany

The implementation of the CR (EC) No 2200/96 occurred in Germany mostly by the support of POs and quality standards in commercialisation and production. The granted financial subsidies for the POs since the implementation of the CR 2200/96 from 1997 are listed in table 1. The financial support by the EU doubled from 1997/98 until 2003/04. The distribution of financial subsidies in different promotion measures is illustrated in Figure 15 (Annex 3, p.49). However, the EU community financial assistance for producer organisations varied according to withdrawals.
Table 1 shows that the greatest amount was granted in the years 1999/2000, because of the high apple yield (figure 6), which lead to an expenditure for intervention through withdrawals. A similar situation could be observed for the co-financed sales promotion measures in developing countries, being the granted subsidies also the greatest in the years 1999/2000.

Table 1: Community financial assistance for producer organisations in Germany

kind of subsidy / farm year	POs subsidies according to the operational funds [Mio. €]	co-financed sales promotion measures to developing countries for apples [Mio. €]
1997/98	9,0	0,10
1998/99	10,5	0,50
1999/00	25,0	1,20
2000/01	12,0	0,15
2001/02	15,4	0,22
2002/03	18,1	0,50
2003/04	20,8	0,80

Source: BMVEL, Agrarbericht 1998 – 2005

The market measures in the CR 2200/96 are implemented in Germany, according to the interviewed experts (see chapter 2). Each PO can define its own policy of the various measures and, thus, design its "own" Operational Programme and contents according to the CR 1432/2003 and 1433/2003. Which one are applied depends on the PO and its members.

1.3 Institutional framework of fruits production in Germany

The BMVEL is responsible in Germany for the implementation of the EU-market measures to the national legislation. The BMVEL subdivision BLE (Bundesanstalt für Landwirtschaft und Ernährung) is in charge for the implementation and control of the compliance of the law. Further implementations to national legislation is within the responsibility of the Laender Ministries, which the agricultural department belongs to.
The Laender ministries through local administration control the compliance of the law with the market measures. In Baden-Württemberg, for example, this control is accomplished by the agricultural chambers. Private auditors, employed by the ministries, control the quality standards in trading, retail and processing.

1.3.1 Institutions in charge of the management, payment of the premiums and control

All the controls in Germany are accomplished by the regional Laender institutions like agriculture chambers and ministries. The regions are very different and act independently.

- Bundesministerium für Verbraucherschutz, Ernährung und Landwirtschaft (BMVEL)

- Bundesanstalt für Landwirtschaft und Ernährung (BLE):
  BLE is the German market regulation institution (in particular with regard to intervention), active during the private storekeeping and in aid measures. It controls the import and export of agriculture products and the payments between Germany and the EU.
- Landwirtschaftsministerien: for example: Baden-Württemberg: Ministerium für Ernährung und Ländlichen Raum; Rheinland-Pfalz: Ministerium für Wirtschaft, Verkehr, Landwirtschaft und Weinbau; Bayern: Bayerisches Staatministerium für Landwirtschaft und Forsten
- Arbeitskreis Qualitätskontrolle bei Obst, Gemüse und Speisekartoffeln:
  The working group "quality control for fruit, vegetable and food potatoes" is regrouping different agencies in Germany, which are responsible for the quality and conformity controls by fruit.

1.3.2 Research Institutes

Important research institutes in Germany are:

- LVG Heidelberg – Staatliche Lehr- und Versuchsanstalt für Gartenbau
- Technische Universität München – Weihenstephan
- Universität Hannover
- FIBL- Forschungsinstitut für biologischen Landbau (CH)
- Technische Universität Berlin
- Universität Bonn
- Bundesforschungsanstalt für Landwirtschaft

1.3.3 Institutes for statistics

- Statistisches Bundesamt Deutschland (DESTATIS)
- BLE
- Landesvermessungsamt Rheinland-Pfalz

1.3.4 Unions

The following unions have a national scope, and are the most representative at German Rural Domain:

- Verband Landwirtschaftlicher Fachschulabsolventen
- Verband der deutschen Fruchtsaftindustrie (VdF)
- Deutsche Landwirtschafts-Gesellschaft (DLG)
- Deutscher Raiffeisen Verband e.V.

1.4 CMO implementation context in Germany

The main focus of the implementation of market and price strategies in the fruit sector is the stabilisation and support of recognised producer organisations (BMVEL, Agrarbericht 2005). The measures supported by the producer organisations' operational programmes serve in particular to:

- a stronger market orientation,
- reduced withdrawals by intervention,
- grouping of supply
- better product quality, and
- introduction of ecological cultivation forms and techniques

Progress has been made with regard to all goals since the implementation of the CR 2200/96. In order to obtain EU subsidies, the POs have to endorse the organic and integrated production in their operational programmes. In the nineties, Germany started to encourage the organic farming through the council regulation for rural development from the European Agricultural Guidance and Guarantee Fund (EAGGF). Nevertheless, the demand for the organic products is still quite small. But, partly due to food scandals in Germany and in the EU, the demand for such products has increased in the last five years. But it is still quite difficult for organic farmers to reach the market standards for trade, because of the high quality standards for dessert fruit (Sutor, LfL 2005).
Besides the promotion of organic fruit cultivation through the POs, some of the German Laender also support the organic cultivation through rural development programmes. These programmes are co-financed by the EAGGF, according to the council regulation (EC) No. 1257/1999 of 17th May 1999.
The most important Laender and their environmental programmes are listed below:

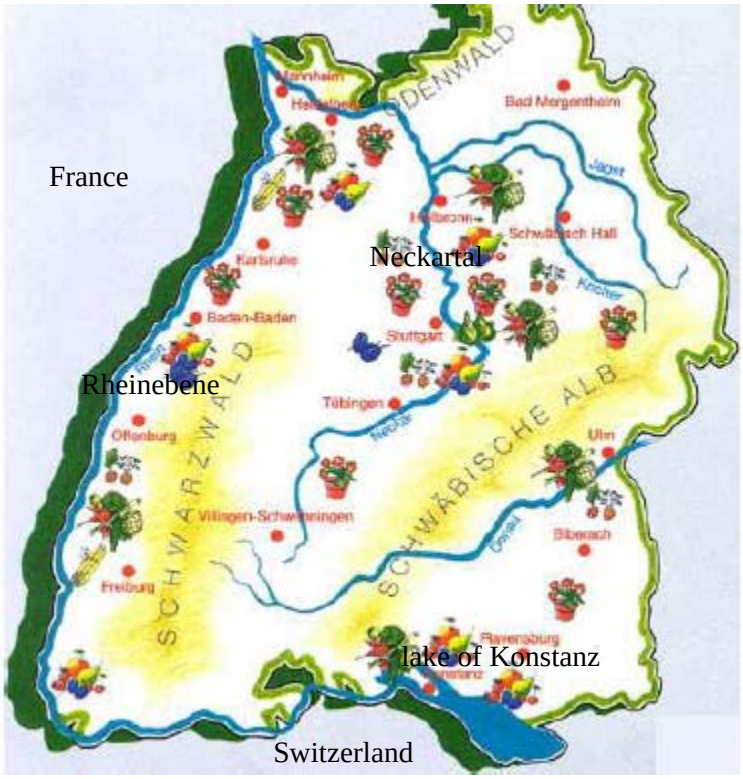
- Baden-Württemberg: MEKA (Marktentlastungs- und Kulturlandschaftsprogramm / Market discharge and cultural landscape programme)
- Rheinland-Pfalz: FUL (Förderung Umweltschonende Landbewirtschaftung / Promotion of environmentally sound land management)
- Bayern: KULAP (Kulturlandschaftsprogramm / Cultural landscape programme)

In the first years after the introduction of the CMO in the fruit cultivation, the goal of grouping of supply was not reached (BMVEL, Agrarbericht 2002, S. 91). One reason could be the traditional distribution channels through direct marketing from producers to consumers or to supermarkets. In the last years, this situation has changed. In 2004, approximately 11 000 members were affiliated to POs, which means about 80% of all fruit cultivation farms from Germany. Actually, the POs commercialise more than one third from the German fruit production, assuming thereby a crucial grouping function (BMVEL, Agrarbericht 2005, S.64).
The increasing importance of producer organisations also becomes evident in considering the yearly granted subsidies. In 1998, the POs received about 9 million Euro from operational funds. Additionally, the German POs' operational programmes obtained in 2004 about 20,8 million Euro (co-financed by the EU).
With the decree of the council regulation (EG) No. 103/2004, which regularises the implementation of intervention possibilities, the simplification process of the market regulation for fruit (begun in 2002 in Germany) was continued. The new council regulation determines the facilitation for free distribution of products, which were taken from the market, to charitable organisations in the community. Moreover, it also prescribes reinforced control, as well as more responsibility of the member states in implementing intervention regulations.
Six representative producer regions for nine products with defined trade characteristics were established for the determination of price quotation of fruits in Germany. The sales promotion measures for fruits in the home market and in development countries' market, which were co-financed by the EU, were carried on in 2003/04.

2. GENERAL CONDITIONS OF THE FRUIT PRODUCTION IN BADEN-WÜRTTEMBERG

The research area taken into consideration is the Federal State of Baden-Württemberg. Baden-Württemberg is located in the very south-west of Germany with a border to France and Switzerland.

Figure 9: fruit cultivation areas in Baden-Württemberg



Source: Metzger 2003, p.1

Baden-Württemberg is the most important fruit producer in Germany. Every second apple produced in Germany is grown in Baden-Württemberg. There are three important regions where fruits are produced. One is the region around the Lake of Konstanz where most apples and pears are produced. The region along the river Rhein (Rheinebene) has different fruit cultivation types and the third region is the fruit producing area near the rivers Neckar and Tauber (Neckartal).

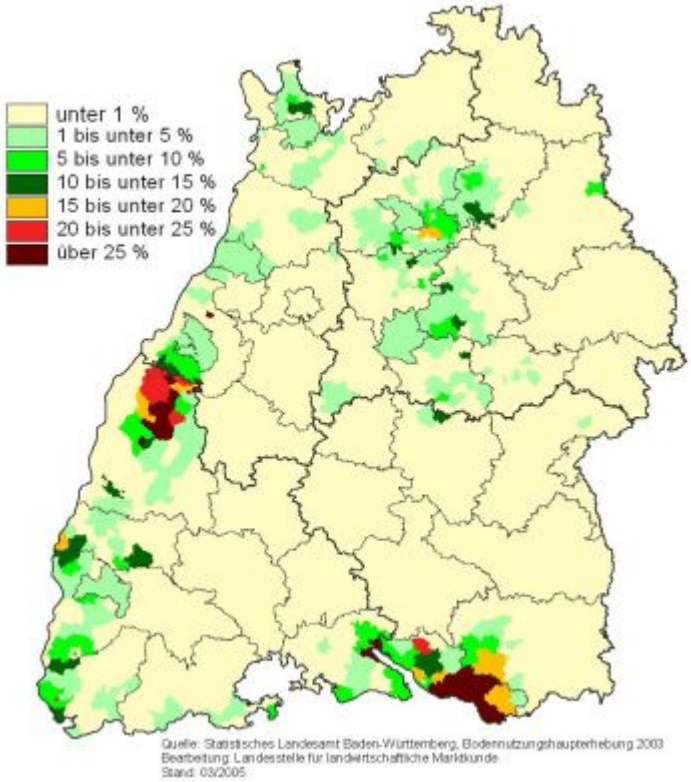
2.1 Important Characteristics of the considered Fruit Production

The following chapters present some statistical data about the fruit production in Baden-Württemberg, being only data about the apple and pear production presented, since the cultivation of these fruits play a crucial role in the fruit production in this area and in Germany.
The statistical data were surveyed by the "Statistisches Bundesamt Baden-Württemberg" (statistical office of Baden-Württemberg). Some data are available for every year while others are just surveyed every five years.

2.1.1 The Acreage of the considered Fruits in the Research Area

The acreage of fruits in Baden-Württemberg is 21315 ha, which corresponds to 30 % of the total area of fruit production in Germany. 9000 farms produce fruits in Baden-Württemberg, mostly around the Lake of Konstanz, along the Rhine river and the rivers Neckar and Tauber. The following map shows the percentage of orchards in this region.

Figure 10: percentage of orchards in Baden-Württemberg



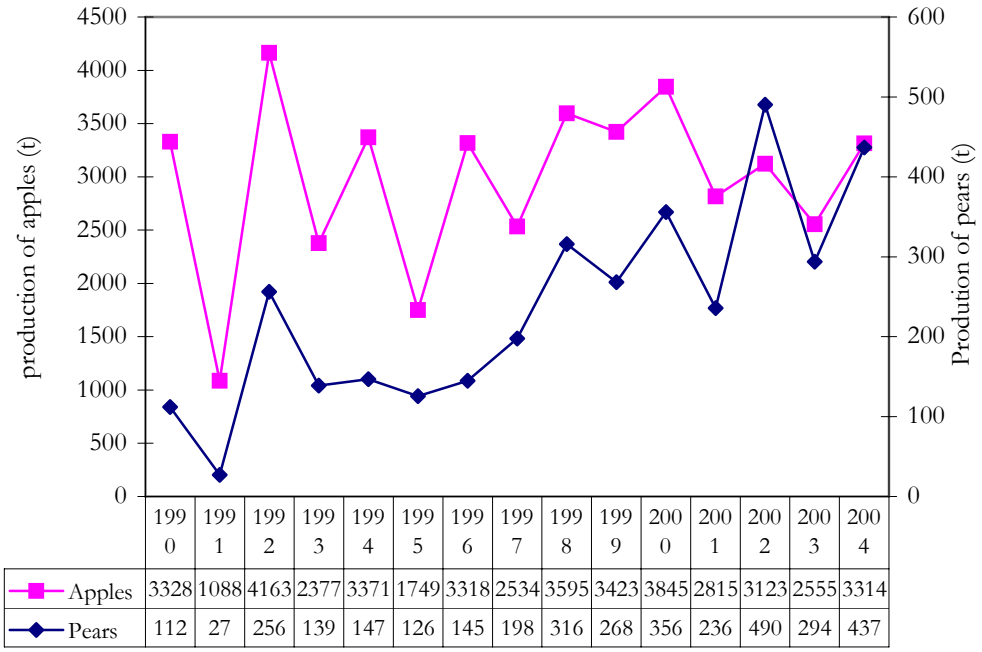
Source: Landesstelle für landwirtschaftliche Marktkunde, 2005

The apple orchards in the Lake of Konstanz region correspond to 6 338 ha, whilst the acreage of pears is 278 ha, being most of apples and pears produced in this area. Near the Rhine river the acreage of apples and pears are 1 815 ha and 280 ha, respectively. A total area of 6,000 ha orchards are cultivated near the Rhine river. In this region almost all different fruits such as plums, cherries and berries are produced, mostly stone fruits and soft fruits. Near the rivers Neckar and Tauber the total area of apple and pear orchards is 1 233 ha 141 ha, most of them located in the Neckartal. (Infodienst der Landwirtschaftsverwaltung, Internet, 22.4.05). All data are from 2002 (Statistische Berichte Baden-Württemberg, Agrarwirtschaft, 27.01.2003, S.3).

2.1.2 Production of Fruits between 1990 and 2002

The production of apples and pears varied strongly between 1990 and 2004 (Figure 11).

Figure 11: Production of Apples and Pears between 1990 and 2004



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Apples	3328	1088	4163	2377	3371	1749	3318	2534	3595	3423	3845	2815	3123	2555	3314
Pears	112	27	256	139	147	126	145	198	316	268	356	236	490	294	437

Source: Statistische Landesamt Baden-Württemberg, Internet, 23.4.05

The greatest increase in the production of apples and pears took place in 1991 and 1992. Between 1990 and 1991, the greatest decrease in apple production could be observed, whilst the major decrease in pear production occurred between 2002 and 2003.

2.1.3 Age of Orchards in 2002

In 2002, most of the apple trees and pear trees grown in Baden-Württemberg were 5 to 9 years old (see Table 1, Table 2). Almost one third of the apple and pear trees cultivated in Baden-Württemberg are younger than 5 years and just 11 % of the apple trees and 15 % of the pear trees are older than 15 years. As shown in the Tables 1 and 2, most of the younger fruit trees grow around the Lake of Konstanz.

Table 2: Age of Apple Trees in Baden-Württemberg in 2002

	Rheinebene		Lake of Konstanz		Neckartal		Baden-Württemberg	
	no. of trees	% of trees	n. of trees	% of trees	no. of trees	% of trees	no. of trees	% of trees
<5 y.	996,460	27	5,618,550	32	550,307	26	7,165,317	31
5-9 y.	1,086,285	30	5,936,123	34	651,191	31	7,673,599	33
10-14 y.	941,637	26	4,562.080	26	557,053	26	6,060,770	26
>15 y.	636,827	17	1,503,791	9	352,218	17	2,492,836	11
total n. of trees	3,661,209	100	17,620,544	100	2,110,769	100	23.392,522	100

Source: Statistische Berichte Baden-Württemberg, Agrarwirtschaft, 27.01.2003, S. 2

Table 3: Age of Pear Trees in Baden-Württemberg in 2002

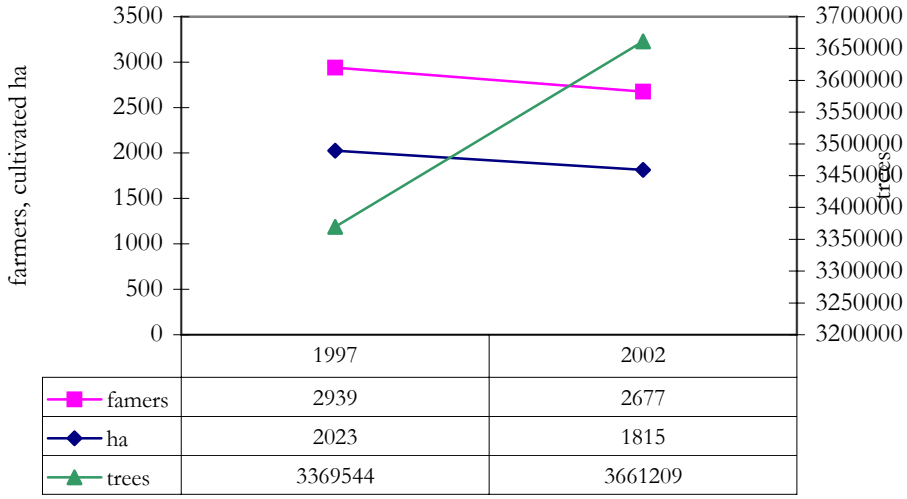
	Rheinebene		Lake of Konstanz		Neckartal		Baden-Württemberg	
	no. of trees	% of trees	no. of trees	% of trees	n. of trees	% of trees	no. of trees	% of trees
<5 y.	66,780	22	175,472	30	36,489	19	278,741	26
5-9 y.	106,643	35	283,796	49	79,138	41	469,577	43
10-14 y.	57,546	19	78,142	13	36,628	19	172,316	16
>15 y.	72,958	24	47.148	8	39,815	21	159,921	15
total n. of trees	303,927	100	584,558	100	192,070	100	1,080,555	100

Source: Statistische Berichte Baden-Württemberg, Agrarwirtschaft, 27.01.2003, S.2

2.1.4 Development of the Structure of Orchards from 1997 to 2002 in the Research Area

From 1997 to 2002, the number of farmers cultivating apples decreased from 7 182 to 5 812, which means a decline of 19.1 % (Figure 2). The number of apple orchards also declined from 11 269 to 10 027 ha, which means a decrease of 11 %. Only the number of apple trees increased from 22,138,382 in 1997 up to 24,663,104 in 2002. Therefore, more apple trees were cultivated per hectare and per farmer in 2002.

Figure 12: Development of the Structure of Apple Orchards from 1997 to 2002 in Baden-Württemberg

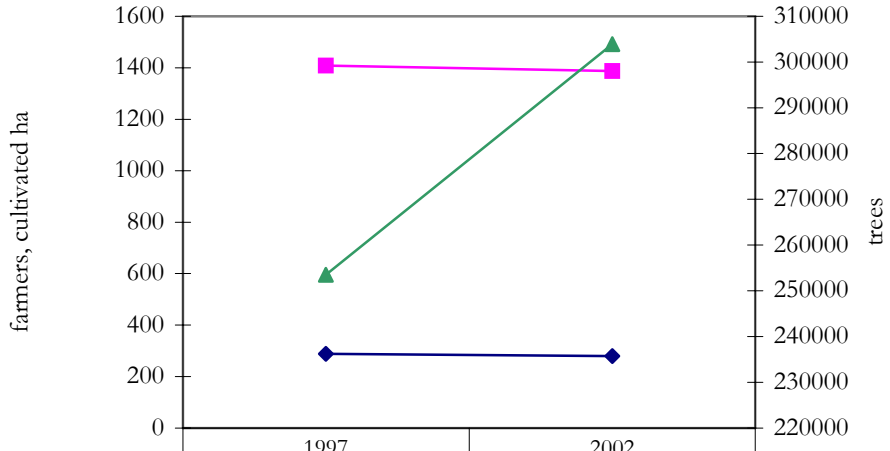


	1997	2002
famers	2939	2677
ha	2023	1815
trees	3369544	3661209

Source: Statistische Berichte Baden-Württemberg, Agrarwirtschaft, 27.01.2003, S. 4

From 1997 to 2002, the number of farmers cultivating pear trees also decreased from 3 532 to 3 016 farmers (see Figure 3), which means a decline of 14.6 %. The number of hectares decreased from 838 ha in 1997 to 786 ha in 2002 (6.2%) However, as in the apple production, the number of trees increased from 949,569 in 1997 up to 1,194,366 in 2002 (25.8 %).

Figure 13: Development of the Structure of Pear Orchards from 1997 to 2002 in Baden-Württemberg



	1997	2002
famers	1409	1388
ha	288	280
trees	253519	303927

Source: Statistische Berichte Baden-Württemberg, Agrarwirtschaft, 27.01.2003, S. 4

In all three areas in Baden-Württemberg, where fruits are produced, the number of farmers decreased from 1997 to 2002. In the Neckartal there was a decrease of 38.5 %, whilst in the Rheinebene the number of farmers decreased only 8.9 %. A decline in the number of pear producers could also be observed in the areas, although not so evident as for the apple producers.
The total area of apples and pears cultivation decreased in all areas between 1997 and 2002, being the decrease of apple acreage greater than of pears. Only in the Lake of Konstanz region the acreage of pears showed an increased of 9.9 %.
The number of apple and pear trees increased in all areas, showing the number of pear trees the greatest increase (e.g. 33.9 % in the Lake of Konstanz region).
As a conclusion one can say, that 2002 more apple and pear trees are cultivated on less area and by less farmers than 1997. Figures of the variation of the number of farmers, cultivated ha and trees of pears and apples of all three regions can be seen in the annex.

Table 4: Development of the Number of Farmers, Acreage and Trees in the Research Area

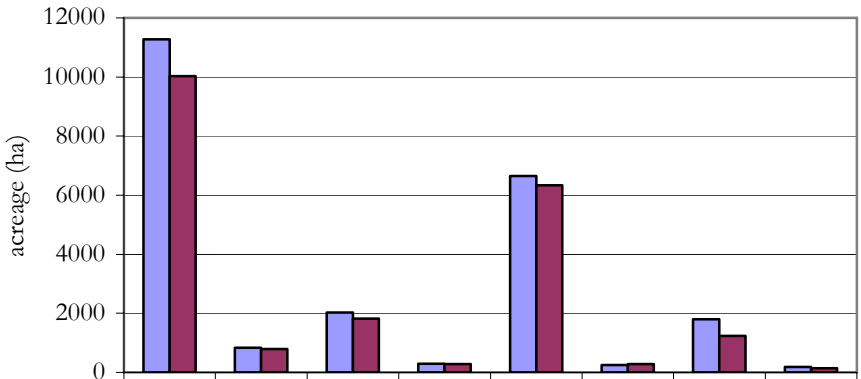
	Farmers			Ha			trees		
	1997	2002	change in %	1997	2002	change in %	1997	2002	change in %
Baden-Württemberg									
Apples	7 182	5 812	-19.1	11 269	10 027	-11.0	22,138,382	24,663,104	11.4
Pears	3 .532	3 016	-14.6	838	786	-6.2	949,569	1,194,366	25.8
Rheinebene									
Apples	2 939	2.677	-8.9	2 023	1 815	-10.3	3,369,544	3,661,209	8.7
Pears	1 409	1.388	-1.5	288	280	-2.8	253,519	303,927	19.9
Lake of Konstanz									
Apples	1 854	1.641	-11.5	6 646	6 338	-4.6	15,543,913	17,620,544	13.4
Pears	778	726	-6.7	253	278	9.9	436,464	584,558	33.9
Neckartal									
Apples	1 650	1.015	-38.5	1 802	1 233	-31.6	2,098,092	2,110,769	0.6
Pears	857	584	-31.9	188	141	-25.0	169,041	192,070	13.6

Source: Statistische Berichte Baden-Württemberg, Agrarwirtschaft, 27.01.2003, S. 4

2.1.5 Development of Clearings

In Germany there were no grants for the producers for the clearing (Treyer oral statement). Concerning the development of number and size of orchards in Baden-Württemberg one can say, that not granted clearing were carried out. The area of apple and pear cultivation decreased between 1997 and 2002 from 11.0 % to 6.2 % in all regions (Rheinebene, Lake of Konstanz, Neckartal). The greatest decline could be observed in the Neckartal, where 31.6 % of apple orchards were cleared. In addition, in the Lake of Konstanz region the area of pear cultivation decreased 9.9% during this period.

Figure 14: Development of Acreage of Apples and Pears in Baden-Württemberg from 1997 to 2002



	Apples	Pears	Apples	Pears	Apples	Pears	Apples	Pears
	Baden-Württemberg		Rheinebene		Bodensee		Neckartal	
1997	11269	838	2023	288	6646	253	1802	188
2002	10027	786	1815	280	6338	287	1233	141

Source: Statistische Berichte Baden-Württemberg, Agrarwirtschaft, 27.01.2003, S. 4

2.1.6 Structure of the Producer Organisations

In Germany less than 30 % of the fruit and vegetables production are commercialised by producer organisations (Kommission der Europäischen Gemeinschaft, 2001, p. 14). There are 36 producer organisations granted by the commission (BMVEL, 2005, p. 64).

There are five producer organisations of fruits and vegetables in the western part of Baden-Württemberg (Baden), all of them belonging to the « Marktkontor Obst und Gemüse Baden ». These producer organisations market a great part of the fruit and vegetables production from Baden-Württemberg (Ministry of Food and Rural Areas Baden-Württemberg b, Internet, 23.4.05). The produced fruits and vegetables are commercialised via markets in Heidelberg, Bruchsal, Oberkirch, Vogtsburg and Reichenau.

In the Lake of Konstanz region there are two fruit producer organisations (Marktgemeinschaft Bodenseeobst, WOG Raiffeisengenossenschaft). For more information about the Marktgemeinschaft Bodenseeobst see chapter 2.2.3. The WOG has 750 members in the Lake of Konstanz region and in the regions along the rivers Neckar and Tauber. The fruit producers cultivate 2 000 ha in the Lake of Konstanz region and 500 ha in the regions along the rivers Neckar and Tauber. The producer organisation trades 65 000 t apples per year. Contractual partners for marketing the fruits are BayWa fruit hypermarkets, which sell the fruits to specialised trade and food retailing. Since 2001, the producer organisation is registered according to the EU regulation 2200/96 (Kompetenzzentrum Obstbau a, Internet, 23.4.05).

2.2 Organisation and Tasks of the interviewed experts Organisations

The following chapters present some information about the organisations involved in the survey of experts. There are more organisations concerned in the implementation of the CMO in Baden-Württemberg but these organisations were not included in the survey. Further details about the survey, the used method and the difficulties in asking experts are presented in the German Fruit - Case Study chapter 3.

2.2.1 Ministry of Food and Rural Regions of Baden-Württemberg

The Ministry of Food and Rural Regions is responsible for all questions connected with the rural regions, agriculture, land consolidation, nature conservation, food, control of food, and forest. The tasks of the structural and agricultural policy are:

- the conservation of an area-wide forestry and agricultural production which is orientated at the market conditions as well as on the interests of the nature
- the development of the rural regions as independent living space and economic area.

The Ministry of Food and Rural Regions subordinated are e.g. the agencies at the district offices, the departments at the regional commission as well as some research institutions (Ministry of Food and Rural Areas Baden-Württemberg c, Internet, 23.4.05).

2.2.2 Centre of Competence of the Fruit Production in the Lake of Konstanz-Region (Kompetenzzentrum Obstbau-Bodensee)

The Centre of Competence works in the legal form of a foundation, being established in September 2000. The tasks of the Competence Centre are the offer of consultation, the establishment of the link between research and practical agricultural work and the publication of new research results, and development of new techniques.
The employees of the Competence Centre work in different fields. These fields of work are: business economics, pest management, storage, physiology of harvest, test of varieties, and ecological fruit production. The Competence Centre also researches and keeps a presentation garden (Kompetenzzentrum Obstbau b, Internet, 23.4.05).

2.2.3 Producer Organisation (Marktgemeinschaft Bodenseeobst)

The Marktgemeinschaft Bodenseeobst is the second biggest producer organisation in Germany. The producer organisation markets 80 000t of fruits per year. 70 000t of fruits can be stored in cold storages and CA storages. 800 producers belong to the producer organisation, who cultivate 3 900 ha orchards between Lindau and Stockach. Ten private contractual partners commercialise the fruits to hypermarkets, specialised trade and food retailing. Since 2001, the producer organisation is registered according to the EU regulation 2200/96 (Kompetenzzentrum Obstbau a, Internet, 23.4.05).

2.2.4 Nature Conservation Organisation (Naturschutzbund NABU Baden-Württemberg)

The Nature Conservation Organisation is an active organisation in Germany, having separate parts in every Federal State. The target of the NABU is to encourage people to do something together for the nature (NABU Internet, 3.5. 05) (http://www.nabu-bw.de/m07/m07_01/). The NABU is more than 100 years old and the NABU Baden-Württemberg was founded in 1965. Nowadays, the NABU Baden-Württemberg has 65 000 members.
The NABU started some campaigns like “coloured grassland instead of uniformity” (hedges were planted, biotopes and lakes were maintained), “healthy food instead of BSE” (NABU lobbies for organic farming), “natural forests instead of plantations” (NABU lobbies for more natural forests) and “experience nature instead of sitting inside” (NABU offers activities for children and adults in the nature). The NABU also lobbies for the maintenance of Streuobst.

2.3 Relevant Measures for the Implementation of the Common Market Organisation in Baden-Württemberg

The target of the reformation of the Common Market Organisation of Fruits was to support the sector in order to become it competitive. This target should be reached by supporting the producers to increase the quality of their products, to enable them to react to the development of the market and to promote their various and healthy products. The focus of the policy in Germany is the support of registered producer organisations, being 36 producer organisations in 2004 registered in Germany (in 2003, there were 37 producer organisations) (BMVEL, 2005, p.64). The producer organisations have about 11 000 members. In Germany the producer organisations do not play such an important role as in other member states, such as the Netherlands and Belgium, being only 30 % of the total turnover traded by producer organisations.
The support of producer organisations is especially defined in the CMO. They should not just have functions in connection with intervention, but also bring the offer of fruits together and market the products, playing an important role in the improvement of the environment conditions. Therefore, the producer organisations have to define operational programmes which are granted by the EU.

The operational programmes were granted of 20.8 millions € co-financed by the EU. The objectives of the granted operational programmes can be seen below.

Since the harvest of 2002/2003, only 8.5 % of the harvested apples could be taken out of the market by intervention. In earlier times it was possible to take up to 50 % of the apples out of the market. The money is now used for the implementation of operational programmes of the producer organisations. Registered producer organisations can get the financial support from the EU for the implementation of funds. The funds are used to pay compensations for intervened fruits and for the definition and implementation of an operational programme. The operational programmes are defined to fulfil the following targets:

- Improvement of the products quality
- Reducing the production costs
- Increasing the market value
- Marketing of the products which are consumer-related
- Establishment of product lines of ecological fruits
- Support of integrated production and other ecological methods of production
- Decreasing the intervention
- Strengthening the producer organisation

Actually, the funds are used for

- Irrigation
- Greenhouses
- Machines
- Trees
- Protection of the environment
- Investments in packing systems
- Control of quality
- ISO certification
- Nets for protection of hail
- Labour costs of the producer organisations
- Trucks with cooling opportunities
- Promotion
- Market research
- Pilot projects.

2.3.1 Good Agricultural Practice

Nowadays, the integrated production of fruits is almost the standard of the fruit production (Treyer, 11.04.2005, oral statement). The integrated production became more popular in the 90ties, since consumers were more concerned about the use of pesticides and other chemical products in the cultivation, asking, thus, for “ecologically correct” fruits (Winter et al., 1992, p. 138). The aim of the integrated production is the conservation of the nature, especially the conservation of the fauna and flora of this area. The SAIO (Swiss Working Group of integrated fruits production) defined the integrated fruit productions as follows:
If the producer works integrated, his objective is to produce fruits of high quality by using ecologically adapted and economically accepted methods of production (Kellerhals et al. 1997, p.46). The minimum requirements the producer have to fulfil are:

- The production according to the requirements of the location
- The conservation of the biodiversity
- The physical balance of the tree
- The careful management of weeds
- The minimisation of pest e.g. and support of beneficial organisms
- The production of fruits of high quality
- The protection of the soil
- The use of other ecological measures (Kellerhals et al. 1997, p.46).

The system of integrated production is not rigidly fixed, since conditions of fruit production always changes. Every year, results of research as well as the experience of producers are used to improve the systems and guidelines of integrated production.
There is no common official definition of good agricultural practice and no official definition of integrated production valuable in all member states.

2.3.2 Environmental Measures according to the CMO

The measures defined by the CMO, which are related to environmental facts, are predominantly the support of producer organisations, of their funds and operational organisations. It is the obligation of the producer organisations to define environmental measures, such as the support of integrated production or ecological production in their operational program, if the producer organisation is supported by the EU. The following environmental measures are defined by the European Commission:

- integrated production
- ecological production
- energy management
- water management
- waste management
- conservation of biodiversity and landscape

Other environmental measures are:

- general environmental measures
- plant protection
- fertilisers and
- other measures (Commission of the European Communities, 2004, p. 24).

Further environmental measures are defined by the rural development programme (EU 1257/1999) of Baden-Württemberg (KULAP). Most of these measures are not specially defined for fruit producers but can also be used by them. These environmental measures of the rural development programme are presented in chapter 2.3.4.

2.3.3 Relevance of Environmental Measures according to the CMO

The classification of environmental measures granted by the European Commission is presented in chapter 2.3.2. The amount of grants given to the producer organisations and the producers in Germany for the implementation of environmental measures is presented in Table 5.

Table 5: Grants for Environmental Measures (€)

	2000	2001	2002
total expenditures for Operational Funds	27,482,306	30,971,159	38,719,761
integrated production	966,411	866,942	1,001,827
organic production	35,000	58,463	35,053
energy management	231,800	93,426	36,122
water management	286,951	322,103	366,207
waste management	279,898	11,292	1,833,843
biodiversity/landscape	1,400	27,360	5,000
general environmental measures	54,258	291,442	258,617
plant protection	667,664	933,638	1,080,297
fertilisers	55,012	47,970	41,742
others	2,828,529	2,271,926	4,605,549

Source: Commission of the European Communities, 2004, p. 24

The expenditures for the operational funds increased every year, from 2000 to 2001. Most of the money was spent yearly for environmental measures, which could not be defined (see table 4). In 2000, the second greatest amount of money was spent for the support of the integrated production, whilst in 2001, it was spent for plant protection and in 2002, for waste management. Subsequently, the levels of expenditures for different measures change every year.

The grants given to producer organisations or producers in Baden-Württemberg for the implementation of environmental measures could not be presented due to the lack of the relevant data.

2.3.4 The Rural Development Programme of Baden-Württemberg

In Baden-Württemberg the relevant programme according to the EU regulation 1257/1999 is called MEKA (Marktentlastungs- und Kulturlandschaftsausgleich). The aim of the programme is:

- the moderation the burden of the market,
- the use of environmental-friendly methods of producing,
- the preservation and protection of the cultural landscape and
- the improvement of the conditions for the existence of a sufficient number of farms.

The targets of the rural development programme MEKA according to the environmental measures are to influence the biotic and abiotic conditions of the environment. The soil conditions are improved by decreasing erosion, reduction of the loss of humus and the soil compaction. Some measures also help to support the soil fauna. The water resource (groundwater and surface water) is protected by the reduction of the amount of fertilizers and pesticides which reach the water. The measures of the rural development programme MEKA help to reduce the emissions of pollutants and pesticides. The measures of MEKA also play an important role on the conservation and enhancement of natural habitats and biodiversity (Ministry of Food and Rural Areas Baden-Württemberg, p. 148).
The rural development programme defines subsidies for environmentally friendly management of the farms, preservation or establishment of an extensive use of grassland, preservation of endangered animals, abandonment of chemical products, extensive and the use of environmental-friendly methods of farming. For producers which fulfil the relevant conditions grants are offered. Fruit producers can get grants for:

- the farming on grasslands with few trees (Streuobst) (10 points/ha),
- ecological production (60 points/ha)
- abandonment of chemical herbicides and the use of mechanical or pyrolytic control of weeds (5 points/ha)
- planting of grass (9 points/ha).

Since 2000, grants are also given for:

- the implementation of an environmental friendly management system (1 to 4 points/ha)
- the protection of useful animals. Therefore models are used for forecasting the optimum time of using pesticides. Also the use of pesticides which protect the useful animals are granted (9 points/ha)
- the documentation of ecological ways of production (10 points/farm)
- the abandonment of herbicides (17 points/ha)
- the use of biological and biological-technical measures to avoid the use of insecticides (10 points/ha).

Each point corresponds to 10 € of payment.
The farming on Streuobst orchards is granted, because these areas are of a high ecological value. The cultivation of these areas is only profitable farmers, if grants for are guaranteed.
The abandonment of chemicals leads to the improvement of the environment. This measure will help to keep the groundwater clean and to enhance biodiversity.
The planting of grass is supported, since the grasses absorb nitrate during the whole vegetation period, and therefore, lower amounts of nitrate reaches the groundwater. Erosion is also minimized if grasses persist during the whole year.
In 1997, 170 millions DM (about 87 millions €) were spent for the measures of the rural development programme (MEKA). In 1996, 65 000 ha of Streuobst orchards were subsidised,

being, consequently, 93 % of all these areas belonging to farmers subsidised. The grants were used in order to compensate the difficulty of farming in these areas and not for the replacement of trees.
The grants for ecological production in 1996 were not fully used by the farmers, which means that not enough farmers asked for this kind of grant. In 1999, 2 901 farms produced according to the regulations of ecological production. The total area used for organic production in 1999 covered 77 894 ha. In 2003, there were 3 101 organic farms. They cultivated 92 947 ha.
The grants for the abandonment of chemical herbicides in favour of mechanical or pyrolytic weed control were mostly used by farmers cultivating permanent crops in 1996. Agricultural farmers did not use this grant due to the loss in the harvest and the increase in efforts of work.
The grants for the plantation of grass were used by farmers for 170 000 ha in Baden-Württemberg in 1996. The number of farmers producing fruits could not be defined.
In 2007, a new period of the rural development programme will start.

3. ANSWER TO EVALUATION QUESTIONS

For the evaluation of the environmental effects through the market measures for fruit and vegetables (CR (EC) No 2200/96), 17 experts of public authorities, research centres and interbranch organisations were chosen and consulted (see the list in appendix).
The selection of qualified people was not easy, since the fruit cultivation has no significant area-wide relevance, playing an inferior role in the remaining agriculture practices in Germany.
The professionals were informed in advance per telephone, asked for their disposition to participate and in which period of time the interview could be done. The questionnaire was sent per email and the interview was done per telephone.
During the evaluation, nine from the chosen persons could not or did not have the time to give a competent statement about the subject. Because of this, these statements, as well as the persons were taken out the of inquiry. The major reasons given from these persons were the lack of knowledge about the market measures and their effects on the environment, and the insufficient time to search for expertly replies for the answers. Further experts were not named.

3.1 Vertical questions relating to the fruits CMO

3.1.1 Fruits - Theme 1: market measures

1+4(F1): What has been the environmental effect of the market measures (notably support for organisations of producers and their operational funds, intervention, destruction/biodegradation) for the following categories: a. citrus b. apples and pears c. peaches and nectarines? [a specific attention will be paid to the impact of the CMO promoting the grouping of supply]

1. Environmental impact of the CMO support to producers' organisations

Context

The CMO is orientated in the increase of quality, efficiency and the market needs. The CMO is not aiming at the intensification of production, measures for the protection of the environment or for the support of the market price.
However, indirect environmental effects can be derived from the CMO for fruits and vegetables, which was one of the first EU market organisations that supported the creation of organic product lines, the integrated production or further methods for the ecological production. According to Art. 15 Paragraph 4 of the council regulation (EG) No. 2200/96, the producer organisations' operational programmes have to maintain the measures in the production and commercialisation in order to improve the environmental conditions.
According to Article 25 CR (EC) No. 2200/96 the producer organisations have to use environmental oriented procedures and elaborate general conditions concerning the intervention methods related to the environment.

Practices evolution

In Germany the production has to follow the good agricultural practices, which is controlled by the Laenders' regional agricultural agencies. Due to the small farm structure, some fruit producers are not able to invest in new technologies. The grouping of producers in PO make this investment profitable. Further measures of the operational programmes for relieving the environment are listed below:

- Support of ecological technologies in the production, processing and transport
- Support of special varieties (with resistance to pests etc.)
- Promotion of consultation to the integrated production

In addition, the experts in Baden-Württemberg account that producer organisations offer consultation about the integrated production, the optimal use of pesticides and fertilisers, the production of fruits with high quality and develop forecast models for the use of pesticides and the improvement of the packaging of products (Center of Competence of the Fruit Production in the Lake of Konstanz-Region, written information; Producer Organisation, oral information).

Implementation

The introduction of the CMO in 1996 did not cause an increase of the POs due to the long tradition of the mergers of the fruit producers. For instance, before the implementation of the council regulation (EU) 2200/96, about 60% of the fruit producers from Baden-Württemberg were members in a producer organisation. The association occurred mainly in the areas, where the direct commercialisation of products was not possible. The trend of association into POs is already performed in Germany, according to the experts.
However, the CMO affected the number of POs in the Laender. The POs had to join forces through the guidelines for promotion in the executive order given by the CMO (e.g. minimum quantity, number of members) in order to be able to use the support. Therefore, there are only one to two producer organisations nowadays in the most important fruit cultivation areas in Germany (two POs in Baden-Württemberg and Niedersachsen, one PO in Rheinland and Niederelbe).

Effects on the environment

Regarding the environmental effects, it is necessary to analyse

- the implementation of the market measures among the POs and
- the reasons and consequences of the intensification in the last years.

The high standards of German laws for protecting the environment have to be taken into account.

Part of CMO

According to the experts on national level, there is no directly measurable environmental effect of the market measures.

Seven of nine interviewed experts pointed out an increase of positive environmental effects through supporting measures in the apple production techniques. They refer to the good agricultural practices and the advantages implicated in the grouping of producers in producer groups (see Practices evolution above).
Furthermore, the national experts indicated possible negative environmental effects through the supporting measures and the market standards, as for example the need of storehouses or transport vehicles with controlled environment conditions due to the high market standards (appearance and size of apples), causing thus, high energy costs.
Moreover, the use of irrigation equipment for the improvement of quality can cause negative environmental effects (water consumption, creation of microclimate, etc). One expert cited the intervention measures as having negative effects on the environment, such as the high energy costs for the destruction of products.
In general, the support of producer organisations was estimated as being positive. The producers market position is strengthened by the grouping of products, as well as the offering of products of high quality to the consumers. The POs can fulfil the necessities of the food retail due to their quantity supplied. Because of this, the POs have better basis for negotiation with the food retail which plays a central role on the commercialisation of fruits in Germany.

The regional experts defined the impacts of the intervention on the environment as neutral or negative. The use of energy (Center of Competence of the Fruit Production in the Lake of Konstanz-Region, written information) and the use of the overproduced products as cheap additions to e.g. juice of fruits from Streuobst-orchards. So the quality of these products decreased (Nature Conservation Organisation, written information).
The CMO does not cause an intensification of fruit production according to the regional experts. The intensification in the last years (e.g. increasing the density of trees and improving the operational procedures) would have occurred anyway (Center of Competence of the Fruit

Production in the Lake of Konstanz-Region, oral information). In addition, it has no impact on the environment because the farmers produce according to the guidelines of the good agricultural practice. Only the nets for the protection against hail can influence the appearance of the landscape (Center of Competence of the Fruit Production in the Lake of Konstanz-Region, oral information).

Conclusion

The CMO has no direct and measurable effect on the environment. The support of organic and integrated production is positive for the environment. The higher quality standards cause higher energy consumption, but this is principally not an effect of CMO as the quality standards of the food retail are much higher.
Considering the intensification of the production, the impact of the market measures on the environment are defined by the experts as being positive or neutral. The support of the operational programmes of the producer organisations has positive environmental impacts. The producer organisations nowadays are able to offer consultation for integrated production, the use of pesticides and fertilisers and to do some research e.g. developing models for the forecast of the optimal point of time for using pesticides and developing machines for optimal application of pesticides.

2. Environmental impact of the CMO promoting the grouping of supply

Context

Producer Organisations are the link between food retail, national and EC-legislation and the producers. Food retail purchases fruits from Producer Organisations, which are grouping the products of their members. The latter are generally bound to sell 65% of their production to a Producer Organisation.
Furthermore, POs offer technical, ecological and economical consultation to their members according to legal requirements.

Practices evolution

The production flow as well as the use of resources is optimised thanks to the POs' consulting and extension service. Furthermore, the production standards often exceed EU requirements for the environmental discharge. In addition, common large storehouses (in comparison to small ones), common packaging stations and transport processes also reduce the environmental impact. Indeed, it is important to emphasize that the multiple transport of fruits is often unnecessary, causing a clear environmental impact.

Implementation

Producer Organisations in Germany are grouping the supply and have fully implemented the CMO guidelines.

Effects on the environment

The grouping of supply could have multiple positive and negative environmental impacts.

Part of CMO

The grouping of offers through the POs shows indirect environmental effects.
The experts on national level indicated positive aspects. The POs' apple production is better adapted to the necessities of the market. Since less apples are produced that are not in accordance with market standards, less apples go bad.
In addition, the association to POs is protecting resources according to the experts (see Practices evolution above).
According to the opinion of the regional experts the CMO promoting the grouping of supply via the support of producer organisations and their operational funds does not have a direct impact on the environment The experts mentioned that a production of fruits according to the demand reduces transaction costs (Center of Competence of the Fruit Production in the Lake of Konstanz-Region, written information).

Conclusion

Both experts do not see direct environmental impacts through the grouping of supply. National experts state environmentally positive economies of scale that are reached by grouping. Regional experts only mention smaller transaction costs.

3(F1): What is the environmental impact of the requirements laid down in the market standards?

Context

The main quality instrument of the CMO of fresh fruits and vegetables is constituted by the market standards, which are applicable to a total of 40 products. These standards fix mainly the minimum criteria relative to calibre, colour, ripeness and labelling fruits and vegetables must fulfil to be marketed in the European Union.
The application of these standards must cause the elimination of those products whose quality is not satisfactory, it must also lead production to satisfy consumers demands and to facilitate commercial relations, thus contributing to improve production return.
However, the requirements of German food retail are often higher.

Practices Evolution

One expert indicated that the market standards of the EU for apples are partly very rigorous, mainly concerning the apple bruise rules, which are not practical. He refers to the series ISSN 1611-4159 with the title: "The effectiveness of standards for fruit, vegetable and food potatoes - an analysis on the basis control results in South Germany"[1]. The main results of the investigation showed that 100% of the articles of trade are controlled, however 60% of the bruise articles did not correspond to the standards from the EU. Since this is accepted by the food retail, a rectification of the market standards is suggested.

Implementation

The market standards are completely implemented and controlled by the Laender (100%). Moreover, the EU market standards are lower than the requirements of the food retail.

Effects on the environment

The application of the market standards can have an impact on the environment. In particular, it has to be analysed, if the CMO leads to an intensification of production and which consequences appear.

Part of CMO

The experts' opinion on environmental effects of the market standards are presented in Table 6. None of the experts could identify a connection between the market standards and an intensification of the production. The market standards only define the appearance of the apples. There is nothing mentioned on the ingredients. As a consequence, no connection between the intensification of the production and the standards could be established. The production requirements are mostly provided by food retail as the main purchaser. They are focusing economical, not ecological aspects.

[1] Date of publication:1/2005;
Source: www.lfl.bayern.de/publikationen/datenerfassung/schriftenreihe_url_1_23.pdf

Table 6: Effects of the Standardisation of Apple

Effect of the standardisation on the:	None	Small	Moderate	big
- intensification of production	8	-	-	-
- reduction in the number of varieties	4	2	1	1
- increases in the number of treatments to eliminate defects	3	1	2	2
- impact of the production being withdrawn from the market	7	-	-	1
Number of answers (n) = 8				

The experts pointed out both positive and negative environmental aspects according to the number of varieties. The promotion of different varieties to the consumers leads to an offer of new apple varieties, which are of a higher value due to their resistance against fungi, contributing to the preservation of the environment because their cultivation needs fewer pesticides.
However, the market standards cause the loss of some varieties, which do not fulfil the uniformity criteria. This leads to a reduction of the variety spectrum. These monocultures, with regard to variety, can negatively affect the environment through higher pest risk and, consequently, higher pesticide use. The food retail usually wants only six to eight different varieties, limiting, therefore, the diversity of the production.
Almost half of the interviewed experts could point out a connection between the market standards and the measures for the reduction of apple bruises. Since the standards often refer to the appearance of the fruits, possibly the input of resources is increased in order to deliver homogeneous apple sizes without damaged spots. Besides, the market standards require storehouses with controlled environment conditions and an intensive sorting, causing high energy costs.

Seven out of eight experts could not indicate a relation between the market standards and the market withdrawal in Germany, since the latter have no relevance. Nevertheless, the requirements of the market standards for the appearance of apples are very high and in order to fulfil these requirements, the intensity of the production and treatment have to be increased.
Apples, that do not meet market requirements are usually used for juice production.

According to the opinion of most of the regional experts, the requirements laid down in the market measures do not have an impact on the environment. The requirements of the market standards are completely fulfilled in Germany because the purchasers (food retailing, wholesale) have higher requirements on the fruits than the market standards.
Additionally, the experts do not think that the definition of market standards has an influence on the intensification of production, on the reduction of the variety, on the measures for the quality improvement and on the intervention. Although the requirements of the market standards do not have an impact on these indicators, some of them are negatively influenced by the requirements of the purchasers.

Conclusion

According to the experts, there is no connection between the CMO-market standards and an intensification of production. A reduction in the number of varieties is seen inconsistently with positive and negative effects on the environment and the biodiversity. The efforts to eliminate defects on fruits cause a higher energy consumption in many cases. In return, the number of removed fruits to meet retail standards is high. This might be a cause for the irrelevance of withdrawals in Germany.
The experts in Baden-Württemberg also do not think that the requirements of the market standards have any impact on the environment, since the requirements defined by the German purchasers are higher than the requirements of the market standards. Therefore, the requirements of the purchasers have impacts on the environment. One expert also cited that the requirements of the market standards can be evaluated as being a reason for the loss of varieties and the problem of commercialising fruits from organic or nature-orientated orchards.

3.1.2 Fruits - Theme 2: environmental measures

1(F2): What are the overall environmental impacts of the environmental cross-compliance provisions – on cultivation practices and waste management, for which the framework was specified by the Member States - in the CMO [Council Regulation 2200/96]?

Context

The good agricultural practice is described by the experts as working according to the national legal requirements. All experts indicated that the fruit producers cultivate their orchards following the guidelines of integrated production. The requirement of the producer organisation is usually the integrated production (Center of Competence of the Fruit Production in the Lake of Konstanz-Region, written information, oral information) and the requirements of the product purchasers (Ministry of Food and Rural Development, oral information).

In Germany, all recognised POs have to create a specification sheet for general conditions of the production and withdrawal methods which respect the environment, according to the implementation of the CMO 2200/96 in national law (Article 16 of the council regulation EU 2200/96). Each PO has to create two specification sheets for the conditions of the production and withdrawal methods, that specify the details about the promoted ecological measures. The promoted measures have to be documented.
The first specification sheet includes the methods concerning the environment. In particular, it contains the environmental measures that can be promoted in the OPs according to Article 15, Paragraph 4 Letter b of the council regulation (EU) 2200/96. They are firstly related to the use of ecological techniques in both methods of cultivation and the processing and packaging of fruit products. Thereby, only measures are supported that exceed both the national and the state laws.
The state legislative provisions result from the following legal requirements:

- Bundes-Naturschutzgesetz (Federal Law of Environmental Protection)(12. March 1987)
- Bundes-Bodenschutzgesetz (Federal Law of Soil Protection) (BBodSchG 17. March 1998)
- Wasserhaushaltsgesetz (Law of water supply (12. Nov. 1996)
- Pflanzenschutzgesetz (Law of Plant Protection) (14. May 1998)
- Düngemittelgesetz (Law of fertilisers) (15. Nov. 1977)
- Kreislaufwirtschafts- und Abfallgesetz (Law of Recycling Management and Waste) (27. Sept. 1994)

The principles of the good agricultural practices (GAP) are closely determined according to the:

- Düngeverordnung (Regulation of Fertilisers) (26. Jan. 1996)
- Bekanntmachung der Grundsätze der GFP im Pflanzenschutz (Declaration of the Principles of the GAP in Plant Protection) (30. Sept. 1998)
- Bekanntmachung der Grundsätze und Handlungsempfehlungen zur GFP der landwirtschaftlichen Bodennutzung nach § 17 BBodSchG (Declaration of the Principles of Trade Recommendation for the GAP of agricultural soil use, according to the § 17 BBodSchG) (17. March 1998)

The last point includes that the fertilisers can only be used according to the plant needs. The removed nutriment-quantity is determined by obligatory periodical soil analysis. Furthermore, fertilisers and pesticides are spread in a way, that the drift angle and the entry in the ground water is reduced to minima.

Controlled integrated production of fruits and the organic fruit producers are supported by the promotion of the OP.
Further measures concerning the environment relief are supported:

- Consultation
- Further training

- Promotion of strategies, e.g. methods involving the reduction of environmental impacts
- Acquisition of better technical installation
- Control concept for the implementation of measures
- Accomplishment of studies and test programs
- Horticultural methods
- Harvest methods
- Methods of preparation
- Methods of storing
- Marketing
- Packaging, e.g. one-way and returnable systems (double-System)
- Waste management
- Other measures, e.g. conception of biotope and buffer areas, or promotion of biological diversity

Practices evolution

In Germany, mainly the integrated production is supported in the great spectrum of measures. The measures concerning the reduction of environmental impact are:

- Use of biological methods for plant protection (use of pheromone)
- Forecast for estimation for the application of pesticides (early warning system)
- Permission of specific pesticides
- Exclusion of specific fertilisers
- Fertilisation only when necessary

These measures are offered and promoted for almost all producer organisations, bringing effective reductions to environmental impacts, such as high water quality (even drinking water quality) in watercourses in the cultivation areas.
There is no recognised ecological PO because they do not reach the production limit for the recognition.
Because of this, each of the Laender offers environmental programmes, which promote on the one hand the organic agriculture and complete, on the other hand, the environmental measures of the operational programmes. A double support is not possible in Germany. Moreover, these programmes are co-financed by the European Agricultural Guidance and Guarantee Fund for the rural development according to the council regulation (EC) No. 1257/99. Some Laenders' programmes are listed below with the description and contents. The documents are in German, a translation was not possible within this survey.

- Baden-Württemberg with Marktentlastungs- und Kulturausgleichsprogramm (Meka)
  http://www.landwirtschaft-mlr.baden-wuerttemberg.de/servlet/PB/-s/...;
  http://www.mlr.baden-wuerttemberg.de/cgi/styleguide/content.pl?ARTIKEL_ID=11450
- Rheinland-Pfalz with Förderung umweltgerechter Landbewirtschaftung (FUL)
  http://www.pflanzenbau.rlp.de/internet/global/themen.nsf/0/...
- Bavaria with Kulturlandschaftsprogramm (Kulap)
  http://www.stmlf.bayern.de/agrarpolitik/programme/foerderwegweiser/11028/
  http://www.stmlf.bayern.de/.../programme/foerderwegweiser/11028/linkurl_1_0_0_13.pdf
  http://www.stmlf.bayern.de/.../programme/foerderwegweiser/11028/linkurl_1_0_0_14.pdf
  http://www.stmlf.bayern.de/.../programme/foerderwegweiser/11028/linkurl_1_0_0_15.pdf
- Niedersachsen with Niedersächsisches Agrarumweltprogramm (NAU)

According to the second specification sheet on the general conditions of the withdrawal methods concerning the environment, the POs are committed (Article 23 and 25 of the council regulation EU 2200/96) to specify determinations for the products taken out of the market that show no prejudicial effects to the environment (water and landscape). The conditions are specified by the Laender. They rule the controls and the determination for the use and disposal of biowaste according to the law of fertilisers, the good agricultural practices, the composting and the disposal of packaging.

Implementation

The GAP is completely implemented in Germany. It serves as a standard in most cases.

Effects on the environment

It is necessary to analyse the potential effects of environmental measures of Operational Programs and their legal framework, specially those related to waste management.

Part of CMO

Although there is no remarkable amplitude of market withdrawal in Germany, the legal requirements are aiming at an effective environmental relief.

The environmental measures in the OP and the structural programmes of the Laender partly exceed the high requirements of the good agricultural practices in Germany. In this way, the utmost environmental relief is reached and ensured by controls.
Besides, the foot retail demands in most cases the standards of good agricultural practices or integrated production.

It is important to know, that, in Germany, most POs concern fruit **and** vegetable. The vegetables are, in most cases, the by far more important product. Therefore the POs and their operational programmes are concentrated on vegetables (and not on fruit production).

At regional level the experts agreed with the statements of the national experts. Environmental measures for the production of fruits are the integrated production, the organic production and the environmentally friendly intervention (Ministry of Food and Rural Development, oral information). The producer organisations have to define requirement specifications about the environmental measures of the operational programme and the intervention (Ministry of Food and Rural Development, oral information). The measures are effective because consultation is supported and forecast systems are implemented.
Environmental measures of waste management are also defined within the requirement specifications, e.g. the use of environmentally friendly packaging material and the implementation of returnable systems, which were evaluated as being effective.

Conclusion

The producer organisations have to define the environmental measures according to the production of fruits and the waste management. These measures are e.g. the integrated production, the ecological production, the use of environmentally friendly packaging materials, and the implementation of reusable systems. These measures were evaluated as being effective and having a positive impact on the environment.
A number of German national laws regulate agricultural practices. In many cases they exceed environmental cross-compliance. Therefore the CMO did not start a change.

2(F2) : Which kind of environmental measures [integrated production, organic production, plant production, fertilisers, energy management, water management, soil management, biodiversity/landscape and environmental management] paid by the operational fund for the producers organisations has turned out to be effective in terms of positive environmental impacts?

Context

Operational Programmes include several environmental measures. They must contribute to the legal framework described above.

Practices Evolution

The GAP have been used long before the implementation of CR EU 2200/96. Therefore practices did not change.

Implementation

German legal framework meets the requirements of the OPs. Furthermore, most fruit producers served the good agricultural practises for a long time as it is a kind of standard in Germany. Hence, there is no evolution of the implementation.

Effects on the environment

The question is aiming on the environmental measures that turned out to be effective in terms of positive environmental impacts. It has to be analysed which measure the experts attach most importance to.

Part of CMO

The experts on national level commented some measures supported by the POs' Operational Programmes according to their positive environmental effects (see Table 7).

Table 7: Evaluation of the of environmental measures

Positive environmental impacts	none	small	moderate	high
integrated production	-	-	2	6
organic farming	-	6	2	-
crop production	1	1	4	2
fertilisers	-	4	4	-
energy management	-	4	2	2
water management		6	2	-
soil management	2	2	3	1
biodiversity/landscape	2	2	4	-
Number of answers (n) = 8				

According to the experts, the integrated production has a distinct positive effect on the reduction of environmental impact.
Most of the organic producers practise direct selling (farmers' market, farm gate). Consequently, they are not a member in a PO, because of the obligation to sell more than 65% of the production through the PO. Therefore, the support of organic farming by the OP has only a limited positive effect on the environmental relief.
The further points were evaluated from small to medium with some exceptions. The experts indicated that these points are regulated by the principles of the good agricultural practices and their rules. Other measures are part of the integrated production. As a consequence the experts evaluation was difficult.

The experts of Baden-Württemberg evaluated the environmental measures paid by the operational fund for the producer organisations as following:
a) integrated production:
The integrated production is evaluated as being effective by three experts (Ministry of Food and Rural Development, oral information; Center of Competence of the Fruit Production in the Lake of

Konstanz-Region, written information; Producer Organisation, oral information). The producers have to document their way of production, which always develops in a more ecological production (Center of Competence of the Fruit Production in the Lake of Konstanz-Region, written information). The guidelines of the integrated production are communicated to the producers by consultation and controls. The labour costs of the producer organisations for the offer of consultation and the research are paid by the CMO (Producer Organisation, oral information). The producers are almost forced to produce according to the guidelines of the integrated production (Producer Organisation, oral information).
One expert indicated that the integrated production is not effective in providing positive environmental impacts and thus, the focus of the support should be on the ecological production (Nature Conservation Organisation, written information).
b) ecological production:
The ecological production is evaluated by one expert as being positive according to environmental impacts (Nature Conservation Organisation, written information). An expert stated that the ecological production has both positive and negative impacts (Ministry of Food and Rural Development, oral information), whilst another expert defined it as having negative effects, due to the higher use of energy, less harvested products, and the use of substances that are dangerous to the environment as plant-extract - pesticides (Centre of Competence of the Fruit Production in the Lake of Konstanz-Region, written information). One expert could not answer this question because no ecological fruits are produced by producers of the PO (Producer Organisation, oral information). Therefore, ecological production could be defined as ambivalent in its impacts on the environment.
c) plant production:
Since the producer organisations offer consultation for the chose of resistant varieties and the use of pesticides , one expert evaluated the plant production as effective. The labour costs of the producer organisations for these services are paid by the CMO (Producer Organisation, oral information). One expert considered the plant production as ambivalent (Nature Conservation Organisation, written information), whilst another expert estimated it as quite effective in relation to the improvement of the situation of the environment (Ministry of Food and Rural Development, oral information).
d) use of fertilisers:
Three experts evaluated the measures for the use of fertilisers as having positive impacts on the environment (Ministry of Food and Rural Development, oral information; Producer Organisation, oral information, Nature Conservation Organisation, written information). The producer organisations give advices for the use of fertilisers e.g. according to the minimum concentration of nitrogen in the soil of an orchard and the age of trees (Producer Organisation, oral information). The costs of these services are paid by the CMO.
e) use of energy:
The environmental measures about the use of energy were broadly estimated by two experts as being slightly effective (Ministry of Food and Rural Development, oral information; Conservation Organisation, written information).
f) use of water:
The use of water was as well considered to be slightly effective by two experts (Ministry of Food and Rural Development, oral information; Conservation Organisation, written information). The other experts mentioned that measures for the use of water are not relevant in Germany because the use of water is regulated by the administrative law (Center of Competence of the Fruit Production in the Lake of Konstanz-Region, written information) and because irrigation is not subsidised by the producer organisations (Producer Organisation, oral information).
g) land use:
The environmental measures for the land use are not relevant in Germany according to the statements of two experts (Center of Competence of the Fruit Production in the Lake of Konstanz-Region, written information; Producer Organisation, oral information), whilst the other experts estimated it as being quite effective.
h) landscape and environmental management:
The environmental measures for the land use are not relevant in Germany according to the statements of two experts (Center of Competence of the Fruit Production in the Lake of Konstanz-

Region, written information; Producer Organisation, oral information). whilst the other experts estimated it as being quite effective.

Conclusion

As integrated production is very common, experts attach most importance to it. The most effective is the combination of the different measures.

3.1.3 Fruits - Theme 3: structural measures

1(F3): What is the environmental impact of structural measures e.g. support for investment in irrigation?

Context

In Germany investments in irrigation are not (always) subsidised by producer organisations (Producer Organisation, oral information). Even the use of irrigation systems is not very common in Germany (Center of Competence of the Fruit Production in the Lake of Konstanz-Region, oral information).

Practices evolution

As mentioned above, standards imposed by the German food retail are much higher than the market standards fixed in the CR 2200/96. Retailers standards often include, as well, regulations how fruit (apples, pears) production should be done and which treatments are allowed or not. According to experts, the terms of CR 2200/96 are completely fulfilled by retail requirements. Therefore experts do agree that the retails standards have more influence on the environmental impact of fruit production than the European market regulations. The food retailers standards are negotiated with POs or with producers themselves. The regulations vary from retail chain to retail chain.

Implementation

Irrigation has nearly no importance in Germany's fruit production. Other structural measures are more important.

Effects on the environment

Irrigation is an important intervention into water household and has positive and negative consequences at the same time.

Part of CMO

Although irrigation has no importance, the experts tried to evaluate the market measures in the CR 2200/96 and in the CR 1432/03 and 1433/03. The structural measures were differently viewed by the experts, half of the experts see positive environmental effects of the support in irrigation, for example:

- With the focused use of water after a measure of plant protection less substances are needed, bringing less contamination of soil and water
- The prevention of damages caused by drought or frost
- The decrease in water consumption by the use of new irrigation techniques

However, irrigation also has negative environmental effects, such as:

- More intensive production
- Change of the soil fauna and flora in the orchards, as well as the in surrounding environment
- High water consumption
- Use of energy for the irrigation

Indeed, irrigation had a secondary role in Germany until now. It is therefore difficult to point out the environmental effects.

The structural measures, such as the offer of advices about the use of herbicides and pesticides have more positive impacts on the environment than the support of irrigation systems according to the experts.
Further environmental effects caused by the structural measures supported by the POs are not known. The grants for protection nets against hail have no influence on the environment, but on its appearance. Since the region of the Lake of Konstanz is a touristic region, the producers need an authorisation for using those nets.

The structural measures are co-financed by the Laender programmes (FUL, Meka, NAU, Kulap, etc), according to the CR (EC) No. 1257/99 and have positive environmental effects.
Important elements for the support are:

- the conservation of the landscape and biodiversity,
- protection of abiotic resources (water, air, soil)
- the extensification of the production,
- the organic production.

Conclusion

According to the experts, environmental effects caused by structural measures supported by the POs are not known. Irrigation used to have a small role in Germany, so that experts could not give a statement on the specific environmental effects. However, the experts think, that the positive effects of irrigation outweigh the negative ones.

2(F3): What are the environmental impacts, in particular in terms of soil, water and biodiversity of the grubbing-up grants for apple trees?

Context

Grubbing-up grants are offered to faster adapt the production to market needs and to take orchards out of the production.

Practices evolution

From 1989 until 1998 there were such subsidies, involving about 100 producers with a total area of orchards of 500 - 600 ha (less than 1% of the total cultivation area). The desired effect was not reached, because the grubbed up orchards presented a low yield and/or were unfavourable for cultivating and anyway would have been taken out of production in the course of time. Helping farmers to make this decision earlier, the grubbing-up grants were a windfall gain.

Implementation

Grubbing-up grants have a marginal importance in German apple cultivation.

Effects on the environment

Possible environmental impacts are the loss of soil, the entering of nutriments into waters, a reduction of biodiversity and the change of cultivated landscape.

Part of CMO

By the national experts, the grubbing-up grants are not considered to be useful because the clearings damage the ecosystem (fruit orchards – mostly Streuobst orchards), causing a change in the landscape and the biodiversity. The cleared areas are integrated in another land use, often with a more intensive cultivation.

According to the German case study, grants for clearings do not have an impact on the environment (Ministry of Food and Rural Development, oral information; Center of Competence of the Fruit Production in the Lake of Konstanz-Region, written information). The clearings take place anyway if they are economical necessary. The cleared orchards are used again as orchards, presenting no change in the land use (Ministry of Food and Rural Development, oral information).

Conclusion

Experts on the national level do not attach importance to grubbing-up grants. However, they can have an negative impact on biodiversity and the appearance of landscape.
According to the opinion of the regional experts the clearings do not have an impact on the environment because the areas are used as orchards again. Clearings will take place anyway if they are economical useful. The clearing should be regulated by the market and not by the offer of subsidies.

3.1.4 Fruits - Theme 4: nuts

Nuts production has no importance in Germany.

3.1.5 Fruits - Theme 5: co-ordination with agri-environmental measures

1(F5): Has the co-ordination between environmental measures in the CMO and the agri-environmental measures been adequate to produce optimal environmental impacts?

Context

The CMO and agri-environmental measures should complement one another in order to conserve the cultural landscape and minimize environmental impacts.

Practices evolution

No Practices evolution.

Implementation

The implementation of the support of agri-environmental measures is the Laenders' responsibility (see Chapter 1: BW with Meka; RLP with FUL; NS with NAU; BY with Kulap). There is a high coherence between the programmes, excluding a double support for environmental measures. The programmes are elaborated in a way that the measures complete each other. For instance, the Operational Programmes promote special varieties and, partly, integrated fruit production. The Laenders' programmes support further cultivation measures conserving the cultivated landscape that are not covered by the operational fund of the producer organisations.

Effects on the environment

On an insufficient co-ordination of both programmes, effects on the environment would be far reaching.

Part of CMO

All national experts pointed out that the co-ordination between environmental measures in the CMO and the agri-environmental measures is adequate in order to produce optimal environmental impacts in Germany.
The current measures are strictly controlled in Germany, being a double support not possible. The control is performed by the Laender and randomly by the European Union. There is a great bureaucratic cost caused by the independent controls of the supporting measures in the OP and the Laenders' programmes according to one expert, resulting in unnecessary higher costs. Therefore, a better control co-ordination is required.
Contrarily, most of the regional experts think that the co-ordination between the environmental measures in the CMO and the agro-environmental measures of the rural development programme could be improved in order to produce optimal environmental impacts (Center of Competence of the Fruit Production in the Lake of Konstanz-Region, written information; Producer Organisation, oral information ; Nature Conservation Organisation, written information), although one expert had an opposite opinion. (Ministry of Food and Rural Development, oral information). One expert mentioned that the programmes are not well coordinated because farmers are tested two times (Producer Organisation, oral information). No expert stated that farmers received subsidies two times for the same measure.
The following agri-environmental measures can be granted:

- the farming on grasslands with few trees (Streuobst)

- ecological production
- abandonment of chemical herbicides and the use of mechanical or thermical control of weeds
- planting of grass
- the implementation of an environmental friendly management system
- the protection of useful animals. Therefore models are used for forecasting the optimum time of using pesticides. Also the use of pesticides which protect the useful animals are granted
- the documentation of ecological ways of production
- the abandonment of herbicides
- the use of biological and biological-technical measures to avoid the use of insecticides

Conclusion

Unanimously the national experts attest a good co-ordination between the CMO and the Laenders' agri-environmental measures. Some regional experts stated that the co-ordination between the environmental measures in the CMO and the agro-environmental measures of the rural development programme could be improved in order to produce optimal environmental impacts.
The contradiction is related to the fact, that, from an experts (more "holistic") point of view, the agri-environmental measures (RDR) and the environmental measures according to the OPs (CMO) are well-co-ordinated, as they are carefully avoiding double-support. From a producers point of view, OPs grant subsidies, whereas agri-environmental measures imply restrictions and complicated regulations on double support. So it might seem ill-co-ordinated to a producer.

3.2 Horizontal questions

3.2.1 Horizontal - Theme 1: land use over time

1(H1): Does the CMO lead to substantial changes in land use over time (abandonment, expansion and set-aside) and if so: what are the positive and negative environmental impacts?

Context

CMO measures may lead to changes in land use related to abandonment, expansion and set-aside of fruit orchards. Changes in land use can have both positive and negative effects on the environment. This question tries to determine which type of cultures have substituted or have been substituted fruit orchards.

Implementation

The situation of the orchards is stable in the last years.

Effects on the environment

The aim of this question is to determine if CMO measures have promoted significant changes in land use over time either abandonment or expansion. It is necessary to establish if any positive or negative environmental impacts have been involved by these possible changes.

Part of CMO

The situation of the orchards is stable in the last years. Only a small amount of orchards have been converted to fallow ground, grassland and other crops or were partially abandoned.
The CMO does not lead to substantial changes in the land use over the time or to the increase or decrease of total area of fruit cultivation according to the opinion of all interviewed experts, because no clearings are subsidised and changes in the land use take only place due to economical needs.
Only the areas of Streuobst decreased in the last years (Nature Conservation Organisation, written information), being used then, as grasslands (Ministry of Food and Rural Development, oral information). Cleared orchards are seldom used as grassland and for the production of crops (Ministry of Food and Rural Development, oral information).

The loss of Streuobst orchards causes a change in the landscape and a loss of species (Ministry of Food and Rural Development, oral information). In addition, the production of fruits in relation to the soil protection and wilderness of an acreage have negative impacts on the environment (Nature Conservation Organisation, written information ; Center of Competence of the Fruit Production in the Lake of Konstanz-Region, written information). Moreover, not the set-aside but the maintaining and the expansion of intensive fruit production causes substantial negative impacts on the environment (Nature Conservation Organisation, written information; Center of Competence of the Fruit Production in the Lake of Konstanz-Region, written information; Ministry of Food and Rural Development, oral information).

Conclusion

The CMO does not lead to substantial changes in the use of land over the time according to the experts. The set-aside of orchards does not have negative impacts on the environment, whilst the negative impacts on the environment are caused by the expansion of orchards.

3.2.2 Horizontal - Theme 2: adequate spending level and method

1(H2) : Are there indications that a change in total spending on the CMO in its present form would have a substantial positive or negative environmental impact? [This question should preferably address the claim of the literature that CMOs for permanent crops differ with respect to their overall environmental impact.]

Context

In this question, we need to find out whether some changes in the distribution of expenditures within the total budget for this CMO would help to reduce the negative environmental effects or to improve the positive ones.

Implementation

Not implemented.

Effects on the environment

Not known yet.

Part of CMO

Two regional experts think that the environmental aspects are sufficiently considered in the CMOs (Ministry of Food and Rural Development, oral information; Centre of Competence of the Fruit Production in the Lake of Konstanz-Region, written information), whilst one expert indicated that a change in the CMO would have substantial positive environmental impacts (Nature Conservation Organisation, written information). Therefore, one expert mentioned that no changes in the CMO are necessary (Ministry of Food and Rural Development, oral information).

The national experts did not point out any negative consequences. The contents of the CMO in the council regulation (EC) NR. 2200/96 for fruits and vegetables (Article 14 and 15, Paragraph 4) were evaluated as positive concerning the protection of the environment. However, some recommendations were proposed in order to improve the environmental relief, according

- the intervention measures,
- the harmonisation of GAP,
- the support of packaging, and
- the height of grants to the OPs.

The interventions, such as the market withdrawal, present environmental impacts. Thus, it might be more useful to invest these subsidies in the promotion of an ecologically friendlier production. These resources should be used in the operational fund for the environmental measures. The rate of promotion should be higher than 4,1% in order to develop and apply further environmental relief techniques.

In addition, a common European definition for the good agricultural practices, the integrated and organic cultivation is urgently required. These common European framework in the production should create a more equitable competition and a reduction of the environmental impacts.

The framework for the operational programmes used to consider the necessities of the producer organisations. Nevertheless, a more generous handling is possible, in order to consider the specific, regional necessities.

The support of the packaging (e.g. one-way, returnable systems) are not considered to be useful, since the food retail demands these systems and the legal framework on packaging standards is satisfying. According to the experts, it is more useful to use this grants for the production with low environmental impacts and preservation of resources.

There are about 3000 ha of apple orchards in Bavaria, of which are 150 ha dessert apples. The other 2850 ha are Streuobst orchards used for fruit juice production. Because of the increasing competition it makes sense to support these cultivation areas, in order to preserve the characteristic landscape, the cultural possessions, and the biodiversity.

The total expenses for environmental measures in Germany on OPs in 2000 and 2002 are shown in Table 8.

Table 8: Expenses for the Operational Programmes (1000 €)

	2000	**2002**
integrated farming	966	998
biological farming	35	182
energy management	232	173
water management	287	217
waste management	280	1676
biodiversity	1	22
In total	1801	3268

Source: BMVEL-Agrarbericht 2004

Conclusion

The experts are not aware of any indications that a change in total spending would have substantial environmental impacts. Instead, they have some suggestions how to reform the CMO for more efficiency and positive environmental effects.

2(H2): Are there indications that decoupling of spending at its present level would have a substantial positive or negative environmental impact?

Context

The CMO of fruit and vegetables establishes aids to PO according to a percentage (4.1%) of the marketed production value, so they are linked to production. The aim of this question is to determine which other means could be possible to pay the aid to fruit and vegetable PO and which could be their environmental effects.

Implementation

Not implemented.

Effects on the environment

Not known yet.

Part of CMO

The grants of the financial aid proved to be useful since the introduction of the market measures. To give grants in relation to the turnover is a very useful instrument in order to support small POs. In that way, those POs are supported which produce high quality fruits and simultaneously have

high environmental measures. Therefore there are no indications for any decoupling, pointed out the experts.
On regional level the spending at its present level is favoured as well. A decoupling should not occur (Ministry of Food and Rural Development, oral information; Centre of Competence of the Fruit Production in the Lake of Konstanz-Region, oral information).
The decoupling of spending could bring negative impacts on the landscape because extensive used orchards will be set aside and fruits will only be produced on fruitful acreages (Centre of Competence of the Fruit Production in the Lake of Konstanz-Region, oral information).

Conclusion

The spending at its present time is useful and should not be changed according to the opinion of the experts.

3.2.3 Horizontal - Theme 3: subsidiarity of agri-environmental schemes and horizontal measures

1(H3): Have the agri-environmental schemes and any environmental requirement ["cross-compliance" ex CE 1259/1999] related to these CMOs been sufficiently targeted by Member States and regions at hotspots of environmental degradation or possibilities for environmentally friendly production?

Context

The rural development programme of Baden-Württemberg (MEKA) includes measures for the environmentally friendly cultivation of permanent crops. The requirements of these measures defined in the rural development programme were presented in chapter 2.3.4. There is also a programme for the regional production in Baden-Württemberg (QSBW), defining the abandonment of special pesticides (Producer Organisation, oral information).

Implementation

Due to the high legal requirements and the cultivation according to the good agricultural practices there are no hotspots of environmental degradation.

Part of CMO

The rural development programme and the environmental measures of the producer organisations support the integrated production as well as the ecological production. There are two producer organisations in Baden-Württemberg for ecological producing farmers (Ministry of Food and Rural Development, written information; Producer Organisation, oral information). The standard of fruit production of other producer organisations is the integrated production.
According to the experts, the EU decision of June 26th 2003 does not affect the cross-compliance of fruit production (orchards) and is not applied to German orchards. Therefore the question could not be answered by the experts. They emphasised the support by the Rural Development Regulation (RDR), which also considers the environmental objectives of the Laender.

On implementing their environmental programmes (e.g. FUL, Meka, Kulap, NAU, and others), the Laender completely considered both the environmental objectives of Germany and of the European Union and partially exceeded them. The environmental programmes only support measures with environmental objectives that exceed the national standards. for example integrated, organic and extensive cultivation.

As a conclusion, the environmental programmes introduced measures to reduce the environmental impact in the Laender. The great participation of producers (more than 60%) in RLP and BW emphasises that these programmes are useful and target-orientated. The experts pointed out, that these programmes afford the willingness of producers as they are associated to higher labour input and/or profit cuts and therefore higher production costs.

Conclusion

Accounting environmental protection, the CMO is completed by RDR-programmes in Germany. In this way environmental requirements have been targeted sufficiently.

There are environmental measures focused on the cultivation of permanent crops in Baden-Württemberg. These programmes support the integrated production as well as the ecological production. If these indicators are used for the evaluation of their impact on the environment, one can conclude that the programmes are aimed at hotspots of environmental degradation or possibilities for environmentally friendly production.

4. LITERATURE RESEARCH FOR THE THEME: EVALUATION OF THE EFFECTS OF THE MARKET MEASURES RELATED TO PERMANENT CULTURE CROPS ON THE ENVIRONMENT

There is a lack of information about the environmental effects of the political market measures in Germany, especially related to permanent crops such as viticulture and fruit cultivation. On the other hand, the environmental effects of the measures of the structural politics obtain attention, according to their explicit position on the quality assurance of the preservation of the environment, nature, and animals. The national promotion measures through the community project: "Improvement of the agricultural structure and the coast protection", as well as the implementation of the council regulation "Support for rural development programme" (CR (EU) No 1257/99 and 1783/2003) offer numerous possibilities to include the permanent culture crops, as for example in the "Investments in agricultural plan", "Agro-environmental measures" or "Improvement of agricultural products processing and commercialisation (CR (EU) No 1257/99 Chapters I, VI and VII). The results of the environmental effects evaluation from these political instruments were mostly published in the internet homepage of the Agricultural Ministries of the Laender.
The influence of different producing processes of fruit cultivation and viticulture on the environmental resources was discussed in several studies. The publications of research institutes, as well as their scientific journals are listed below:

- http://www.fal.de/index.htm?page=/de/publikationen/default.htm
- http://www.zalf.de/home_zalf/service/service/bibliotheken/
- Mitteilungen des Obstbauversuchsringes des Alten Landes; ISSN 0178-2916;
- Fruit processing; ISSN 0939-4435;
- Obst und Garten (Germany, F.R.); ISSN 0029-7798;
- Obst und Weinbau (Schweiz); ISSN 1023-2958;
- Industrielle Obst- und Gemüseverwertung (Germany, F.R.); ISSN 0367-939X;
- Rheinische Monatsschrift für Gemüse, Obst und Zierpflanzen (Germany, F.R.).

APPENDICES

Annex 1: List of people met or contacted

Annex 2: Main bibliography identified (used or not) in relation with the study

Annex 3: Operational Funds Spending in Germany

Annex 4: Evaluation of the environmental impacts of the measures of the CMO for fruits

Annex 1: Experts contacted on fruit study

State Ministry and Laender Ministries (agriculture, environment):

	Ministries for Agriculture	Contacted person	Reply
1	Bundesministerium für Verbraucherschutz, Ernährung und Landwirtschaft (BMVEL) / Federal Ministry of consumer protection, food and agriculture	Dr. Bernd Mönning	Answer
2	Rheinland-Pfalz	Mr. Peter Hardt	Answer
3	Baden-Württemberg	Dr. Friedrich Klotz	Answer
4	Niedersachsen	Mr. Ulrich Einhoff Mr. Alexander Burgath	Answer
5	Sachsen	Mr. Axel Busek	Answer
6	Sachsen	Mr. Hohlfelder	Answer
7	Bayern	Mr. Wheeler	No answer (lack of time)

Research Institutes and Universities:

		Contacted person	Reply
8	Bayern: Bayerische Landesanstalt für Wein- und Gartenbau, Ausbildung.	Mr. Dr. Sutor	Answer
9	Versuchs und Beratungszentrum Hamburg	Dr. Matthias Görgens	Answer
10	Stiftung Kompetenzzentrum Obstbau Bodensee	Dr. Manfred Büchele	Answer
11	Fachhochschule Weihenstephan	Prof. Treutter	No answer (lack of knowlege)

Producer organisations, interbranches:

		Contacted person	Reply
12	Deutscher Bauernverband	Dr. Stallknecht	Answer
13	Erzeugerorganisation Bodensee	Mr. Hoffmeister	No answer (lack of knowlege)
14	Lehr- und Versuchsanstalt für Wein- und Obstbau	Dr. Rueß	No answer (lack of knowlege)
15	Fachgruppe Obstbau im Bundesausschuss Obst und Gemüse; Verbandsorgan des deutschen Obstbaues	Mr. Herbert Knuppen	No answer (lack of knowlege)
16	des NABU - Bundesfachausschuß Streuobst	Markus Rösler	Answer
17	Marktgemeinschaft Bodenseeobst	Mr. Egon Treyer	Answer

Annex 2: Bibliography

BMVEL 1993: Statistisches Jahrbuch über Ernährung, Landwirtschaft und Forsten 1993, Landwirtschaftsverlag GmbH Münster-Hiltrup,

BMVEL 1995: Statistisches Jahrbuch über Ernährung, Landwirtschaft und Forsten 1995, Landwirtschaftsverlag GmbH Münster-Hiltrup

BMVEL 1999: Statistisches Jahrbuch über Ernährung, Landwirtschaft und Forsten 1999, Landwirtschaftsverlag GmbH Münster-Hiltrup, ISBN 3-7843-3012-6

BMVEL 2003: Statistisches Jahrbuch über Ernährung, Landwirtschaft und Forsten 2003, Landwirtschaftsverlag GmbH Münster-Hiltrup, ISBN 3-7843-3336-2

BMVEL-Agrarbericht 2000: Agrarbericht der Bundesregierung 2000; MuK. Medien- und Kommunikations GmbH, 2000

BMVEL-Agrarbericht 2001: Agrarbericht der Bundesregierung 2001; MuK. Medien- und Kommunikations GmbH, 2001

BMVEL-Agrarbericht 2002: Agrarbericht der Bundesregierung 2002; MuK. Medien- und Kommunikations GmbH, 2002

BMVEL-Agrarbericht 2003: Agrarbericht der Bundesregierung 2003, MuK. Medien- und Kommunikations GmbH, 2003

BMVEL-Agrarbericht 2004: Agrarbericht der Bundesregierung 2004, MuK. Medien- und Kommunikations GmbH, 2004

Bayerisches Staatministerium für Landwirtschaft und Forsten, 2002: Bayerischer Agrarbericht 2002,

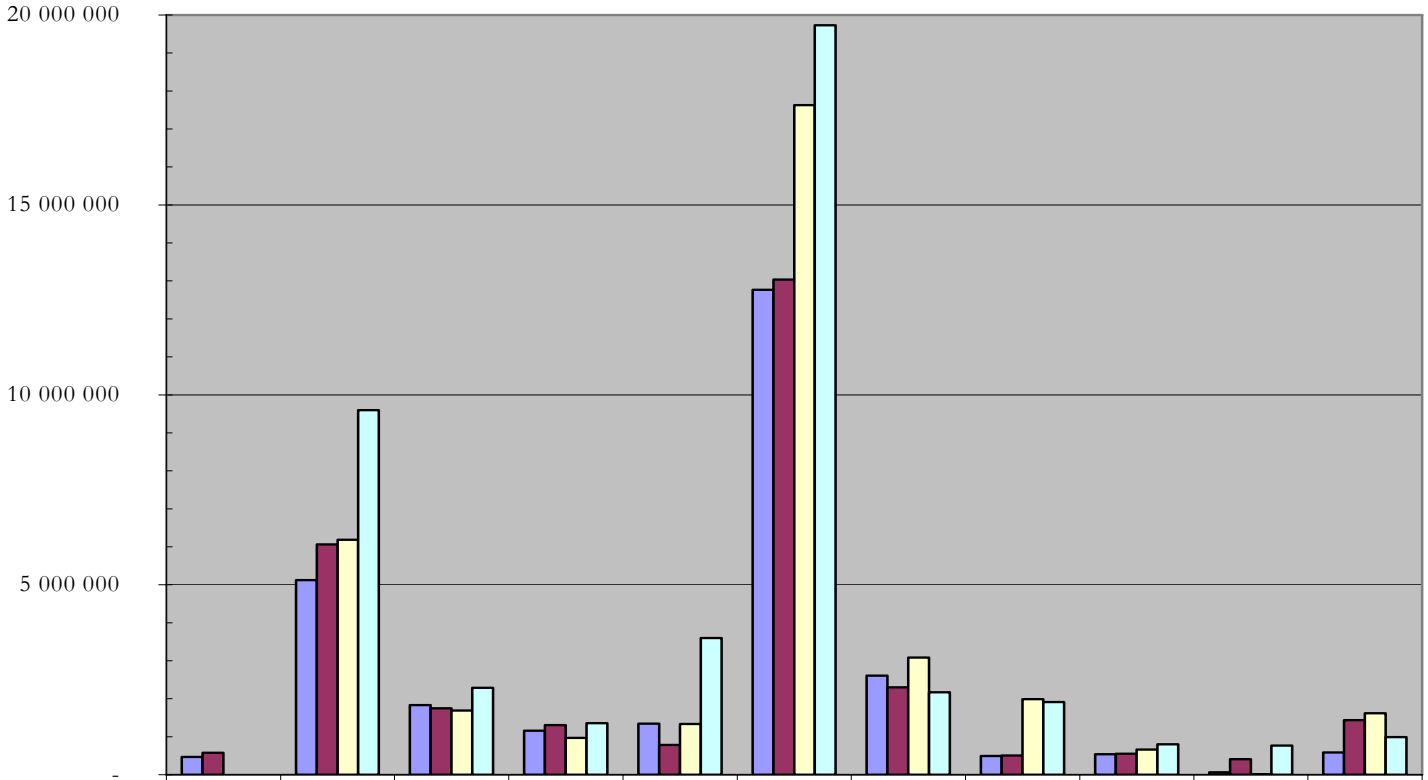
Council Regulations (EC) No. 2200/1996 of 28 October 1996 on the common organization of the market in fruit and vegetables; 1996; Official Journal of the European Communities

Council Regulations (EC) No. 1432/2003

Council Regulations (EC) No. 1433/2003

Annex 3: Operational Funds Spending in Germany

Figure 15: Operational Funds Spending in Germany (€)



	Specific measures for	Technical measures	Services, training, research	Special environmental	Quality and phytosanitary	Technical measures	Sales, promotion, outlets	special environmental	Overheads	Mergers and	Other
2000	469 045	5 121 565	1 830 310	1 159 262	1 341 856	12 768 536	2 610 551	493 170	538 788	59 265	580 277
2001	572 500	6 061 924	1 750 772	1 303 459	783 056	13 031 799	2 304 168	503 874	550 495	403 310	1 431 826
2002	0	6 185 724	1 684 927	969 128	1 332 321	17 629 147	3 087 314	1 989 129	657 019	4 134	1 617 790
2003	0	9 599 602	2 289 568	1 357 114	3 596 519	19 730 755	2 169 399	1 911 107	799 552	767 253	986 753

Annex 4: Evaluation of the environmental impacts of the measures of the CMO for fruits

1. Württembergische Obstgenossenschaft

Measures in the framework of...	**Does exist in OP?** yes/no	**implementation** (0/1/2)	**type of environmental impact** (+/0/-)	**importance of environmental impact** (0/1/2/3)	**type of milieu concerned** (all, water, soil, air, biodiversity, other)	**comments** (more precise information about the impact, other measure mobilized, etc.)
1: Action plan	yes	1	+			concerns a number of measures, see below
2-1: Production - Technical measures						
phytosanitary measures	no					
quality improvement measures, including certified seeds, mycelium and plants	yes	1	+			Use of resistant species
irrigation	no					
machinery	no					
greenhouses	no					
facilities	yes	1				plasticboxes for harvest
R&D	yes	1				breeding of resistant species
2-2: Production - Services, training and research						
advice	yes	2	+	2	all	always includes organic or integrated production
frost and diseases	no					
training courses	no					
R&D	no					
2-3: Production - Special environmental measures						
Biological/Integrated production	yes	2	+	2	all	all members produce organic or integrated
R&D	no					
3: Control - Quality and phytosanitary measures						
expenses with personnel	yes	2	+	1	all	neutral controlling, observed by PO
incl. waste analysis	yes	2	+	2	soil, water	
R&D (Art 15§4(c))	no					
4-1: Marketing - Technical measures						
storage	no					sourced out
packing	no					sourced out
transportation: refrigeration	no					sourced out
transportation:	no					sourced out
transportation:	no					sourced out
R&D	no					

Measures in the framework of...	**Does exist in OP?** yes/no	**implementation** (0/1/2)	**type of environmental impact** (+/0/-)	**importance of environmental impact** (0/1/2/3)	**type of milieu concerned** (all, water, soil, air, biodiversity, other)	**comments** (more precise information about the impact, other measure mobilized, etc.)
4-2: Marketing - Sales, promotion and outlet						
planning of production	yes	2	+	2	all	range of products defined. resistant species for organic production. therefore less phytosanitary measures
R&D	no					
4-3: Marketing - Special environmental measures						
waste management	no					
additional transportation expenses	no					
R&D						
Environmental measures :						
organic production	yes	1	+	3	all	see above
plant protection	yes	2	+	3	all	see above
energy management	no					
water management	no					
biodiversity/landscape	no					
general environmental measures	no					indirect: organic/integrated production
fertilisers	no					indirect: organic/integrated production
others						

2. Marktgemeinschaft Bodenseeobst

Measures in the framework of...	**Does exist in OP?** yes/no	**implementation** (0/1/2)	**type of environmental impact** (+/0/-)	**importance of environmental impact** (0/1/2/3)	**type of milieu concerned** (all, water, soil, air, biodiversity, other)	**comments** (more precise information about the impact, other measure mobilized, etc.)
1: Action plan	no					
2-1: Production - Technical measures						
phytosanitary measures	yes	1	+	2	all	in the framework of consultation
quality improvement measures, including certified seeds, mycelium and plants	yes	1	+	2	all	in the framework of consultation
irrigation	no					
machinery	yes	1	+	2	all	development of a vacuum cleaner for leaves for reducing of fungus
greenhouses	no					
facilities	no					
R&D	yes	2	+	2	biodiversity	research project for reducing driftage
2-2: Production - Services, training and research						
advice	yes	2	+	2	all	integrated production, phytosanitary measures, quality improvement
frost and diseases	yes	2	+	2		for reducing phytosanitary measures
training courses	yes					training courses for consultants and producers, corporate inspections
R&D	yes	2	+	2	all	desease warnings have been optimized an adapted to local climates
2-3: Production - Special environmental measures						
Biological/Integrated production	yes	2	+	3	all	part of specification sheet, consultation aims at integrated production, special consultation for organic producers
R&D	yes	0	+	1	biodiversity	research project for naturally reducing applemooth/codling worm
3: Control - Quality and phytosanitary measures						
expenses with personnel	yes	2	+	1	all	in the framework of integrated production, proofed qualitity (QS) Eurepgap; tolerant value-analysis
incl. waste analysis	no					
R&D (Art 15§4(c))	no					
4-1: Marketing - Technical measures						
storage	no					sourced out
packing	no					sourced out

Measures in the framework of...	**Does exist in OP?** yes/no	**implementation** (0/1/2)	**type of environmental impact** (+/0/-)	**importance of environmental impact** (0/1/2/3)	**type of milieu concerned** (all, water, soil, air, biodiversity, other)	**comments** (more precise information about the impact, other measure mobilized, etc.)
transportation: refrigeration	no					sourced out
transportation:	no					sourced out
transportation:	no					sourced out
R&D	no					
4-2: Marketing - Sales, promotion and outlet						
planning of production	no					
R&D	no					
4-3: Marketing - Special environmental measures						
waste management	yes	1	0	0		eurepgap
additional transportation expenses	no					
R&D	no					
Environmental measures :						
organic production	no					
plant protection	yes					consultation, see above
energy management	no					
water management	no					
biodiversity/landscape	yes					in the framework of consultation an integrated production
general environmental measures	no					
fertilisers	yes					consultation, see above
others						

OCM FRUITS
ETUDE DE CAS BADEN-WÜRTTEMBERG

Novembre 2005

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INTRODUCTION

In the chosen research area the cultivation of fruits, wine, vegetables and flowers plays an relatively important role (Ministry of Food and Rural Areas Baden-Württemberg, Internet, 25.4.05). The producers realise a turnover of approx. 1 billion € per year, which corresponds to 47.2 % of the total production value of these sectors in Baden-Württemberg (Ministry of Food and Rural Areas Baden-Württemberg a, Internet, 25.4.05). In Germany, however, only 27 % are made by these sectors, showing their little importance.
The following report presents some data about the fruit production in Baden-Württemberg, the environmental measures, and the answers to the evaluation questions. At the end of this report conclusions will be formulated from the answers given to the evaluation questions.

1. GENERAL CONDITIONS OF THE FRUIT PRODUCTION IN THE RESEARCH AREA (BADEN-WÜRTTEMBERG)

See the chapter 2 in the national report.

2. ANSWER TO EVALUATION QUESTIONS

2.1 Used Empirical Method

A quantitative survey was carried out asking experts about their experiences and opinions (telephoned based survey) about the influences of the CMO on the environment situation. A second survey was carried out with fruit producing farmers. 20 farmers were asked about the way of cultivating fruits and the changes since the implementation of the CMO in 1996.
Since the survey was made mostly per telephone, some experts asked for the questionnaire, which was sent by email. Therefore, the questionnaire was both answered per telephone and email. A list of the contacted experts can be seen in the appendix. Many experts were not able to answer the questions, because they did not know enough about the CMO. The reasons why experts did not answer the questionnaire can also be seen in the list in the appendix. Five experts answered the questions.
The survey of farmers was carried out in the area of the Lake of Konstanz. The research area is located in southern Baden-Württemberg.
The survey carried out with the farmers was a face-to-face interview. The farmers were contacted by phone to arrange a date or asked at local markets or similar places for their co-operation to participate in the survey. Some farmers did not want to participate because they had a lot of work in the orchards at this time of the year. The interviews took in average 40 minutes (30 to 60 minutes). The sample of the interviewed farmers is presented in the Table below.

Table 1: Sample of interviewed Farmers

Typology of producers	Expected numbers	Number of producers actually interviewed
Producers in PO	18	16
Producers out of PO	2	4
Producers that used the subsidies for irrigation of the CMO or RDR	2	0
Producers, members of PO who have implemented measures relating to the environmental programmes of the PO	8	8
Producers that used the subsidies for grubbing-up of the CMO or RDR	3	0
Producers under Agri-environmental contract	2	19
Producers practising organic production	2 (organic or integrated production)	3
Producers practising integrated production		15
Total number of interviewed Farmers		20

2.2 General Description of the interviewed Farmers

The interviewed farmers were between 29 and 62 years old. Most of the farmers were between 51 and 60 years old (see Table 6).

Table 2: Age of the interviewed Farmers

	Nr. of Farmers
< 30	1
30-40	5
41-50	5
51-60	8
>61	1

Source: Own Inquiry 2005

The interviewed farmers cultivate 243.5 ha of orchards, cultivating each farmer an average of 12.175 ha of orchards. Most of the farmers have orchards of 5 to 10 ha (see Table 7).

Table 3: Cultivated Acreage of Orchards of the interviewed Farmers

	Nr. of Farmers
<5	2
5-10	8
10-15	3
15-20	3
>20	4

Source: Own Inquiry 2005

Most of the farmers work as full-time farmers. Only 3 of 20 interviewed farmers are part-time farmers (see Table 8).

Table 4: Number of Full- and Part-Time Farmers

	Nr. of Farmers
part-time	3
full-time	17

Source: Own Inquiry 2005

Besides fruits, the farmers also cultivate vegetables, crops, grasses and hop. The average area of cultivation, as well as the number and percentage of farmers cultivating these products are shown in Table 9.

Table 5: Main Crops and their area

	ha (average)	Nr. of Farmers
wine	0	0
fruit	12	20
vegetables	0.5	1
crops	6	8
grassland	3	7
hop	1.6	2

Source: Own Inquiry 2005

The area of fruit cultivation is only used for the production of apples, cherries and plums. 13 of the interviewed farmers described their fruit production as intensive, whilst 4 described them as extensive (see Table 10).

Table 6: Level of Intensification of the Fruit Production

	Nr. of Farmers
intensive	13
nor (not intensive, not extensive)	3
extensive	4

Source: Own Inquiry 2005

On average the farmers cultivate 4.2 ha with trees younger than five years, corresponding to 0 – 75% of the total area of the farms. The average acreage with trees older than five years is 7.88 ha (25 – 100% of the total area of the farms) (see Table 11).

Table 7: Age of Trees

total acreage (ha)	acreage: trees < 5 years (ha)	% of acreage: trees < 5 years (ha)	acreage: trees >5 years (ha)	% of acreage: trees > 5 years (ha)
2.50	0.00	0.00	2.50	100.00
3.50	0.00	0.00	3.50	100.00
5.00	0.50	10.00	4.50	90.00
5.00	1.00	20.00	4.00	80.00
5.50	1.50	27.27	4.00	72.73
6.00	1.00	16.67	5.00	83.33
6.00	2.00	33.33	4.00	66.67
6.00	2.00	33.33	4.00	66.67
8.00	6.00	75.00	2.00	25.00
9.00	2.50	27.78	6.50	72.22
10.00	2.50	25.00	7.50	75.00
12.00	5.00	41.67	7.00	58.33
14.00	8.00	57.14	6.00	42.86
15.00	5.00	33.33	10.00	66.67
17.00	7.00	41.18	10.00	58.82
18.00	10.00	55.56	8.00	44.44
19.00	5.00	26.32	14.00	73.68
22.00	7.00	31.82	15.00	68.18
25.00	8.00	32.00	20.00	80.00
30.00	10.00	33.33	20.00	66.67
Sum of ha	84.00	620.73	157.50	1391.27
Average (ha)	4.20	31.04	7.88	69.56

Source: Own Inquiry 2005

The production of fruits in the year 1996, 2000 and 2004 can be seen in Table 12. In 1996, the fruit production varied from 95 to 500 t per farmer, whilst in 2004 it showed a variation from 95 to 850 t per farmer.

Table 8: Fruit Production between 1996 and 2004

fruit production 1996 (t)	fruit production 2000 (t)	fruit production 2004 (t)	production of processed fruits 1996 (t)
95		95	0
100		90	
110		260	136
120		90	
150		100	
350	350	350	0
375		500	33
400	700	1200	200
400		400	0
425		500	18
450		450	0
450		1000	122
500		900	80
		600	
		180	
		300	
		850	

Source: Own Inquiry 2005

The average fruit production per farmer was 302 t in 1996, 525 t in 2000 and 463 t in 2004 (Table 13). The reason for the variations of the fruit production is not shown.

Table 9: Average Fruit Production between 1996 and 2004

	fruit production 1996 (t)	fruit production 2000 (t)	fruit production 2004 (t)	production of processed fruits 1996 (t)
average Fruit production	302	525	463	59

Source: Own Inquiry 2005

Since 1996, changes have occurred in the farms. One third of all farms increased the area of cultivation. The acreage for the production of apples increased in average 10 ha, mostly due to the change of the cultivated varieties. Two farmers began to cultivate hop and 1 farmer started to cultivate cherries. Besides the increase of cultivated areas, two farmers presented smaller acreage of crops and grassland as well as five farmers who reduced their acreage of orchards (reduction of 6 ha in average). One sixth of all farmers (3) intensified the production of fruits by densely planting of trees. Moreover, some farmers affirmed that they use less pesticide nowadays. Five farmers have changed to integrated production since 1996 and one sixth of all farmers (3) started to produce according to the guidelines of the organic production.
The number of employees on the farm increased in average for 2.1 seasonal workers and 0.15 full-time workers.

The answers given to the evaluation questions are presented in the following chapters. The available data from both experts and farmers are presented below.

2.3 Vertical Questions

2.3.1 Theme 1: Market Measures

1+4(F1): What has been the environmental effect of the market measures (notably support for organisations of producers and their operational funds, intervention, destruction/biodegradation) for the following categories: a. citrus b. apples and pears c. peaches and nectarines? [a specific attention will be paid to the impact of the CMO promoting the grouping of supply]

Context

The CMO for fruits and vegetables was one of the first CMOs combining the subsidies with environmental efforts (Ministry of Food and Rural Development, oral information). The CMO defined that the operational programmes of the producer organisations have to include environmental measures for the production and the marketing of the products as well as for the intervention.

Implementation

Most of the interviewed farmers belong to a producer organisation according to the definition of the sample of the survey, being all of them members of the producer organisations for apples (Table 14).

Table 10: Member of Producer Organisations

	Nr. of Farmer
No	4
Yes	16

Source: Own Inquiry 2005

The names of the producer organisations are presented in Table 15. Most of the farmers belong to the Marktgemeinschaft Bodenseeobst.

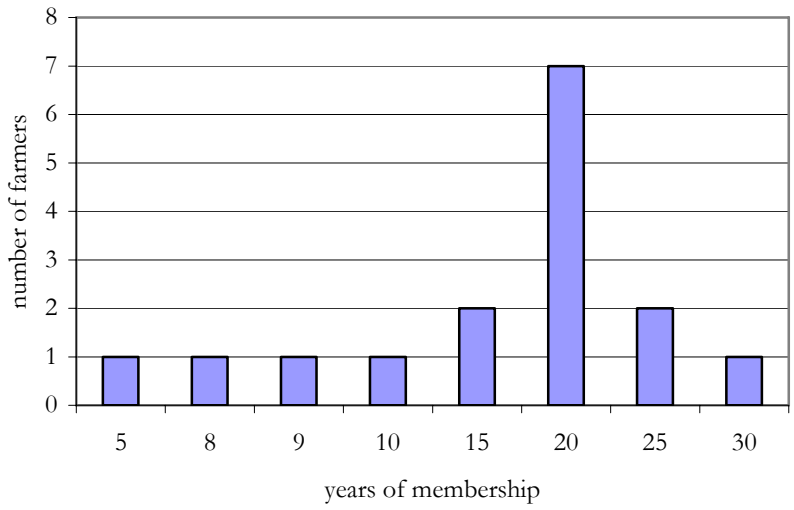
Table 11: Name of the Producer Organisations

Producer Organisation	Nr. of Farmers
Marktgemeinschaft Bodenseeobst	7
Marktgemeinschaft Friedrichshafen	3
Biomosterzeugung Mochenwang	2
Obstbauring Überlingen	3
Erzeugergemeinschaft Tafelobst	1

Source: Own Inquiry 2005

Most of the farmers are members of POs since twenty years, being the average 17 years.

Figure 1: Years of Membership in a PO



Source: Own Inquiry 2005

Most of the farmers were already members of the producer organisation before 1996 (Table 16). Therefore, the CMO did not influence the number of members.

Table 12: Membership of PO caused by CMO

	Nr. of Farmers
yes	2
no	14

Source: Own Inquiry 2005

Practices evolution

Producer organisations offer consultation about the integrated production, the optimal use of pesticides and fertilisers, the production of fruits with high quality and develop forecast models for the use of pesticides and the improvement of the packaging of products (Centre of Competence of the Fruit Production in the Lake of Konstanz-Region, written information; Producer Organisation, oral information).

Only one farmer mentioned that the new regulations of the CMO led him to change his practice of fruit production, increasing his area of apple orchards.

Environmental effects

Regarding the environmental effects, it is necessary to analyse

the implementation of the market measures among the POs and

the reasons and consequences of the intensification in the last years.

The high standards of German laws for protecting the environment have to be taken into account.

Part of CMO

According to the opinion of the experts the support of producer organisations causes positive environmental impacts. The requirements about the size of the producer organisation could not be fulfilled by small producer organisation, being a negative aspect (Nature Conservation Organisation, written information).
The impacts of the intervention on the environment were defined as neutral or negative by the experts. The use of energy (Centre of Competence of the Fruit Production in the Lake of Konstanz-Region, written information) and the use of the overproduced products as cheap additions to e.g. juice of fruits from Streuobst orchards. So the quality of these products decreased (Nature Conservation Organisation, written information).
The CMO does not cause an intensification of fruit production according to the experts. The intensification in the last years (e.g. increasing the density of trees and improving the operational procedures) would have occurred anyway (Centre of Competence of the Fruit Production in the Lake of Konstanz-Region, oral information). In addition, it has no impact on the environment because the farmers produce according to the guidelines of the good agricultural practice. Only the nets for the protection against hail can influence the appearance of the landscape (Centre of Competence of the Fruit Production in the Lake of Konstanz-Region, oral information).

The new regulations of the CMO did not cause intensifications of the fruit cultivation. Additionally, the change from a traditional to an intensive practice of fruit production was not related to the new regulations of the CMO according to the farmers.
The CMO promoting the grouping of supply via the support of producer organisations and their operational funds does not have a direct impact on the environment according to the opinion of the experts. The experts mentioned that a production of fruits according to the demand reduces transaction costs (Centre of Competence of the Fruit Production in the Lake of Konstanz-Region, written information).

Most of the farmers think that the grouping of the offer via producer organisations has no significant impacts on the environment (see Table 20). Only one farmer indicated that there are important environmental impacts.

Table 13: Level of Importance of the Grouping of the Offer on Environmental Impacts

level of importance	Nr. of Farmers
no importance	14
little importance	1
great importance	1

Source: Own Inquiry 2005

The trend of grouping the offer in the region was evaluated by 13 farmers as major and by 13 as marginal. Most of the farmers (13) think that the grouping of the offer is regrettable, none of them think that it is desirable.

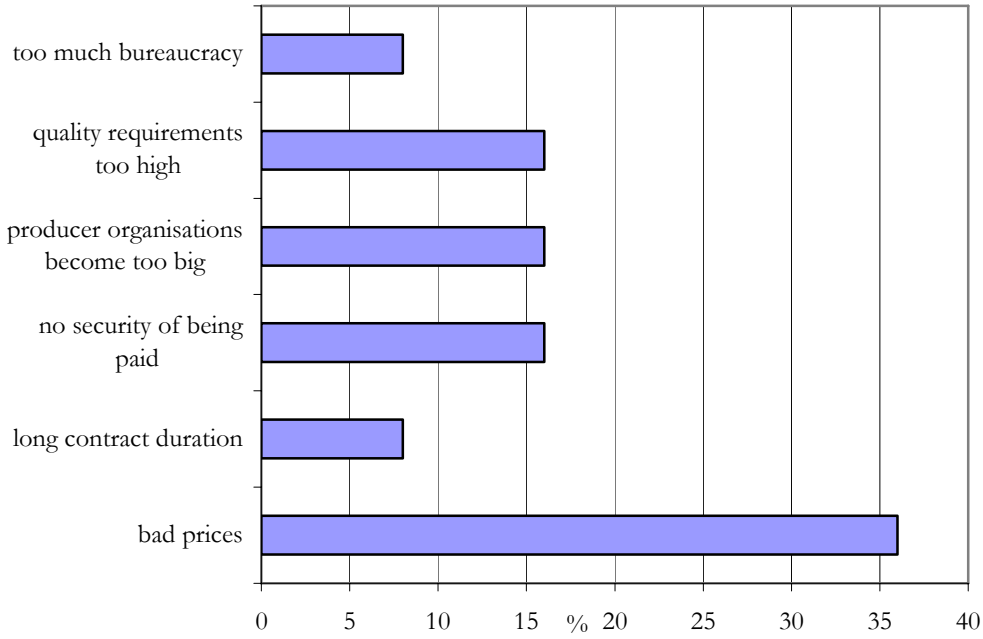
Table 14: Trend of Grouping the Offer in the Region

Trend	Nr. of Farmers
major	13
marginal	13
desirable	0
regrettable	13
do not know	3

Source: Own Inquiry 2005

The grouping of the offer is rated by the farmers as not regrettable due to the bad prices paid for the fruits, long contract durations, no security for the farmers on the payment by the producer organisations, the concentration of the producer organisations and the amount of bureaucracy.

Figure 2: Reasons for the regrettable Effect of the Grouping of the Offer



(More than one possible answers)

Source: Own Inquiry 2005

Most of the farmers believed that the grouping of the offer had no or just little effects. The trend to monoculture cultivation as well as to uniformity of cultural practice have great effects as evaluated by the farmers (see table 19; Table 28 : Evaluation of Effects Supporting the Grouping by Producer Organisations).

Table 15: Evaluation of Effects Supporting the Grouping by Producer Organisations

Effects	no	little	big	don't know
an increase in the variety of the offer to cover a longer period	8	2	0	6
diversification into other fruit to satisfy the consumers wishes	7	5	0	4
monoculture of species which sell best	7	6	2	1
uniformity of cultural practices to obtain uniform products	10	2	1	3
concentrating packing and despatch operations in a limited number of places	12	2	0	2
transfer of the production from certain marginal zones into very productive zones	13	1	0	2

Source: Own Inquiry 2005

Conclusion

Considering the intensification of the production, the impacts of the market measures on the environment are defined by the experts as being positive or neutral. The support of the operational programmes of the producer organisations has positive environmental impacts. The producer organisations nowadays are able to offer consultation for integrated production, the use of pesticides and fertilisers and to do some research e.g. developing models for the forecast of the optimal point of time for using pesticides and developing machines for optimal application of pesticides.

According to the farmers, the CMO causes no negative impacts on the environment and no intensifications in the fruit production. Most of the farmers are members of producer organisations, but the CMO was not the reason for the membership.

The CMO promoting the grouping of supply via the support to the producer organisations and their operational funds does not have an environmental impact according to the opinion of the interviewed experts.

The farmers did not recognise an impact on the environment of the grouping of the offer.

2(F1): What is the environmental effect of transferring price support from fruit processors to producer groups? [Please note that in the CMO for fruit and vegetables the main measure is the support for organisations of producers and their operational funds].

Context

The target of the support of producer organisations is to strengthen the producers and to improve the reaction to the market demands, improving the efficiency of the use of funds. The improvement of the reaction to the market demands also improves the production with fewer resources (Ministry of Food and Rural Development, written information).

Environmental effects/Part of CMO

The experts defined the environmental effects of transferring price support from fruit processors to producer groups as being neutral. One expert mentioned that the fruit processors in the region have never received grants from the CMO (Producer Organisation, oral information).
The trend of grouping the offer is evaluated as important and useful in order to improve the competitive situation of the producers (Centre of Competence of the Fruit Production in the Lake of Konstanz-Region, oral information; Ministry of Food and Rural Development, oral information).

Conclusion

The environmental effect of transferring price support from fruit processors to producer groups were defined as being neutral by the experts. The trend of grouping the offer is positive and useful for the producers due to the improvement of the competitive situation at the market.

3(F1): What is the environmental impact of the requirements laid down in the market standards?

Context

The main quality instrument of the CMO of fresh fruits and vegetables is constituted by the market standards, which are applicable to a total of 40 products. These standards fix mainly the minimum criteria relative to calibre, colour, ripeness and labelling fruits and vegetables must fulfil to be marketed in the European Union.
The application of these standards must cause the elimination of those products whose quality is not satisfactory, it must also lead production to satisfy consumers demands and to facilitate commercial relations, thus contributing to improve production return.
However, the requirements of German food retail are often higher.

Implementation

The requirements of the market standards are completely fulfilled in Germany because the food retail has higher requirements on the fruits than the market standards.

Practices evolution

15 farmers produce fruits according to the European standards, whilst 2 affirmed that they do not produce according to the standards (see Table 17).

Table 16: Is your marketed fruits production according to the European standards?

	Nr. of Farmers
yes	15
partial	3
no	2

Source: Own Inquiry 2005

Most farmers (17) think that the fruit production in their region conforms the European standards (Table 18).

Table 17: Is the fruits production in your region according to the European standards?

	Nr. of Farmers
yes	17
partial	2
no	0
no comment	1

Source: Own Inquiry 2005

10 of the interviewed farmers indicated that their products have been tested on chemical residues (see Table 19). All tested farmers mentioned that no breach of regulation has been notified.

Environmental effects

The application of the market standards can have an impact on the environment. In particular, it has to be analysed, if the CMO leads to an intensification of production and which consequences appear.

Part of CMO

The requirements laid down in the market measures do not have an impact on the environment according to the opinion of most of the experts.
The experts do not think that the definition of market standards has an influence on the intensification of production, on the reduction of the variety, on the measures for the quality improvement and on the intervention. Although the requirements of the market standards do not have an impact on these indicators, some of them are negatively influenced by the requirements of the purchasers.
One expert indicated that the requirements of market standards have negative influences on farmers that have organic production The requirements are evaluated as being an important reason for the reduction of varieties and the cultivation of fruits in monocultures. Genetic resources of fruits trees get lost (Nature Conservation Organisation, written information).

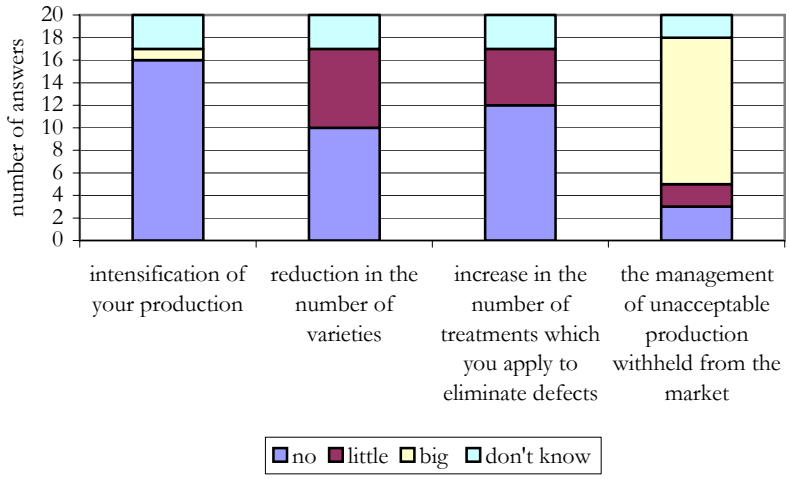
Table 18: Number of Farmers that tested their products

	Nr. of Farmers
yes	13
no	13

Source: Own Inquiry 2005

An effect of the standardisation is the management of unacceptable production withheld from the market. There is no further information on this topic: the effects caused by the standardisation are often evaluated as being little or not relevant.

Figure 3: Evaluation of the Effects of the Standardisation



Source: Own Inquiry 2005

Conclusion

Most of the experts do not think that the requirements of the market standards have any impact on the environment, since the requirements defined by the German purchasers are higher than the requirements of the market standards. Therefore, the requirements of the purchasers have impacts on the environment. One expert also cited that the requirements of the market standards can be evaluated as being a reason for the loss of varieties and the problem of commercialising fruits from organic or nature-orientated orchards.

According to the farmers, the fruit production follows the market standards, having the definition of these standards no environmental impact.

2.3.2 Theme 2: Environmental Measures

1(F2): What are the overall environmental impacts of the environmental cross-compliance provisions – on cultivation practices and waste management, for which the framework was specified by the Member States – in the CMO (Council Regulation 2200/96)?

Context

The good agricultural practice is described by the experts as working according to the national requirements, such as the regulation of the use of fertilisers, the law of soil protection, and the law of the use of pesticides. All experts indicated that the fruit producers cultivate their orchards following the guidelines of integrated production. The requirement of the producer organisation is usually the integrated production (Centre of Competence of the Fruit Production in the Lake of Konstanz-Region, written information, oral information) and the requirements of the product purchasers (food retail) (Ministry of Food and Rural Development, oral information).

Implementation

The experts indicated the existence of requirements to the producer organisations to define measures for the environmentally friendly production and the environmental waste management (Ministry of Food and Rural Development, oral information).
14 farmers indicated that they are familiar to the good agricultural practice for the cultivation of orchards (see Table 22). Some farmers did not answer the question but no farmer said that he is not familiar with the good agricultural practice.

Table 19: Familiarity with the "Good Agricultural Practices"

	Nr. of Farmers
yes	14
no	0
no comment	6

Source: Own Inquiry 2005

Practices evolution

15 of 20 farmers are aware of environmental obligations which are included in the programmes of the producer organisations. Only one farmer did not know about the environmental obligations within the programmes (see Table 23).

Table 20: Awareness of Environmental Obligations in the Programmes of Producer Organisations

	Nr. of Farmers
yes	15
no	1
no comment	4

Source: Own Inquiry 2005

Environmental effects

It is necessary to analyse the potential effects of environmental measures of Operational Programs and their legal framework, especially those related to waste management.

Part of CMO

Environmental measures for the production of fruits are the integrated production, the organic production and the environmentally friendly intervention (Ministry of Food and Rural Development, oral information). The producer organisations have to define requirement specifications about the environmental measures of the operational programme and the intervention (Ministry of Food and Rural Development, oral information). The measures are effective because consultation is supported and forecast systems are implemented.
Environmental measures of waste management are also defined within the requirement specifications, e.g. the use of environmentally friendly packaging material and the implementation of returnable systems, which were evaluated as being effective.

The farmers do not think that the obligations of the programmes of the producer organisations go beyond agricultural practice (see Table 24). A possible reason is that all the farmers in the region produce according to the guidelines of the integrated production, corresponding thus, the integrated production to the good agricultural practice.

Table 21: Opinion of the farmers if the Environmental Obligations of the Programmes of the Producer Organisations go beyond Good Agricultural Practice

	Nr. of Farmers
yes	0
no	10
no comment	10

Source: Own Inquiry 2005

Only 7 farmers know one or more environmental programmes of the producer organisations (Table 25). Few farmers know that the offers of the producer organisations are part of special programmes. Moreover, the German expression "Maßnahme" (measure) might not have been understood in the right way. This word is normally used in connection to measures for which the farmers have to sign a contract, fulfil defined regulations during a certain period of time. The environmental measures of the producer organisations which are based on consultation might not have been recognised as

"Maßnahme". Therefore, all following questions about the environmental programmes could not be answered by the producers.

Table 22: Opinion about the Programmes of the Producer Organisations

	Nr. of Farmers
are you aware of their existence	
yes	7
no	5
no comment	8
are they satisfactory according to the measurement	
yes	2
no	2
no comment	16
are they satisfactory according to the easiness to implement	
no	4
yes	0
no comment	16
are they satisfactory according the utility	
no	4
yes	0
no comment	16

Source: Own Inquiry 2005

Conclusion

The producer organisations have to define the environmental measures according to the production of fruits and the waste management. These measures are e.g. the integrated production, the ecological production, the use of environmentally friendly packaging materials, and the implementation of reusable systems. These measures were evaluated as being effective and having a positive impact on the environment.

The environmental impacts of the environmental cross-compliance provisions of the CMO could not be evaluated by the answers given by the farmers, since they did not recognise the offers of the producer organisations as being part of an environmental programme. Only the farmers that participated in a training programme for integrated production recognised these measures.
Most of the farmers cultivated their orchards even before 1996 according to the guidelines of the integrated production. Those did not recognise these measures.
Since the questions could not be properly answered by the farmers, it was not possible to evaluate the environmental measures of the producer organisations.

2(F2): Which kind of environmental measure (integrated production, organic production, plant production, fertilisers, energy management, water management, soil management, biodiversity/landscape and environmental management) paid by the operational fund for the producer organisations has turned out to be effective in terms of positive environmental impact?

Context

Operational Programmes include several environmental measures. They must contribute to the legal framework described above.

Environmental effects

The environmental measures paid by the operational fund for the producer organisations were evaluated by the experts as described in *Part of CMO/Practices evolution.*

Part of CMO/Practices evolution

a) integrated production:
The integrated production is evaluated as being effective by three experts (Ministry of Food and Rural Development, oral information; Centre of Competence of the Fruit Production in the Lake of

Konstanz-Region, written information; Producer Organisation, oral information). The producers have to document their way of production, which always develops in a more ecological production (Centre of Competence of the Fruit Production in the Lake of Konstanz-Region, written information). The guidelines of the integrated production are communicated to the producers by consultation and controls. The labour costs of the producer organisations for the offer of consultation and the research are paid by the CMO (Producer Organisation, oral information). The producers are almost forced to produce according to the guidelines of the integrated production (Producer Organisation, oral information).
One expert indicated that the integrated production is not effective in providing positive environmental impacts and thus, the focus of the support should be on the ecological production (Nature Conservation Organisation, written information).
b) ecological production:
The ecological production is evaluated by one expert as being positive according to environmental impacts (Nature Conservation Organisation, written information). An expert stated that the ecological production have both positive and negative impacts (Ministry of Food and Rural Development, oral information), whilst another expert defined it as having negative effects, due to the higher use of energy, less harvested products, and the use of substances that are dangerous to the environment as chemical pesticides (Centre of Competence of the Fruit Production in the Lake of Konstanz-Region, written information, written information). One expert could not answer this question because no ecological fruits are produced by producers of the PO (Producer Organisation, oral information). Therefore, ecological production could be defined as ambivalent in its impacts on the environment.
c) plant production:
Since the producer organisations offer consultation for the chose of resistant varieties and the use of pesticides , one expert evaluated the plant production as effective. The labour costs of the producer organisations for these services are paid by the CMO (Producer Organisation, oral information). One expert considered the plant production as ambivalent (Nature Conservation Organisation, written information), whilst another expert estimated it as quite effective in relation to the improvement of the situation of the environment (Ministry of Food and Rural Development, oral information).
d) use of fertilisers:
Three experts evaluated the measures for the use of fertilisers as having positive impacts on the environment (Ministry of Food and Rural Development, oral information; Producer Organisation, oral information, Nature Conservation Organisation, written information). The producer organisations give advices for the use of fertilisers e.g. according to the minimum concentration of nitrogen in the soil of an orchard and the age of trees (Producer Organisation, oral information). The costs of these services are paid by the CMO.
e) use of energy:
The environmental measures about the use of energy were broadly estimated by two experts as being slightly effective (Ministry of Food and Rural Development, oral information; Conservation Organisation, written information).
f) use of water:
The use of water was as well considered to be slightly effective by two experts (Ministry of Food and Rural Development, oral information; Conservation Organisation, written information). The other experts mentioned that measures for the use of water are not relevant in Germany because the use of water is regulated by the administrative law (Centre of Competence of the Fruit Production in the Lake of Konstanz-Region, written information) and because irrigation is not subsidised by the producer organisations (Producer Organisation, oral information).
g) land use:
The environmental measures for the land use are not relevant in Germany according to the statements of two experts (Centre of Competence of the Fruit Production in the Lake of Konstanz-Region, written information; Producer Organisation, oral information), whilst the other experts estimated it as being quite effective.
h) landscape and environmental management:
The environmental measures for the land use are not relevant in Germany according to the statements of two experts (Centre of Competence of the Fruit Production in the Lake of Konstanz-Region, written

information; Producer Organisation, oral information). whilst the other experts estimated it as being quite effective.

The questions about the environmental measures of the producer organisations were not understood by the farmers (see explanation above). Besides, most of the mentioned measures in the questionnaire are subsidised by the rural development programme of Baden-Württemberg (MEKA), not by the producer organisations. Sometimes the producer organisations grant these measures if the participation is too expensive for the agro-environmental programmes. However, the producer organisations usually offer consultation for the farmers.

Conclusion

Most of the experts considered the environmental measures for the integrated production (three of four experts), the ecological production (two of three experts), the plant production (two of three experts), the use of fertilisers (three of four experts), the use of energy (two of two experts), the use of water (two of two experts), the land use (two of two experts) and the landscape and the environmental management (two of two experts) as being at least slightly effective in improving the situation of the environment.

The effectiveness of the environmental programmes of the producer organisations could not be answered by the results of the farmers' survey. The reasons are described above.

2.3.3 Theme 3: Structural Measures

1(F3): What is the environmental impact of structural measures e.g. support for investment in irrigation?

Context

In Germany investments in irrigation are not (always) subsidised by producer organisations (Producer Organisation, oral information). Even the use of irrigation systems is not very common in Germany (Centre of Competence of the Fruit Production in the Lake of Konstanz-Region, oral information).

Implementation

Almost no farmer (19) has the equipment for the orchard irrigation (Table 26). Only one farmer obtained the necessary equipment for irrigation.

Table 23: Existence of Equipment for Irrigation

	Nr. of Farmers
no	19
yes	1

Source: Own Inquiry 2005

The purchase of the equipment for irrigation was not subsidised. The farmer bought the equipment for irrigation in case of a longer period of drought.

Practices evolution

No evolution.

Environmental effects

Irrigation is an important intervention into water household and has positive and negative consequences at the same time.

Part of CMO

The opinions of the experts about the support of irrigation systems varied. One expert considered that the irrigation has positive impacts on the environment because after the use of pesticides, the irrigation can be used very targeted (Producer Organisation, oral information). One experts indicated that environmental standards (German law of environment) should be considered so that no negative

impacts on the environment would occur (Ministry of Food and Rural Development, oral information). Two experts evaluated the support of irrigation systems as negative according to the environmental impact, since the ecosystem is influenced by the added water (Centre of Competence of the Fruit Production in the Lake of Konstanz-Region, oral information; Nature Conservation Organisation, written information). Another expert mentioned that every structural measures causes an intensification of production, but the positive effect is that the input-output-relation of the production is improved (Centre of Competence of the Fruit Production in the Lake of Konstanz-Region, oral information).
The structural measures, such as the offer of advices about the use of herbicides and pesticides have more positive impacts on the environment than the support of irrigation systems according to the experts.

Conclusion

Concerning the environmental impacts of structural measures it can be said, that two experts evaluated the support of irrigation systems as having a positive impact on the environment, whilst two experts had the opposite opinion. The opinions about other structural measures are also ambiguous. One experts considered that the structural measures have positive impacts on the environment, since the existing German environmental laws avoid negative impacts. However, another expert indicated that every structural measure has a negative impact on the environment due to the intensification of production.

The environmental impacts of structural measures according to the farmers could not be evaluated because the only farmer who bought the necessary equipment for irrigation did not receive subsidies.

2(F3): What are the environmental impacts, in particular in terms of soil, water and biodiversity of the grubbing-up grants?

Context

Grubbing-up grants are offered to faster adapt the production to market needs and to take orchards out of the production.

Implementation

Grubbing-up grants have a marginal importance in German apple cultivation.

Practices evolution

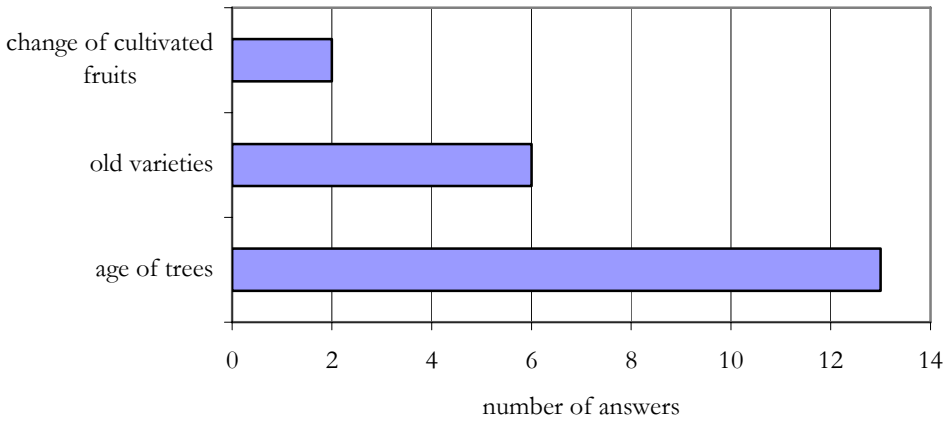
14 farmers indicated that they have cleared orchards since 1996 (see Table 27), due to the age of the trees, old varieties and the change in the fruit cultivation.

Table 24: Clearing of Orchards

	Nr. of Farmers
yes	14
no	6

Source: Own Inquiry 2005

Figure 4: Reason for Clearings



(More than one possible answers)

Source: Own Inquiry 2005

Environmental effects

Possible environmental impacts are the loss of soil, the entering of nutriments into waters, a reduction of biodiversity and the change of cultivated landscape.

Part of CMO

Most of the experts indicated that the grants for clearings do not have an impact on the environment (Ministry of Food and Rural Development, oral information; Centre of Competence of the Fruit Production in the Lake of Konstanz-Region, written information). The clearings take place anyway if they are economical necessary. The cleared orchards are used again as orchards, presenting no change in the land use (Ministry of Food and Rural Development, oral information).

The cleared orchards were all used again for the cultivation of fruits. Only two farmers planted other fruits (cherries, strawberries) on the cleared orchards. All other farmers planted apple trees again. None of these clearing was subsidised.

Conclusion

According to the opinion of the experts the clearings do not have an impact on the environment because they are used again as orchards. Clearing would take place anyway if they are economical useful. The clearing should be regulated by the market and not by the offer of subsidies.

The farmers cleared orchards due to of the age of the trees and the demand of the market for other varieties and fruits. The cleared orchards were used as orchards again, presenting thus, no environmental impact.

2.3.4 Theme 5: Co-ordination with Agri-environmental Measures

1(F5): Has the co-ordination between environmental measures in the CMO and the agri-environmental measures been adequate to produce optimal environmental impacts?

Context

The CMO and agri-environmental measures should complement one another in order to conserve the cultural landscape and minimize environmental impacts.

Implementation

The implementation of the support of agri-environmental measures is the Laenders' responsibility (MEKA in Baden-Württemberg). There is a high coherence between the programmes, excluding a

double support for environmental measures. The programmes are elaborated in a way that the measures complete each other. For instance, the Operational Programmes promote special varieties and, partly, integrated fruit production. The Laenders' programmes support further cultivation measures conserving the cultivated landscape that are not covered by the operational fund of the producer organisations.

Practices evolution

Almost all interviewed farmers (19) participate in the rural development programme of Baden-Württemberg (MEKA) (see Table 28).

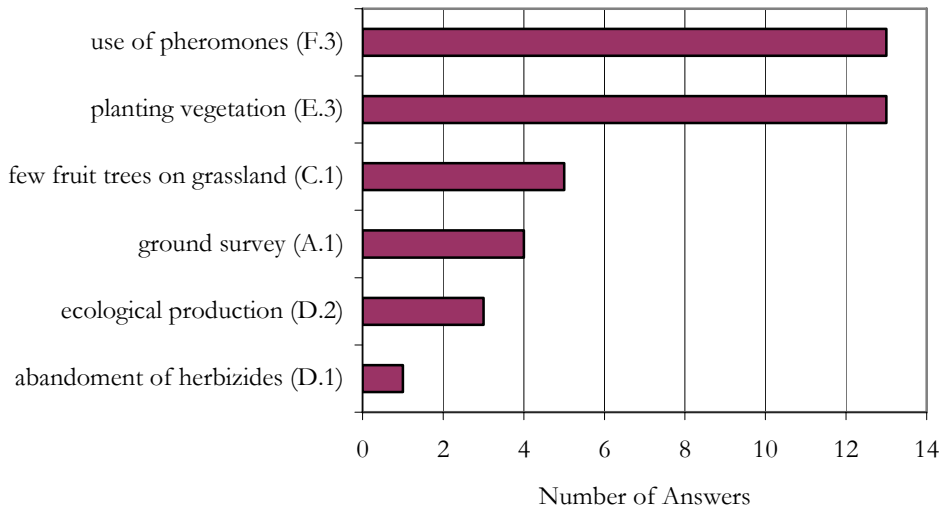
Table 25: Participation in the Rural Development Programme of Baden-Württemberg (MEKA)

	Nr. of Farmers
no participation	1
participation	19

Source: Own Inquiry 2005

13 farmers participated in the measures "planting of vegetation", whilst 13 of the farmers participated in the "use of pheromones". The other measures which are attended are shown in the following graph.

Figure 5: Attended Measures of the Rural Development Programme



Source: Own Inquiry 2005

Environmental effects

On an insufficient co-ordination of both programmes, effects on the environment would be far reaching.

Part of CMO

Most of the experts think that the co-ordination between the environmental measures in the CMO and the agro-environmental measures of the rural development programme was not adequate in order to produce optimal environmental impacts (Centre of Competence of the Fruit Production in the Lake of Konstanz-Region, written information; Producer Organisation, oral information ; Nature Conservation Organisation, written information), although one expert had an opposite opinion. (Ministry of Food and Rural Development, oral information). One expert mentioned that the programmes are not well coordinated because farmers are tested two times (Producer Organisation, oral information). No expert stated that farmers received subsidies two times for the same measure.

Since the existence of environmental programmes of the producer organisations is not sufficiently known by the farmers, they were not able to estimate consistency of the measures of the rural development programme and the measures of these programmes.

The situation described above could also be a reason for the making mention of examples of inconsistency between the rural development programme and the operational programme of the producer organisations. One farmer gave an example that, in his opinion, indicated inconsistency of both programmes: The producer organisations subsidies nets for the protection against hail and re-plantings. These measures are not subsidised within the rural development programme.

Conclusion

Three experts stated that the co-ordination between the environmental measures in the CMO and the agro-environmental measures of the rural development programme could be improved in order to produce optimal environmental impacts. However, one expert indicated an example for inconsistency of this co-ordination.

Almost all interviewed farmers participate in the rural development programme of Baden-Württemberg called MEKA. The farmers attend at different environmental measures of this programme. However, the consistency of both programmes could not be evaluated, since the farmer did not recognise the existence of such programmes as offered by the producer organisations. Therefore some farmers could not understand the question.

2.4 Horizontal Questions

2.4.1 Theme 1: Land use over Time

1(H1): Does the CMO lead to substantial changes in the land use over time (abandonment, expansion and set-aside) and if so: what are the positive and negative impacts?

Context

CMO measures may lead to changes in land use related to abandonment, expansion and set-aside of fruit orchards. Changes in land use can have both positive and negative effects on the environment. This question tries to determine which type of cultures have substituted or have been substituted fruit orchards.

Implementation

The situation of the orchards is stable in the last years.

Practices evolution

The farmers have not changed their area of orchards since 1996. 4 farmers increased their acreage of orchards. Four increased the acreage of apple orchards (see Table 29).

Table 26: Increased Acreage since 1996

increased culture	Nr. of Farmers	average increase (ha)
apples	4	10
cherries	1	3
strawberries	1	2
hop	2	

Source: Own Inquiry 2005

Only one farmer reduced his acreage of orchards for 0.5 ha.

Environmental effects

The aim of this question is to determine if CMO measures have promoted significant changes in land use over time either abandonment or expansion. It is necessary to establish if any positive or negative environmental impacts have been involved by these possible changes.

Part of CMO

The CMO does not lead to substantial changes in the land use over the time according to the opinion of all interviewed experts, because no clearings are subsidised and changes in the land use take only place due to economical needs. Only the areas of Streuobst decreased in the last years (Nature

Conservation Organisation, written information), being used then, as grasslands (Ministry of Food and Rural Development, oral information). Cleared orchards are seldom used as grassland and for the production of crops (Ministry of Food and Rural Development, oral information).
The loss of Streuobst orchards causes a change in the landscape and a loss of species (Ministry of Food and Rural Development, oral information). In addition, the production of fruits in relation to the soil protection and wilderness of an acreage have negative impacts on the environment (Nature Conservation Organisation, written information ; Centre of Competence of the Fruit Production in the Lake of Konstanz-Region, written information). Moreover, not the set-aside but the maintaining and the expansion of intensive fruit production causes substantial negative impacts on the environment (Nature Conservation Organisation, written information; Centre of Competence of the Fruit Production in the Lake of Konstanz-Region, written information; Ministry of Food and Rural Development, oral information).

Conclusion

As a conclusion, the CMO does not lead to substantial changes in the use of land over the time according to the experts. The set-aside of orchards does not have negative impacts on the environment, whilst the negative impacts on the environment are caused by the expansion of orchards.

Since the implementation of the CMO, the acreage of orchards of five of the interviewed farmers has increased. Only one farmer decreased for the area in 0.5 ha. One farmer changed the cultivated fruit from apples to cherries and strawberries (on together 5 ha), occurring such changes not due to the CMO. The clearings of apple orchards did not change the land use.
Since 1996, the land use has not changed. Therefore, the CMO did not influence the land use, having no impact on the environment.

2.4.2 Theme 2: Adequate Spending Level and Method

1(H2): Are there indications that a change in the total spending on the CMO in its present form would have a substantial positive or negative environmental impact?

Context

Two experts think that the environmental aspects are sufficiently considered in the CMOs (Ministry of Food and Rural Development, oral information; Centre of Competence of the Fruit Production in the Lake of Konstanz-Region, written information), whilst one expert indicated that a change in the CMO would have substantial positive environmental impacts (Nature Conservation Organisation, written information). Therefore, one expert mentioned that no changes in the CMO are necessary (Ministry of Food and Rural Development, oral information).
Two experts indicated useful changes of the CMO that could cause positive impacts on the environment:

- fruits should be cultivated on exalted tree trunks and not on low tree trunks, which have to be cultivated in an intensive way (Nature Conservation Organisation, written information)
- research, breeding and training should focus on the fruit cultivation on exalted tree trunks (Nature Conservation Organisation, written information)
- market standards like form, colour and size should be abolished (Nature Conservation Organisation, written information)
- no support of integrated production, as standard should be organic production (Nature Conservation Organisation, written information)
- uniform regulations for the use of pesticides and herbicides should be defined (Centre of Competence of the Fruit Production in the Lake of Konstanz-Region, oral information)
- no subsidies for packaging, only regulations (Centre of Competence of the Fruit Production in the Lake of Konstanz-Region, oral information).

Conclusion

According to the answers of the experts changes in the total spending in the CMO in its present form would have both positive and negative environmental impact, being some changes defined by some experts.

The adequate spending level and method could not be evaluated from the point of view of the farmers.

2(H2): Are there indications that decoupling of spending at its present level would have a substantial positive or negative environmental impact?

Context

The spending at its present level is favoured. A decoupling should not occur (Ministry of Food and Rural Development, oral information; Centre of Competence of the Fruit Production in the Lake of Konstanz-Region, oral information).

The decoupling of spending could bring negative impacts on the landscape because extensive used orchards will be set aside and fruits will only be produced on fruitful acreages (Centre of Competence of the Fruit Production in the Lake of Konstanz-Region, oral information).

Conclusion

The spending at its present time is useful and should not be changed according to the opinion of the experts.

The question could not be answered from the point of view of farmers.

2.4.3 Theme 3: Subsidiarity of Agri-environmental Schemes and horizontal Measures

1(H3): Have the agri-environmental schemes and any environmental requirement ("cross-compliance" ex CE 1259/1999) related to these CMOs been sufficiently targeted by Member States and regions at hotspots of environmental degradation or possibilities for environmentally friendly production?

Context

The experts indicated the existence of environmental programmes for permanent crops in Baden-Württemberg. The rural development programme of Baden-Württemberg (MEKA) includes measures for the environmentally friendly cultivation of permanent crops. The requirements of these measures defined in the rural development programme were presented in chapter 2.3.4. There is also a programme for the regional production in Baden-Württemberg (QSBW), defining the abandonment of special pesticides (Producer Organisation, oral information).

Practices evolution

19 of the 20 farmers participate in the rural development programme of Baden-Württemberg (MEKA) (see Table 25). The farmers take part at the measures "planting of vegetation" (13 farmers), "use of pheromones" (13 farmers), "few trees on grassland" (Streuobst) (5 farmers), "ground survey" (4 farmers), "ecological production" (3 farmers) and "abandonment of herbicides" (1 farmer) (see Table 31).
It was not possible to evaluate the subsidies of these schemes by the results of the survey carried out with the farmers, because they do not recognise that producer organisations offer environmental measures (see above).

Part of CMO

The rural development programme and the environmental measures of the producer organisations support the integrated production as well as the ecological production. There are two producer organisations in Baden-Württemberg for ecological producing farmers (Ministry of Food and Rural Development, written information; Producer Organisation, oral information). The standard of fruit

production of other producer organisations is the integrated production. One expert indicated that the integrated production causes many environmental problems due to the intensification of cultivation. Therefore, the fruit production on exalted tree trunks should be supported (Nature Conservation Organisation, written information). It should be mentioned that this expert has the opinion, intensive fruit production should be reduced in general in favour of producing fruits in Streuobst orchards.

Conclusion

There are environmental measures focused on the cultivation of permanent crops in Baden-Württemberg. These programmes support the integrated production as well as the ecological production. If these indicators are used for the evaluation of their impact on the environment, one can conclude that the programmes are aimed at hotspots of environmental degradation or possibilities for environmentally friendly production.

The measures of the rural development programme can possibly cause positive impacts on the environment, according to the farmers. Nevertheless, an evaluation of the effectiveness of the measures of the rural development programme was not possible in this context.
The effectiveness of the measures of the programme of the producer organisations could not be evaluated because the interviewed farmers did not know about the existence of these programmes (see above).

APPENDICES

Annex 1: List of people met or contacted

- National Organisations, responsible for the Implementation and Control of the Measures

Institution	Tel.-Nr.	1. questionnaire	2. questionnaire	Reason for Refusal	Further Comments
Ministry of Food and Rural Areas Baden-Württemberg	0711/126-0	X	-		
Regional Council Freiburg	0761/208-1234	-	-	Send to the Ministry	Send to Ministry of Food and Rural Areas Baden-Württemberg
Regional Council Tübingen	07071/757-3358	-	-	Not his area of specialisation	Recommended other experts

- National Organisations – Reference to Environment

Institution	Tel.-Nr.	1. questionnaire	2. questionnaire	Reason for Refusal	Further Comments
Ministry of Food and Rural Areas Baden-Württemberg	0711/126-0	X	-		
Institute for environmentally friendly Agriculture	07631/36840	-	-	Not his area of specialisation	Further experts

- Producer Organisations

Institution	**Tel.-Nr.**	**1. questionnaire**	**2. questionnaire**	**Reason for Refusal**	**Further Comments**
LVEO Obst Stuttgart	0711/2140150	-	-		
Dr. Treyer	07541/50100	x			
Hr. Bahler	0751/808227			Did not feel hold in respect	

- Technical Organisations (Production and Economy)

Institution	**Tel.-Nr.**	**1. questionnaire**	**2. questionnaire**	**Reason for Refusal**	**Further Comments**
Regional Office for crop production Rheinstetten	0721/9518210	-		Not his area of specialisation	

- Office of Agriculture

Institution	**Tel.-Nr.**	**1. questionnaire**	**2. questionnaire**	**Reason for Refusal**	**Further Comments**
District Office Breisgau-Hochschwarzwald	0761/70346-275	-		His organisation not member of CMO	
Office of Agriculture Stockach	07771/92220 07771/93990			Not his area of specialisation	
District Office Bodenseekreis, Markdorf	07544/9503-45	-		Not his area of specialisation	

- Other Organisations Institutes (Industry, Research Institutes, Nature Conservation)

Institution	**Tel.-Nr.**	**1. questionnaire**	**2. questionnaire**	**Reason for Refusal**	**Further Comments**
Research					
Kompetenzzentrum Obstbau-Bodensee	0751/7903-311	X	X		
Industry					
Verband der agrargewerbl. Wirtschaft Stuttgart	0711/1677912			Questions do not match the important points	
Obstgroßmarkt Grundler Espasing	07771/93930				
Obstgroßmarkt Markdorf Markdorf	07544-95080				
Environment					
Bioland	07134/8935			Not his area of specialisation	
NABU	0711/96672-0	X			

Annex 2: Main bibliography identified (used or not) in relation with the study

BMVEL 2005: Agrarbericht 2005

Centre of Competence of the Fruit Production in the Lake of Konstanz-Region, oral information

Centre of Competence of the Fruit Production in the Lake of Konstanz-Region, written information

Commission of the European Communities, 3.9.2004, Commission Staff Working Document: Analysis of the common market organisation of fruits and vegetables, Brussels

Infodienst der Landwirtschaftsverwaltung: http://www.landwirtschaft-mlr.baden-wuerttemberg.de/servlet/ PB/-s/1hk3wrje38rv71o41o1x1yodogg8bxax9/menu/1035143_l1/ index.html, 22.4.05

Kellerhals, Markus et al. 1997: Obstbau, Wädenswil

Kommission der Europäischen Gemeinschaften, 24.1.2001, Bericht der Kommission an den Rat über die Anwendung der Verordnung (EG) Nr. 2200/96 über die gemeinsame Marktorganisation für Obst und Gemüse, Brüssel

Kompetenzzentrum Obstbau a: http://www.kob-bavendorf.de/stiftung/Folder.2004-05-05.5653, 23.4.05

Kompetenzzentrum Obstbau b: http://www.kob-bavendorf.de/stiftung, 23.4.05

Landesstelle für landwirtschaftliche Marktkunde, 2005

Metzger, Marion 2003: Obstanbau in Baden-Württemberg, Tübingen

Ministry of Food and Rural Areas Baden-Württemberg a http://www.mlr.baden-wuerttemberg.de/cgi/styleguide/content.pl?, 25.4.05

Ministry of Food and Rural Areas Baden-Württemberg b http://www.mlr.baden-wuerttemberg.de/cgi/styleguide/content.pl?ARTIKEL_ID=31990, 23.4.05

Ministry of Food and Rural Areas Baden-Württemberg c http://www.mlr.baden-wuerttemberg.de/cgi/styleguide/content.pl?ARTIKEL_ID=556, 23.4.05

Ministry of Food and Rural Areas Baden-Württemberg: Maßnahmen und Entwicklungsplan ländlicher Raum des Landes Baden-Württemberg

Ministry of Food and Rural Development, oral information

Ministry of Food and Rural Development, written information

Nature Conservation Organisation (NABU Naturschutzbund – Baden-Württemberg http://www.nabu-bw.de/m07/m07_01/, 3.5.05

Nature Conservation Organisation, written information

Producer Organisation, oral information

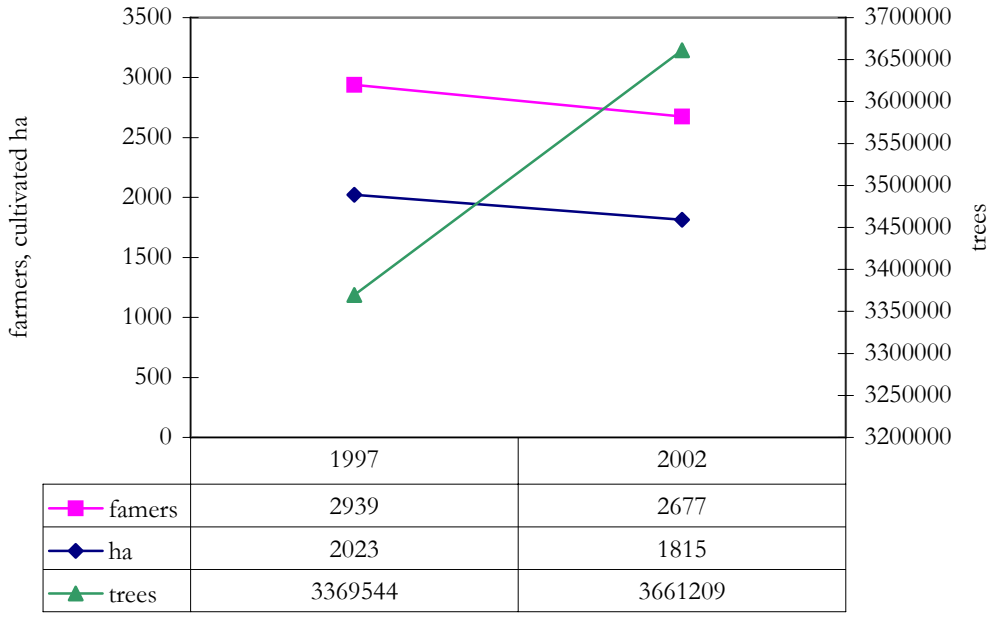
Statistisches Landesamt Baden-Württemberg 2003: Statistische Berichte Baden-Württemberg, Agrarwirtschaft, 27.01.2003

Statistische Landesamt Baden-Württemberg, http://www.statistik.baden-wuerttemberg.de, 23.4.05

Treyer, 11.04.2005, oral statement

Winter, Fritz et al., 1992, Lucas' Anleitung zum Obstbau, Stuttgart

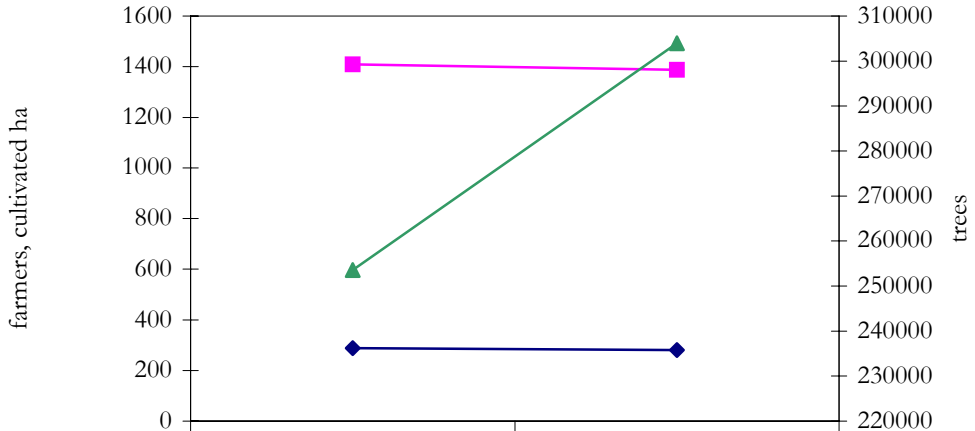
Annex 3: Development of the Structure of Apple Orchards from 1997 to 2002 in the Rheinebene



	1997	2002
famers	2939	2677
ha	2023	1815
trees	3369544	3661209

Source: Statistische Berichte Baden-Württemberg, Agrarwirtschaft, 27.01.2003, S. 4

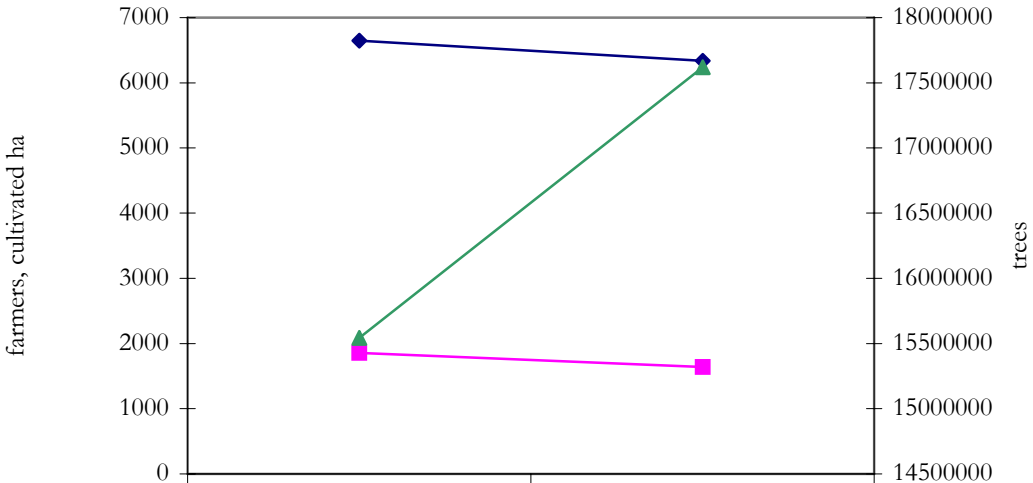
Annex 4: Development of the Structure of Pear Orchards from 1997 to 2002 in the Rheinebene



	1997	2002
famers	1409	1388
ha	288	280
trees	253519	303927

Source: Statistische Berichte Baden-Württemberg, Agrarwirtschaft, 27.01.2003, S. 4

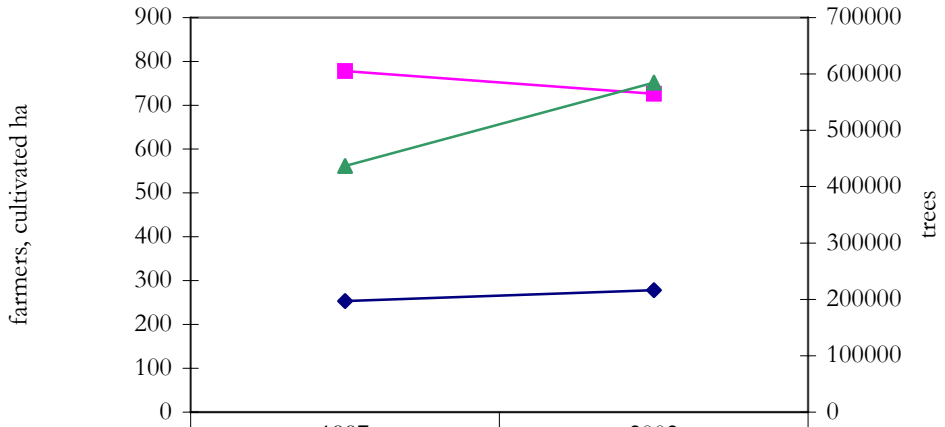
Annex 5: Development of the Structure of Apple Orchards from 1997 to 2002 in the Lake of Konstanz region



	1997	2002
famers	1854	1641
ha	6646	6338
trees	15543913	17620544

Source: Statistische Berichte Baden-Württemberg, Agrarwirtschaft, 27.01.2003, S. 4

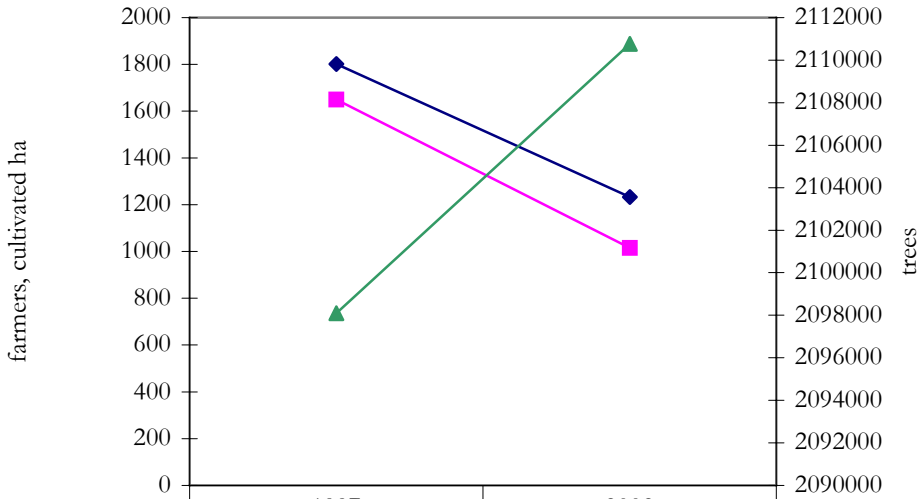
Annex 6: Development of the Structure of Pear Orchards from 1997 to 2002 in the Lake of Konstanz region



	1997	2002
famers	778	726
ha	253	278
trees	436464	584558

Source: Statistische Berichte Baden-Württemberg, Agrarwirtschaft, 27.01.2003, S. 4

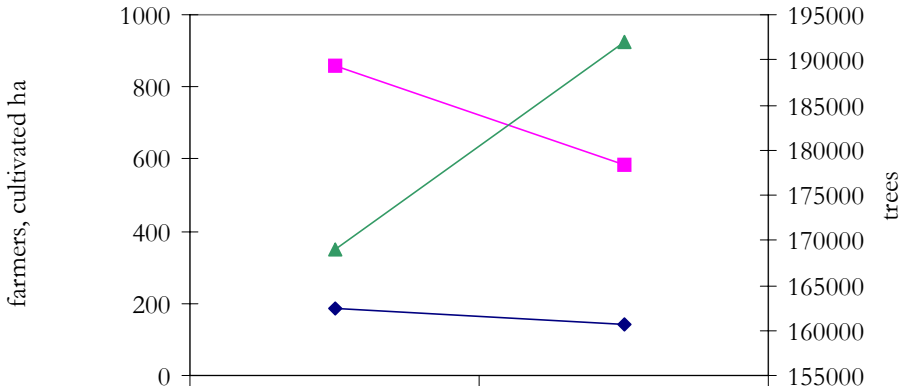
Annex 7: Development of the Structure of Apple Orchards from 1997 to 2002 in the Neckartal



	1997	2002
famers	1650	1015
ha	1802	1233
trees	2098092	2110769

Source: Statistische Berichte Baden-Württemberg, Agrarwirtschaft, 27.01.2003, S. 4

Annex 8: Development of the Structure of Pears Orchards from 1997 to 2002 in the Neckartal



	1997	2002
famers	857	584
ha	188	141
trees	169041	192070

Source: Statistische Berichte Baden-Württemberg, Agrarwirtschaft, 27.01.2003, S. 4

Annex 9: Producers' answer

Table 27 : Years of Membership in a PO

Nr. of Year	Nr. of Farmers	% of Farmers
5	1	6.25
8	1	6.25
9	1	6.25
10	1	6.25
15	2	12.5
20	7	43.75
25	2	12.5
30	1	6.25

Source: Own Inquiry 2005

Table 28 : Evaluation of Effects Supporting the Grouping by Producer Organisations

	increase in the variety of the offer to cover a longer period	diversification into other fruit type to satisfy the consumers wishes	monoculture of species which sell best	uniformity of cultural practices to obtain uniform products	concentrating packing and despatch operations in a limited number of places	transfer of the production from certain marginal zones into more productive zones
Nr. of Farmers						
no	8	7	7	10	12	13
little	2	5	6	2	2	1
big	0	0	2	1	0	0
do not know	6	4	1	3	2	2
% of Farmers						
no	50	43.75	43.75	62.5	75	81.25
little	12.5	31.25	37.5	12.5	12.5	6.25
big	0	0	12.5	6.25	0	0
do not know	37.5	25	6.25	18.75	12.5	12.5

Source: Own Inquiry 2005

Table 29 : Evaluation of the Effects of the Standardisation

	intensification of your production	reduction in the number of varieties	increase in the number of treatments which you apply to eliminate defects	the management of unacceptable production withheld from the market
Nr. of Farmers				
no	16	10	12	3
little	0	7	5	2
big	1	0	0	13
do not know	3	3	3	2
% of Farmers				
no	80	50	60	15
little	0	35	25	10
big	5	0	0	65
do not know	15	15	15	10

Source: Own Inquiry 2005

Table 30 : Reasons for the regrettable Effect of the Grouping of the Offer

	Nr. of Answers	% of Answers
bad prices	9	36
long contract duration	2	8
no security of being paid	4	16
producer organisations become too large	4	16
quality requirements too high	4	16
too much bureaucracy	2	8

(More than one possible answers)

Source: Own Inquiry 2005

Table 31 : Attended Measure of the Rural Development Program

	% of farmers	% of Answers
abandonment of herbicides (D.1)	5	1
organic production (D.2)	15	3
ground survey (A.1)	20	4
Streuobst orchards(C.1)	25	5
planting vegetation (E.3)	65	13
use of pheromones (F.3)	65	13

Source: Own Inquiry 2005

Table 32 : Reason for Clearings

	Nr. of Answers	% of Answers
age of trees	12	54.5
old fashioned variety	8	36.4
change of fruit	2	9.1

(More than one possible answers)

Source: Own Inquiry 2005