



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

**ANNEXE 8 : OCM FRUITS  
ETUDE NATIONALE GRECE et  
ETUDE DE CAS PELOPONNESE**

Novembre 2005

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## GLOSSARY

UAA	: Utilised Agricultural Area
OPEKEPE	: Payments Authority
E.P.A.A. – A.Y	: Operational Programme Rural Development - Reconstruction of Countryside
SPD RD	: Single Programming Document of Rural Development
NSSG	: National Statistical Service of Greece
AGROCERT	: Certification organisation for agriculture products
EDOVRA	: National Inter professional Organisation of Industrial Peaches and Pears
AAC	: Association of Agricultural Cooperatives
CAC	: Central Organisation of Agricultural Cooperatives
ACFV	: Agricultural Cooperative of Fruits and Vegetables

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## 1. CONTEXT OF FRUITS PRODUCTION IN COUNTRY

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### 1.1 Introduction

European Union (EE) is the leader, worldwide, in the sector of fruits and vegetables. Moreover, it constitutes the leading importer and exporter of fruits and vegetables. A percentage of 15% of total agricultural production worth of EU emanates from the sector of fruits and vegetables, which offers a wide range of fresh and processed products, in remarkable variety. The sector of fruits and vegetables is particularly developed in the Mediterranean States, in which it represents more or less the one-quarter of total agricultural output. These States are Spain, Italy, Greece, Portugal, Malta and Cyprus. Fruits and vegetables in the Greek agriculture constitute one from the more dynamic sectors according to its value, volume of production, marketing, occupied human potential, imported exchange and almost the whole domestic needs.

The total production of vegetables in EU of fifteen States was 55 millions tons in period 2001/2002. The production of fresh fruits at the same farming period was 57 millions tons, from which 10 millions tons corresponded in citrus fruits. In the above total production of citrus fruits, oranges represent 6 million tons and the small citrus fruits (mandarines, clementines and satsoumas) 2.6 millions tons. Spain constitutes the major producer of citrus fruits (5.6 millions tons), followed by Italy (3 millions tons) and Greece (1.3 millions tons). The production of peach and nectarine trees at the same period was 4.2 millions tons, and the production of pear-trees was 2.9 millions tons. The ten new member states, all together, produce 9 millions tons of vegetables and 6 millions tons of fruits. Poland is the major producer (5 millions tons of vegetables and 3 millions tons of fruits).

The Common Market Organisation of fresh fruits and vegetables was set up in 1962. From 1968 and after a regime for the processed fruits and vegetables was enacted. The role of subsidised withdrawals of production from the market (intervention) was seriously decreased, in order the producers to direct their production to the market demand. The Common Market Organisation in fresh fruits and vegetables was modified considerably in 1996 through the following three regulations of EU and their amendments:

- Regulation No 2200/1996 on the common organisation of the market in the fruit and vegetables.
- Regulation No 2201/1996 on the common organisation of the market in processed products of fruits and vegetables.
- Regulation No 2202/1996 on a Community aid scheme for producers of certain citrus fruits;

On the basis of the above Regulations an aid regime has been established for the following products:

- Community compensation for withdrawals for the following products: cauliflowers, tomatoes, aubergines, apricots, peaches, nectarines, lemons, pears, table grapes, apples, satsuma, mandarins, clementines, orange, melons and watermelons.
- Citrus fruits, for processing (the aid is given to the Producers Organisations). This arrangement covers:
  - Lemons, pomelos, grape fruits, oranges, mandarines and clementines that are processed to juice.
  - Clementines and satsumas that are processed in segments.
- Processed products of fruits and vegetables (the aid is given to the grower).

By regulation No 2200/1996 the rate of aid for Producers Organisations was increased and the role of Producers Organisations was strengthened. Moreover the Producers Organisations represent the base elements of common markets organisation in the sector of fruits and vegetables.

European Union offers economic support to recognized Producers Organisations. This support constitutes the operational funds of Producers Organisations, and encourages POs to play the major role in the market of fruits and vegetables. Almost 1400 Producers Organisations provide a percentage of about 40% of total production of fruits and vegetables in the European market. The number and the size of Producers Organisations vary widely between the Member States. Specifically, there were 115 Producers Organisations (active in fruits and vegetables sector) in Greece in 2002, while their number rose at 125 in year 2004. The major objectives of Producers Organisations as well as the uses of the operational funds are:

- ◆ to ensure that the production is planned and adjusted to demand requirements in terms of quality and quantity of products,
- ◆ to encourage concentration of supply and the placing on the market of products that the members produce,
- ◆ to improve the technical and economic management of harvest and stabilise the producer prices,
- ◆ to promote the use of cultivation practices, production techniques and environmentally sound waste management practices, particularly to protect the quality of waters, soil and landscape, and preserve and/or encourage the biodiversity.

The operational programs include objectives, as improvement of product quality, rising of commercial value of products, promotion campaigns addressed to the consumers, establishment of organic products plants, promotion of unified production or other production methods that do not harm the environment and reduction of withdrawals from the market. They are also expected to include actions to ensure the conformity to crop health standards and maximum allowed limits of residuals (eg crop-protection products).

The operational funds are financed by the members of Producers Organisations and the contribution of EU (50% - 50%). The financial assistance of EU is limited to a maximum of 4.1% of the value of the marketed production of each Producer Organisation. The operational funds can be used:

- for financing both market withdrawals and processing of citrus fruit
- for financing operational programs approved from the Member States.

The financing of market withdrawals can be:

- financing market withdrawals of products, which are not eligible for compensation from EE,
- financing a supplementary compensation to the Community withdrawal compensation

Interbranch Organisations are activated also in the sector of fruits and vegetables, apart from the Producers Organisations. Organisations or associations that are involved in the production, marketing or processing of vegetables, compose the interbranch organisations. Their objective is to support the production of fruits and vegetables and the way fruits and vegetables are placed in the market in a more integrated way, than that of the Producers Organisations. Six Interbranch Organisations have been recognized in the EU:

- two in France –Interfel for fresh fruits and vegetables and Anifelt for fruits for processing
- three in Spain –Aipema for pears and apples, Ailimpo for lemons and grapefruits and Intercitrus for fresh and processed products of citrus fruits (orange, mandarines, clementines, satsouma)
- one in Greece – EDOVRA for peaches and pears for processing.

Concerning nuts, the existing support schemes consist of plans of improvement that were established in the frame of 1989 regime, covering five products: almonds, hazelnuts, walnuts, Aigina's pistachio and locusts. The most significant measure was the financing of ten-years plans

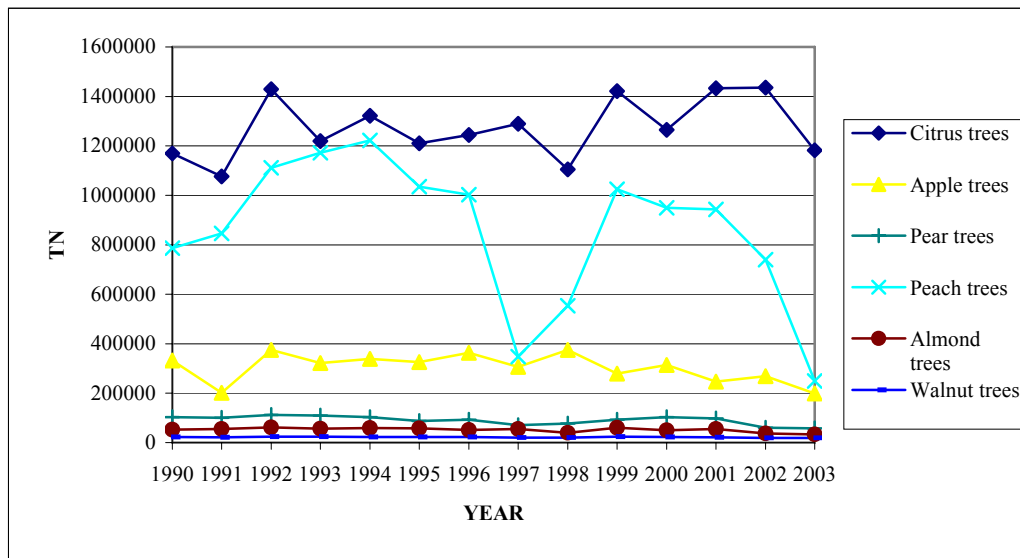
of quality improvement and disposal in the market, which have been introduced by Producers Organisations. The last one from the plans of improvement will expire at the period of 2006/2007. With the revision of Common Agricultural Policy (CAP) in 2003 and concretely under Regulation No 1782/2003, the regime in force for nuts was replaced by annual flat-rate payment of 120.75 Euros/hectare.

## 1.2 Mains characteristics of the fruits production in Greece

The evolution of fruits production in Greece (for the examined period) is given in the following Chart 1 and Table 1, according to data derived from the General Secretariat of National Statistical Service of Greece.

The evolution of each one of the products under examination is given in separate charts.

**Chart 1 : Evolution of production of the fruits concerned (period 1990 – 2003), (tonnes)**



Source: National Statistical Service of Greece

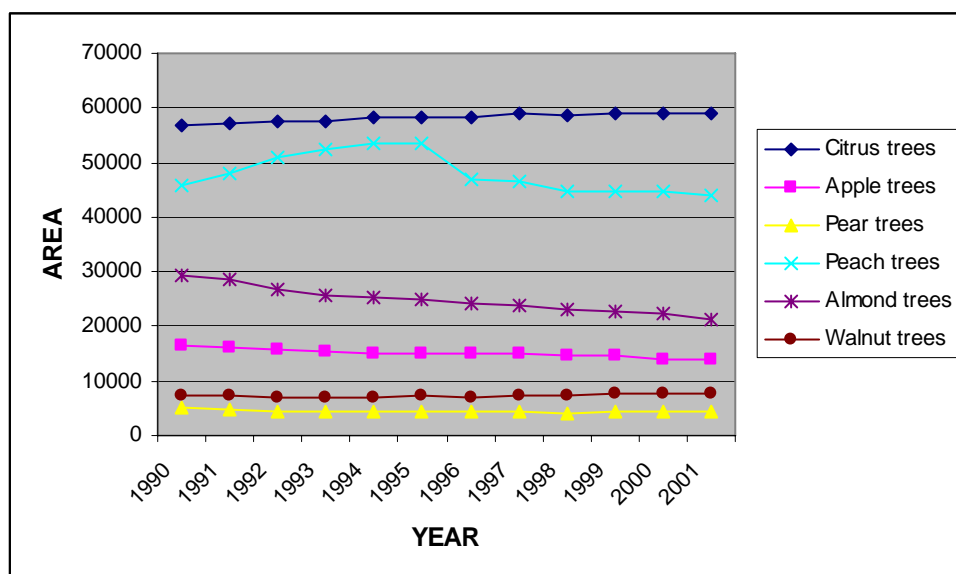
**Table 1 : Evolution of production of the fruits concerned (period 1990 – 2003), (tonnes)**

Production n, (tn)	YEAR													
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<b>Fruits trees</b>														
<b>Citrus</b>	1169280	1076136	1429120	1219428	1321484	1211053	1244792	1289313	1104222	1422047	1265264	1432504	1435295	1181914
<b>Apples</b>	331924	201664	375125	321579	339450	325799	363143	306617	375345	279112	314510	247666	268998	198996
<b>Pears</b>	103277	101438	112390	110220	102986	88316	93626	70968	77384	92757	104121	98819	60382	58013
<b>Peaches</b>	786939	845908	1110531	1171657	1222448	1034421	1002832	348010	553353	1024591	949944	943336	739602	249437
<b>Nuts</b>														
<b>Almonds</b>	53394	56185	61869	56663	58872	57577	51359	56046	40347	60426	50956	55115	37349	33899
<b>Walnuts</b>	22988	22150	25100	24275	23234	22692	22658	21053	20706	24193	23518	22341	19692	19672

Source: National Statistical Service of Greece

The corresponding areas of orchards have been changed during the examined period and they are presented in the following Chart 2 and Table 2.



**Chart 2 : Evolution of area of different fruits (in Ha), in period 1990 – 2003, (ha)**

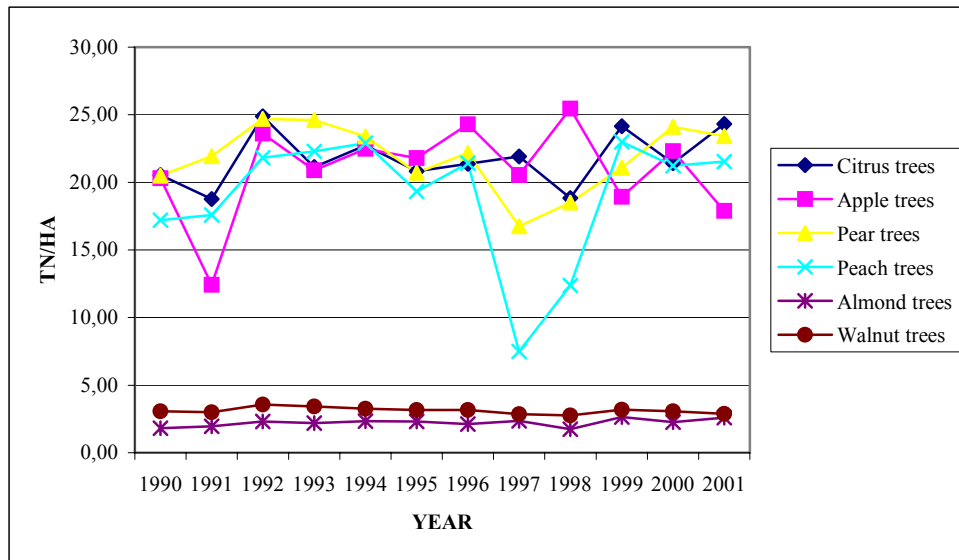
Source: National Statistical Service of Greece

**Table 2 : Evolution of the orchards of different fruits concerned (period 1990 – 2001), (ha)**

Area (hectares)	Year														
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	% Change 90-01
Citrus trees	56943	57340	57436	57703	58120	58156	58240	58832	58646	58843	59123	58898	No data available		3.43%
Fruit trees															
Apple trees	16353	16241	15882	15397	15101	14954	14950	14932	14740	14743	14103	13840		-15.37%	
Pear trees	5040	4624	4552	4477	4403	4265	4223	4238	4180	4400	4320	4217		-16.33%	
Peach trees	45722	48115	50921	52558	53376	53504	46846	46429	44707	44561	44770	43818		-4.16%	
Nut and dried fruit trees															
Almond trees	29358	28501	26721	25831	25248	24846	24076	23678	23086	22850	22349	21258		-27.59%	
Walnut trees	7450	7353	7023	7093	7107	7148	7141	7352	7458	7555	7625	7750		4.03%	

Source: National Statistical Service of Greece

At the same period the efficiency of fruits production has changed accordingly, and is presented in the next Chart 3 and Table 3.

**Chart 3 : Evolution of efficiency of fruits production, in period 1990 – 2003, (tonnes/ha)**

Source: National Statistical Service of Greece

**Table 3 : Evolution of efficiency of fruit production in period 1990 – 2003, (tonnes/ha)**

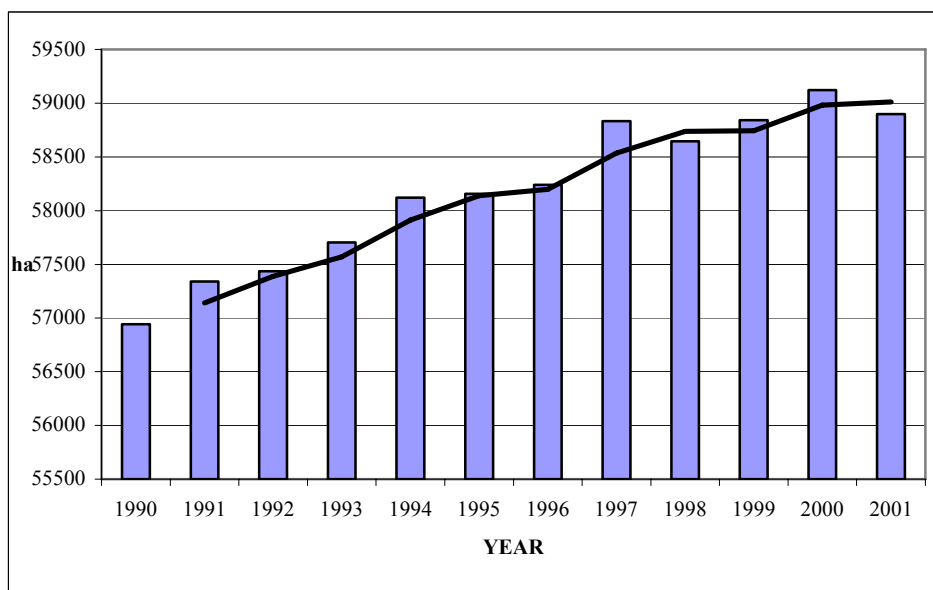
tn/ha	Year														% Change90-01
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	
Citrus trees	20.53	18.77	24.88	21.13	22.74	20.82	21.37	21.92	18.83	24.17	21.40	24.32	No Available data		18.44%
Fruit trees															
Apple trees	20.30	12.42	23.62	20.89	22.48	21.79	24.29	20.53	25.46	18.93	22.30	17.90			-11.84%
Pear trees	20.49	21.94	24.69	24.62	23.39	20.71	22.17	16.75	18.51	21.08	24.10	23.43			14.35%
Peach trees	17.21	17.58	21.81	22.29	22.90	19.33	21.41	7.50	12.38	22.99	21.22	21.53			25.08%
Nut and dried fruit trees															
Almond trees	1.82	1.97	2.32	2.19	2.33	2.32	2.13	2.37	1.75	2.64	2.28	2.59			42.55%
Walnut trees	3.09	3.01	3.57	3.42	3.27	3.17	3.17	2.86	2.78	3.20	3.08	2.88			-6.58%

Source: National Statistical Service of Greece

More specifically for each one of the fruits under consideration the growth of production and cultivation areas is described as follows.

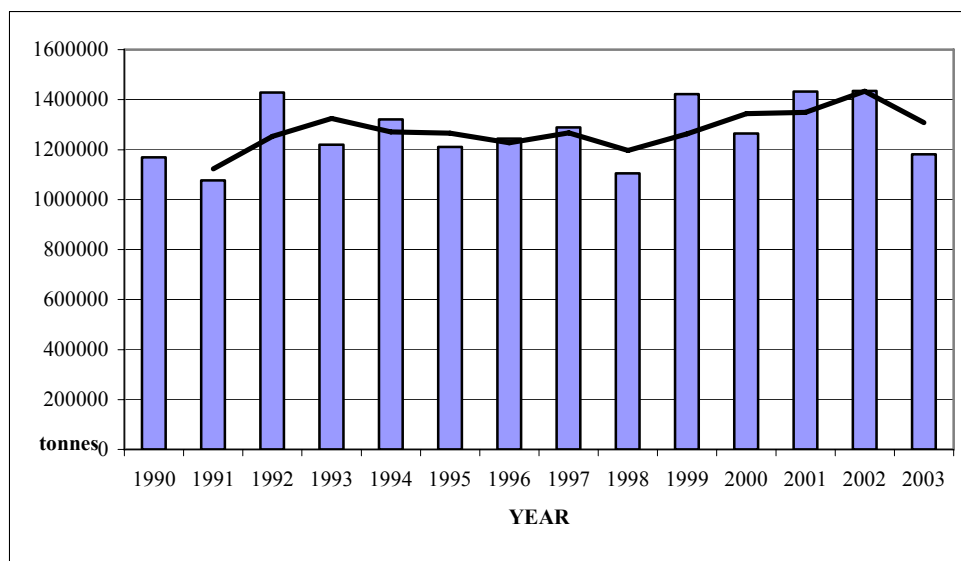
### 1.2.1 Citrus fruits

The growth of citrus fruits cultivation areas, according to the above data (Chart 2) was increasing at the period 1990 – 2001. Specifically, the cultivated area of citrus fruits reached 58898.3 hectares at year 2001, from 56 942.6 hectares that was in year 1990. The area of citrus fruits covered a percentage of 27.02% of total arboriculture cultivated areas, except olive groves. The citrus cultivated areas per geographical region are given in an Annex. Citrus cultivation is predominant in the geographical region of Peloponnese, covering a part of about 60% of the total citrus orchards cultivated areas in Greece. This situation has remained almost the same for all the examined period.

**Chart 4 : Evolution of citrus trees orchards, in period 1990 – 2003, (ha)**

Source: National Statistical Service of Greece

The production of these areas had respectively increased from 1169280 tons in year 1990 to 1432504 tons in year 2001 (Table 1).

**Chart 5 : Evolution of citrus fruits production, in period 1990 – 2003, (tonnes)**

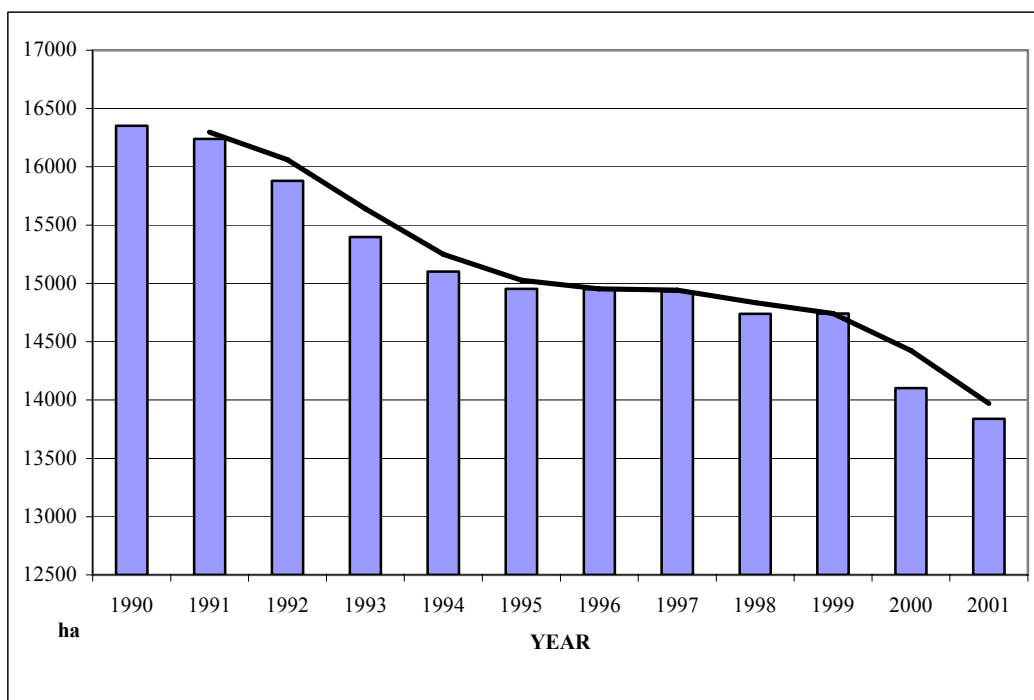
Source: National Statistical Service of Greece

The production of citrus fruits was on average the 47.02% of total production of arboriculture, except olive groves.

Moreover, the efficiency of citrus fruits production expressed as the ratio of production to corresponding cultivated area was increased from 20.53 ton/ha that was in year 1990 to 24.32 ton/ha in year (Table 3), presenting fluctuations between the two borderline years.

### 1.2.2 Apples

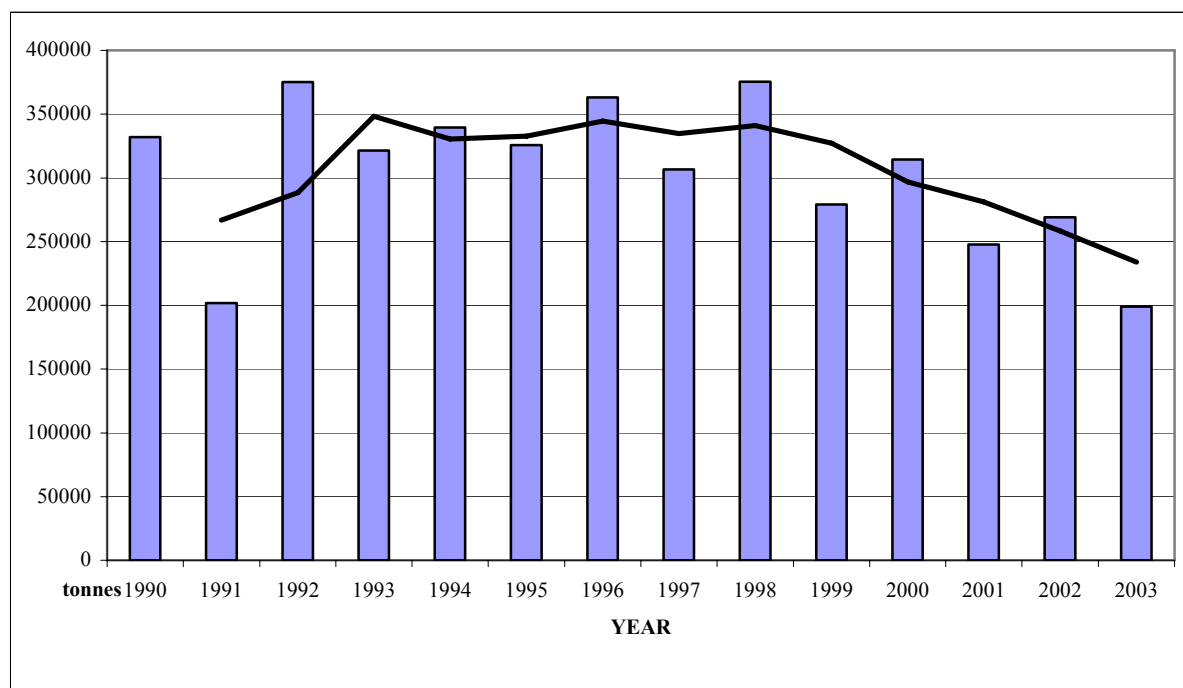
As far as apples concerns, both cultivated areas and production were decreased during the examined period. Specifically, the areas covered by apple trees were decreased from 16352.9 hectares that were in year 1990 to 13839.7 hectares in year 2001 (Table 2). This area was the 7.01% of total arboriculture cultivated areas, except olive groves. The majority of apple orchards are located at the region of Macedonia, which is followed, in a big distance, by Thessalia. The apple orchards area in Macedonia decreased in a greater percentage than this of Thessalia. (Annex 4).

**Chart 6 : Evolution of apple trees orchards, in period 1990 – 2003, (ha)**

Source: National Statistical Service of Greece

The production of apples had shown respectively a decrease from 331924 tons that was in year 1990, to 247666 tons in year 2001. The production of apples was on average 11.14% of total production of arboriculture, excluded olive groves.

The production efficiency (ton/ha) of apple orchards decreased from 20.30 ton/ha that was in year 1990, to 17.90 ton/ha in year 2001 (Table 3), presenting also fluctuations between the two borderline years.

**Chart 7 : Evolution of apple fruits production, in period 1990 - 2003 (tonnes)**

Source: National Statistical Service of Greece

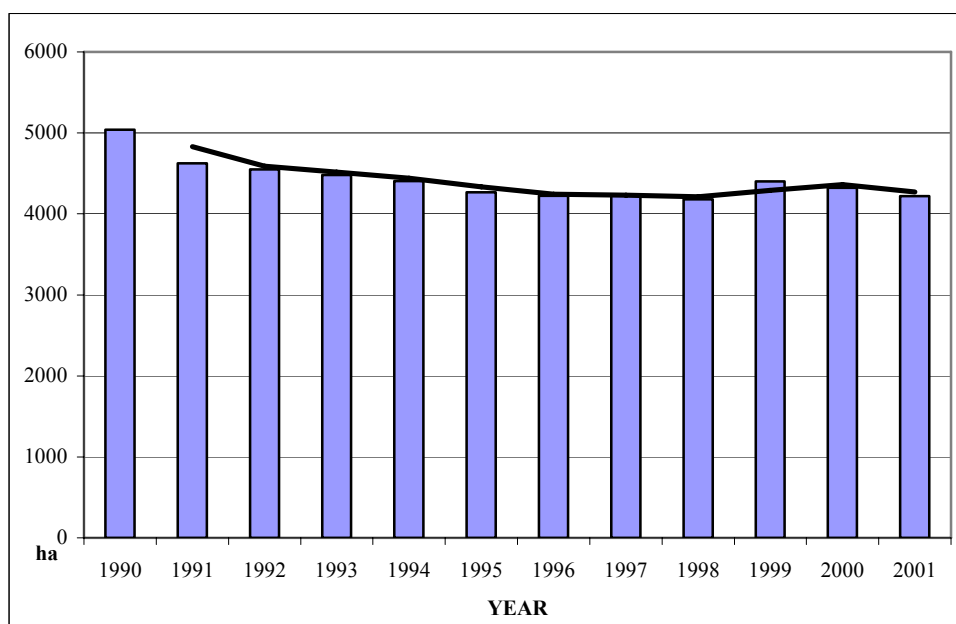
### 1.2.3 Pears

The pear orchards cultivated area followed the same declining trend with that of apple orchards. Concretely, the cultivated area of pear-trees decreased from 5040.0 hectares that was in year 1990 (Table 2) to 4217.1 hectares in year 2001. This area was 2.05% of total arboriculture cultivated areas, except olive groves. The majority of pear orchards are located at Macedonia followed by Thessalia, and by Peloponnese in a big distance. The pears area in Macedonia decreased in a greater percentage than this of Thessalia. (Annex 4).

The production of pears had shown a similar trend and it decreased from 103277 tons that was in year 1990, to 98819 tons in year 2001 (Table 1). The production of pear-trees was on average 3.31% of total production of arboriculture, excluded olive groves.

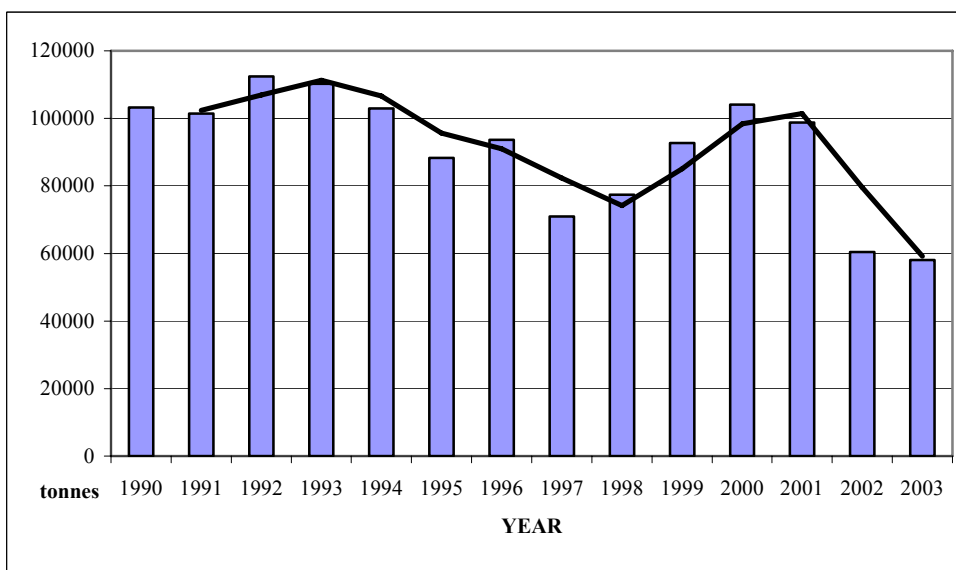
On contrary, the production efficiency increased from 20.50 ton/ha in year 1990, to 23.43 ton/ha in year 2001 (Table 3).

**Chart 8 : Evolution of the pears trees orchards, in period 1990 – 2003, (ha)**



Source: National Statistical Service of Greece

**Chart 9 : Evolution of pear fruits production, in period 1990 – 2003, (tonnes)**

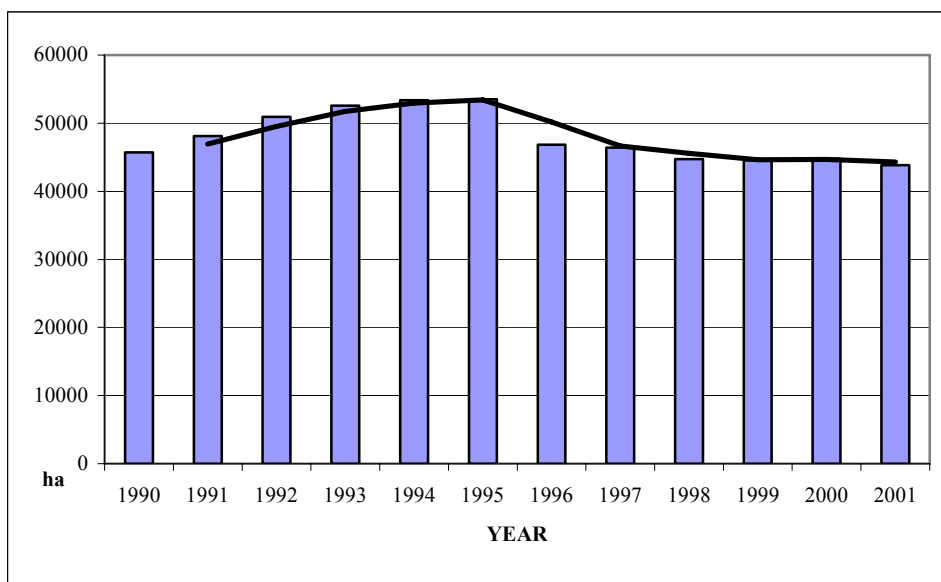


Source: National Statistical Service of Greece

### 1.2.4 Peaches

The growth of peaches cultivated area was similar with that of apples and pears. The cultivated area decreased, but less than the cultivated area of apples and pears. Specifically, the cultivated area of peaches trees from 45721.8 hectares that was in year 1990 fell to 43818.2 hectares in year 2001 (Table 2). This area was 22.24% of total arboriculture cultivated areas, except olive groves. Almost the whole areas of peaches orchards can be found in Macedonia (96-97%), while the rest are located in Thessalia (2-3%) and Peloponnese (1%). (Annex 4).

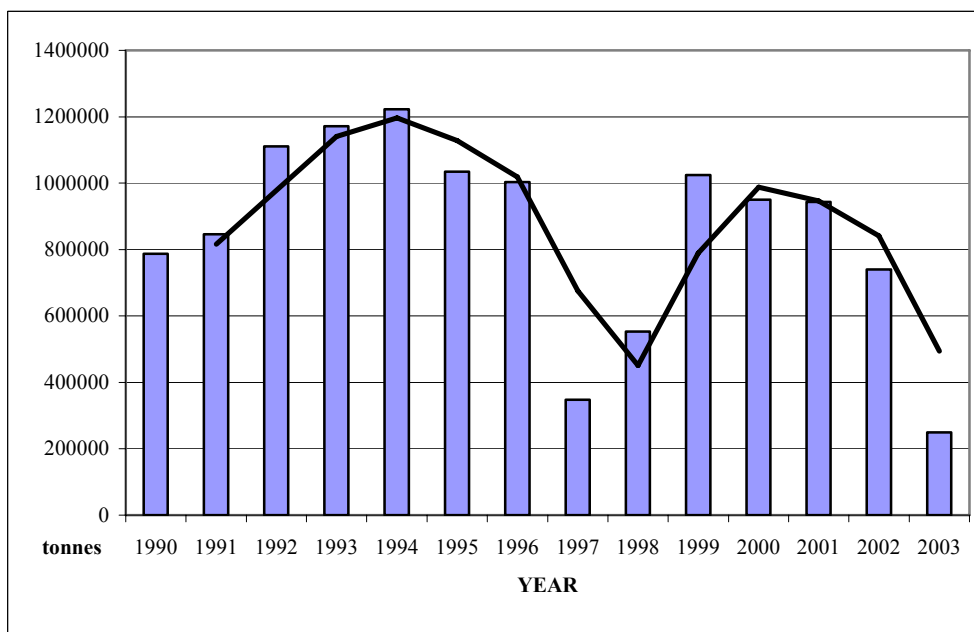
**Chart 10 : Evolution of peaches trees orchards in period 1990 – 2003, (ha)**



Source: National Statistical Service of Greece

The production of peaches increased from 786939 tons that was in year 1990, to 943336 tons in year 2001. The production of peaches was on average 30.19% of total production of arboriculture, excluded olive groves.

**Chart 11 : Evolution of peach fruits production, in period 1990 – 2003, (tonnes)**

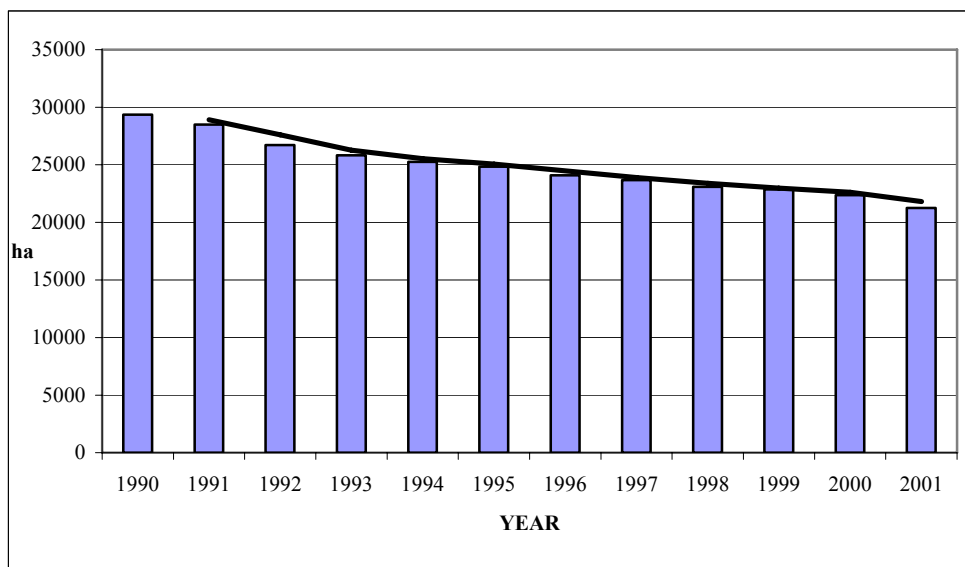


Source: National Statistical Service of Greece

With regard to the efficiency of peaches production, despite the reduction of cultivated area, the efficiency presented increase from 17.21 ton/ha in 1990 to 21.53 ton/ha in 2001 (Table 3). This

area is the 11.51% of the total cultivated areas of arboriculture, except the olive groves. The corresponding production was increased from 53394 tons in year 1990 to 55115 tons in year 2001 (Table 2). A decrease in production has been marked in last two years (2002 – 2003).

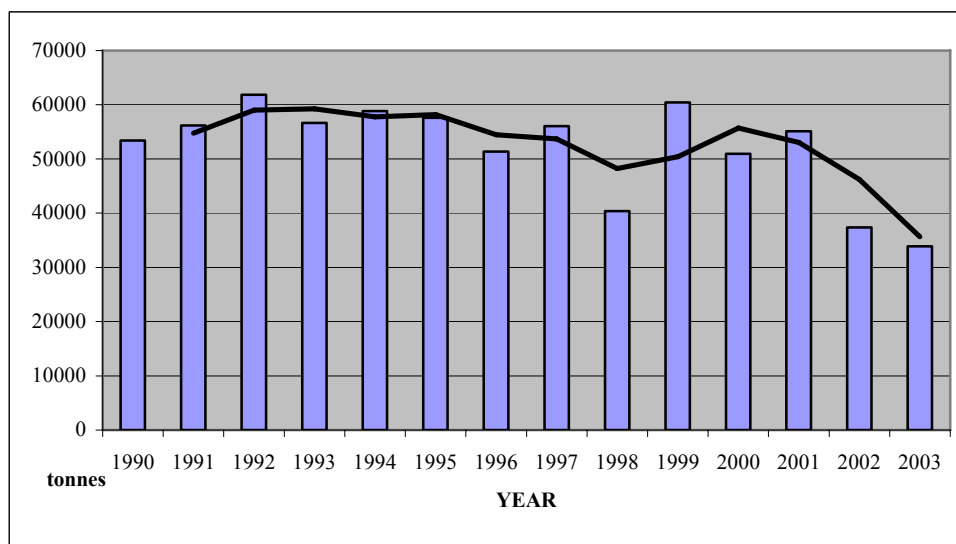
**Chart 12 : Evolution of the almond trees orchards, in period 1990 - 2003, (ha)**



Source: National Statistical Service of Greece

The production of almonds was on average 1.91% of the total production of arboriculture, excluded olive. Thessalia and Macedonia host the majority of almond trees.

**Chart 13 : Evolution of almonds production, in period 1990 – 2003, (tonnes)**

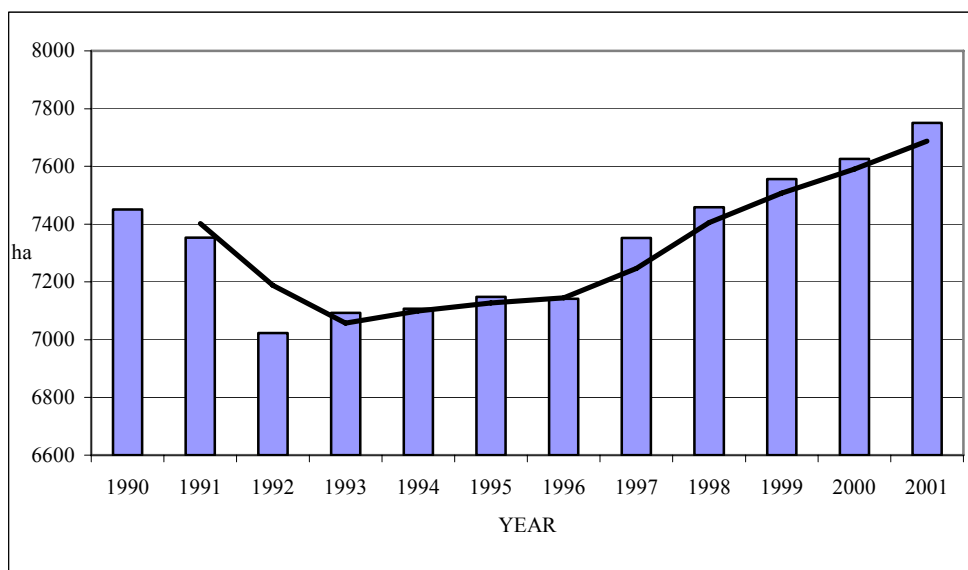


Source: National Statistical Service of Greece

Moreover, the production efficiency of almonds orchards presented an increase from 1.82 ton/ha that was in year 1990 to 2.59 ton/ha in year 2001 (Table 3).

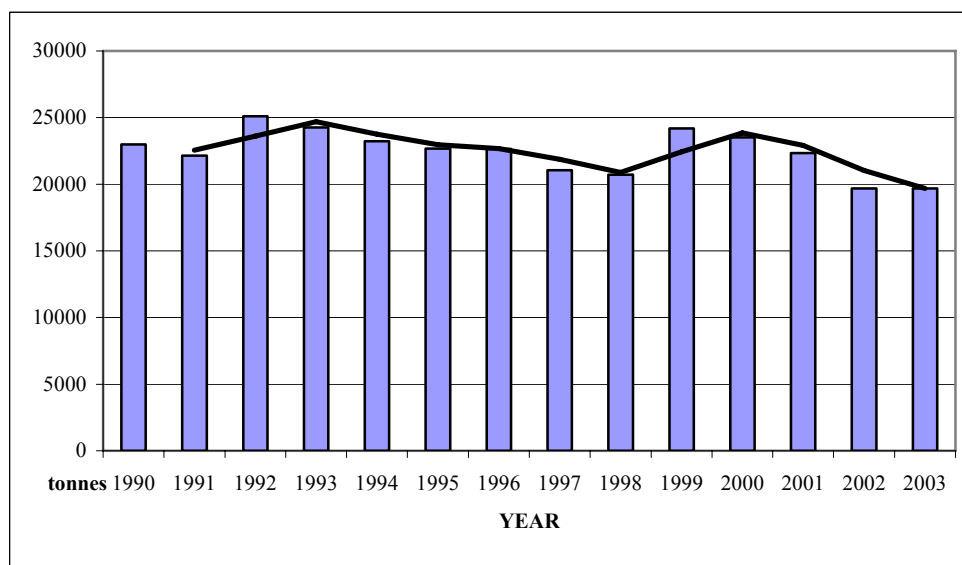
### 1.2.5 Walnuts

The cultivated area of walnuts was increased lightly from 7450 hectares that was in year 1990 to 7750 hectares in year 2001 (Table 2). This area is on average 3.41% of the total cultivated areas of arboriculture, except olive groves.

**Chart 14 : Evolution of the walnuts trees orchards, in period 1990 – 2003, (ha)**

Source: National Statistical Service of Greece

On the contrary, the production was decreased from 22988 tons that was in year 1990 to 22341 tons in year 2001 (Table 1). The ratio of walnuts production was on average 0.83% on the total production of arboriculture, excluded olive trees (Table 15). The most walnut trees orchards are located in Peloponnese – followed by Macedonia –.

**Chart 15 : Evolution of walnuts production, in period 1990 – 2003, (tonnes)**

Source: National Statistical Service of Greece

The production efficiency of walnuts decreased from 3.09 ton/hain year 1990 to 2.88 ton/ha in year 2001 (Table 3).

### 1.2.6 Producers Organisations

The objectives of Producers Organisations are:

- A. to ensure the planning of production and its adaptation to the market requirements, concerning mainly the quality and the quantity,
- B. to promote the concentration of offer and to promote the fruits production of their members to the market
- C. to decrease the production cost and to regulate the prices in the production, and

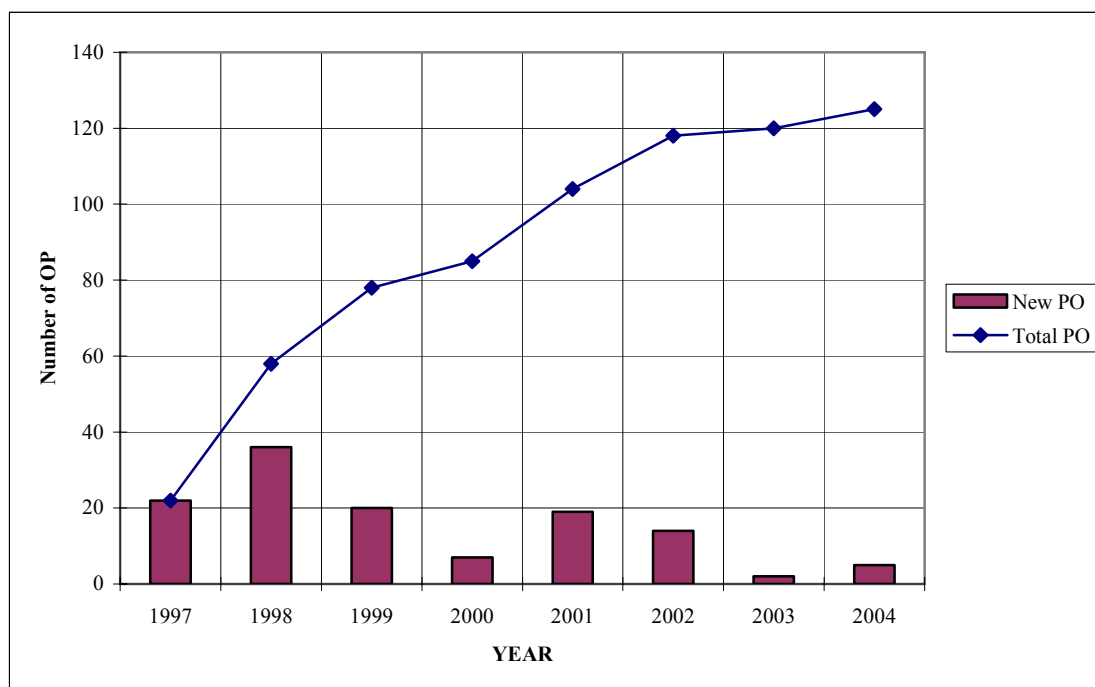


- D. to promote environmental sound practices of cultivation, techniques of production and waste disposal methods, aiming to the protection of the quality of water, soil, landscape and to the maintenance and/or the promotion of biodiversity.

The Producers Organisations in Greece handle a share of the total production of fruits and vegetables less than 20%. Greece presents a high delay compared to the other Member States of European Union and it is the country with the lower ratio of fruits and vegetables value, that are handled through the Producers Organizations, except Portugal.

One hundred twenty five (125) Producers Organisations are activated in Greece. Eighty five (85) of them were implementing their operational programmes at the period of 2002. The total budget of Producers Organizations operational fund in year 2003 was 15000000 Euros.

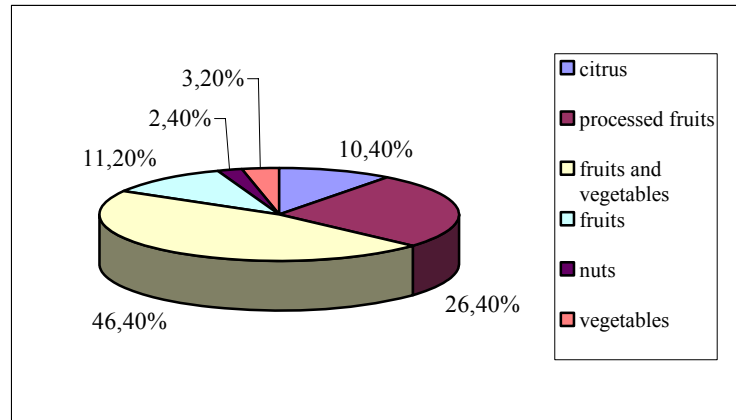
**Chart 16 : Evolution of Producers Organisations in Greece, in period 1997 - 2004**



Source: Ministry of Agricultural Development and Food

The Producers Organisations are activated in the sectors of fruits, fruits and vegetables, products to be processed, citrus fruits, nuts and vegetables. The distribution of the Producers Organisations in the above categories is the following (Chart 17).

- Fruits : 14 (11.2%)
- Fruits and vegetables : 58 (46.4%)
- Citrus fruits : 13 (10.4%)
- Products to be processed : 33 (26.40%) (12 POs concern industrial tomato process)
- Nuts : 3 (2.4%)
- Vegetables : 4 (3.2 %)

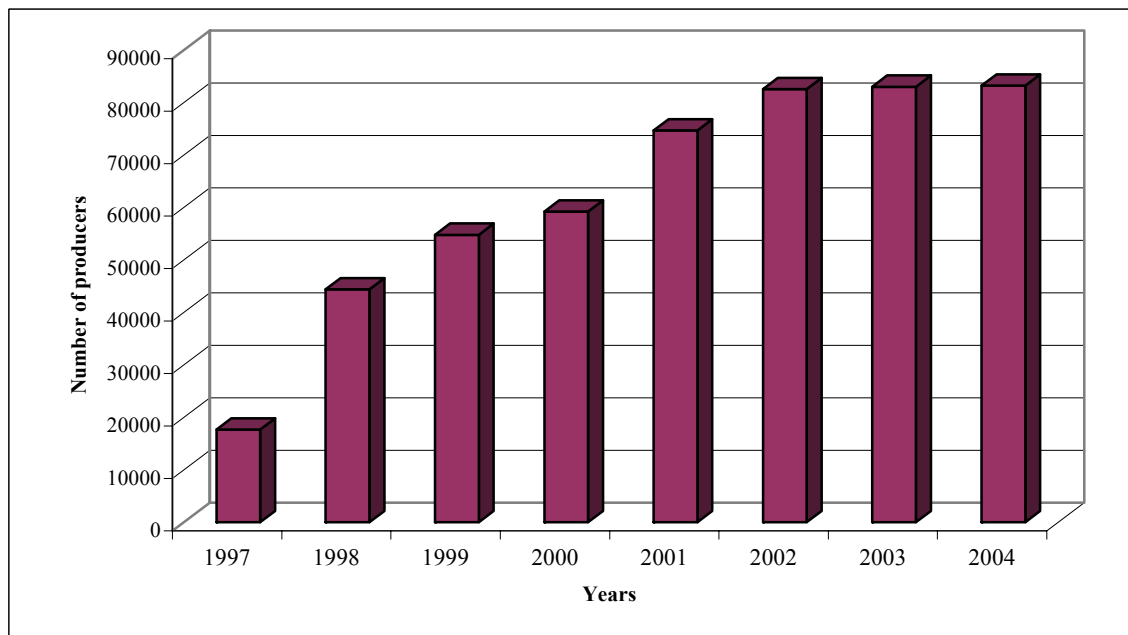
**Chart 17 : Distribution of producers organisation in different categories (in Greece), in year 2004**

Source: Ministry of Agricultural Development and Food

The most significant category of Producers Organisations is this of the sector of fruits - vegetables and products to be processed, relating to 46.4% and 26.4% respectively on the total number of Producers Organisations, while those activated in fruits and citrus fruits follow with 11.2% each one category. The existence of nuts (2.4%) and vegetables Producers Organisations (3.2%) is low.

#### **1.2.7 Evolution of number of producers - members of Producers Organisations**

As far as the number of producers concerns, there are available data only for the producers who are members of Producers Organisations. Their growth is given in the following Chart and Table.

**Chart 18 : Evolution of number of producers in fruits PO, in period 1997 - 2004**

Source: Ministry of Agricultural Development and Food

**Table 4 : Evolution of number of producers in fruits POs**

Year	1997	1998	1999	2000	2001	2002	2003	2004
Number	17706	44440	54826	59253	74745	82607	83054	83268
Change from previous year		150,99%	23,37%	8,07%	26,15%	10,52%	0,54%	0,26%

Source: Ministry of Agricultural Development and Food

As it can be seen from the above Chart 18, the number of Producers joining fruits POs is continuously increasing, while the trend of this join was tremendous in years 1997 and 1998, just after the modification of Common Market Organisation of fresh fruits and vegetables. From then onwards this trend is decreasing.

### **1.2.8 Operational Means - Funds (Operational Funds)**

The operational means – funds aim at the improvement of operation of Producers Organisations, in order the Producers Organisations to be more competitive.

The operational means - funds may be used in two ways:

- *Financing of withdrawals*

The financing of withdrawals from the operational fund is only allowed when the Producers Organisation has an approved operational program. The operational fund can supplement the Community aid for withdrawals for the products that correspond to the existing Regulations or can grant compensations for products withdrawals except these products of Annex of Regulation No 2200/1996. Member States determine maximum limits in order the compensations or the supplements plus the Community aid to do not exceed the prices of withdrawal of period of years 1995/1996. The part of the operational funds that finance supplementary the withdrawals cannot exceed the 30% of the total budget of the operational program.

- *Financing of an operational program that has been introduced to the national competent authorities and it has been approved by them.*

The operational program should:

- ◆ aim at similar objectives of those aims reported above,
- ◆ include measures / actions for the adoption of practices for environmental protection
- ◆ provide control means for the monitoring of standards application, crops health regulations and residuals.

The operational programme is financed at 50% from the members of the Producers Organisation and at 50% from the European Union.

The aid of the operational funds - means in Greece came up to 6.0 million Euros in year 2003. The average aid that a Greek Producers Organisation received for the operational funds was 0.1 million Euros in year 2003.

### **1.2.9 Withdrawals**

According to EC Regulation No 2200/1996 (Annex II), the regime of withdrawals can be applied to all the products examined in the present report. The Producers Organisation decides about the type of intervention for any product (under consideration) and whenever the Producers Organisation judges that this intervention is necessary without any restriction. The application of the measure of withdrawals cannot be considered as a market alternative for these products, but as a mean of prices' and consequently market's stabilisation. For this reason and in order disturbances in the market to be avoided, the European Union established through Regulation No 2200/96 maximum limits of withdrawals on the following products:

- 5% for citrus fruits,
- 8,5% for apples and pears, and
- 10% for other products.

The Producers Organisations may withdraw also products of non-members of their organization at 10% lower prices and in a limit of 10% of the whole production of each independent producer allocated in the market.

The products that are withdrawn are disposed:

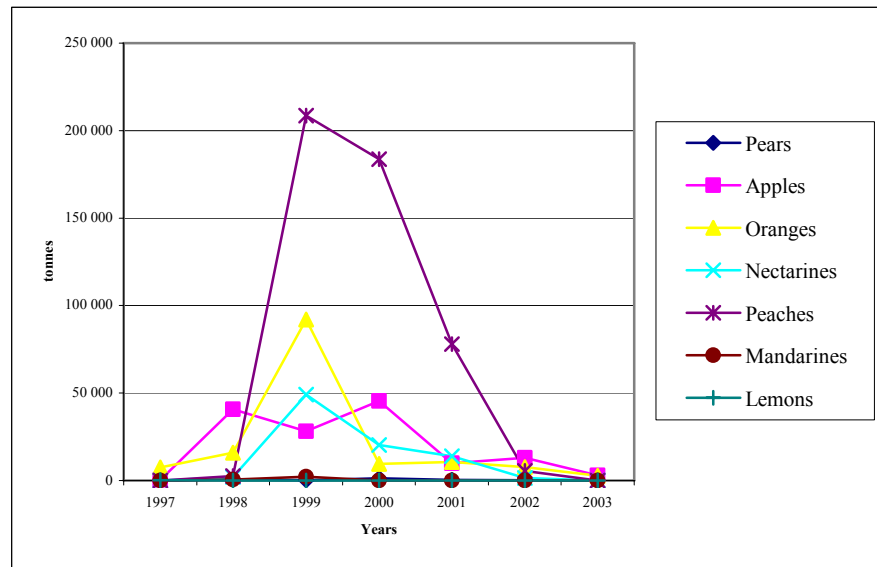
- for free distribution to charitable institutions,

- for free distribution to correctional institutions, camps, hospitals and nursing homes under the condition that the quantities of relative products bought by these institutions are not decreased,
- for free distribution outside Community,
- for forages,
- for not food aims,
- for free distribution to students, besides the regular dinners that potentially are offered,
- for alcohol processing over 80 degrees,
- in processing industry, provided that does not result in any distortion of competition.

If the above-referred uses are not possible, then the withdrawn products are disposed for composting or for biological decomposition. The European Union undertakes the expenses of free distribution (transport, screening, and packaging).

According to data from the Greek Ministry of Agricultural Development and Food the withdrawals of fruits for period 1997 – 2003 are given in the next Chart 19.

**Chart 19: Evolution of withdrawals in Greece, in period 1997 – 2003, (tonnes)**



Source: Ministry of Agricultural Development and Food

**Table 5 : Evolution of withdrawals in Greece, in period 1997 – 2003, (tonnes)**

CROP / WITHDRAWALS (in tonnes)	YEARS						
	1997	1998	1999	2000	2001	2002	2003
Pears		702	245	1 234	336	262	68
Apples	336	40 728	28 065	45 488	9 805	12 966	2 981
Oranges	7 548	15 923	92 028	9 453	10 655	7 742	2 794
Nectarines		1 942	49 177	20 333	13 891	1 422	
Peaches		2 588	208 618	183 636	77 939	5 551	
Mandarines	80	566	2 280				
Lemons	133						

Source: Ministry of Agricultural Development and Food

The withdrawn quantities compared to the produced quantities were significant for peaches in years 1999 and 2000, as well as for apples. The results of this comparison are given in Table 6.

**Table 6 : Withdrawals percentage (of total production of fruits crops), (tonnes)**

CROPS	YEAR						
	1997	1998	1999	2000	2001	2002	2003
Pears		0.91%	0.26%	1.19%	0.34%	0.43%	0.12%
Apples	0.11%	10.85%	10.06%	14.46%	3.96%	4.82%	1.50%
Peaches		0.47%	20.36%	19.33%	8.26%	0.75%	
Citrus trees	0.60%	1.49%	6.63%	0.75%	0.74%	0.54%	0.24%

Source: Ministry of Agricultural Development and Food

### 1.3 Main characteristics of the fruits production in the region of Peloponnese – Case Study area

#### 1.3.1 Introduction

The case study for fruits has taken place at the region of Peloponnese and concretely at Argolida prefecture. The case study should included citrus fruits, peaches and nectarines. However, in the region of Peloponnese, there are few only areas (small holdings), that covered by peaches cultivation as it is analyzed below, thus it was not possible to find and meet producers that cultivate peaches. Peaches producers organisations do not exist in Peloponnese. Thus, the implementation of the case study has been limited to the citrus fruits.

The majority of the producers were members of Producers Organisations, which usually are the former local cooperatives. Only one, out of twenty interviewed producers, was individual producer. The majority of producers use seasonal workers, the number of which varies depending on the needs of cultivation; however it is usually varies between one and maximum three workers (Table 7)

Concerning the age of trees, most of them are big, old trees (50 years old and above). Only one producer had included been in a program of reformation and concretely he reformed orange trees, before 18 years (Table 7).

The density of planting of citrus fruits in Argolida prefecture is regular (400 – 500 trees per hectare), with two exceptions. The production ranges in regular levels (70-130 Kg per tree).

**Table 7 : Profile of the producers interviewed in Peloponnese (Argolida Prefecture)**

a/a	Age	Member of PO	UAA (hectares)		Workers		Number of trees	Trees /ha	Age of trees - Number		Production (tn)	Yield (t/ha)	kg per tree
1	36	Yes	2.2	citrus (oranges)	seasonal	2	1010	459	50 years and older	1010	90-100	45.50	99.00
			0.7	vegetables									
2	39	Yes	5	citrus (oranges)	seasonal	1	2500	500	old	2500	325	65.00	120-130
			1	citrus (mandarins)			430	430	old	430	34.4	34.40	70-80
			0.7	pears									
3	58	Yes	1.2	citrus (oranges)	seasonal	1	400	333	old	400	20	16.70	50.00
4	37	Yes	1	citrus (oranges)	seasonal	1	410	410	old	410	49.2	49.20	120.00
			1	pears									
5	58	Yes	4.7	citrus (oranges)	seasonal	2	2300	489	old	2.3	180	38.30	78.00
			1	citrus (mandarins)			400	400	old	400	40	40.00	100.00
			2	apricots									

6	58	Yes	2	citrus (oranges)	seasonal	2	800	400	old	800	80	40.00	100.00
			0.55	citrus (mandarins)			200	364	old	200	12	21.80	60.00
7	46	No	2	citrus (oranges)	seasonal	1	900	450	old	270	50	25.00	56.00
			0.4	apricots					18 years	630			
8	55	Yes	1.5	olives	seasonal	2							
			6.1	Citrus (mandarins, oranges)			2900	475	old new	2900	200	32.79	68.97
9	65	Yes	5	Citrus (oranges)	seasonal	3	2500	416	old	2500	180	36.00	72.00
10	44	Yes	2.85	citrus (oranges)	seasonal	2	1200	416	old	1200	100	35.09	83.33
11	50	Yes	8	citrus (mandarins, oranges)	seasonal	3	3300	413	old	2000	300	37.50	90.91
									new	1300			
12	80	Yes	1.3	Citrus (oranges)	seasonal	1	565	435	old new	420 145	45	34.62	79.65
13	44	Yes	9.7	olives	seasonal	2							
			0.5	apricots									
			4.8	citrus			2690	560	old new	2340 350	200	41.67	74.35
14	50	Yes	12	citrus	seasonal	3	5800	483			650	54.17	112.07
15	45	Yes	2.1	citrus	seasonal	1	1000	476			90	42.86	90.00
16	50	Yes	4	citrus	seasonal	1	1800	450			180	45.00	100.00
17	34	Yes	0.6	citrus	seasonal	1	260	433			30	50.00	115.38
18	31	Yes	6	citrus	seasonal	2	2650	442			200	33.33	75.47
19	50	Yes	3	citrus	seasonal	2	1350	450			110	36.67	81.48
20	50	Yes	6	citrus	seasonal	2	2800	467			190	31.67	67.86

Source: Personal communications

The categories of fruits that are examined in the case study are the following:

- citrus fruits, and
- peaches and nectarines.

Available data do not exist concerning the growth of areas and the production of the studied crops, for years 2002 and 2003, (from the National Statistical Service of Greece). Also, no separate data for nectarines are recorded.

### ***1.3.2 Evolution of citrus farming in Peloponnese (period 1990 – 2001)***

The growth of cultivated areas of citrus fruits was increasing both in the whole country and in the region of Peloponnese at the period of 1990 – 2001. In the region of Peloponnese, the cultivated areas with citrus trees from 34255 hectares that were in year 1990 have been increased to 35212 hectares in year 2001 (Table 8).

**Table 8 : Evolution of citrus and peaches orchards in Peloponnese, in period 1990 – 2001, (ha)**

Area (in ha)	Year											
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
<b>Citrus trees</b>												
<b>Peloponnese Region</b>	<b>34255</b>	<b>34356</b>	<b>34347</b>	<b>34318</b>	<b>34656</b>	<b>34677</b>	<b>34834</b>	<b>35162</b>	<b>35051</b>	<b>35134</b>	<b>35498</b>	<b>35212</b>
<b>Argolida prefecture</b>	11804	11909	11967	11998	11975	12007	12075	12195	12143	12323	12352	12380
<b>Arkadia prefecture</b>	286	288	289	328	305	298	295	290	289	293	287	287
<b>Achaia prefecture</b>	3525	3390	3466	3441	3450	3462	3471	3471	3457	3446	3459	3469
<b>Ilia prefecture</b>	3587	3634	3551	3557	4275	4350	4354	4506	4564	4556	4566	4607
<b>Korinthia prefecture</b>	6705	6649	6576	6512	6282	6186	6016	6074	5943	5867	5862	5787
<b>Lakonia prefecture</b>	6763	6952	6996	7085	6996	7022	7272	7292	7334	7393	7719	7466
<b>Messinia prefecture</b>	1585	1534	1502	1398	1373	1353	1352	1335	1322	1256	1253	1215
<b>Peach trees</b>												
<b>Peloponnisos Region</b>	<b>313</b>	<b>347</b>	<b>289</b>	<b>292</b>	<b>283</b>	<b>274</b>	<b>257</b>	<b>257</b>	<b>235</b>	<b>236</b>	<b>239</b>	<b>222</b>
<b>Argolida prefecture</b>	39	50	48	47	48	48	45	44	44	43	43	43
<b>Arkadia prefecture</b>	24	17	12	12	24	23	10	9	10	9	23	13
<b>Achaia prefecture</b>	100	127	87	81	66	59	54	56	54	54	48	48
<b>Ilia prefecture</b>	95	99	92	96	87	86	86	84	84	84	83	80
<b>Korinthia prefecture</b>	37	37	37	37	37	38	46	49	29	32	27	24
<b>Lakonia prefecture</b>	0	0	0	0	0	0	0	0	0	0	0	0
<b>Messinia prefecture</b>	18	18	13	17	20	19	15	14	14	14	14	14

Source: National Statistical Service of Greece

The citrus orchards in Peloponnese covers on average a percentage of 60% of the total cultivated citrus orchards areas in all the country (Table 9) during the examined period (1990 – 2003).

The production of these areas in Peloponnese presented respectively an increase and from 678144 tons that were in year 1990, reached 890316 tons in year 2001 (Table 10).

**Table 9 : Evolution of citrus and peaches orchards in Peloponnese, as percentage of the total areas in Greece, in period 1990 – 2001, (ha)**

Area, in ha	Year											
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
<b>Citrus orchards, in Greece</b>	56943	57340	57436	57703	58120	58156	58240	58832	58646	58843	59123	58898
<b>(%) Citrus orchards in Peloponnese</b>	60.16	59.92	59.80	59.47	59.63	59.63	59.81	59.77	59.77	59.71	60.04	59.78
<b>Peach orchards, in Greece</b>	45722	48115	50921	52558	53376	53504	46846	46429	44707	44561	44770	43818
<b>(%) Peach orchards, in Peloponnese</b>	0.68	0.72	0.57	0.56	0.53	0.51	0.55	0.55	0.53	0.53	0.53	0.51

Source: National Statistical Service of Greece

**Table 10 : Evolution of citrus and peaches production in Peloponnese, in period 1990 – 2001, (tonnes)**

Production, in tons	Year											
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
<b>Citrus trees</b>												
<b>Peloponnisos Region</b>	<b>678144</b>	<b>709503</b>	<b>915668</b>	<b>752946</b>	<b>760709</b>	<b>743860</b>	<b>821116</b>	<b>766297</b>	<b>657058</b>	<b>879563</b>	<b>785696</b>	<b>890316</b>
<b>Argolida prefecture</b>	312411	342973	465245	335405	318690	305616	365068	316984	198145	413421	342484	395747
<b>Arkadia prefecture</b>	5872	6788	8131	9046	8588	7187	7019	6995	6096	5946	5680	5723
<b>Achaia prefecture</b>	52093	36876	58905	57717	65161	63394	59243	63860	61146	63829	73383	72791
<b>Ilia prefecture</b>	66377	68235	82815	78700	97485	95021	91558	98408	108396	113419	111639	111151
<b>Korinthia prefecture</b>	81001	89075	100468	72952	76604	64110	82507	80211	82743	73970	70209	66440
<b>Lakonia prefecture</b>	133516	137582	171728	175161	170236	184614	191219	175524	176339	185515	158843	216133
<b>Messinia prefecture</b>	26874	27974	28376	23965	23945	23918	24502	24315	24193	23463	23458	22331
<b>Peach trees</b>												
<b>Peloponnisos Region</b>	<b>4329</b>	<b>5128</b>	<b>3834</b>	<b>3991</b>	<b>3839</b>	<b>3292</b>	<b>3125</b>	<b>3148</b>	<b>2891</b>	<b>3887</b>	<b>3742</b>	<b>3432</b>
<b>Argolida prefecture</b>	412	414	542	523	544	270	288	491	292	946	664	632
<b>Arkadia prefecture</b>	58	89	162	184	141	142	115	94	101	104	110	79
<b>Achaia prefecture</b>	1535	2112	852	844	699	639	593	610	585	715	687	669
<b>Ilia prefecture</b>	1642	1783	1523	1598	1484	1263	1262	1229	1199	1342	1443	1246
<b>Korinthia prefecture</b>	382	384	418	455	509	568	459	319	322	400	529	469
<b>Lakonia prefecture</b>	100	97	101	89	89	77	77	80	71	70	74	69
<b>Messinia prefecture</b>	200	249	236	298	373	333	331	325	321	310	235	267

Source: National Statistical Service of Greece

The percentage of the production of citrus fruits in the region of Peloponnese was on average a 61.64% of the total production of citrus fruits in Greece (Table 11).

**Table 11: Evolution of citrus and peaches production in Peloponnese, as percentage of the total production in Greece, in period 1990 – 2001, (tonnes)**

Production, in tons	Year											
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
<b>Citrus production, in Greece</b>	1169280	1076136	1429120	1219428	1321484	1211053	1244792	1289313	1104222	1422047	1265264	1432504
<b>(%) Citrus productions</b>	58.00	65.93	64.07	61.75	57.56	61.42	65.96	59.43	59.50	61.85	62.10	62.15
<b>Peaches production</b>	786939	845908	1110531	1171657	1222448	1034421	1002832	348010	553353	1024591	949944	943336
<b>(%) Peaches production</b>	0.55	0.61	0.35	0.34	0.31	0.32	0.31	0.90	0.52	0.38	0.39	0.36

Source: National Statistical Service of Greece

Moreover, the yield of citrus fruits in the region of Peloponnese was increased from 19.80 ton/ha that was in year 1990 to 25.28 ton/ha in year 2001 (Table 12).



**Table 12 : Evolution of citrus yield in Peloponnese, in period 1990 – 2001, (tonnes/ha)**

Year											
1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
19.80	20.65	26.66	21.94	21.95	21.45	23.57	21.79	18.75	25.03	22.13	25.28

Source: National Statistical Service of Greece

As far as Argolida prefecture concerns (where the case study took place), the cultivated area of citrus fruits was increased during 1990 - 2001. More specifically, the citrus fruits orchards from 11804 hectares that were in year 1990 reached the 12380 hectares in year 2001 (Table 8).

**Table 13 : Citrus and peaches cultivated areas in Argolida prefecture, as a percentage of the total citrus and peaches areas cultivated in Peloponnese, in period 1990 - 2001**

(%) Area	Year											
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
(%) Citrus orchards	34.46	34.66	34.84	34.96	34.55	34.63	34.66	34.68	34.64	35.07	34.80	35.16
(%) Peach orchards	12.46	14.41	16.61	16.10	16.96	17.52	17.51	17.12	18.72	18.22	17.99	19.37

Source: National Statistical Service of Greece

The cultivated area of citrus fruits in Argolida covers on average a 34.75% of cultivated areas of citrus fruits in the region of Peloponnese (Table 13) during period of 1990 - 2001.

The production of citrus fruits presented respectively an increase and it was 395747 tons in year 2001, from 312411 tons, that was in year 1990 (Table 10). The production of citrus fruits in Argolida was on average a 43.65% of the total production of citrus fruits in Peloponnese (Table 13), during the examined period of 1990 – 2001.

**Table 14: Citrus and peaches production in Argolida prefecture, as a percentage of the total citrus and peaches areas cultivated in Peloponnese, in period 1990 - 2001**

	Year											
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
% Citrus production	46.07	48.34	50.81	44.55	41.89	41.09	44.46	41.37	30.16	47.00	43.59	44.45
%Peaches production	9.52	8.07	14.14	13.10	14.17	8.20	9.22	15.60	10.10	24.34	17.74	18.41

Source: National Statistical Service of Greece

In regard to the yield of citrus fruits in Argolida, it presented an increase from 26.47 ton/ha that was in year 1990, to 31.97 ton/ha in year 2001 (Table 15).

**Table 15 : Evolution of Citrus yield in Argolida Prefecture, in period 1990 – 2001, (tonnes/ha)**

Year												
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Yield	26.47	28.80	38.88	27.96	26.61	25.45	30.23	25.99	16.32	33.55	27.73	31.97

Source: National Statistical Service of Greece

### **1.3.3 Evolution of peaches farming in Peloponnese**

Both the cultivated areas of peaches orchards as well as their production were decreased during the examined period of 1990 - 2001.

The area covered by peaches orchards was decreased from 313 hectares that was in year 1990 to 222 hectares in year 2001 (Table 8). This area covers on average a percentage of hardly 0.56% of total cultivated areas with peaches in the whole country (Table 9).

The corresponding production was decreased from 4329 tons that was in year 1990, to 3432 tons in year 2001 (Table 10). Peaches production in the region of Peloponnese was on average a 0.45% of the total peaches production all over the country (Table 11).

### 1.3.4 Producers Organisations in Peloponnese

Twenty two (22) recognized Producers Organisations are activated in the region of Peloponnese (Table 16). Six of them have as their main object citrus fruits. Moreover, two (2), out of 22 recognized Producers Organisations with main object the fruits, are located in the Prefecture of Argolida.

**Table 16 : Producers organisations in Peloponnese**

A/A	PRODUCERS ORGANISATION	YEAR OF RECOGNITION	CATEGORY	NUMBER OF PRODUCERS
<b>ARGOLIDA PREFECTURE</b>				
1	CACF of Argolida "DANAOS"	1998	fruits (i)	2000
2	AAC of Argolida	2001	fruits (ii)	5576
<b>ARKADIA PREFECTURE</b>				
3	AAC of Arkadia	1997	processing (iv) (Industrial tomatoes)	37
<b>ACHAIA PREFECTURE</b>				
4	AAC of Patras	1997	processing (iv)	1076
5	AAC of Aegion	1999	processing (iv)	2564
<b>ILIA PREFECTURE</b>				
6	AC of Gastouni	1997	processing (iv)	1842
7	AAC of Amaliada	2002	fruits (u)	473
8	AAC of Lechaina	2002	fruits (ii)	545
9	AAC of Lechaina of industrial tomatoes	2004	processing (iv)	
10	AAC of Ilia - Olympia	2002	fruits(ii)	2,192
11	AC of industrial tomatoes of Ilia Prefecture	2003	processing (iv)	447
12	AC of Tragano Ilias	2004	Citrus fruits	214
<b>KORINTHOS PREFECTURE</b>				
13	UAC of Korinthos	2002	Fruits and vegetables (i)	1286
14	CACFV (KASOK) "Asopos"	2002	Fruits and vegetables (i)	1032
15	CACFV (KASOK) DIAS	2002	Fruits and vegetables (i)	484
<b>LAKONIA PREFECTURE</b>				
16	AC of Citrus in Scala	1998	Citrus fruits (v)	
17	COACL "LYKOURGOS"	1998	Citrus fruits (v)	1273
18	AAC "LAKONIA"	1997	Citrus fruits (v)	1039
19	ACLTD of Sparti « HELIOFRUIT »	1999	Citrus fruits (v)	
<b>MESSINIA PREFECTURE</b>				
20	AAG of Messinia "PYLIA"	2002	Citrus fruits (v) (for processing)	550
21	Cooperative of Figs	1997	processing (iv) dried figs	100
22	AAC of Messinia	1999	Processing (iv) raisin	100

Source: Ministry of Agricultural Development and Food

### 1.3.5 Organic farming in Peloponnese

The area of organic citrus trees farming in the region of Peloponnese was decreased from 1178.32 hectares that was in year 1999 to 751.98 hectares in year 2003 (Table 17). These areas represent a percentage of 73.29% and 47.34% (respectively for years 1999 and 2003) of areas of citrus fruits that are under organic farming in the whole country. This reduction is owned possibly to the difficulties that the organic farmers face mainly regarding the disposal of their products, at satisfactory prices level.

The organic farming areas of citrus fruits in the Prefecture of Argolida presented a similar reduction trend. The organic farming areas with citrus orchards from 518.26 hectares that were in 1999 were decreased to 219.69 hectares in year 2003 (Table 17). The organic citrus fruits production in the Prefecture of Argolida was the 29.21% of organic citrus fruits in the region of Peloponnese, in year 2003 against 43.98% that it was in year 1999.

**Table 17 : Citrus organic farming in Peloponnese**

Organic Farming (area in ha)	Year		
	1999	2002	2003
<b>Greece</b>	<b>1607.81</b>	<b>1422.25</b>	<b>1588.22</b>
<b>Peloponnisos Region</b>	<b>1178.32</b>	<b>733.2</b>	<b>751.98</b>
<b>Argolida prefecture</b>	518,26	233.50	219.69
<b>Arkadia prefecture</b>	14.77	22.42	24.85
<b>Achaia prefecture</b>	361.75	104.35	107.32
<b>Ilia prefecture</b>	59.89	80.04	76.08
<b>Korinthia prefecture</b>	16.30	20.41	28.83
<b>Lakonia prefecture</b>	171.48	258.34	277.50
<b>Messinia prefecture</b>	35.87	14.14	17.71

Source: Ministry of Agricultural Development and Food

## 1.4 Level of implementation of the various measures of the CMO in Greece

OPEKEPE the Payment Authority (its description is given in next paragraphs) has the responsibility of payments. Analytical data for each Hellenic region per product are expected from OPEKEPE. At this point a general presentation of payments is given in the following table. Based on data from OPEKEPE we will be able to describe the level of implementation of each measure during the period 1990 – 2003.

**Table 18 : Payments to fruit producers, in period 1988 – 2003, (mil drs, mil €)**

SECTORS	Payments																
	in mil drs										in mil Euros						
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2001	2002	2003
<b>Fresh fruits / vegetables</b>	9472	24888	41360	33762	32806	68516	69826	83402	53072	60294	17868	7248	22140	17766	52138	34655	18929
<b>Processed fruits / vegetables</b>	18893	26920	37191	36093	47511	47181	54635	64786	67636	65286	64295	71622	73062	63057	185054	197244	188444

Source: Ministry of Agricultural Development and Food

## **1.5 Institutional framework of the fruits production in Greece**

In this chapter the presentation of the main public and private bodies related to the production, treatment, payments, control etc of fruits sector in Greece is included. Every body is presented with a brief description of each role.

### **1.5.1 Institutions in charge of the management and payment of the premiums**

OPEKEPE is the responsible payments Authority under the application of the CAP and CMO.

Aim of OPEKEPE is the management of credits of European Agricultural Guidance and Guarantee Fund –Department of Guarantees. This management is based on a system of control of payment documents of Community aids beneficiaries and the consecutive recognition and liquidation of expenses, the approval of payment and the relative command, so that the legality of payments is ensured according to the national and Community requirements. Another aim of OPEKEPE is the prevention and the cracking down of any financial irregularity, as well as the recuperation of any pecuniary financial aids, which has been overwhelmed illegally or unduely. The competences of OPEKEPE, according to the article 24 of Greek Law No 2045/01, are the following:

- the control of payment documents and recognition and liquidation of expenses. Recording of data and files of payments done
- the realisation of all kinds of control concerning the legality of payments and the activation of forecasted procedures for the recuperation overwhelmed illegally or unduely, as well as for the imposition of any legal ratification
- the collection of economic data and the proposal for the formulation of budget of Special Account of Guarantees of Agricultural Products
- the proposal for the publication of decisions and the publication of circulars and directives that determine the details of application of common agricultural policy in the sector of guarantees, the controls and the necessary supporting documents
- the publication and the issuing of imports and exports certificates, as well as certificates of predetermination of contribution in the import and return at the export
- the undertaking of competences of purchase and clearance of products of purchasing intervention, after the decision of Minister of Agriculture as well as the undertaking of competitions, contracting of relative conventions, control of supporting documents, determination of the value of cleared out products, liquidation of financial aids to be recovered or to be returned, follow-up of reserves, ascertainment and certification of deficits or surpluses, deteriorations or alterations
- the maintenance of letters of guarantee and the receipts of guarantees
- the participation in the formulation of lending contracts for the financing of Special Account of Guarantees of Agricultural Products

### **1.5.2 Institutions in charge of the controls (premiums, surfaces, etc.)**

*Agrocert*

The public, non-profit organization operating under the auspices of the Minister of Rural Development & Food with the title AGROCERT is the standardization, inspection and certification authority in Greek Agriculture. AGROCERT is a Private Law Legal Entity and operates for the public interest. The mission of AGROCERT is the contribution to the improvement of rural population income, the reinforcement of agricultural economy and the sustainable development of the countryside. AGROCERT aims to contribute to the constant collaboration of the different institutions that act as agents of development. Furthermore AGROCERT seeks to become the institutional medium that guarantees the product quality and also implement procedures responsible for the production of qualitative agricultural products.

The scope of AGROCERT is the promotion of quality assurance in Agriculture; the protection of terms that refer to a product origin; the support of environmental - friendly systems, such as the

system of integrated management in agriculture and forest exploitation. The competences of AGROCERT, according to the current legislation, are:

- The certification of production and surveillance procedures for agricultural products, according to International, European and National Regulations and Standards. The certification is enforced by issuing certificates, compliance labels, quality system certificates and environmental management system certificates.
- The editing and publication of optional standards and guides; the drafting of principles that govern the development and certification of management systems for the quality assurance of agricultural products.
- The evaluation and supervision of the organizations that are responsible for the inspection and certification of organic agricultural and animal products; the control of trade and distribution for the organic agricultural and animal products; the granting of a single label for the acknowledgement of the Greek organic agricultural and animal products.
- The evaluation, approval and supervision of private sectors, responsible for the certification of certain documents application that are composed, published, and recognized by AGROCERT.
- The inspection, supervision and certification of the following agricultural products:
  - protected designation of origin
  - protected geographical indication
  - traditional specialty guaranteedaccording to valid European regulations.
- Record keeping of the following:
  - Private Organizations that cooperate with AGROCERT and are responsible for certifications;
  - Auditors, technical experts and inspectors responsible for agricultural products;
  - All the certified products;
  - Agricultural exploitations.

The fields of interest of AGROCERT are:

- **Organic Agricultural Products**
- **Integrated Management in Agricultural Production**
- Quality Assurance of Pork
- Quality Assurance of Mariculture Products
- Quality Assurance of Beef & Veal Meat
- HACCP, ISO
- PDO, PGI, Traditional Specialty Guaranteed Agricultural Products
- Special Poultry Farming

OPEKEPE and Prefectural Authorities are in charge for the control of producers statements on which the subsidies are based.

### **1.5.3 Interbranch organisations,**

In Greece there is one interprofessional organisation in the sector of fruits and especially peaches and pears. It has been recognised by Ministerial Decision No 369894 of 14-6-01 with the subject: "Recognition of National Inter professional Organisation of Industrial Peaches and Pear". In this Decision, the foundation of a National Interprofessional Organisation of Industrial Peach and Pear (EDOVRA) is recognized. The Organisation's foundation is the Municipality of Skydras of Pella Prefecture.

The National Interprofessional Organisation of Industrial Peaches and Pears is recognized for some activities. These activities should be undertaken from at least one third of the members of the organisation. These activities are:

- The production of raw material
- The processing of raw material
- The marketing of raw material
- The marketing of final product

Regional Organisations of Industrial Peaches and Pears are also recognised under the condition that they have been registered as members of the National Interprofessional Organisation of Industrial Peaches and Pears, which it is represented by the regional organisations in their region.

Supervising Authority as well as responsible authority is the Directorate of Processing, Standardisation and Qualitative Control of Ministry of Agriculture, and especially the Department of processed fruits and vegetables.

#### **1.5.4 Research and technical institutes**

##### **1.5.4.1 Research Institutes**

###### **National Agricultural Research Foundation (N.AG.RE.F.)**

The National Agricultural Research Foundation (N.AG.RE.F.) is the national body responsible for agricultural research and technology in Greece, functioning as a Legal Private Entity sponsored by the Ministry of Agriculture. It was established in 1989 under the Decree 1845/1989 entitled "Development and Exploitation of Agricultural Research and Technology". N.AG.RE.F. is also in charge of research for technological improvement and development in agricultural, forest, and fish production, it is also concerned with topics of veterinary, management of marine resources, soil science, land reclamation, processing and preservation of agricultural products, as well as agricultural economy and sociology. N.AG.RE.F. is administered by an eleven member Administrative Council, whereas the planning of its scientific and research activities is carried by the Scientific Council.

N.AG.RE.F. promotes research and technological activities in both the primary and secondary agricultural production sectors, aiming at an integrated approach to deal with rural problems within the framework of national agricultural policy and the agricultural policy of the European Union. N.AG.RE.F. plays a significant role in the improvement and creation of new plant varieties and animal breeds and in the production of healthy propagative material.

N.AG.RE.F. has taken part in all the EU framework programmes and has also submitted proposals for programmes that are announced directly by the different directorates of the EU and for programmes that are announced through national bodies (mainly the Ministry of Agriculture and Ministry for the Environment, Physical Planning and Public Works).

N.AG.RE.F.'s research activities are carried out through its National Institutes. The related to fruits, olive oil and wine CMO branches of NAGREF are:

- National Agricultural Research Foundation of arboriculture and vineyards
  - Institute of Olive Tree and Subtropical plants of Chania
  - Institute of vineyards and wine in Attica
  - Institute of olive tree of Kerkyra
  - Self existent Laboratory of genetic improvement and cultivation practices of nuts, in Fthiotida
- National Agricultural Research Foundation of soil science and water resources
  - Institutes of Soil science
  - Institutes of land mapping and classification in Larissa
  - Institute of water resources and environmental management
- Agricultural Economics & Policy Research Institute (A.G.E.P.R.I.)
- Self existent laboratory of economy of less favourable areas.
- Centers of Agricultural Research Application in 27 Prefectures of Greece, three of them in Peloponnese (Arkadia, Argolida, Messinia)

##### **1.5.4.2 Universities**

###### **Agricultural University of Athens**

A) Department of Rural Economics and Development,

The primary aim of the Department is to promote knowledge and to educate scientists specialized in research and in tackling problems connected with the economic, social, political and environmental dimension of a viable rural development within the framework of European integration.

As far as its research activities concerns, the Department participates and plays a significant role in a great number of the most important European programs. For the conduction of its research programs, the Department has developed relations and close collaboration with many research and non-research institutions, principally within Greece and Europe. The Department works together with a number of large research foundations of globally acknowledged status.

The research interests of the Department are oriented towards almost all modern trends in agricultural economy and concern among other issues: Agricultural policy, Integrated agricultural development, International agricultural integration, evaluation of projects and programs, innovation management sustainable development and protection of the environment

Up to now, the Department has undertaken the organisation of all the Greek conferences on Agricultural Economy that have taken place in Athens and has contributed as co-organiser to several other conferences. Teaching staff duties include further activities, such as evaluation of EU research programs and participation in working groups -depending on their specialization, professors of the Department are called upon to collaborate in groups which work on policy-determining issues. Teaching staff duties also include the evaluation of papers submitted to Greek and international scientific journals as well as presentations of topics of general interest at public events.

#### **B) Department of Crop Science**

The Department's objective is to train agronomists who will contribute to the development of Greek agriculture and will upgrade its competitiveness. Under the Division of Horticulture, Floriculture and Landscape Architecture the Laboratory of Vegetable Crops exists and under the Division of Pomology and Viticulture the Laboratory of Viticulture is hosted and under the Division of Plant Protection and Environment the Laboratory of Ecology and Environmental Sciences exists.

#### **Aristotle University of Thessaloniki**

The School of Agriculture of the Aristotle University of Thessaloniki is one of the Greek Schools for undergraduate and postgraduate university teaching in agricultural sciences. The mission of the School of Agriculture is to advance and transmit knowledge and understanding of the biological, physical and social sciences as they relate to the production, storage, processing, marketing, and distribution of agricultural products in a manner consistent with sustainability of the agri-food business, conservation of natural resources, maintenance or enhancement of environmental quality and the supply of safe and high quality food. The School carries out its mission through undergraduate and postgraduate education and training. The sectors of specialisation concerning permanent crops are: Agricultural Economics; Field Crops and Ecology; Horticulture and Viticulture; Crop Protection.

#### **University of Thessaly**

The "School of Agricultural Sciences" has two Departments:

- a) Department of Agriculture, Crop Production & Rural Environment
- b) Department of Agriculture, Animal Production & Aquatic Environment

The Department of Agriculture, Crop Production & Rural Environment cooperates closely with Universities and Institutions in Greece and abroad by exchanging experts and students, and by joint meetings and research projects. The department consists of four sectors:

- a) Sustainable Production of Crop and Horticulture Plants includes amongst others the related topics Crop Cultivation, Viticulture and Vegetable Production, Organic Agriculture, Models of Plant Growth Simulation, Agricultural Sociology and Policy, Agricultural Economics and Marketing of Agricultural Products.
- b) Plant breeding and Biotechnology, which focuses amongst others on the Agricultural Pharmacology and Control of Agrochemicals in the Environment.
- c) Integrated Crop Protection and
- d) Water Resources, Soil Resources and Agricultural Engineering.



The related research topics of this Sector focus on irrigation and Drainage, Hydraulics and Water Quality, Plant Nutrition and Fertilizers, Sustainable Management of Water and Soil Resources, Soil Pollution and Management.

### **1.5.5 Institutes for statistics**

The National Statistical Service of Greece is a General Secretariat of the Ministry of Economy and Finance, with the following structure: a Central Service, with two General Directorates, twelve Central Divisions and seven Decentralised Divisions.

#### *Sources providing the NSSG with data*

Individuals, households, public and private enterprises of almost all the branches of economic activity (agricultural, industrial and commercial enterprises, enterprises providing services), state services, local government, public utility organizations, educational establishments, hospitals, social insurance organizations etc consist the sources from which the NSSG collects data. These data are then tabulated after the appropriate processing. The response rate of the above sources is considered satisfactory and facilitates the collection of data by the NSSG.

#### *Data Collected*

The statistics compiled by the NSSG – monthly, tri monthly, annual, five yearsl and ten years– cover almost all the activity sectors. Population data (population by different categories, vital statistics – marriages – births – deaths), employment and unemployment data, data concerning health and social insurance, education, justice, the production process, finance, prices, the national income and, finally, the cultural activities consist the main input for the derivation of statistical tables and indices compiled by the NSSG on a short-term and long-term basis.

#### *The use of the NSSG Data*

The State is the main user of statistics and indices compiled by the NSSG. On the basis of these data it materializes and follows-up its policies in various domains. Other users are the European Union, which needs the particular data of its Member – States in order to compile the European statistics, international organizations (UN, UNESCO, FAO, ILO, OECD etc), businessmen, scientists, researchers and analysts, as well as citizens.

#### *Points of particular interest for the NSSG*

The National Statistical Service of Greece concentrates on and operates properly in order to:

- coordinate effectively all the statistical works,
- ensure the harmonization of statistics compiled in our country, through uniform methodology, concepts, definitions and classifications to be applied by all services and institutions,
- provide methodological support to services and institutions asking its assistance,
- set up and update databases and meta-databases,
- provide products of high quality.

The data gathered by NSSG are:

- Census Of Population 1991
- Censuses 2000-2001
- Demography
- Labour Market
- Indices
- National Accounts
- Trade & Services
- External Trade
- **Primary Sector**
  - Aquaculture and Fisheries
  - **Survey on the Structure of Agricultural - Livestock Holdings**
  - Distribution of the Country's Area into Basic Categories of La...
  - Agriculture and Livestock Census
  - **Agricultural Statistics**
  - Fishery Census



- Livestock Surveys
- **Annual Agricultural Survey**
- Input - Output Price Indexes in Agricultural and Livestock Production.
- Survey on Agricultural and Livestock Products
- Secondary Sector (Industry)
- Social Statistics

## 1.6 CMO implementation context in Greece

### 1.6.1 *Environmental actions of operational programmes*

The environmental actions that should be included in an operational programme are given in a separate question.

### 1.6.2 *Relationship between AEM measures and fruits orchards.*

No specific measures relating to fruits orchards have been proposed in the AEM catalogues. In some measures the contracts signed concern fruits orchards.

According to the existing data of AEM implementation and evaluation, the situation concerning AEM is as follows. The Agroenvironmental measures (AEM) have been implemented in two distinct phases in Greece.

During the first phase, 4 measures were implemented according to Reg.(EEC) No 2078/92 from July 1995 till 1999. According to this Regulation an aid is foreseen for farmers, who undertake the obligation to follow certain codes / rules of production, with positive environmental impacts. With a 5-years contract, farmers were obliged to follow a Farming Plan in compliance to the obligations of Regulation No 2092/91 and its amendments and be under the inspection of a Certifying Body. In Greece, these programmes were:

- Organic farming
- Long term set aside of agricultural land
- Protection of rare breeds of farm animals
- Reduction of nitrate leaching of agricultural origin at the plain of Thessaly

The most significant programme, this of organic farming was approved in year 1995 (EC Decision E(99)12 of 20-01-1999) with a budget forecast of 4.2 millions ECU covering an area of 6000 ha up to year 1997. Priority was given to holdings already under the inspection of Certifying Organisations (and most of them were geographically randomly distributed), holdings into NATURA 2000 candidate areas, holdings of lakesides, riversides and seaside areas, holdings of islands (with exception of plains on Crete and Evia islands) and finally mountainous and semi-mountainous areas with altitude more than 200 m. In case of no response and no uptake at the above-mentioned areas, the plains would be eligible from the beginning of 1997.

At the end of year 1998 a total of 1305 farmers and 6501.6 ha were contracted and the programme was amended in year 1991 having an extension of 14000 ha. At the end of year 1998, classified by crops, olives were representing the vast majority (58%) of the contracted UAA. The rest were wine vineyards (9%), cereals (9%), arboriculture (8%), citrus (6%), horticultures (5%) and raisins (4%).

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<sup>1</sup> EC Decision E(99)12 of 20-01-1999.

**Table 19 : Evolution of the AEM 2078/92 of Organic Farming in Greece (1995-1999)**

Year	No of new contracts	New Contracted Area (ha)	Total expenditure (GDR)
1995	332	2356.2	464 716 000
1996	326	1318.3	936 647 750
1997	586	2347.1	62 927 416
1998	61	4884.0	777 618 811
1999	N/A	N/A	N/A
<b>Total</b>	<b>1305</b>	<b>6501.6</b>	<b>2 241 909 977</b>

At the end of year 1999, organic farming covered hardly 0.12%, of the total cultivated area. That low implementation was probably due to the complexity of application of codes of organic farming, since many fungus mainly crops diseases were very difficult to be fight with methods and techniques that were suggested in the frame of the program application. As far as citrus fruits and fruit trees concerns, the cultivated areas included in the programme of organic farming were at year 1999, 1607409 and 102891 hectares respectively. These areas were 8.42% and 0.54% of the total cultivated areas under the programme of organic farming at the same period.

In the second phase, AEM have been launched in year 2001, according to SPDRD (Single Programming Document of Rural Development). All AEM of SPDRD are included in one sole Axis (Axis 3): Agri-environmental measures. Priority Axis 3 of SPDRD was approved with E(2000) 2733/27.9.2000 Decision of European Commission and includes AEM in compliance to Regulation No 1257/99 and its amendments, with an additional effort for complementarity and harmonization with other EU's legislative documents (e.g. Dir. 91/676/EEC, Dir. 92/43/EEC, Dir. 79/409/EEC).

Aim of "Priority Axis 3: Agri-environmental measures of RDR", is the support of the farming production methods intended to the protection of the environment and the conservation of natural land. Axis 3 includes 13 measures:

- M 3.1 Organic farming
- M 3.2 Organic livestock farming
- M 3.4 Livestock farming extensification
- M 3.3 Long-term set aside
- M.3.7 Programme for endangered local livestock breeds
- M 3.8 Conservation of extensive crops (local varieties) under threat of genetic erosion
- M 3.12 Conservation and restoration of terrasses for soil erosion protection
- M 3.5 Reduction of Nitrate Pollution
- M 3.6 Environmental Protection of Lake Pamvotis
- M 3.9 Management Programme for the Lakes and Lagoons of Thrace
- M 3.10 Management Programme for the lakeside areas of Lakes Volvi and Koronia
- M 3.11 Conservation and Restoration of Hedgerows
- M 3.13 Conservation of agricultural lands for the protection of wild fauna species

Up to the end of year 2003, only 5 measures have begun to be implemented, named:

- Organic farming.
- Programme for endangered local livestock breeds
- Organic livestock farming.
- Long-term set aside
- Reduction of Nitrate Pollution

### **1.6.3 Good Farming practices.**

Concerning Good Farming Practices a Joint Ministerial Decision No 125347/568/20.1.2004 with subject: "Codes of Good Farming Practice" exists. This Ministerial Decision concerns all the cultivations and the codes are not dedicated specifically to fruits and vegetables. Under Joint Ministerial Decision No 125347/568/20.1.2004, the application of codes of good farming practices as they approved by No (2003)3139/22.8.2003 European Commission Decision which amends the SPD RD 2000 – 2006, is obligatory, from the beginning of year 2004. Codes of Good Farming Practices aim to the confrontation of the problems caused by agricultural activities.

These practices aim to:

- sustainable development of farming soils and natural
- protection and maintenance of agricultural landscape and its characteristics
- protection of growers and consumers health

Codes of Good Farming Practices intervene in all the phases of agricultural and cattle breeding activities, as well as in specific cases of areas or zones under special protection regimes.

They are dealing with issues like:

- Inputs management
- Soil treatment
- Crop rotation
- Fertilization
- Water resources protection
- Irrigation systems
- Crop protection
- Self-sown flora management
- Farming waste management
- Waste management

### **1.6.4 Recognition criteria of producers organisations**

As far as the recognition criteria for producers organizations of fruits and vegetables concerns a number of Ministerial Decisions have been entered in force named:

- Ministerial Decision no 328716/04-07-1997 on the subject "Determination of minimal national criteria for recognition and pre recognition of Producers Organisation of fruits and vegetables" (as it was modified).
- Ministerial Decision No 389877 of 04/09/2001 on the subject "Modification of decision No 328716/97 concerning the determination of minimal national criteria for recognition and pre - recognition of Producers Organisations of Fruits and Vegetables ".
- Ministerial Decision No 282711 of 22/12/2003 with the subject "Determination of minimal National criteria for recognition and pre recognition of Producers Organisations of Fruits and Vegetables"

The Ministerial Decision No 282711 of 22/12/2003 is in force now, and the previous related Decisions have been suppressed. According to this Decision:

- For the recognition of Producers Organisations of fruits and vegetables of organic farming (categories up to VII) the minimal national criteria are determined for all the country, which are minimal number of producers 7 members and minimal value of marketable production of 0.1 millions Euros.
- For special cases of specialised, dynamic and viable Producers Organisations with vertical production or integrated business form that were recognized according to article 11 paragr. 3 of Regulation No 2200/96, the minimal criteria of recognition are determined in 150 members and 1.5 millions EUROS.
- For the pre recognition of Producers Organisations of fruits and vegetables the minimal sizes that are reported in the above annexes are decreased in the half.

## 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]

##### Implementation

The categories of fruits that are examined are the following:

- A. citrus fruits,
- B. apples,
- C. pears, and
- D. peaches

It should be mentioned that for years 2002 and 2003, there are no available data regarding the growth of areas of fruits cultivation, according to the National Statistical Service of Greece. In addition, no specific data are recorded concerning nectarines. They are recorded together with peaches.

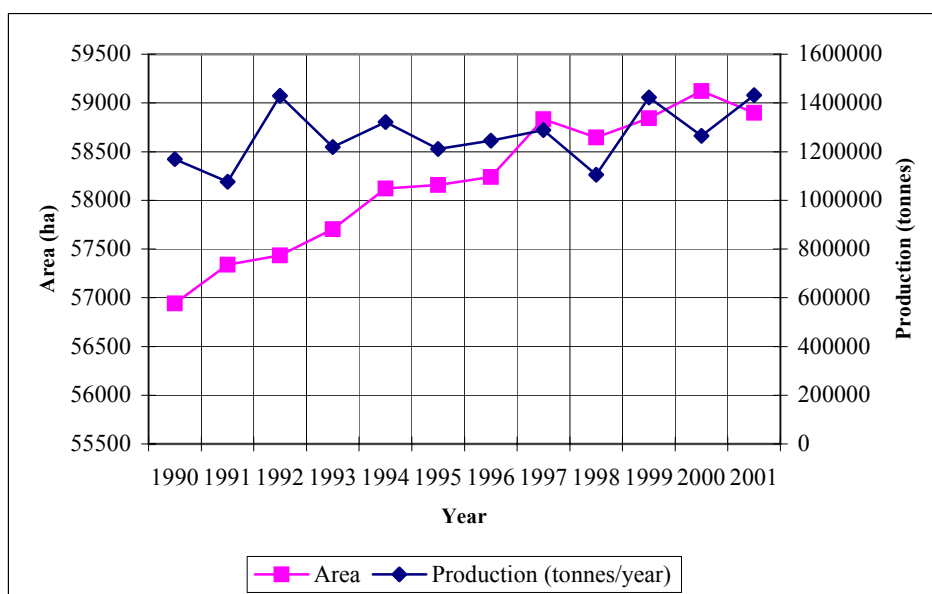
##### Growth of surfaces orchards

From the analysis of the above data, given in Chapter 1, it can be concluded that intensifying is observed in the following two fruit cultivations:

- Peaches, and
- Pears.

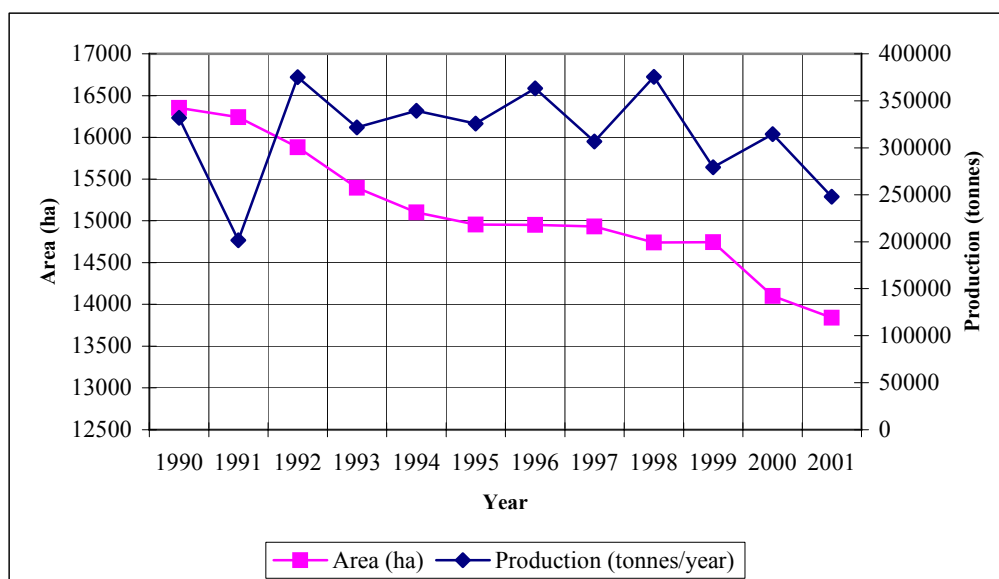
Specifically, the growth of both area and production of citrus fruits is given in Chart 20, where it can be shown that no remarkable intensification occurred, since the cultivated areas increased in a higher percentage than the production.

**Chart 20 : Evolution of area and production of citrus trees, in period 1990 - 2001**



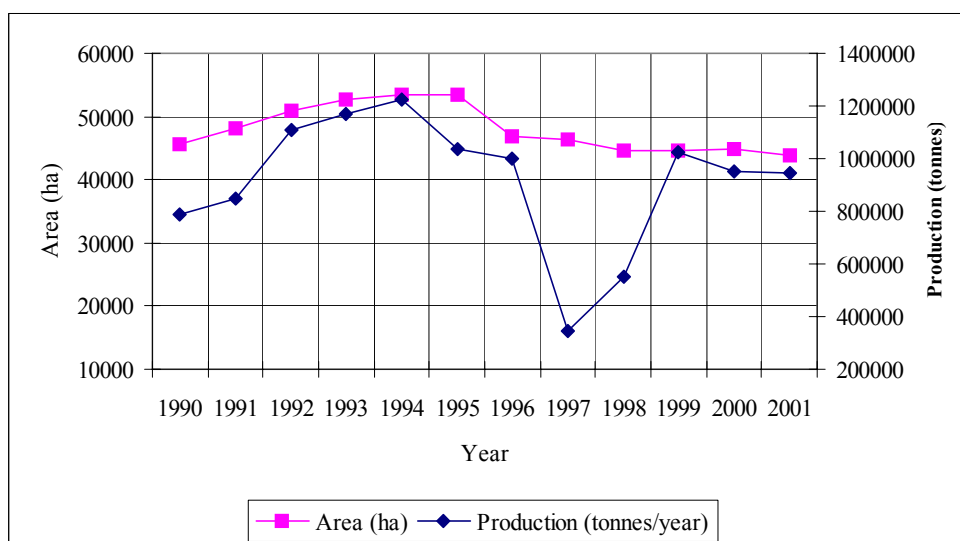
Source: Ministry of Agricultural Development and Food

The growth of area and production of cultivated apple trees is presented in Chart 21.

**Chart 21 : Evolution of area and production of apple trees, in period 1990 - 2001**

Source: Ministry of Agricultural Development and Food

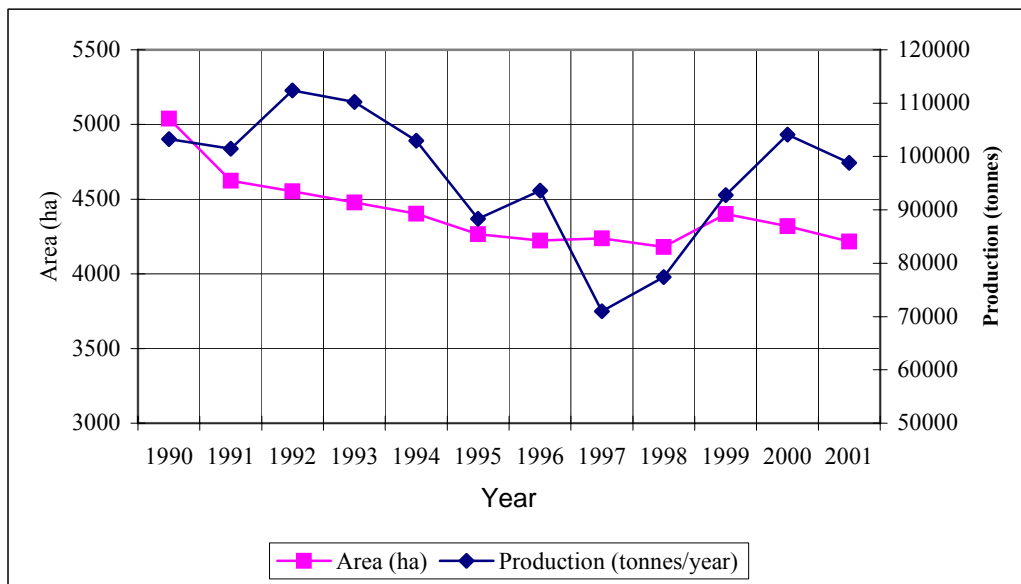
A reduction of apple trees production is noticed, which proportionally is higher than the reduction of the cultivating areas, not resulting therefore in intensification. The peaches cultivation is characterized as intensified, since despite the reduction of cultivated areas, both the production and the efficiency were increased (Chart 22).

**Chart 22 : Evolution of area and production of peach trees, in period 1990 - 2001**

Source: Ministry of Agricultural Development and Food

The efficiency of peaches production presented an increase of 4.32 ton/ha, between the first and the last year of the evaluation period, although a significant production fall occurred in period 1997 – 1998.

The same trend of growth is noticed regarding the cultivation of pear-trees with lower however increase of efficiency, which is for the period under examination 2.93 ton/ha.

**Chart 23 : Evolution of area and production of pear trees, in period 1990 - 2001**

Source: Ministry of Agricultural Development and Food

#### Yields growth

Regarding the yield of fruits cultivations, according to the data presented in Part 1, it has been increased for citrus fruits, pears and peaches.

More specifically:

- the yield of citrus fruits was increased from 20.53 ton/ha that was in 1990 to 24.32 ton/ha in year 2001 (Chart 3, Table 3), presenting fluctuations between the first and last year of evaluation period.
- The yield of apple orchards decreased from 20.30 ton/ha that was in year 1990, to 17.90 ton/ha, in year 2001 (Chart 3, Table 3), presenting also fluctuations between the first and last year.
- The pear trees yield increased from 20.50 ton/ha that was in year 1990, to 23.43 ton/ha in year 2001 (Chart 3, Table 3).
- With regard to peach trees yield, despite the reduction of cultivated area, it presented an increase from 17.21 ton/ha that was in year 1990 to 21.53 ton/ha in year 2001 (Chart 3, Table 3).
- As far as nuts concerns, the yield of almonds orchards presented an increase from 1.82 ton/ha that was in year 1990 to 2.59 ton/ha in year 2001 (Chart 3, Table 3).
- The yield of walnuts orchards decreased from 3.09 ton/ha that was in year 1990 to 2.88 ton/ha in 2001 (Chart 3, Table 3).

#### Withdrawals

Regarding withdrawals, it should be noticed that the withdrawals of the examined products have decreased considerably last years both in European Union and in Greece. Specifically, in Greece in 2003 we had withdrawals for apples, pears, oranges, lemons and mandarins (from citrus fruits) and peaches and nectarines.

In other words, only 68 tons of pears were withdrawn in year 2003, a ratio of hardly 0.12% of total production of pears at the same year. In regard to peaches, 5551 tons were withdrawn in year 2002, equal to 0.75% of their total production in the same year, while no withdrawal of peaches took place in year 2003. As far as apples concerns, 2981 tons of apples equal to a ratio of 1.50% of their total production in year 2003, were withdrawn in the same year. Finally, the quantity of citrus fruits that was withdrawn from the market in year 2003 was 2794 tons, which is equal to 0.24% of their total production. This quantity concerned only oranges, as it was mentioned already above. The last withdrawals for mandarins took place in year 1999 and for lemons in year 1997.

According to the Ministry of Agricultural Development and Food, the withdrawals of citrus fruits, which amounted in 80,000-110,000 tons, in the past today is under 5,000 tons (2794 tons in year 2003). Withdrawals of peaches also, which exceeded the 600,000 tons several times in the past, today are ver low.

***Environmental impacts of Common Market Organisation (CMO): Operational Means - Funds and Withdrawals***

***Growth of irrigation water demand***

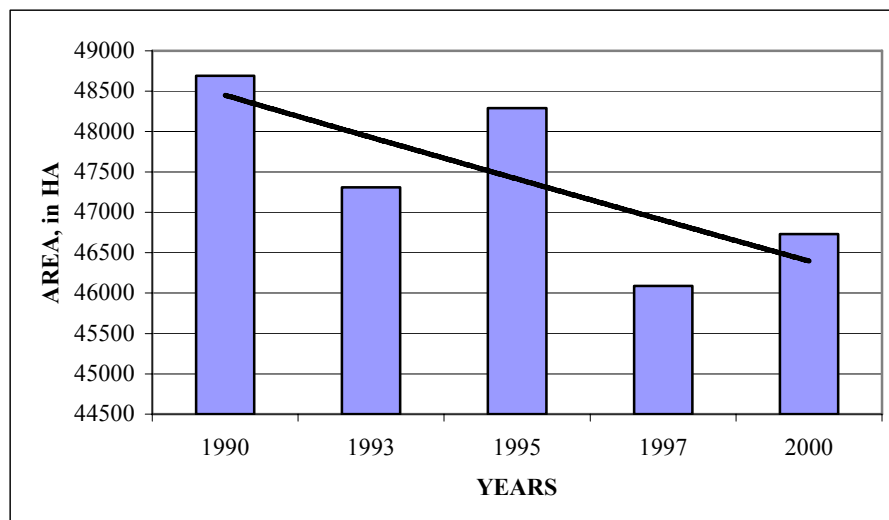
Fruits growing intensification had of course certain impacts to the environment, which however cannot be measured and be quantified, because no recorded data exist concerning the use of agrochemicals (fertilizers, pesticides) specifically for these crops, as well as data regarding the evolution of irrigated areas of these specific cultivations.

Data concerning irrigation water consumptions, are given per municipality and not by holding or cultivation, by the NSSG. No specific connection between geographic region, type of irrigation and type of crop can be drawn and in most regions of Greece and for most crops, all types of irrigation systems are used. Both groundwater and surface water sources are used mainly for irrigation purposes and, in some cases, a small proportion of water is drawn from springs. For all crop types and geographic regions, the predominant system of irrigation is the one of “support” irrigation, lasting from late spring to early sutumn.

There are some reports concerning water management problems connected to irrigation in certain areas / regions of Greece, such as Crete (Aggelakis et al., No 2) and Argolis area (in Peloponnese). In both areas, fruits are cultivated, with the predominance of citrus fruits, mainly in Argolis. Water quality problems as well as extended irrigation are met in Central Macedonia, where the biggest production of peaches and nectarines is met.

IRENA report gives water use (intensity) trends in irrigable area and trends in total area irrigated at least once a year (actual area irrigated). Information is provided for the ten most important crops irrigated, amongst them fruit and berries, and citrus fruits. IRENA report data for citrus cultivated areas that are irrigated at least once a year show a reduction over the period under examination.

**Chart 24 : Areas irrigated at least once a year (citrus fruits cultivation), in period 1990 – 2000, (ha)**

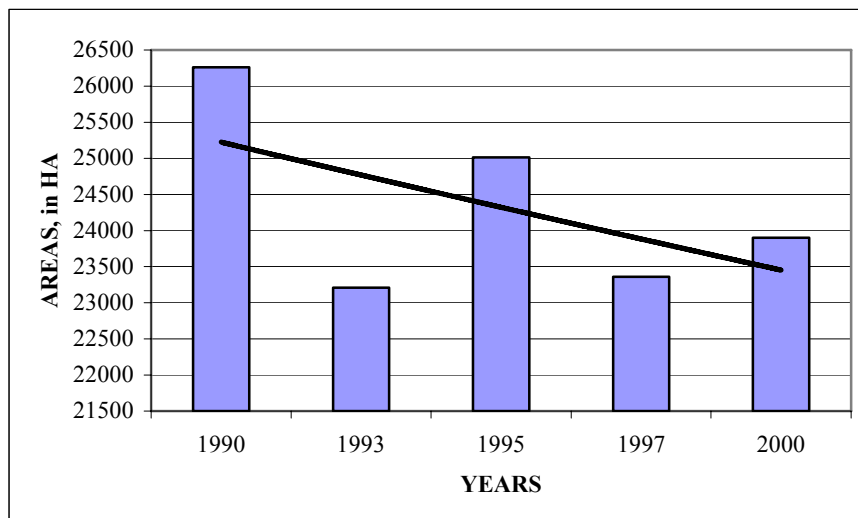


Source: IRENA Report

At the same time the total farming areas irrigated at least once a year increased at about 24.4%. The same situation is appeared also in Peloponnese, where the most citrus fruits areas irrigated at least

once per year exist (about 50% of the total citrus fruits areas in Greece). The citrus cultivated areas in Peloponnese, which are irrigated at least once a year, present a reduction over the evaluation period.

**Chart 25 : Areas irrigated at least once a year in Peloponnese (citrus fruits cultivation), in period 1990 – 2000, (ha)**

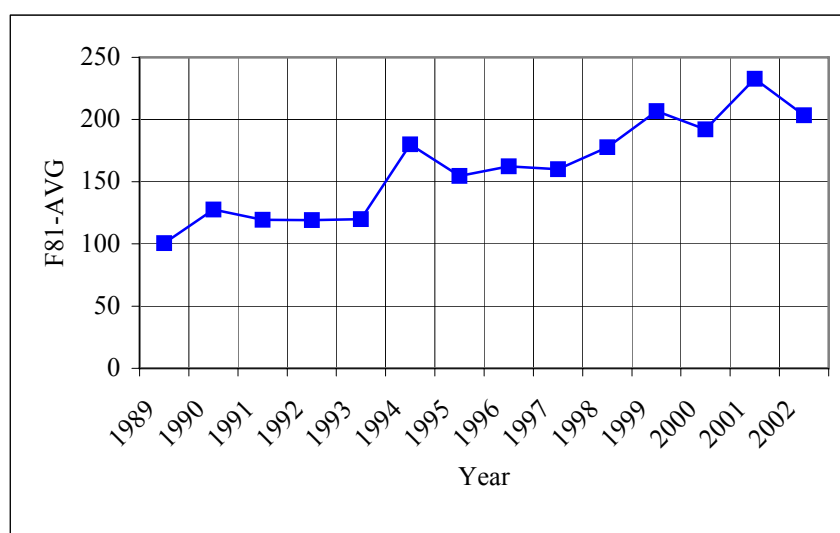


Source: IRENA Report

At the same time the total irrigable area (in national level) presented an increase of about 16%. This trend increase cannot be connected to fruits irrigation.

Furthermore, according to FADN data, the water consumption cost for specialist fruit and citrus fruit irrigation increased more than 100% over the period from 1989 to 2002.

**Chart 26 : Evolution of water consumption cost for specialist fruit and citrus fruit**

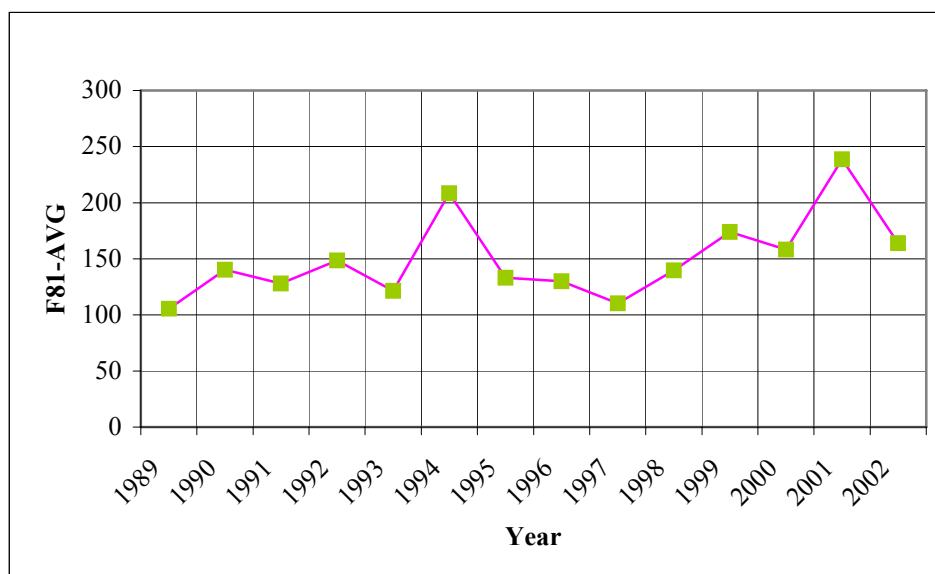


Source: FADN

The same data for Peloponnese present also a remarkable increase (50%) in water consumption cost for specialist fruit and citrus fruit, which may mean that irrigation for fruits and citrus fruits has a lower increase in Peloponnese than in the whole country. From the above data, no certain conclusion can be extracted.



**Chart 27 : Evolution water consumption cost for specialist fruit and citrus fruit, in Peloponnese, Ipiros, Ionian Islands**



Source: FADN

#### Irrigation water quality

Studies concerning the water quality in Peloponnese show that the salinity status of the soil is correlated with that of the groundwater used in irrigation; most of the salt is found to be leached through the soil profile and to move towards the groundwater; and sea water intrusion in conjunction with the leaching process tends to establish a vicious circle of soil and groundwater degradation, leading to desertification, if untreated (Poulovassilis et al, 1996, No 1). Other studies in Greece have indicated that salinisation due to irrigation with brackish water is higher for tree crops (citrus) than for annual horticultural crops, because the former use water for a much longer season (May to October).

In Greece, sea water intrusion into the aquifers due to over-pumping is occurring with varying intensity in almost all the valleys neighbouring the sea of both the mainland and the islands where irrigated agriculture based on groundwater has been introduced. However, the phenomenon has been studied rather systematically only in the case of Argolida in the northeastern part of the Peloponnese (Poulovassilis, 1998). The study, which has been conducted covers the main Argolida plain, the valley of Assini-Drepanon, located eastwards of the main plain, and the Iria valley, located further eastwards. The predominant cultivations are that of citrus fruits.

Irrigated agriculture exercised in Argolida, has been mostly based on groundwater. Its expansion resulted in an over-exploitation of Argolida groundwater resources followed by sea water intrusion into its aquifers. There is not accurate information concerning the expansion of the irrigated agriculture in the region. Sea water intrusion into the aquifers was first recorded during the early 1960s, when groundwater as it was pumped from some wells showed an increase of concentration in chlorides, while signs of chloride toxicity, such as leaf burns and defoliations, particularly in citrus trees, were observed.

The research programme was initiated during 1963, and lasted for four years. Thus, valuable information about the water and soil resources of the region were collected which could help in forming a plan for their rational use for a sustainable agriculture. Unfortunately the research programme came to a halt during 1967. Research efforts re-started after 1985 in the frame of a new research project funded by the Ministry of Agriculture and later by the EU and conducted under the responsibility of the staff of the Laboratory of Agricultural Hydraulics of the Agricultural University of Athens, in collaboration with the staff of the local unit of the Ministry of Agriculture. In the frame of these projects artificial recharge re-started during 1990.

In Argolida plain where the overdraft continued to increase through the years, the advance of the salinisation front obliged the farmers to abandon their affected wells and to open new ones farther away from the coast or to buy irrigation water from their northern neighbours. In this way, the pumping fields moved gradually inland towards the central and northern part of the plain. This inland movement moderated, perhaps, the salinisation process, but, of course, did not prevent the descent of the piezometric surfaces and water tables in the central and northern part of the plain. This fall obliged the farmers to deepen their boreholes or drill new ones penetrating deeper layers, so that in many cases they had to pump water from a depth of 200 metres. There was a progress in salinisation of groundwater over the period 1963-90 and, further, a dramatic fall of the piezometric surfaces that, in some cases, was of the order of 100 metres, so that many boreholes were dried up. The serious shortage of water observed during the late 1980s.

In the case of Assini-Drepano valley, in Argolida area, the deterioration of groundwater quality has been more or less checked mainly because artificial recharge of its aquifer with Kefalari water has been continued, with some interruptions, from 1964 onwards. A substantial improvement of the groundwater quality has been attained from 1962 to 1993 which allowed even the sensitive to chloride plants such as citrus to have a satisfactory productivity.

In Iria valley of Argolida area, the quality of both soils and groundwater continued to deteriorate through the years. In this case water could not be transported from the Argolida plain to be used either for irrigation or artificial recharge in Iria valley due to the large distances involved, so that the only source for irrigation water was groundwater. In 1993, the chloride content of groundwater and in general its salt content was so high that it could not be used for irrigation. However, groundwater has been used for irrigation through the years so that the citrus plantations of the valley have been exterminated.

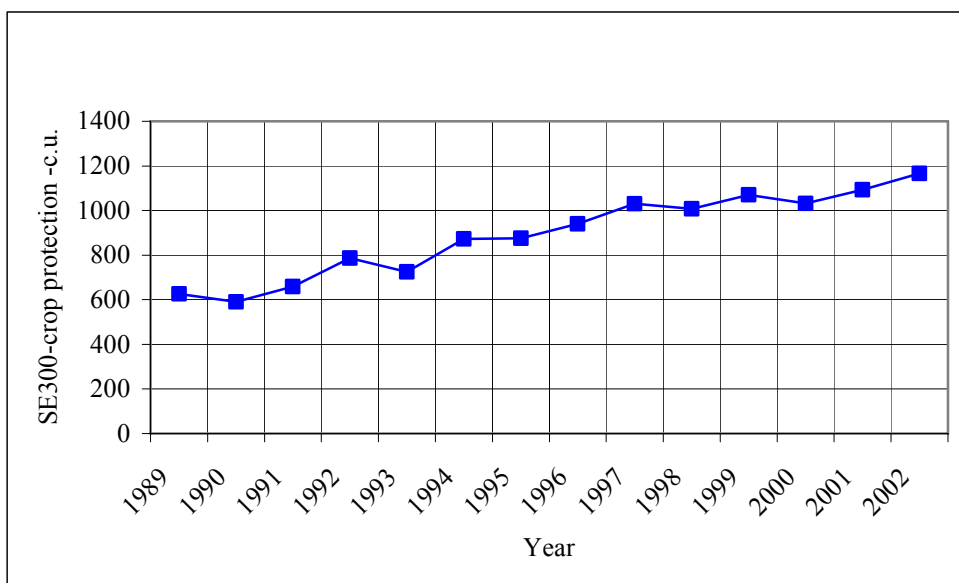
#### Growth of use of Fertilisers -Pesticides

As far as fertilisers consumption concerns, according to IRENA project it is difficult to link some decreasing usage trend directly with environmental impacts, because the final effect on the environment depends also on other factors. The total fertiliser consumption in Greece presented an increasing trend from 1961 to 1990 and then a decreasing trend from 1990 until 2001. Unfortunately, no data are available connecting the use of fertilisers to fruits cultivation.

IRENA indicators report refers to estimated pesticide application rates (kg a.i./ha) in Greece higher than the EU average. Currently, existing data does not allow an assessment of the potential increase in environmental risk associated with higher pesticide sales or use volumes. This is partly due to the lack of knowledge on the spatial, seasonal and crop application patterns of pesticides by farmers, and partly due to the changing nature of plant protection products in terms of active ingredients (toxicity), application behaviour and decomposition patterns (persistence).

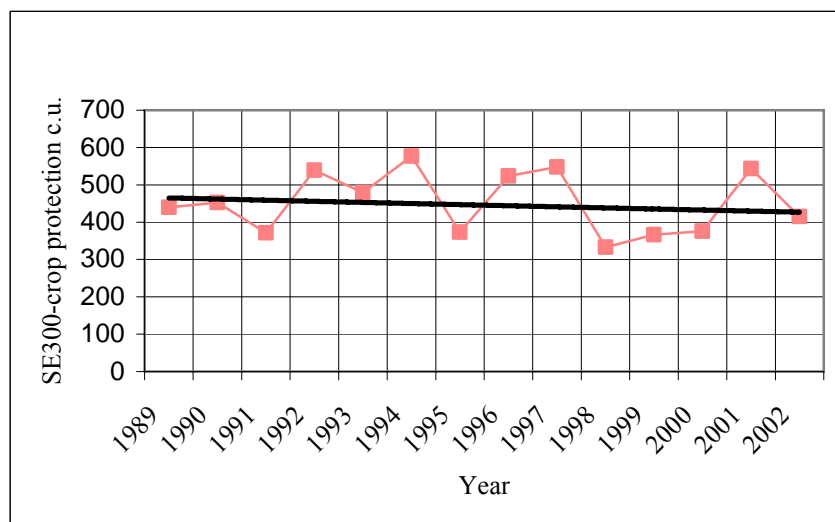
No specific data are available for pesticides use in fruits cultivation, in Greece. According to FADN data a significant increase of crop protection products cost (almost doubled) can be noticed, which is lower compared to the similar costs for vineyards and higher than the same cost for olives.

The lack of specific data concerning both fertilisers and pesticides consumption in Greece should be emphasized.

**Chart 28 : Evolution of crop protection cost of specialist fruit and citrus fruit**

Source: FADN Data

The same data of FADN for Peloponnese (Ipiros and Ionian Islands) present a light decrease in the crop protection cost of specialist fruit and citrus fruit (fruit cultivation predominant in Peloponnese). This may lead to assumptions, that maybe the increase of crop protection products cost in national level is connected to the related increase in other areas, possibly Central Macedonia, where we have the highest production of peaches and nectarines.

**Chart 29 : Evolution of crop protection cost of specialist fruits and citrus fruit, in Peloponnese, Ipiros and Ionian Islands**

Source: FADN

### ***Environmental impacts of Withdrawals***

The percentage of Producers Organisations that implemented operational programmes in year 2002 was 52% of their total number (65 out of 125 that are activated in Greece). This means that these Producers Organisations were obliged to apply basic rules and codes of environmental protection in order to be financed. Moreover, Producers Organisations are obliged to apply the requirements of the National Regulating Frame for the environment, which has been established in the Hellenic legal framework. The National Regulating Frame for the environment is analyzed below. The combination of these two factors minimises the negative impacts to the environment. This does not mean that a satisfactory level of protection of environment has been achieved, since the Producers

Organisations handle, as was reported above, a low ratio only (lower than 20%) of both the total production and the economic value of this production.

Besides, the reduction of withdrawals of examined products has also positive effect in the environment, since the withdrawn products are not be buried anymore but they are usually forwarded to the process industry, decreasing considerably the environmental charge.

Finally, it should be noticed that the legal frame for the biological decomposition and composting of withdrawn products has been already established, while the National Regulating Frame for withdrawals is under development.

This legal frame is described in the answer of Question 1(F2). At this point, it is interesting to mention that the prerequisites for the sites of decomposition and composting are given in these legislative elements and not specific environmental friendly regulations concerning withdrawals.

### CASE STUDY RESULTS

All the above are supported by the information gathered from the interviews carried out to citrus fruits producers of Argolida Prefecture. According to them, the majority of producers belong in the two Producers Organisations of the area, that they usually have the same synthesis as the local agricultural cooperatives and their associations. There are, also, individual producers, who trade the quantities of citrus fruits that are intended for processing via the Producers Organisations. The necessity for integration of growers - producers in Producers Organisations derived from the application of the new Common Market Organisation (CMO) of fruits, which is in force since 1996. Most of the producers were members of the preexisting Local Agricultural Cooperatives The Association of Agricultural Cooperatives created the related Producers Organisation, which has around 5500 members and is fully recognized from year 2001. The second one PO in the sector of fruits is KASO of Argolida (CACF) with about 2000 members and recognized from year 1998.

Two growers installed drop irrigation system for better water management (in the last 5 years). All the producers decreased the quantity of fertilisers and pesticides / herbicides used as a result of the continuously increasing acknowledgment of the bad impacts of these products to the human health and environment as well as of their increased prices. The reduction of fertilisers and pesticides use is recorded after year 1990 and is decreased today to about one third of year 1990 value.

Two growers out of twenty interviewed producers have increased their cultivated area the last decade. The two producers bought the new areas, because the areas were property of relatives, were neighbouring their farms and they were under sale. The producers did not want to have new neighbours. They did not involve any change in the farming practices that he used to apply.

The replacement of certain varieties with other that are not necessarily more productive, but produce bigger size of fruits, and oranges for a larger period of the year. The size of fruit constitutes decisive criterion of tradability and the adoption of organic farming. The trend is the replacement of Merlin orange variety to Newhole and navel orange varieties and to clementines mandarins.

None of the producers connects the above changes with the CMO subsidies. They seek to secure products of a better quality, marketed in a larger period during the year and produced with lower cost. The adoption of organic farming (by 4 producers) is not connected with the CMO granting.

As a consequence of the above conditions, the production of citrus fruits is maintained almost at the same levels that it was before the application of new CMO of fruits (view that is in accordance with the existing data from NSSG). The growers express their opinion, that Regulation 2200/1996 did not result to any significant intensification of citrus fruits cultivation.

In regard to the concentration of production at the Producers Organisations, on one hand (according to one grower) it is considered to be positive, since with this way both the tradability of products and the achievement of better prices are ensured.. On the other hand, however, this leads to the cultivation of certain varieties (mainly orange), that is monocultivation, as well as to the application of homogeneous farming practices aiming at the production of certain products. Thirteen interviewed growers answered that the importance of grouping the offer within the PO in these changes is little.

The grouping of citrus offer in Argolida prefecture is a major and desired trend in the area (17 out of 20 growers) which is well accepted because by this way a significant part of the production is assured that it will be marketed for standardisation in good prices. In addition, the subsidy for citrus processing is a very well accepted measure as an alternative market way out for the products which can not be promoted to the market.

Another important thing is, that not many parcels has been checked for remains of pesticides, non the less, in all parcels soil analysis in regular time intervals (usually 2-5 years) takes place and in some of them foliar diagnosis is also applied. Eight of the twenty interviewers said that parts of all their farms have been checked for remains of pesticides.

Besides, all respondents pointed out the problems they face concerning the quality of irrigation water. Concretely, the water that is used for irrigation in the entire region of Argolida has a very high content in nitrates, as it was analyzed above, which in many cases reaches the 350 ppm. Moreover, very often, the water of drillings is brackish. These problems are not owed to the intensive cultivation of citrus fruits as a result of the CMO, but to the overpumping as there were uncontrolled drillings years ago. As a result, the producers are obliged to drill very deeply (sometimes until 450 m) so that they find good quality of water. At this point it should be stressed that the irrigation system that prevails is sprinkler irrigation. Only a producer is excepted, who applies drip irrigation.

***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 organizations of producers and their operational funds]***

*Transfer of price support from fruit processors to producers*

According to Council Regulation (CE) No 2201/1996 of 28 October 1996 for the common market organisation in the sector of processed fruits and vegetables, the aid scheme is applied in the production of certain products according to Annex I of the regulation. This aid in the production is granted to the fruit processor that paid it to the fruits growers, to buy raw material, at prices at least equal with the minimal price that has been agreed between the Producers Organisations and fruit processors through their contracts.

The aid scheme is differentiated for certain citrus fruits according to this Regulation. Particularly, according to this regulation an aid scheme is established for Producers Organisations that supply the processors with certain citrus fruits. This aid scheme covers:

- a. lemons, pomelos, grape - fruits, oranges, mandarins and clementines that are processed to juice, and
- b. Clementines and satsoumas that are processed to segments.

This aid scheme is based on contracts between Producers Organisations and Processors. The contracts are concluded before a fixed date and they can be short term or long-term contracts. Concerning the case study results, according to respondents, these contracts are usually triennial and in certain cases annual. The price that the Producers Organisations and at extension the producers receive as subsidy for the raw material addressed to juice processing oscillates the last years by 0,11€/ Kgr.

Consequently, it is concluded from the above, that only in the case of citrus fruits the aid has been transferred from the processors to the producers organisations and consequently to the producers (members of producers organisations).

#### Citrus fruits delivered for processing

It should be noted that the efficiency of citrus fruits, as it was also reported in Chapter 1, was increased in Greece from 20.53 ton/ha in year 1990 to 24.53 ton/ha in year 2001 (Chart 3). This was a result deriving from both the increase of cultivated areas of citrus fruits (Chart 2) and the increase of production (Chart 2).

The transfer of aid from processors to the producers might constitute a motive for further development and intensification of citrus fruits cultivation. From the other hand, this transfer has as result the obligation of producers to follow the Codes of Good Farming Practices. The impacts however cannot be measured and quantified, since the existing recorded data were referred only to the quantities of products that were delivered for processing afterwards the change of aid scheme. In particular, the quantities of citrus fruits that were delivered for processing were decreased during the period 1997-2003 (Table 8). More specifically, the quantity of citrus fruits to processing was decreased from 328710 tons in year 1997 to 257742 tons in year 2003. The ratio of these quantities to the total harvest of citrus fruits ranged between 25.49% in 1997 to 21.81% in 2003.

#### CASE STUDY RESULTS

All the interviewed producers grew citrus fruits before the transfer of support prices from the processors to the growers.

This change (financial support from the processors to the growers) did not involve any change either to the produced quantity or to the farming techniques that the producers of citrus fruits apply. Some producers have changed the cultivated varieties in order to achieve a better market share (more extensive harvest period, better quality and appearance, better prices).

This change did not involve any change either to the produced quantity or to the farming techniques that the producers of citrus fruits apply. Consequently, the change of aid scheme did not result to the additional deterioration of the environment.

Moreover, the European Union determined processing thresholds for citrus fruits, in order to avoid the processing of citrus fruits to be the basic output of citrus fruits in the market and affect the quality of consumable fresh fruits. These thresholds are :

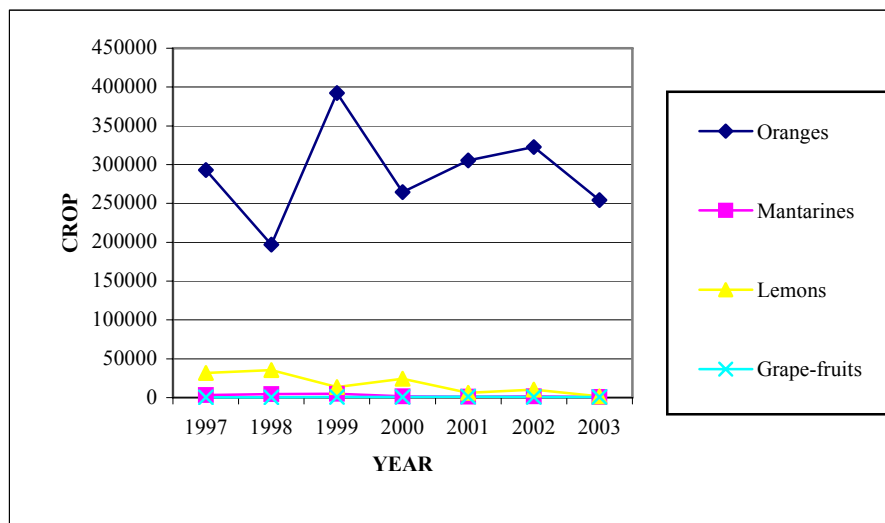
- For lemons: 510600 tons,
- For oranges: 1500236 tons, and
- For mandarines, Clementines and satsoumas: 384000 tons.

When an excess of these thresholds is ascertained the aid that is determined for the period required, is decreased depending on the percentage of excess.

Additionally, the quantities of citrus fruits that are delivered for processing depend on the number of contracts concluded for a delivery period and the quantities of raw material to be delivered that these contracts include, which is agreed and committed between the producers and the processors. Concerning the results of the case study, as, it can be concluded from the questionnaires, in general, roughly 20% of orange production is led for processing and concretely for juice production.

#### Processed fruits production

Finally, another very important factor that affects the quantity of processed citrus fruits is the climatic conditions and mainly the atmospheric rainfall (hail, snow, etc), which vary a lot from year to year. The processed fruits production is given in the following Chart 30 and Table 20.

**Chart 30: Evolution of Citrus fruits to be processed**

Source: Ministry of Agricultural Development and Food and NSSG

**Table 20 : Evolution of the processed citrus fruits production (raw material in tonnes), in period 1997 - 2003**

Crops	YEARS						
	1997	1998	1999	2000	2001	2002	2003
<b>Oranges</b>	292 836	196 947	392 342	264 764	305 526	322 716	254 441
<b>Mantarines</b>	3 396	4 456	5 038	1 710	1 263	1 443	985
<b>Lemons</b>	31 896	35 374	13 690	24 192	6 283	10 127	1 695
<b>Grape-fruits</b>	582	597	991	793	1 038	1 017	621
<b>Total</b>	<b>328 710</b>	<b>237 374</b>	<b>412 061</b>	<b>291.459</b>	<b>314 110</b>	<b>335 303</b>	<b>257 742</b>
<b>Production of Citrus Trees</b>	1 289 313	1 104 222	1 422 047	1 265 264	1 432 504	1 435 295	1 181 914
<b>% of processed citrus fruits in total production</b>	25.49%	21.50%	28.98%	23.04%	21.93%	23.36%	21.81%

Source: Ministry of Agricultural Development and Food and NSSG

***Environmental impacts of transfer of price support***

With regard to the environmental impacts from the transfer of prices support from the processors to the producers, they are considered as positive (according to authorities), because after this change the producer is obliged to apply the codes of good agricultural practice, to control remains of pesticides, heavy metals, nitrates etc. Even if it is not possible to calculate precisely the positive effects of the above measures, it is certain that the accompanying positive measures are applied by the producers mainly because the transfer of the price (direct aid to the producer and direct risk of its loss).

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

***Market standards***

Fruits and vegetables, which are intended to be delivered fresh to the consumption, are classified according to a system of standards that takes into consideration the standards of Economic Committee for Europe of UN. The respect of these standards is obligatory for the handling of products in all the stages of marketing, with the following exceptions:

- The Member States may exclude this commitment / conformity to the standards for the products that are sold by the producers in places of bulk sale in the region of production or that are channelled from the places of bulk sale to packaging stations or storage areas of the same region.
- Also, the products that are channelled by the producer to packaging stations or storage areas, inside the region of production, are not compelled to conform to the standards.
- Finally, products that are channelled to process industry, products that are sold to the final consumer in the same region of agricultural holdings, as well as products of a region that are sold to the traditional local consumption, are all excluded from the obligation of these standards application.

The appropriate evidence should be given for the above exceptions, mainly evidence concerning the destination of the products.

***CASE STUDY RESULTS***

In this point it should be stressed that most citrus fruits producers have not changed, as it was aforementioned, their farming techniques. With exception, the replacement of certain varieties with other, which are not necessarily more productive, but produce bigger size of fruits, since the size of fruit constitutes decisive criterion of tradability. The fruits, which do not fulfil this criterion and the rest of quality criteria, are led for processing. Generally, as it results from the questionnaires, about 20% of citrus fruits production (mainly orange) is led for processing and concretely for juice production.

The respect of standards is also obligatory for imported (from third countries) products. Of course, the same requirement stands for the exported products.

***Other standards (except CMO)***

The CMO market standards are stricter than any other requirement set by individuals such as supermarkets or consumers. Products directed to the market out of the frame of an OP may have lower criteria concerning the appearance of the crops, but usually the consumers ask for higher performance in terms of taste and preservation.

***Effects of market standards***

The requirements of market expressed through the quality standards, have directed the production to the cultivation of concrete fruit varieties, which are characterized by increased productivity, increased resistance in the various pathogenic organisms (fungus, bacteria, insects, viruses) and generally better adaptability in the microclimate of different areas of cultivation. Consequence of this situation is the reduction and the disappearance of varieties, mainly local (eg common mandarin), which despite their good sensory perception characteristics, do not meet other market requirements (eg the common mandarin has kernels while the market requires mandarins without kernels). This leads to a kind of genetic diversity shrinkage of various crop species.

***CASE STUDY RESULTS***

All the responders say that in a high percentage in general in Argolida, the marketed fruit production conforms to European standards. In Argolida, oranges are mainly cultivated and more specifically the varieties: Salustiana, Washington Navel or Merlin, Newhall and Navelina. The



most widespread is the Washington Navel variety. In any case, all the aforementioned orange varieties are characterized by the big size of their fruits, the lack of kernels and the early maturity of the production. The producers insist that the application of quality models resulted to the predominance of certain big fruits mainly varieties of citrus fruits (oranges).

According to the producers the standardisation had a moderate to big effect to the production of varieties that they produce. The predominance of few varieties (almost with the form of monoculture) results to the growth of concrete pathogenic organisms, which are developed and become more resistant to the various crop-protection products. Consequently, their confrontation requires repeated interventions and alternation of drastic crop protection substances. The environmental degradation due to the increased use of these substances is a significant impact of the above situation. Of course, if the application of different crop-protection products takes place, taking into consideration the entire essential measures, their environmental impacts are not so significant.

Unfortunately, there is no available specific data that would argue all the above, which are a consequence of usual farming practices.

### **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]?***

#### Legal framework for the environmental measures which are foreseen in Regulation 2200/1996

The Greek national legal framework for the environmental measures, which are foreseen in Regulation No 2200/1996, is as follows:

- Ministerial Decision No 100949/2478/9.10.2000 on the subject: “Codes of Good Farming Practice”.
- Ministerial Decision No 396122/9.10.2000 on the subject: “National Regulating Framework for the Environment “.
- Ministerial Decision No 21.5.2001 on the subject: “Amendment – Completion of National Regulating Framework of Environmental Actions (ERF) for the application of Regulation of (EC) No 2200/1996 “.
- Circular No 4 389819/8.8.2001 on the subject: “Details of application of EU Council Regulation No 2200/1996, regarding the Operational Programmes and Funds, as well as the financing aid in the frame of EU Regulation No 609/2001 afterwards the suppression of EU Regulation No 411/1997 “.
- Joint Ministerial Decision No 125347/568/20.1.2004 on the subject: “Codes of Good Farming Practice”.
- The details of application of Regulation No 2200/1996 regarding the producers Organisations and the operational programmes are established through the application of Circular No 4 (as already mentioned above).

As far as the operational programs of producers' organisations concerns, they should cover inter alia the following eligible actions:

- ☐ Special budget for:
  - Organic farming, integrated or experimental production, that is determined according to eligibility criteria of experimental actions, which are determined by the Ministry of Rural Development and Food.
  - Biological crop protection products, either for organic, or integrated or conventional farming.
  - Environmental measures, which include also the use of recyclable packaging.
  - Measures of quality improvement, which include the use of certified seeds for seeding and plants for planting.

The National Regulating Framework for the Environment and its amendment in year 2001, foresee actions for the protection of environment. The Producers Organisations are obliged to apply the

requirements of these actions. These actions foreseen in the National Regulating Framework for the Environment are the following:

***Environmental actions and relevant activities.***

1. Organic farming application.
2. Application of Environmental Management Systems
3. Application of Integrated Management (integrated production ICM).
4. Application of integrated treatment of enemies, illnesses and herbs of cultivations
5. Rational use and potentially reduction of agrochemical products (fertilizers, pesticides), for the protection of soil quality, water resources, biodiversity and landscape.
6. Rational management of land resources.
7. Rational management of water resources.
8. Actions for biodiversity maintenance and enhancement.
9. Treatment and management of waste and used packaging – materials.
10. Protection of environment and production of products free from undesired residuals of crop protection products. B. Analyses of soils, residuals in products and waste.
11. Monitoring of waste and water analyses.
12. Soil disinfection (insecticides).
13. Hedgerows restoration.
14. Recycling of nutritious solutions (sub layers)
15. Actions for the disposal of withdrawn products with technologies henceforth advanced from these foreseen in the National Regulating Framework for withdrawals.
16. Improvement of composting methods.
17. Genetic improvement of genetic resistance to diseases, experimental orchards (concerning the environment) after approval of Ministry of Rural Development and Foods.

The operational program of a Producers Organisation should include at least one from the above suggested environmental actions.

Both the Producers Organisations and the individual producers should follow the Codes of Good Farming Practice.

**CASE STUDY RESULTS**

The Codes of Good Farming Practice are unknown to five of the interviewed producers, as it results from the questionnaires. The three organic farmers know the Codes of Good Agricultural Practice very well, since for the AEM materialization it is essential not only to know the GFP but also to apply them..

In regard to the environmental obligations and actions, that are related both with the farming practices and with withdrawal methods of the products, which are included in the operational programs of Producers Organisations, 9 out of 20 producers declared ignorance of not only the content, but also of their existence. The producers that were aware of the existence of operational programs reported that the Operational Programmes include only the necessary environmental actions so that they can be subsidised.

The two producers' organisations of Argolida prepare their Operational Programmes for the period 2006 – 2010 which include environmental actions connected to better water management and some provisions for integrated production management.

**Legal framework for withdrawals**

The present national legal framework concerning withdrawals in Greece, is the following:

- Ministerial Decision No 346712/6.10.97 on the subject: “Procedures for the biological decomposition and composting of withdrawn agricultural products “
- Ministerial Decision No 362016/28.11.97 on the subject: “Amendment – Completion of decision No 346712/6.10.97 with regard to the processes for the biological decomposition and composting of withdrawn agricultural products”.
- Ministerial Decision No 215334/5.2.2003 on the subject: “Prerequisites, processes and determination of supporting documents on the actions of free distribution of withdrawn vegetables according to the requirements of Regulation No 2200/1996”.

The selection criteria of burial areas for withdrawn agricultural products are determined in the Ministerial Decision No 346712/6.10.97. Specifically, for an area selection as a place of withdrawn agricultural products disposal, the following general principles should be applied. The principles aim to the environmental protection and to the appropriateness of the selected area:

- Suitable geological and hydrogeological conditions.
- Sufficiency of soil material of suitable granulometry.
- Morphology of the region and conditions of leachates draining
- Possibilities of rainfall deviation and flood-preventing protection of space.
- Distance of water supply infrastructures / installations.
- Distance from surface waters.
- Estimated quantity of produced drainage, and their qualitative characteristics and way of collection and management.

More specifically, the selected area for withdrawals of agricultural products should meet the following specifications, to ensure the protection of environment:

- The ground slop should be 1-20%.
- The minimal distance from potable water wells should be 400 m. except the case where the area for withdrawals is upstream of the wells; therefore the distance should be increased. This restriction does not cover the case of organised water drillings for domestic water supply where the minimal distance should be determined after special hydrogeological study.
- The selected area should not be inside the basin of water sources flow, reservoirs, serving irrigation and domestic water supply requirements.
- The region should not be influenced from floods.
- The minimal distance between the bottom base of the area selected and the highest level of underground waters should be at least 1.5 m.

Generally speaking, the following area types are preferable as areas for withdrawal of agricultural products:

- Areas where the aquifers have poor quality of underground water (eg because of salinity or pollution by different reasons),
- Areas with small fluctuations in underground levels, as this limits the diffusion from the partially saturated zone towards the aquifer.
- Areas where other similar units already also exist.

It should be noticed that the withdrawn products are only disposed for composting units or for biological decomposition when they cannot be used by no other way among what is permitted for these products.

#### Presence/quality of the PO TORs for withdrawals

As far as the PO TORs for withdrawals concern, the following legislative issues are in force

- Ministerial Decision No 396122/9.10.2000 on the subject: “National Regulating Framework for the Environment”.
- Ministerial Decision No 21.5.2001 on the subject: “Amendment – Completion of National Regulating Framework of Environmental Actions (ERF) for the application of Regulation of (EC) 2200/1996”.

Producers Organisations set guidelines towards their members which are:

- Rules of production (concerning the seeds selection, agrochemicals use)
- Marketing rules
- Rules regarding withdrawals

The only recommendation for withdrawals concerns the way that withdrawals should be realized, so that the environment is protected.

Concluding, if the producers' organisations comply with all the above rules which are obligatory, an important reduction of negative environmental impacts of agricultural activity can be noticed. The increase of producers' organisations number can play a significant role to the direction of environmental protection, in a way that they will constitute the main source of fruits and vegetables production and disposal, respecting the environment. However, it should be noticed that often in

the past hygiene problems with the withdrawals places (especially peaches in Central Macedonia) have been reported.

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

#### National Regulating Framework for the environment

Regulation No 2200/1996 states that one of the four basic aims of Producers Organisations is the promotion of usage of cultivation practices, production techniques and environmentally sound waste-management practices in particular to protect the quality of water, soil and landscape and preserve and/or encourage biodiversity. Moreover, one of the recognition criteria of Producers Organisations is that the Producer Organisation should effectively enable its members to obtain technical assistance in using environmentally-sound cultivation practices.

In Greece particularly, the existing National Regulating Framework for the environment recommends to the Producers Organisations a number of promoted horizontal environmental actions, which contribute to the common confrontation of different environmental problems (pollution, biodiversity, landscape), either due to their integrated content (organic farming, etc.) or to their multiple usages (hedgerows, recycling of materials, etc.) Producers Organisations should obligatory include at least one environmental action in their operational programmes in order to ensure that their programmes will be approved and financed by the European Union. In case that the operational programme includes only one action, this action should correspond to the main environmental problem of geographic area, which covered by the Producers Organisation or have an integrated content (organic farming, integrated production management, integrated treatment, and environmental management systems). The operational programme should be accompanied by an Environmental Management Plan, aiming to prove the relation of the proposed environmental action with the environmental problems of the geographic area covered by the producers' organisation as well as the cohesion of environmental action with the whole operational program.

Environmentally friendly actions that should be included in the operational programmes of producers' organisations may be one of the following:

- ☐ Organic farming.
- ☐ Integrated production.
- ☐ Rational use and potential reduction of agrochemicals (fertilizers, pesticides).
- ☐ Rational management of water resources.
- ☐ Rational management of land resources.
- ☐ Action for the maintenance and promotion of biodiversity
- ☐ Protection of environment and production of products without undesirable residuals of agrochemicals

#### ❖ Organic farming

Regulation No 2092/91 determines the specifications of organic farming. The reliability of organic products in the markets is ensured through a system of their controls and certification, according to Regulation No 2091/91 and the related national legislation, which is the Joint Ministerial Decision 315705/7.3.95.

#### ❖ Integrated production

The specifications of integrated production are based on AGRO 2-1 and AGRO 2-2, standards, which analysed in next pages.

❖ Rational use and potential reduction of agrochemicals (fertilizers, pesticides).

Regulation No 2091/91 prescribes the restriction of fertilizers usage and the application of integrated crop protection against illnesses and herbs, avoiding the negative impacts to the environment and consumers health.

❖ Rational management of water resources.

It includes actions related to the quantitative and qualitative protection of underground and surface waters, mainly actions for the mitigation of exhaustion and salinity of water resources.

The reduction of irrigation water consumption is recommended through application of irrigation water losses reduction techniques, enrichment of aquifers and reduction of quantity and number of irrigation dosages.

❖ Rational management of land resources.

It includes actions related to land protection from soil erosion, control of soil compaction, rehabilitation of acidic and pathogenic soils, increase of organic substances of soil.

Actions like: less treatment of soil at contours, avoidance of use of heavy agricultural equipment, neutralisation of soil acidity, use of composts and organic fertilizers, green fertilizations and land set aside during autumn and winter, are recommended.

❖ Actions for the maintenance and promotion of biodiversity

Actions promoting the biodiversity and recommended to be applied by Producers Organisations are:

- ☐ Monitoring of existing conditions indicators. Determination of holdings areas characterized by a particular problem or a particular importance for the wild species.
- ☐ Actions for the avoidance of dwellings of wild fauna elimination of (eg nests of birds) and self-sown wooden plants (provided that they do not become herbs).
- ☐ Planning for the increase of dwellings and biodiversity (eg management of hedgerows and herbs, crops covering of multiannual cultivations, installation of new hedgerows).
- ☐ Maintenance of safety areas at the application of fertilizers and crop protection additives
- ☐ Multicultivation of different species of trees or horticultural instead monoculture.
- ☐ Maintenance of part of the holding area out of production (at preference at the perimeter of the area).
- ☐ Adoption of specific measures for the protection of local threatened species (e.g cultivation of cereals even in declining / decaying areas for the protection of bird species that are nested or are fed by them. Maintenance of part of the area without any application of crop-protection products that is toxic for the mammals and the birds especially during the season of their reproduction).

❖ Environmental Protection and production of products free of undesirable residuals of crop-protection products.

The crop-protection products should be used according to their specific guidance of use. Every producer is obliged to keep data about the type, the quantity and the dates of application of fertilizers and crop-protection products that are used in every cultivation type.

Unfortunately, there are no available data for the ratio of the budget of operational programs of producers' organisations that have been allocated for the implementation for the environmental actions with positive effects on the environment.

Finally, it should be noticed, that the integrated production is characterized by high development in Greece, as can be concluded from the data mentioned in question 1(F5). Integrated production is the usual cultivation practice either by the members – producers of producers organisations or by the individual growers.

### CASE STUDY RESULTS

Five of the nineteen producers, who are members of Producers Organisations, are not aware of, as it was aforementioned, the environmental measures, that are included in their operational programs. Given the ignorance, none of them has received any subsidy for any environmental friendly activity. The only environmental actions of the operational programs concern changes on the irrigation systems (from sprinklers to drip irrigation) and introduction of integrated production.

Practically speaking the predominant environmental action in their operational programmes (and in some cases the only) environmental measures in the OPs, according to the discussions with citrus growers, is the change of irrigation system (from sprinklers to drip irrigation).

The organic farming that three producers apply is financed by the AEM of organic farming of SPD RDR.

### ***Environmental impacts***

According to the authorities, the integrated management of production is already applied and has been extended in remarkable percentage. The organic production of fruits and vegetables make also satisfactory steps. These activities may be included in the operational programs of Producers Organisations and they have positive effects on the environment.

### ***2.1.3 Fruits – Theme 3: Structural Measures***

The two questions concerning the structural measures can not be answered in national level, since no available data exist, for the implementation of Regulation No 1257/1999 in the different categories of cultivations (citrus, peaches, apples, pears and nectarines).

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

In the frame of application of Regulation No 1257/1999 in Greece through the means of Operational Program “Rural Development - Reconstruction of Countryside” (E.P.A.A. – A.Y.), that is materialised by the Ministry of Rural Development and Foods, no subsidy is included exclusively for fruits cultivation.

For example, no any subsidy for irrigation exclusively to fruits cultivation is included. Funds are given for improvement of irrigation conditions in the frame of the Operational Programme of “Rural Development - Reconstruction of Countryside”. These funds are given under the following measures.

- Priority Axis 6: Growth and protection of Natural Resources and Environment
  - Measure 6.2 - *Saving and exploitation of surface flows – Artificial enrichments of underground aquifers – Modernisation and improvement of conditions of irrigation*  
*Priority is given in regions where water balance has been disturbed seriously, or where for social and environmental reasons, the maintenance of anthropogenic activities is essential (i.e. islands, isolated mountainous regions, areas of intensive agriculture/with environmental problems).*
- Priority Axis 7: "Programs of rural land development"
  - Measure 7.7 -*Management of agriculture water resources*

Both measures finance public or local authorities for projects of water resources management improvement.

Under Measure 6.5 - *Confrontation of damage that is caused in the agriculture from calamities, fires and other extraordinary incidents and preventive relative measures*, producers can be financed for replacement of irrigation piping and other equipment.

### CASE STUDY RESULTS

According to the discussions with the citrus fruits producers, all of them irrigate, so they have bought irrigation equipment. However, none of them has received any subsidy for this investment. The producers are forced to irrigate because of the climatic conditions in combination with the fact that the citrus fruits require a lot of water. More specifically, the long drought period, which begins

early in spring and many times is extended up to the end of autumn, can turn out to be detrimental for the production, decreasing significantly both the production volume and the size of the fruits.

The irrigation system that is preferred is the sprinklers irrigation, while in a few cases drip irrigation is applied (two out of twenty producers).

Besides, all respondents pointed out that they face a lot of problems regarding the quality of irrigation water. More precisely, the water that is used for irrigation in entire region of Argolida is of very high nitrates content, as it was aforementioned, which in many cases reaches 350 ppm. Moreover, very often the drilling water is brackish. These problems are not owed to the cultivation of citrus fruits, but to the overpumping as there was uncontrolled drillings many years ago. As a result, the producers are obliged to drill very deeply (sometimes until 450 m) so that they find good quality of water. The problems that the producers face were not created by increased irrigation during the last years but existed years ago, well before the examined period.

**Questions 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?**

According to data from Ministry of Agricultural Development and Food an abandonment of apple trees during the period from 1990 –until 1994 (European Programmes of Reforming) has been occurred. The same data refer to a grubbing up of apple and pear trees and peaches and nectarines for year 1995. In year 1997 areas of apple, pear, peach and nectarine trees have been also abandoned. The areas of peach and nectarine trees that have been grubbed up were almost the 15% of the total cultivated areas of these fruits.

**Table 21 : Abandonment of cultivation according to European Reforming Programmes, (ha)**

	Years							
	1990-1993	Percentage of the total area	1994	Percentage of the total area	1995	Percentage of the total area	1997	Percentage of the total area
Apple Trees	388.0	2.43%	455,9	3.02%				
Peach Trees and Nectarine Trees					8451.1	15.80%		
Apple and Pear Trees							505.26	2.64%
Peach and Nectarine Trees							2513.03	5.41%

Source: Ministry of Agricultural Development and Food

According to personal communications with servants of the Ministry of Agricultural Development and Food, there are no data concerning the future of the areas where fruit trees were grubbed up. Therefore, the environmental impacts of grubbing-up grants cannot be assessed.

#### **2.1.4 Fruits – Theme 4: Nuts (Almonds – Walnuts)**

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

##### Regimes for nuts support

The existing regimes for nuts financial support consist of improvement plans that were inaugurated in the frame of arrangements in year 1989. The improvement plans cover five products: almonds, hazelnuts, walnuts, Aigina pistachios and locusts. The main measure was the financing of ten years improvement plans of product quality and disposal in the market, which were formulated and presented by producers' organisations. The last one from these plans will expire in the period 2006/2007.

A Community aid, up to 50%, has been established through the EC Regulation No 2200/1996, for actions that aim at the development and improvement of consumption and utilisation of fruits with nutshell (nuts). These actions aim at:

- ☐ the qualitative improvement of products, mainly through the implementation of market studies, and the seeking for new uses, as well as the determination of means for the adaptation of nuts production in these uses,
- ☐ the perfection of new packaging methods,
- ☐ the provision of advices concerning the commercial promotion to the various economic key factors of nuts sector,
- ☐ the organisation and the participation in fairs and other commercial events.

The support regime for nuts has changed by the revision of Common Agricultural Policy (CAP) via Regulation No 1782/2003. Concretely, farming land aid was established to be given to the farmers that produce fruits with nutshell. This aid is 120.75 Euros/ha. A National Guaranteed Area for Greece has been determined, which equals to 41100 ha. This change aims at the strengthening of the significant role that the traditional nuts production plays for the protection and maintenance of the environmental, social and rural balance in certain European regions.

It should be noticed that Greek Ministerial Decision No 255982/17.5.2004 on the subject: "Acreage support to orchards of fruits with nutshell", decreased National Guaranteed Area to 19851.3 ha combined with an increase of aid amount to 250 Euros/ha. This change was realised taking into consideration the statistical data concerning the cultivation of arborised fruits with nutshell in whole Greece. The most important nuts cultivations in Greece are:

- Almonds, and
- Walnuts.

Concluding, the almonds cultivation presented intensification, since despite the reduction of cultivated area, both the production and the efficiency were increased. Concretely, the efficiency of production was increased 0.77 ton/ha. On the contrary, the walnuts cultivations are characterised by abandonment, since despite the increase of cultivated areas, both the production and the efficiency were decreased. The efficiency of production was decreased 0.21 units ton/ha.

It should be mentioned that the intensification of almonds cultivation had of course certain environmental impacts, which however cannot be measured and be quantified, because no available recorded data exists regarding the use of agrochemical (fertilizers, pesticides), as well as the growth of irrigated areas of this cultivation. In regard to the walnuts cultivation, its abandonment may lead to increased soil erosion, reduction of genetic diversity of various crop species and likely replacement of this cultivation with another more profitable and intensive.

The farming land aid for nuts, by CAP revision, as it was mentioned above, is likely to have as result the intensification of these cultivations. If however this becomes applying farming practices and techniques friendly to the environment, then the negative environmental impacts can be minimized.

### ***2.1.5 Fruits – Theme 5: Co-ordination with Agro-environmental Measures***

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

#### ***List of AEM connected to the studied orchards***

The Agroenvironmental measures (AEM) have been implemented in two distinct phases in Greece.

During the first phase, 4 measures were implemented according to Reg.(EEC)No 2078/92 from July 1995 till 1999. According to this Regulation an aid is foreseen for farmers, who undertake the obligation to follow certain codes / rules of production, with positive environmental impacts. With a 5-years contract, farmers were obliged to follow a Farming Plan in compliance to the obligations



of Reg.No 2092/91 and its amendments and be under the inspection of a Certifying Body. In Greece, these programmes were:

- ☐ Organic farming
- ☐ Long term set aside of agricultural land
- ☐ Protection of rare breeds of farm animals
- ☐ Reduction of nitrate leaching of agricultural origin at the plain of Thessaly

The most significant programme of organic farming was approved in year 1995 (EC Decision E(99)12 of 20-01-1999) with a budget forecast of 4.2 millions ECU covering 6000 ha up to year 1997. Priority was given to holdings already under the inspection of Certifying Organisations (and most of them were geographically randomly distributed), holdings into NATURA 2000 candidate areas, holdings of lakesides, riversides and seaside areas, holdings of islands (with exception of plains on Crete and Evia islands) and finally mountainous and semi-mountainous areas with altitude more than 200 m. In case of no response and no uptake at the above-mentioned areas, the plains would be eligible from the beginning of year 1997.

At the end of year 1998 a total of 1305 farmers and 6501.6 ha were contracted and the programme was amended in 1999<sup>2</sup> having an extension of 14000 ha. At the end of year 1998, , olives were representing the vast majority (58%) of the contracted UAA (classified by crops). The rest were wine vineyards (9%), cereals (9%), arboriculture (8%), citrus (6%), horticultures (5%) and raisins (4%).

**Table 22 : Evolution of the AEM 2078/92 of Organic Farming in Greece (1995-1999)**

Year	No of new contracts	New Contracted Area (ha)	Total expenditure (GDR)
1995	332	2 356.2	464 716 000
1996	326	1 318.3	936 647 750
1997	586	2 347.1	62 927 416
1998	61	4 884.0	777 618 811
1999	N/A	N/A	N/A
<b>Total</b>	<b>1305</b>	<b>6 501.6</b>	<b>2 241 909 977</b>

Source: SPD Rural Development

At the end of year 1999, organic farming covered hardly 0.12%, of the total cultivated area in Greece. That low implementation was probably a result of the complexity of application of codes of organic farming, since many fungus mainly crops diseases were very difficult to be fight by methods and techniques that were suggested in the frame of the program application. As far as citrus fruits and fruit trees concerns, the cultivated areas included in the programme of organic farming were at year1999, 1607409 and 102891 hectares respectively. These areas were 8.42% and 0.54% of the total cultivated areas under the programme of organic farming at the same period.

In the second phase, AEM have been launched in 2001, according to RDP (Single Programming Document of Rural Development). All AEM of SPDRD are included in one sole Axis (Axis 3): Agri-environmental measures. Priority Axis 3 of SPDRD was approved with E(2000) 2733/27.9.2000 decision of European Commission and includes AEM in compliance to Reg.1257/99 and its amendments, with an additional effort for complementarity and harmonization with other EU's legislative documents (e.g. Dir. 91/676/EEC, Dir. 92/43/EEC, Dir. 79/409/EEC). Aim of "Priority Axis 3: Agri-environmental measures of RDR", is the support of the farming production methods intended to the protection of the environment and the conservation of natural land.

Axis 3 includes 13 measures:

- M 3.1 Organic farming
- M 3.2 Organic livestock farming
- M 3.4 Livestock farming extensification

<sup>2</sup> EC Decision E(99)12 of 20-01-1999.

- M 3.3 Long-term set aside
- M.3.7 Programme for endangered local livestock breeds
- M 3.8 Conservation of extensive crops (local varieties) under threat of genetic erosion
- M 3.12 Conservation and restoration of terrasses for soil erosion protection
- M 3.5 Reduction of Nitrate Pollution
- M 3.6 Environmental Protection of Lake Pamvotis
- M 3.9 Management Programme for the Lakes and Lagoons of Thrace
- M 3.10 Management Programme for the lakeside areas of Lakes Volvi and Koronia
- M 3.11 Conservation and Restoration of Hedgerows
- M 3.13 Conservation of agricultural lands for the protection of wild fauna species

Up to the end of 2003, only 5 measures have begun to be implemented, named:

- Organic farming.
- Programme for endangered local livestock breeds
- Organic livestock farming.
- Long-term set aside
- Reduction of Nitrate Pollution.

### ***Organic farming***

The EU at 22.8.2003 approved the amendment of SPD RD. The technical sheet of organic farming was also amended. The specific amendments include inter alia:

- Level of aids modification
- Cancel of Prefectoral Programmes.
- Possibility for old beneficiaries to be introduced in the program. The old beneficiaries have had completed a five-year contract in the program, and they may have a new five-year contract aiming at the effective coverage of program objectives.

According to the “2003 Annual Report of SPD implementation” the program of organic farming had been implemented as following:

- The program has been applied in 54 out of the 57 Prefectures of Greece.
- The signed contracts in the program were 5224 (for both programmes: of 2078/92 and 1257/99, 1199 contracts in 2003). The contracts correspond to an area of 18953 hectares, from which 3554 hectares concern the contracts of 2003.
- The program of organic farming concerns arable and permanent crops. The cultivated area of organic fruit trees (except citrus) was decreased from 79.93 hectares in 2002 to 79.47 hectares in 2003. On the contrary, the citrus fruits presented an increase reaching at 1588.22 hectares in 2003 from 1422.253 hectares in 2002 (Table 23).

**Table 23 : Evolution of fruits – Organic Farming, in period 1999 – 2003, (ha)**

YEAR			
Organic Farming (Area, in ha)	1999	2002	2003
Fruit Trees	102,89	79,93	79,47
Citrus Trees	1.607,41	1.422,25	1.588,22
Almond trees	70,40	35,70	58,96
Walnut trees	114,98	132,46	178,16

Source: Ministry of Agricultural Development and Food

Comparing both the areas of citrus fruits and the areas of fruit trees (except citrus) with the related areas of 1999, we may conclude that both of them were decreased. Moreover, from the follow-up of program implementation at year 2003 it can be noted that in certain cases it was observed an unwillingness of farmers to participate in the program. It is possible, that the complexity of administrative part of the program has been a significant reason for both the reduction of the cultivated areas (organic farming) and the unwillingness of farmers to participate.

### **CASE STUDY RESULTS**

Moreover, according to the discussions with the citrus fruits producers, it is observed that there is a general unwillingness and reserve regarding the agro-environmental measures. This unwillingness of the producers is owed mainly to the complexity of the processes (a lot of bureaucracy) and to the difficulty they have in conceiving what alternative cultivation means.

Generally, the producers not only hesitate to be included in some program but also many of them that are included in the program they eventually withdraw. One producer had only been included in the program of organic farming and during the materialisation of the program he withdrew because of various problems, but mainly because the difficulties he faced in placing his products in the market, in a competitive and profitable price. This problem is faced from most organic farmers.

#### ***Long term set aside of agricultural land***

The measure concerns the paying off of undertaken financial obligations during the pre existing related programme of Regulation 2078/1992.

#### ***Reduction of nitrate leaching of agricultural origin***

The program is applied in the four (4) prefectures of Thessaly and in Fthiotida Prefecture. The distribution of areas in the 5 prefectures has as follows:

- Larissa: 4 500 ha
- Magnesia: 3 000 ha
- Karditsa: 2 000 ha
- Trikala: 1 000 ha
- Fthiotida: 2 500 ha

The beneficiaries aided by this agro environmental measure were only 20, in 2003. The reasons for unwillingness of farmers to be financed by the financial aid of the specific measure were:

- Relative administrative complexity, lack of flexibility and mistrust of farmers
- Low level of aid compared to the type of undertaken engagement by them.
- Limitation of aid only to cultivations of maize and cotton.
- Insufficient information of farmers

By a new amendment two new types of cultivation are also eligible (sugar beets and industrial tomato).

In the following Tables (Table 24 and Table 25) the level of AEM payments is given.

**Table 24 : AEM 2057/92 (Payments), (million €)**

	YEARS					
	2001		2002		2003	
	Total payments	EC contribution	Total payments	EC contribution	Total payments	EC contribution
<b>Indicator budget</b>	17.4	13.0	11.8	8.9	14.5	10.9
<b>Payments</b>	15.88	11.91	9.05	6.79	4.852	3.639
<b>% of implementation</b>	91.26%	91.62%	76.69%	76.29%	33.47%	33.38%

Source: SPD Rural Development

**Table 25 : SPD RD, Regulation 1257/99, (million €)**

	YEARS					
	2001		2002		2003	
	Total payments	EC contribution	Total payments	EC contribution	Total payments	EC contribution
<b>Indicator budget</b>	12.9	9.7	33.1	24.7	47.4	35.5
<b>Payments</b>	0	0	1.06	0.8	4.49	3.37
<b>% of implementation</b>	0	0	3.2%	3.24%	9.48%	9.49%

Source: SPD Rural Development

Apart from above agroenvironmental measures, a System of Integrated Agricultural Production Management is applied in Greece from 2000. This is a system of a rural holding organisation that includes inter alia, good farming practices, health and safety of workers, products safety, traceability and environmentally friendly actions. It aims in the development of an environment suitable for effective and profitable agricultural production in an economically viable and environmentally responsible rural holding, incorporating in the modern farming practices, useful natural processes. The continuously increasing demands of markets for certified products according to the System of Integrated Management, induced the development of the following standards:

- *AGRO 2-1: Specification*

This standard includes general requirements for agriculture. It includes the whole principles for the certification of the Integrated Management System that is applicable in every agricultural holding independent from its specific cultivations.

- *AGRO 2-2: Requirements for use*

This standard describes the technical and legal requirements of the Integrated Production Management System for crop production and accompanies the standard AGRO 2-1. It includes the general codes of Good Farming Practice and the accompanying measures of environmentally friendly agriculture (crop production), in a way that safe and qualitative products are produced and best environmental management is achieved.

**Table 26 : Cultivated areas with Integrated management system, in year 2004 (ha, no of producers)**

Crops	Area (in ha)	Producers
Almonds	8.8	2
Pears for industrial processing	78.4	39
Apples	317.1	271
Peaches, nectarines, peaches for processing	8161.1	5039
<b>Total</b>	<b>8565.4</b>	<b>5351</b>

Source: Agrocert

The benefits deriving from the system application are:

- Guarantee of cultivations output and income of farmers
- Reduction of environmental impacts of agricultural activities
- Satisfaction of social and market requirements for both environmental protection and agricultural products free (as much as possible) from synthetic chemical substances

The total certified areas, according to the Integrated Production Management System are 15 632.2 hectares in 2005. Fruit producing trees are cultivated in 8 556.6 hectares or in 54.8% of total area concerned.

At this point, it should be noted that for the accession of a holding to anyone of the above programmes, the application of Codes of Good Farming Practice is obligatory.

### CASE STUDY RESULTS

Three out of twenty of the citrus fruits producers have contracted agri-environmental measures for their production.

In general, it is observed that there is a general unwillingness and reserve regarding the agro-environmental measures. This unwillingness of the producers is owed mainly to the complexity of the processes (a lot of bureaucracy) and to the difficulty they have in conceiving what alternative cultivation means. One of the organic producers said that organic farming present the following problems:

- Reduced production
- Increased cost of production.
- Increased manual work.
- The same price as the non organic fruits
- No plants restructuring.

The cost of all the above items does not be covered by the subsidy of the AEM of organic farming. He is not sure that he will continue to have a new contract of organic farming.

Generally speaking (furthermore than the interviewed) the producers not only hesitate to be included in some program but also many of them that are included in the program they eventually withdraw. One producer who used to be included in the program of organic farming, during the materialisation of the program he withdrew because of various problems, but mainly because the difficulties he faced in placing his products in the market, in a competitive and profitable price. This problem is faced from many organic farmers.

Six of the interviewers have started to apply the principles of integrated production management which still presents some difficulties in its application.. This is due to the lack of specific rules, and the fact that each time, regarding to the product, the aforementioned rules must be readjusted. The growers however believe that the application of integrated production management is an increasing trend, due to the market requirements for certified products.

Usually, organic farming is more easily applied to citrus fruits, although a significant part of the total certified areas, according to the Integrated Production Management System, concerns fruits. No specific connection exists between AEM and environmental actions of the Operational Programmes, because the Operational Programmes contain mainly actions for better water management and some actions connected to the Integrated Production Management.

The interviewed producers do not know any example of inconsistencies between AEM and environmental measures of the operational programmes of OPs.

From the above response on behalf of the interviewed producers, it can be concluded that there is no special care for co-ordination between environmental measures in the CMO of fruits and vegetables and the agri-environmental measures.

## **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.]***

In any case we cannot extract safe conclusions concerning the type and the kind of environmental impacts, since we don't have data on the cultivations that have been changed to fruit orchards. Unfortunately, data regarding land use change were not available neither from national sources, neither from LUCAS or IRENA report (Land use changes data for UK, Sweden, Austria, Finland and Greece at the time of writing of IRENA report were not available).

**Table 27 : Abandonment of cultivation according to European Reforming Programmes, in ha**

	Years							
	1990-1993	Percentage of the total area	1994	Percentage of the total area	1995	Percentage of the total area	1997	Percentage of the total area
<b>Apple Trees</b>	388,0	2,43%	455,9	3,02%				
<b>Peach Trees and Nectarine Trees</b>					8.451,1	15,80%		
<b>Apple and Pear Trees</b>							505,26	2,64%
<b>Peach and Nectarine Trees</b>							2.513,03	5,41%

None of the interviewers had a clear view concerning the impacts of change of land use in case of fruits. The only data available concern programs of abandonment and grubbing up of apple, pear, peach and nectarine trees.

The statistics for abandonment and grubbing up are given in the previous table. We do not have data on the change in land use, neither national scientific projects nor studies concerning the environmental impacts of the change in land use.

***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.]***

No data are available concerning the subsidies for different environmental measures of the operational plans of the producers' organizations. Therefore, a reliable answer cannot be formulated.

It can only be mentioned a Circular of Ministry of Agriculture with the subject: "Details of Application of No 2200/96 Council Regulation, with regard to the Operational Programs and Funds, as well as the financing aid in the frames of Regulation No 609/2001 afterwards the suppression of Regulation No 411/97". In this Circular, the various plans for financing are addressed. Amongst them, special support aid is foreseen for:

- organic, integrated or experimental production,
- organic crop protection products (pheromone and predatory), independently of whether the production is organic, integrated or conventional.
- Environmental measures in which the utilisation of recyclable packing is included.

In order an answer to be drawn under this question, it is required to implement initially a kind of environmental analysis of each significant measure of fruits CMO, in connection with its positive or negative environmental results.

The Measures of fruits CMO are:

- subsidy to the producers
- fruits processing,
- fruits withdrawals

These measures are evaluated according to their environmental effects.



❑ Fruits processing (citrus, peaches, pears)	
Nature of the impact	soil and surface and groundwater contamination from wastes and wastewater
Target	local, secondary, long term, average, reversible, Fairly sensitive site
Overall characterisation	Negative
❑ Fruits withdrawals	
Nature of the impact	soil and surface and groundwater contamination
Target	Local, primary, long term, average, Reversible, sensitive sites
Overall characterisation	Very negative
❑ Subsidy to producers	
Nature of the impact	improvement of the environment as a result of rational use of agrochemicals, of Biodiversity reduction as a result of monocultures
Target	Local, primary, long term, average, Reversible, no sensitive sites
Overall characterisation	Positive

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

This question can not be answered in case of fruits, since we don't have production subsidy. EU resources finance the members of producers organisations at a rate of 50% (50% of operational funds is financed by the members of producers organisations). The financial assistance of EU is limited to a maximum of 4.1% of the value of the marketed production of each producer organisation. The operational funds can be used:

- for financing both market withdrawals and processing of citrus fruit
- for financing operational programs approved from the Member States.

Based on the above, we cannot interrelate the content of this question with fruits production.

### **2.2.2 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?*

None of the AE measures that are applied under SPD RD (or earlier in the frame of financing of No 2078/92 Regulation) is addressed specifically to fruits or to areas conquer to environmental deterioration due to peaches, pears, apples and citrus trees or nuts cultivation. Concretely, as it is also reported in the bibliography the environmental impacts of citrus cultivation in terms of irrigation water consumption and groundwater salinisation are focused mainly in the area of Argolis in Peloponnese. Some regional measures have been applied that concern mainly the problem of salinisation of aquifers, but not specific environmental measures to citrus cultivation.

In the AE measure of organic farming, some beneficiaries are growers of fruits. The cultivated area of organic fruit trees (except citrus) was decreased from 79.93 hectares in 2002 to 79.47 hectares in 2003. On the contrary, the citrus fruits presented an increase reaching at 1588.22 hectares in 2003 from 1422.25 hectares in 2002 (Table 28).

**Table 28 : Evolution of Fruits Organic Farming, in period 1999 – 2003, (ha)**

Organic Farming (Area, in ha)	YEAR		
	1999	2002	2003
Fruit Trees	102,89	79,93	79,47
Citrus Trees	1.607,41	1.422,25	1.588,22
Almond trees	70,40	35,70	58,96
Walnut trees	114,98	132,46	178,16

Source: Ministry of Agricultural Development and Food

Comparing both the areas of citrus fruits and the areas of fruit trees (except citrus) with the related areas of 1999, we may conclude that both of them were decreased. Moreover, from the follow-up of program implementation at year 2003 it can be noticed that in certain cases it was observed an unwillingness of farmers to participate in the program. It is possible, that the complexity of administrative part of the program has been a significant reason for both the reduction of the cultivated areas (organic farming) and the unwillingness of farmers to participate.

In order a beneficiary to be financed by any of the AEM Measures of SPD RD he should apply obligatory the Codes of Good Farming Practice, as well as the requirements of the National Regulating Frame for the environment, which has been established in the Hellenic legal framework.

Under Joint Ministerial Decision No 125347/568/20.1.2004, the application of codes of good farming practices as they approved by No (2003)3139/22.8.2003 European Commission Decision which amends the SPD RD 2000 – 2006, is obligatory, from the beginning of year 2004. Codes of Good Farming Practices aim to the confrontation of the problems caused by agricultural activities.

These practices aim to:

- sustainable development of farming soils and natural
- protection and maintenance of agricultural landscape and its characteristics
- protection of growers and consumers health.

Codes of Good Farming Practices intervene in all the phases of agricultural and cattle breeding activities, as well as in specific cases of areas or zones under special protection regimes.

They are dealing with issues like:

- Inputs management
- Soil treatment
- Crop rotation
- Fertilization
- Water resources protection
- Irrigation systems
- Crop protection
- Self-sown flora management
- Farming waste management
- Waste management

Apart from above agroenvironmental measures, a System of Integrated Agricultural Production Management is applied in Greece from year 2000. This is a system of the organisation of a farm that includes inter alia, good farming practices, principles of health and safety of workers, products safety, traceability and environmentally friendly actions. It aims to the development of an environment suitable for effective and profitable agricultural production in an economically viable and environmentally responsible agricultural business, incorporating useful natural processes, in the modern farming practices.

The continuously increasing demands of markets for certified products according to the System of Integrated Management induced the development of the following standards:

- *AGRO 2-1: Specification*

This standard includes general requirements for agriculture. It includes all the principles for the certification of the Integrated Management System that is applicable in every agricultural holding independent from its specific cultivations.

- *AGRO 2-2: Requirements for use*

This standard describes the technical and legal requirements for the application of the Integrated Production Management System in crop production and accompanies the standard AGRO 2-1. It includes the general codes of Good Farming Practice and the accompanying measures of environmentally friendly agriculture (crop production), in a way that safe and qualitative products are produced and best environmental management is achieved.

The benefits deriving from the system application are:

- Guarantee of cultivations output and income of farmers
- Reduction of environmental impacts of agricultural activities



- Satisfaction of social and market requirements for both environmental protection and agricultural products free (as much as possible) from synthetic chemical substances

The total certified areas by AGROCERT, according to AGRO 2-1 and AGRO 2-2 standards, are 15632.2 hectares in March 2005. Fruit trees are cultivated in 8565.4 hectares or in about 55% of the total cultivated land according to the IPMS. The predominant cultivation is this of peaches fruits.

**Table 29 : Certified areas of fruits cultivation according to the IPMS, in year 2004, (ha)**

<b>Crops</b>	<b>Area (in ha)</b>	<b>Producers</b>
Almonds	8.8	2
Pears for industrial manufacturing	78.4	39
Apples	317.1	271
Peaches, nectarines, industrial peaches	8161.1	5039
<b>Total</b>	<b>8565.4</b>	<b>5351</b>

Source: Agrocet, 2005

Concluding, the only environmental friendly measure related to fruits cultivation that is financed anyhow, is the measure of organic farming. According to organic farming requirements the adoption and application of Codes of Good Practice is obligatory. Besides, there does not exist currently any certain providence for measures to mitigate the environmental deterioration which is a consequence of fruits cultivation.

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## **APPENDICES**

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**Annex 1: List of people met**

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

**Annex 3: Typology of the producers met**

**Annex 4: Fruits orchards per region**

## **Annex 1: List of people met**

1. Mrs T. Papavasileiou, General Manager OPEKEPE (Payments Authority)
2. Mr Gavalekas, Directorate of land use and Environment, Ministry of Agricultural Development and Food.
3. Mrs Pyriovoli, Directorate of land use and Environment, Ministry of Agricultural Development and Food.
4. Mrs Marianthi Loupassaki, NAGREF, Institute of Olive Tree and Subtropical plants of Chania
5. Mr Alexandros Efthimiou, General Directorate of Crop Protection, Directorate of Production and Exploitation of Arboricultural Products
6. Mr Bourdaras, Ministry of Agricultural Development and Food.
7. Mr Apostolos Zontanos, Agronomist, Owner a business of crop protection sales
8. Mr A. Kountouris, General Directorate of Crop Protection, Directorate of Production and Exploitation of Arboricultural Products
9. Mr K. Stournaras, General Directorate of Crop Protection, Directorate of Production and Exploitation of Arboricultural Products
10. Mrs E. Mpousiou, General Directorate of Crop Protection, Directorate of Production and Exploitation of Arboricultural Products
11. Mr Bourdaras, Ministry of Agricultural Development and Food.
12. Mr T.Dimalexis, Researcher, Hellenic Ornithological Society
13. Mrs Antonia Galanaki, Biologist, Consultant to the Hellenic Ornithological Society
14. Mrs M. Aravantinou, Ministry of Environment, National Network of Environmental Information
15. Mrs Alexia Chomata, Ministry of Environment, National Network of Environmental Information
16. Mr Kyriakos Georgiou, Assistant Professor in the National University of Athens, Department of Biology
17. Mr Dionyssi Assimacopoulos, Professor in Chemical Engineering Department of NTUA,

## **List of producers met**

1. Antonopoulos Spyros
2. Damoulas Nikolaos
3. Demis Ioannis
4. Dimakis Ioannis
5. Zervos Ioannis
6. Kalogeropoulos Thanassis
7. Lampada Anna
8. Lermas Panayiotis
9. Maglara Evangelia
10. Ntoulia Penelope
11. Ntoulas Dimitris
12. Ntoulas Georgios
13. Paivanas Athanasios
14. Pikis Sotirios
15. Platis Georgios
16. Soursos Ioannis
17. Tasopoulou Sofia
18. Tsipianidis Dimitris
19. Varveris Konstantinos
20. Yiannopoulou Ntina

<b>Annex 2: Main bibliography identified in relation with the study</b>
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1. Alexandros Poulouvassilis, Agricultural University, Athens, Greece, SUSTAINABLE MANAGEMENT OF WATER IN AGRICULTURE ISSUES AND POLICIES – OECD, The Athens Workshop Proceedings, Water resource management for sustainable agriculture in coastal areas
2. K.S. Chartzoulakisa,\*, N.V. Paranychianakisb, A.N. Angelakis, Water resources management in the Island of Crete, Greece, with emphasis on the agricultural use, Water Policy 3 (2001) 193–205, Elsevier
3. Helen Caraveli, A comparative analysis on intensification and extensification in mediterranean agriculture: dilemmas for LFAs policy., Journal of Rural Studies 16 (2000) 231}242, Elsevier
4. Michel POIRET (Eurostat), Crop trends and environmental impacts
5. PESERA PROJECT, SOIL EROSION RISK ASSESSMENT IN EUROPE
6. Effects of fertilizers in soil fertility, M. Loupassaki, GEO. C. G, 1990. Agrochemicals and Environment. Proc. GEO.C.G Workshop, Chania, Crete. 7-8 Dec. 1989. Chania, Greece. (In Greek.)
7. Draft Report of Sustainability Indices – Greece 2003
8. The Environmental Impacts of irrigation in the European Union, A report to Environment Directorate of EC, Institute for European Environmental Policy, Polytechnical University of Madrid, University of Athens, 2000
- E. Assimacopoulos Chemical Engineering Department, National Technical University of Athens, Water Management and Protection in Greece, WaterStrategyMan project

### Annex 3: Typology of the producers met

**Table 30: Types of producers met/targeted**

Type of producers	Number of required farmers to be interviewed	Total number of responded farmers
Producers of citrus fruits in PO	9	19
Producers of peaches and nectarines in PO	9	0
Producers of citrus fruits out of PO	1	1
Producers of peaches and nectarines out of PO	1	0
Producers of fruits having used the subsidies for irrigation of the CMO or RDR	4	0
Producers of fruits (members of who have implemented measures relating to the environmental programmes of the PO	8	0
Producers of peach and nectarine trees, having used the subsidies for grubbing-up of the CMO or the RDR	3	0
Producers under Agri-environmental contract	2	3
Producers practicing organic production or integrated production system	2	6

## Annex 4: Fruits orchards per region

Greece is divided in 13 administrative regions. The geographical regions are different of the administrative ones. For example there are three administrative regions: West Macedonia, Central Macedonia (Kentriki Macedonia), East Macedonia-Thraki, which correspond to the geographical regions: Macedonia and Thraki.

The National Statistics Service of Greece keeps agricultural statistical data per geographical region, and all the data given in this study concern the geographical regions.

Athens area is a strongly urban region and orchards areas are limited (Table 30)

**Table 31 : Evolution of fruits orchards, in Athens Area, in period 1990 - 2001, (ha)**

	Year												
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	% Change 90-01
Citrus trees	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0	0	0	0	-100.00%
Fruit trees													
Apple trees	0	0	0	0	0	0	0	0	0	0	0	0	
Pear trees	1	1	1	1	1	1	1	1	1	1	1	1	0.00%
Peach trees	0	0	0	0	0	0	0	0	0	0	0	0	0.00%
Nut trees													
Almond trees	2	2	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.2	10.00%
Walnut trees	0	0	0	0	0	0	0	0	0	0	0	0	0.00%

Source: National Statistical Service of Greece

As far Sterea Ellada and Evia island concerns citrus fruits and almonds have an interesting presentation, while an increase of walnuts areas is also can be shown (Table 31).

**Table 32 : Evolution of fruits orchards in Sterea Ellada – Evia, in period 1990 - 2001, (ha)**

	Year												
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	% Change 90-01
Citrus trees	4592.5	4786.9	4886.9	5139.8	5253.5	5267.7	5281.1	5352.6	5149.9	5185.3	5124.7	5129.6	11.70%
Fruit trees													
Apple trees	397.4	364.6	367.2	348.3	343.6	342.9	347.1	340.7	333.9	320.2	328.9	315.7	-20.56%
Pear trees	199.8	206.2	206.2	197.4	177	185.5	189.9	181.2	170.2	176	190.2	181.9	-8.96%
Peach trees	169.1	160.5	166.6	173.5	173.1	172.6	163.6	163.2	159.1	156.5	155.8	146.9	-13.13%
Nut trees													
Almond trees	3924.8	3796.6	3734.9	3593.9	3544	3449.2	3190.7	3097.2	3166.3	3096.4	3044.5	2878.6	-26.66%
Walnut trees	964	1013.1	10225.8	1070.8	1082.9	1081.5	1081	1080.4	1106.7	1140.3	1165.5	1249.2	29.59%

Source: National Statistical Service of Greece

Citrus fruits are cultivated mainly in Peloponnese, while all the other fruits presented a decreasing trend in their cultivated areas (Table 32).

**Table 33 : Evolution of fruits orchards in Peloponnese, in period 1990 - 2001, (ha)**

	Year												
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	% Change 90-01
<b>Citrus trees</b>	34254.8	34355.6	34347	34317.8	34656.1	34676.9	34834.3	35161.7	35051.3	35133.7	35498.3	35211.7	2.79%
<b>Fruit trees</b>													
<b>Apple trees</b>	2005.8	2016.8	1828.3	1526.5	1499.3	1497.8	1469.2	1435.5	1427.6	1377.6	1354.3	1278.1	-36.28%
<b>Pear trees</b>	750.9	715.3	731.3	717.7	677.9	654.1	682.4	661.1	643.9	633.8	601.3	600.4	-20.04%
<b>Peach trees</b>	312.6	346.9	289	291.6	282.5	273.8	257.1	256.8	234.6	235.9	239.1	221.8	-29.05%
<b>Nut trees</b>													
<b>Almond trees</b>	1994.7	1997.1	1850.3	1735.4	1672.8	1612.1	1558.3	1530.1	1508.4	1503.5	1495.9	1435.2	-28.05%
<b>Walnut trees</b>	3047.6	2986.9	2691.3	2744.8	2707.5	2695.5	2685.1	2737.9	2754.9	2780.9	2727.4	2787.9	-8.52%

Source: NATIONAL STATISTICAL SERVICE OF GREECE

In Ionian Islands the areas covered by fruit trees are limited (Table 33).

**Table 34 : Evolution of fruits orchards in Ionian Islands, in period 1990 - 2001, (ha)**

	Year												
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	% Change 90-01
<b>Citrus trees</b>	1074.8	1099.2	1104.2	1105.1	1103.8	1105.2	1108.6	1110.5	1106	1097.3	1094.1	1099.7	2.32%
<b>Fruit trees</b>													
<b>Apple trees</b>	89.6	89.5	79.9	78.3	74.5	76.2	74.1	73.7	90.4	91	90.9	62.4	-30.36%
<b>Pear trees</b>	54.5	52	48.7	48.6	47.8	47.2	46.8	45.4	66.7	65.4	64	30	-44.95%
<b>Peach trees</b>	16.5	15.8	15.3	15.1	15.3	14.6	14.6	14.8	15.6	15.6	15.6	15.6	-5.45%
<b>Nut trees</b>													
<b>Almond trees</b>	363.1	352.6	342	339.7	323.3	318.7	316.5	312.2	302.1	302.2	297.8	289.4	-20.30%
<b>Walnut trees</b>	34.1	33	30.4	29	28.2	28.6	28.5	27.5	34.1	33.8	33.5	37.6	10.26%

Source: National Statistical Service of Greece

As far as Ipiros concern, walnuts are present in a relative significant number of ha, compared with the other regions (Table 34). Some remarkable areas with citrus fruits can be met, which are the only fruits that had increasing cultivated areas (Table 34).

**Table 35 : Evolution of fruits orchards in Ipiros, in period 1990 - 2001, (ha)**

	Year												
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	% Change 90-01
<b>Citrus trees</b>	8977.7	8976.3	8931.2	8997.1	8985.8	8999.4	8990.6	9229.9	9379.9	9491.1	9531.2	9591.9	6.84%
<b>Fruit trees</b>													
<b>Apple trees</b>	348.9	321.1	302.9	295.8	194.3	190.3	177.9	176	170.9	161.6	160.2	160.7	-53.94%
<b>Pear trees</b>	61.6	59.3	59.1	50.4	49.3	48.1	37.2	37.2	39.5	37.5	37.3	38.8	-37.01%
<b>Peach trees</b>	71.1	57.8	59.1	57.8	54.3	59.1	59.4	55.9	57.8	50.3	50.1	52.4	-26.30%
<b>Nut and dried fruit trees</b>													
<b>Almond trees</b>	292.4	259.2	252.4	244.5	238.4	230.9	210.9	224.4	205.9	184.5	190.4	217.4	-25.65%
<b>Walnut trees</b>	871.4	822.1	823.9	817.1	776.1	775.4	768.5	786.8	790.2	777.9	766.1	746.8	-14.30%

Source: National Statistical Service of Greece

Thessalia has remarkable areas of apple trees, which were increased during the examined period. Pears and peaches areas presented an increase also (Table 35).

**Table 36 : Evolution of fruits orchards in Thessalia, in period 1990 - 2001, (ha)**

	Year												
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	% Change 90-01
<b>Citrus trees</b>	120.7	97.6	87.9	87.9	83.2	81.1	77.9	77.9	77.9	78.7	78.9	78.7	-34.80%
<b>Fruit trees</b>													
<b>Apple trees</b>	4099.9	4439.6	4557.3	4653.9	4655.3	4672.4	4677.8	4707.3	4753.2	4822.8	4819	4791.1	16.86%
<b>Pear trees</b>	1253.1	1198.4	1156.5	1192.9	1194.1	1171.1	1170.9	1206.2	1199.6	1342.8	1348	1351.7	7.87%
<b>Peach trees</b>	1054.2	1090.6	1062.1	1156.4	1179.9	1180.4	1125.8	1138.6	1082.1	1232.8	1245.2	1210.1	14.79%
<b>Nut trees</b>													
<b>Almond trees</b>	12083.2	11536.5	10505.3	10230	9982.5	9882.9	9797.6	9727.3	9307.5	9269	9027.2	8847	-26.78%
<b>Walnut trees</b>	960.7	977.5	979	1016.3	1048.4	1041.7	1014.3	1063.9	1131.6	1154.8	1179.7	1216.7	26.65%

Source: National Statistical Service of Greece

Macedonia is characterized by extended areas of peaches (although they were slightly decreased) covering the majority of the Greek peaches production (96-97%) (Table 36).

**Table 37 : Evolution of fruits orchards in Macedonia, in period 1990 - 2001, (ha)**

	Year												
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	% Change 90-01
<b>Citrus trees</b>	7.6	7.6	7.6	8.6	8.6	8.6	9.5	10.9	10.9	10.9	11.2	13	71.05
<b>Fruit trees</b>													
<b>Apple trees</b>	9012.7	8620.9	8381.8	8137.4	7978.9	7828.5	7865.4	7873.9	7643.6	7550	6921	6806.1	-24.48
<b>Pear trees</b>	2103.6	1840.6	1817.7	1741.6	1733.4	1654.5	1593	1604	1557	1660.9	1606.4	1550.7	-26.28
<b>Peach trees</b>	43934.9	46277.2	49147.3	50685.6	51497.3	51632.6	45068.1	44639.2	42988.4	42705.6	42899.3	42019	-4.36
<b>Nut trees</b>													
<b>Almond trees</b>	8130.2	8135.1	7725.4	7426.3	7265.6	7172.8	6979.4	6876.7	6664.6	6616.9	6553.6	5950.3	-26.81
<b>Walnut trees</b>	1414.2	1392.6	1342.6	1294.1	1326.1	1339.7	1379.1	1443.3	1440.8	1459	1508.2	1496.1	5.79

Source: National Statistical Service of Greece



Thraki is not characterized by any important fruits cultivation, although an increase of walnut trees areas may be noticed, which however is referred to small areas (Table 37).

**Table 38 : Evolution of fruits orchards in Thraki, in period 1990 - 2001, (ha)**

	Year												
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	% Change 90-01
<b>Citrus trees</b>	0	0	0	0	0	0	0	0	0	0	0	0	
<b>Fruit trees</b>													
<b>Apple trees</b>	101.6	97.8	71.9	71.2	71	71.6	66.2	69.4	68	56.1	54.8	51.7	-47.14%
<b>Pear trees</b>	35.2	34.7	35.8	35.6	35.5	36.7	34.7	35.7	36.2	36	35.2	32.3	-6.92%
<b>Peach trees</b>	37.4	35.8	36.6	36.5	33.5	33.5	31.6	33.9	33.9	28.9	28.9	22.4	-37.43%
<b>Nut trees</b>													
<b>Almond trees</b>	641.8	577.6	544.9	553.8	539.4	535.9	512.8	467.7	450.5	406	374.5	326.4	-43.49%
<b>Walnut trees</b>	79.6	74	67.3	67.7	66.5	57.9	57.2	74.8	85.4	101.4	119.3	164.3	122.03%

Source: National Statistical Service of Greece

Some areas of citrus fruits are predominant in Aegean Islands, as far as fruits cultivation concerns (Table 38).

**Table 39 : Evolution of fruits orchards in Aegean Islands, in period 1990 - 2001, (ha)**

	Year												
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	% Change 90-01
<b>Citrus trees</b>	2011.8	2076	2102.4	2101.1	2104.8	2099.9	2038.5	2040	2024.7	2024.4	2016.8	2018.4	0.33%
<b>Fruit trees</b>													
<b>Apple trees</b>	190.3	192.9	192.7	191.1	189.7	180.5	180.6	161.8	160	97.9	97.9	99.4	-48.47%
<b>Pear trees</b>	493.6	440.3	424.9	423.4	418.3	398.8	397.6	398.2	397.9	167.5	156.6	159.4	-63.80%
<b>Peach trees</b>	109.5	113.3	127.6	124	123.5	122.1	111.1	111.5	120.6	120.6	118.7	113.8	0.44%
<b>Nut and trees</b>													
<b>Almond trees</b>	811.9	649.3	620.6	618.8	615.2	606.4	606	606.2	607.4	604.5	606.1	573.3	-11.70%
<b>Walnut trees</b>	17.9	13	10.7	10.7	12.4	14.6	15.1	15.1	15.1	15.3	15.6	17.8	36.92%

Source: National Statistical Service of Greece

Crete has areas of citrus fruits and almond trees, presenting both a decrease under the examined period. Important increases in apple and pear orchards may be noted, which however are not big (Table 39).

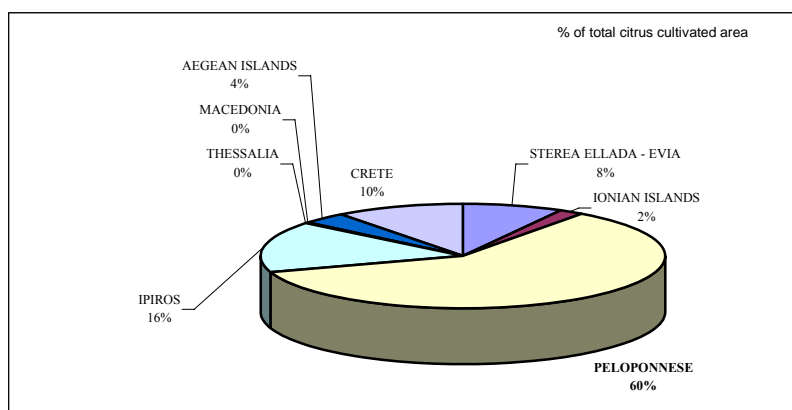
**Table 40 : Evolution of fruits orchards in Crete, in period 1990 - 2001, (ha)**

	Year												
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	% Change 90-01

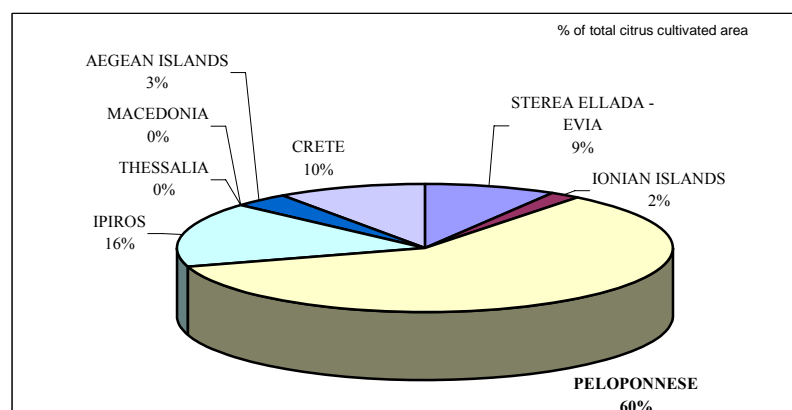
<b>Citrus trees</b>	5902.5	5940.6	5968.2	5945.6	5924.2	5916.7	5899.2	5848	5845.2	5821.5	5767.9	5755.3	-2.49%
<b>Fruit trees</b>													
<b>Apple trees</b>	106.7	98.1	99.6	94.1	94.2	93.5	92.1	93.2	92.7	265.3	275.6	274.5	179.82%
<b>Pear trees</b>	86.7	75.9	70.9	68.8	68.4	68.1	69	67.6	68.3	279.4	280.1	271.4	257.58%
<b>Peach trees</b>	16.5	17.5	17.4	17.6	17	15.6	14.7	14.8	14.8	14.7	17.2	16.2	-7.43%
<b>Nut trees</b>													
<b>Almond trees</b>	1113.6	1191.7	1142.2	1086.3	1063.9	1034.8	901.6	833.6	870.3	864.2	756.7	738.1	-38.06%
<b>Walnut trees</b>	60.8	41	54.6	42.4	59	113	112.4	122.4	99.1	92	110	34	-17.07%

Source: National Statistical Service of Greece

A series of charts is given in the following presenting the share of fruits orchards in every Greek region for years 1990 and 2001.

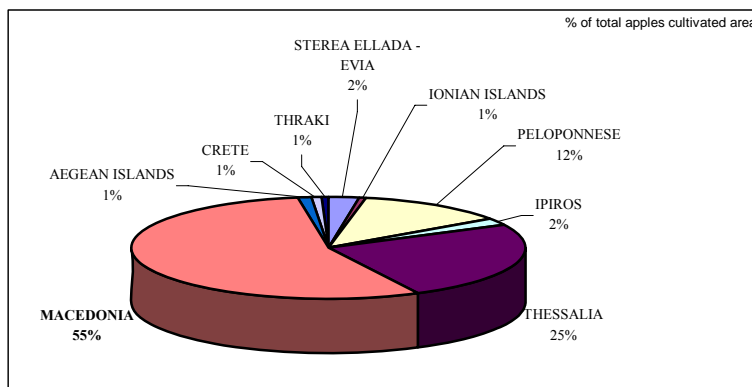
**Chart 31 : Citrus orchards areas per region, in year 1990**

Source: National Statistical Service of Greece

**Chart 32 : Citrus orchards areas per region, in 2001**

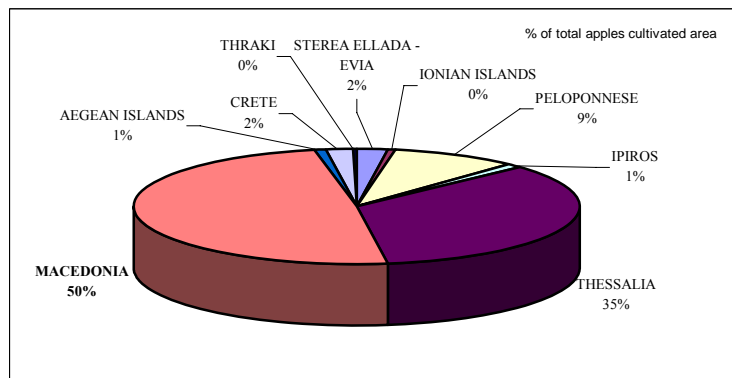
Source: National Statistical Service of Greece

**Chart 33 : Apple orchards areas, per region, in 1990**



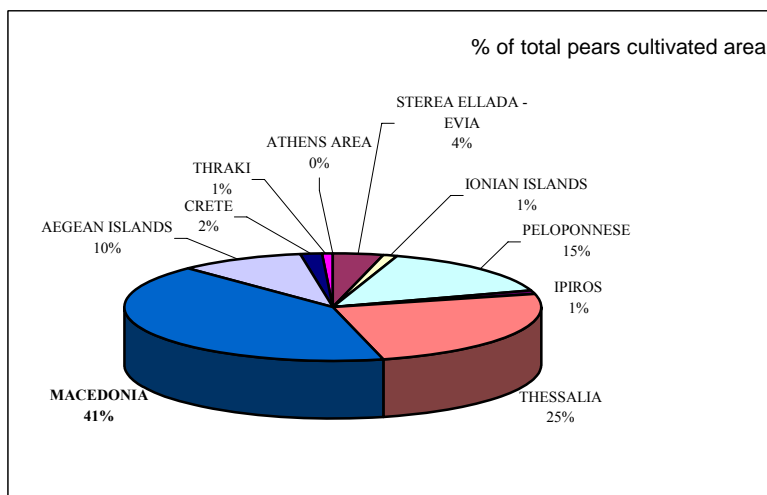
Source: National Statistical Service of Greece

**Chart 34 : Apple orchards areas, per region, in 2001**



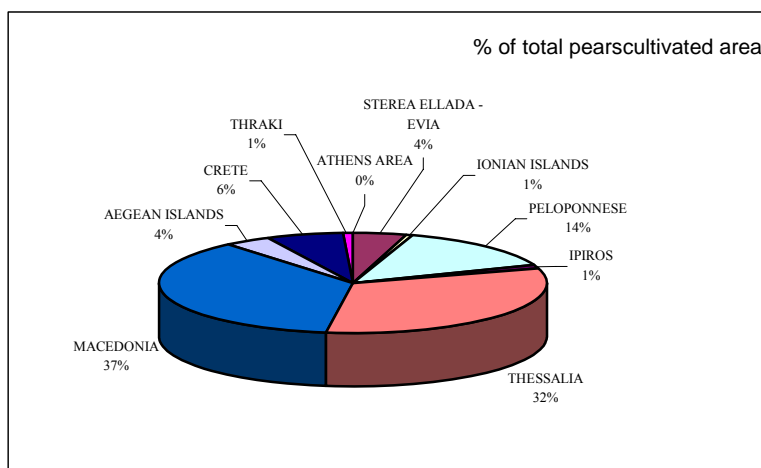
Source: National Statistical Service of Greece

**Chart 35 : Pears orchards areas, per region, in 1990**



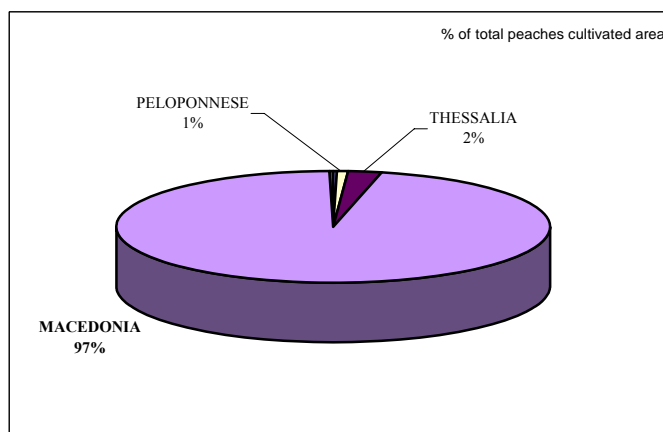
Source: National Statistical Service of Greece

**Chart 36 : Pears orchards areas, per region, in 2001**



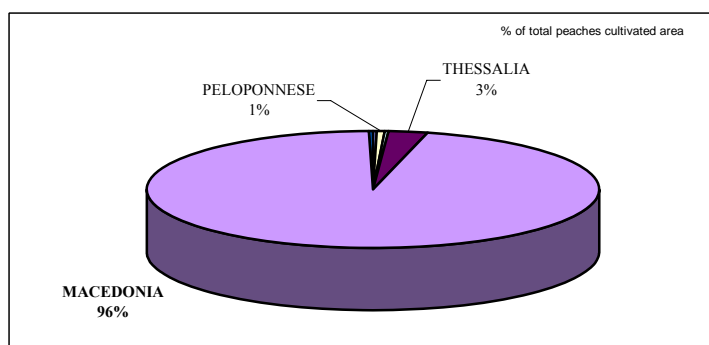
Source: National Statistical Service of Greece

**Chart 37 : Peaches orchards areas, per region, in 1990**



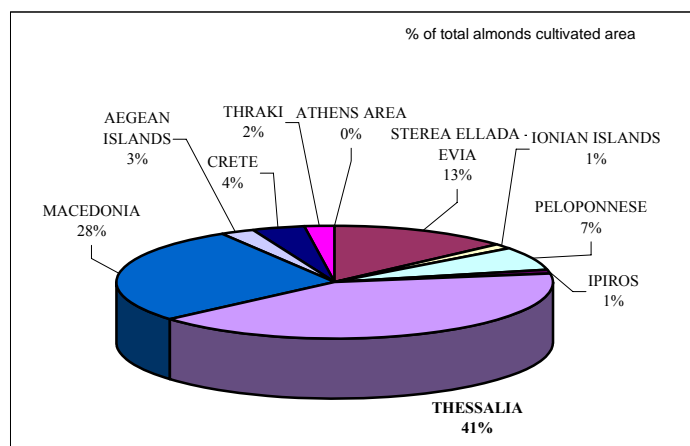
Source: National Statistical Service of Greece

**Chart 38 : Peaches orchards areas, per region, in 2001**



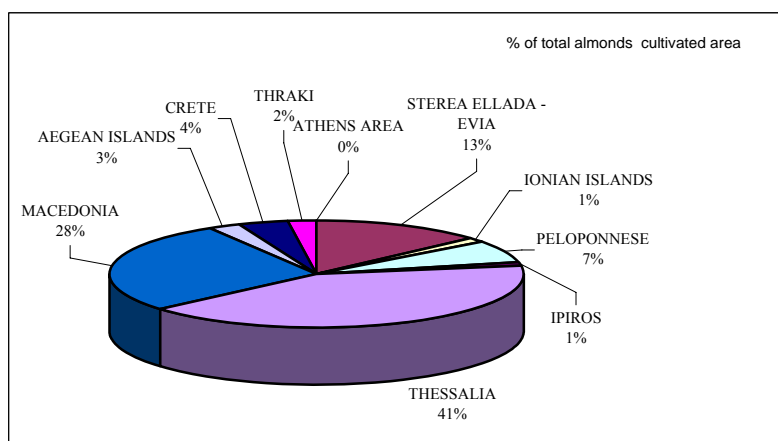
Source National Statistical Service of Greece

**Chart 39 : Almonds orchards areas, per region, in 1990**



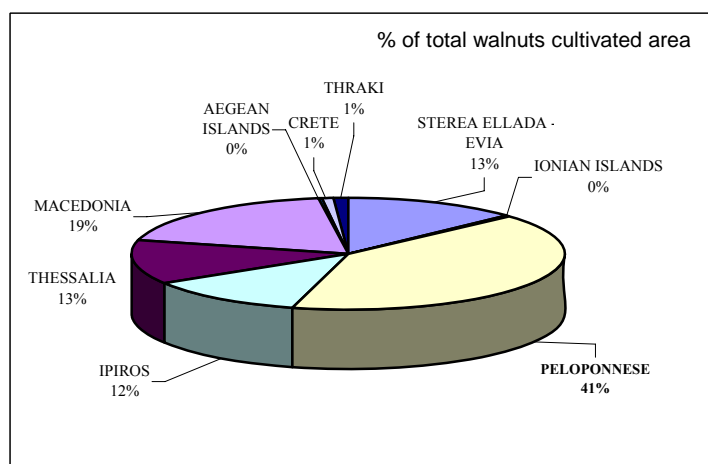
Source: National Statistical Service of Greece

**Chart 40 : Almonds orchards areas, per region, in 2001**



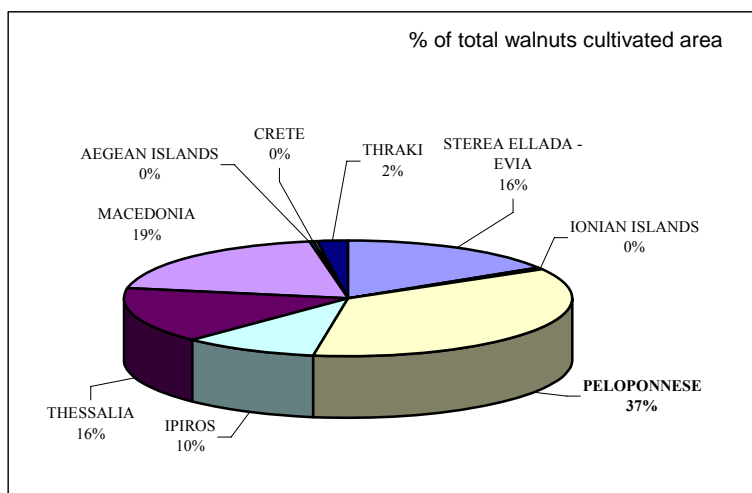
Source: National Statistical Service of Greece

**Chart 41 : Walnuts orchards areas, per region, in 1990**



Source: National Statistical Service of Greece

**Chart 42 : Walnuts orchards areas, per region, in 2001**



Source: National Statistical Service of Greece