



**EVALUATION DE L'IMPACT ENVIRONNEMENTAL
DE L'ORGANISATION COMMUNE DE MARCHÉ DES
CULTURES PERMANENTES**

**ANNEXE 12 : OCM FRUITS
ETUDE NATIONALE PORTUGAL**

Novembre 2005

TABLE OF CONTENTS

1.	CONTEXT OF FRUITS PRODUCTION IN PORTUGAL.....	5
1.1	Mains characteristics of the fruits production in Portugal	5
1.1.1	Production of Fresh Fruit	5
1.1.2	Production of Nuts.....	9
1.1.3	Production of Citrus Fruit.....	10
1.1.4	Producer Organizations - POs	12
1.1.5	Withdrawals.....	16
1.2	Level of implementation of the various measures of the CMO in Portugal.....	18
1.3	Institutional framework of the fruits production in country	21
1.4	CMO implementation context in Portugal.....	21
2.	ANSWER TO EVALUATION QUESTIONS	23
2.1	Vertical questions relating to the fruits CMO	23
2.1.1	Fruits - Theme 1: market measures	23
2.1.2	Fruits – Theme 2: environmental measures.....	40
2.1.3	Fruits – Theme 3 structural measures.....	44
2.1.4	Fruits – Theme 4: nuts.....	50
2.1.5	Fruits – Theme 5: co-ordination with agri-environmental measures.....	55
2.2	Horizontal questions	64
2.2.1	Horizontal – Theme 1: land use over time	64
2.2.2	Horizontal – Theme 2: adequate spending level and method.....	68
2.2.3	Horizontal – Theme 3: subsidiarity of agri-environmental schemes and horizontal measures	72
	APPENDICES.....	80
	Annex 1: List of people met.....	80
	Annex 2: Main bibliography identified in relation with the study.....	80

TABLE INDEX

Table Q1F3 - 1. Orchard areas supported by the RDF and their relative importance against total area	45
Table Q1F3 - 2. Orchard areas supported by PAMAF (new plantations and restructurings)	46
Table Q1F3 - 3. Evolution of orchard areas supported by Measure 1 of AGRO	46
Table Q1F3 - 4. Evolution of the density of orchards between 1992 and 2002	47
Table Q1F3 - 5. Evolution of the irrigated area of orchards between 1992 and 1998	47
Table Q1F5 - 1. Agro-environmental measure of Reg. (EC) n. 2078 in 1998	56
Table Q1F5 - 2. Area in hectares of new orchards introduced within the integrated protection programme	60
Table Q1F5 - 3. Area in hectares of new orchards introduced within the integrated production programme	60
Table Q1F5 - 4. Area in hectares of new orchards introduced within the organic farming programme	61
Table Q1F5 - 5. Area in hectares introduced in the inter row grass sowing in permanent crops programme	61
Table Q1F5 - 6. Areas subject to aid within the Traditional Orchards measure	61
Table Q1F5 - 7. Comparison of the declared area (ha) of each fruit tree species in each AEM in the 2003/2004 campaign and the total area disclosed by INE (2002)	62

CHART INDEX

Chart 1. Evolution of the area (ha) and quantity (tonnes) of the production of Fresh Fruit	5
Chart 2. Evolution of area (ha) and quantity (tonnes) of the production of Apples	6
Chart 3. Evolution of the area (ha) and quantity (tonnes) of the production of Pears	7
Chart 4. Evolution of the area (ha) and quantities (tonnes) of the production of Peaches	8
Chart 5. Evolution of the area (ha) and quantity (tonnes) of the production of Nuts	10
Chart 6. Evolution of the area (ha) and quantity (tonnes) of the production of Citrus Fruit	11
Chart 7. Evolution of the number of POs	12
Chart 8. POs by category - 2002	13
Chart 9. Evolution of number of Members of POs	13
Chart 10. Marketed Quantities (TMQ) and Values (TMV) until 2003	14
Chart 11. TMV by type of fruit	15
Chart 12. TMQ by type of fruit	16
Chart 13. Fruit withdrawals	16
Chart 14. Fruit withdrawals – value (euros)	17
Chart 15. Level of Expenditure of all OFs (euros)	18
Chart 16. Distribution of total value of OFs by measures (euros)	19
Chart 17. Representation of measures in all OFs (%)	19
Chart 18. Distribution of OFs by measures (euros) for PO fruit and citrus fruit	20
Chart 19. Distribution of OFs by measures (euros) for PO fruit and citrus fruit	20
Chart Q1F1 - 1. Evolution of producers' organizations in number and importance since 1997	23
Chart Q1F1 - 2. Evolution of the value of production marketed by POs in terms of value and relative importance since 1997	24
Chart Q1F1 - 3. Evolution of the proportion of fruit marketed by POs, between 1998 and 2003 (%)	24
Chart Q1F1 - 4. Evolution of the production of fruits marketed by the 16 selected POs, in terms of value and weight in the total fruit production.	25
Chart Q1F1 - 5. Evolution of OFs of the 16 POs specialized in fruit and citrus fruit	25
Chart Q1F1 - 6. Evolution of the allocation of OF expenditure by the different measures.	26

Chart Q1F1 - 7. Evolution of the area of apple orchards in Portugal, between 1992 and 2002, by density class (trees/ha).	27
Chart Q1F1 - 8. Composition of the area of apple orchards in 1992.	28
Chart Q1F1 - 9. Composition of the area of apple orchards in 1998.	28
Chart Q1F1 - 10. Evolution of the area of the production of pears in Ribatejo e Oeste, between 1992 and 2002, by density class (trees/ha).....	29
Chart Q1F1 - 11. Composition of the regional area of pear orchards in 1992.....	29
Chart Q1F1 - 12. Composition of the regional pear area, in 1998.....	30
Chart Q1F1 - 13. Evolution of the area of the production of peaches, by density class (trees/ha). .	30
Chart Q1F1 - 14. Evolution of the area of orange orchards in the Algarve, between 1992 and 2002, by the different density classes.....	31
Chart Q1F1 - 15. Irrigation types in orchard farms, by agricultural region, in 1992.....	32
Chart Q1F1 - 16. Types of irrigation in orchard farms, by agricultural region, in 2002.	32
Chart Q1F1 - 17. Evolution of IC, by agricultural region, between 1992 and 2002.....	33
Chart Q1F1 - 18. Evolution of the importance of fruit withdrawals, in relation to their own production (%)	34
Chart Q1F1 - 19. Evolution of the value of fruit withdrawals, by product.....	34
Chart Q1F1 - 20. Destination of fruit withdrawn quantities, in 2002.	35
Chart Q2F1 - 1. Evolution of the area (ha) and quantity (tonnes) of the production of citrus fruit .	37
Chart Q2F1 - 2. Evolution of the relative importance of density classes of citrus fruit plantations (trees/ha).....	37
Chart Q2F1 - 3. Evolution of average national productivities of citrus fruit	37
Chart Q2F1 - 4. Evolution of orange and Clementine quantities delivered for processing.	38
Chart Q1F4 - 1. Comparison for 2003 between the Value of Production marketed by POs and total marketed production of nuts (values in euros)	51
Chart Q1F4 - 2. Evolution of nut areas subject to the shell-nut aid system (ha).....	52
Chart Q1F4 - 3. Evolution of the production of nuts subject of shell-nut aid (tonnes).....	52
Chart Q1F4 - 4. Evolution of areas by region of nuts receiving shell-fruit aid.....	53
Chart Q1F4 - 5. Comparison between (eligible) nuts area and area receiving aid payment per region.	54
Chart Q1H1 - 1. Evolution of the area (ha) of fruits throughout the 1990-2000 period	64
Chart Q1H1 - 2. Area of some fresh fruit orchards with subsidized grubbing, in 1999.	65
Chart Q1H1 - 3. Evolution of the pears production area in Ribatejo e Oeste, between 1992 and 2002, by density class (trees/ha).	66
Chart Q1H1 - 4. Regional composition of the area of pear orchards area, in 1992.	67
Chart Q1H1 - 5. Regional composition of the pears orchards area, in 1998.....	67
Chart Q1H1 - 6. Evolution of the average crop occupation on farms specialized in shell fruit.....	68
Chart Q1H2 - 1. Evolution of the CMO expenditure between 1999 and 2003.....	69
Chart Q1H2 - 2. Structure of CMO expenditure in 2003.....	70
Chart Q1H2 - 3. Structure of CMO expenditure with fresh fruits and vegetables (%), in 2003 (without banana aid).....	71
Chart Q1H3 - 1. Evolution of fruit and nuts production area in organic farming, since 1997.....	75

GLOSSARY

GPPAA – GABINETE DE PLANEAMENTO E POLÍTICA AGRO-ALIMENTAR

LVT – LISBOA E VALE DO TEJO

INGA – INSTITUTO DE INTERVENÇÃO E GARANTIA AGRÍCOLA

OP – OPERATIONAL PROGRAMS

PO'S – PRODUCER ORGANIZATION

PG – PRODUCER GROUP

OF'S – OPERATIONAL FUNDS

IFADAP – INSTITUTO FINANCEIRO DE APOIO AO DESENVOLVIMENTO AGRÍCOLA E DAS PESCAS

INGA - INSTITUTO NACIONAL DE GARANTIA AGRÍCOLA

INE – INSTITUTO NACIONAL DE ESTATÍSTICA

IDRHA - INSTITUTO DE DESENVOLVIMENTO RURAL E HIDRÁULICA

ENV - ESTAÇÃO VITIVINICOLA NACIONAL

INIA - INSTITUTO NACIONAL DE INVESTIGAÇÃO AGRARIA

AEM – AGRO – ENVIRONMENTAL MEASURES

1. CONTEXT OF FRUITS PRODUCTION IN PORTUGAL

1.1 Mains characteristics of the fruits production in Portugal

The existing orchard area in Portugal (fresh fruit, citrus fruit, subtropical fruit and nuts) in 1999 represented, according to the 1999 RGA-Recenseamento Geral de Agricultura (General Agricultural Census), a little over 159 thousand hectares of agricultural area, 20 thousands hectares less than in 1989.

From this area, more than 50% corresponds to **nut** orchards, 33% to **fresh fruit orchards** and around 15% to **citrus fruit orchards, subtropical fruit orchards** showing a residual value that is not over 2%.

In terms of number of farms, fresh fruit is the most significant crop (RGA99) with 65 thousand farms (25.5 thousand less than in 1989), followed by nuts with 51 thousand farms (560 more than in 1989) and citrus fruit with 46 thousand farms (11 thousand less than in 1989).

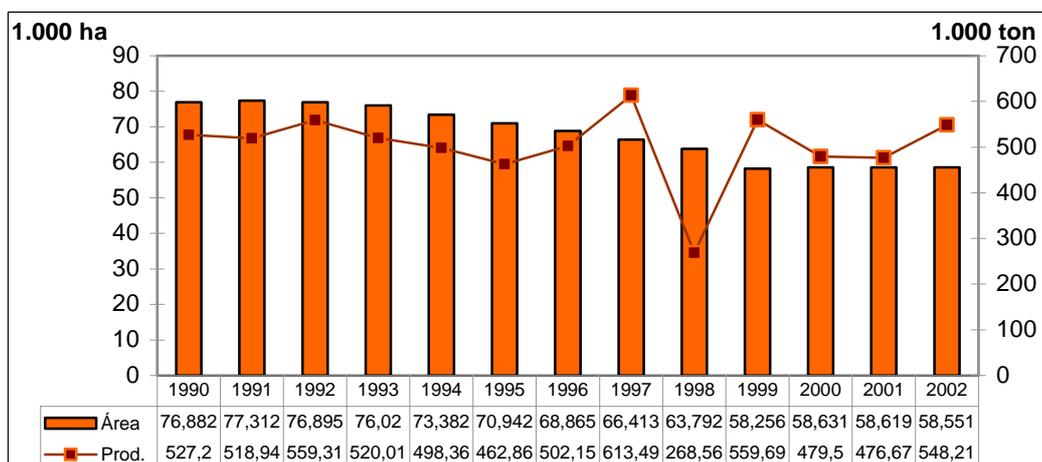
Portugal is divided into 7 big Regions (Entre-Douro-e-Minho, Trás-os-Montes, Beira Litoral, Beira Interior, Ribatejo e Oeste, Alentejo and Algarve), although in terms of RICA only 5 of them are considered (North, Centre, Lisboa e Vale do Tejo, Alentejo and Algarve).

1.1.1 Production of Fresh Fruit

The evolution of the area of fresh fruit in Portugal shows a predominantly degressive trend. From the analysis of the following chart, one verifies that, throughout the analysed period, the total area has decreased more than 18 thousand hectares, being just over 58 thousand hectares in 2002.

Produced quantities have remained practically constant throughout the period, with the exception of the 1997/1998 biennium, when an extremely significant production gap occurred.

Chart 1. Evolution of the area (ha) and quantity (tonnes) of the production of Fresh Fruit



Source: INE, Estatísticas Regionais de Produção Vegetal e Animal, 1990-2000

In regional terms, **fresh fruit** shows in 2000 its greatest expression in the LVT Region (46% of the area, 53% of production) followed by the North (21% of the area, 19% of the production) and Centre (19% of the area e 19% of production) Regions, significant changes having not occurred in these relations between 1990 and 2000.

The number of producing units of fresh fruit evolved as presented in the following table.

Table 1. Number of producing units in 1989 and 1999, by region.

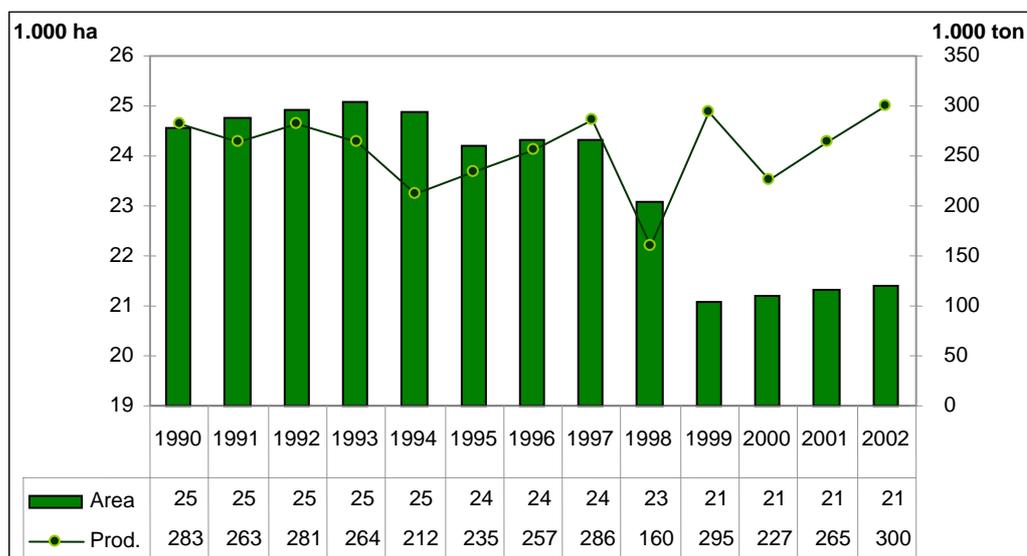
	1989		1999	
	Number of units	Área	Number of units	Área
Norte	20.778	10.694	19.236	10.919
Centro	17.820	14.672	14.560	10.332
Lisboa e Vale do Tejo	31.559	38.763	15.986	24.614
Alentejo	4.383	5.369	3.270	2.686
Algarve	10.728	6.217	8.425	3.791
Região Autónoma dos Açores	3.197	290	1.845	185
Região Autónoma da Madeira	1.867	261	1.450	219
<i>Portugal - fresh fruits</i>	90.332	76.266	64.772	52.746

Source: RGA89 and RGA99, INE

Apples - 1990/2002 evolution and representation

Apples represented, in 2000, around 36% of the area and around 47% of the total national production of fresh fruit, being the most representative crop, both in terms of area and in terms of output.

The evolution of areas and annual productions is schematized in the following chart.

Chart 2. Evolution of area (ha) and quantity (tonnes) of the production of Apples

Source: INE, Estatísticas Regionais da Produção Vegetal e Animal, 1990-2000

In spite of its high representation, the apple crop has lost 3 thousand hectares during the period under analysis, mainly between 1998 and 1999. In terms of quantities, the production of apples has suffered more or less significant annual fluctuations, ending the period to which this analysis refers at the same level as registered in 1990.

In terms of number of farms, according to RGA99, the production of apples occupied 35.4 thousand farms, 15 thousand less than in 1989.

	1989		1999		evolution 1989-99	
	Number of units	Area (ha)	Number of units	Area (ha)	units	area (ha)
Apple trees	50.282	27.306	35.476	20.001	-29%	-27%

In terms of regions, LVT is the most representative in what concerns both area and output (39% and 37%, respectively), although it has suffered a relatively important reduction in terms of area, in favour of both the Centre and North Regions of the country, maintaining, nevertheless, the same output level.

Table 2. Evolution of the relative regional importance of Apples in terms of area and produced quantity (1990-2003)

	Area				Production			
	1990		2000		1990		2000	
	ha		ha		ton		ton	
Norte	6 624	27%	6 500	31%	89 637	32%	69 968	31%
Centro	6 098	25%	5 625	27%	75 308	27%	59 190	26%
Ribatejo e Oeste (Lx. Vale Tejo)	11 033	45%	8 280	39%	99 840	35%	84 545	37%
Alentejo	458	2%	524	2%	13 887	5%	9 909	4%
Algarve	39	0%	32	0%	226	0%	291	0%
Regiões Autónomas	315	1%	252	1%	3 623	1%	2 842	1%
Portugal	24 567		21 213		282 521		226 745	

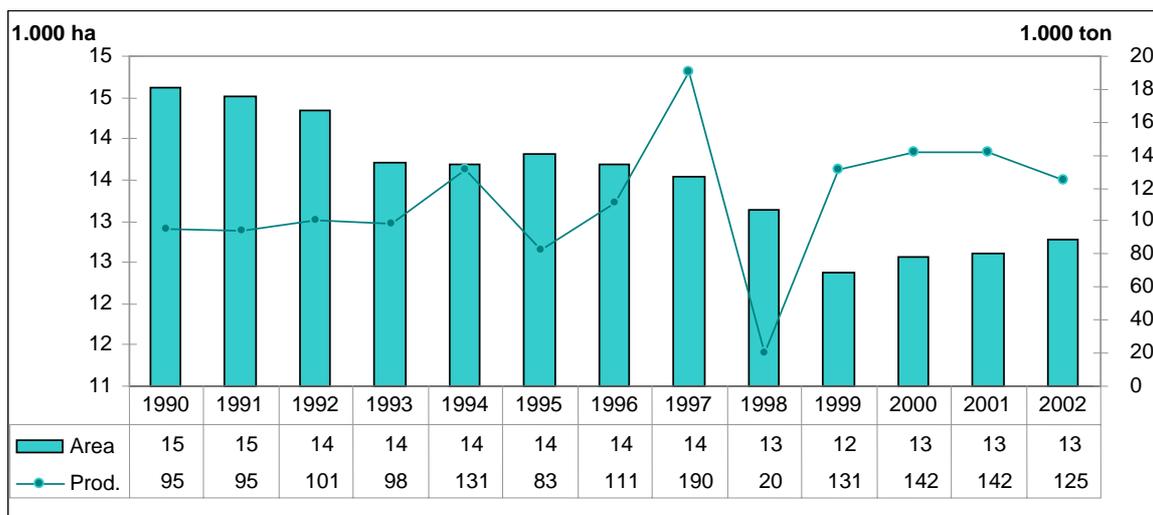
Source: INE, Estatísticas Regionais da Produção Vegetal e Animal, 1990-2000

Pears – 1990/1992 Evolution and representation

Pears represented, in 2000, 21% of the area (21.213 ha) and 30% of the quantity (226,745 tonnes) of the fresh fruit produced in Portugal.

The evolution of areas and annual productions is schematized in the following chart.

Chart 3. Evolution of the area (ha) and quantity (tonnes) of the production of Pears



Source: INE, Estatísticas Regionais da Produção Vegetal e Animal, 1990-2000

Observing the chart, one verifies that the pear crop has progressively lost, since 1990, around 2 thousand ha of planted area. In terms of produced quantities, in general, the evolution was not very significant, nevertheless with a particular emphasis on the drastic reduction in production verified from 1997 to 1998.

Table 3. Evolution of the relative regional importance of Pears in terms of area and produced quantity (1990-2003)

	Area				Production			
	1990		2000		1990		2000	
	ha	%	ha	%	ton	%	ton	%
Norte	1 053	7%	551	4%	5 876	6%	4 377	3%
Centro	1 203	8%	801	6%	6 391	7%	6 381	4%
Ribatejo e Oeste (Lx. Vale Tejo)	11 769	80%	10 826	86%	80 031	84%	128 007	90%
Alentejo	249	2%	228	2%	804	1%	1 687	1%
Algarve	265	2%	117	1%	1 058	1%	1 053	1%
Regiões Autónomas	88	1%	47	0%	570	1%	330	0%
Portugal	14 627		12 570		94 730		141 835	

Source: INE, Estatísticas Regionais da Produção Vegetal e Animal, 1990-2000

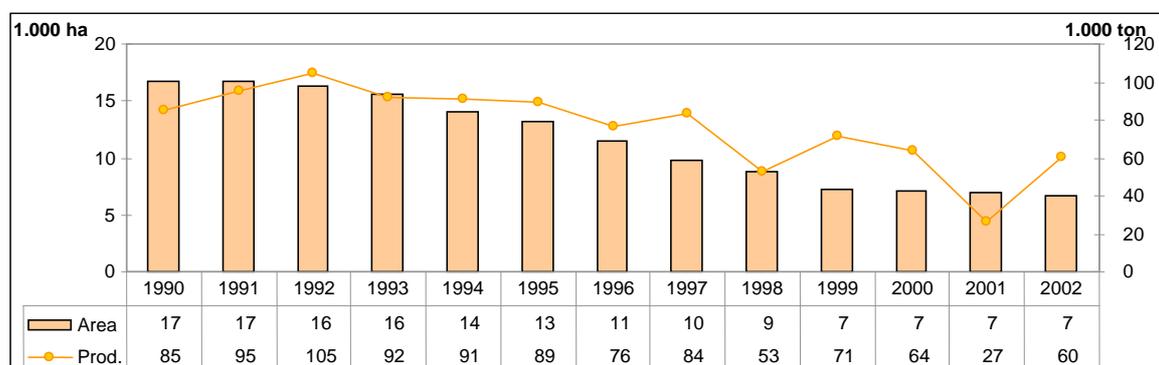
The number of farms producing pears in 1999 amounted to 22 thousand, 9 thousand less than ten years before.

	1989		1999		evolution 1989-99	
	Number of units	Area (ha)	Number of units	Area (ha)	units	area (ha)
Pears trees	31.022	14.402	22.109	11.983	-29%	-17%

The production of pears is traditionally linked to RO-LVT, a region which represented, in 2000, more than 86% of the area and 90% of the quantity produced in Portugal, followed, in terms of representation, by the Centre Region, although with a much smaller expression in terms of area and quantity.

Peaches - 1990/2002 evolution and representation

In 2000, the peach crop represented 12% of the area and 13% of the quantity produced at a national level. From the point of view of evolution, since 1990, the area of this crop has suffered a progressive but extremely significant reduction, losing in twelve years around 9600 ha of planted area. The produced quantity followed the decreasing trend of the area, reaching, in the 2001-2002 biennium, two of its lowest values since 1999 – 27,000 and 60,000 tonnes, respectively. This evolution can be followed in the following chart.

Chart 4: Evolution of the area (ha) and quantities (tonnes) of the production of Peaches

Source: INE, Estatísticas Regionais da Produção Vegetal e Animal, 1990-2000

Since 1989, the number of peach producing farms has suffered a significant reduction (less 11 thousand farms), ending the last year of this analysis with around 18 thousand farms.

	1989		1999		evolution 1989-99	
	Number of units	Area (ha)	Number of units	Area (ha)	units	area (ha)
Peach trees	29.297	16.722	18.347	6.729	-37%	-60%

Table 4. Evolution of the relative regional importance of Peaches in terms of area and produced quantity (1990-2003)

	Area				Production			
	1990		2000		1990		2000	
	ha	%	ha	%	ton	%	ton	%
Norte	1 371	8%	830	12%	7 166	8%	4 887	8%
Centro	3 937	23%	1 806	25%	18 267	21%	18 346	29%
Ribatejo e Oeste (Lx. Vale Tejo)	8 140	48%	3 307	46%	47 036	55%	29 873	47%
Alentejo	2 075	12%	647	9%	8 022	9%	3 892	6%
Algarve	1 260	7%	538	8%	4 509	5%	6 456	10%
Regiões Autónomas	23	0%	22	0%	116	0%	141	0%
Portugal	16 806		7 149		85 116		63 596	

Source: INE, Estatísticas Regionais da Produção Vegetal e Animal, 1990-2000

From a regional point of view, the LVT Region is the most representative in the country, contributing with the largest area and the highest produced quantity (46% e 47%, respectively), followed by the Centre Region (25% of the area and 29% of the quantity). From 1990 to 2000 there were no significant changes in the relative regional representations.

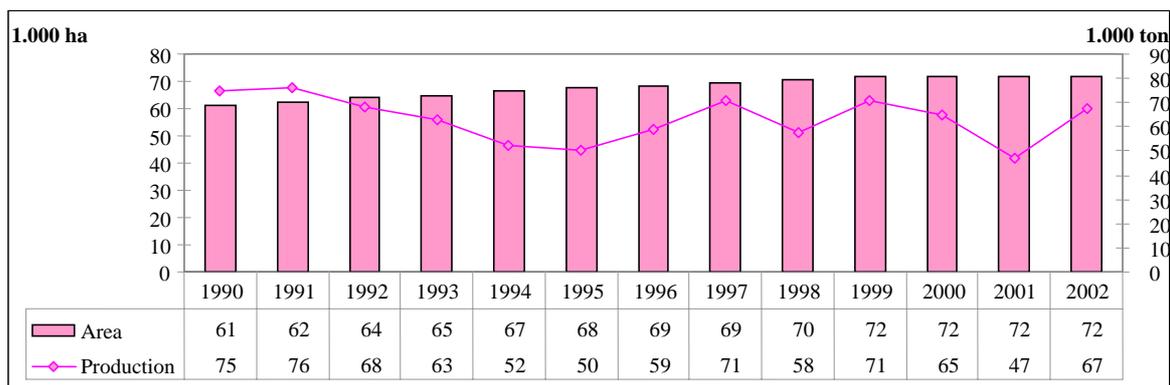
1.1.2 Production of Nuts

The area of nuts in Portugal has decreased around 18 thousand ha between 1990 and 2002, occupying around 78 000 ha in this last year.

From the total area, more than 45% (RGA1999 data) refers to the almond tree crop (16% less than in 1989), around 34% to the chestnut tree crop (a 14% increase against 1989) and 16% to the carob tree crop.

According to RGA99, the number of farms producing nuts suffered a slight decrease between 1989 and 1999. This decrease was accompanied by an increase of the area.

	1989		1999		evolution 1989-99	
	Number of units	Area (ha)	Number of units	Area (ha)	units	area (ha)
Chesnut tree	17.536	15.176	22.660	27.713	29%	83%
Carob tree	10.906	10.214	9.191	12.670	-16%	24%
Almond trees	29.712	45.269	24.522	36.530	-17%	-19%
Hazelnut trees	1.246	1.379	915	636	-27%	-54%
Walnut trees	4.178	1.765	5.203	2.751	25%	56%
<i>Portugal - shell fruits</i>	63.578	73.803	62.491	80.300	-2%	9%

Chart 5. Evolution of the area (ha) and quantity (tonnes) of the production of Nuts

Source: INE, Estatísticas Regionais da Produção Vegetal e Animal, 1990-2000

Nuts prevail in the North Region (69% of the area and 85% of the production), which is followed, in terms of area, by the Algarve Region (19%) and, in terms of production, by the Centre Region (9%).

Table 5. Evolution of the relative regional importance of Nuts in terms of area and produced quantity (1990-2003)

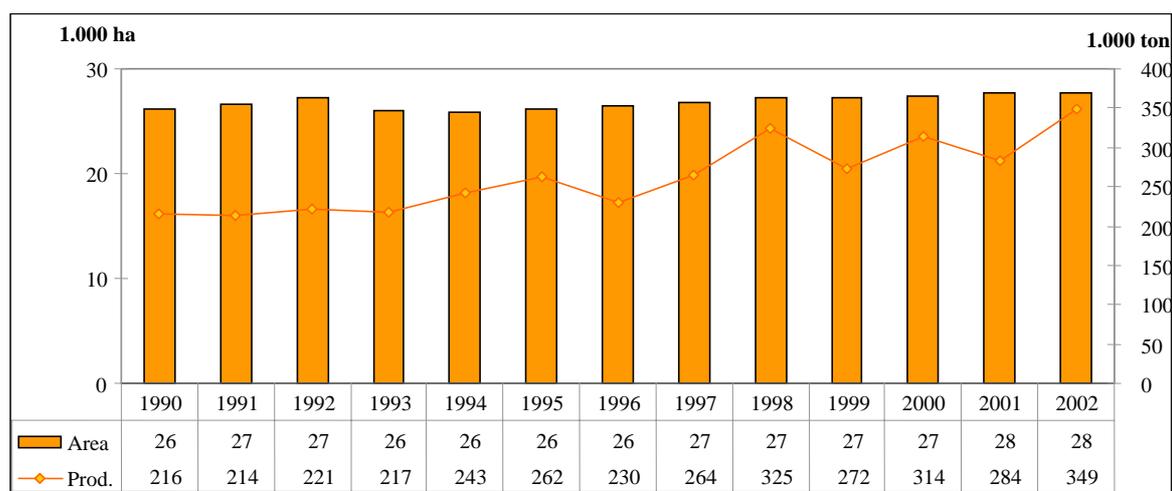
	Area				Production			
	1990		2000		1990		2000	
	ha	ha	ha	ha	ton	ton	ton	ton
Norte	35 788	59%	49 392	69%	54 348	73%	55 359	85%
Centro	6 407	10%	5 875	8%	6 286	8%	5 716	9%
Ribatejo e Oeste (Lx. Vale Tejo)	646	1%	760	1%	1 275	2%	762	1%
Alentejo	1 708	3%	1 625	2%	2 766	4%	1 082	2%
Algarve	16 501	27%	13 817	19%	9 783	13%	1 850	3%
Regiões Autónomas	115	0%	179	0%	155	0%	158	0%
Portugal	61 165		71 648		74 613		64 926	

Source: INE, Estatísticas Regionais da Produção Vegetal e Animal, 1990-2000

From the 1990-2000 evolution, the change in the relative regional importance of the Algarve Region stands out, having lost 16% of its area 81% of its production, corresponding to a loss of relative regional importance of 8% in terms of area and 10% in terms of production.

1.1.3 Production of Citrus Fruit

The total area of citrus fruit in 2000 was over 27 500 ha, with a positive evolution since 1994, when it had reached a minimum.

Chart 6. Evolution of the area (ha) and quantity (tonnes) of the production of Citrus Fruit

Source: INE, Estatísticas Regionais da Produção Vegetal e Animal, 1990-2000

Produced quantities followed the evolution trend of the total planted area, reaching 349,000 tonnes in 2000.

According to RGA99, there is a decrease of around 11 thousand farms in citrus fruit producing farms, their number amounting to 45,863 in 1999.

	1989		1999		evolution 1989-99	
	Number of units	Area (ha)	Number of units	Area (ha)	units	area (ha)
Citrus fruit trees	57.260	26.759	45.863	23.453	-20%	-12%

Table 6. Evolution of the relative regional importance of Citrus Fruit in terms of area and produced quantity (1990-2003)

	Area				Production			
	1990		2000		1990		2000	
	ha	%	ha	%	ton	%	ton	%
Norte	1 371	5%	1 289	5%	10 223	5%	13 754	4%
Centro	1 196	5%	1 547	6%	7 808	4%	18 132	6%
Ribatejo e Oeste (Lx. Vale Tejo)	4 765	18%	3 419	12%	42 031	19%	40 203	13%
Alentejo	1 918	7%	2 245	8%	13 326	6%	21 115	7%
Algarve	15 697	60%	17 892	65%	132 162	61%	211 625	68%
Regiões Autónomas	1 153	4%	1 027	4%	10 272	5%	8 674	3%
Portugal	26 100		27 419		215 822		313 504	

Source: INE, Estatísticas Regionais da Produção Vegetal e Animal, 1990-2000

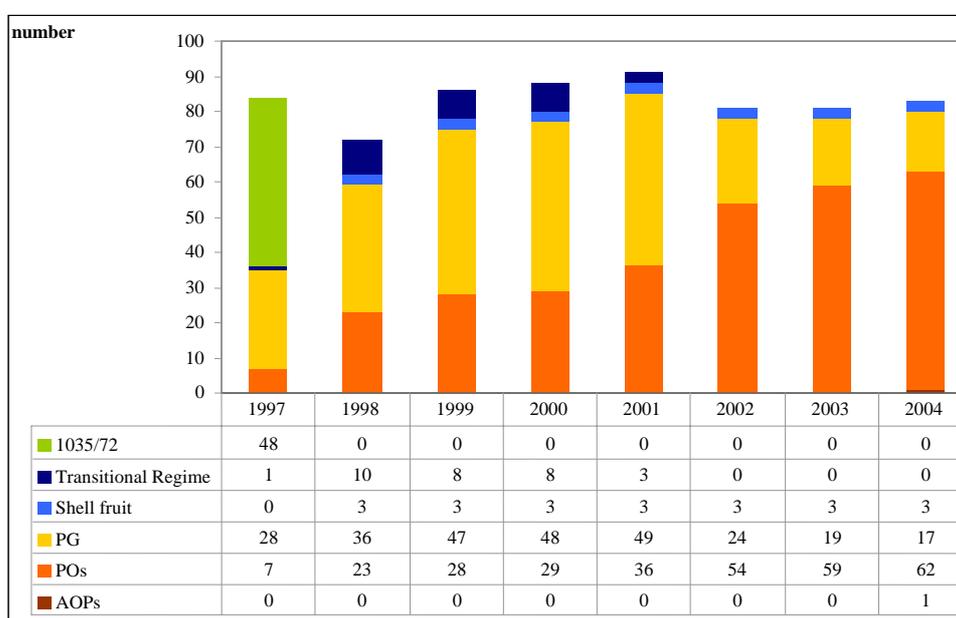
In regional terms, the Algarve Region was in 2000 the most important region in terms of area and in terms of production, with 65% of the national planted area and 68% of the total production. The LVT Region follows with 12% and 13% of area and production, respectively. The evolution of processed citrus fruit production is presented in the next table.

(values in tons)	93/94	94/95	95/96	96/97	97/98	98/99	99/2000	2000/01	2001/02	2002/03	2003/04
Citrus fruit production	216.629	242.638	262.284	229.536	264.193	324.742	272.409	313.504	283.858	349.091	357.958
Orange production	173.080	189.198	208.241	178.210	211.419	270.251	211.375	255.548	222.055	277.295	279.547
(source: INE)											
oranges to processing industries	6.880	13.500	9.964	14.101	26.476	14.442	7.292	26.370	16.202	36.939	20.035
clementinas to processing industries	0	0	455	766	3.894	84	961	78	1.398	2.006	3.463
(source: GPPAA)											

1.1.4 Producer Organizations - POs

From the point of view of evolution of POs (Art. 11 e 14 from Reg. 2200/96, Reg. 1035/72 before 1998, and Artº 13 Reg. 2200/96 from 1998 onwards), one verifies that the number of POs/PGs has not varied significantly throughout the 7 years represented in the charts, with 81 POs/PGs in 2003 according to data made available by GPPAA, the same number as in the previous year.

Chart 7. Evolution of the number of POs

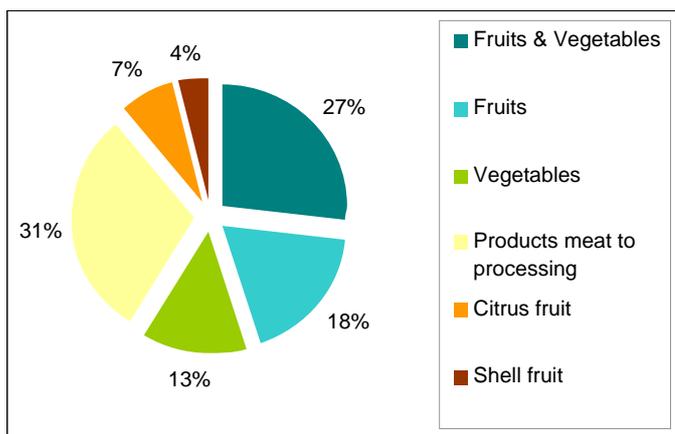


Source: GPPAA 1997-2004

Nevertheless, the relative expression of each type of entity changed as time went by. Naturally, the representation of PG, which has reached a maximum in 2001, decreased with time, changing from 49%, in that year, to just 17% of the whole of the analysis in 2004. In the same context, POs increased from 7, in 1997, to more than 60 in 2004.

In 2002, from the more than 80 POs, 22 referred to *fruit and vegetables*, 15 exclusively to *fruit*, 11 exclusively to *vegetables*, 25 to *products meant for processing*, 6 to *citrus fruit* and just 3 to *shell-fruit*. The relative representation is shown in the following chart.

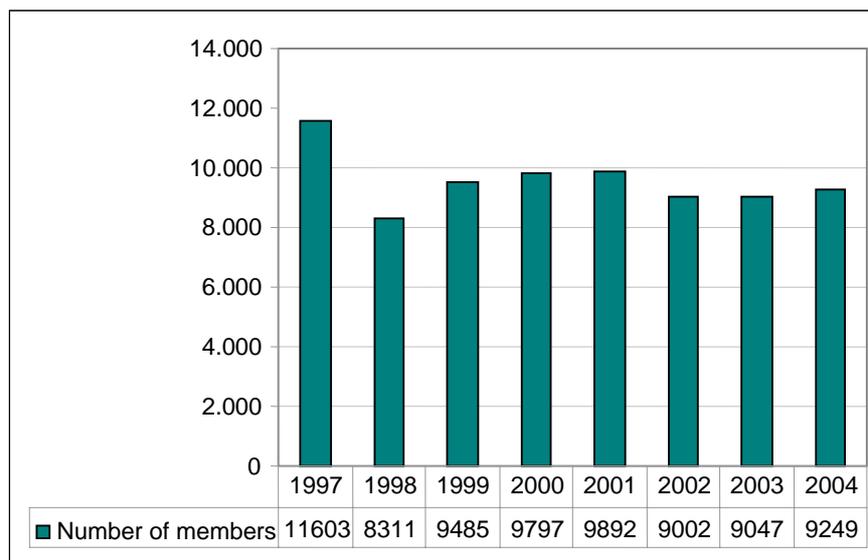
Chart 8. POs by category - 2002



Source: GPPAA 2002

From the point of view of number of members, in an analysis carried out for the whole set, the fluctuations have little significance, mainly in the last 5 or 6 years.

Chart 9. Evolution of number of Members of POs



Source: GPPAA 1997-2004

Between 1997 and 2004, the most significant number of members was found in the first year (11603), the minimum number in 1998 (8311), remaining steady at 9249 members in 2004.

The value of marketed production registered a positive evolution between 1997 and 2003, of over one hundred and seventy million euros (173,857,743) in the last year under analysis (chart 10), 74 million more than in 1997.

In 2002, PGs represented 18% of about 128 marketed million euros.

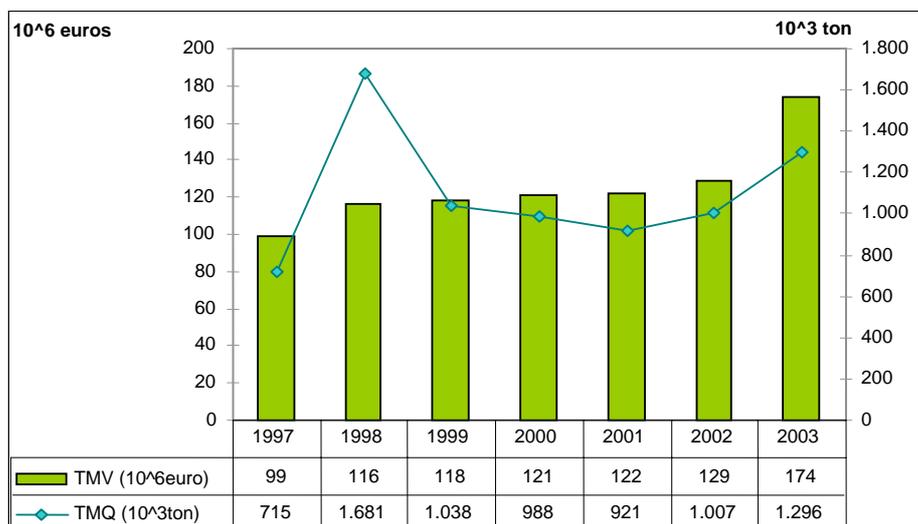
Table 7. CMV Classes

CMV Class (€)	Year	number of Pos	Region
> 1 000 000	2001	23	1 TM; 1 BL; 1 BI; 16 RO; 1 ALT; 3 AG
	2002	36	1TM; 2 BL; 2 BI; 24 RO; 3 ALT; 4 AG
	2003	45	2 EDM; 2 TM; 3 BL; 2 BI; 26 RO; 5 ALT; 5 AG
500 000 - 1 000 000	2001	12	2 RO; 7 ALT; 3 AG
	2002	13	2 TM; 2 BL; 6 RO; 2 ALT; 1 AG
	2003	13	1 TM; 2 BL; 7 RO; 1 ALT; 2 AG
< 500 000	2001	3	1 TM; 1 RO; 1 AL
	2002	2	1 RO; 1 AG
	2003	0	

When o Source: GPPAA – 2001-2003

observing table 6, where POs are shown by classes of marketed values (CMV), one verifies that the number of POs with more than 1 million marketed euros has doubled between 2001 and 2003.

Chart 10. Marketed Quantities (TMQ) and Values (TMV) until 2003



Source: GPPAA 1997-2003

Quantities marketed by POs evolved in a less linear way. After a significant increase between 1997 (715,268 tonnes) and 1998 (1,680,748 tonnes), they have decreased until 2001, to rise again until 2003, when nearly one million three hundred thousand tonnes (1.295.868 tonnes) were registered.

From the universe of existing POs/PGs in 2003, only 16 refer exclusively to fruit (see list). In terms of expression, this group represented 14%, 15% and 23% of the total value of the universe under analysis in the years 2001, 2002 and 2003, respectively.

The list is shown as follows.

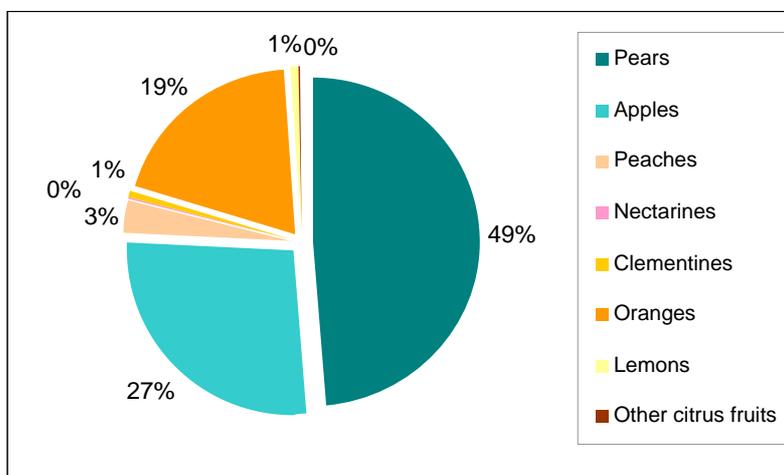
Table 8. Fruit and citrus fruit POs

Denomination	Category
FRUTOESTE - Cooperativa Agrícola Hortofruticultores do Oeste, CRL	i) Fruits & Vegetables
Cooperativa Agrícola Fruticultores Beira Alta, CRL	ii) Fruits
FRUCAR - Comércio de Frutas, Lda	ii) Fruits
Cooperativa Agrícola do Távora, CRL	ii) Fruits
Cooperativa Agrícola de Mangualde, CRL	ii) Fruits
Cooperativa Agrícola dos Fruticultores da Cova da Beira, CRL	ii) Fruits
FRUBAÇA - Cooperativa Hortofrutícola, CRL	ii) Fruits
Cooperativa Agrícola do Bombarral, CRL	ii) Fruits
SOMA - Sociedade Agro-Comercial da Maçã, Lda	ii) Fruits
CPF - Centro de Produção e Comercialização Hortofrutícola, Lda.	ii) Fruits
FRUTUS - Estação Fruteira de Montejunto, CRL	ii) Fruits
FRUTARADE - Cooperativa de Fruticultores de Silves, CRL	v) Citrus fruit
TAVIFRUTA - Sociedade de Citricultores de Tavira, Lda	v) Citrus fruit
FRUSOAL - Frutas do Sotavento Algarvio, Lda	v) Citrus fruit
CACIAL - Cooperativa Agrícola dos Citricultores do Algarve, CRL	v) Citrus fruit
CITRIPOR - Cooperativa de Citrinos de Portugal, CRL.	v) Citrus fruit

Source: GPPAA -2003

When analysing the graphic representation of marketed value (TMV) by type of fruit, one easily realizes that pears are the most representative fruit, in terms of value, of the whole of fruit and citrus fruit, with around 49% of the marketed value in 2003, followed by apples with 27%.

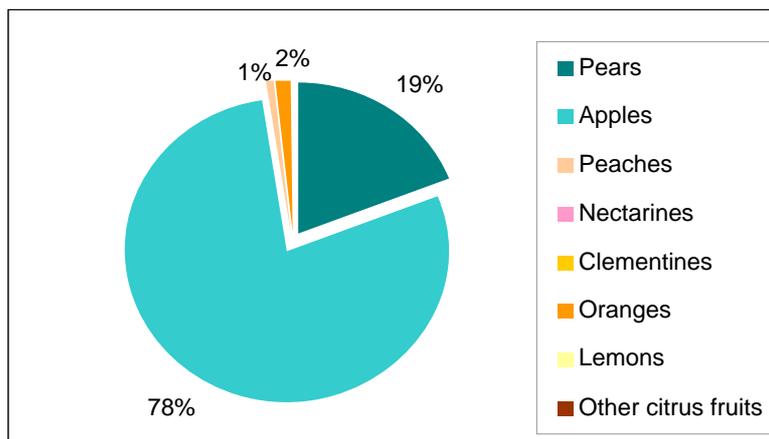
Chart 11. TMV by type of fruit



Source: GPPAA 2003

In terms of marketed quantities, positions are clearly inverted. Apples are the most marketed fruit, in terms of quantity, with 78%, followed by pears which, in 2003, represent just 19% of the quantity of marketed fruit (see chart).

Chart 12. TMQ by type of fruit



Source: GPPAA 2003

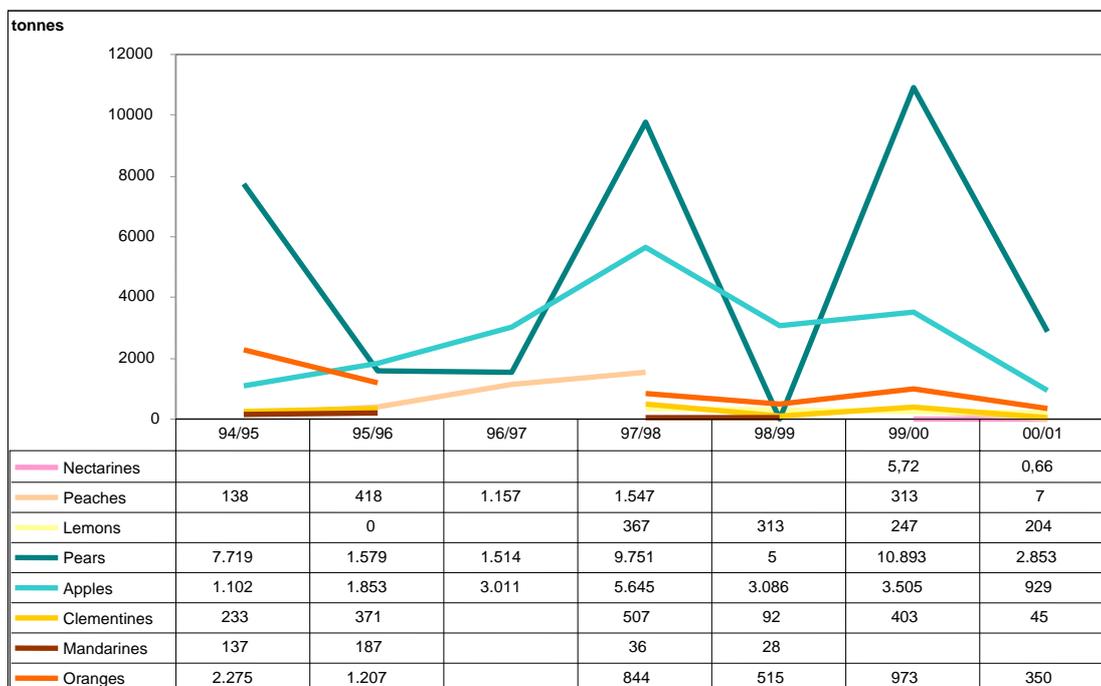
1.1.5 Withdrawals

Fruit withdrawals are characterised by seasonality, annual variation of withdrawn quantities according to market and weather conditions, type of withdrawn products and variety of locations within the country where withdrawals are carried out.

As the expression points out, fruit withdrawals consist of fruit, i.e., organic matter. Although organic matter is a natural element in Nature and indispensable for the good functioning of soils, when highly concentrated it can generate significant impacts on the receiving media, like water or the soils themselves.

Withdrawals of fruit in Portugal throughout the 1994-2001 period are graphically represented in the following picture.

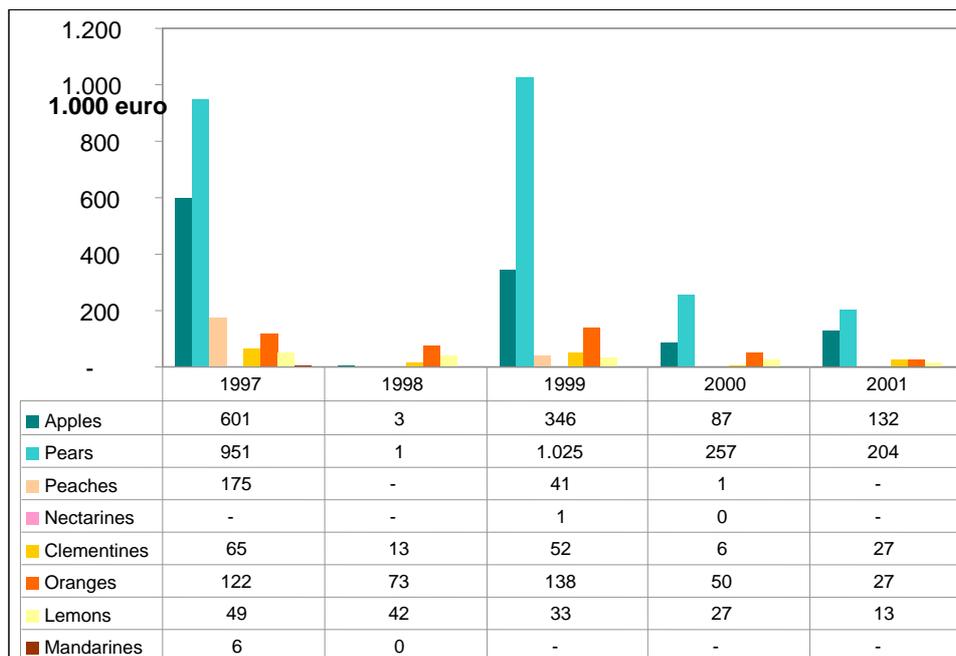
Chart 13. Fruit withdrawals



Source: AGRIC/4-1994/2001

In Portugal, pears and apples are the most frequently withdrawn types of fruit and those which, in terms of quantity, have a more significant expression against the whole total and throughout the analysed period.

Chart 14. Fruit withdrawals – value (euros)



Source: AGRIC/4-1997/2001

Environmentally acceptable destinations for fruit withdrawals are established in community and national legislation, as follows: Distribution free of charge, non-food purposes, animal feeding, distillation and composting/biodegradation.

Table 9. Destinations of fruit withdrawals-2002/03 (tonnes)

	Distribution Free of Charge 1c	Animal Feeding 1e
Nectarines	3,6	
Peaches	43,12	
Lemons	51,57	
Pears	462,34	712,46
Apples	1.053,20	196,8
Clementines	46,7	
Oranges	534,52	
	1c Reg. 2200/96 art 30 1a)1° e 2°P	
	1e Reg. 2200/96 art30 1a) 5°P	

Source: AGRIC/4 -2002/03

According to available information, in the 2002/2003 campaign in Portugal, the main destination of fruit withdrawals was distribution free of charge, with the exception of a residual fraction of pears and apples which were destined to animal feeding.

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

The number of the whole of POs/PGs kept relatively stable between the years of 1997 e 2004, there being nevertheless significant changes in the relative position of each one of them.

In 2001 there were 49 PGs for 36 POs, the relation having changed from 17 PGs to 62 POs in 2004.

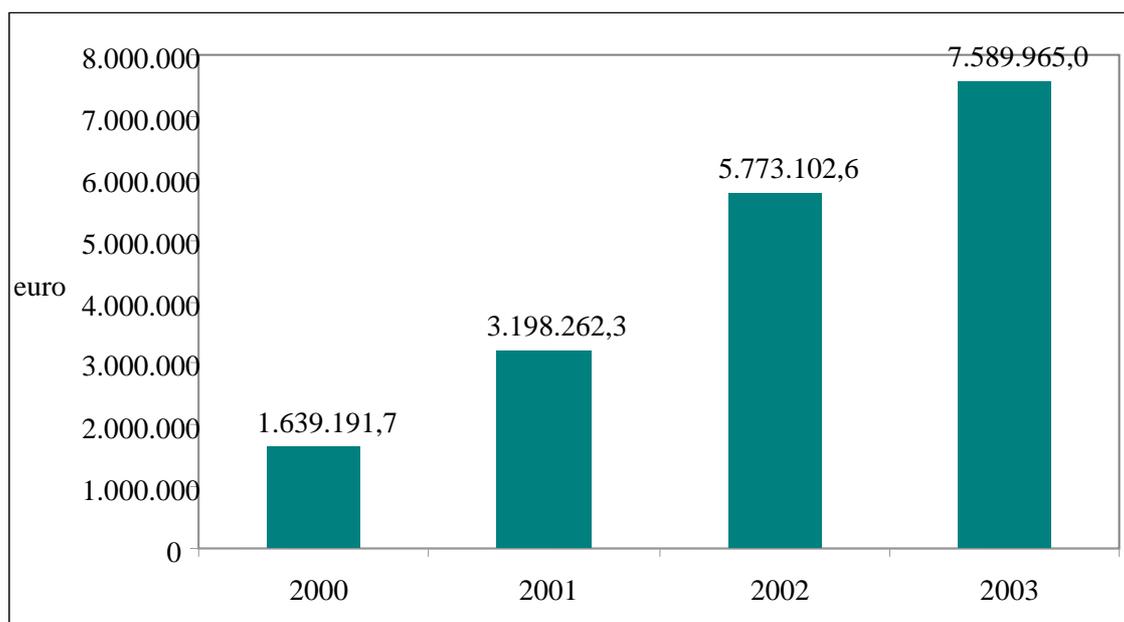
In 2002 there were 22 fruit and vegetables POs, 15 fruit POs, 11 vegetables PO's, 25 POs for products destined for processing, 6 citrus fruit and only 3 shell-fruit POs.

In terms of members (producers), one verifies that their evolution since 1998 has been of little significance, remaining steady at 9,249 producers in 2004.

From the universe of existing POs/PGs in 2003, only 16 refer exclusively to fruit (see list). In terms of expression, this set represented 14%, 15% and 23% of the total universe under analysis for the years 2001, 2002 and 2003, respectively.

In what concerns amounts involved in **operational funds**, since 2000, inclusive, there is a positive evolution trend, reaching, in 2003, 7.5 million euros, 4.6 times more than in 2000.

Chart 15. Level of Expenditure of all OFs (euros)



Source: GPPAA - 2000-2003

Operational Funds are composed of the following measures:

1: Action plan

2-1: Production – Technical measures (phytosanitary measures, irrigation, machinery, greenhouses, facilities, R&D)

2-2: Production - Services, training and research (advice, alert _ hail, frost and diseases _, training courses and R&D)

2-3: Production – Special environmental measures (Biological/Integrated production, R&D)

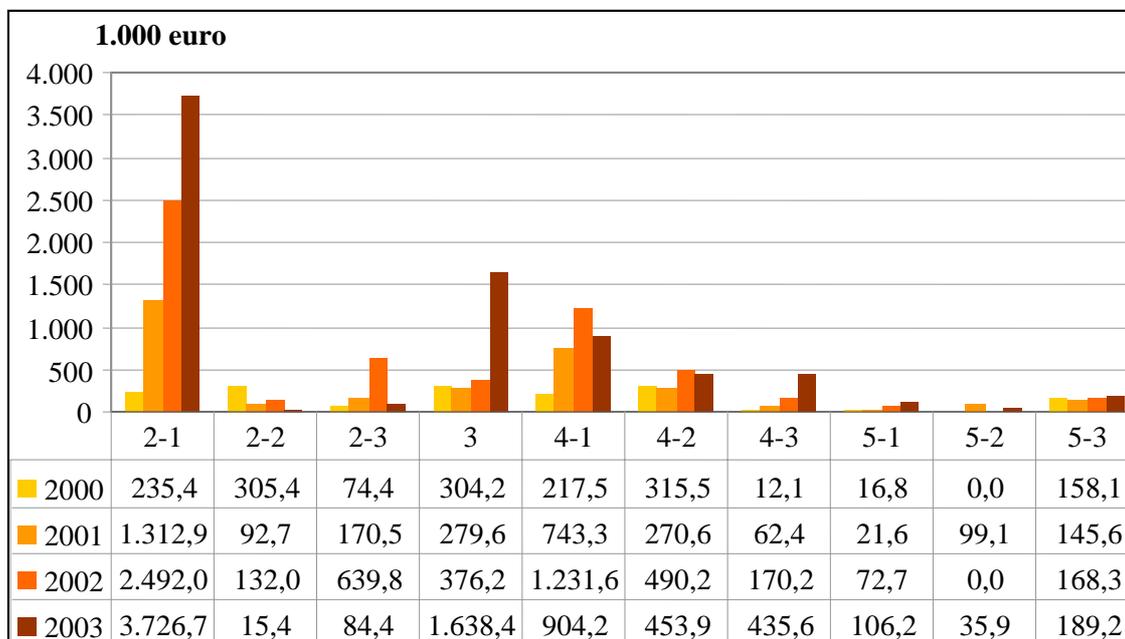
3: Control – Quality and phytosanitary measures (equipment, expenses with personnel, (incl. waste analysis), R&D) (Art 15§4(c))

4-1: Marketing – Technical measures (land, real estate, storage, packing, transportation, R&D)

4-2: Marketing - Sales, promotion and outlet (planning of production, market analysis, sales offices, promotion and R&D)

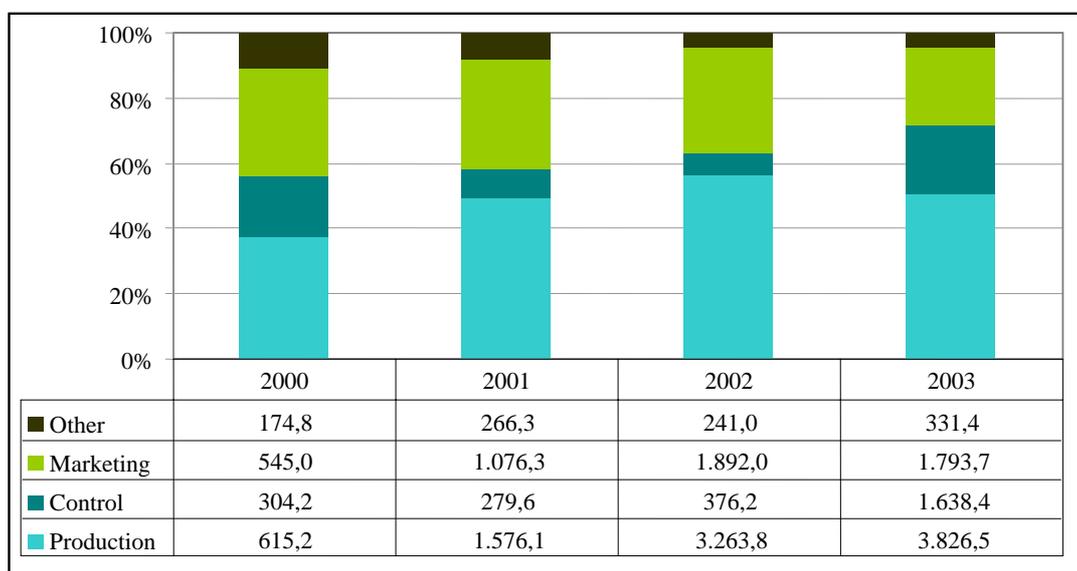
- 4-3: **Marketing** - Special environmental measures (waste management, additional transportation expenses, research and R&D)
- 5-1: **Other** – General expenses (admin. expenses)
- 5-2: **Other** – Mergers and acquisitions
- 5-3: **Other** - Other (ISO 9000 systems, other (specify))

Chart 16. Distribution of total value of OFs by measures (euros)



Source: GPPAA - 2000-2003

Chart 17. Representation of measures in all OFs (%)

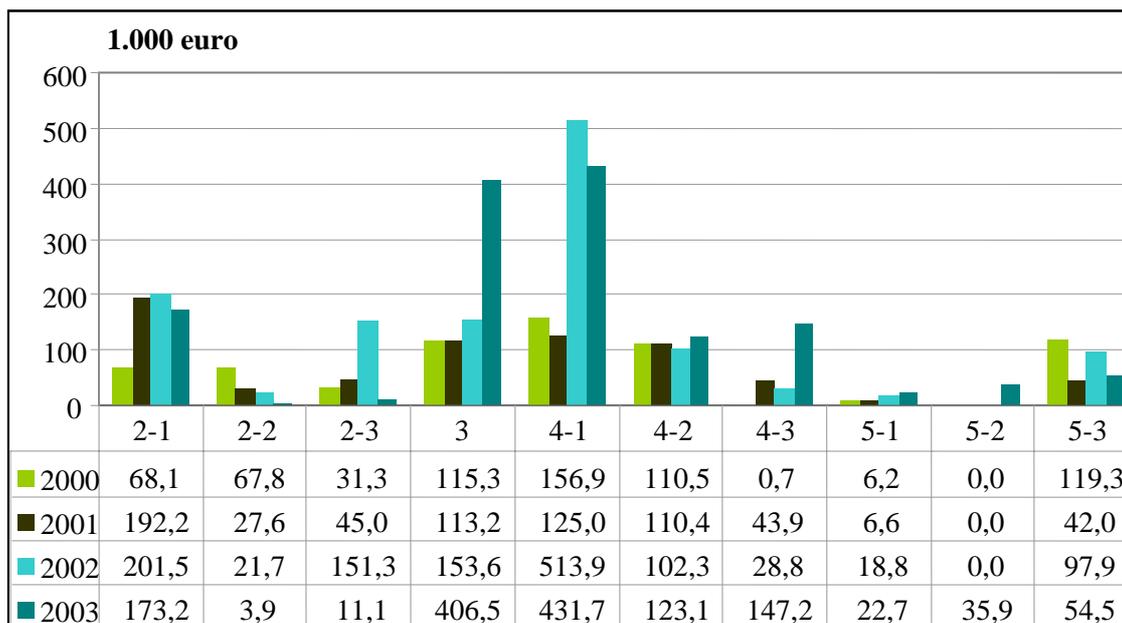


Source: GPPAA - 2000-2003

From the observation of charts above one verifies that around 50% of the amounts spent in the years under analysis had to do with *production* measures, which are the most representative. In terms of relative importance follows the set of *marketing* measures, *control* e *other* measures being deferred to a third and fourth plan.

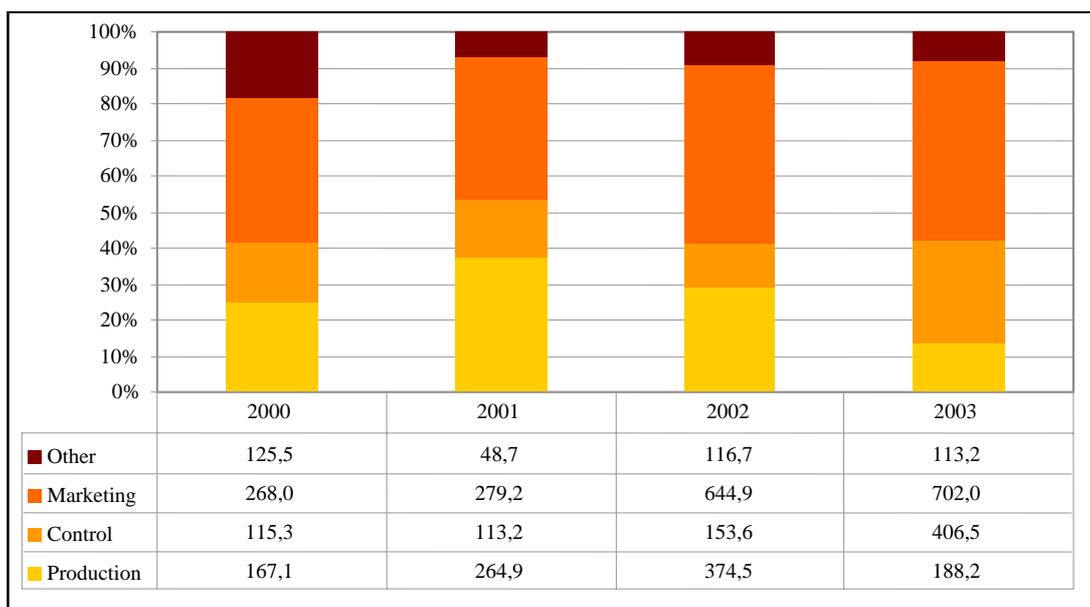
The same analysis is made exclusively for the set of **POs that markets fruit and citrus fruit.**

Chart 18. Distribution of OFs by measures (euros) for PO fruit and citrus fruit



Source: GPPAA - 2000-2003

Chart 19. Distribution of OFs by measures (euros) for PO fruit and citrus fruit



Source: GPPAA - 2000-2003

The first conclusion that one should draw has to do with the relative importance of the set of 16 POs now under consideration, in terms of expenses, against the total operational funds. When observing the figures, one verifies that in 2000, 2001, 2002 and 2003, the 16 POs represented 41%, 22%, 22% and 19% of the funds spent during those years, respectively.

That, from this set, measures 3 and 4.1 was the most representative in 2003, with a very significant increase of expenditure in what concerns measure 4.3 since 2002 and a quite relevant decrease in what concerns measure 2.3.

In general terms, in this subgroup, measures related to marketing were the ones generating more expenditure, followed at a great distance by expenditure with measures relating to production.

1.3 Institutional framework of the fruits production in country

For the Development measures, there are two institutions: IFADAP/INGA and Instituto de Desenvolvimento Rural e Hidráulica (IDRHa), the first one responsible for AEM with physical controls made by its regional structures, and the second through the application of special environmental measures, as will be detailed below.

The AEM are integrated in the Ruris Programme.

Still within RURIS is included the support of farms and management of support to marketing and processing. The physical controls are made by the IFADAP structures.

Concerning AEM, IFADAP is also supported by its regional structures, which co-ordinate and manage measures and perform the physical control of measures, although such measures are within a frame of a programme called RURIS, for which there is a manager.

Payment of all above mentioned supports are the responsibility of one sole paying agency, Instituto Nacional de Garantia Agrícola, IFADAP/INGA

Institutions for management and payment of premiums :

Instituto Nacional de Intervenção e Garantia Agrícola (INGA)– Entity paying OFs
Gabinete de Planeamento e Política Agro-Alimentar(GPPAA) – Entity deciding OFs
Instituto de Financiamento e Apoio ao Desenvolvimento da Agricultura e Pescas (IFADAP)

Control institutions

Direcção Geral de Fiscalização e Controlo da Qualidade Alimentar (GFCQA) – horizontal safety and quality rules, etc.
Instituto Nacional de Intervenção e Garantia Agrícola (INGA)– Entity paying OF

Research institutes

Instituto Nacional de Investigação Agrária - INIA
Centro Operativo e Tecnológico Hortofruticola Nacional

Statistics institutes

Instituto Nacional de Estatística (INE)

1.4 CMO implementation context in Portugal

There is a relatively poor implementation of fruit CMOs in Portugal, since fruit marketed through POs represents only 8% of the value of marketed production.

POs follow their associated producers' methods through the establishment of specification sheets and field collection of information in order to ensure their certification and food safety to consumers.

Withdrawals have already represented 0.4% (1997) of the value of marketed production and represent today a much more negligible value.

Marketing rules for fruit and vegetables are in force and have to apply at all stages of the marketing process and to all intervening operators, except for the cases provided for under article 3 of Reg. 2200/96 of 28th October.

They are currently being applied by most fruit and vegetable operators registered as such in Direcção Geral de Fiscalização e Controlo de Qualidade Alimentar (Directorate-General for the

Supervision and Control of Food Quality) (around 9,500) at the level of continental and insular territories.

In what concerns the change of the aids system to the processing of citrus fruit, given the low representation of production marketed by POs against the country's total, it is certain that the impact can not have been significant and, due to statistical secrecy, it is totally impossible to establish quantities having benefited from this aid.

Operational funds are established according to the value of marketed production and their values are therefore still relatively low in national terms. For 2003, only around 29% of the value of operational funds concerned headings of an environmental nature.

Regarding the global value of CMO expenditure (2003), not counting the value of aid to the banana sector, the highest weight refers to operational funds from POs (58%) and from pre-recognized organisations (22%), shell-fruit improvement plans accounting for 16% and financial support to fruit withdrawals accounting for 4%.

Reg. 1259/99, which allowed for the introduction of a certain type of direct subsidies to the sector, provided certain eco-conditionality conditions were fulfilled, was not applied.

Agri-environmental measures applied to fruit trees (CSFII (reg. no. 2078/92), CSFIII (reg. no. 1257/99)) are, on one hand, in what concerns protection of the environment (pollution reduction), integrated protection, integrated production and organic farming, and, in what concerns biodiversity, landscape and maintenance of traditional systems, the measures of traditional orchards, with an incidence mainly on nuts. The evolution of AEM along time was the growing redirection towards the questions of pollution reduction. Areas subject to agri-environmental measures represent 23.6% of the total area of fruit trees. These areas are subject to the performance of good agricultural practices (eco-conditionality).

In what concerns application of improvement plans to nuts, the incidence was just on 3,135 ha (7,5% of the target production), since there are only 3 shell-fruit POs and, consequently, most of the nuts production is not organised. The new aid to shell-fruits (Reg. no. 1782/2003) registered a more significant incidence, 14.386,23 ha, since it was possible to obtain a transitional permission for the adherence of individual farmers.

During the nineties, it has been possible to obtain financing for the grubbing of orchards through operational funds, what had a weight of between 0.2% and 15% of the existing area per fruit tree variety, the higher value having corresponded to peach trees.

Structural support to new plantations was not obtained through the CMO, but through the Rural Development Fund, having corresponded to 8.2% of the area of fruit trees during CSFII and to 3.3% of the area of fruit trees of CSFIII.

2. ANSWER TO EVALUATION QUESTIONS

2.1 Vertical questions relating to the fruits CMO

2.1.1 Fruits - Theme 1: market measures

Question 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]

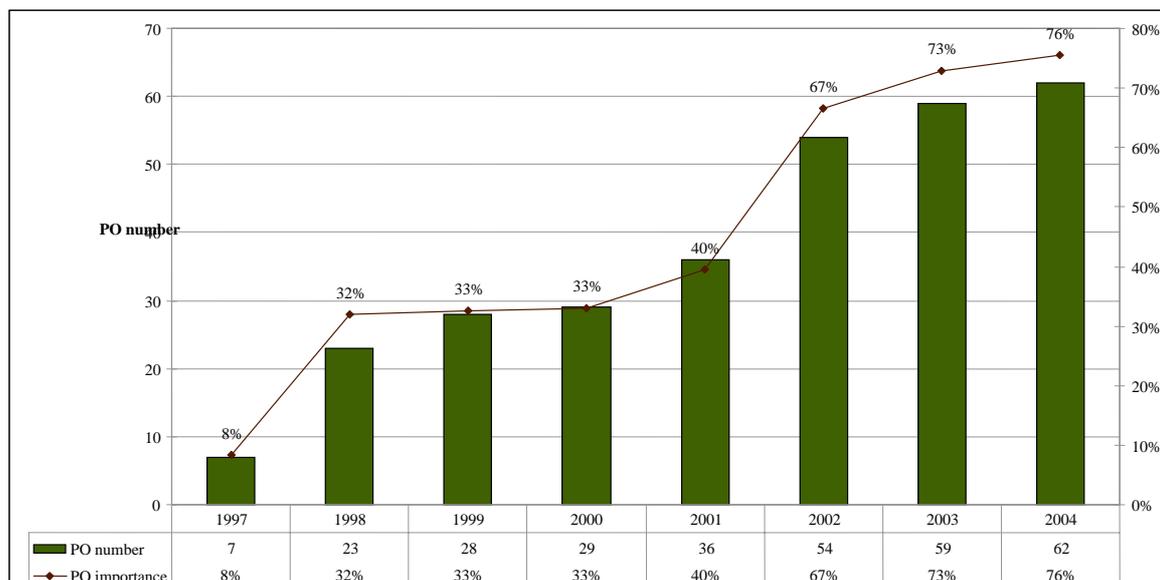
Context

National regulation about the grouping of supply promotion refers only to the management of operational funds (decree order no.385/98 and decree order no.677/07) and pre-recognition of producer organizations (decree order no.210/05 and decree order no.215/01).

Implementation

As explained in the characterisation of the fruit production sector in Portugal, in 2004 there were 83 producers' organised entities for fruit and vegetables. However, only 62 of such entities corresponded to POs. We show ahead the evolution of number of POs, as well as their relative importance between the several types of entities in which producers organise themselves (associations, cooperatives, POs and other).

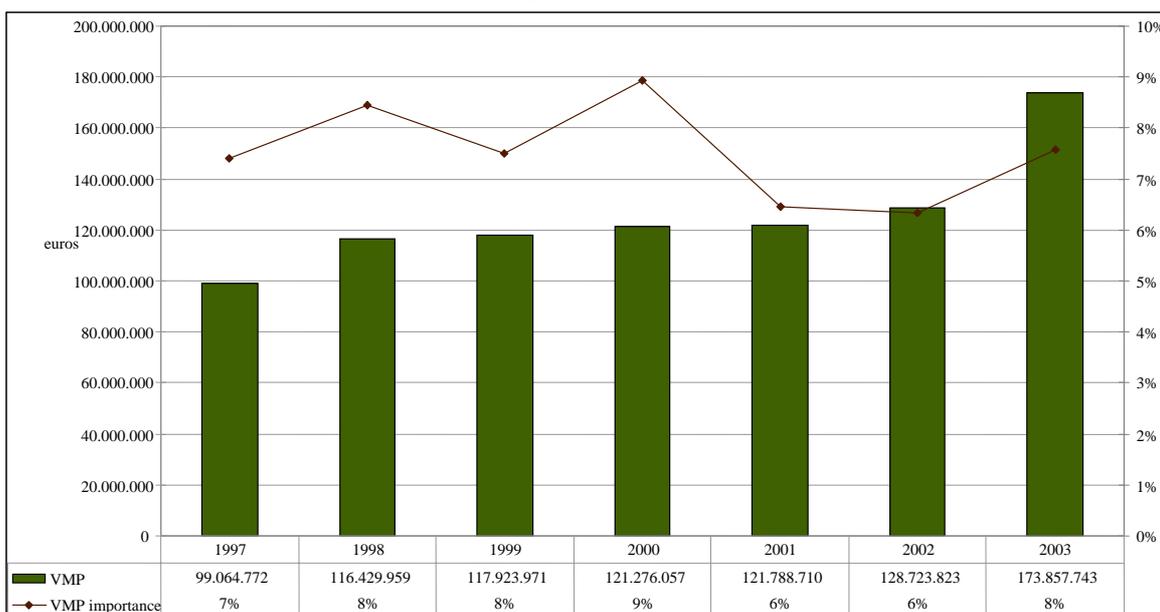
Chart Q1F1 - 1. Evolution of producers' organizations in number and importance since 1997



Source: GPPAA

In spite of the weight of POs in the organisation of fruit and vegetables production, we verify that the value of marketed production (VMP) by these POs did not follow such evolution and represents only 8% of the national production of fruits and vegetables.

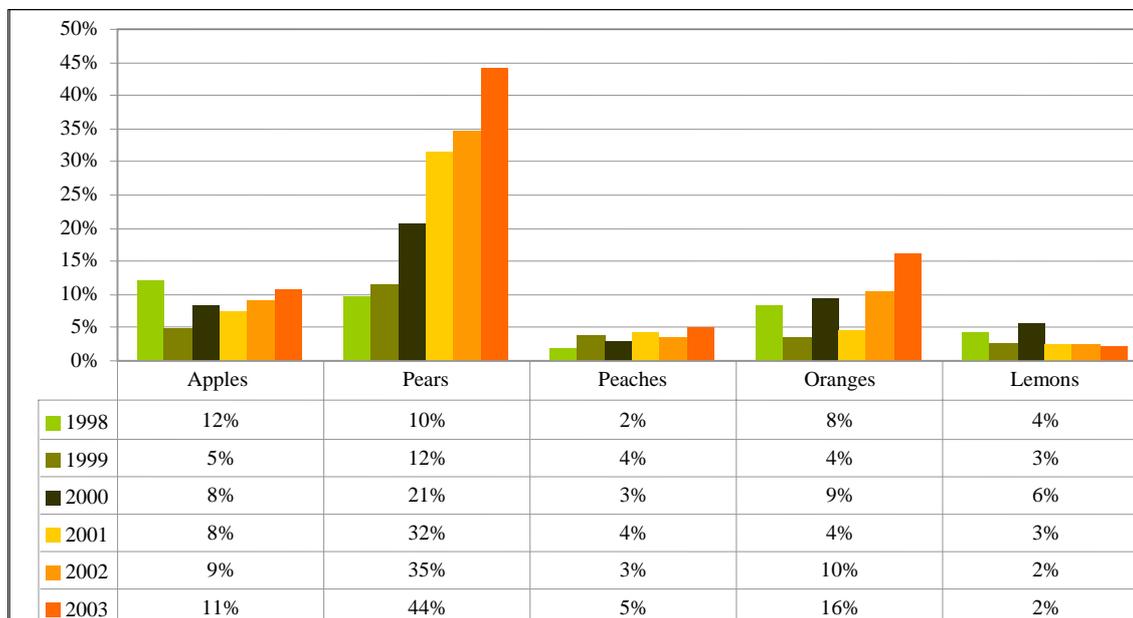
Chart Q1F1 - 2. Evolution of the value of production marketed by POs in terms of value and relative importance since 1997.



Source: GPPAA e INE

Even if one tries to make a more detailed analysis of the value of national production of each type of fruit marketed by POs, one verifies that the production with the most significant representation is pears.

Chart Q1F1 - 3. Evolution of the proportion of fruit marketed by POs, between 1998 and 2003 (%)



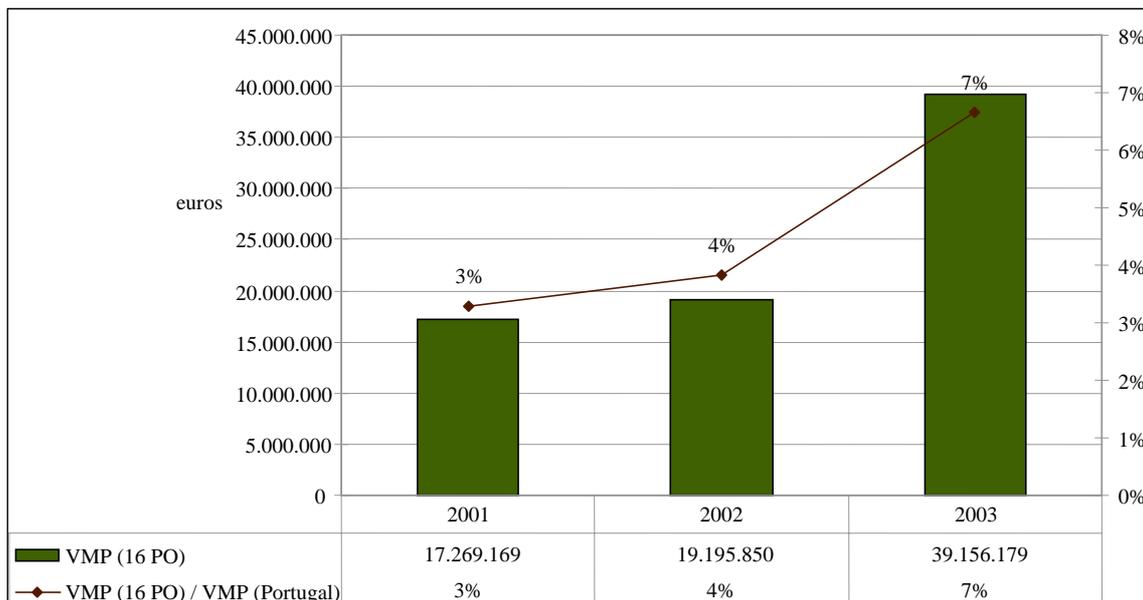
Source: GPPAA

There is a different importance of marketed production between types of fruit. Around 44% of the national production of pears is marketed by POs. Oranges (15%) and apples (10%) have some importance. The productions of lemons and peaches being marketed through POs represent only 4% and 5%, respectively.

Being so, we consider that the available information for POs hardly shows any alterations in the fruit sector, namely any environmental impacts caused by the application of OFs, since most of the fruit production is made outside the scope of this CMO.

In order to analyse the impact of POs through their operational funds (OF), we have made a sampling of 16 POs which have shown exclusive fruit and citrus fruit productions. The evolution of the representation of these POs is shown below.

Chart Q1F1 - 4. Evolution of the production of fruits marketed by the 16 selected POs, in terms of value and weight in the total fruit production.

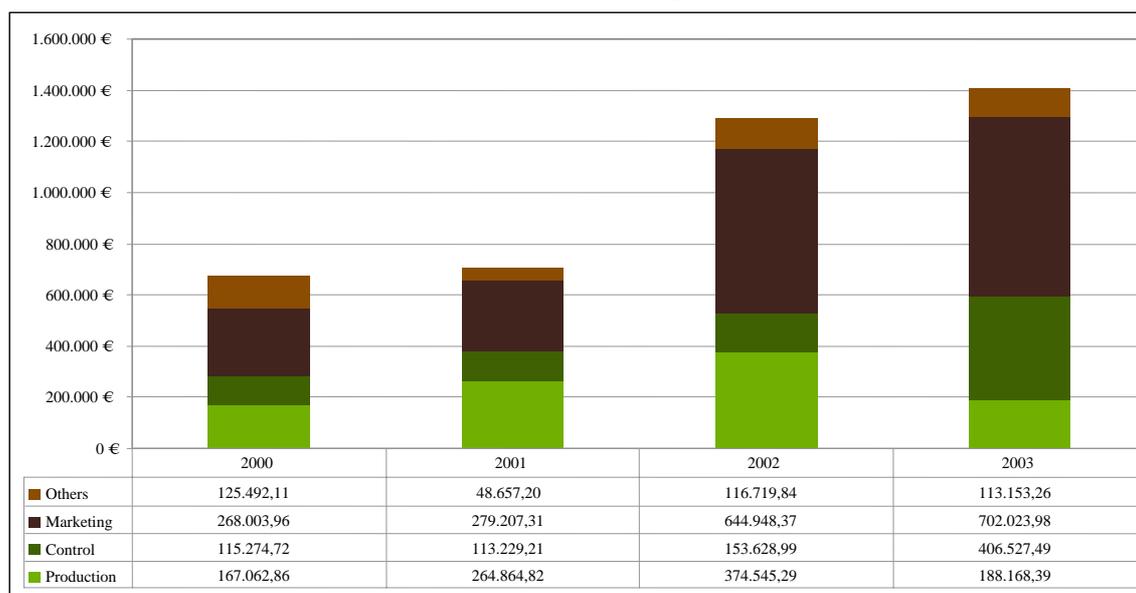


Source: GPPAA

Selected POs, although specialised in fruit production and having increased, between 2001 and 2003, the value of marketed production (VMP), have only marketed, in 2003, 7% of the total production of fresh fruit and citrus fruit. They show therefore a very small representation of production.

The amount of PO OFs specialised in fresh fruit and citrus fruit has increased, between 2000 and 2003, to more than the double, representing in 2003 an amount of 1400 thousand euros.

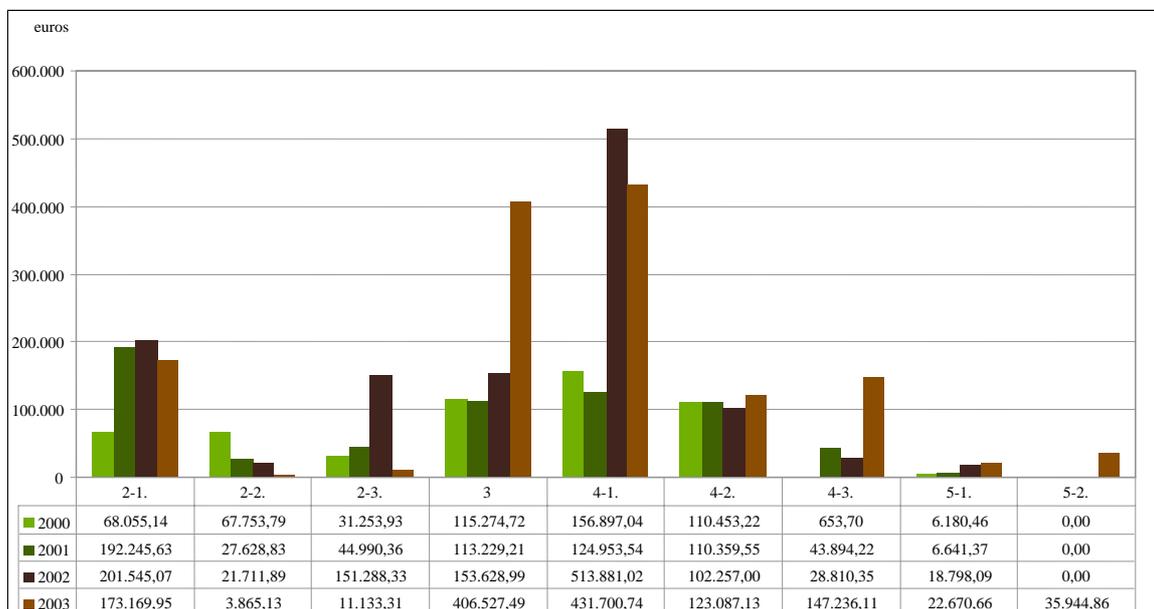
Chart Q1F1 - 5. Evolution of OFs of the 16 POs specialized in fruit and citrus fruit.



Source: GPPAA

The increase of operational funds was done mainly resorting to increases of the marketing measures – directed towards sales and product promotion, as well as production control – which include control of the application of plant protection products and quality of productions. Evolution is shown in more detail in the next chart.

Chart Q1F1 - 6. Evolution of the allocation of OF expenditure by the different measures.



- 2-1: Production - Technical measures (phyto-sanitary measures, irrigation, machinery, greenhouses, plants, R&D)
- 2-2: Production - Services, training, research (advice, warning, training courses, R&D)
- 2-3: Production - Special environmental measures (organic / integrated production, R&D)
- 3: Control - Quality and phyto-sanitary measures (equipment, personnel costs, residue analysis, R&D)
- 4-1: Marketing - Technical measures (land, real state, storage, packaging, transport, R&D)
- 4-2: Marketing - Sales, promotion, outlets (production planning, market research, sales offices, R&D)
- 4-3: Marketing - Special environmental measures (waste management, additional transport costs, research, R&D)
- 5-1: Other - Overheads (admin costs)
- 5-2: Other - Merges and acquisitions
- 5-3: Other - Other (ISO 9000 systems, other)

Source: GPPAA

Since for these selected POs there is no detailed information by type of produced fruit – moreover since some of them produce more than one type of fruit – it is not possible to measure the environmental impact of the directing of operational programmes and of the application of OFs in the three types of fruit (apples and pears, peaches and nectarines, and citrus fruit), as we had wished.

This being the case, and although we show ahead the evolution of the sector in what concerns the main characteristics having impacts in the environment (intensification of productions, degree of abandonment, number of varieties, etc.), it is not correct to say that the sense of evolution of the impact of the fruit sector on the environment has to do with the evolution of POs and with the composition of their operational funds.

Practices evolution from 1990 to 2003

When analysing the evolution of density of the 3 groups of crops that we intend to study, we observe that, in general terms, between 1992 and 2002 there was a concentration of production, with increases in the area of orchards with a higher density.

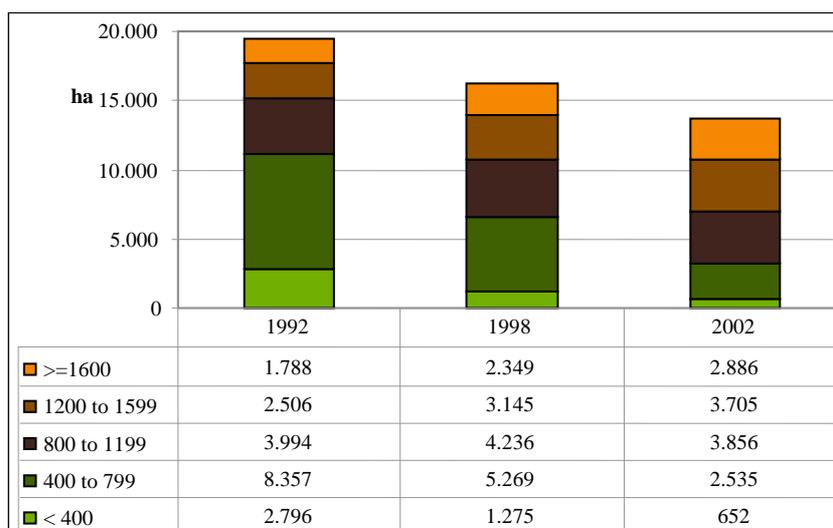
Apples, most of which are produced in the Trás-os-Montes, Beira Litoral and Ribatejo e Oeste regions – and are responsible for 80% of the area and 79% of production – have suffered, between 1992 and 2002, a decrease of the total area. This decrease took place together with some restructuring of production, especially in the Trás-os-Montes region, where orchards with a lower

density have suffered a pronounced reduction and the ones with higher density have increased (in terms of production, only in future years will this investment become evident).

In the Beira Litoral region, there was a reduction of the total area of orchards, followed by increases in production. Since the area reduction took place at the cost of low density orchards, the high density orchards having registered area increases, one can understand the 9% increase of regional productivity.

In Ribatejo e Oeste, although restructuring of production could have taken place, there was a big reduction of orchard area, indicating an abandonment of less productive areas, taking into consideration that productivity has increased in this region.

Chart Q1F1 - 7. Evolution of the area of apple orchards in Portugal, between 1992 and 2002, by density class (trees/ha).

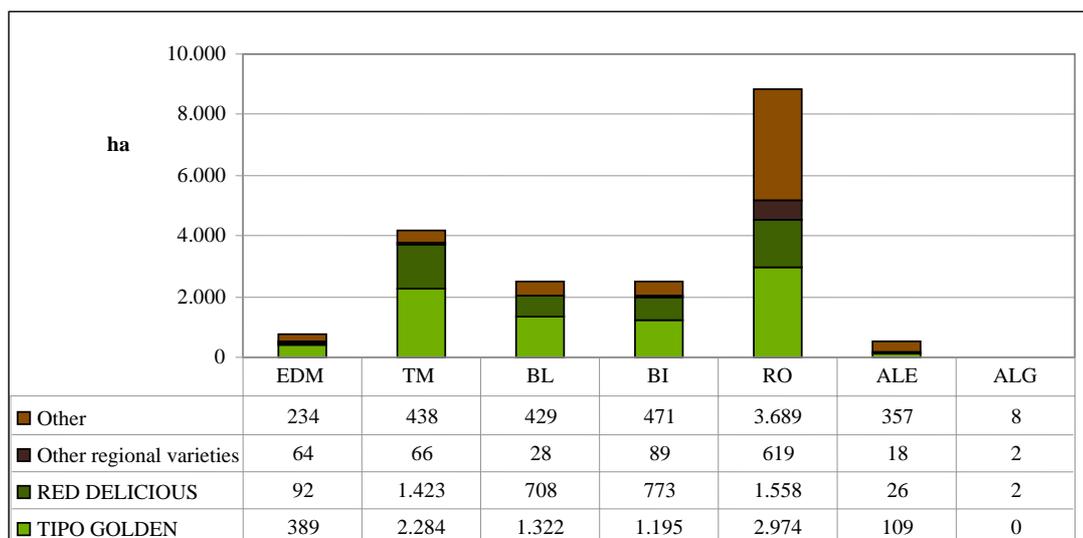


Source: INE

This decrease took place at the cost of the area of orchards in Ribatejo e Oeste (which fell to almost one half), although some intensification of the apple crop is visible in this region, since orchards with a higher density than 1200 trees per hectare have registered increases of around 60%. In Trás-os-Montes there was an increase of orchard area (+8%), which took place at the cost of orchards with a density of over 800 trees per hectare, which have doubled their area.

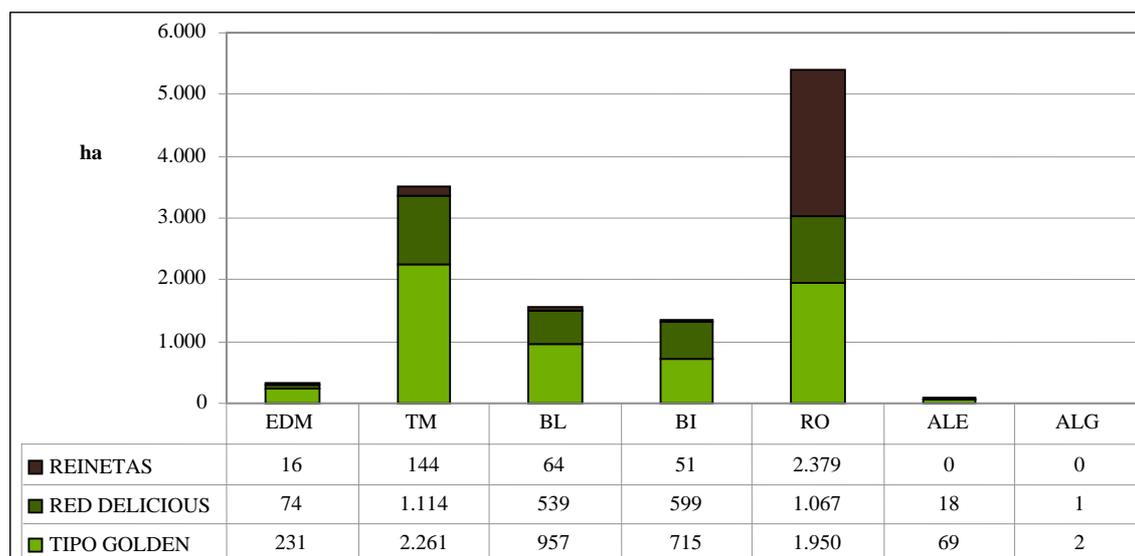
In what concerns the number of cultivated apple varieties, the reduction of the total orchard area is evident in all varieties, with an emphasis on the reduction of the area of “red delicious” apple in Trás-os-Montes.

Chart Q1F1 - 8. Composition of the area of apple orchards in 1992.



Source: INE

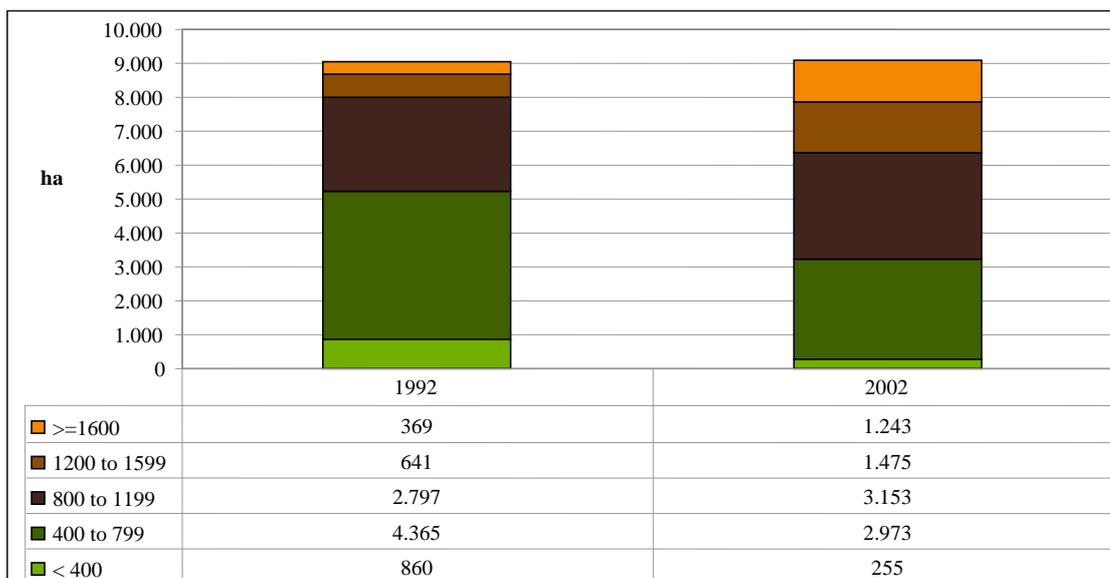
Chart Q1F1 - 9. Composition of the area of apple orchards in 1998.



Source: INE

In what concerns **pears**, there was a slight drop of the total area of orchards (-3%), due to the abandonment of orchard areas in less representative regions of the national production. In fact, in the Ribatejo e Oeste region, which represents 90% of the production de pears, the area remain unchanged (+1%).

Chart Q1F1 - 10. Evolution of the area of the production of pears in Ribatejo e Oeste, between 1992 and 2002, by density class (trees/ha).



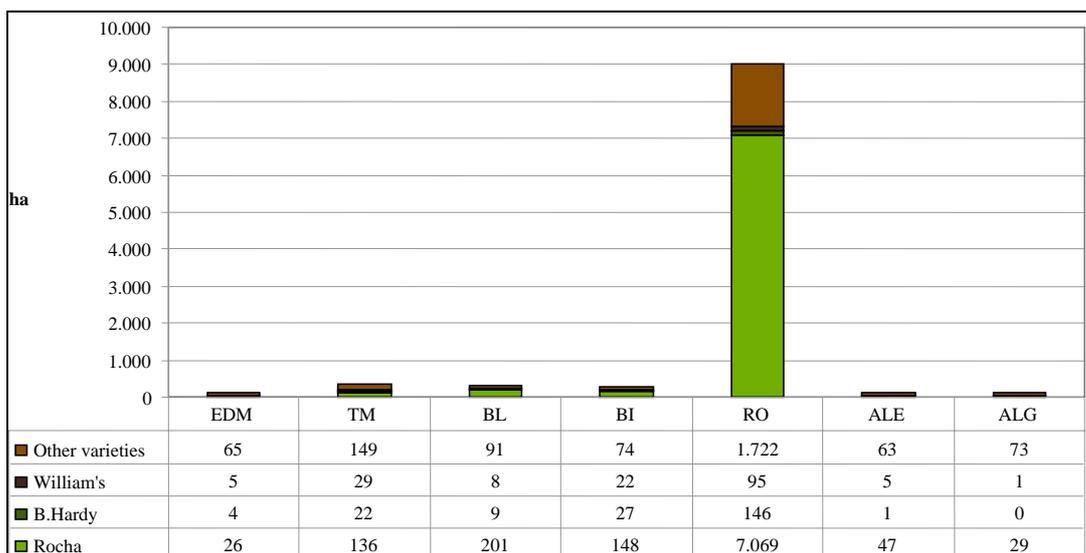
Source: INE

Pear production restructuring is evident in Ribatejo e Oeste, with density classes of over 800 trees/ha registering big increases.

In fact, not only were there many increases, but also produced quantities have grown. This led to an increased productivity in this region of +67%.

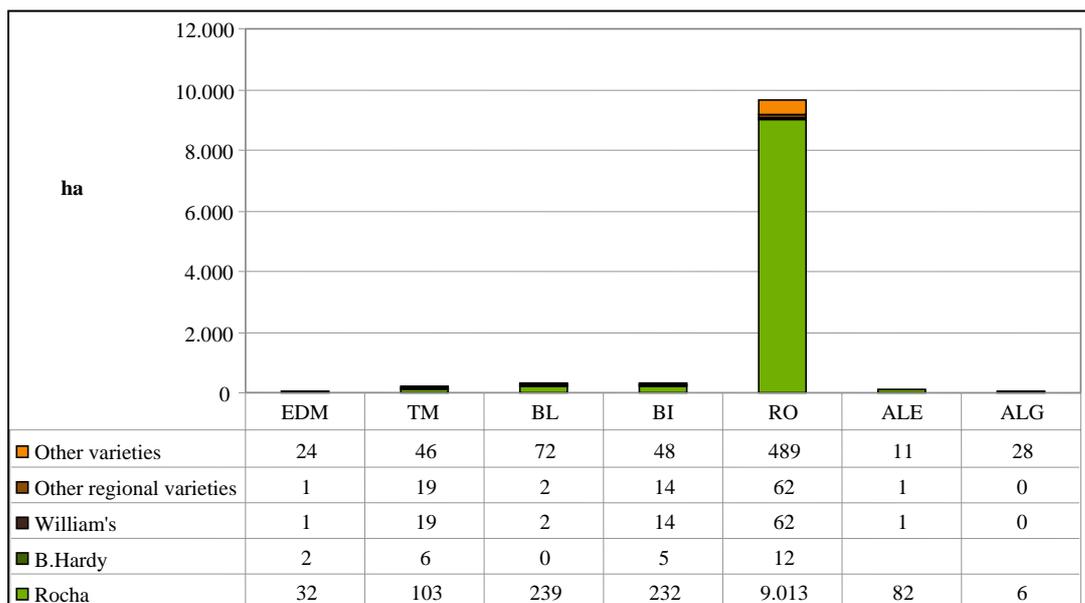
Regarding produced varieties, we can only say that most of the production in 1992 was Pêra Rocha, and that the importance of such variety grew in 1998.

Chart Q1F1 - 11. Composition of the regional area of pear orchards in 1992.



Source: INE

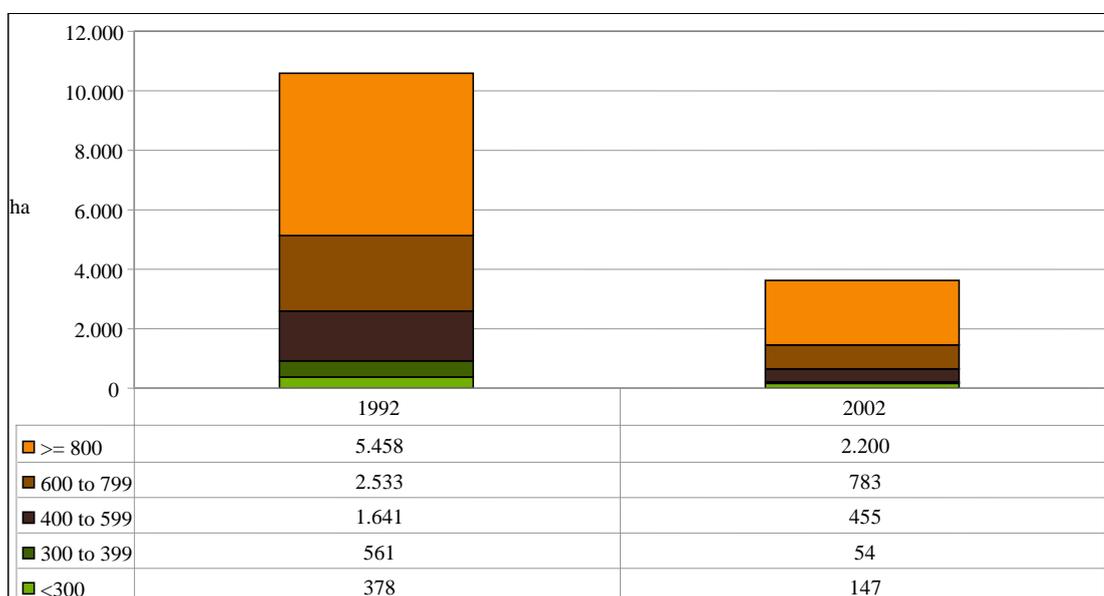
Chart Q1F1 - 12. Composition of the regional pear area, in 1998.



Source: INE

The production of **peaches** bore a very significant area reduction during the analysed period. The lost areas were mostly low density areas and orchards. Nevertheless, there were still area reductions in orchards with more than 400 trees per hectare.

Chart Q1F1 - 13. Evolution of the area of the production of peaches, by density class (trees/ha).



Source: INE

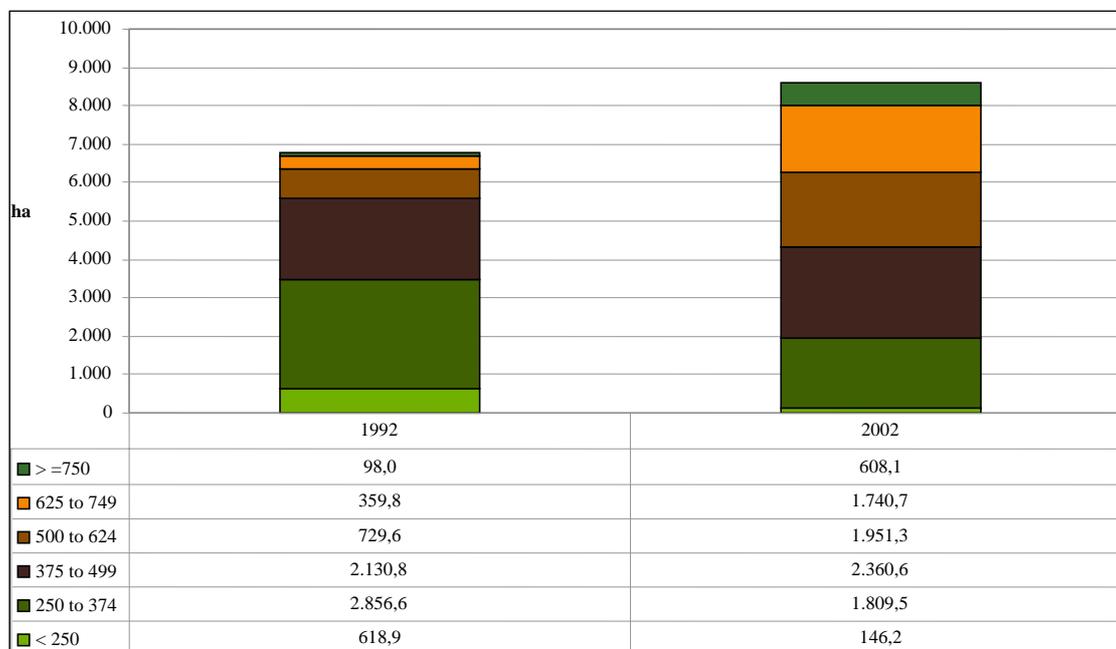
The reductions of orchard areas during 1990 and 2000 were far above the reductions of produced quantities, meaning an increase in productivity. This increase was more significant in the regions of Algarve (12 tonnes/ha) and Ribatejo e Oeste, where production increased together with reductions in the area of orchards of all density classes.

Since we do not have data on total **citrus fruit**, we will now analyse the evolution of orange orchards areas and densities.

80% of the **orange** production concentrates in two regions: Ribatejo e Oeste and Algarve.

Between 1992 and 2002, orange orchards showed a maintenance of their total area to the cost of disappearance of orchards in the regions with less expression and concentration in the Algarve region.

Chart Q1F1 - 14. Evolution of the area of orange orchards in the Algarve, between 1992 and 2002, by the different density classes.



Source: INE

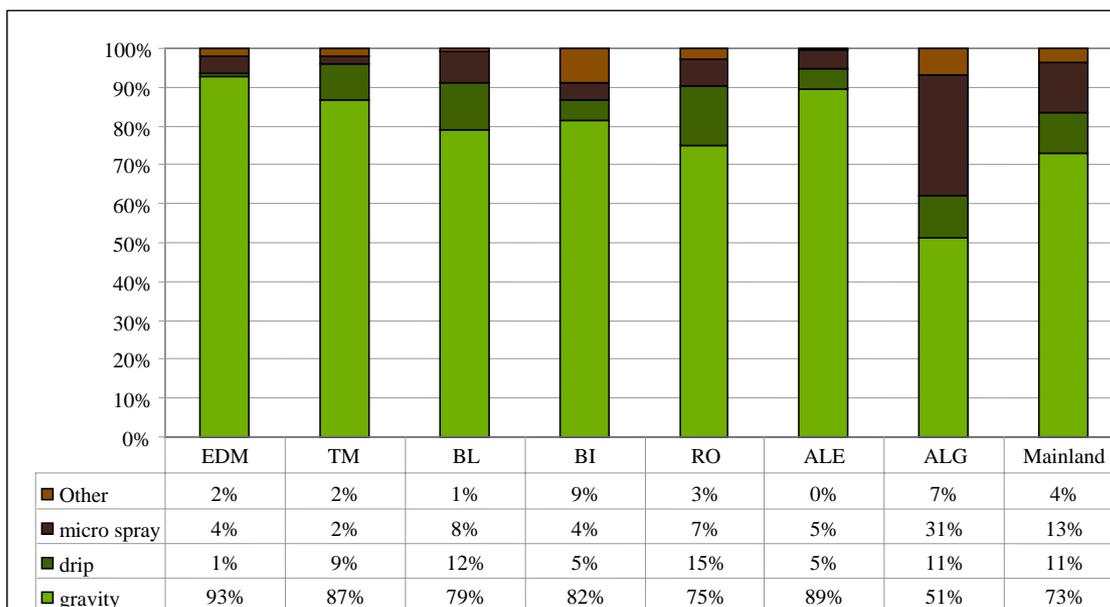
This region had an increase of 1,800 hectares of its orange orchard area, having achieved this increase to the cost of restructuring of production – new high density orchards have been implanted, and orchards with lower density classes were converted, with increased density.

This production restructuring is visible in the productivity analysis – the increase of area in the Algarve was carried out together with even more significant production increases, generating productivity increases from 8.2 tonnes/ha to 11.9 tonnes/ha.

From the analysis of the evolution of the ***number of farms with irrigation*** between 1992 and 2002, we have observed that the relative importance of irrigation against the number of farms has practically remained unchanged (+1%).

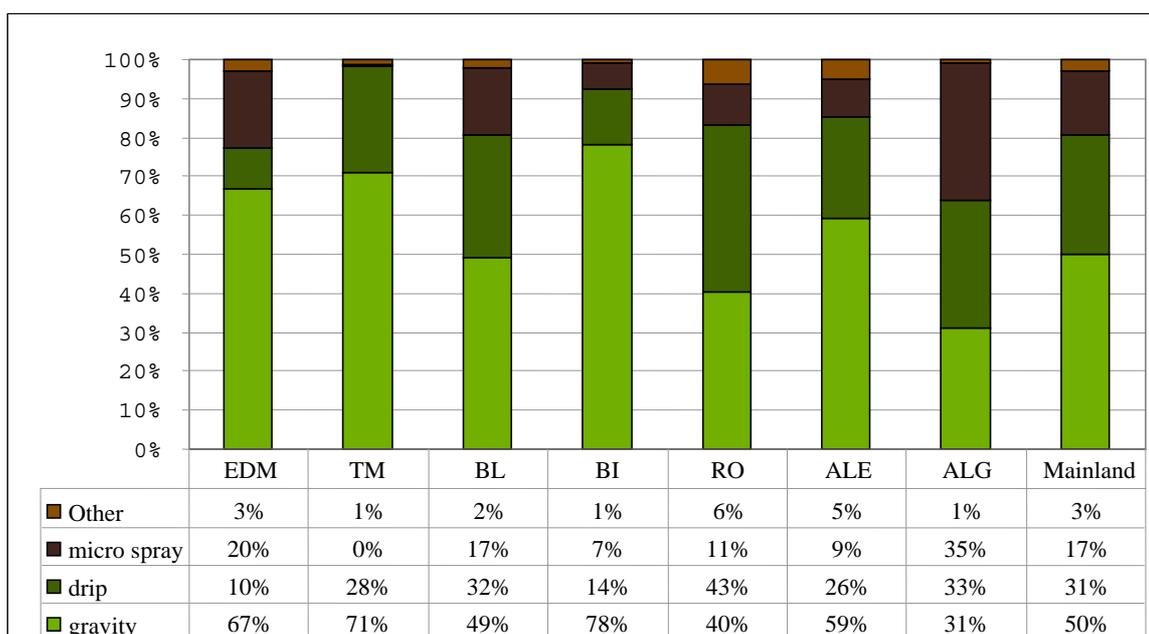
It was not quite so in terms of quality. In fact, we are in a position to maintain that, while in 1992 most farms had their irrigation through gravity (73%), drip irrigation and micro spray irrigation representing only 11% and 13%, respectively; in 2002 the weight of gravity irrigation gave place to more environmental friendly type of irrigation: drip and micro spray represented, in 2002, 31% and 17%, respectively.

Chart Q1F1 - 15. Irrigation types in orchard farms, by agricultural region, in 1992



Source: INE

Chart Q1F1 - 16. Types of irrigation in orchard farms, by agricultural region, in 2002.



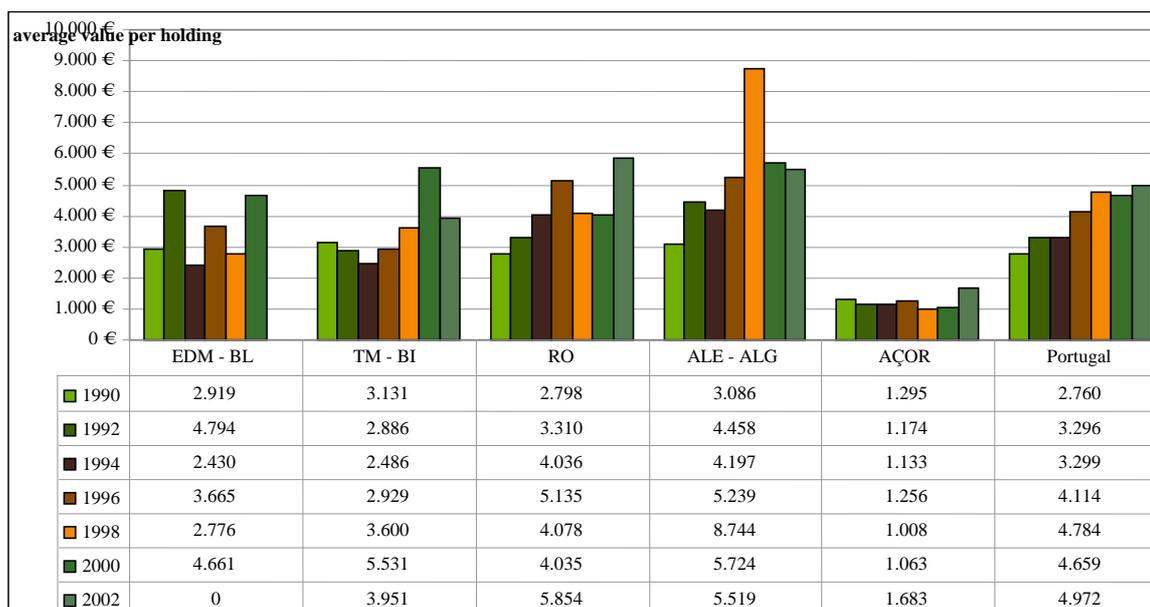
Source: INE

In regional terms, this trend was followed in the same way by all regions, with an emphasis on the regions of Ribatejo e Oeste and Algarve, where already in 1992 a diversity of irrigation systems had been noted, having increased in 2002, its weight (in RO) currently being 40% of gravity irrigation, 43% of drip irrigation and 11% micro spray irrigation. It is in the Algarve that this type of irrigation shows a higher weight (35%), drip irrigation representing 33% and gravity irrigation 31%.

Through the information available in the FADN database, it was possible to estimate, for farms specialised in fruit trees and citrus fruit, the *evolution of intermediate consumption*, by region and between 1992 and 2002.

Intermediate consumptions have increased, in value, during the analysed period.

Chart Q1F1 - 17. Evolution of IC, by agricultural region, between 1992 and 2002.



Source: FADN

In 1992, the most important element of intermediate consumptions of these farms were power expenses (24%), followed by crop protection measures and expenses with fertilizers (18% and 15%, respectively).

1992								
	Seeds and Plants	Fertilizers	Crop protection	Other crop specific costs	Machin.&build. current costs	Energy	Contract work	Other direct inputs
EDM - BL	2%	14%	13%	17%	9%	21%	5%	14%
TM - BI	4%	10%	20%	3%	13%	19%	4%	14%
RO	1%	14%	22%	6%	10%	25%	3%	10%
ALE - ALG	2%	13%	16%	11%	16%	28%	4%	8%
AÇOR	5%	52%	14%	6%	3%	10%	5%	7%
Portugal	2%	15%	18%	8%	12%	24%	4%	11%

2002								
	Seeds and Plants	Fertilizers	Crop protection	Other crop specific costs	Machin.&build. current costs	Energy	Contract work	Other direct inputs
EDM - BL								
TM - BI	1%	14%	25%	3%	8%	18%	10%	12%
RO	2%	9%	32%	4%	16%	21%	1%	16%
ALE - ALG	3%	20%	10%	8%	14%	28%	3%	13%
AÇOR	1%	47%	22%	10%	2%	6%	0%	8%
Portugal	2%	16%	21%	6%	13%	22%	4%	15%

The evolution to 2002 shows that power now represents a lesser weight in the total charges, while expenses with crop protection and fertilizers have increased.

Unfortunately, given the type of information that we have available, it is not possible to say whether this evolution occurred due to the quantities of consumed inputs, or due to the increase of their prices.

Market Intervention: refunds to exports and fruit withdrawals

Export refunds are not used in Portugal, since the country is a fruit importer and does not export.

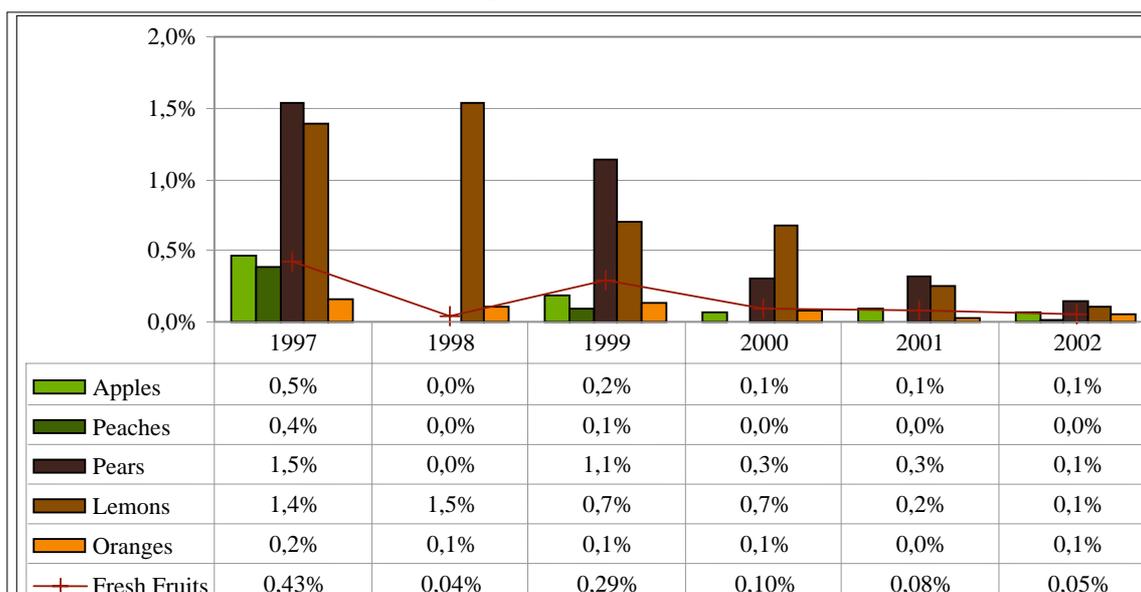
There is no specific regulation on withdrawals for Portugal. When a PO wants to withdraw a given quantity of fruit, it sends a fax to INGA, indicating the quantity to withdraw and the date in which

it will withdraw. INGA verifies if the quantity respects the authorised withdraw quantity, and concedes the authorisation and registers the operation.

The main destinies for withdrawal are human consumption, through free distribution for charity, and animal feed. Deposition in spoil banks is not an option due to its high cost.

In what concerns fruit withdrawals, there is an evident reduction of their weight. Its expression has nevertheless been always very much reduced – in 1997 fruit withdrawals have represented only 0,4% of the value of fresh fruit and citrus fruit production. Pears were the fruit with a greater deal of intervention, 1,5% of their national production having been subject to withdrawal.

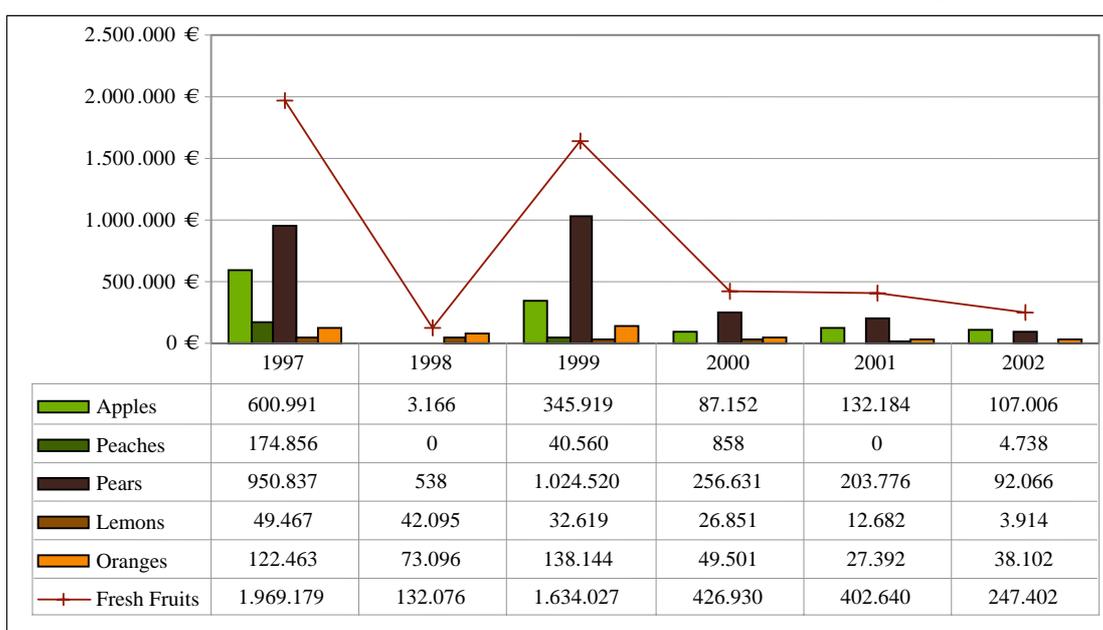
Chart Q1F1 - 18. Evolution of the importance of fruit withdrawals, in relation to their own production (%)



Source: INE, GPPAA

In terms of absolute values, withdrawals have also decreased.

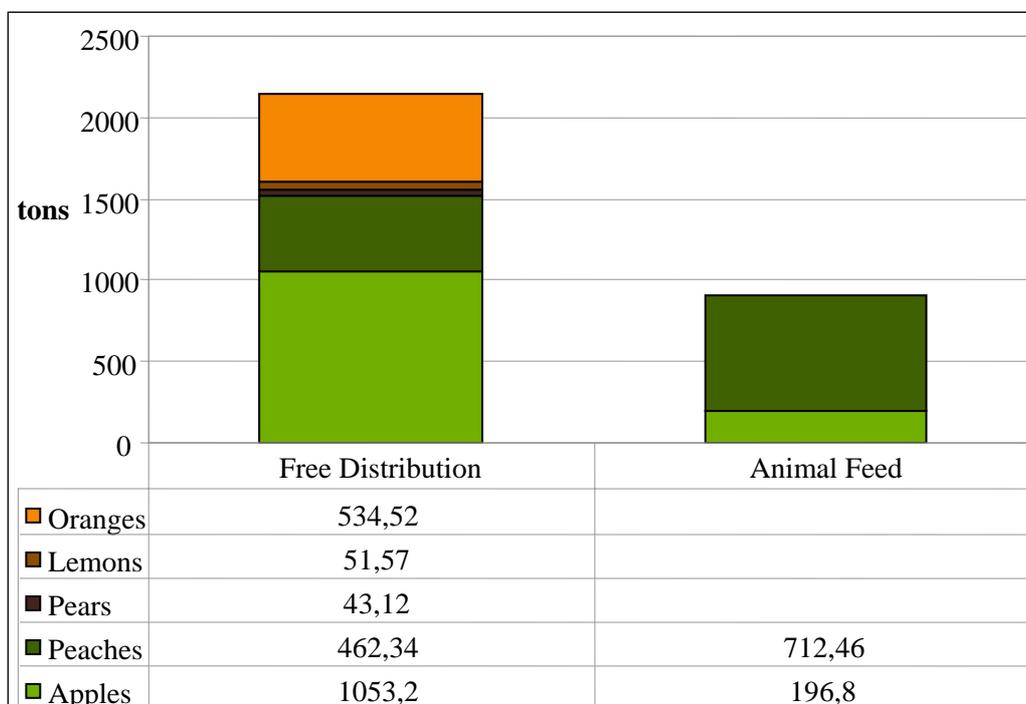
Chart Q1F1 - 19. Evolution of the value of fruit withdrawals, by product.



Source: INE, GPPAA

As to the destination of these withdrawals of fruit, the most common one is distribution for free. Actually, in 2002 around 70% of the withdrawn quantity was delivered to Banco Alimentar Contra a Fome (Food Bank Against Hunger), the remaining quantity having been delivered for animal feeding.

Chart Q1F1 - 20. Destination of fruit withdrawn quantities, in 2002.



Source: GPPAA

Environmental effects

Unfortunately we can't list the contents of producer organisation's actions normally included in their operational programmes, as INGA and GPPAA found this information confidential, and didn't provide us copies of those programmes.

Part taken by the CMO in this evolution

Due to the reduced representation of POs and consequently, their operational funds, we cannot attribute any contribute of the CMO to the evolutions occurred.

Summary

Unfortunately, from what was said regarding the representation of POs in what refers to the fruit production, one cannot say that aids to POs and to their operational funds have led to an intensification of crops.

In fact, one verifies that, during the analysed period, there was an intensification of crops, with a reinforcement of the orchard areas with higher densities and productivities, improvements on the types of irrigation used having also occurred: more efficient and with a reduction of the impact on the environment.

What cannot be said is that this was a consequence of structural changes induced by POs and their OFs.

We have observed that, in some crops, there was a grouping of the big offer, with specialization by regions, in the production of some fruits. Examples of this are the cases of Pears, in Ribatejo e Oeste, where the Rocha pear area was incremented, to the disadvantage of other varieties, 90% of the production concentrating in this region.

Also in what concerns citrus fruit we note a concentration of offer in the Algarve region: some areas disappeared in regions with a smaller expression in production, and the orange production having concentrated itself, in 2002, in this region, and in high density orchards.

In what regards intervention measures, since there are no refunds because the country has a production deficit, what we have left are withdrawals of fruit from the market.

From the analysis that we have carried out, we have concluded that withdrawals have very little expression. On one hand, they represented in 2002 less than 0.5% of the total value of marketed production and, on the other hand, in the same year they represented only 4% of the total amount of national expenditure of the fresh fruit CMO.

In terms of environmental impact, since care is taken in the choice of acceptable environmental destinations, most of these withdrawals are channelled to Banco Alimentar Contra a Fome (Food Bank Against Hunger), thus minimizing their impact in the environment.

Question 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

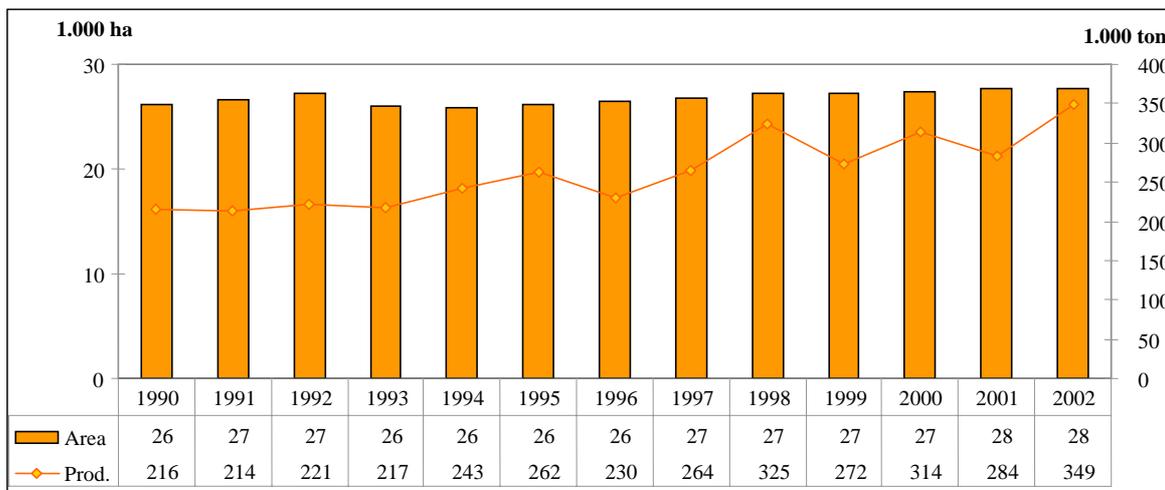
The alteration of the support system to citrus fruit subject to processing, approved by Reg. 2202/96, directing the aids, which up to then were directed to the processing industry, to the producers' organisations, had the objective of, on one hand, avoiding processing to become a systematic outlet path of the production originally directed towards the fresh products market; on another hand, to allow for the redirection of industry towards the processing of new products.

The main difference appointed by operators resulting of transferring price support from fruit processors to producers groups, was the greater importance of the fruit producer in determining its price.

Practices evolution from 1990 to 2003

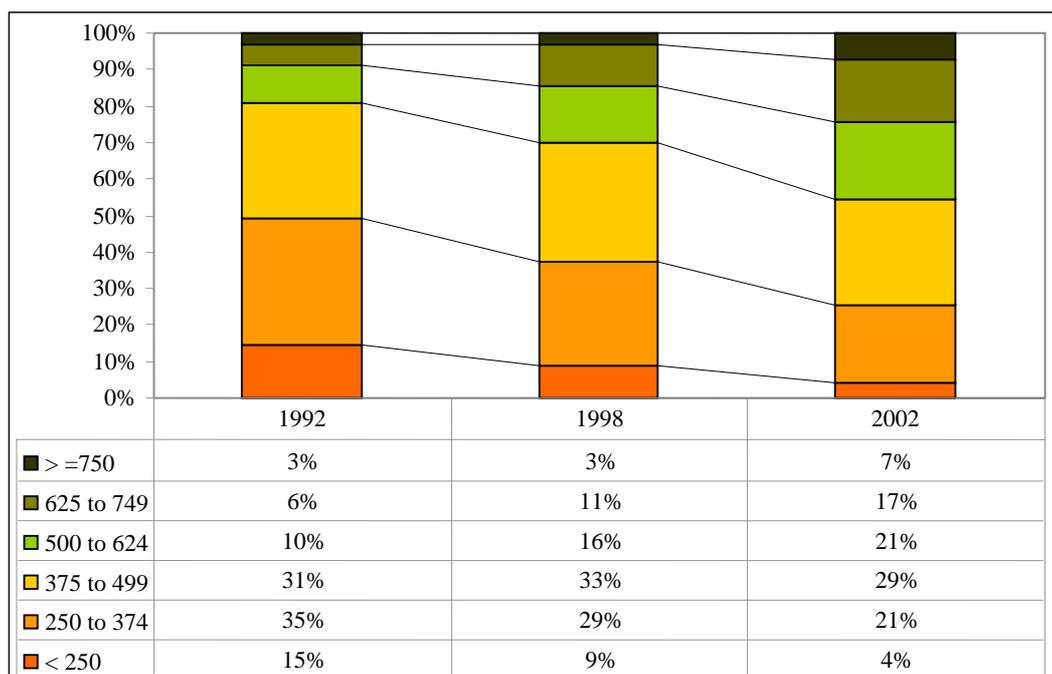
The environmental impacts arising from this alteration of the support system are, however, difficult to identify and to quantify, because, in spite of the increase of both the areas and the produced quantities of citrus fruit between 1990 and 2002 (Chart Q2F2-1), as well as of the very significant increase of the intensification of citrus fruit plantations, verifiable through the increase of citrus fruit plantation densities (Chart Q2F2-2) and through the national average productivities (Chart Q2F2-3), the relative importance of production marketed through POs and, therefore, within both Reg. 2200/96, and Reg. 2202/96, was not over 7% and 9% in 2001 e 2002, respectively, of the total national production.

Chart Q2F1 - 1. Evolution of the area (ha) and quantity (tonnes) of the production of citrus fruit



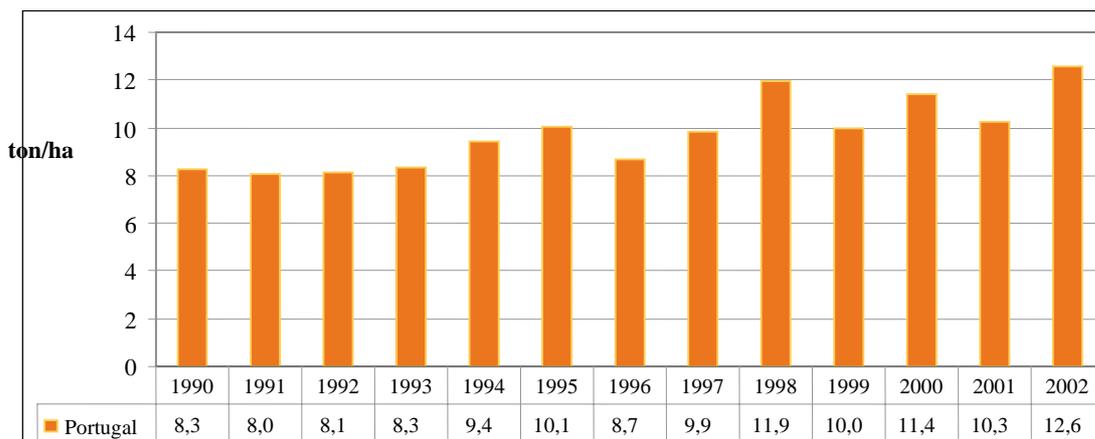
Source: INE, Regional Statistics of Vegetable and Animal Production, 1990-2002

Chart Q2F1 - 2. Evolution of the relative importance of density classes of citrus fruit plantations (trees/ha)



Source: INE, Basis Survey to Fruit Tree Plantations (1992, 1998, 2002)

Chart Q2F1 - 3. Evolution of average national productivities of citrus fruit

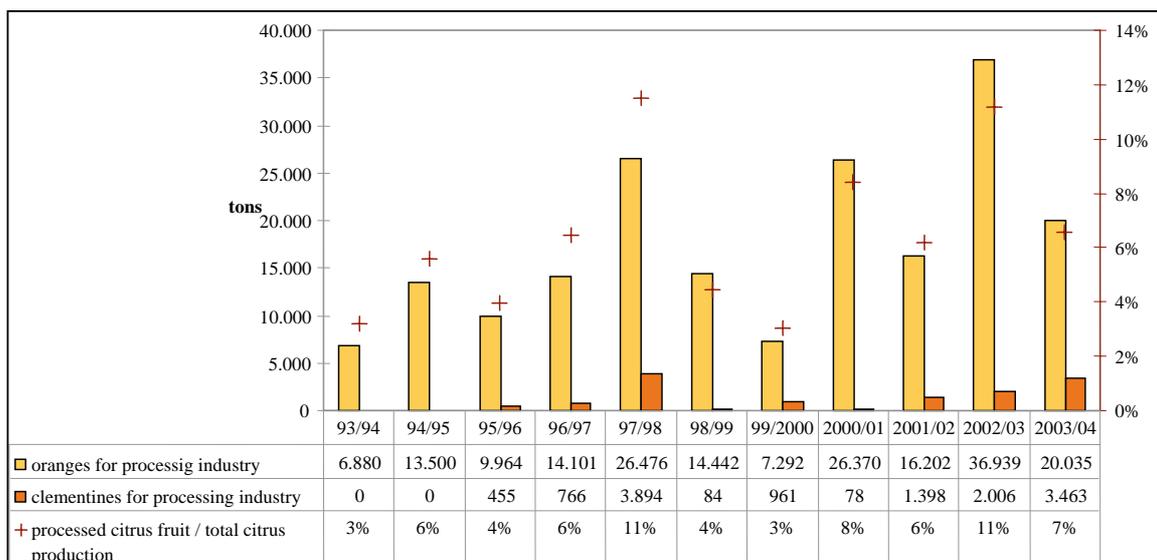


Source: INE, Regional Statistics of Vegetable and Animal Production, 1990-2002)

Besides the extremely reduced representation of the two above mentioned Reg. in the context of citrus fruit production and marketing in Portugal, processing industries, given their reduced number, have their eventually relevant data for answering this question (raw materials' quantities and values, processed quantities, etc.) doomed to statistical secrecy.

Despite this, we can present the evolution of the processed citrus fruit and orange, since 1993.

Chart Q2F1 - 4. Evolution of orange and Clementine quantities delivered for processing.



Source: GPPAA

Environmental effects

We do not have information that suggest any environmental effects of transferring price support from fruit processors to producers groups. In fact: trough interviews with national authorities and with producers they state that transferring price support didn't have any environmental impact – neither direct, nor indirect as reducing/increasing withdrawals.

Part taken by the CMO in this evolution

According to interviews with producers and national authorities, the transference of the price support from processors to producers, didn't had any environmental impact.

Summary

Objectively, with the available data, we can affirm that there wasn't any environmental impact caused by the alteration of the support system

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

In what concerns the environmental impacts resulting from the application of fruit marketing rules, we will base our answer on the interview we had with the people responsible for the Divisão de Fiscalização dos Produtos de Origem Vegetal (Supervision Division of Products of Vegetable Origin), the state organisation responsible for the supervision of the above referred to rules.

Context and implementation

Marketing rules for fruits and vegetables are in force and must be applied at all stages of marketing by all intervening operators, except for the cases provided for under article 3 of Reg. 2200/96, of 28th October.

It does not exist specific regulation for marketing standards for Portugal.

They are presently being applied by most horticultural and fruit operators registered as such in Direção Geral de Fiscalização e Controlo e Qualidade Alimentar (Directorate-General of Supervision and Control of Food Quality) (around 9500) at continental and insular territories level.

The application of common marketing rules had effects at the level of production intensification, generating significant environmental impacts on soil, water and biodiversity. The intensification of production is usually associated with the systematic use of artificial fertilizers and pesticides, with a more intensive control of weeds, as well as irrigation and higher cultural densities.

The more intensive farming systems are associated to a lower natural value and have potential negative environmental impacts in the form of soil erosion, pollution of water courses through superficial draining, degradation of habitats and landscapes and exploitation of water resources for irrigation.

Environmental impacts

As a consequence of the application of marketing rules, production was directed to more easily handled orchard varieties (in terms of transportation/storage/conservation/marketing...), with the exclusion of damages that would make fruits inadequate to be placed in the channel of commerce. Hence, we can say that there was a reduction in genetic variability with the replacement of the varieties of traditional orchards by new varieties (genetic erosion).

The increase in the use of phytosanitary products in order to avoid defects which could jeopardise the marketing of products may well be another consequence of the application of marketing rules in the sector, with a negative environmental impact. However, there are no available data to allow us to link the increase of total consumption of plant protection products with the marketing rules. What we can maintain is that a more responsible use of plant protection products has been registered, as well as a search for production methods that reduce their use, and only for more specific applications.

In what regards the environmental impacts resulting from the withdrawal from the market of products which do not comply with marketing rules for fruit and vegetables, they will depend on the destination given to such fruits and vegetables. Hence, depending on the non-compliances, rejected products will be destined to:

- donations to welfare institutions
- delivery to food industries and animal food industries
- delivery for direct animal feeding
- deposit in municipal landfills, or in municipal containers after destruction with repellents.

There are no records for the quantities of fruits which do not comply with marketing rules, and therefore are withdrawal from the market.

Summary

As a consequence of the application of marketing rules, some environmental impacts were appointed: genetic erosion, increase of use for phytosanitary products (although it may seem to be accompanied by greater use of plant protection products with smaller impact on environment) and when the destination of rejected products is in landfills or municipal containers, that might generate negative environmental impacts.

Destruction of the product for phytosanitary reasons can also be considered. Such destruction is usually made through burning, the environmental impact being essentially air pollution.

Finally, there are also environmental impacts resulting from the application of rules for the conditioning of products, since there has been a significant increase of the quantities of residues from packages, mainly with the outcome of non-returnable packages and pre-packaged products.

2.1.2 Fruits – Theme 2: environmental measures

Question 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 and implementation

From the interpretation of EC Reg. no. 2200/96, which establishes the common market organisation in the fruit and vegetables sector, as well as from EC Reg. no. 659/97/2200/96, which establishes the enforcement rules of such regulation in what concerns the intervention system in the fruit and vegetables sector, 4 main guidelines of an environmental nature can be drawn, as follows:

- the obligation of POs to find an environmentally acceptable destination for fruit withdrawals;
- the conditions of disposal of withdrawals and the hierarchy of destinations;
- rules;
- the need to establish a national framework for the “drawing up of specification sheets concerning the methods used for ecologically friendly withdrawals”.

Producers’ Organisations, recognised as such, should also comply with the criteria provided for in Article 11 of the Regulation: b) “to promote cultivation practices and environmentally friendly residues production and management techniques” and “c) the by-laws of which oblige their producers to apply, in what concerns knowledge of production, marketing and environmental protection, the rules adopted by the PO”

In spite of the existing guideline in Reg. 2200/96, up to the moment no type whatsoever of national framework has been approved for the drawing up of specification sheets concerning the measures aimed at in paragraph 4 b) of article 15, and there are only specification sheets for POs specialized in integrated protection or production.

In the absence of such a framework, GPPAA follows Reg. 2200/96 when analysing operation programs. All the producer organizations present a proposal of operational program to this national authority, who decides if determinate measure can be financed by its operational fund.

In what concerns residues, there is, nevertheless, decree-law no. 239/97, which establishes the rules for their management, as well as **decree-law no. 366-A/97**, which transposes Parliament and Council **Directive no. 94/62**, which establishes the principles and applicable rules for the management of packages. Both decree-laws are horizontal application laws.

EC Directive 94/62 reaffirms the need for economic operators being fully aware that - according to the principle of shared responsibility – they have to take upon themselves the responsibility for the management and final destination of their package residues. The adoption of EC Directive no. 94/62 – the guiding principle of which is to harmonise the provisions of Member States concerning the management of packages and package residues – as well as of **decree-law no. 366-A/97 and decree order no. 29-B/98**, constitute the legal framework within which economic operators move. The Community Directive left to the Member States’ discretion the choice of management models for treatment of package residues. Hence, according to Portuguese law, the responsibility of economic operators for the management of their package residues may be transferred to a duly licensed entity to perform such an activity. In Portugal, up to the present date, **Sociedade Ponto Verde S.A.** is the only licensed entity for such a purpose.

From the 16 POs, all of them for fruit only, every one of them has made agreements with Sociedade Ponto Verde S.A., transferring to this company the responsibility of managing their package residues.

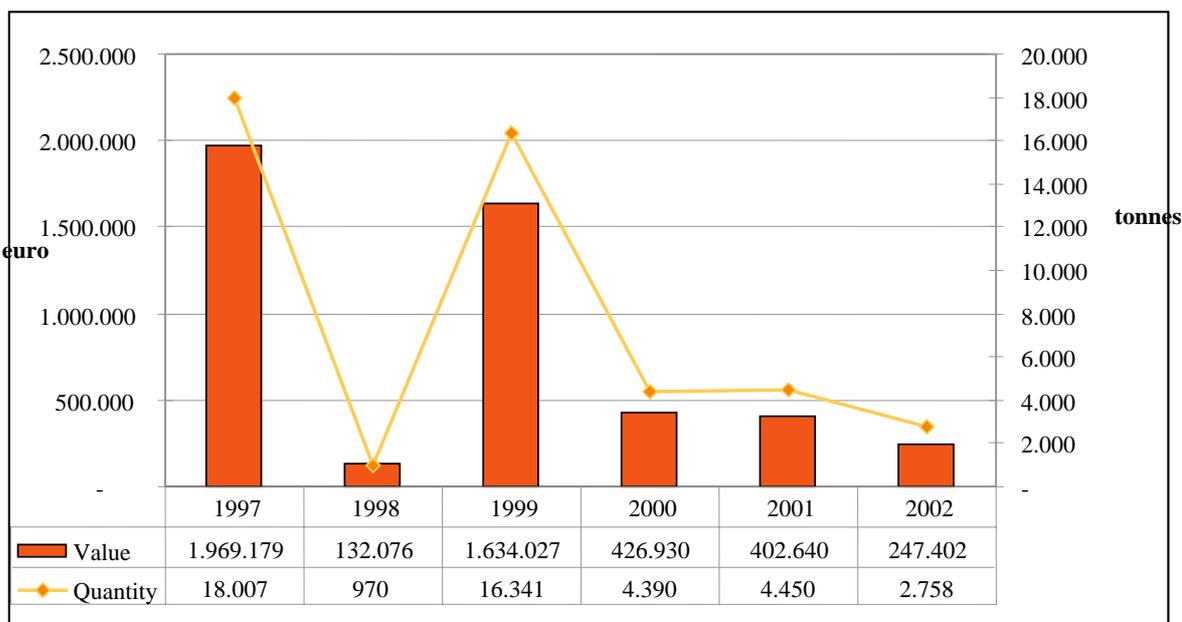
Environmental effects

In what concerns **waste management**, in Portugal the problem of waste from withdrawals is being overcome mainly by the reduction of fruit withdrawals themselves, as a consequence of structural and cyclical adjustments (premiums to grubbing).

Besides this, from a situation where withdrawals had as prevailing destination the destruction through deposit in land-fills, environmentally and socially more acceptable destinations are now being privileged, **distribution for free** being a notorious example (see chart).

This fact was mainly due to the conjunction of 2 fundamental aspects. On one hand, the significant costs involved with fruit destruction in land-fills; on the other hand, the superb logistical management of fruit withdrawals made by Banco Alimentar contra a Fome (Food Bank Against Hunger), an entity that plays a fundamental social role.

Chart Q1F2 - 1. Evolution of quantities and values of fruit withdrawals



Source: INGA

Animal feeding is the second and last destination of fruit withdrawals in Portugal. Its extremely reduced expression is mainly due to 3 situations:

- Firstly, because the intensiveness of livestock production is not compatible with the use of this kind of food;

- Secondly, because only stone less fruits are adequate for animal feeding;
- Thirdly, because the putrefactiveness of fruit determines its consumption in a short period of time.

Summary

In short, one may conclude that, although there is no national framework for the drawing up of specification sheets by POs, the entity analysing operational programmes (GPPAA) has the responsibility of making sure that environmental measures are provided for, refusing those programmes where such measures are not provided for or, in the affirmative case, if such measures do not comply with the guideline from Reg. 2200/96.

Management of residues and waste from fruit withdrawals has been solved through national horizontal legislation, in one case, and through structural and cyclical adjustment processes, in the other.

These two combined effects result in a positive environmental impact (well managed residues and practically no wastes from fruit withdraw)

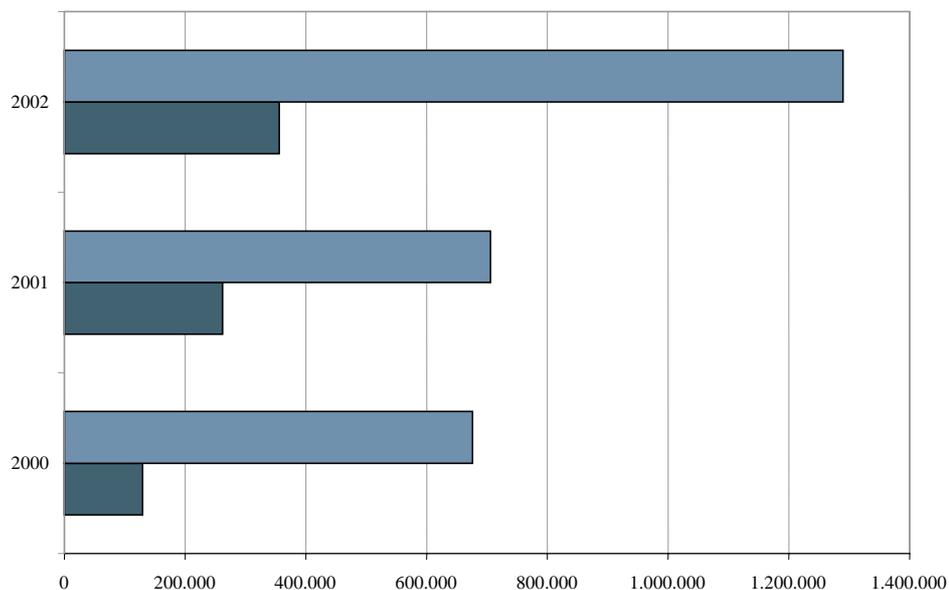
Question 2 (F2) : Which kind of environmental measures [integrated production, organic production, plant production, fertilisers, energy management, water management, soil management, biodiversity/landscape and environmental management] paid by the operational fund for the producers organisations has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

Context and implementation

EC Reg. 2200 refers in several of its aspects to the need of the fruit and vegetable sector taking into account certain environmental aspects. On one hand, under article 11 1) 4) b) it specifies that producer organisations have “*namely as a purpose to promote environmentally friendly cultivation practices and residues production and management techniques, namely in order to protect the quality of waters, soil and landscape and to preserve and/or promote biodiversity*”. On the other hand, article 15 4) b) on the establishment of operational funds, specifies that the operational programmes financed by such funds should “*include measures meant to develop the use by associated producers of ecologically friendly techniques, both at cultivation practices level, and at the level of management of used materials*”. Also article 15 4) a) refers to the development of lines of biological products, to the promotion of integrated production or other ecologically friendly production methods. The emphasis on environmental aspects is also stressed by article 15 4) c), which provides that operational programmes should include “*the necessary technical and human means to ensure control of the compliance with phytosanitary rules and provisions and with allowed limits of residues*”

In fact, part of the expenditure of fruit OP operational funds in Portugal refers to measures of an environmental nature, as can be seen in the following chart:

Chart Q2F2 - 1. Comparison between the value spent with measures of an environmental nature and the total value of the fund for the 2000-2002 period (values in euros)



	2000	2001	2002
Operational Fund Value (euros)	675.834	705.959	1.289.842
Environmental measures (euros)	129.682	262.245	355.982

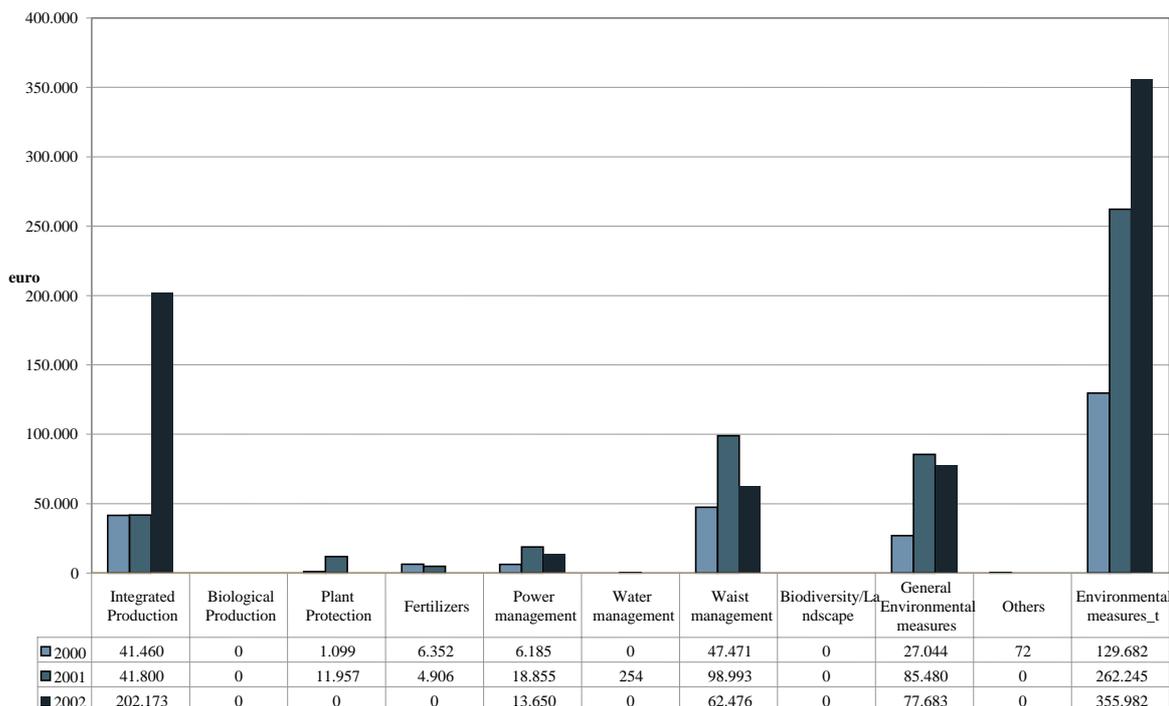
Source: GPPAA

As can be confirmed by the values shown in the previous chart, the value of expenditure in measures of an environmental nature in the POs' fund has not only been increasing in absolute value, but is has been uplifted, representing around 29% in 2002.

In what concerns the breakdown of the value with environmental expenditure by the different headings (following chart), we can conclude that the most significant values are environmental measures with a general nature, measures related to residues management and integrated production measures.

Note that during 2002 there was a relatively high increase in the value of integrated production through the introduction of EUREP-GAP rules in one of the POs under study.

Chart Q2F2 - 2. Breakdown of expenditure by the several environmental headings of fruit POs for the 2000-2002 period (euros).



Source: GPPAA

Environmental impacts

From the surveys sent to the different entities, one concludes from the obtained sampling that the most relevant environmental actions carried out by POs, besides residues management, are the ones that refer to support to advice on plant protection (risk analysis estimates in order to detect the critical moments in which to intervene), on soil, water and leaf analyses in order to suggest the ideal level of fertilization, and to the introduction of EUREP-Gap and HACCP rules.

Summary

In short, the proportion of environmental related measures within the operational funds has been increasing, accounting for 29% of their total value, with very positive environmental impacts.

2.1.3 Fruits – Theme 3 structural measures

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

Context and implementation

To start with, we should identify what are the structural measures within the Operational Funds and the Rural Development Fund (RDF).

In what concerns structural measures financed by the Operational Funds, there are only “Plans for the Improvement of Quality and Marketing of Shell-fruits” which were started in 1997 and will be concluded in 2007. From 1997 to 2002, the approved and executed actions aimed at the conversion of orchards; from 2002 to 2007 at the maintenance of orchards (i.e. tillage, fertilization, pruning, bush cleaning, hoeing, phytosanitary treatments and irrigation). 3,135 hectares were converted within this plan, corresponding to around 4% of the total area of nuts in 2002.

In spite of the little importance, in terms of area, of these conversion actions financed by Operational Funds, the environmental impacts that may be expected from these conversions are

similar to the ones which will be referred to regarding the conversion within the Rural Development Fund.

In what concerns actions for the maintenance of orchards, their environmental impacts might be significant, since support falls on tillage (that could contribute for loss of soil and impoverishment in Organic Matter) , application of fertilizers and plant protection products (water pollution), and irrigation (use of finite water reserves).

Regarding structural measures financed by the Rural Development Fund, there is only support to investment in farms, which used to be granted through PAMAF- Programa de Apoio à Modernização Agrícola e Florestal (Support Plan for Agricultural and Forest Modernisation) up to 1999, which was replaced by the current Measure 1 of AGRO – Programa Operacional para a Agricultura e Desenvolvimento Rural (Operation Plan for Agriculture and Rural Development).

The data that we have managed to obtain do not allow us to break down the different types of investment that were supported within each one of the programs. However, investments supported by the two programs are mainly in new plantations and in the restructuring of old orchards. In these two cases, installation of irrigation is very frequent, but there's no information available on the share of support for investment in irrigation. In the next table, we show the areas of orchards supported by each one of the programmes and their importance against the total area of fruit trees.

Table Q1F3 - 1. Orchard areas supported by the RDF and their relative importance against total area

	Crop occupation area in 2000 (ha) (Source: INE)	Crop occupation area in 2002 (ha) (source INE)	Measure 2 – PAMAF (CCSFII)			AGRO-measure 1 (CSFIII)		Total supported area	Total percentage of support
			Plantations and restructurings (ha) 1994-1999	Total CCSFII (ha)	Percentage of area with support to investment	Plantations (ha) (2001-2003)	Percentage of area with support to investment		
Prunoideae	15.463	15.156	1.576	1.576	10,2%	1.146	7,6%	2.722	18,0%
Pomoideae	33.783	34.161	3.580	3.580	10,6%	1.442	4,2%	5.022	14,7%
Citrus fruit	27.419	27.755	2.574	2.574	9,4%	763	2,7%	3.337	12,0%
Nuts	71.648	71.679	4.471	4.471	6,2%	1.483	2,1%	5.954	8,3%
Area of this type of fruit trees	148.313	148.751	12.200	12.200	8,2%	4.835	3,3%	17.035	11,5%

Source: INE and IFADAP.

As can be verified, Measure 2 of PAMAF had more significance than Measure 1 of AGRO. In total, the two programs supported 11.6% of the total area of fruit trees. From the different fruit trees, prunoideae (peaches, nectarines,...) had a bigger area proportion with support to investment (18% of the total area).

Measure 2 of PAMAF had two different actions: one that supported new plantations and another that supported restructurings, while Measure 1 of AGRO covers two types of investments in just one action. This way we can break down the areas of new plantations and of restructurings for the period of PAMAF:

Table Q1F3 - 2. Orchard areas supported by PAMAF (new plantations and restructurings)

	Crop occupation area in 2000 (ha) (Source: INE)	Measure 2 – PAMAF (CCSFII)			
		New Plantations		Restructurings	
		Plantations (ha) (1994-1999)	Percentage of area with support to investment	Plantations (ha) (1994-1999)	Percentage of area with support to investment
Prunoideae	15.463	826	5,3%	749	4,8%
Pomoideea	33.783	1.022	3,0%	2.558	7,6%
Citrus fruit	27.419	559	2,0%	2.015	7,4%
Nuts	71.648	1.736	2,4%	2.735	3,8%
Area of this type of fruit trees	148.313	4.143	2,8%	8.057	5,4%

Source: INE and IFADAP

Within PAMAF, a great part of the supported area went to restructuring of orchards (8,000 hectares against only 4,000 hectares of new plantations).

The data available on the “Plans for the Improvement of Quality and Marketing of Shell-fruits” and PAMAF refer to the entire period of implementation, as presented above. However, we have annual information on Measure 1 of AGRO, which shows the evolution of structural measures’ implementation from 2001 to 2003 (Table Q1F3-2).

Table Q1F3 - 3. Evolution of orchard areas supported by Measure 1 of AGRO

	Values in ha		
	2001	2002	2003
Prunoideae	316	316	227
Pomoideea	741	409	292
Citrus fruit	763	362	103
Nuts	884	552	337
Area of this type of fruit trees	2705	1639	959

Source: IFADAP

As we may see, the orchard areas supported by this structural measure decreased significantly, in total values and for the different types of fruit trees.

Environmental effects

We couldn’t find any specific study about the environmental effects of new orchard plantations or restructuring, but by adapting some information available in reports on the environmental effects of other permanent crops production (for example: olive production) we may say the following:

The main environmental impacts of restructuring are a decrease of genetic variability whenever there is a replacement of traditional varieties by more productive and easier to place in the market varieties. Likewise, whenever restructuring leads to increased densities and/or production intensifications, the negative environmental impacts on soil, water and biodiversity become more significant.

Table Q1F3 - 4. Evolution of the density of orchards between 1992 and 2002

Density classes /trees/ha)	1992				Values in percentage of the total area 2002			
	800 to 1199	1200 to 1599	>=1600	Total	800 to 1199	1200 to 1599	>=1600	Total
Apple trees	21%	13%	9%	43%	28%	27%	21%	77%
Pear trees	31%	7%	4%	42%	35%	16%	14%	65%
Density classes /trees/ha)	1992				2002			
	400 to 599	600 to 799	>= 800	Total	400 to 599	600 to 799	>= 800	Total
Peach trees	16%	24%	52%	91%	13%	22%	60%	94%
Density classes /trees/ha)	1992				2002			
	500 to 624	625 to 749	> =750	Total	500 to 624	625 to 749	> =750	Total
Orange trees	10%	6%	3%	19%	21%	17%	7%	45%
Lemon trees	15%	19%	11%	46%	26%	6%	13%	46%
Small citrus fruit	14%	8%	4%	26%	24%	13%	8%	46%

Source: INE, Basis Survey on Fruit Tree Plantations

By analysing the table above, we can verify the evolution of areas of orchards with higher densities (for each fruit tree we have considered the 3 higher density classes). Hence, one verifies that between 1992 and 2002 there was a significant increase of areas of orchards with higher density, i.e., there was an intensification of production. Only the areas of intensive lemon tree and peach tree orchards remained relatively stable, in the remaining cases there was an increase of the proportion of area in the classes with higher density.

In what concerns new plantations, environmental impacts will depend on the crops that were previously on the land.

If the preceding crop was an annual crop, planting of an orchard may result in better soil protection throughout the year, the adoption of systems that allow for minimum tillage, and a reduction in the dragging of the superficial layer of the soil and of fertilizers and plant protection products by superficial waters.

On the other hand, if the crop that was in the plot before the installation of the orchard was a permanent crop, a natural pasture or a forest, the installation of the new orchard might result in negative environmental impacts such as: increased soil erosion, destruction of habitats with a consequent decrease of biodiversity and the deterioration of water quality through dragging or leaching of fertilizers and plant protection products.

Given the fact that, both in the case of restructurings and new plantations, it is very frequent that installation of irrigation in the orchard takes place (also supported by the above mentioned actions) it is important to take into consideration the environmental impacts of this type of investment.

The normally used system for new orchards is predominantly drip irrigation, allowing for a rational irrigation with less loss and lesser quantities of water per hectare in comparison with annual crops.

The only available data on the irrigated orchards area in national statistics is from 1992 and 1998, referring to fresh and citrus fruits, and is presented in Table Q1F3-5.

Table Q1F3 - 5. Evolution of the irrigated area of orchards between 1992 and 1998

	Values in ha							
	Irrigated orchards		Total		% Irrigated		1992	1998
	1992	1998	1992	1998	1992	1998		
Apple	19.365	11.202	25.757	16.231	75%	69%		
Pear	10.267	4.069	17.011	10.781	60%	38%		
Peach	10.559	4.116	12.321	5.131	86%	80%		
Apricot	603	204	936	497	64%	41%		
Orange	11.145	10.458	11.369	10.633	98%	98%		
Lemon	573	383	632	418	91%	92%		
Other Citrus fruits	4.299	4.131	4.313	4.157	100%	99%		
Area of this type of fruit trees	56.812	34.563	72.338	47.847	79%	72%		

Source: INE, Basis Survey on Fruit Tree Plantations.

According to this table, the total area of those types of orchards decreased significantly, between 1992 and 1998, as well as the percentage of the irrigated area. However, this does not mean that the new plantations and restructurings of orchards were not made with the installation of irrigation, as the decrease of irrigated orchards area was caused by the abandonment of the production by some farmers. In fact, there were restructurings and new plantations of irrigated orchards, but this increase of area was not able to compensate the abandonment that occurred.

We do not have any information on the evolution of cultural practices after the installation of irrigation. Nevertheless, we may say that one of the main changes is related with the fertiliser application in irrigation water, which can have negative impacts on the pollution of underground water, if the fertilizers are not applied with caution and in the correct doses.

Summary

Although we do not have data on areas of irrigated orchards for the period after 1998, we know that the national orchards have registered an increase in density in the last years (Table Q1F3 – 4.) namely through restructurings and new plantations of more intensive orchards. This intensity increase includes, in most situations, the installation of irrigation in the orchards with the support of the above mentioned structural measures.

Therefore, in certain regions the environmental impact of the increase of irrigated orchard area might have been quite significant, since it might lead to the exhaustion of underground water reserves, what could be, in extreme cases, one of the causes of desertification.

One other of the impacts irrigated orchard areas could be increased pollution of superficial and underground waters due to the leaching of nutrients and plant protection products through irrigation water, especially in situations of defective irrigation.

The increase of irrigation water needs by orchards could also lead to indirect environmental impacts through the building of water reservoirs (small dams, ponds etc.) that affect the survival of certain species (biodiversity) and the landscape.

On the other hand, the development of small water reservoirs could mean positive contributions for biodiversity, if built in harmony with the landscape and respecting the habitats of species.

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

Context and implementation

Two different actions should be considered when analysing this question:

- the grubbing of orchards, financed by OPs' Operational Funds, aiming at a reduction of community production of certain fruits.
- the renewal of orchards, financed by certain measures of the Rural Development Fund (Chapters I and IX of EC Reg. .no. 1257/99), since what is at stake are situations of support to grubbing followed by replanting.

In what concerns the premium for grubbing of orchards, throughout the period under study, four Council regulations were published, establishing premiums for the grubbing of certain fruit plants for limited periods of time. The following table shows the quantification of areas subject to grubbing for each one of said periods:

Table Q2F3 - 1. : Importance of grubbing actions financed by Operational Funds

Regulation	Grubbing Period	Grubbing Area	National Area when Grubbing was Completed	Percentage of Grubbed Trees
Reg. N° 1200/90	1990/91 to 1992/93	865 ha of apple trees	25.084	3,40%
Reg. N° 1890/94	1994/1995	1067 ha of apple trees	24.313	4,40%
Reg. N° 2505/95	1995/1996	1721 ha of peach trees	11.497	15,00%
		170 ha of nectarine trees	n.d.	-
		282 ha of apple trees	23.095	1,20%
Reg. N° 2200/97	1997/1998	25 ha of pear trees	13.129	0,20%
		223 ha of peach trees	8.856	2,50%

When analysing this table, we can see that grubbing areas financed by OFs have a reduced expression in the total area of orchards. Only the grubbing of peaches during the 1995/1996 campaign had some importance, since it represented 15% of the total existing area of peach trees in 1996. Nevertheless, if we analyse the evolution of the area of peach trees between 1998 and 2002, we verify that it was reduced to half, even without any support action to the grubbing of peach trees having taken place. We can therefore say that, in global terms, the environmental impacts of such actions were not very significant. After 1998, no more premiums for grubbing-up were established.

There is no information on the budget for the grubbing-up grants.

Environmental effects

Since there is no information by regions, we cannot verify whether there was some concentration of grubbing in any region in particular, what would have led to more significant environmental impacts, namely in terms of biodiversity.

Also, since there are not many specific data, either in quantitative or qualitative terms, on environmental effects in changes in the use of soil, we will show here the environmental impacts which, in general terms, the consulted literature points out for the different types of crop. (“The Environmental Impact of Olive Oil Production in the European Union” and “The Environmental Impact of Arable Crop Production in the European Union”).

Environmental impacts arising from the grubbing of orchards are different according to the cultural occupation, i.e., the type of crop planted after grubbing.

If the farmer consecrates the area where the orchard was previously installed to the production of annual crops, the most significant environmental impacts will be those resulting from an intensification of agricultural activity:

- **Soil erosion**, due to successive soil tillage which affects the soil structure and speeds up the mineralization of organic matter, increasing soil loss through superficial draining. From the environmental impacts of soil erosion, we should emphasize dragging of manures and fertilizers, together with the superficial layer of soil (the most fertile), which will later on pollute water courses.

- **Soil compaction** caused by successive run-throughs by heavy machinery in order to carry out cultural operations.

- **Pollution of superficial and underground waters** through the dragging of fertilizers (namely nitrogen fertilizers) and pesticides by rain or irrigation water, frequently affecting the quality of water for human consumption and making it impossible for certain aquatic organisms to survive.

- **Decrease of the ecosystem’s biodiversity** due to the intensification of production (namely frequent tillage and a high use of herbicides and insecticides), which causes the disappearance of many non-agricultural species, with the consequent interruption of food chains and the disappearance of many species that existed under natural conditions. Soil erosion and compaction are also responsible for the decrease of activity of soil organisms.

Nevertheless, these environmental effects are not generalizable, since they depend greatly on the environmental conditions of the place in question and on used cultivating practices.

On the other hand, the farmer may decide to use the area where grubbing of the orchard took place to plant another permanent crop or to install a permanent grazing field. In such a situation, negative environmental impacts resulting from this change may be smaller, since tillage will be reduced and it will be possible to keep a permanent soil cover throughout the year.

One other possible situation is land abandonment after grubbing, what will generate negative environmental impacts, namely in terms of soil erosion. Impacts would be even more reduced if tree grubbing would not take place and such trees were to constitute the basis for the development of a natural vegetation cover that would protect the soil from erosion, provided it would not be destroyed by successive fires.

In what concerns the renewal of orchards financed by Rural Development Funds, we should consider two situations, which might have more significant environmental impacts:

- A renewal of the orchard with increased density (increased number of trees per hectare), i.e., an intensification of production with similar environmental impacts to the ones above referred to for annual crops.
- A renewal of the orchard, directed to a certain variety (e.g.. with a better market outlet) with an environmental impact at the level of biodiversity, with a risk of genetic erosion due to the loss of traditional varieties.

Since we don't have spatial information about the evolution of land cover, we cannot tell which was the land occupation after the grubbing-up of orchards, or the proportion for each type of cultural practice.

Summary

Generally speaking, the grubbing areas financed by the operational funds have a reduced expression in the total area of orchards. Environmental impacts arising from the grubbing of orchards are different according to the type of crop planted after grubbing. If there is an intensification of the land use there may be negative environmental impacts in the soil, water and biodiversity. If the area is used for more extensive activities there will be less negative environmental effects. However, we have to consider the risk of land abandonment, which will leave the soil totally unprotected and subject to erosion.

In what concerns the grubbing linked to the renewal of orchards, the possible negative environmental effects are mainly those resulting from intensification of production and loss of traditional varieties.

In what concerns the grubbing linked to the renewal of orchards, the possible negative environmental effects are mainly those resulting from intensification of production and loss of traditional varieties.

2.1.4 Fruits – Theme 4: nuts

Question 1 (F4): What are the environmental impacts of the income support measure to improve nut quality?

Context and implementation

Reg. (EC) no. 1035/72 has introduced specific measures for the shell-fruit sector, in order to face the inadequacy of production and marketing. Such measures cover five products: almonds, hazelnuts, walnuts, pistachios and carob nuts.

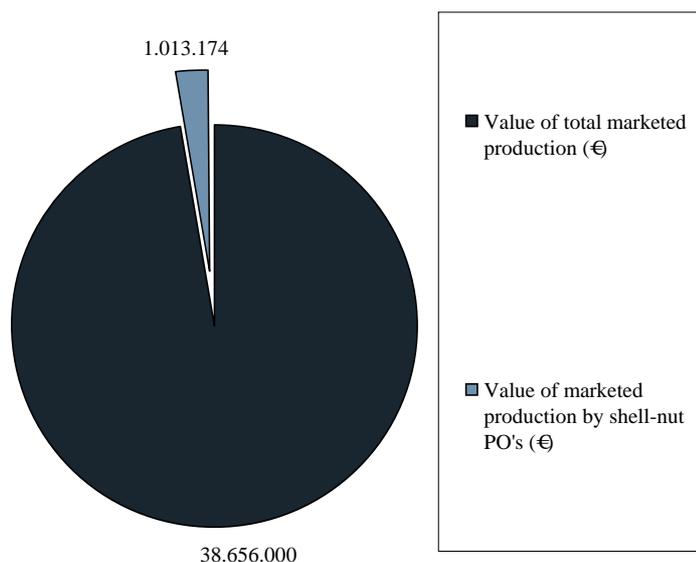
The main measure consisted of financing the quality and marketing improvement plans submitted by producer organisations for ten year periods.

The public financing of such plans has corresponded to 55%, subject to a maximum amount of 241,5 euros per hectare. The financing of the measure has a transitional and degressive nature in what concerns the maximum level of aid to be paid.

The measures were revoked by Reg. (EC) no. 2200/96. Nevertheless, the plans now in force may proceed until their conclusion: the last one expires in 2006. In the case of Portugal, those plans are in their eighth year of implementation.

In Portugal, those ten year plans had a very limited application, since there are only three POs in the sector, representing in 2003 only 2.6% of the value of marketed production.

Chart Q1F4 - 1. Comparison for 2003 between the Value of Production marketed by POs and total marketed production of nuts (values in euros)



Source: Economic accounts from INE and Data on the Value of marketed production GPPAA.

The area of nuts concerning improvement plans is 3.135 ha (according to GPPAA), corresponding to around 7,5% of the area of eligible nuts (41.886 ha).

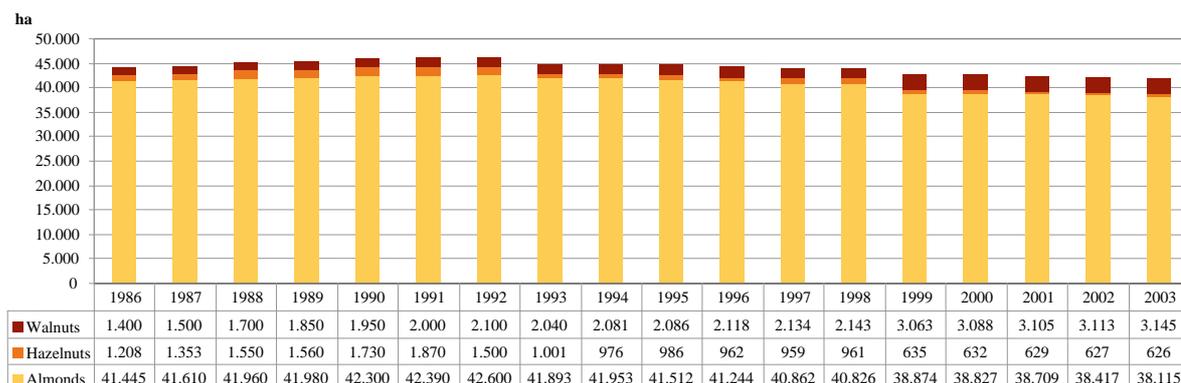
Existing POs in this sector are shown in the following table:

COFRAL - Cooperativa dos Fruticultores do Alentejo, CRL
Agrupamento de Alfarroba e Amêndoa, CRL
COOPROBOL - Cooperativa de Produtos Agrícolas de Boliqueime, CRL

The production of shell-nut in the European Union through producer organisations is eligible for other additional support measures:

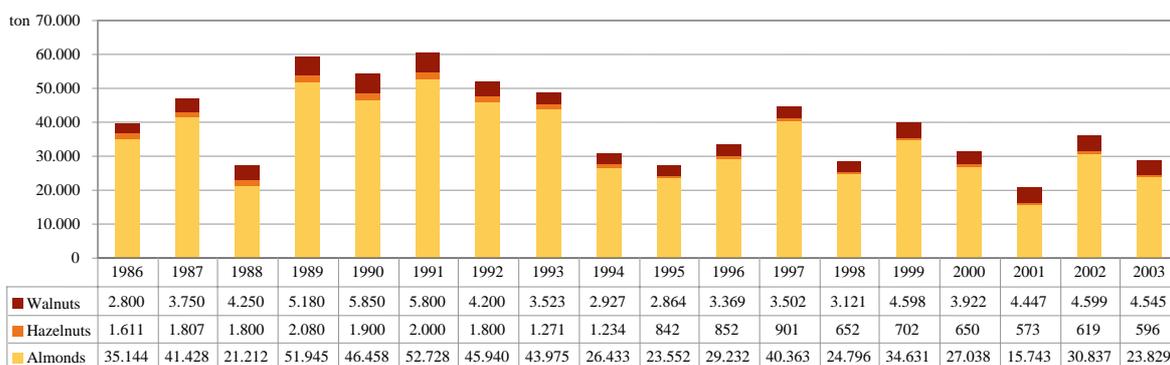
- rules governing operational funds from Reg. (EC) no. 2200/96;
- structural measures from Reg. (EC) no. 1257/1999 (rural development plans).

The area of nuts by variety throughout the 1986-2003 period is shown in the following table, where a trend towards a slight, although not very significant gap, stands out. In fact, the maximum area during this period has reached as much as 46.260 ha, representing just 41.886 ha at the moment. Note that the area of Carob Nut has not been registered, since there is no statistical information available.

Chart Q1F4 - 2. Evolution of nut areas subject to the shell-nut aid system (ha)

Source: GPPAA

In what concerns produced quantities, as can be seen in the next chart, variations throughout the period are quite more significant. This shows that most orchards are extensive crops, i.e., with a low incorporation of fertilization and treatments, as well as the big weight of this crop being done through dry farming.

Chart Q1F4 - 3. Evolution of the production of nuts subject of shell-nut aid (tonnes)

Source: GPPAA

The funds spent with POs' nut *improvement plans* were, in an initial stage, destined to help establish POs, in a second stage mainly for quality and marketing, with a first component concerning grubbing and replantation with new varieties with a value of 573,57 euros/ha and a second stage of further 5 years of 241,5 euros/ha for maintenance. The main effects of those improvement plans, according to the opinion of interviewed technicians, were to avoid degradation and abandonment of the orchards, to improve productivity, in treatment and fertilization and in the choice of the most adequate varieties in technical and market terms.

Besides that type of initiatives for a substantial area, expenses concern mainly income support in order to allow for an improvement of the quality of the product. This area corresponds to less-favoured zones with extensive farming, although it plays an important role in the maintenance of rural population and of environmental effects (anti-erosion and firebreaks).

It should nevertheless be noted that, as previously referred to, this effect had relatively little significance, since only 7.6% of the nut orchards area was covered by the POs' nut improvement plans.

In 2003, Council Reg. no 1782/2003, which establishes the common rules for the direct aid system within CAP, established, in this way, payment by area for shell-fruit. This regulation establishes the possibility for a Member State to establish the national guaranteed area (NGA), which in the case of Portugal corresponds to 41.300 ha. Within this measure, each Member State grants

community support within a maximum limit, by multiplying the number of hectares by the average amount of 120,75 euros. In the case of Portugal, the global limit of this aid amounts to 4.986.975 euros.

The species that benefit from this aid are: hazelnut trees, almond trees, walnut trees, pistachio trees and carob trees, provided that they are in a contiguous surface where the minimum number of trees is:

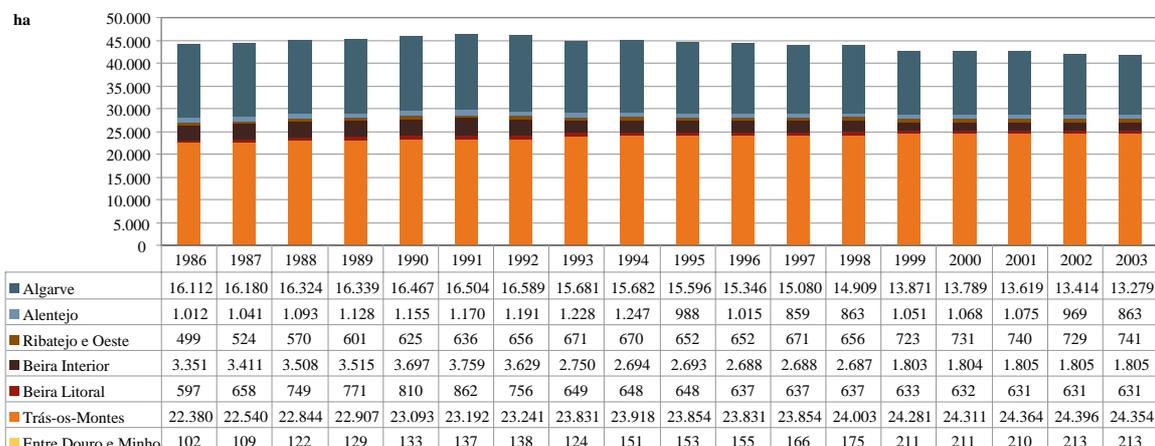
- hazelnut trees: 125;
- almond trees: 50;
- walnut trees: 50;
- pistachio trees: 50;
- carob trees: 30.

As seen previously, there is a deficient organisation of production in this sector in Portugal. For this reason, although it is foreseen that the granting of aid to shell-nut producers will depend on their joining a producers' association recognised under the terms of Reg. (EC) no. 2200/96, given the fact that community laws concerning this type of aid (Reg. (EC) no.1782/2003 and Reg (EC) no.2237/2003) provide the Member States with specific regulating competence, normative decree no.15/2004 e no.3/2005 has established the possibility of the granting of aid not being subject to farmers joining a producers' organisation.

Notwithstanding what was referred to above, the area which applied for aid was just 14.383,6 ha, i.e., 34,3% of the potential area. The distribution of this proportion was uneven for the different national regions.

The distribution of existing areas by region is shown in the following chart.

Chart Q1F4 - 4. Evolution of areas by region of nuts receiving shell-fruit aid.

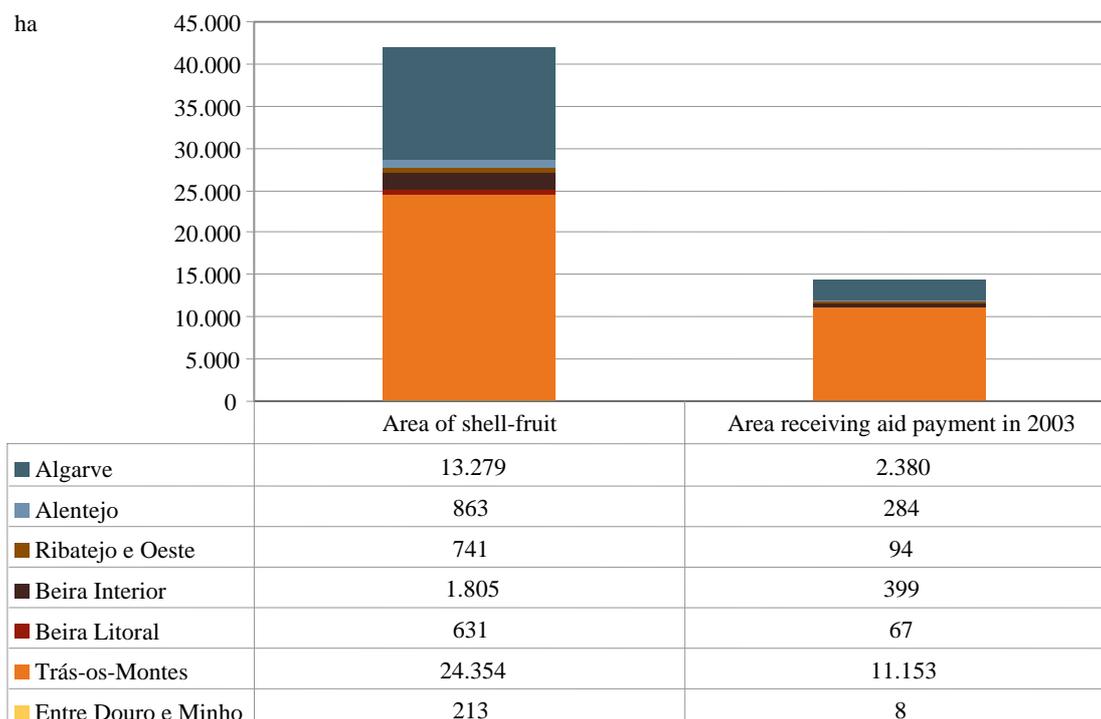


Source: GPPAA.

From this chart, one may conclude that, on one hand, the regions of Trás-os-Montes and Algarve are by far the most relevant regions in terms of nuts while, on the other hand, while in Trás-os-Montes and the West Region there was an area increase, in Beira Litoral the area remained steady and in other regions there was a decrease in the respective areas during the analysed period.

In what concerns the weight of declared area in the total area, we should emphasize the fact that, in Trás-os-Montes and Alentejo, 45.8% and 35.9% of the respective existing areas were subject to new shell-fruit aid .

Chart Q1F4 - 5. Comparison between (eligible) nuts area and area receiving aid payment per region.



Source: GPPAA

In this case, in spite of the non-imposition to farmers of the obligation to join recognised POs, areas subject to the application for aid were far beneath potential aid.

Environmental effects

Two types of measures were analysed:

- *POs improvement plans*, now at their 8th year of application but that only affected 3 PO's they represent only 2.63% of the total nut area in Portugal.

Given their reduced importance, it is not correct to say that there were any environmental effects due to these plans.

- the implementation of *common rules for direct aid system* in 2003, introducing the payment per area for shell fruit with the possibility of the granting of aid not being subject to farmers joining a producers' organisation, allowed that a bigger number of producers it benefited. And in the campaign 2003/04, the area witch applied for aid represented 34,3% of total nut area in Portugal.

Nevertheless, this type of aid has only started to be implemented one year ago, therefore the expected environmental effects will only be felt in the future.

Summary

To the obligations of this type of aids should be added the obligation to guarantee good agricultural practices required by conditionality and, in this case, the possibility to support an orchard which otherwise would probably have been abandoned (as has happened in some regions in the last years), moreover with an important effect in fighting erosion, as well as in natural landscape, not counting the maintenance of genetic diversity. Nevertheless, this type of aid has only started to be implemented one year ago, therefore the expected environmental effects will only be felt in the future.

In what concerns orchards which have been made part of PO improvement plans, they are allowed to choose to apply for this aid, but they will have to waive the aid they are receiving within the improvement plan. In our opinion, that will only happen after the term of such plans, unless the value received per hectare becomes more interesting from an economic point of view

2.1.5 Fruits – Theme 5: co-ordination with agri-environmental measures

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

Context

Agri-environmental measures were first established in Portugal by Council Reg. (EEC) no. 2078/92, of June, which established for Portugal an aid system consisting of a set of measures, structured in four big groups, with specific objectives:

1. Group I – Reduction of pollution effects of agriculture: the objective of which was to encourage farmers to use chemicals in a more rational way, to adopt alternative control methods against pest and diseases and to promote less intensive production systems in order to obtain better quality products, integrating the following measures:

- a) Chemical control under advice
- b) Integrated protection
- c) Integrated production
- d) Promotion of organic farming

2. Group II – Extensification and/or maintenance of extensive traditional agricultural systems: the objective of which was to support extensive systems, traditional in Portugal, allowing for their maintenance and avoiding the desertification of huge inland zones. The following measures integrated this group:

- a) Traditional mixed farming systems from Northern and Central Portugal;
- b) Dry farming grain systems;
- c) Wet pastures
- d) Extensive forage systems
- e) Traditional olive groves
- f) Torres Novas fig groves
- g) Vineyards in terraces in Douro
- h) Fruit trees of regional varieties
- i) Traditional dry farming orchards
- j) Traditional dry farming almond plantations
- k) Holm Oak plantations
- l) Support to endangered autochthonous breeds

3. Group III – Conservation of rural resources and landscape: in order to restrain the growing abandonment of certain agricultural and forest areas, this group of measures was developed, namely with the objective of organising and controlling the increase of forest fires and consequently the erosion and degradation of the landscape. The following were included in these measures:

- a) Maintenance of abandoned forest areas
- b) Maintenance of forest areas that are complementary of farms
- c) Preservation of dense forest of tree or brush autochthonous species
- d) Maintenance of agricultural lands inside forest areas
- e) Maintenance of traditional agricultural systems in sensitive zones from an environmental point of view (Zonal Plan of Castro Verde)

4. Grupo IV – Professional Training: it is intended with this group to favour awareness and training of farmers in terms of agricultural production compatible with requirements of the environment. It grouped:

- a) Training actions
- b) Demonstration fields

Implementation

There are no complete statistical figures on the application of this regulation in what concerns its physical incidence, i.e., number of hectares. However, as with groups I, II e III, aids were granted

per hectare (with the exception of endangered autochthonous breeds, in which case aids are paid per head of cattle) and are modulated according to the type of crop and payments are annual for a 5 year period. The numbers shown ahead and that refer to areas receiving support in 1998, reflect areas in force for each measure this year and therefore all commitments undertaken during the 1994-1998 period for Continental Portugal.

Table Q1F5 - 1. Agro-environmental measure of Reg. (EC) n. 2078 in 1998

Agri-environmental measure of Reg. (EC) no. 2078 in 1998 Total (area in hectares)		Total (area in ha)
Group I	2 Chemical Control Under Advice	4.025
	3 Integrated Protection	20.549
	4 Integrated Production	70
	5 Organic farming	2.349
	Total for the Group	26.992
Group II	6 Cultural Systems of Northern and Central Portugal	6.804
	7 Dry Farming Grain Systems	12.241
	8 Wet pastures	1.725
	9 Extensive Forage Systems	103.754
	10 Traditional Olive Groves	7.023
	11 Torres Novas Fig Groves	12
	12 Vineyards in Terraces in Douro	386
	13 Fruit Trees of Regional Varieties	644
	14 Traditional Orchards	2.450
	15 Dry Farming Almond Plantations	671
Total for the Group Total	170.292	
Group III	20 Maintenance of Abandoned Forest Areas	416
	21 Maintenance of Forest Areas that are complementary of farms	2.828
	22 Preservation of Dense Forest of Autochthonous Species integrating ecosystems of significant interest	904
	23 Maintenance of Agricultural Lands inside forest areas	112
Total for the Group	4.260	
Total	201.544	

Source: IFADAP

From these measures, the ones having incidence in our analysis (analysed orchards) are Chemical Control Under Advice, Integrated Protection, Integrated Production, Organic Farming, Fruit Trees of regional varieties, traditional orchards, dry farming almond plantations.

In the measures of Group II, where the objective is maintenance of traditional agricultural systems, it is possible to know the exact orchard area subject to the agri-environmental measure, while in the measures of Group I we know the area receiving aid, but not which part of such area are orchards. In this case, there is available information by group of measures for the different crops. In the case of fruit growing, the area subject to aid for integrated protection, integrated production and organic farming is 11665,3 ha for this period.

In what concerns the measures of Group II, the three measures with incidence on fruit trees were fruit trees of regional varieties, traditional orchards and dry farming almond plantations.

As previously referred to, the objective of these measures was to maintain traditional agricultural systems.

In the case of fruit trees of regional varieties what is at stake is tree systems based on regional varieties farmed in dry farming system, of great organoleptic variety but with low and irregular outputs, representing 644 ha in the 1994-1998 period. The objective of this measure was to avoid the conversion of these orchards in exotic varieties' orchards with higher incomes, but with additional requirements in terms of fertilizers and plant protection products.

In the case of traditional orchards, what was at stake was dry farming traditional orchards, composed of, depending on the zones, different proportions of carob, almond, fig and olive trees. These orchards are a characterising element of the Barrocal Algarvio landscape and represented the sustaining pillar of the regional agricultural economy, both due to the occupied area and to the number of people depending on them. Aid was justified by the need to fix populations and to preserve the rural landscape, as well as the typical regional productions, some of which characterize the local cuisine. The area subject to this type of aid was 2450 ha, as can be seen in the previous table.

In what concerns the dry farming almond plantations measure, what is at stake is extensive almond tree orchards, of traditional non-bitter cultivars, which constitute a relevant landscape and genetic heritage of regions that are subject to a strong demographic recession, usually located in slaty and steep slopes, with no alternative soil occupations and subject to growing abandonment. The objective of introducing this measure was to avoid the abandonment of such orchards, preserving at the same time the rural landscape typical of these regions and contributing for the fixation of populations. This measure was applied in some municipalities of the Trás os Montes and Beira Interior regions and was implemented in an area of 671 ha.

From 2000 onwards, through the implementation of the Agri-environmental Measures, provided for under Chapter IV (articles no. 22 and no. 24^o) of the Rural Development Regulation, a point was made to maintain a certain continuity in what concerned the structure of measures provided for under Reg. (EC) no. 2078/92. Anyway, adjustments were made in order to improve, materialise and increase the contribution of traditional agricultural systems to the protection of the environment and to the preservation of unspoiled nature.

Agri-environmental measures, provided for under Reg. (EC) no. 1257/1999, integrate the Rural Development Plan, called RURIS.

The application of RURIS was carried out through the decision C(2000) no. 3368 of 22/11/2000 and Regulations (EC) no. 1257/1999 from the Council and no.1750/1999 from the Commission.

Agri-Environmental Measures, applying to Continental Portugal, provide for a set of structured measures in five big groups, with specific objectives.

GROUP I – Protection and improvement of the environment, soils and water.

In the Portuguese agriculture there are practices and agricultural systems which cause environmental externalities of some significance, in what concerns negative impacts, on the social welfare level. Negative externalities have mainly to do with:

- the use of pesticides in general, mainly the most toxic ones and those that persist longer in the ecosystem;
- soil fertilization, in intensive agricultural systems;
- accelerated erosion of soils, as the result of practices of certain systems, coupled with certain soil complexes – gradient of slopes – erosiveness, widely represented in the national territory.

This group's measures are as follows:

- chemical control under advice;
- integrated protection;
- integrated production;
- organic farming;
- improvement of soils and fight against erosion:
- direct sowing;
- minimum tillage;
- inter row grass sowing in permanent crops.
- extensive forage systems;

- reduction of agro-chemicals leaching into aquifers

Group II – Preservation of landscape and of the traditional characteristics of agricultural lands

Some landscapes and landscape attributes impose themselves as bearing cultural significance, not only due to their distinctive nature, but also to centuries of co-evolution between landscape and human groups who inhabit it. Such cultural significance can have a local, regional, national, or even international scale. For all these landscapes there are projects for processes of development of a support system to the preservation of landscape and landscape attributes typical of the countryside and with a significant cultural value.

This group's measures are as follows:

- qualification of the villages envelope *;
- qualification of unspoiled nature for public use *;
- vineyards in terraces in Douro;
- recovery and maintenance of traditional systems:
- southern vegetable gardens (Alentejo and Algarve)
- Colares vine growing system.

Group III – Conservation and improvement of cultivated spaces with significant cultural value

In Portugal, just as happens, anyway, in most of Europe, a significant part of the biodiversity is linked to the cultivated agricultural space. This results from a history of centuries of human occupation and agricultural use of the territory, during which usually stable agri-ecosystems, based on a judicious use of resources (water, soil and biodiversity), have developed.

It is therefore justifiable to support a set of agricultural systems and practices leading to the conservation of that element of biodiversity which depends on the maintenance of cultivated agricultural spaces. This is the main objective of this group of measures, which are circumscribed to those geographical areas and systems that were considered as priority, both due to their high natural value and to the degree of threat that lies upon them.

This group's measures are as follows:

- traditional mixed farming systems;
- groves (holm oak and Spanish oak-*Quercus pyrenaica*);
- Wet pastures and other meadows and pastures with a high floristic value;
- traditional olive plantations;
- traditional orchards;
- Zonal plan of Castro Verde.

Group IV – Conservation of residual spots of natural ecosystems in predominantly agricultural landscapes

Presently cultivated space, or space that has been cultivated in the past, occupies, in practically all Portuguese regions, a very significant part of the territory. Therefore, what remains of natural ecosystems is confined to small spots where conversion into agricultural land was made difficult by the steep gradient, by the amount of stones in the land, bad drainage or poor accessibility. In spite of their reduced size, pronounced fragmentation, and insertion in a predominantly agricultural landscape matrix, these residual spots of natural ecosystems play an important role.

This group's measures are as follows:

- preservation of clumps or dense bush/tree forests, interesting from an ecological/landscape point of view;
- riparian strips *;

* not made operational in this campaign

* not made operational in this campaign

- conservation of wetlands and respective agricultural envelope:
- lagoon and moor banks*;
- rice fields.

Group V – Protection of genetic diversity

One of the conditions that led to a successful adaptation of traditional production systems to local ecological conditions, was the development, along time, of certain plant varieties and animal breeds. Although less productive than those resulting from genetic improvement, these varieties and breeds are more capable of taking advantage of the local ecological conditions, in the absence of high input consumptions. Besides this, many of these varieties and breeds are, by their “landscape” looks and gastronomical use, important elements of the regional and/or national culture. As such, they are an important rural development factor, an opportunity that should be left open for the future, through the maintenance of the diversified genetic heritage held by all these varieties and breeds.

The existence of an incentives system to the conservation of local breeds is therefore justified, being the objective of this group of measures.

This group integrates the measure:

- Maintenance of autochthonous breeds.
- The possibility of accumulating some measures in the same parcel is also provided for, something that can only happen provided:
 - # they have different and complementary objectives;
 - # their conjugation is favourable from an environmental point of view;
 - # their access conditions being compatible;
 - # there is no commitment incompatibility;
 - # a maximum aid value (fixed in the annex to Reg. (EC) no. 1257/99) will not be exceeded.

Form and duration of aids

Aids foreseen within Agri-environmental Measures are granted in the form of annual premiums, for a 5 year period.

Without prejudice of commitments concerning each one of the measures, the beneficiaries are obliged to:

- maintain the conditions which have determined the granting of aids, as well as to comply with all commitments undertaken in regard of the applied for plots during the period of aid granting;
- comply with “good agricultural practices” in the whole area of the production unit.

From these measures, we will now characterise the ones that apply to fruit trees in progress. From GROUP I (Protection and improvement of the environment, soils and water) the following measures apply to orchards:

1. CHEMICAL CONTROL UNDER ADVICE – this measure aims at supporting a rational use of plant protection products, by encouraging farmers to join the National Agricultural Warning Service, in such a way as to confine the use of such products to the periods of greater risk.

Density of fruit trees (no. of trees per hectare as follows) in order to become eligible for this measure:

- # Pomoideae – 150 trees/ha;
- # Prunoideae (except cherry trees) – 250 trees/ha;
- # Citrus fruit – 100 trees/ha

In this case, new applications within this community framework (2001-2003) amounted to just 10 ha concerning citrus fruit orchards (Source : Interim evaluation of the rural development plans for Continental Portugal RURIS , (CEFAC, ERENA CIDEC)).

2. INTEGRATED PROTECTION – that aims at using whenever possible alternative control methods; limiting the application of plant protection products to situations where crop enemies reach the economic level of attack, or to risk periods, determined through prevision methods; using plant protection products that preserve auxiliary organisms which naturally contribute to fight pests.

Density of fruit trees (no. of trees per hectare as follows) in order to become eligible for this measure:

- # Pomoideae – 150 trees/ha ;
- # Prunoideae (except cherry trees) – 250 trees/ha ;
- # Citrus fruit – 100 trees/ha

In what concerns this measure, the number of adherences during this period was relatively higher, with a total of 5839 ha of new orchard areas being covered by this programme, as can be seen in the following table;

Table Q1F5 - 2. Area in hectares of new orchards introduced within the integrated protection programme

		Citrus fruit and cherry trees	Pomoideae	Prunoideae except cherry trees	Total Orchards
CONTINENTAL	2001	688	1.644	400	2.733
PORTUGAL	2002	1.671	2.072	532	4.275
	2003	1.306	3.709	824	5.839

Source: Interim evaluation of the rural development plan for Continental Portugal RURIS (CEFAC, ERENA CIDEC).

3. INTEGRATED PRODUCTION - that aims at conjugating Integrated protection with the adoption of a correct use of fertilizers and other inputs and adequate cultural techniques; altering the production pattern with the view of increasing efficiency and minimizing environmental impacts. Density of fruit trees (no. of trees per hectare as follows) in order to be eligible for this measure is as follows:

- # Pomoideae – 150 trees/ha;
- # Citrus fruit – 100 trees/ha

In this case the new adherence area was 2218 ha of orchards, as can be seen in the following table.

Table Q1F5 - 3. Area in hectares of new orchards introduced within the integrated production programme

		Poimoideae
CONTINENTAL	2001	880
PORTUGAL	2002	1.467
	2003	2.218

Source: Interim evaluation of the rural development plan for Continental Portugal RURIS , (CEFAC, ERENA CIDEC)

4. ORGANIC FARMING – that aims at making agricultural and livestock activities compatible with the preservation of the environment; contributing for the improvement soil fertility and for the development of a sustainable agriculture; reducing the application of potentially leachable nutrients; improving crop diversity; improving the efficiency of the use of the farm's natural resources; producing high quality food. Density of fruit trees (no. of trees per hectare as follows) in order to become eligible for this measure is as follows:

- # Pomoideae – 150 trees/ha;
- # Prunoideae (except cherry trees) – 250 trees/ha;
- # Citrus fruit – 100 trees/ha
- # Walnut trees – 100 trees/ha

Hazelnut trees – 300 trees/ha

In what concerns the new areas of application of this measure, as can be seen in the following table, there were only 58.8 ha of almond and walnut trees, showing that this measure has a reduced implementation in Portugal.

Table Q1F5 - 4. Area in hectares of new orchards introduced within the organic farming programme

		Almond and Walnut Trees
CONTINENTAL	2001	41,14
PORTUGAL	2002	41,89
	2003	58,79

Source: Interim evaluation of the rural development plan in Continental Portugal RURIS, (CEFAC, ERENA CIDEAC)

Finally, still within Group I, but within soil improvement and fight against erosion, a new measure appears in this table, applying to fruit trees, called Inter row grass sowing in permanent crops.

5. INTER ROW GRASS SOWING IN PERMANENT CROPS (IGSPC) – that aims at reducing or removing soil erosion or degradation processes. Density of fruit trees (no. of trees per hectare as follows) in order to become eligible for this measure is as follows:

Pomoideae – 150 trees/ha;

Prunoideae (except cherry trees) – 250 trees/ha;

Citrus fruit – 100 trees/ha

At the present moment, only general data on application are available, including also vine and cherry tree areas. The total application of this measure during this period was 4721.5 ha

Table Q1F5 - 5. Area in hectares introduced in the inter row grass sowing in permanent crops programme

	2001	2002	2003
CONTINENTE	1.119	1.646	4.722

Source: Interim evaluation of the rural development plan for Continental Portugal RURIS, (CEFAC, ERENA CIDEAC)

Finally, the Traditional Orchards measure included in Group III – Conservation and improvement of cultivated spaces with significant cultural value also applies to the fruit trees under study.

6. TRADITIONAL ORCHARDS – aiming at the maintenance of rural landscapes with high natural value and touristic interest; potentiation of alternative activities.

In this measure, there is for the fruit trees under study the sub-measure Algarvian Orchards, which applied to dispersed orchards with one or more of the species almond, carob, fig and olive trees and the total density of which should be between 40 and 150 trees/ha and the sub-measure Almond Tree Plantations that should be a production unit with extensive dry farming of almond tree plantations of non-bitter varieties, with a density between 60 and 150 trees/ha.

Table Q1F5 - 6. Areas subject to aid within the Traditional Orchards measure

		Almond tree plantations	Algarvian Orchards	Total
CONTINENTAL	2001	1.370	5.466	6.835
PORTUGAL	2002	1.646	6.859	8.505
	2003	1.927	9.229	11.156

Source: Interim evaluation of the rural development plan for Portugal RURIS, (CEFAC, ERENA CIDEAC)

Since the agri-environmental contracts are five year plans, it is difficult to ascertain which of the new contracts of this CSFIII are renewals of contracts from CSFII (Reg.no.2078/92), in our opinion the best way to check what is the expression of the area subject to the agri-environmental measure in the total area is to ascertain the declared area in this last 2003/2004 campaign.

In fact, the declared areas in the last campaign reflect the contracts in force, whatever the date of the 1st commitment may be.

In the following table we can see the comparison of the declared area by fruit tree species declared for each measure with the total area.

Table Q1F5 - 7. Comparison of the declared area (ha) of each fruit tree species in each AEM in the 2003/2004 campaign and the total area disclosed by INE (2002)

Cultural occupation area in 2002 (ha) (source INE)	Integrated Protection		Integrated Production		Organic Farming		Inter row grass sowing		Traditional Orchards		Total	
	Declared area	Percentage of total area	Declared area	Percentage of total area	Declared area	Percentage of total area	Declared area	Percentage of total area	Declared area	Percentage of total area	Declared area	Percentage of total area
Fresh fruit (a)	58.551	8.468 14,5%	3.932 6,7%	682 1,2%	4.398 7,5%	- 0,0%	17.481 29,9%					
Plums	2.037	400 19,6%			5 0,2%	128 6,3%	533 26,1%					
Cherries	5.875	1.601 27,3%			194 3,3%	346 5,9%	2.141 36,4%					
Apricots	547	1 0,2%			12 2,1%	1 0,2%	14 2,5%					
Figs	7.396				61 0,8%		61 0,8%					
Kiwi	1.005						0 0,0%					
Apples	21.388	3.772 17,6%	1.534 7,2%	240 1,1%	1.907 8,9%	7.452 34,8%						
Pears	12.773	1.661 13,0%	2.398 18,8%	145 1,1%	1.561 12,2%	5.766 45,1%						
Peaches	6.697	1.033 15,4%			26 0,4%	456 6,8%	1.515 22,6%					
Citrus fruit	27.755	2.293	76 0,3%	115 0,4%	1.375 5,0%	3.860 13,9%						
Oranges	21.650	1.937 8,9%	52 0,2%	91 0,4%	1.187 5,5%	3.267 15,1%						
Lemons	1.009	34 3,4%	4 0,4%	1 0,1%	9 0,9%	47 4,7%						
Pomelo	394					0 0,0%						
Tangerines	4.674	323 6,9%	20 0,4%	24 0,5%	179 3,8%	546 11,7%						
Grapefruit	28											
Dried fruit	71.679	0	0 0,0%	1.440 2,0%	6 0,0%	16.013 22,3%						
Almonds	38.417			1.212 3,2%	6 0,0%	7.896 20,6%						
Hazelnuts	627			30 4,8%		30 4,8%						
Chestnuts	29.522			170 0,6%		4.435 15,0%						
Walnuts	3.113			28 0,9%		28 0,9%						
Carob bean						3.624						
Area of fruit trees	157.985	10.762 6,8%	4.008 2,5%	2.238 1,4%	5.780 3,7%	37.353 23,6%						
Proportion of the area of fruit trees in the total declared area		8,8%	28,2%	2,9%	99,4%	15,8%						
Total area of all crops declared in the AEM		122.720	14.190	77.126	5.814	237.060						

(a) Includes also dyospyrus fruit, sour cherries, quinces, loquat fruit and pomegranates.

Source:INGA

As can be verified, around 23.6% of the area of fruit trees was subject to an AEM. It is nevertheless important to refer that, in the case of inter row grass sowing in orchards, this measure can be overlapped with any one of the other measures, being so if we consider that all grass sowing is carried out together with one of the other measures (almost in all cases, we believe), then around 20% of the area of fruit trees shown above is included in one of the other four agri-environmental measures.

Regarding the fruit trees considered in our study, we can emphasize the following aspects (not considering the area of IGSPC):

- pear trees are the fruit trees with a larger area subject to AEM, showing 32.9% of the total covered area;
- apple trees show 25.9% of their area subject to AEM;
- peach trees show 15.8% of their area subject to AEM;
- citrus fruit trees show 8.9 % of their area subject to AEM;
- almond trees show 20.5% of their area subject to AEM;
- hazelnuts show 4.8% of their area subject to AEM;
- walnut trees show 0.9% of their area subject to AEM.

On the other hand, the division between measures of GROUP I – Protection and improvement of the environment, soils and water and the measures of GROUP III – Conservation and improvement

of cultivated spaces with high natural value, in terms of area, corresponds respectively to 61% and 39% of the total area subject to AEM.

Finally, we should comment the fact that the quantity of marketed fruit through POs of the sector is 23%, as can be seen in our introduction, not far from the proportion of area subject to AEM. Although it is difficult to establish a parallel between production subject to AEM and belonging to a PO, we can refer that, except for the case of shell-fruits to which we have referred in the question on the subject, in the case of other fruits a large part of the areas with AEM are already associated in POs.

Summary

In what concerns the coordination between AEM and environmental measures provided for by in CMO, we can refer that, according to what we have been told, there is a complementarity between the two types of measure, since in the case of AEM support is granted directly to production, while in the case of CMO, through their operational funds, environmental expenses are according to what was described in question q2f2, mainly in what concerns residues and packages control and, in the case of other headings, other differentiated initiatives, as explained below.

Environmental initiatives included in CMOs and introduced through their operational funds are mainly technical assistance to producers so that to be in position to advise them as to the contents and way to carry out treatments and fertilization, quality control from production to trading, introduction of good agricultural practice rules, namely EUREP_GAP, processing of data collected in the field in order to certify production and to ensure food safety.

However, we should emphasize the fact that the environmental component of POs' operational funds, although having been increasing, is around 29% only.

In what regards the eventual overlapping of environmental support within the framework of CMO, and that of AEMs in the carried out analysis, we can conclude that this type of situation might eventually exist in the case of the new aid to shell-fruits.

In fact, in this case a contiguous area with at least 50 trees/ha is eligible for this type of aid. At the same time, almond tree areas with at least 250 trees/ha or walnut tree areas with 100 trees/ha, or hazelnut tree areas with 300 trees/ha are also eligible for organic farming. As can be seen from the previous table, this type of area represents 1212 ha of almond trees, 30 ha of hazelnut trees and 28 ha of walnut trees. The value per hectare of organic farming varies between 80 and 200 euros.

Besides this, probably some cases of traditional orchards having between 60 and 100 trees/ha of almond or carob trees might receive simultaneously aid within shell-fruits. In the case of traditional orchards, aid varies between 665 and 109 euros/ha.

The question is how to establish what the objective of shell-fruit aid and of those two types of AEM measures is, so that the target areas be differentiated according to the nature conservation aspect or the market commercial aspect, even if according to added food safety forms as is the case of organic farming.

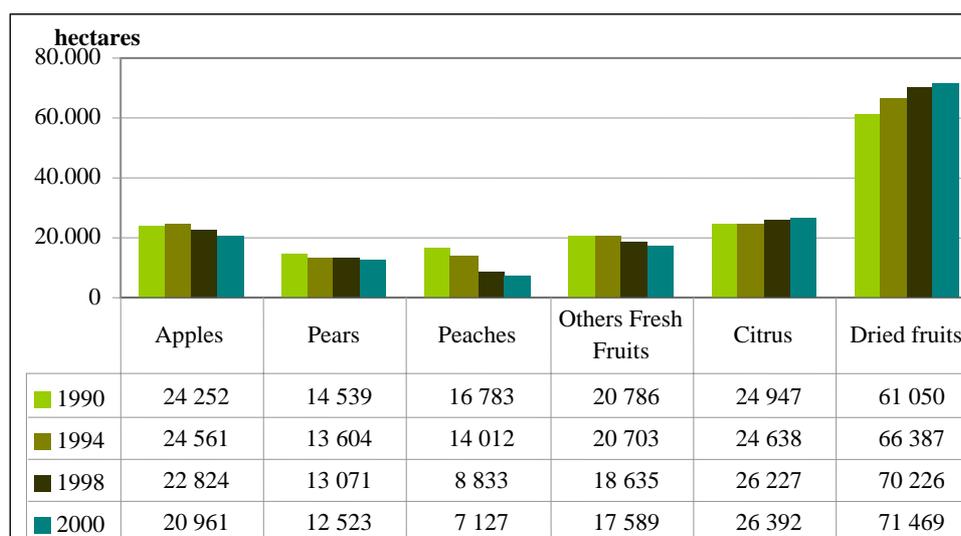
2.2 Horizontal questions

2.2.1 Horizontal – Theme 1: land use over time

Question 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? [This question should preferably consider typical patterns of alternative status/use after or before use of the land for the permanent crop to which the CMO relates.]

The evolution of the areas of the several fruit trees under analysis was differentiated, along time, as can be seen in the next chart.

Chart Q1H1 - 1. Evolution of the area (ha) of fruits throughout the 1990-2000 period



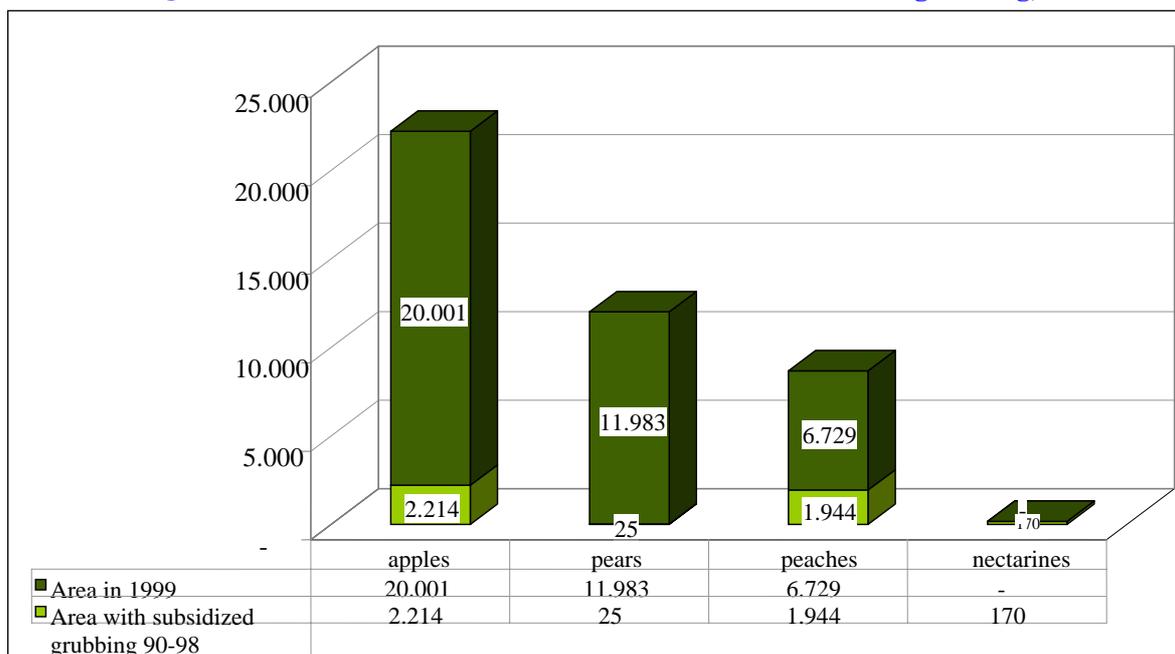
Source: INE.

From the analysis of the previous chart, one may conclude that during this period only nuts have increased their area. However, from the detailed analysis of nuts, the area increase occurred mainly in the case of chestnuts (not subject of CMO) and in a small proportion of walnuts, which have increased around 980 ha from 1989 to 1999.

Since the analysis we wish to carry out refers to the effects of the changes in land use due to the CMO, it is important, on one hand, to establish which are the CMO measures with an impact on the evolution of areas, so that afterwards we can quantify the respective impact.

In our opinion, CMO measures with an incidence on land use were directly the operational funds' measures which would allow for the financing of grubbing and of improvement plans for shell-fruits and, indirectly, for support through operational funds in the normalization, certification and marketing of fruit with certain production methods, having the added value of a guarantee of outlet and price.

The first aspect, i.e., areas with subsidized grubbing, had a very different weight depending on the fruit tree species.

Chart Q1H1 - 2. Area of some fresh fruit orchards with subsidized grubbing, in 1999.

Source: INGA.

We can conclude that in the case of pear trees, it was quite residual, since only 0,2% of the existing area in 1999 was grubbed between 1990 and 1998. In the case of apple trees, the grubbed area represented 11,1% and, in the case of peach trees, the value was quite substantial (28,9%). In these cases, the environmental impact of this grubbing may have been for different reasons, as explained below.

If the farmer dedicates the area where the orchard was to the production of annual crops, what is most probable, the more significant impacts will be those resulting from an intensification of agricultural activity:

- **Soil erosion**, due to successive soil tillage which affects the soil structure and speeds up the mineralization of organic matter, increasing soil loss through superficial draining. From the environmental impacts of soil erosion, we should emphasize dragging of manures and fertilizers, together with the superficial layer of soil (the most fertile), which will later on pollute water courses.
- **Soil compaction** caused by successive run-throughs by heavy machinery in order to carry out cultural operations.
- **Pollution of superficial and underground waters** through the dragging of fertilizers (namely nitrogen fertilizers) and pesticides by rain or irrigation water, frequently affecting the quality of water for human consumption and making it impossible for certain aquatic organisms to survive.
- **Decrease of the ecosystem's biodiversity** due to the intensification of production (namely frequent tillage and a high use of herbicides and insecticides), which causes the disappearance of many non-agricultural species, with the consequent interruption of food chains and the disappearance of many species that existed under natural conditions. Soil erosion and compaction are also responsible for the decrease of activity of soil organisms.

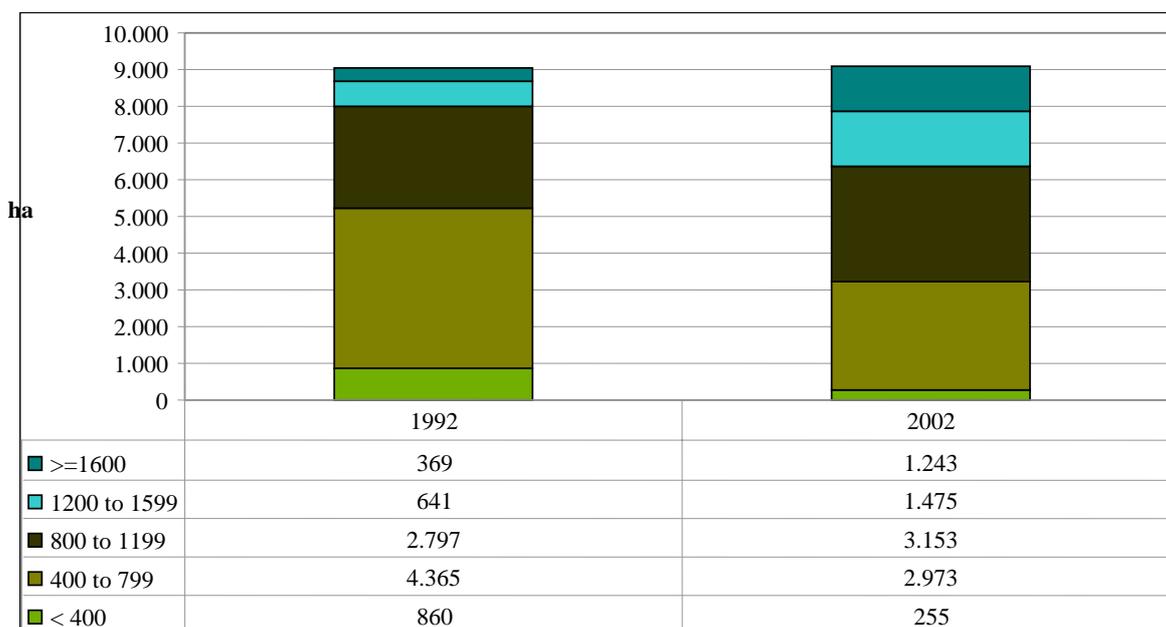
Nevertheless, these environmental effects are not generalizable, since they depend greatly on the environmental conditions of the place in question and on used cultivating practices.

In what concerns the aspects referring to PO operational funds, we should refer the fact that the universe represented by the value of marketed production is relatively reduced (8% in 2002) and for that reason it cannot be extrapolated to explain what happened in terms of evolution of the general area of fruit trees.

Anyway, there are cases of success, in what is the intervention of the role of POs.

In fact, although there has been for pear trees a slight drop in the total area of orchards (-3%), this drop was due to the abandonment of orchard areas in less representative regions of the national production. In fact, in the Ribatejo e Oeste region, which represents 90% of pear production, the area remained unchanged (+1%).

Chart Q1H1 - 3. Evolution of the pears production area in Ribatejo e Oeste, between 1992 and 2002, by density class (trees/ha).



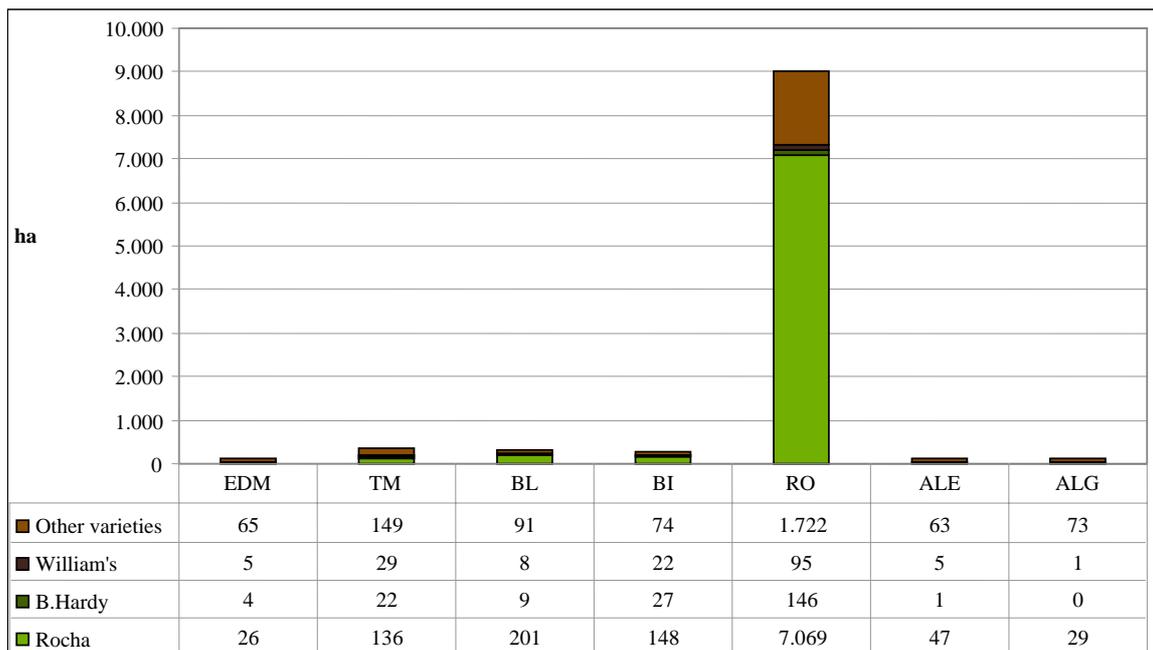
Source: INE

The restructuring of pear production in Ribatejo e Oeste is evident, with classes with a density of over 800 trees/ha registering significant increases.

In fact, not only were there area increases, but produced quantities also increased. This caused this region's productivity to register increases of +67%.

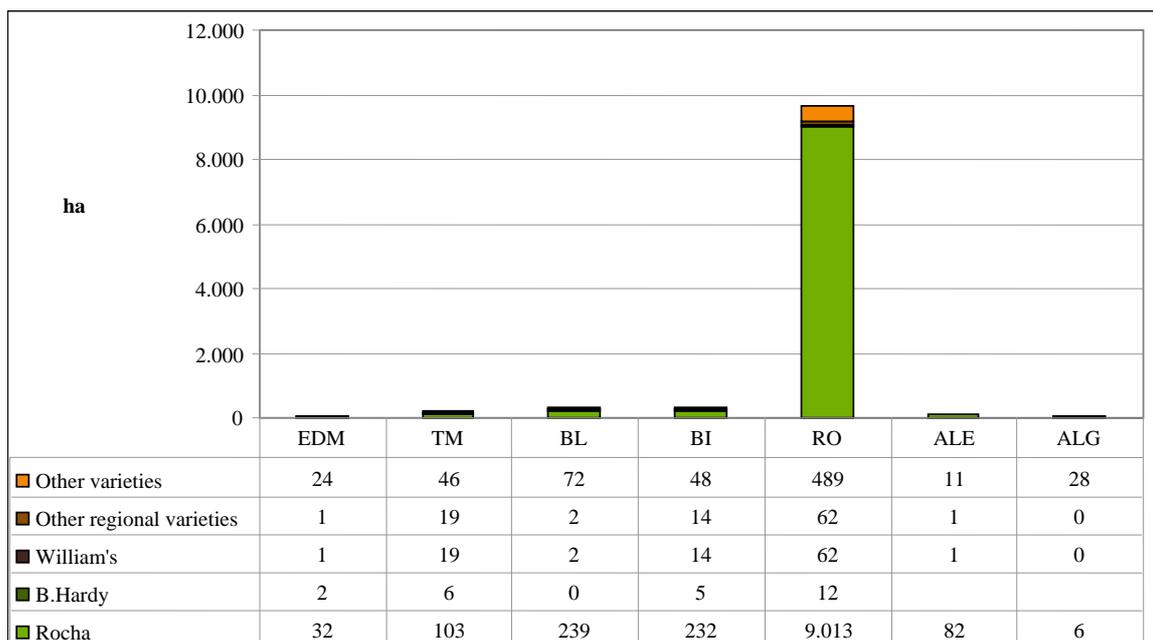
In what concerns produced varieties, one can only say that most of the fruit involved was Rocha pears, in 1992, and that such variety increased its importance, in 1998

Chart Q1H1 - 4. Regional composition of the area of pear orchards area, in 1992.



Source: INE

Chart Q1H1 - 5. Regional composition of the pears orchards area, in 1998.



Source: INE

In this case, the role of POs was critical. In fact, it is in this region that fresh fruit POs have their highest weight, and a much higher global weight than for the whole country.

Although there has been an intensification of production, and a very significant productivity increase, there was technical assistance and the implementation of the treatments and fertilizations warning system, which allowed for its optimization to the minimum necessary.

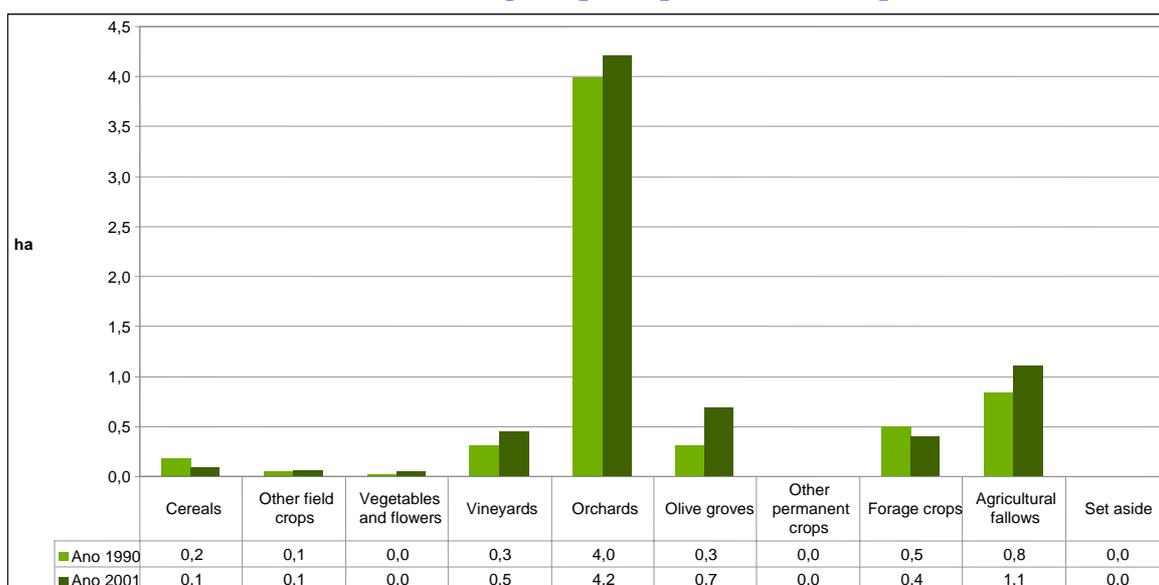
On the other hand, the certification of production according to the integrated protection and organic farming rules is very developed, allowing for a commercial added value. These data are self-confirmed by the fact that 45% of the pear tree area being subject to an AEM.

The areas of fruit tree plantations were not farmed within any CMO measure, nevertheless they represent 11.5% of the total area, 5.4% of this area having been subject to restructuring, therefore having been maintained, however with new technologies/varieties.

In what concerns shell-fruit improvement plans within CMO, it had a relatively small impact due to the fact that it only reached 7,5% (3.136 ha) of the target area, what is explained by the lack of organization of producers into POs. Anyway, we can say that in this area there was an increase of density and an alteration of traditional varieties with the negative environmental effects in what concerns biodiversity and effects on the soil, but on another hand supporting producers of this type of fruit so that they do not abandon their productions, namely some almond varieties.

Finally, according to FADN data, farms specialized in shell-fruit trees have the average crop occupation shown below. The average area between 1990 and 2002 increased from 6,2 ha of UAA to 7 ha of UAA, having orchards, vines and olive groves raised their average area at the cost of arable crops and forages. Although this evolution cannot be ascribed to the CMO, it helps us to draw conclusions in what concerns succession of crops. As a matter of fact, it helps us to conclude that, in terms of balance of these dozen years, it is in fact the conversion of arable crops what did happen, with all its eventual environmental consequences. Note that this analysis is based only on farms specialized in fruits, and, not allowing us to extrapolate to the universe, it gives us a qualitative idea.

Chart Q1H1 - 6. Evolution of the average crop occupation on farms specialized in shell fruit.



Source: FADN

Summary

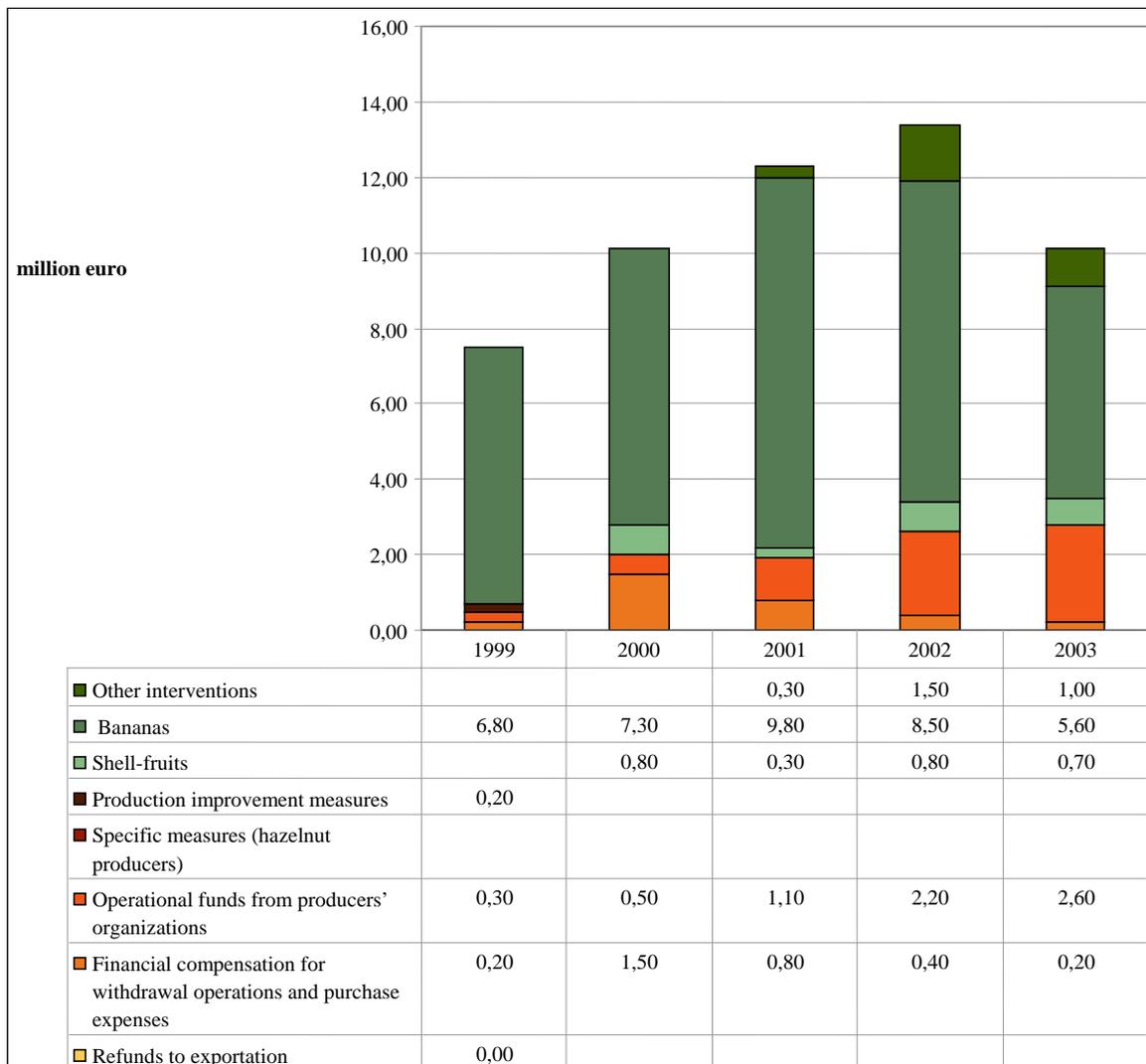
The effect of the CMO in the change of soil use was important in the decrease of the peach tree area, in the alteration of varieties in pear production and in the support to shell-fruit so that to stop the decrease of area that was taking place, namely in what concerns almonds.

2.2.2 Horizontal – Theme 2: adequate spending level and method

Question 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.]

In order to be in a position to analyse the several CMO expenditure headings with environmental effects, we described in a summarised way the evolution of the expenditure structure of CMO and proceed by concentrating our analysis on expenditure headings that hold some weight. The evolution of expenditure from 1999 to 2003 is represented in the following chart. These data correspond to values in million euros concerning the fresh fruit and vegetables CMO.

Chart Q1H2 - 1. Evolution of the CMO expenditure between 1999 and 2003.

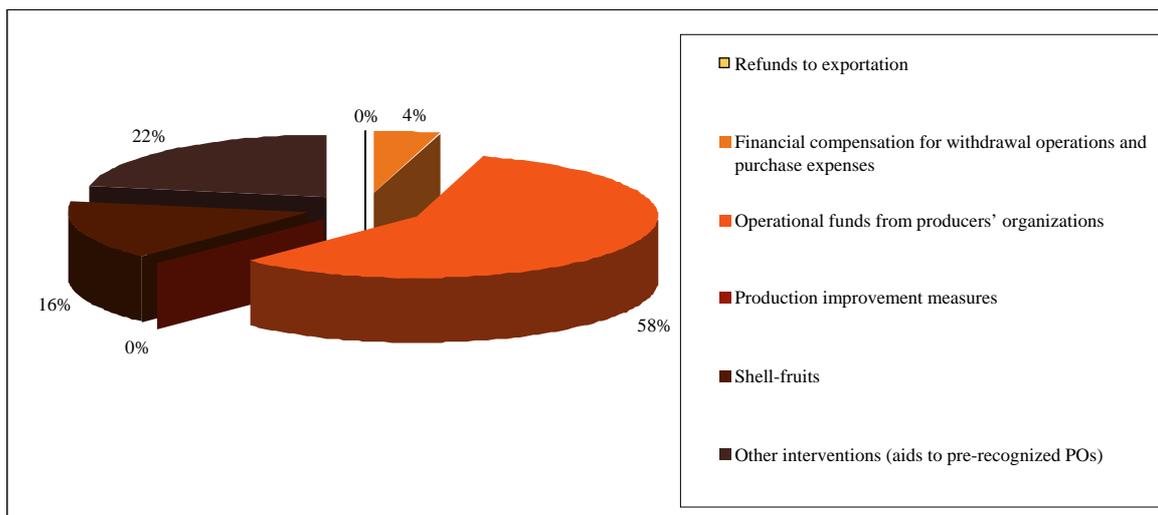


Source: GPPAA

As can be verified, the compensatory aid to the banana sector has an enormous weight in the budget, having even reached more than 70% and representing in the year 2003 55% of the CMO global expenditure. Operational funds, on their side, kept increasing their weight in the budget structure, going from 4% in 1999 to values of around 26% at the moment.

Since bananas are not part of our evaluation, we will now concentrate on the evolution of the structure of the CMO expenditure in 2003, removing the value spent with bananas (following chart).

Chart Q1H2 - 2. Structure of CMO expenditure in 2003.



Source: GPPAA

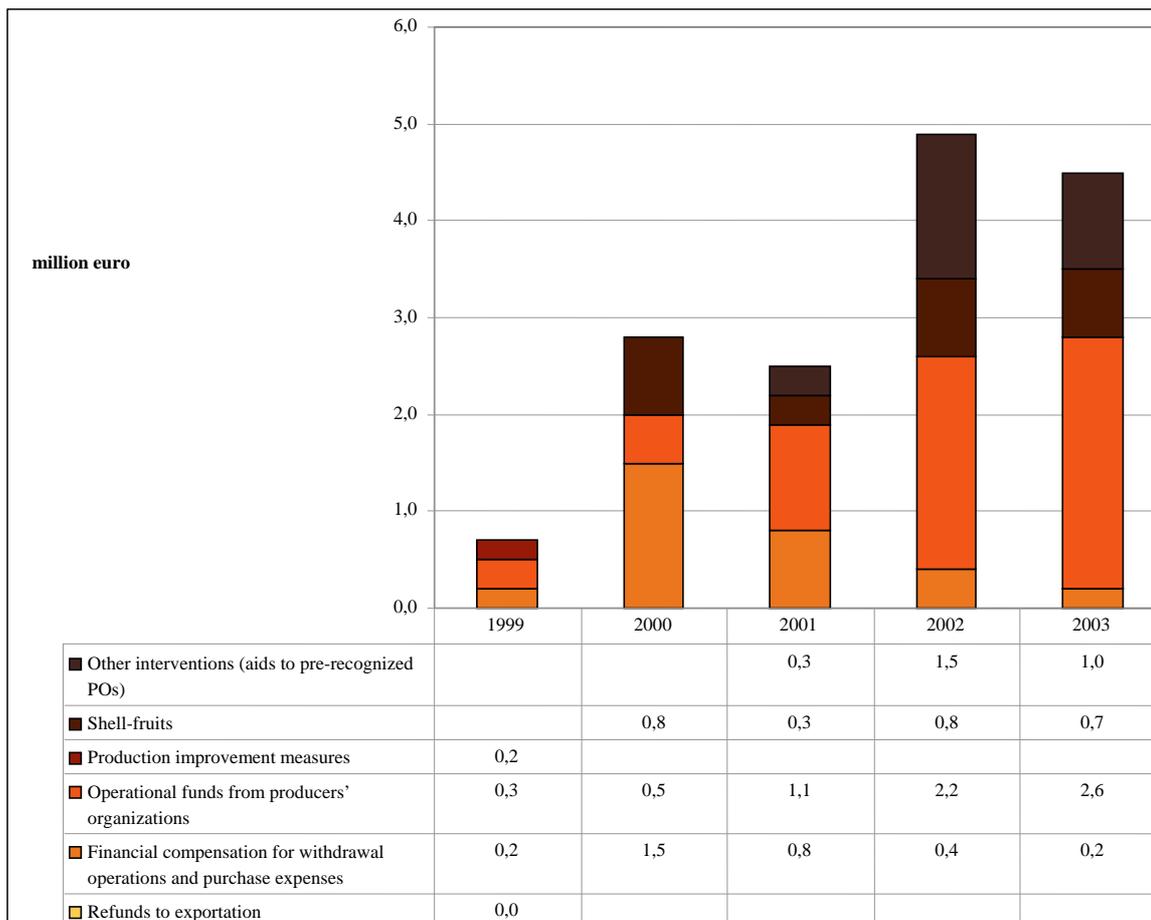
In this case, we can conclude that the financial weight with withdrawals kept decreasing, having increased the value of operational funds along time on basis of the higher weight of the value of production marketed by POs. On their side, improvement plans registered a relatively constant value in terms of absolute value.

In what concerns the structure of CMO expenditure for 2003 (removing the banana aid), we are in a position to confirm (following chart) that the highest weight refers to producers' operational funds (58%), to which 22% concerning aids to pre-recognized producer associations can be added. Shell-fruit (improvement plans) comes in third place, with 16%, and finally financial compensations for withdrawal and purchase operations with 4%.

We will therefore analyse the environmental impact of the four referred to measures.

Breakdown in terms of percentage of CMO expenditure with fresh fruit and vegetables , removing the banana aid.

Chart Q1H2 - 3. Structure of CMO expenditure with fresh fruits and vegetables (%), in 2003 (without banana aid).



Source: GPPAA

Since aids to pre-recognized producer organisations are very similar to PO operational funds, excepting the question of timing (pre-recognized organisations have five years to be recognized), we will analyse the respective environmental impact on the whole.

Environmental impact of PO operational funds and aids to pre-recognized organisations

Evaluation parameters	Type of notation		
Positive	Support to several types of environmental measures which allow for the safeguarding of the certification of the type of production, integrated or organic in the whole chain (production-consumption), as well as for the minimisation of the use of plant protection products and fertilizations to an essential minimum, as well as also residue management.		
Target	Applies only to producers' organisations which represent just 8% of total value of marketed production		
Geographical effect			National
Level	Whole chain		
Duration		Medium term	Long term
Intensity		Average	
Reversibility		Average	
Sensitivity		Average	
Characterisation of the range and seriousness of the impact through combination of the different factors	Positive impact in order to give the consumer recognition of the production method and to ensure his food safety		

Environmental impact of shell-fruit improvement plans

Evaluation parameters	Type of notation		
Positive	Improvement plan (conversion of orchards in a 1st stage and support to maintenance in a 2 nd stage) allowed for the support of production development, although of just 5% of the sector and for the acceptance of a certain kind of operations which avoided abandonment, desertification, plagues, fires (diversity)		
Target	Applied only to producers' organisations which represent just 7.5 % of the target production and, after the introduction of Reg. 1782/2002, the possibility for application also to producers not organised into POs of 34.3% of the potential area		
Geographical effect		Regional	
Level	Primary sector		
Duration		Medium term	Long term
Intensity		Average	
Reversibility		Average	
Sensitivity			High
Characterisation of the range and seriousness of the impact through combination of the different factors	Positive impact in order to enable the maintenance of the nut sector and avoid abandonment, desertification and ensure biodiversity, maintenance of Portuguese traditional varieties		

Environmental impact of financial compensations for withdrawal operations and purchase expenses

Evaluation parameters	Type of notation		
Positive	Aid to withdrawal allows avoiding fruit destruction and to place such fruit with institutions supporting people in need		
Target	Fruit with different calibre or quality from the market parameters, corresponding at the present moment to an insignificant quantity		
Geographical effect			National
Level	Primary sector	Secondary sector	
Duration	Short term		
Intensity	Low		
Reversibility			High
Sensitivity	Poor		
Characterisation of the range and seriousness of the impact through combination of the different factors	Positive impact, however given its small size, both in terms of budget and in terms of quantity, we do not consider it as one of the most important for the sector, being nevertheless important as a support to people in need (ex: Food bank against hunger)		

Summary

The several types of fruit and vegetable CMO expenditures have considerable effects in environmental terms, nevertheless they have small representation in relation with the universe of fruit production in Portugal

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

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

Question 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 and implementation

Reg. (EC) no. 1259/99 provides in article 3 that MS can implement the environmental measures deemed necessary, taking into account the situation of the used agricultural area, or according to the type of farmed products and their potential effects on the environment. Although this possibility existed, Portugal did not introduce any measure within this regulation.

Being so, we will answer this question based on the application to fruit trees of Agri-environmental measures, both from CSFII and from CSFIII.

We will now describe the evolution within the several AEM groups, namely in what concerns the evolution of areas and value of expenditure of the big concern areas:

- a) Questions of pollution (Reduction of polluting effects of agriculture (CSFII) and Protection and improvement of the environment, soils and water (CSFIII))
- b) Questions of extensification and/or maintenance of extensive traditional agricultural systems (CSFII) and Conservation and improvement of spaces of significant natural value (CSFIII);

In what concerns Reg. (EC) no. 2078/92 (namely for the 1994-1998 period), as can be seen in the following table, the concern was in terms of area and mainly in what concerns maintenance of extensive traditional agricultural systems (84,5%), corresponding in the case of expenditure to 51% of the value paid in 1998. In that very same year, the questions of reduction of the polluting effects corresponded to 13,4% of the area subject to AEM and 47% of the value of paid aids.

It is necessary to refer the fact that, since statistical information concerning this regulation is not broken by types of crop it is not known, for the fruit tree sector in the case of Group I, what the area of fruit trees is, and the only known value is the value of the measure Dry farmed almond tree plantations, which showed 671 ha, corresponding to 66.288 euros.

Table Q1H3 - 1. Area (ha) and amount (ECU) spent in each AEM.

	Agri-environmental measure of Reg. (EC) no. 2078 in 1998 Total (area in hectares)	Total (area in ha)	Total (ECUS)	% area	% value
Grupo I	2 Chemical Control Under Advice	4.025	108.918	2,0%	0,4%
	3 Integrated Protection	20.549	7.186.070	10,2%	29,7%
	4 Integrated Production	70	3.870.882	0,0%	16,0%
	5 Organic farming	2.349	203.138	1,2%	0,8%
	Total for the Group	26.992	11.369.007	13,4%	47,0%
Grupo II	6 Cultural Systems of Northern and Central Portugal	6.804	1.385.594	3,4%	5,7%
	7 Dry Farming Grain Systems	12.241	889.882	6,1%	3,7%
	8 Wet pastures	1.725	184.436	0,9%	0,8%
	9 Extensive Forage Systems	103.754	5.663.906	51,5%	23,4%
	10 Traditional Olive Groves	7.023	875.030	3,5%	3,6%
	11 Torres Novas Fig Groves	12	814	0,0%	0,0%
	12 Vineyards in Terraces in Douro	386	135.318	0,2%	0,6%
	13 Fruit Trees of Regional Varieties	644	165.378	0,3%	0,7%
	14 Traditional Orchards	2.450	239.962	1,2%	1,0%
	15 Dry Farming Almond Plantations	671	66.288	0,3%	0,3%
16 Holm Oak Plantations	34.581	2.749.635	17,2%	11,4%	
Total for the Group	170.292	12.356.243	84,5%	51,0%	
Grupo III	20 Maintenance of Abandoned Forest Areas	416	62.101	0,2%	0,3%
	21 Maintenance of Forest Areas that are complementary of farms	2.828	347.095	1,4%	1,4%
	22 integrating ecosystems of significant interest	904	57.065	0,4%	0,2%
	23 Maintenance of Agricultural Lands inside forest areas	112	14.378	0,1%	0,1%
Total for the Group	4.260	480.639	2,1%	2,0%	
Total		201.544	24.205.890	100%	100%

Source: IFADAP.

In what concerns CSFIII (AEM- RURIS – Reg. no.1257/1999), concerns were already in another direction. In this case, since there is available information of areas by each type of fruit tree, we

will analyse the two kinds of concerns within the fruit tree universe. (The measures applying to each type of fruit tree are described in the answer to theme 5 - vertical).

In terms of area, as can be seen in the following table (declared area in 2003), whatever the origin of the contract may be, Reg. 2078/92 or Reg. 1257/99, we can conclude that 61% of the area refers to the questions of Group I, therefore concerning the questions of Protection and improvement of the environment, soils and water, while the concerns regarding Conservation and improvement of the cultivated spaces with significant cultural value de significant natural value reflect only 39% of the area

Table Q1H3 - 2. Area (ha) of each fruit tree species in each AEM in the 2003/2004.

	Cultural occupation area in 2002 (ha) (source INE)	Grupo I					Grupo III		Total area	% of total area	
		Integrated Protection	Integrated Production	Organic Farming	Inter row grass sowing	Total Group I	% area Grupo I	Total Group III (Traditional Orchards)			% area Grupo III
Fresh fruit (a)	58.551	8.468	3.932	682	4.398	17.481	100,0%	-	-	17.481	29,9%
Plums	2.037	400		5	128	533	100,0%			533	26,1%
Cherries	5.875	1.601		194	346	2.141	100,0%			2.141	36,4%
Apricots	547	1		12	1	14	100,0%			14	2,5%
Figs	7.396			61		61	100,0%			61	0,8%
Kiwi	1.005									0	0,0%
Apples	21.388	3.772	1.534	240	1.907	7.452	100,0%			7.452	34,8%
Pears	12.773	1.661	2.398	145	1.561	5.766	100,0%			5.766	45,1%
Peaches	6.697	1.033		26	456	1.515	100,0%			1.515	22,6%
Citrus fruit	27.755	2.293	76	115	1.375	3.860	100,0%	0		3.860	13,9%
Oranges	21.650	1.937	52	91	1.187	3.267	100,0%			3.267	15,1%
Lemons	1.009	34	4	1	9	47	100,0%			47	4,7%
Pomelo	394					0				0	0,0%
Tangerines	4.674	323	20	24	179	546	100,0%			546	11,7%
Grapefruit	28										
Dried fruit	71.679	0	0	1.440	6	1.447	9,0%	14.566	90,97%	16.013	22,3%
Almonds	38.417			1.212	6	1.218	15,4%	6.678	84,6%	7.896	20,6%
Hazelnuts	627			30		30	100,0%			30	4,8%
Chestnuts	29.522			170		170	3,8%	4.265	96,2%	4.435	15,0%
Walnuts	3.113			28		28	100,0%			28	0,9%
Carob bean								3.624	100,0%	3.624	
Fruit area	157.985	10.762	4.008	2.238	5.780	22.787	61,0%	14.566	39,0%	37.353	23,6%

Source: INE and INGA.

In what concerns the value of expenditure, for the 2003/2004 campaign, following table, one can conclude that, by the comparison with what happened in 1998, there was a very significant reinforcement in terms of amount and area subject of AEM in this first group of concerns, more connected with the reduction of pollution. In fact, while in this last campaign the value of area of this group is 164.223 ha, in 1998 it was 26.992 ha. On the other hand, this group represents currently 95% of the annual expenditure, and represented in 1998 47% of the respective annual expenditure.

Table Q1H3 - 3. Expenditure in AE measures in 2003/04.

MEASURE	Producers (n°)		Paid area (ha)		Value (euro)	
Integrated protecion	14.101	68,5%	110.096	61,2%	20.946.011	65,4%
Integrated production	984	4,8%	12.908	7,2%	4.315.225	13,5%
Organic farming	677	3,3%	35.792	19,9%	4.758.105	14,9%
Inter row grass sowing	581	2,8%	5.427	3,0%	395.853	1,2%
TOTAL GROUP I	16.343	79,4%	164.223	91,3%	30.415.193	95,0%
GROUP III (Traditional Orchards)	4.234	20,6%	15.573	8,7%	1.601.846	5,0%
TOTAL	20.577	100,0%	179.796	100,0%	32.017.039	100,0%

Source: INGA.

In what concerns the evolution of different production methods, one concludes that the one that has registered more adherence is the method of integrated protection (67% of the area), followed by the method of organic farming (21,8%).

In what regards the evolution of organic farming in fruit trees, the following chart reflects a very positive evolution, nevertheless with its ups and downs. As a matter of fact, since 1997 it has doubled its adherence area and nuts have increased around 30%. However, as can be seen in the answer to theme 5, the weight of fruit trees with organic farming in the total is residual, since it represents only 1.4%. Integrated protection is the production method of AEM with a higher weight, standing for 6.8% of the area.

Chart Q1H3 - 1. Evolution of fruit and nuts production area in organic farming, since 1997.



Source: National Plan for the Development of organic farming (2004-2007) – MADRP

As previously referred to, operational funds have some agri-environmental measures, consisting of, besides residues and packages management aspects, the following up of the whole sector, both regarding integrated protection products and organic farming. Such measures include the introduction of specific rules, specification sheets, technical assistance, treatment warning system, certifications, etc.

Fruit trees benefiting from AEM will mandatorily have to comply with good agricultural practices introduced by AEM' decree law no. 1212/2003.

Farmers applying to any one of the Agri-environmental Measures have the following obligations:

1. Without prejudice of the commitments concerning each one of the measures, beneficiaries are obliged, during the period of granting of aids, to:

- Maintain the conditions that determined the granting of aids;
- Fulfill the undertaken commitments in regard of the plots, the area of commitment, or the Production Unit and the animals covered by the application;
- In each one of the four years following the year of application, to confirm or rectify the statements included in such application, submitting an Application for Areas or Animals Aid.

2. Comply with **Good agricultural practices** in the whole area of the production unit.

Good agricultural practices

1. In order to ensure a handling of cattle that is compatible with the natural mean, stocking density of grazing cattle of the Production Unit can never exceed:
 - 3 Normal heads/UAA ha in mountain areas or in production units with less than 2 ha of UAA;
 - 2 Normal Heads/FA (forage area) ha for stocking purposes in the remaining cases.
2. To comply with the provisions of Decree-Law no. 446/91, of 22.11.1991, regarding the application of sewage sludge in the agricultural activity;
3. Fertilizers and plant protection products should be stored in a safe and dry place, with a waterproof floor, more than 10 meters away from water courses, trenches and drainage pipes, wells, water holes or springs, except in the case of liquid manure irrigation reservoirs having an anti-leakage protection system;
4. To apply in each crop only approved plant protection products;
5. To carry out collection and concentration of plastics, tyres and oils;
6. To comply with applicable rules for management of areas appointed for nature conservation.
7. In all plots of the Production Unit:
 - a) With the exception of plots in terraces or integrated in flood plain areas, when the IFQP (Index of Physiographical Qualification of the Plot) is 4:
 - i) No annual crops are allowed;
 - ii) Installation of new tree and bush crops or pastures is allowed only in situations considered technically appropriate by the regional services of the Ministry of Agriculture, Rural Development and Fisheries;
 - b) With the exception of plots in terraces or integrated in flood plain areas, when the IFQP (Index of Physiographical Qualification of the Plot) is 5
 - i) No annual crops are allowed, nor the installation of new pastures;
 - ii) Improvement of natural pastures is allowed, but without tillage;
 - iii) Installation of new tree and bush crops or pastures is allowed only in situations considered technically appropriate by the regional services of the Ministry of Agriculture, Rural Development and Fisheries;
8. In the case of Production Units with more than 40 ESU, in plots with more than 1 ha of forcing or horticultural-industrial crops, or in the parcels with more than 5 ha of wet or permanent crops, the farmer must:
 - a) Have earth analyses available every 5 years, by plot, together with the fertilization recommendation bulletin, except for uncultured lands, permanent pastures under extensive use or olive plantations with over 25 years of non-irrigation. Have an irrigation water analysis available every 5 years and in the period from March to April, together with the respective technical recommendation bulletin;

***NOTE 1:** If the Production Unit has a plot with more than 5 ha of permanent pasture (even if included in uncultured land), the Economic Size of the PU should be calculated.*

***NOTE 2:** At GAP level, for plots with certain characteristics and included in PUs with more than 40 ESUs, the farmer must have irrigation water analyses (as well as earth analyses) every 5 years, i.e., the analyses can be carried out in the 1st, 2nd, 3rd, 4th or 5th year of the commitment.*

***NOTE 3:** In case the irrigation water comes from wells or holes, a 1 liter sample should be taken, collected around half an hour after water pumping having started. The water sample should be kept in a glass or plastic flask (preferably a flask that has contained mineral water before), well cleaned, washed or rinsed, for at least three times, with the very same water from which the sample will be collected.*

The flask should be completely filled up, with no air bubbles, and duly sealed. Whenever there will not be a prompt arrival to the laboratory, the sample should be kept in a refrigerator at a temperature not exceeding 5° C.

The irrigation water analysis should be carried out in duly qualified laboratories, accompanied by the respective technical recommendation bulletin and, depending on its use, it should include the following measurements:

Orchards subject to traditional irrigation:

Bicarbonates;

Boron;
Calcium;
Chlorides,
Electric conductivity;
Magnesium;
Nitrates;
pH;
Sodium;
Adjusted sodium adsorption rate.

Orchards subject to spraying with liquid manures – Besides the measurements referred to above, the following should also be included:

Iron;
Manganese;
Sulphates;
Solids in suspension.

b) To keep a record of fertilizations in a field book;

c) To keep records of the applications of plant protection products in a field book and to keep written evidence of the purchase of such products.

9. In the case of production units with intensive livestock breeding (> 50 Normal Stalled Heads of Cattle), they should keep a record of the management system of livestock effluents and silos, detailing the stalled total livestock, the annually produced effluents and their destination.

Besides general good agricultural practices, in case the farm is located in a vulnerable area, it is necessary to comply with *Good Agricultural Practices Specific for Vulnerable Areas*.

These vulnerable areas were defined between 1997 and 2003 and those who affect areas with permanent crops are located in Esposende, Aveiro and Faro.

Besides the established conditions for the remaining areas, rules from action programmes of vulnerable areas should be complied with:

a. Waterproofing of the floor is mandatory in the building of facilities for the storage of nitrogenous fertilizers;

b. All projects for the treatment of effluents from livestock facilities or for storage of organic fertilizers will have to be licensed by the Directorate-General for the Environment;

c. Application of liquid manures, mixed liquid manures and manures or animal droppings is forbidden from December to January;

d. Whenever soil water logging periods occur, in order to apply liquid manures, mixed liquid manures and manures or animal droppings, the moisture state corresponding to the season should be waited for;

e. In the case of production units with intensive livestock breeding (> 50 Normal stalled Heads of Cattle), a retention structure is necessary, with storage capacity for the longest period during which application is not allowed. Such a structure needs to be licensed by the Directorate-General for the Environment

Good agricultural practices specific to the Area of the Free Aquifer between Esposende and Vila do Conde (Decree law no. 706/2001, of 11th July)

Application to the land of the following fertilizers is not allowed during the following periods:

Fertilizers	Organic conditioners	Bovine liquid manures	Nitrogenous chemical fertilizers
Non-cultivated soils	All year long		
Forages	From October to February		
Maize	-		
Vegetables (open air)	October to January	From October to February	Until 2 days before sowing or planting
Vegetables (forcing crops)	-		
Pastures	Remove the animals between October and February		

The maximum quantity of organic fertilizers to be applied, per hectare and per annum, cannot exceed 210 kg of nitrogen.

The quantities of nitrogen to be applied (kg N/ha) in organic fertilizers cannot exceed the maximum quantities established in the law for each crop.

The quantities of nitrogen to be applied (kg N/ha) in mineral fertilizers cannot exceed the maximums established by the Code of Good Agricultural Practices for each crop.

Good agricultural practices Specific to the Area of the Quarternary Aquifer of Aveiro (Decree law no. 705/2001, of 11th July)

It is not allowed to apply to the land the following fertilizers in the following periods:

Fertilizers	Manures, compounds and dry sludge	Bovine and swine liquid manures	Nitrogenous chemical fertilizers
Non-cultivated soils	All year long		
Forages (Autumn/Winter)	From October to January		Multiple cutting – until the first cutting Sole cutting – until the beginning of tillering
Maize	Follow provisions of the Good Agricultural Practices Code in what concerns rules		
Vegetables (open air)	Until one month before sowing or planting	Until 5 days before sowing or planting	Until 2 days before sowing or planting

The maximum quantity of organic fertilizers to be applied, per hectare and per annum, cannot contain more than 210 kg of nitrogen.

Good agricultural practices Specific to the Miocenic and Jurassic Aquifer of Campina de Faro (Decree order no. 704/2001, of 11th July)

It is not allowed to apply to the land the following fertilizers during the following period:

Fertilizers	Manures, compounds and dry sludge	Liquid manures and dry sludge	Spraying with liquid manures
Vegetables	Until one month before sowing or planting	Until 15 days before sowing or planting	Nitrogenous fertilizing in the first 3 weeks after sowing or planting, which should be suspended two weeks before the last harvesting.
			Interval between sprayings with liquid manure not bigger than two weeks
Tree crops	During dormancy, until one month before resumption of growth		Interval between sprayings with liquid manure nor bigger than two weeks
Non-cultivated soils	The discharge of fertilizing substances containing nitrogen not allowed		

The maximum quantity of organic fertilizers to be applied, per hectare and per annum, cannot contain more than 170 kg of nitrogen. The quantities of nitrogen to be applied (kg N/ha) in organic fertilizers cannot exceed the maximum quantities established in the law for each crop. The quantities of nitrogen to be applied (kg N/ha) in mineral fertilizers cannot exceed the maximums established in the Code of Good Agricultural Practices for each crop. Keep a record of fertilizations per homogenous plots, according to the existing model.

Summary

Although there is still a great concern with the preservation of the so-called «friendly» agriculture, one may conclude that the larger part of the agri-environmental measures declared area and annual expenses (95%) relate to pollution issues.

APPENDICES

Annex 1: List of people met

Annex 2: Main bibliography identified in relation with the study

Annex 1: List of people met

Entity		Person
Administration	Direcção de Serviços de Fiscalização da Qualidade Alimentar	Eng. Maria de Madre Deus Reynolds de Sousa
Administration	Gestor do PO Agro	Eng. Tito Rosa
Administration	GPPAA	Eng. Luis Caiano
Administration	GPPAA	Eng. Mafalda Gois
Administration	GPPAA	Eng. Ana Filipa Morais
Administration	INGA	Eng Teresa Costa Neves
Certification entity	SATIVA	Eng. António Mantas
Confederation of Farmers	CAP- frutas	Eng ^a Cláudia Gonçalves
PO	CACER	Eng. Paulo Castro
PO	CACIAL	Eng. Horácio
PO	CITRIPOR	Eng. Luisa
PO	FRUTOESTE	Eng. Rosário Andrade
PO	COFRAL	Coronel Tété
PO	Coop. Agrícola de Porto Mós	Sr Poitier
PO	COOPVAL (Cadaval)	Sr.Pedro Nuno
PO	Frutalgarve	Eng, João Maio
PO	Frutus	Sra D. Dália Fialho

Annex 2: Main bibliography identified in relation with the study

The Environmental Impact of Olive Oil Production in the European Union: Practical Options for Improving the Environmental Impact, European Forum on Nature Conservation and Pastoralism and the Asociación para el Análisis y Reforma de la Política Agro-rural.

The Environmental Impact of Arable Crop Production in the European Union: Practical Options for Improvement (11/1999), Study Contract by the European Commission DG ENVIRONMENT

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Estatísticas Agro-ambientais – Práticas agrícolas em pomares 2002, Instituto Nacional de Estatística (Portugal's national statistics).

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