

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

ANNEXE 19 : OCM VIN ETUDE NATIONALE ITALIE et ETUDE DE CAS SICILIA

Novembre 2005



<p>OCM VIN ETUDE NATIONALE ITALIE</p>

Novembre 2005

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GLOSSARY

AEM - Agro-Environmental Measures

AEMBAC - Definition of a common European analytical framework for the development of local agri-environmental programmes for biodiversity and landscape conservation (Fifth framework programme 1998-2002)

AFDRS Agriculture and Forests Department of Sicilia Region

AGEA - National Agency for Payment in Agriculture

APAT - Agenzia per la Protezione dell'Ambiente e per i Servizi tecnici

CCIAA Chamber of Commerce

CMO common market organization

CM.RCM Concentrated and rectified must

COD: Controlled Origin Denomination

CRPV Centro ricerche produzioni vegetali - Regional research institute of Emilia Romagna

ESA Environmental Sensitive Areas (north East part of Italy)

GAP- Good Agriculture Practices

LEDRS: Land and Environment Department of Regione Sicilia

ICRF ispettorato centrale repressione e frodi

IPM Integrated Pest Management

INEA - Istituto Nazionale Economia Agraria

ISMEA - Servizio per il Mercato Agricolo Alimentare

ISTAT - Istituto Nazionale di Statistica

OF- operational funding

OP operational program of the POs

PO- producers' organisation

MiPAF- Ministry of Agriculture and Forestry

RDP- Rural Development Plans

RDI -Regulated Deficit Irrigation

SIAN- Sistema Informativo Agricolo Nazionale

SINAB- Sistema di informazione nazionale sull'agricoltura biologica

RDP - Rural Development Programme,

TA: technical assistance

TGI: Typical Geographical Indication

VQPRD: Quality wines produced in specified Regions

1. CONTEXT OF WINE PRODUCTION IN ITALY

1.1. Main characteristics of wine production in Italy

1.1.1. Evolution of the vineyards area - 1990 to 2003

According to ISTAT census data, in 2000 in Italy total vineyards area was 675.579 ha. Sicilia (49%), Puglia (10%) and Veneto (8%) are the most important vine regions, in terms of vineyards area.

In Italy wine growing has a clear dual structure: on one side, quality wine and on the other side, table wine. The two sectors have had totally different evolutionary patterns, as the following table shows:

Table 1 : Evolution of the vineyards area (Ha)

	III Census 1982	IV Census 1990	V Census 2000
	Vineyards Area (Ha)	Vineyards Area (Ha)	Vineyards Area (Ha)
VPQRD wines	209.794	190.852	233.522
table wines	853.536	671.535	442.057
total vines	1.063.330	862 387	675.579

Source: ISTAT Census (1982, 1990, 2000)

Starting from 1982 up to 2000 vineyards area in Italy has decreased in a remarkable way. However, this trend is composed of about halving of the table wine grape area and a slight increase of VPQRD wine grape area.

When looking at the evolution of vineyards area at regional level, one can see that the trend to decrease has been very different from region to region. In general, southern regions have decreased their vineyard area much more than northern regions.

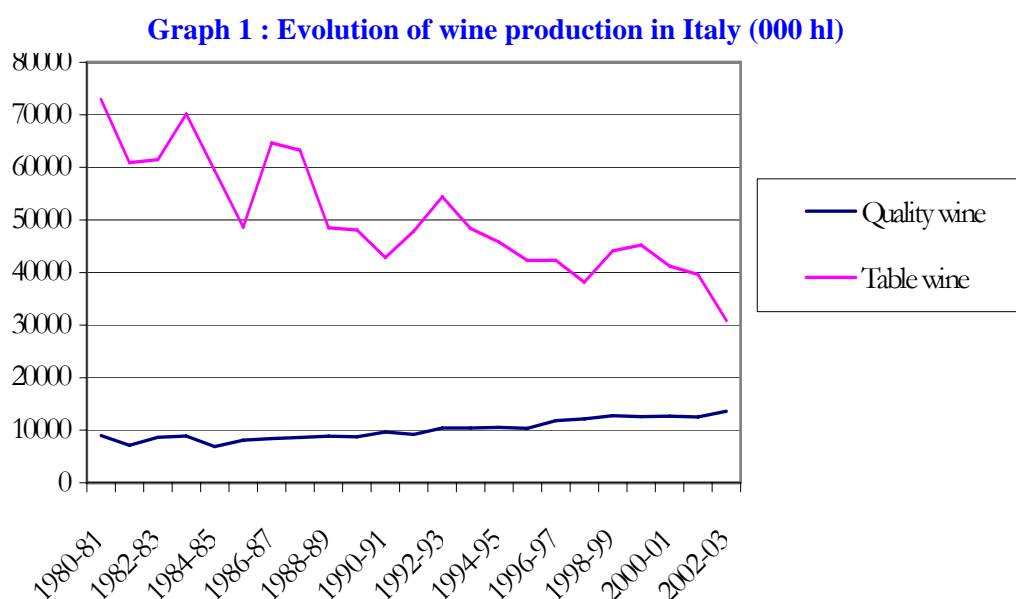
Table 2 Rate of change of the vineyards area, by region (%)

Region	2000/1990
Liguria	-56%
Lazio	-49%
Sardegna	-45%
Calabria	-41%
Puglia	-35%
Basilicata	-33%
Molise	-28%
Sicilia	-27%
Valle d'Aosta	-26%
Marche	-26%
Campania	-25%
Umbria	-21%
Lombardia	-19%
Toscana	-17%
Piemonte	-14%
E.Romagna	-11%
Veneto	-9%
Friuli V.G.	-8%
Abruzzo	-3%
Trentino A.A.	1%

Source: Elaboration on ISTAT data

1.1.2. Evolution of production - 1990 to 2003, and if known by categories e.g.; table wine, vqprd, etc

Likewise to trends related to vineyards area, production has decreased of about 50% starting from 1980 up to 2003. Also in this case, we can observe a diverse trend for the quality wine sector and the table wine sector.



Source: ISTAT

Concerning the regional distribution of the wine production, in the last ten years the share of Southern Italy has decreased from 59% to 38%.

Table 3 : Evolution of wine production by macro regions (000 Hl)

	1993	1997	2000
Centre-North	3.379.044	4.361.286	4.304.452
Southern Italy	4.959.068	2.724.259	3.251.151
Italy	8.338.112	6.923.137	7.555.603
CALABRIA	136.146	114.215	91.737
SICILIA	1.325.556	1.038.004	979.643
PIEMONTE	453.227	1.325.556	420.191
TOSCANA	452.250	333.080	372.100

Source: ISTAT

As far as quality wine is concerned, though a large proportion is produced in Centre-North, the share of Southern Italy has increased from 13% to 15,6%.

Table 4 : Evolution of Italian quality-wine production (000 Hl)

	Average 1995-1997	Average 1998-2000	Average 2001
Italy	10.522	11.471	11.562
Centre-North Italy	9.158	9.891	9.761
South Italy	1.364	1.580	1.801

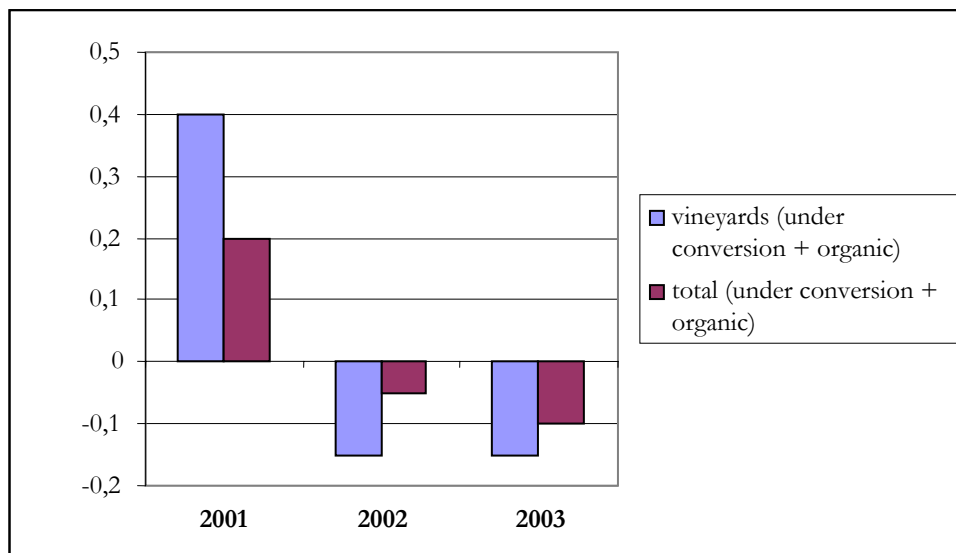
Source: Federdoc

With respect to the organic sector the organic vineyards areas is characterised by a decreasing trend, after a period of strong growth till 2001.

Table 5 Evolution of organic vineyards area (ha)

	1999	2000	2001	2002	2003
vineyards	27.590	31.249	44.175	37.380	31.709

Source: SINAB

Graph 2 : Evolution of the organic areas (% on the previous year)

Source: Mipaf data

1.1.3. Evolution of the irrigated areas

Irrigated vineyard areas have increased from 159.177 ha in 1982 (about 18%) to 182.694 (about 27%) in 2000.

Table 6 : Evolution of irrigated areas (ha)

	Irrigated area 1982	Irrigated area 1990	Irrigated area 2000
vineyards	159.177,35	162.391,37	182.694,03

Source: ISTAT Census data (1982-1990-2000)

In order to look into the trend of the vineyards irrigated areas by region, we refer to the ISTAT data on the evolution of the specialised vine holdings adopting irrigation systems and their irrigated areas. The Italian trend of the last ten years is characterised by an increase in the irrigated areas (+9,9%). The majority of the Italian regions follow this trend, with the exception of Liguria, Toscana, Calabria where a relevant decrease has occurred.

Table 7 : Evolution of specialised vine holdings adopting irrigation systems and irrigated areas

REGIONS	Holdings (n)		Irrigated areas	
	Number	Var.% 2000/1990	ha	% 2000/1990
Trento	4322	5,7	4276,06	-4,8
Bolzano	1248	70	1280,37	49,7
Lombardia	744	-8,3	991,72	59,4
Liguria	2.020	-42,2	192,85	-34,3
Emilia-Romagna	4.179	8,8	5.951,10	50,9
Toscana	1.596	-11,5	1.303,31	-33,2
Lazio	3.853	-4,8	2.656,61	-30,3
Basilicata	1.076	36,2	759,97	-39,3
Puglia	21.473	2,9	47.344,01	9,1
Calabria	1.161	18,1	239,74	-61,9
Sicilia	9.889	-16,9	26.880,13	3,6
Sardegna	4.520	17,6	2.563,28	37,4
Italy	74.958	-0,7	121.385,02	9,9

Source: ISTAT

1.1.4. Evolution of the structure of the vineyards

The data on the evolution of the class of vineyards plantation point out that in Italy a tendency of increase of vineyards ageing has occurred: in 1982 the over 30 years were 21,5%, whereas in 2000 the percentage of the vineyards over 30 years represents more than 26%.

Table 8 : Share of vineyards area by class of age of the vineyard (%)

	1982	1990	2000
less than 3 years	5,7	4,1	6,9
3-6 years	7,7	6,9	6,4
6-10 years	11,8	11,1	9,4
10-20 years	25,9	29,1	23,6
20-30 years	15,1	22,1	27,3
more than 30 years	21,5	18,1	26,4
Total	100	100	100

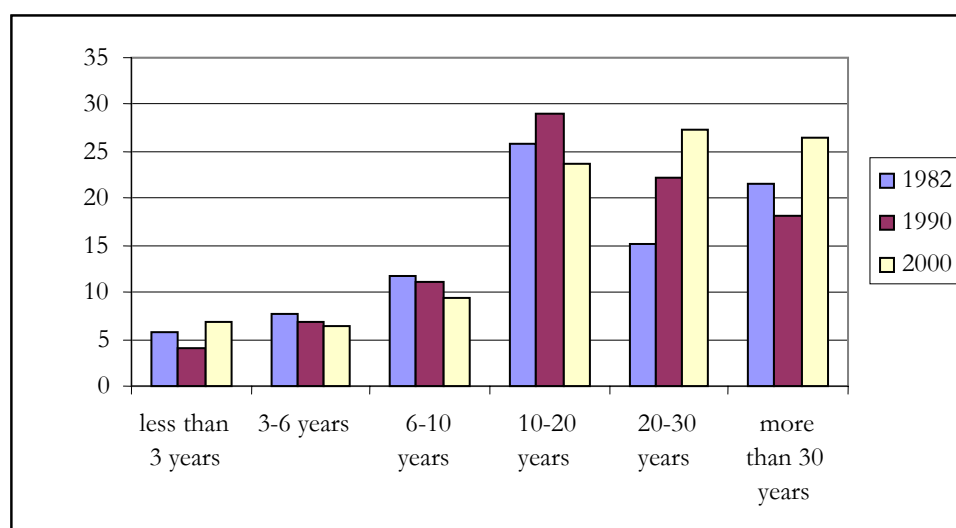
Source: ISTAT Census

Table 9 : Share of vineyards area by class of age of the vineyard (%) in 1999

Class of age	Ha	%
Total	636662,38	100
Less than 3 years	44411,9	6,98
Between 3 and 5 years	41951,45	6,59
Between 3 and 9 years	103567,5	16,27
Between 6 and 9 years	61616,05	9,68
Between 10 and 19 years	153143,56	24,05
max 20 years and over	335539,41	52,70
Between 20 and 29 years	174300,56	27,38
max 30 years and over	161238,83	25,33

Source: Eurostat

Graph 3 : Share of vineyards area by class of age of the vineyard (%)



Source: ISTAT

Besides the age of plantation, other important criteria of characterisation of the different vineyards are based on the density of plantation, the cultural practices (level of mechanisation, irrigation systems) and the richness of varieties used. As official data on these structural aspects are not available, we will refer to the model proposed by Toni (2003), based on either 'territory' or 'vine variety'.

Table 10 : Main features of the two models of vine growing in Italy

	Territory	Vine variety
Layout of the vineyard	Small vineyards in hilly areas with complex morphology	Large farms in plains or smooth hills
Varieties	A range of diverse varieties	High level of specialisation
Yields	Depend on code of practices	High
Plant density	High	Lower to allow mechanisation
Land management	Low level of mechanisation	High level of mechanisation
Irrigation	Crisis irrigation	Drip irrigation systems
Landscape	Conservation of landscape	Transformation of landscape
Regions where the model is most diffused	Toscana Piemonte Trentino Liguria	Veneto Emilia Romagna, Centre and Southern Italy

Source: Toni 2003

1.1.5. Evolution of the number of producers - 1990 to 2003

The Italian vine sector is historically characterised by a high number of farms. However, the number of farms has decreased dramatically in twenty years, as it has passed from 1,5 million farms in 1982 to 690 thousands farms in 2000. Yet this has not changed substantially the average size, as for table wine it has changed from 0,56 to 0,64 ha.

Table 11 : Evolution of the number of holdings and areas

	1982		1990		2000		Average of the holding area (ha)		
	Holdings n.	Area ha	Holdings n.	Area ha	Holding n.	Area ha	1982	1990	2000
Vqprd wines	105.019	209.794	92.590	190.852	108.711	233.522	2,00	2,06	2,15
Table wine	1.512.454	853.536	1.089.352	672.535	694.894	442.057	0,56	0,62	0,64

Source ISTAT data

According to ISTAT census data, the number of specialised farms in vine growing is much less than the total number (about 204 000 farms), with a fall of about 50% of about 30% of non-quality wine specialised farms.

Table 12 : Number of specialised farms in vine growing and relative area

	number	% change 2000/1990	Area (ha)	% change 2000/1990
Vine growing for quality wine	43756	5,2	187747	1,6
Vine growing not for quality wine	136955	-30,3	239842	- 26,2
Vine growing mixed for quality wine and non for quality wine	9119	35,6	56370	24,7
Mixed vine growing and for diverse production	14429	-50,5	46735	- 54

Source: ISTAT data

1.1.6. Evolution of the number of PO (as defined by CMO) and Interbranch organisation

The National Decree n. 228/01, modified by the National Decree. n. 99/04, in application of the Reg .(CE) n° 1493/99 art. 40 and art. 41 concerns the criteria for the recognition of the producers' organisation and the Interbranch organisations of the whole agricultural sector (except for the fruits sector).

According to the criteria for the recognition, the producers' organisation:

1. should be a joint-stock company
2. should have a minimum number of members (50)
3. should market a minimum level of production (3% of the total regional production)

In Italy, the winegrowers' co-operatives (*Cantine sociali*) are adapting to the criteria defined by the national decree, in order to be recognised as producers' organisations, whereas until now, there are still not POs or Interbranch organisations recognised as defined by the art. 41 of the Reg. 1493/99.

1.1.7. Evolution of the number of distilleries

With respect to the evolution of the total number of distilleries, census data show an increasing trend.

Table 13 : Evolution of the number of distilleries 1991-2001

	1991	2001
Piemonte	62	59
Val d'Aosta	9	8
Lombardia	77	79
Trentino alto adige	53	57
Veneto	84	83
Friuli Venezia Giulia	23	19
Liguria	11	11
Emilia Romagna	35	40
Toscana	28	31
Umbria	6	8
Marche	11	9
Lazio	13	12
Abruzzo	14	25
Molise	2	2
Campania	17	99
Puglia	22	26
Basilicata	1	2
Calabria	7	24
Sicilia	14	18
Sardegna	7	23
Total Italy	489	635

Source: ISTAT census data

Nevertheless, in Italy a considerable share of wine production is processed by co-operatives.

According to ISMEA, over the last years, in Italy the role of the winegrowers' co-operatives (*Cantine sociali*) has been mainly addressed to the distillation and the dealing with the by-products of wine. As matter of fact, during the '90s years, the majority of *Cantine Sociali* was concentrated in those regions where the production was mainly addressed to low quality wine, such Puglia, Sicilia, followed by Emilia Romagna Veneto and Piemonte..

However, starting from '90 years, the general market wine crisis together with the reduction of the European subsidies in support of the distillation process led to a progressive reduction and concentration of the number of the winegrowers' co-operatives (ISMEA).

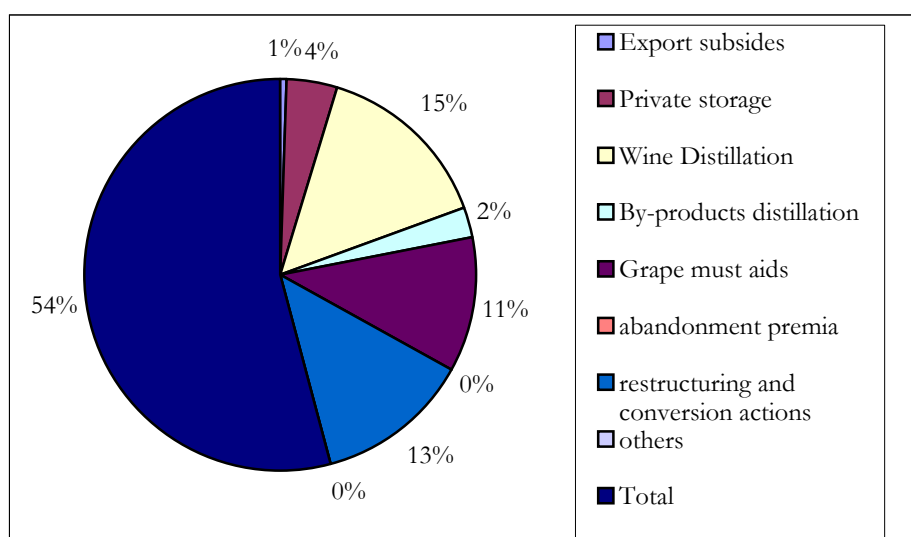
Table 14 : Evolution of winegrowers' co-operatives number

	1970-71	1980-81	1985-86	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96
Piemonte	82	67	73	67	67	67	66	60	62
Lombardia	20	17	19	18	16	15	13	13	12
Trentino A.A	41	37	38	36	32	32	32	31	30
Friuli V. Giulia	10	9	10	10	10	10	8	9	8
Veneto	56	59	61	57	62	58	55	56	62
Emilia- R.	106	109	97	86	84	83	73	76	81
Toscana	18	24	29	22	21	19	18	15	19
Umbria	9	12	13	13	13	13	12	13	13
Marche	7	31	30	26	27	24	21	21	22
Lazio	23	39	44	33	30	32	28	26	24
Abruzzo	17	37	41	36	36	38	94	34	36
Molise	0	5	6	0	0	0	0	0	4
Campania	3	5	8	0	0	0	0	0	5
Puglia	127	134	148	112	108	109	96	92	95
Basilicata	5	0	7	7	2	4	2	2	0
Calabria	10	7	7	5	6	6	6	6	7
Sicilia	63	134	148	130	121	115	77	73	90
Sardegna	38	28	35	30	27	30	24	24	23
Other Regions	1	8	8	14	14	16	15	13	9
Total	636	762	822	702	676	671	580	564	602

source: ISMEA 1999

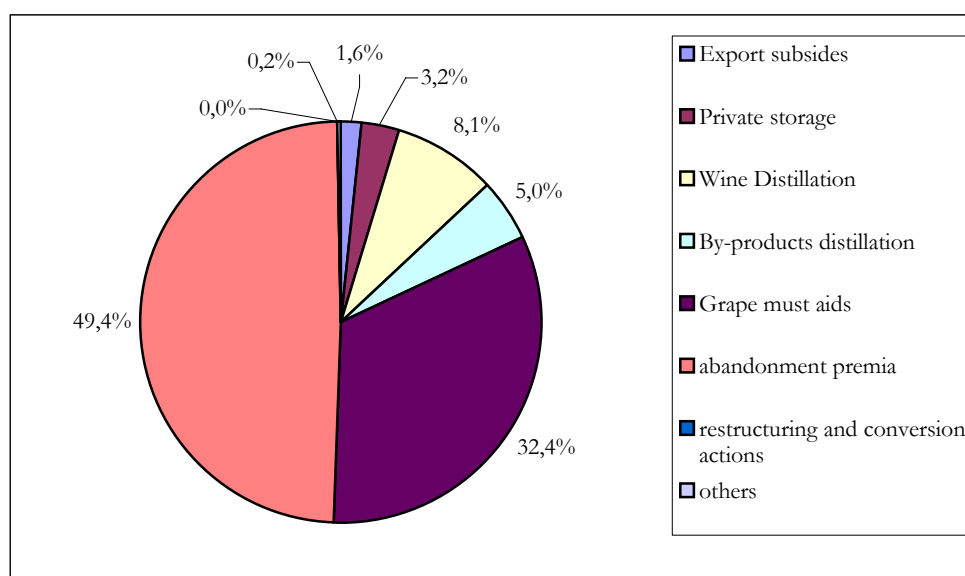
1.2. Level of implementation of the various measures of the CMO in Italy

In 2002 the total expenditure for wine CMO measures amounted to about 435 mio EUR. More than half of the expenditure was composed of aid to restructuring and conversion premia and the 32% of grape must aids.

Graph 4 : Share of CMO measure on total CMO expenditure. Year 2002

Source: INEA

In 1996 the situation was slightly different, as about half of the expenditure was represented by abandonment premia.

Graph 5 : Share of CMO measure on total CMO expenditure. Year 1996

Source: INEA

Table 15 : Expenditures of the CMO's measures (mio ECU/EUR).

	1996	1997	1998	1999	2000	2001	2002
Export subsidies	5,0	11,7	6,3	3,5	5,3	4,9	5,3
Private storage	10,1	22,3	21,0	15,9	22,2	25,9	31,9
Wine Distillation	25,2	75,5	87,2	71,8	81,4	95,9	120,2
By-products distillation	15,7	21,1	16,4	17,4	23,1	22,5	19,1
Grape must aids	101,1	107,1	69,0	106,1	114,7	84,3	90,0
Abandonment premia	153,8	103,0	1,8	2,5	0,0	-0,1	0,0
Restructuring and conversion actions	0	0	0	0	0	115,0	103,6
Others	-0,7	-0,7	0,0	-0,6	-0,2	-2,3	-0,1
Total	339,3	441,3	225,7	249,8	281,3	379,7	435,5

Source: INEA elaboration on European Commission data

1.3. Institutional framework of the wine production in Italy

1.3.1. The ministry of Agricultural policies

The Ministry of Agricultural policies (MIPAF) defines and co-ordinates the policies in the wine sector. The MIPAF is articulated into two Departments: Market policies and Agro-food product quality. Another relevant body of the ministry related to the wine sector is the inspectorate of fraud repression (ICRF).

1.3.2. The regional governments

At the moment, regional governments have competencies on: formulation and implementation of regional policy in relation to economic development, social affairs, territorial planning, and in particular to agriculture, agri-tourism activity, forests, fishing, environment, wildlife and regional protected areas, tourism, culture, education and professional training. They consequently play a central role in the policy-making process at local level, also through the dialogue and negotiation with the representatives of economic and social actors. In particular, regional government defines the Rural Development Regional Plans. Several regional governments have established their own regional Paying Agencies.

1.3.3. The local public bodies

Through the process of devolution, local public bodies (Provinces, Municipalities, other public agencies) have gained new competencies and responsibilities in planning and administration of local development. They have also

acquired a new role in creating the local system of governance together with the enterprises' system and the representatives of social actors. They play a significant role in promoting local productions and short circuits of distribution.

1.3.4. *Farmers' unions*

There are three main organisations, which in the past represented very different typologies of farms, interests, social and ideological positions: Coldiretti, until the middle of the '90s narrowly linked to the centre-catholic party and to the big economic-political power of Federconsorzi, and representing the small family farms; Confagricoltura, linked to the Right and representing the large capitalistic farms; Confederazione Italiana Agricoltori, linked to the Left and representing farm labourers and small farms.

1.3.5. *Institutions in charge of the management and payment of premiums*

The Ministerial Decree 27/7/2000 in actuation of the Reg (CE) n. 1493/99 and the Reg. 1227/00 concerning the CMO of wine. It sets the following roles:

The Ministry

- Co-ordinates the regional government policies
- Perform control tasks through its ICRF

Regional Governments

- define regional plans for distribution of abandonment premia
- define and manage regional restructuring and conversion plans
- keep the inventories of production potential
- perform control tasks
- Authorises the distillation contracts
- Authorises payments for oenological practices
- communicate all data relative to grubbing up, replanting, new planting and distillation to the Ministry and to AGEA

1.3.6. *Paying agencies*

There is one National paying agency, AGEA, and several Regional paying agencies.

Where Regional paying agencies are established they replace AGEA for payment of subsidies.

1.3.7. *Associations of Cooperatives*

Co-operatives

In Italy, the winegrowers' co-operatives (*Cantine sociali*) are adapting to the criteria defined by the national decree, in order to be recognised as producers' organisations, while at the moment there are not Interbranch organisations (as defined in art. 41 of the Council Reg. 1493/99) because of the delay in the producers' organisations recognition.

AGCI Associazione generale cooperative italiane

ANCALEGACOOP Associazione Nazionale delle Cooperative Agroalimentari aderente alla Lega delle Cooperative

CONFCOOPERATIVE

1.3.8. *Consortia*

The most important forms of organisation of producers are the Consortia for the protection of geographical names.

The consortia are grouped at national level into **FEDERDOC**, Confederazione nazionale dei consorzi volontari per la tutela delle denominazioni dei vini italiani. (http://www.vqprd.it/vqprd_ita/federdoc/federdoc.html)

1.3.9. *Producers' associations*

The National Decree n. 228/01, modified by National Decree. n. 99/04, in application of the Reg. (CE) n° 1493/99 art. 40 and art. 41 concerns the criteria for the recognition of the producers' organisation and Interbranch organisations of all agricultural sectors (except for the fruits sector).

According to the criteria for the recognition, the producers' organisation:

- should be a joint-stock company
- should have a minimum number of members (50)
- should commercialise a minimum level of production (3% of the total regional production)

Untill now, in spite of the large number of producers associations at regional and provincial level, none of them are recognised as defined by the regulations; the process of recognition is still ongoing¹.

1.3.10. Unions of producers' associations

UNAVINI: members of UNAVINI represent about 42.000 producers and 97 Cooperatives with about 3 -3,5 millions hl wine.

Confederazione Italiana della Vite e del Vino, body of Unione Italiana Vini, groups industrial wine producers and traders

1.3.11. Research and technical institutes

INEA	Istituto nazionale Economia Agraria
CRPV Centro ricerche produzioni vegetali	Regional research institute of Emilia Romagna
CORERAS Consorzio Regionale per la Ricerca Applicata e la sperimentazione	Research consortium in Sicily. Makes several studies on agriculture
CRA Consiglio per la ricerca e la sperimentazione in agricoltura	an Agency of the Ministry of agricultural policies articulated in a large number of research institutes in the agricultural sector
Istituto agrario di S. Michele all'Adige (Trento);	
Istituto Sperimentale per la Viticoltura Conegliano (Treviso);	
Istituto sperimentale enologia (Asti)	Nationally known for the quality of their research and training
ISMEA Istituto di Servizi per il Mercato Agricolo Alimentare	Provides data and analyses on marketing of agricultural products

1.4. CMO implementation context in Italy

1.4.1. The conditions of implementation of regulation 1259/99 relating to the eco-conditionality of premiums in agriculture and in particular if the payments of the wine CMO's subsidies are linked or not to any eco-conditionality rules

In Italy the payments of the wine CMO's subsidies are not linked to any eco-conditionality rules (the national decree 15 September 2000, implementing the Reg. 1259/99, does not relate to the wine sector)

1.4.2. The relationship between the Agri-environmental Measures and the vineyards.

In general, all rural development regional plans have introduced agri-environmental actions related to wine growing, both as integrated production and organic production.

Some RDPs have also introduced:

- aids to investments aimed at improving environmental impact of the farms; they have financed, among others, the restructuring of terraces and slopes (Toscana);
- specific aids to let grass (permanent grass cover) in the vineyard (Lombardia, Friuli Venezia Giulia, Emilia Romagna);

¹ Responsible of the CMO wine sector of the Ministry

- ‘protection of the space of vine growing’ (Valle d’Aosta);

1.4.3. The existence (or not) of Good Agricultural Practice (GAP) for vineyards in the AEM catalogues (if yes collection of those documents)

Each Regional Government has the task to define regional codes of practice. Operational Plans refer to Regional codes of practice to implement their environmental measures. In the following table we have reported a comparative table of the good practices for four significant regions of Italy.

Table 16 Comparative overview by relevant region

		CALABRIA	PUGLIA	LIGURIA	TOSCANA
soil management	ploughing depth when planting	>50-60 cm d	-	-	-
	ploughing depth				
	superficial soil workings		2-3 harrowing/year		
Varieties	use of certified varieties	X		X, favouring the typical varieties of the area	no OGM varieties
Fertilisation	Nitrogen maximum levels kg/ha Potassium maximum levels kg/ha Phosphorus maximum levels kg/ha	N: 120 K2O: 150 P2O5:60 (no fertilisation plans or soil analysis are suggested)	N: 120 K2O: 140 P2O5:140	The optimum level of applications should be suggested by the technical assistance (no fertilisation plans or soil analysis)	N: 70 K2O: 100 P2O5:50
Irrigation	water max levels	Only emergency irrigation	Only emergency irrigation drip irrigation suggested	Only emergency irrigation	Irrigation is allowed only during the first 4 years; then only emergency irrigation
Pest management	list of tolerated pesticides	No limitations	Cupric product mixed with ditiocarbammati and fenilammidi IBE and Sulphur	No limitations	Forbidden: sodium Arsenito and Fenoxicarb
	pest management strategy	pre-emptive calendar cure	intervention only when necessary suggested; biological pest management suggested	pre-emptive calendar cure	
	number of applications	no limitations	no limitations (normally 2 interventions)	No limitations	No limitations
plant workings		yearly pruning; residuals to be removed from the ground	no limitations	The plant working is strictly linked to the fertilisation	No limitations
Harvesting		Respecting the time of lack of phytosanitary products.	From end of September to end of October	residuals to be removed from the plants	The grapes have to be processed in 24 hours

Source: elaboration on RDPs data

1.4.4. The intermediate evaluations of the AEM / RDR measures and the evaluations relating to 2078/92 AEM in order to see if some AEM have been implemented in vineyards and their results.

The agri-environment programme 2078/92 is implemented through 21 regional detailed programmes, in which the measures are adapted to local conditions and requirements.

In general, the measures differently set up in all 21 regions, are the following:

2. low-input and organic farming;
3. extensive crop production including reducing output by reducing irrigation use and conversion of arable land;
4. extensive livestock production;

5. other environmental farming practices such as maintenance of hedges, cultivation of rare species of plant and rearing of animals in danger of extinction;
upkeep of abandoned land; long-term set aside of farmland in protected areas or water catchments areas;
6. maintenance of footpaths to encourage public access;
7. training and demonstration projects are provided in addition to training of technical advisors to assist with the implementation of the agri-environment programme.

The most important measures, which provide agro-environmental impacts through their implementation in vineyards have been the following:

- 7.1. low-input and organic farming; extensive crop production including reducing output by reducing irrigation use and conversion of arable land (measure A);
8. extensive productions (measure B);
9. other environmental farming practices such as maintenance of hedges (measure D1)

The following table shows their take up rate in Italy.

Table 17 National implementation of the measures A, B, D1 for vineyards. (1994-97)

	Area 2078 (Ha)	% on the total concerned area			
		Italy	North	Centre	South and Islands
vineyards	105.009	17,6	19,5	8,7	18,2
total	734.796	11,3	16,2	11	6,8

Source: INEA elaboration on regional and provincial data.

From the evaluation report of 2078/92 programme (INEA 1999 and DG AGRI 1999) the following remarks emerge:

10. delays in approving and launching the programmes: the implementation of the AEM has occurred mainly in mountainous and hilly areas, and it has failed in the most intensive areas;
11. increased attention among producers for the agro environmental issues, with a positive impacts on environment, in terms of decrease in pesticide and fertilizers use

2. ANSWER TO EVALUATION QUESTION

2.1. Vertical questions

2.1.1. Wine – Theme 1 : supply control

Question 1(V1). What is the environmental impact of the ban on planting new vines except in regions of growing demand ?

Detailed answer

1. Context

Starting from 1976 a vine grower cannot plant a new vineyard unless he holds a right to replant or a right to make a new planting. Until 1999, exemptions to the ban were granted only for research programs and to meet insufficient supply (decided by the European Council). Replanting rights could be allocated to vine growers that had grubbed a certain area of their vineyard or bought rights of other vine growers.

According to our respondents², the effect of these regulations have been the establishment of a market in planting rights, with a trend of transferring replanting rights from the southern regions to the Centre-North Italy. More recently, many regional governments of regions which have lost many planting rights for effect of their sale to producers of other regions, have introduced regulations to limit the transfer of replanting rights outside their boundaries in order to avoid their production potential.

The ban of new plantings has sustained a search for alternative strategies to add value to wine production. In fact, ban of new planting, in presence of a dynamic wine market, has produced at least three effects:

- increase of the price of quality wine;
- increase of the price of vineyards and of replanting rights;
- incentive to non quality wine producers to sell their replanting rights;

All these aspects led to the following facts:

- growth of area cultivated with the purpose to produce quality wine;
- reduction of area cultivated with the purpose to produce not for quality wine.

2. Impact on a holding level: practice evolution of the wine production

As the ISTAT census data show, there has been a strong reduction in vineyard area from 1982 to 2000. This trend hides two opposite trends: the first is a strong decrease in the area dedicated to table-wine production, and the second is an increase of the area dedicated to quality-wine production.

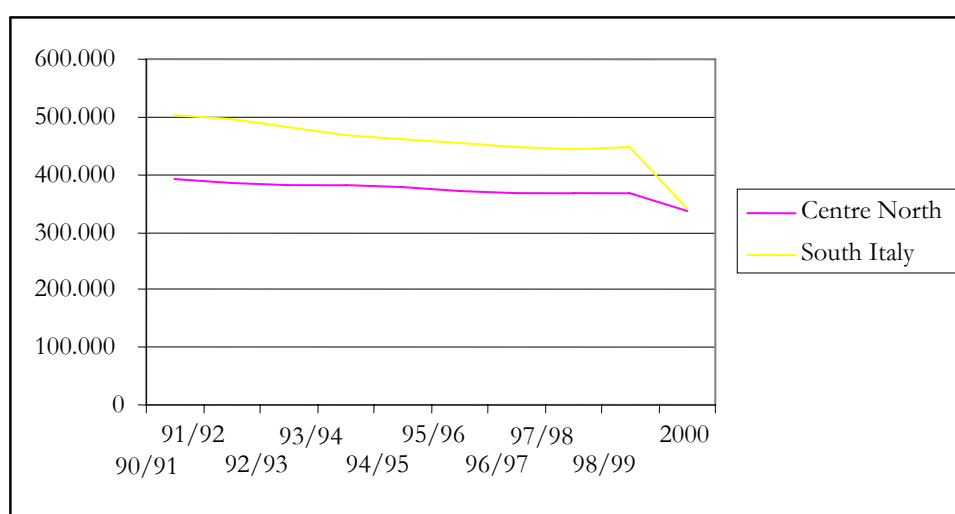
Table 18 : Evolution of the vineyards area (ha)

	III Census 1982	IV Census 1990	V Census 2000
VPQRD wines	209.794	190.852	233.522
table wines	853.536	671.535	442.057
total vines	1.063.330	862.387	675.579

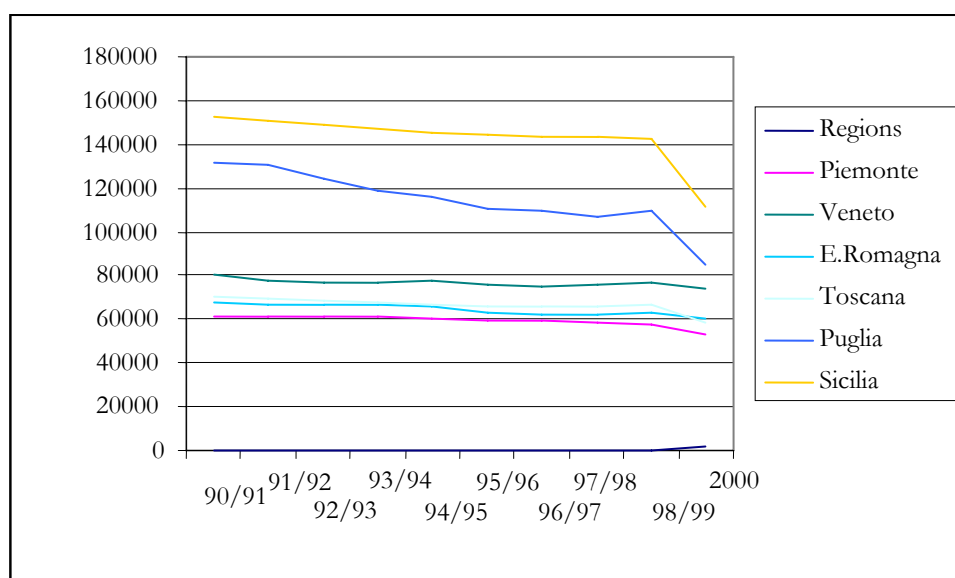
Source: ISTAT Census data (1982, 1990, 2000)

As it is largely known, quality wine in Italy is largely related to specific areas of production. As the market is strongly segmented, when certain wines undergo market growth, market forces have specific impact on some areas and limited or no effect on others. The impossibility to react rapidly to market forces has limited the pace of restructuring of areas whose wine had good market performance.

² ISMEA and INEA functionaries

Graph 6 : Evolution of the vineyard area in Italy. 1990-2000

Source: ISTAT

Graph 7 : Evolution of vineyards areas in some regions (1000 Ha)

Source: ISTAT

Another effect of the ban is a tendency of increase of ageing of the vineyards. In 1982 the over 30 years were 21,5%; in 2000 the percentage of the vineyards over 30 years represents more than 26%. These data confirm that there is a large reserve of vineyards area – mainly in marginal areas or scattered into non specialised farms - which soon could be either abandoned or replaced by new vineyards.

Table 19 : Share of vineyards area by class of age of the vineyard (%)

	2000	1990	1982
less than 3 years	6,9	4,1	5,7
3-6 years	6,4	6,9	7,7
6-10 years	9,4	11,1	11,8
10-20 years	23,6	29,1	25,9
20-30 years	27,3	22,1	15,1
more than 30 years	26,4	18,1	21,5
Total	100,0	100,0	100,0

Source: ISTAT Census

At farm level, census data show an increase in the average of the holding area for the quality wine, whereas specialised farms in table wine decrease both in number and area.

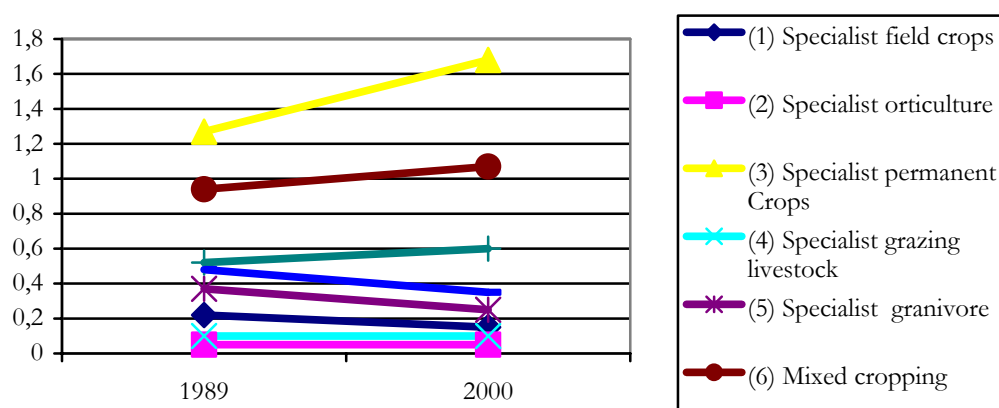
Table 20 : Number of vine growing farms, vineyard area and evolution 1990-2000. By farm specialisation

	Number	variati. % 2000-1990	Ha	variati. % 2000-1990	holding size 2000	holding size 1990
Quality wine specialised farms	44.435	5,3	187.835,11	1,6	4,2	4,4
Non quality wine specialised farms	153.431	-31,7	242.241,53	-26,4	1,6	1,5
Quality and non quality specialised farms	9.134	35,4	56.373,82	24,7	6,2	7,2
Mixed vine growing with other cultivations	14.839	-50,2	46.793,91	-54	3,2	3,2

Source: ISTAT census data

More in depth, RICA data show in many non specialised vines growing farms a reduction in average vineyard area between 1989 and 2000, whereas in specialised farms in permanent crops, the average size per farm of vineyards increases of 0,41 units.

Graph 8 : Average area (Ha) of vineyards in farms with different specialisation. 1989 and 2000



Source: RICA data

Impact on farming practices:

According to our respondents³, if we look at average data, it is apparent that a trend to agro-chemical input reduction has occurred. As quality becomes the key to good economic performance, farmers tend to rationalise the use of chemical inputs. (Di Vita 2003). In accordance with this trend we assist to an increase of the level of mechanisation, which fits better with new growing practices, such as “*doppie cortine*” e “*cordone libero*” (Intrieri, 2001).

However, the evolution on farming practices should be ascribable to the restructuring and conversion of vineyards measures (see Q2V2), whereas we can see more direct effects of the ban of planting on a regional level, as the following paragraph shows.

3. Impact on a regional level

As said before, census data show a generalised reduction in the table wine grape areas. This reduction has been largely more intense in the mountains (-59% farms and -53% area in the period 1982/2000) and in the plains than in the hills. On the contrary, quality wine grape areas have increased in hills and in the mountain and decreased in the plains.

³ University of Pisa

Table 21 : Evolution of Vineyards area- by typologies and regions (mountain, hilly and plains) (ha)

	2000		% change 1990-2000		% change 1982-2000	
	Quality wines	Table wines	Quality wines	Table wines	Quality wines	Table wines
Mountain						
Holdings (n)	16.040	117.096	14,9	-42,3	20,7	-59,3
Area	17.712	30.306	26,7	-47,5	31,5	-53,6
Hills						
Holdings (n)	70.555	401.519	18,6	-35,1	7	-52,2
Area	163.666	237.975	22,7	-35,5	16,9	-48,3
Plains						
Holdings (n)	22.210	176.376	15,5	-33,7	-13,6	-54,4
Area	52.025	173.654	19,9	-28,4	-7,3	-44,0

Source: ISTAT – Census data 2000

Also geographical distribution of vineyard areas within regions has changed. Over the time, vineyards located in marginal areas have been abandoned and a process of concentration in specialised wine districts has taken place. Tempesta (2003) has made an evaluation of the area included into the category of ‘scattered vine growing’, which is vine growing in municipalities with less than 100 ha. This category has lost vineyard areas much more than the rest during the decade between the last census surveys.

Table 22 : Evolution of geographical concentration of vineyard areas. 1990-2000 (ha)

	1990	2000	1990	2000	% 2000/1990	
	Scattered		Total		scattered	total
north	44.550	30.074	274.650	242.624	- 0,32	- 0,12
centre	80.950	18.982	166.700	122.262	- 0,77	- 0,27
south	58.050	37.728	173.200	115.278	- 0,35	- 0,33
islands	33.300	8.653	266.000	195.903	- 0,74	- 0,26

Source: Tempesta (2003) on Istat census data

Great part of the vineyard abandoned area was cultivated with traditional planting systems, which used to mix vine with other cultivation. This system has been for a long time a peculiar characteristic of Italian landscape. (Tempesta, 2003).

4 Environmental impact

The effects related to the ban on planting new vines are strongly linked to those related to the atonement premia and restructuring and conversion of vineyards measures (Miraglia, 2000). Therefore, it is difficult to assess the environmental risks which are only related to the implementation of ban on planting

With respect to the environmental risks related to the implementation of ban on planting the following points are the most relevant:

Landscape: according to Tempesta (2003), as already stated before, the less suitable areas for vineyards growing have undergone a process of marginalisation, becoming ex-agriculture landscape, semi-natural or turned into grazing land.

On the other hand, the more suitable areas have had a privileged position in the implementation of single-crop farming resulting in the loss of diversity at different levels, mainly genetic stocks and agriculture techniques. (Tempesta, 2003). However, in spite of the negative impacts related to the loss of richness in different ecosystems, the *wine-landscape* is very appreciated by citizens, as the growth of the eno-tourism phenomenon demonstrates (Barbera, 2003).

Soils : mainly in the hilly areas, the abandonment of mixed cropping brings to a reduction of the soil cover, and as a consequence to higher risks of erosion (Tempesta 2003).

Biodiversity: according to *Aembac* study, in both of the two analysed areas of Tuscany (Chianti and Maremma) the replacement of the traditional mixed cropping systems with single-crop farming results in the loss of different natural habitats.

Furthermore, on the basis of the literature, the main negative effect of vineyards specialisation is the loss of genetic biodiversity, as a consequence of the adoption of only a few numbers of varieties, which are the most demanded by the market. However, in spite of the genetic erosion phenomenon, especially in the emerging vineyards areas, we can notice a growing attention to the maintenance of autochthonous varieties (Intrieri, 2001)

Water use: the impact on water resources is a factor of risk, especially in some regions of Southern Italy, where the use of low quality water is a common practice, with several environmental risks related. Fortunately, the use of drip irrigation systems is more and more spreading in the Northern and Central regions with a positive effect on water and energy conservation. Furthermore, in the more marginal areas, the impact on the water resource is lower, as there is no economic convenience to adopt irrigation systems (Barbera, 2003).

5 Role of the CMO

According to our interviews⁴ banning of new vineyards, together with abandonment premia, has been the key factor in changing the rural landscape, as a consequence of two main factors:

- Concentration process: crop specialisation of vineyards is growing in certain regions. Basically the increase in intensive production has had different effects in different regions, bringing somehow to the geographic concentration of the specialised wine production. As it has slowed down the pace of restructuring, it can be said that the intensity of landscape change related to new planting has been tempered.
- Abandonment process: on the other hand, those areas which are less suitable to quality wine production have undergone a process of marginalisation. One example is offered by the strong decrease in vineyards an area which has occurred in Puglia. According to Miraglia (2000), in this region the negative trend is not related to the CMO implementation, but it is a consequence of the opposite market scenery. The CMO regulations have accelerated the ongoing process. As matter of fact, being caused mainly by market forces, it is quite evident that the process of would have happened also without regulation but, if not fostered, abandonment would have been much less intense and expansion of quality wine much faster.

6 Results from the Sicily case study

The researchers stated that the ban's removal would probably allow the plantation of grape trees on marginal areas, where the permanent crop would play a role of soil protection, and this would represent an environmental improvement since such areas are presently neglected or even abandoned. However, according to other respondents, marginal areas were the first to be uprooted between 1988/89 and 1995/96, when the corresponding CMO measure was in force, due to their low profitability.

7 Conclusion

During the period in which banning has been in force, there have been the following facts:

- strong decrease in vineyard area, especially for table wine, in southern Italy and in the mountains, with a reduction mainly of traditional cultivation systems and small vineyards;
- geographical concentration of vine growing, and shift of concentration from south to north;
- vineyards ageing;

Banning of new vineyards has slowed down the pace of restructuring, which would have happened more intensively without the ban. As wine is subject to cyclical crisis, certain rigidity is beneficial both to the sector and to the environment, as it reduces the impact of cyclical fluctuations.

⁴ INEA

Question 2 (VI) : What is the environmental impact of the by-products distillation mechanism, and other market measures like aid for the use of concentrated grape must ?

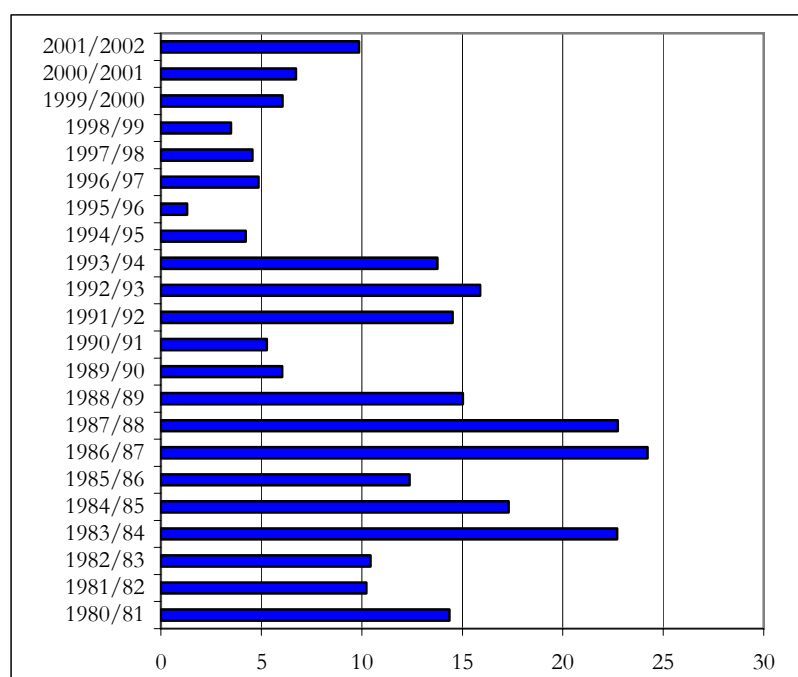
Distillation measures are the following:

By product distillation	art 35 822/87 and art 27 1493/99
Preventive distillation	article 38 822/1987
Support distillation	article 41 822/1987
Distillation for potable alcohol	art 29 1493/99
Crisis distillation	art 30 1493/99
Dual purpose wines distillation	art 36 822/87 art 28 1493/99
Effective compulsory distillation	art 39 822/87

1. Evolution of distilleries and the quantity of distilled wine and by-products

With respect to the evolution of the number of distilleries, the census data show an increasing trend (see 1.7). Nevertheless, in Italy a considerable share of wine production is processed by co-operatives. According to ISMEA, over the last years, in Italy the role of the winegrowers' co-operatives (*Cantine sociali*) has been mainly addressed to the distillation and the dealing with the by-products of wine. As matter of fact, during the '90s years, the majority of *Cantine Sociali* was concentrated in those regions where the production was mainly addressed to low quality wine, such Puglia, Sicilia, followed by Emilia Romagna Veneto and Piemonte. However, starting from '90 years, the general market wine crisis together with the reduction of the European subsidies in support of the distillation process led to a progressive reduction and concentration of the number of the winegrowers' co-operatives (ISMEA). The evolution of volumes of distillation, even though influenced by weather trends and consequent level of production shows a general decrease since the beginning of the 90s up to 1999. Apparently, the reform has given a new impulse to distillation, as data reveal a trend to grow in the last years.

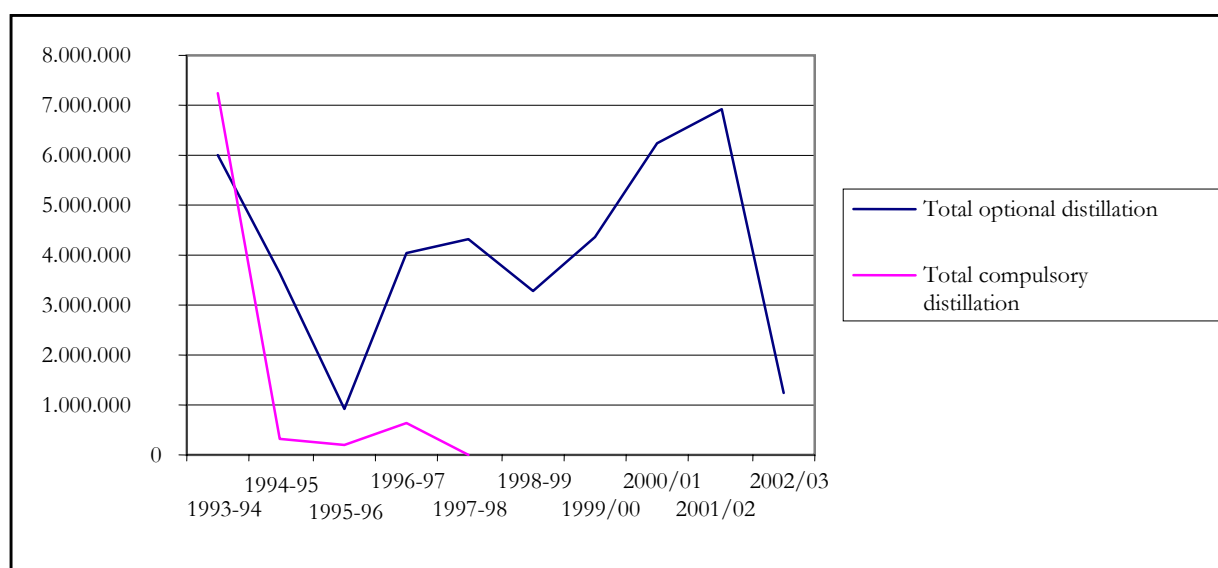
Graph 9 : Distilled wine in Italy (1000hL)



Source: Coreras

A breakdown of distillation volumes show that until the reform preventive distillation was by and large the most important modality of distillation. Starting from 1999, crisis distillation has started to become very important, and in 2001/2002 it overcomes by product distillation for importance.

The voluntary delivering of wine to the distillation process is a practice mostly diffuse in the South Italy.

Graph 10 : Distillation volumes 1993-2003 (hL)

Source: Ismea on Agea data

Table 23 : Breakdown of distillation volumes (hL)

	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999/00	2000/01	2001/02	2002/03
Preventive distillation	4.382.000	3.638.000	916.000	3.937.000	4.328.401	3.285.619	4.356.855			
Support distillation	1.633.000			85.400						
Distillation for alcohol (1493/99)								4.917.215	2.918.826	1.259.752
Crisis distillation								1.331.500	4.000.000	
<i>Total optional distillation</i>	6.015.000	3.638.000	916.000	4.022.400	4.328.401	3.285.619	4.356.855	6.248.715	6.918.826	1.259.752
Dual purpose wines distillation	1.435.000	333.500	185.000	630.150	384					
Effective compulsory distillation	5.805.000									
<i>Total compulsory distillation</i>	7.240.000	333.500	185.000	630.150	384					
Total distillation	13.255.000	3.971.500	1.101.000	4.652.550	4.328.785	3.285.619	4.356.855	6.248.715	6.918.826	1.259.752

Source: ISMEA

The majority of distillation activities is concentrated in three regions (Emilia Romagna, Umbria and Sicilia), where wines come also from other regions, confirming the previous data on the concentration of the wine co-operatives.

Table 24 : Distillation volumes by region (Hl)

	2000/01		2001/02		2002/03	
Emilia- R.	3097,431	52,3	3124,426	45,9	755,898	60,3
Umbria	169,089	2,9	499,903	7,3	19,059	1,5
Sicilia	2205,279	37,2	2356,514	34,6	452,818	36,1
Others	456,126	7,7	832,114	12,2	25,076	2,0
Total	5927,925	100,0	6812,957	100,0	1252,851	100,0

Source: ISMEA

2. Treatments

In Italy, distillation of the cellar's by-products (marc and dreg) is mandatory. All the by-products have to be sent to the distillery, after signing a withdrawal contract under strict control of the RSRFWS (U.O. 29, Service V, AFDRS). As matter of fact, according to the Reg. EC 1493/99 and to the Reg. EC 1623/2000 the over pressing of grapes, and the pressing of wine lees is outlawed. All wine-producers who produce more than 25 hl of wine must deliver for distillation all the by-products of the wine processing, whereas the wine producers who produce less than 60 hl have to submit the products, which have particularly chemical characteristics, to a withdrawal under the supervision of the ICRF.

According to the rules laid down by Italian authorities,

- dregs should be withdrawn in 20 days from the end of harvesting;
- "lies" should be withdrawn in 30 days from the transformation process
- waste waters should be collected in tanks and then, conferred to a dump or submitted to a process of plants-purification in order to obtain usable water. (Lante, Crapisi, Lomolino and Spettoli, 2001; Villimburgo, 2003)

The by-products of the distillation process, and therefore their environmental impacts are quite different, depending on the specific technologies used. The following table, elaborated by ONV and APAT in 1999, shows the by-products of distillation and their rate on the raw materials (100 Kg of grapes processed):

Table 25 : By products of grape distillation

	Products	Amount
Inputs of distillation process for 100 Kg of grapes processed	Dregs	10,9 Kg
	Grapes	0.7 Kg
	Wine of pressing	5 Kg
	Lies	3,4 Kg
Outputs of distillation processing	Waste materials from packaging	0.01 Kg
	Industrial products	0,3 Kg
	Seeds	2,2 Kg
	Alcoholics solutions for the industry	0.8 Kg
	Mud	0,6 Kg
	Expended dregs	4,6 Kg
	Alcoholics beverage	2,5 Dm ³

Source: APAT 1999

As the distillation activity is quite concentrated in few regions and in few distillation plants, obligatory distillation of by products may displace and concentrate pollution. However, new technologies are improving the environmental impact of the process, as many processing units apply to environment certification schemes (see 3Q2).

According to technical articles we observe that oenological industry has high energy consumption concentrated in shorts periods (harvest) and lower requirement to refrigerate the grape must and to bottle the final product. More in depth, average consumptions are about 4-5 kWh/hl for the first processing steps, where the highest consumption is related to the use of the refrigerators systems in order to stabilize the grape and the wine. In addition, there is the consumption for preserving the wine, which is 0,05-0,06 kWh/day/hl, with peaks of 1,5 KW (Piemonte Region Government document).

According to our respondents, modern technologies may reduce the energy consumptions:

- new machines and technologies with low energy consumption per unit of product processed, such as use of vacuum filters instead of ceramic ones; use of floating systems instead of centrifuge ones;
- insulation of the tanks
- system with a warm accumulation in order to reduce the peaks of energy consumptions

With reference to the level of implementation of the above described environmental friendly techniques our interviews state that they are implemented only by few big co-operatives such as “Caviro” Cevico, Riunite, Civ&Civ distilleries which are mainly concentrated in Emilia Romagna, whereas the majority of the other farms do not adopt any specific treatments of spreading/spilling or specific rules in order to reduce the environmental impacts of the processing phases.

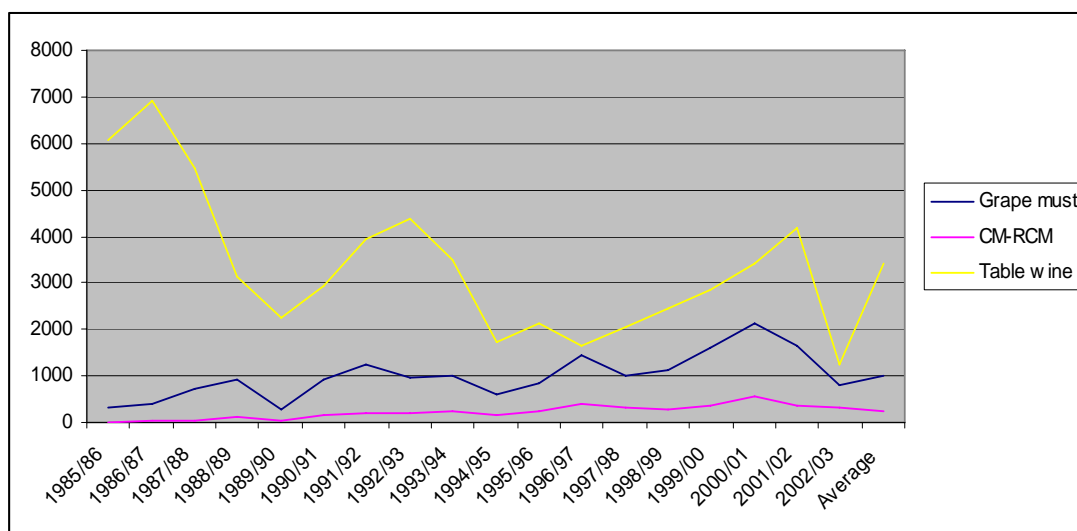
3. Aid for private storage and production of grape must

ISMEA data on the private storage show:

- a trend to decrease for the aid to table wine storage;
- a trend to increase for the aid to grape must and rectified grape must.

The most interested regions to storage aids are Emilia Romagna, Sicilia and Veneto.

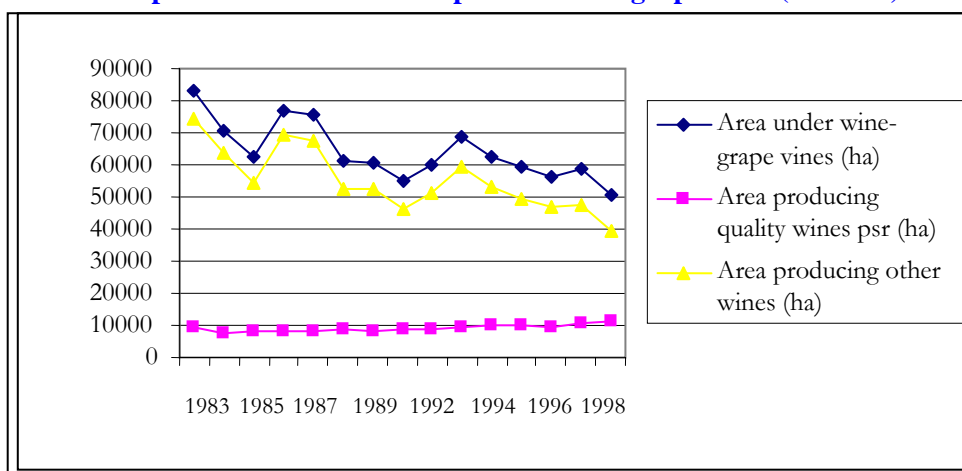
Graph 11 : Aids for private storage by different category: table wine, grape must and ratified grape must (100hL)



Source: DG Agriculture

With respect to the production of grape must, the following graph shows the trend at national level:

Graph 12 : Evolution of the production of grape must (1000 hL)



Source :Eurostat

As already said before, the importance of quality wine production is increasing. This production is connected with higher quality standards and limitations on yields per hectare, which are always much lower than the production

potential of the vineyards. Irrigation is only partially allowed, therefore the quantity and quality risk is reduced. So the temptation for over-pressing grapes is much reduced in comparison with former times; it is easy to harvest enough to produce the allowed production quantity without over-pressing.

According to DG AGRI data, the main producer regions of grape must are Emilia Romagna, Puglia, Veneto and Sicilia, as the following table shows.

Table 26 : Main producers and storing regions of grape musts in Italy

Product	Main producer regions (average wine percentage on the total national production during the period 1997/98-2002/03)	Main regions that recur to private storage aid (average wine percentage on the total national production during the period 1997/98-2002/03)
Table wine	Puglia 22% Sicilia 19% Emilia Romagna 19% Veneto 15%	Sicilia 30% Emilia Romagna 19% Puglia 18% Lazio 15%
Grape must	n.a.	Sicilia 64% Puglia 15% Emilia Romagna 10% Veneto 4%
Concentrated grape must	Emilia Romagna 52% Puglia 23% Veneto 14% Sicilia 6%	Emilia Romagna 53% Veneto 19% Sicilia 10% Puglia 9%
Rectified concentrated grape must	Emilia Romagna 46% Sicilia 18% Lazio 10% Puglia 5%	Emilia Romagna 60% Sicilia 13% Veneto 13%

Source DG AGRI

The aid for private storage measure should be evaluated under the environmental point of view mainly on the light of the following issues:

- additional energy costs necessary to store wine;
- additional energy costs related to transportation;
- incentive that storage of wine could give to maintaining a certain level of production.

According to our interviews, the grape must is in large part processed into concentrated (water content diminution) and concentrated rectified (water content diminution and removal of anions/cations) must mainly by recognised factories in the southern regions; a minor part is processed by factories of centre-north part of Italy.

Results from Sicily case study

Wine distillation has been always playing an important role in the economy of the Sicilian wine sector:

Table 27 : Wine volumes destined to distillation in Sicily

year	Sicily (hl)	% on Sicilian wine total production	Sicily on Italy distillation %
1985/86	4.163.148	39,7	26
1986/87	4.360.066	35,5	21
1987/88	4.474.039	37,6	21
1988/89	3.232.478	36,0	22
1989/90	1.291.864	13,8	24
1990/91	1.412.211	18,3	26
1991/92	4.351.269	42,9	33
1992/93	3.528.070	30,2	24
1993/94	2.745.338	27,1	23
1994/95	751.150	8,1	21
1995/96	604.427	5,8	65
1996/97	1.139.020	12,6	28
1997/98	1.825.443	22,6	42
1998/99	1.643.363	17,9	50
1999/00	1.639.695	20,1	38
2000/01	1.868.097	26,3	37

Source: CORERAS on ISTAT

The large cooperatives social cellars, characterized by massive production of low quality wines, have been largely applying to the “*optional distillation*”, which represents each year the 12-15% of their total wine production. As confirmed by cooperatives leaders, over the last 5 years the CMO aid for distilled wine has been higher than the market price of the wine itself, making distillation much profitable than the sale of the wine.

Distances between the cellars and the distilleries range from 10 to 50 km at most, so not representing a problem under environmental terms.

As reported by the interviewed actors, cellar’s by-products are transferred to the distillery after 7-10 days of their production, on the average. Legs are distinguished in liquid and solid ones. The distillery also arranges the extraction of tartaric acid and separation of grape seeds that in turn will be processed elsewhere for oil production.

The distillery by-products are usually burned by the distillery itself to generate energy.

To this regard, as reported by the local environmental NGO and by the concerned officials of the LEDRS, the emission of polluting smokes and smells from the distilleries activity has been a focus problem in Sicily for several years, especially when big plans are concerned where massive amounts of by-products are continuously processed. Such pollution problems, that are not properly tackled by the management since state-of-the-art technologies for the disposal are not being adopted, easily turn into street protests by the local citizens, supported by the environmental NGOs: this, in some circumstances, led to the temporary sequestration of (part of) the plan by the judicial Authority, with consequential social discomfort.

Therefore, many producers definitely maximized grape production through intensification (the higher the produced wine quantity, the higher the eligible amount for distillation), aiming at getting the highest yield, without interest in quality: this in part may explain the high spreading of the white berry high-producing cultivars, as Trebbiano, Catarratto, etc., bred with the “*tendone*” system and requiring high inputs.

Under this aspect, therefore, the respondents agree that the CMO measure on wine distillation could have encouraged producers in increasing to use of inputs to boost production, with likely negative effects on the water/soil/biodiversity quality.

Grape must production :

In Sicily the production of grape must, plays a key role in the regional wine sector.

Table 28 : Long term contracts for wine storage in Sicily

Campaign	Table wine	Mute must	Conc. and rectified conc. must	% on national storage		
				Table wine	Mute must	Concentrated and rectified must
1990/91	776.345	654.229	15.952	26	70	9
1991/92	771.227	792.980	25.581	20	65	12
1992/93	1.516.301	429.689	21.806	35	44	11
1993/94	1.013.029	600.035	32.989	29	61	14
1994/95	551.413	289.531	8.858	32	49	6
1995/96	827.850	564.555	39.579	39	67	17
1996/97	743.456	1.000.923	68.187	28	70	17
1997/98	464.852	727.438	52.949	23	73	16
1998/99	695.747	813.964	49.223	29	81	18
1999/00	895.788	1.120.082	70.174	36	70	19
2000/01	913.721	1.210.144	93.857	29	54	58
2001/02	1.328.359	907.832	123.143	33	61	62

Source: CORERAS on ISMEA statistics

According to the interviewed sector leaders, around the 80% of the Sicilian producers of low quality wines use concentrated grape must to increase the alcohol metric volume of their wine (not more than 2 degrees): this occurs almost every year, allowing the producers to receive the corresponding CMO premium. The practice of “*enrichment*” is carried out under the control and authorization of the Regional service of repression of frauds in the wine sector.

4. Environmental impacts

With respect to the effects of the by products of the distilleries taking into account the effects of the treatments, the national framework provides that all by products have to confer to the dumps; therefore, it is difficult to assess their environmental effects and scientific publications about this issue are not available so far.

According to our interviews⁵ in general, the environmental impacts of distillation measures are related with the following aspects:

- continuous implementation of distillation measures producing industrial alcohol out of wine might be an incentive for higher yields.
- wine is transformed into alcohol with a relevant use of energy; for effect of aid to distillation, distillation from wine becomes more convenient than distillation from other sources whose environmental impact could be lower.

5. Conclusion

By product distillation has been made compulsory to avoid grapes over pressing. This has a positive impact on surpluses, at it limits their level, and on quality of wine, as over pressing is a cause of low quality.

The alternative to distillation is disposal of by-products on the soil. This can be cause of an excess of nutrients and toxic wastes in the soils and in the groundwater. However, as distillation is concentrated in fewer regions, potential of pollution can be transferred to the location of the distilleries.

However, as by products of distillation are under waste regulation, they must be processed according to specific rules. Distilleries are increasingly adopting cleaner technologies and introducing environmental certification systems, so the impact of distillation is decreasing.

We have to consider the environmental impact of storage grape must in terms of:

- energy costs of transportation
- energy costs of processing

To conclude, distillation of wine is not an efficient measure in the elimination of structural surpluses: wine which is not needed is transferred using large amounts of natural resources, such as energy, into another product, alcohol.

2.1.2. Wine – Theme 2: structural measures

Question 1 (V2) : What are the environmental effects of abandonment premia?

1. Context

Starting from 1976, the abandonment measures were applied on the basis of different EC regulations. Reg. 1442/1988 came into force in 1992, and Reg.EC 1595/96 for two years (1996/97, 1997/98). With the 1999 wine CMO reform, the system changed, with each country having annually established quotas and rules and Member States having to indicate the regions where the measure could be applied.

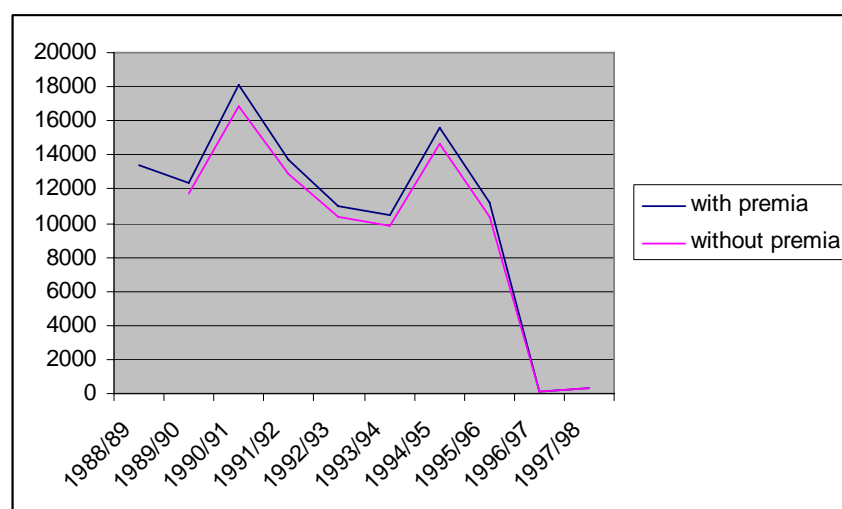
- **First period:** the level of the premium was mainly related to the varieties and to the yield average of the total area receiving the abandonment premium, and a supplementary aid was granted whenever abandonment regarded the whole vineyard area of the producer. All wine-growers with a vineyards area > 10 ha could receive the subsidies.
- **Second period:** the regulation introduced a new different criteria related to the abandonment: the possibility of grubbing up without premium, but receiving new planting rights. The regulation was aimed at changing vine varieties through planting varieties more productive and more adapted to consumers' demand and aid for abandonment is aimed at getting rid of vineyards that are no longer commercially viable.

2. Implementation

As a consequence of the abandonment premia about 106 thousands hectares have been grubbed up, mainly in Southern Italy.

Graph 13 : Evolution of grabbed up vineyard area (ha)

⁵ Ufficio Repressioni Frodi



Source: AGEA

The periods of most intense implementation of abandonment premia corresponded to the periods when the largest wine surpluses occurred, that are 1990 and 1994-95, while after 1998 this measure had a low take up (INEA 1999). Of the total grubbed up area, more than 50% has affected three southern regions (Puglia, Sicilia, Sardegna), and the most important among Centre or Northern regions for intensity of grubbing up is Tuscany, at the fifth place.

Table 29 : Share on grubbed up area with premia on the total for the most significant regions between 1988/89 and 1997/8.

	grubbed up vineyard area (ha)	share
Puglia	27.209	25.6%
Sicilia	17.264	16.2%
Sardegna	15.371	14.4%
Calabria	5.917	5.6%
Toscana	5.261	4.9%

Source AGEA

However, the trend of grubbing up is not linked only to premia. About 87 thousands hectares have been grubbed up without premia, and also in this case Puglia, Sicilia and Sardegna are those Regions that have grubbed up most.

Table 30 : Share on grubbed up area without premia on the total for the most significant regions between 1988/89 and 1997/98 (%)

Region	share
Puglia	23.5%
Sicilia	19.1%
Sardegna	14.8%
Lazio	5.63%
Calabria	5.3%
Toscana	4.3%

Source: AGEA

The analysis of the evolution of vineyard area reveals that there has been a general decrease of the area cultivated to vine, and that the most relevant reduction has affected:

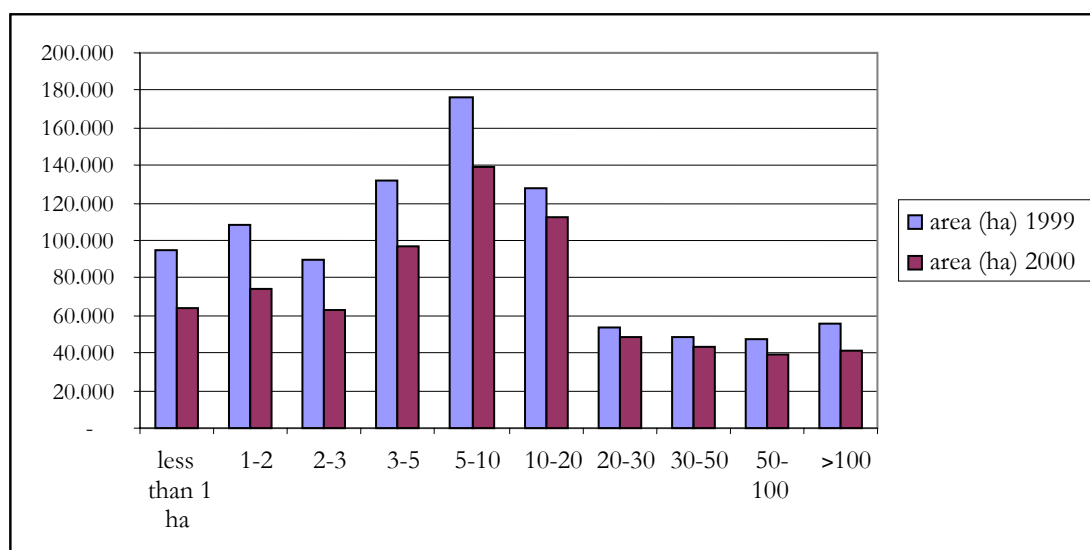
- table wine production
- southern regions
- mountain areas
- small vineyards

Census data show a generalised reduction of areas cultivated with table wine grape between 1982 and 2000. This reduction has been by far more intense in the mountains (-59% farms and -53% area in the period 1982/2000) and more in the plains than in the hills. On the contrary, quality wine grape areas have increased in hills and in the mountain and decreased in the plains.

Census data also show that the most relevant decrease of vineyard areas occurred in mountain areas, while in 20 years there has been a concentration of vine growing in the hills.

The decrease of the total vineyard-area has mainly affected traditional cultivation systems, and namely “mixed cropping” systems, peculiar of farms with small size vineyard area. (Tempesta, 2003). Istat census shows a marked intensity of the decrease in the small size vineyard groups.

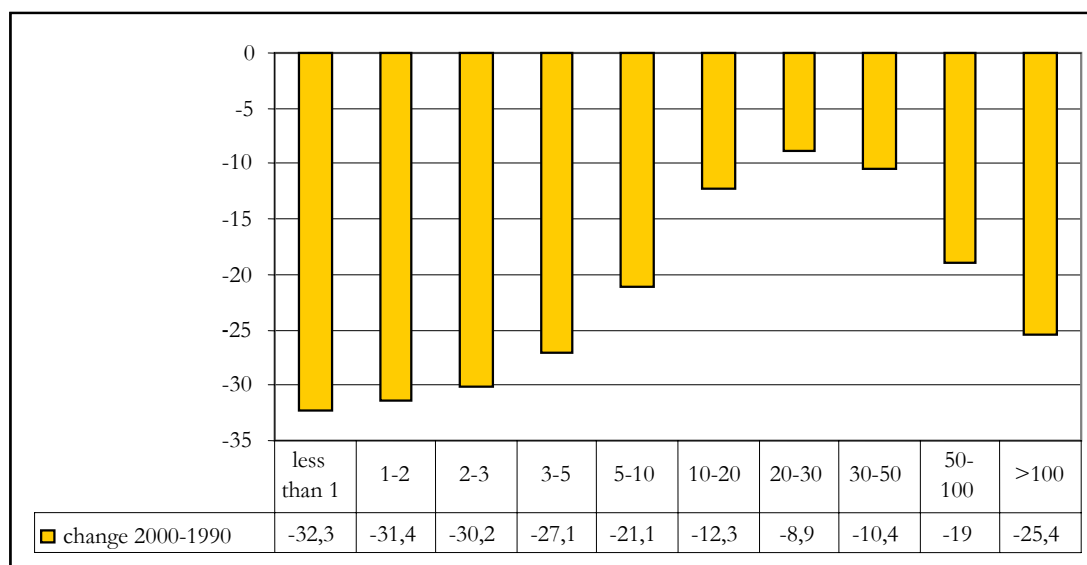
Graph 14. Evolution of the total vineyard area between 1990 and 2000. By size of vineyard.



Source: ISTAT census data

If we look at relative change, it results evident that the strongest intensity of loss has been sustained by small size vineyards (up to 3 ha). However, also vineyards above 100 ha have lost their vineyard area by 25%.

Graph 15 : Pourcentage of change of the total vineyard area between 1990 and 2000. By size of vineyard.



Source: ISTAT census data

There are no available data showing what crops have replaced abandoned vines. Tempesta (2003) hypothesises the following patterns:

- Tilled crops in the plains of Emilia and Veneto;
- Fruits in Trentino and in Romagna hills;
- Olive trees in Southern Italy

3. Environmental impacts

According to researchers⁶, as for the environmental impact of abandonment premia, it depends on a lot of variables. For example: the type of cultivation system abandoned, the crops that have replaced vines, the way these crops are cultivated, etc.

As there are no data supporting these evaluations, we can make only a general assessment, as follows:

Soils: In general, there are authors who stress the importance of mixed cropping in the traditional Italian landscape (Tempesta 2003). As matter of fact, the abandonment of mixed cropping led to a reduction in the soil coverage and, as a consequence an higher risk of erosion. (Tempesta 2003).

Biodiversity: The impact on biodiversity could have been significant. The disappearing of mixed cropping causes a loss of *refugium functions* (Aembac, 2004), and as most of the grabbed up vines were economically obsolete, a large number of local varieties ("other varieties") have been abandoned.

Table 31 Evolution of some grape variety area and their share on the total grape vines area (1000 ha)

Varieties:	1970	1982	1990	2000	Variation	Share 1982	Share 2000	Variation
Other varieties	403	388	164	210	-192,9	35,66	31,13	-4,54
primitivo n.	45	32	17	8	-37	2,94	1,19	-1,76
barbera n.	78	63	47	28,3	-49,7	5,79	4,19	-1,60
negro amaro n.	41	39	31	16,7	-24,3	3,58	2,47	-1,11
nerelli n.	17	20	19	6	-11	1,84	0,89	-0,95
merlot n.	51	49	32	25,6	-25,4	4,50	3,79	-0,71
cabernet sauvignon	1	2	3	8	7	0,18	1,19	1,00
Sangiovese	77	101	87	69,9	-7,1	9,28	10,36	1,07
trebbiano toscano	54	60	61	44,5	-9,5	5,51	6,59	1,08
montepulciano n	24	35	31	29,8	5,8	3,22	4,41	1,20
Chardonnay	3	5	9	11,8	8,8	0,46	1,75	1,29

Source: ISTAT

Pollution : The impact on pollution largely depends on whether the grubbed up land has undergone a process of intensification or not. Taking for good the hypothesis of Tempesta, it is possible to say that in Trentino and in Puglia abandonment has not brought an improvement on pollution.

It is not possible to demonstrate what would have happened without any premium for permanent abandonment, since a trend to vineyard abandonment might well have occurred even without the subsidy payments. Experts' opinions⁷ recognise that an element of dead-weight loss arises through subsidy payments for vineyards that would have been grubbed-up in any event, but cannot quantify its size.

Results from Sicily case-study

The aid for the abandonment was not linked to any environmental precautions/restrictions: it was assigned to any applicants and calculated on the last 5 years production of the vineyard to be grabbed out.

According to the interviewed professionals and researchers, in Sicily vineyards have been mostly uprooted in marginal areas (on steep slopes; bad soils, etc.) in the period 1980-2000. Actually, the abandonment interested the less productive vineyards, preserving mainly the most yielding ones, given the prevailing target of quantity of the Sicilian wine sector.

This fact had two distinct negative consequences:

1. very marginal fields were abandoned for good, thus with no protection against soil erosion and exposed to fire;
2. vineyards in marginal areas are the best ones to produce quality, but these were the first to be uprooted.

Some farmers stated that abandoned areas were cultivated with arable crops (wheat); others reported that vegetable crops and olive groves took the place of the removed vineyards. Others, finally, reported that the land was definitively abandoned: only in this case, in fact, negative environmental effects on soil conservation were emphasized by the respondents.

⁶ University of Pisa

⁷ INEA

4. Conclusion

Per se, abandonment has not a negative impact, and the net effect should be assessed together with land use change. However, there is a large consensus that the way abandonment has been managed has brought to a loss of agrobiodiversity (reduction of number of local varieties) and to a deterioration of landscape in areas where traditional systems of vine cultivation was an essential component of cultural landscapes.

Question 2 (V2) : What are the environmental effects of restructuring and conversion of vineyards (variety conversion, relocation, adoption of new production techniques) ?

1. Context

Since 1976 to 1999 vines could not be planted unless a right to replant or a right to make a new planting was held by the vine-grower. The 1999 reform made significant changes. The existing ban on new plantings has been maintained and the provisions regarding replanting rights did not significantly change. The major change was the creation of 68,000 ha of new planting rights, of which the Commission allocated 51,000 ha among the Member States for them to distribute to individual wine-growers. The 1999 reforms also reduced the use of the premium for permanent abandonment.

After 1996 new planting rights were allocated to relevant Member States for the production of quality wine psr and table wines with geographical indications. In 1999 the approach of reducing the total area was formally abandoned in favour of controlled expansion plus restructuring and varietals conversion.

The allowance of new planting rights has counterbalanced this reduction trend of the total vineyard area, giving farmers the possibility to follow the opportunities offered by a growing market.

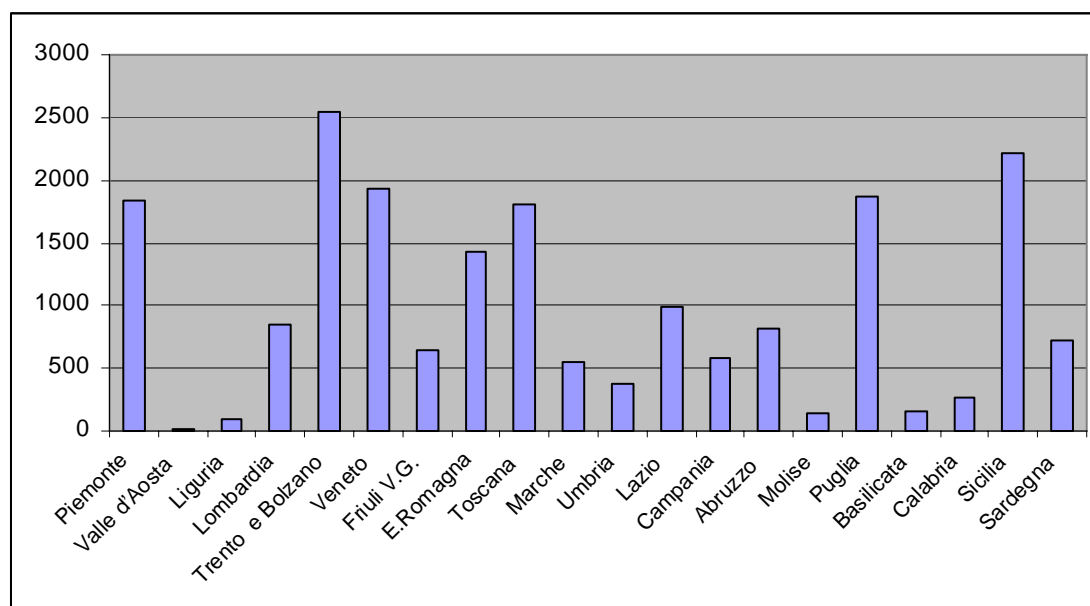
2. Implementation

According to the Reg. (CE) 1592/96 concerning years 96/97 e 97/98 and the Reg. (CE) 1627/98 for the followings years, Italy has received new planting rights (**4.884 Ha**) only for quality wine and table wine with geographical indications (TGI). According to the Agenda 2000 have been assigned additional rights for **12.993 Ha**.

New planting rights have been redistributed to Regions according to the following criteria:

- 40 % on the basis of the weight of existing VPQRD area on each region
- 60% on the basis of the weight of regional vineyard area over the national total vineyard area

Graph 16 : New planting rights distributed to Italian regions (ha)



Source: MIPAF

In Italy each regional government defines and manages the restructuring and conversion plans. The measures of restructuring and conversion are almost the same in every producing region. One of the main task of the restructuring plans is to obtain "environmental friendly" productions. Moreover a further goal is to guarantee the productions through certified methods, such as UNI ISO.

More in detail, the environmental protection should be implemented by the improvement of the cultivation management through the followings actions:

- vineyards management should be based on the integrated methods of productions
- fertilisation should be based only on the level of nutrients ablation of the plants
- permanent gross-cover systems suggested is suggested
- irrigation interventions should be done only in case of emergence.
- use only authorised vine varieties

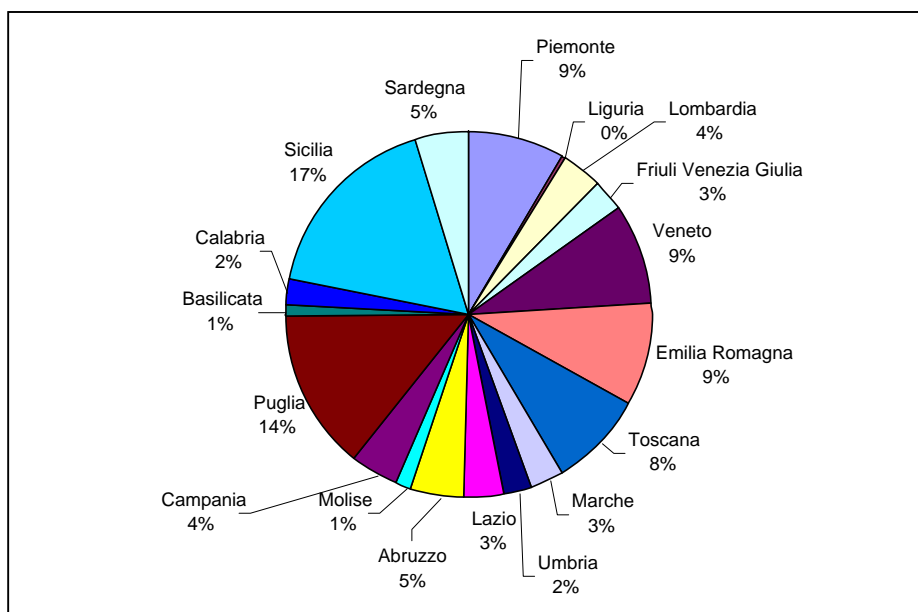
The priority criteria for the authorisation of the restructuring plans favour the vineyards which are located in the hilly areas and high quality varieties.

In order to prevent a production growth, restructuring plans have set out some rules:

- use of low vigour rootstocks (such as, 420A, 161-49, 157-11, S.O4, Kober 5BB, Paulsen)
- use of short pruning interventions which are able to reduce the productivity and increase the quality of the grapes.
- priority is given to the quality wines varieties, with low yields/ha

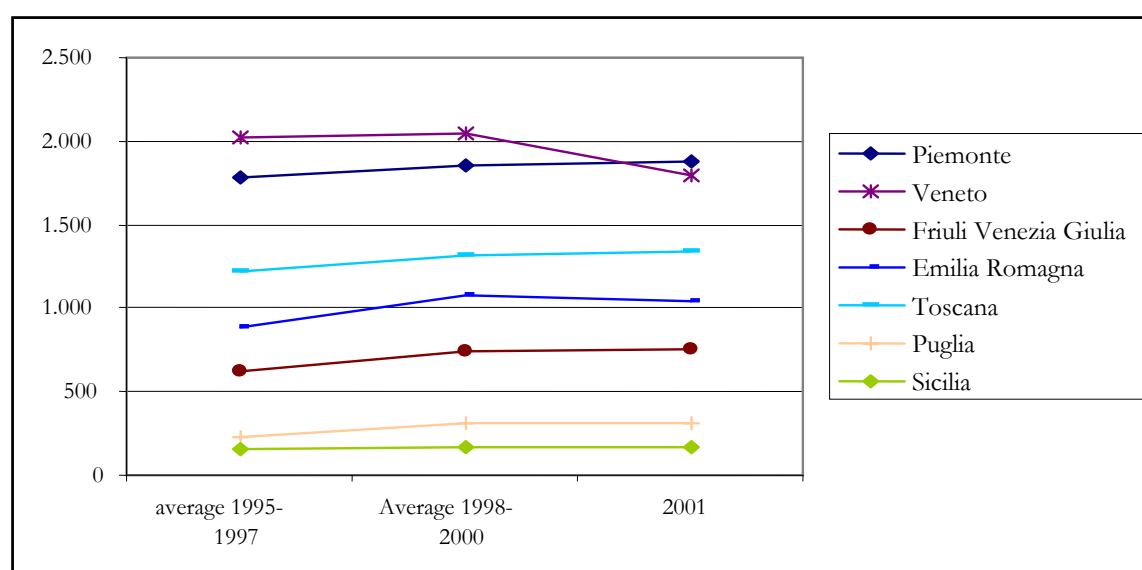
Moreover, in compliance with the Reg. (CE) 1493/99 art. 15, and Reg. (CE) 1227/2000 art. 13 all kind of intervention which lead to an increase of productive capacity is excluded by the subsidies. Therefore, in order to achieve this goal, vine growers, who want to receive the subsidies, have to declare own vineyards area and the yield average of the total area before and after the realisation of the restructuring plans.

Graph 17 : Share (%) of the restructurations and reconversion measure implementation - By region



Source DM 03/04/03

Piemonte, Emilia Romagna, Toscana, Veneto in North Italy, and Puglia and Sicilia in the South Italy have been the regions that have benefited most from restructuring aid. As a consequence, quality wine has increased. Between 1995-97 and 1998-2000. In 2001, the last year available, quality production has decreased in some regions such as Veneto and Emilia, while it has kept increasing in the other regions.

Graph 18 : Evolution of Italian quality-wine production (000 hL)

Source Federdoc

3. Environmental impacts

In order to assess the environmental impact of the restructuring of vineyards occurred in the examined period, it is necessary to make a synthetic picture of the technical characteristics of the main cultivation systems existing in Italy.

Evolution in farming practices: Toni (2003) proposes a dualist model, based on either 'territory' or 'vine variety'.

Table 32 : Main features of two models of vine growing in Italy

	Territory	Vine variety
Layout of the vineyard	Small vineyards in hilly areas with complex morphology	Large farms in plains or smooth hills
Varieties	A range of diverse varieties	High level of specialisation
Yields	Depend on code of practices	High
Plant density	High	Lower to allow mechanisation
Land management	Low level of mechanisation	High level of mechanisation
Irrigation	Crisis irrigation	Drip irrigation systems
Landscape	Conservation of landscape	Transformation of landscape
Regions where the model is most diffused	Toscana Piemonte Trentino Liguria	Veneto Emilia Romagna, Centre and Southern Italy

Restructuring has affected both the models, but in different ways. In the first model, the restructuring has proceeded along the following lines (AEMBAC 2004) :

- relocation of vineyards in more suitable areas for exposition and position to the sun; up-down ditching plantations are not rare in the steep areas.
 - Use of certified clones;
 - specialised cropping;
 - reduction of yield per plant, sometimes compensated by a higher density plantation.
 - Increased mechanisation of harvest. However, this practices has often limited by the severe slope of most soils.
- In the other areas, and especially in southern Italy, where big wine companies have purchased large vineyards, restructuring has gone along the lines of the specialised vine variety, and the main focus has been on mechanisation (Toni, 2003).

From the available data some aspects can be put into evidence.

On farming: census data show an increase of the average of the holding area for the quality wine, while specialised farms in table wine decrease both in number and surface

Table 33 : Number of specialised farms in vine growing and evolution 1990-2000

	Number	variati. % 2000-1990	Ha	variati. % 2000-1990
Quality wine specialised farms	44.435	5,3	187.835,11	1,6
Non quality wine specialised farms	153.431	-31,7	242.241,53	-26,4
Quality and non quality specialised farms	9.134	35,4	56.373,82	24,7
Mixed vine growing with other cultivations	14.839	-50,2	46.793,91	-54

Source: ISTAT

The presence of vine growing in no specialised farms decreases. RICA data show a reduction in average vineyard area in most non specialised vine growing farms, while the average size per farm of vineyards in specialised farms in permanent crops increases from 1,27 ha to 1,68 between 1989 and 2000.

Table 34 : Average area of vineyards in farms with different specialisation (ha). 1989 and 2000

	1989	2000	Variation
(1) Specialist field crops	0,22	0,15	-0,07
(2) Specialist horticulture	0,05	0,05	0
(3) Specialist permanent Crops	1,27	1,68	0,41
(4) Specialist grazing livestock	0,1	0,1	0
(5) Specialist granivore	0,37	0,25	-0,12
(6) Mixed cropping	0,94	1,07	0,13
(7) Mixed livestock	0,52	0,6	0,08
(8) Mixed crops-livestock	0,48	0,35	-0,13
TOTAL	0,73	0,84	0,11

Source: RICA data

On yields: There is no linear relation between the trend of area and that of the volume of production. Yields are directly or indirectly limited by several aspects of the European regulations (compulsory distillation discouraged high-yield production by requiring the distillation of the production in proportion to the yield, and regulations for the quality wines) and are also influenced by vine variety, the age of the vineyard, cultivation and processing practices. Yields also change between regions (due to density of plantation, share of area dedicated to quality wines as well as climatic and soil type factors). Data on yields from 1993 to 2000 have been examined in detail.

Table 35 : Evolution of Yields (tons/ha) by macro region and in some outstanding regions

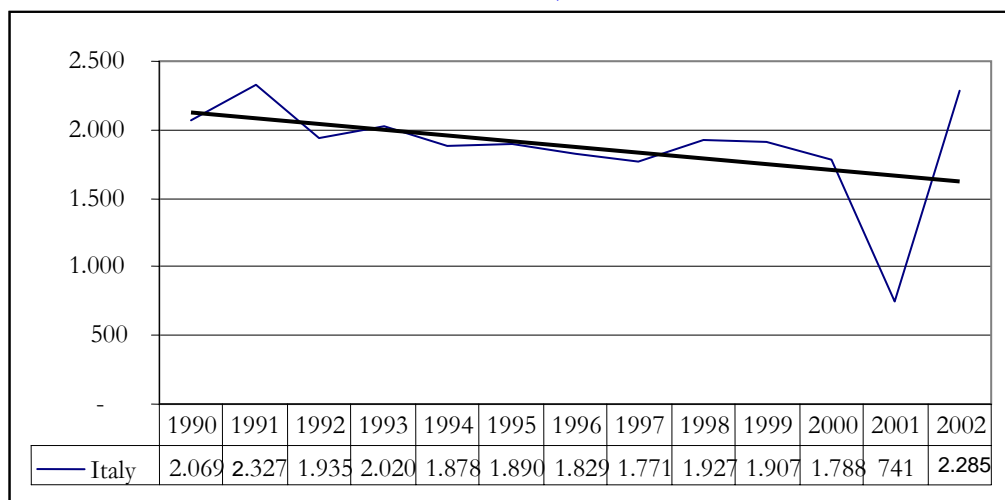
	1993	1997	2000
Centre-North	9,9	7,67	10,65
South Italy	7,2	6,53	8,17
Italy	8,9	8,64	9,42
VENETO	14	12,24	13,77
CALABRIA	5,5	4,69	3,27
SICILIA	9	7,77	7,49
PIEMONTE	7,7	7,7	7,43
TOSCANA	6,4	5,23	5,81

Source: ISTAT

Between 1993 and 2000 there has been a slight increase in yields (from 8,9 to 9,42 tons/ha grape). Trends have been calculated for three periods: during the first period (1977 to 1984), yield was on average increasing. During the second period (1990 to 1996), yield decreased by about 0.3 tons/ha. Between 1996 and 2000 yields increase about 0.78 hl/ha.

On farming practices and on the varieties choice. If we look at average data, it is apparent that a trend to input reduction has occurred. This trend can be easily explained by the trade-off between quality and quantity. As quality becomes the key to good economic performance, farmers tend to rationalise the use of chemical inputs.

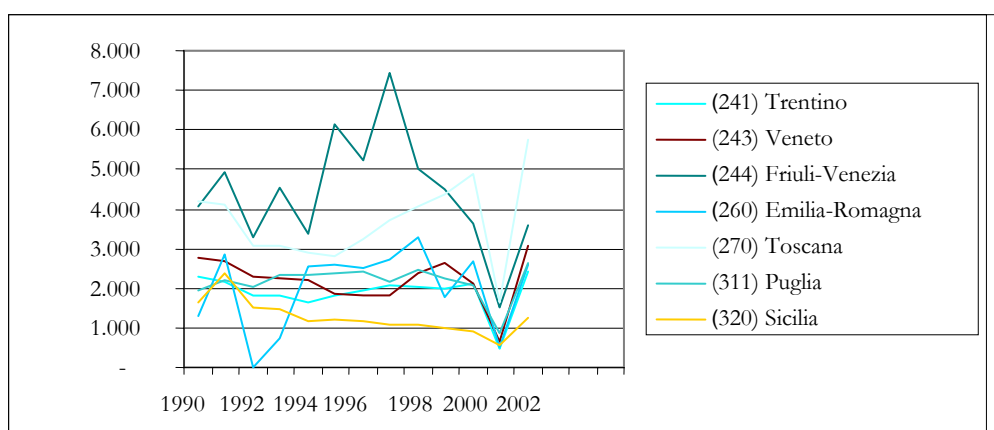
Graph 19 : Use of chemical input in specialised farms in Italy. Expenditure per ha of vineyard (constant EUR/ha)



Source: RICA data

Regional data show more or less the same trend, also if we can detect a tendency to grow until 1998 and thereafter an intense rate of decrease.

Graph 20 : Use of chemical input in specialised farms in some Italian regions. Expenditure per ha of vineyard (EUR/ha)



Source: RICA data

However, the average data can't detect possible concentration of use of pesticides and fertilisation along with spatial concentration of vine growing, and probably this is one of the effects of geographical concentration of production. Another important aspect to be considered is the evolution of varieties employed in the production process. Data show an outstanding reduction of diversity over the time. The category 'other varieties' in fact groups together a lot of local varieties cultivated in traditional systems of cultivation, and this category has lost 4,5 % share between 2000 and 1982, while some 'international' varieties, such as Chardonnay, Cabernet Sauvignon and Sangiovese have increased their share. Within white grape varieties, some as *Catarrati*, *Trebbiano*, *Malvasia* have decreased because of the tendency of consumers to prefer red wines; on the other hand, other white varieties increase because they are valorised as GTI or quality wines (DOC), such as *Pinot white* and *grey* and *Chardonnay* (Ciccarelli, 2005).

Notwithstanding the strong reduction of vineyard areas, irrigated vineyards have increased of 12,5%, from about 159 thousand ha to about 182 thousand ha, and its share on total vineyard area has grown from about 17% to 27%.

Table 36 : Evolution of irrigated vineyard area and share on total vineyard area (ha)

	1990	2000
Irrigated	159.857	182.694
Total	893.730	675.580
% share on total vineyard area	17,9	27,0

Source: ISTAT census

In order to assess the trend of the vineyards irrigated areas, we refer to the ISTAT data on the evolution of the specialised vine holdings adopting irrigation systems and their irrigated areas. The Italian trend of the last ten years is characterised by an increase in the irrigated areas (+9,9%). The majority of the Italian regions follow this trend, with the exception of Liguria, Toscana, Calabria where a relevant decrease has occurred.

Table 37 : Evolution of specialised vine holdings adopting irrigation systems and irrigated areas

REGIONS	Holdings (n)		Irrigated areas	
	Number	Var.% 2000/1990	ha	% 2000/1990
Trento	4322	5,7	4276,06	-4,8
Bolzano	1248	70	1280,37	49,7
Lombardia	744	-8,3	991,72	59,4
Liguria	2.020	-42,2	192,85	-34,3
Emilia-Romagna	4.179	8,8	5.951,10	50,9
Toscana	1.596	-11,5	1.303,31	-33,2
Lazio	3.853	-4,8	2.656,61	-30,3
Basilicata	1.076	36,2	759,97	-39,3
Puglia	21.473	2,9	47.344,01	9,1
Calabria	1.161	18,1	239,74	-61,9
Sicilia	9.889	-16,9	26.880,13	3,6
Sardegna	4.520	17,6	2.563,28	37,4
Italy	74.958	-0,7	121.385,02	9,9

Source: ISTAT

The environmental impact of the above decrypted facts can be assessed as follows:

Soil: The impact of new plantations may be strong. In fact, farmers choose the layout of the vineyard according to position and sun exposition, not to morphology, and therefore many steep slopes are chosen as loci for planting new vineyards. So far, farmers have not found alternatives to up-down ditching plantations, and this is the main cause of soil erosion. It also seems that the practice of removal of soil cover is largely diffused, also if good cultivation practices recommend grass cultivation between the rows (Aembac 2004).

At the moment, however, the permanent-grass cover system of the inter-row is a rather common practice especially in Northern Italy (in Trentino, every holdings adopt the cover crops) and it is becoming more and more diffused in the Centre and South. This practice has a positive effect on the maintenance of soil structure and it is very important in order to balance the water availability for the plants (Gily, 2005). More in depth, according to the literature, grass-covered soil in vineyards has been one of the most implemented environmentally friendly practice adopted in the more fragile areas from an environmental point of view. The permanent grass cover with natural or artificial species may be used on the whole surface or only on inter- rows, weeding planting-rows. Legumes are used as a green manure, soil cover and living mulch to improve soil properties and to enrich the soil through their rhizobial N fixation ability (Parente and Frame, 1999). Sowing specific grasses of reduced size can result in many advantages, namely, soil cover, reduced sward-tree competition for water, weed growth inhibition, possibility to make pesticide treatments in every climatic condition, enhanced sward bearing, increased organic matter soil content, increased nutrient availability and reduced soil surface temperature in summer. While grasses may cause a yield decrease, wine quality can be improved and ground water quality may be preserved in the so called Environmentally Sensitive Areas (ESAs) of the North East part of Italy (Veneto, Emilia Romangna) which are characterised by shallow soils.

Landscape: The shift to specialised vine growing has negative impacts on landscape related functions, particularly on diversity of the scenery. However, this aspect can be considered as highly subjective, as there is an increasing tourist movement related to wine and vine landscape.

Biodiversity: Crop specialisation has an impact on agri-biodiversity, as the number of cultivated varieties is reduced. Moreover, specialised fields reduce the refugium function for wild species. Refugium function is also reduced by removal of soil cover (Aembac, 2004)

Water and air pollution: If we look at regional level, there is an evident trend to input reduction (RICA data). This trend can be explained in terms of a trend to rationalisation of input use, and may not be related to specific support measures. However, it should be taken into consideration that, as spatial concentration of vine growing is taking place, there could be a tendency to localised concentration in the use of fertilisers and pesticides as well.

Scarce water resources: Definitively, irrigated vineyard areas have increased consistently. This means that restructuring of vineyards has proceeded along with a trend to consider irrigation as a helpful resource to improve cultivation systems. According to the literature, the impact of vine growing on the use of scarce water resources is not relevant, as the vineyards cultivation requires small quantities of water (5-15% of the average annual rain per hectare); the consequence is that the risk of the impoverishment of the ground water resources is limited, whether the artesian wells are not spatially concentrated (Gily, 2005). Furthermore, in the slope areas, where vineyards plantations are often located, the only way to feed the irrigation systems is through catchments areas, without affecting the use of ground waters. After 2003, when a drastic draught period seriously affects the Italian wine production. As a consequence of this fact, the meaning and the relevance of vineyards irrigation has changed: whereas once, the common irrigation systems were done by submerging fields, with the clear target of increasing in yields, at the moment, the use of drip irrigation is more and more spreading, following the new concept of *Regulated Deficit Irrigation*, with a positive effect on water and energy conservation. As matter of fact, at the basis of the RDI is the valuation of the water stress for the plant, which is estimated around 200-1000 m³ of water per year and hectare (a little bit more in Sicilia and Sardegna) (Gily, 2005). Furthermore, many experimentations and researches show that the drip irrigation systems allow to a better management of water rather than increasing the plant productivity. The new irrigation systems are characterised by higher supply efficiency (90-95%), by saving 80-90% of water in comparison with the other irrigation systems, during the first years of plantation.

Results from the Sicily case study

The overall objective of the restructuring and conversion measures is to encourage the modernization of the regional vineyard, supporting the replacement of the old cultivars, more quantity-oriented, with the more market-demanded ones, allowing to obtain good quality products, even if less productive.

Innovative cultivation methods are chiefly encouraged, fully suitable for mechanization.

For instance, the restructuring and conversion measures introduced the “re-grafting” method that was unknown in Sicily until a few years ago, allowing renovating young vineyards at lower costs than replacing the whole plant.

Most of the interviewed producers benefited by the Plan, reconverting their vineyard with international grapevines and with the autochthonous “*Nero d’Avola*”.

Professionals and researchers agreed that the innovative changes addressed by these measures, in terms of less productive vineyards for quality wines, are leading to a lower impact on the agro-environment, due to the lesser amounts of needed inputs (agro-chemicals).

However, the intense boost to mechanization brought by the Plan on one hand allows reducing production costs, but on the other hand is likely to increase soil erosion, e.g. through planting along the lines of steepest slope. Actually, the provision to apply soil management methods that enhance water harvesting has not been respected on large scale, so far. Field trials on cover crops cultivation on vineyards are being carried out by the Horticulture and the Agronomy Departments of the University of Palermo, with good outcomes (Gristina L. and Alii, 2005). However, the major part of the interviewed farmers showed a sceptical attitude toward such an innovative technique, which means that much educational/demonstrative work has still to be done.

Finally, a certain negative impact on the landscape evolution might be due to the kind of poles the use of which is highly encouraged, made up by pre-compressed cement and suitable for mechanized harvest. This kind of poles is not biodegradable and poses problems for their disposal in the mid-term.

4. Conclusion

Banning new plantations and allowing for a replanting of old vines has generated a double process of abandonment and restructuring. In fact, vine growers oriented to cultivation systems privileging non quality production were penalised by a progressive reduction of profitability of their activity, and then tended to reduce investments. This aspect is evident in the growing weight of the oldest class of vineyards.

On the other hand, the ban on new plantings increased both quality wine and vineyard prices, and in a phase of growth of the sector there has been a intense movement to invest into the quality wine sector. This has led to restructuring of old vineyards according to criteria of quality and specialisation. As quality is linked to specific areas, the resulting process has been spatial concentration of the activity.

In terms of environmental impacts, we can say that the restructuring and conversion of vineyards measures have been responsible of stimulating the crop specialisation and concentration in the more profitable areas, and in some cases (Chianti area is one of the most emblematic example) these measures brings to strong landscape changes with a consequence of negative impacts on landscape related functions, particularly on diversity of the scenery and reduction in *refugium* function for wild animal species.

2.1.3. Wine – Theme 3: Other regulatory measures and specially those for quality wines produced in specified regions

Question 1 (V3) : What are the environmental impacts of the CMO requirements for quality wines produced in specified regions? [in particular those concerning: traditional conditions of production, cultivation methods, yield per hectare and demarcation of production]

1. Context

Art. 55 of reg. 1943/99 sets that the production of quality wine in specified regions should follow the code of practices regarding the area of production, the type of vine variety, the cultivation and oenological practices, the minimum alcoholic rate, the yields per ha and the organoleptic characteristics.

At the moment, in Italy there are 331 VQPRD wines. Each of them has rules for vine cultivation and for the wine processing, according to Chap. VI of the EC Council Reg.1493/99.

Table 38 : Number of quality wines and TGI wines 2003

	Docg	Doc	Tgi
Piemonte	8	45	0
Valle d'Aosta	0	1	0
Lombardia	3	15	13
Trentino Alto Adige	0	7	4
Veneto	3	22	10
Friuli Venezia Giulia	1	9	3
Liguria	0	8	3
Emilia Romagna	1	20	11
Toscana	6	34	5
Umbria	2	11	6
Marche	0	12	1
Lazio	0	26	5
Abruzzo	1	3	9
Molise	0	3	2
Campania	3	16	9
Puglia	0	25	6
Basilicata	0	2	2
Calabria	0	12	13
Sicilia	0	19	7
Sardegna	1	19	15
Total*	29	302	118

Source: ISMEA

More in depth, the codes of practices define the following specific requirements, related to environmental issues:

- Delimitation of production areas
- Choice of wine varieties: the Code of Practices defines a list of varieties which better respond to quality standards
- Vineyards management: a higher level of mechanisation is suggested;
- Irrigation: only *crisis irrigation* is allowed
- Yields restriction: in all the regions of quality wine production the limit of yields is 7-12 tons grapes/ha and the maximum allowed rate grape/wine should be 70%. Downgrading occurs when yields get over the limited defined in the Codes of Practices.

2. Implementation

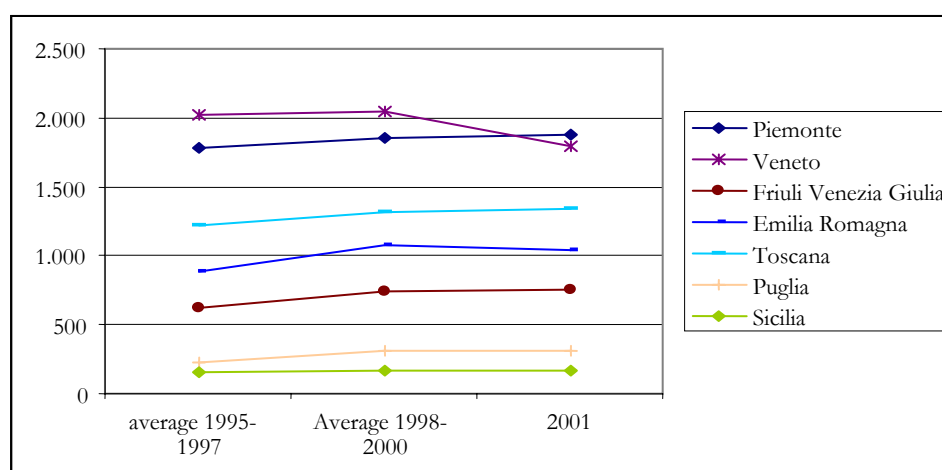
As said before, vineyard area for quality wines has grown very much in the last years.

Table 39 : Evolution of the vineyards area (ha)

	III Census 1982	IV Census 1990	V Census 2000
VPQRD wines	209.794	190.852	233.522

Source: ISTAT Census data (1982, 1990, 2000)

Graph 21 : Evolution of Italian quality-wine production (000 Hl) by region



Source Federdoc

Results from the Sicily case study

Common focus points of quality wines Code of Practices are:

- 1) The characterization of the geographical boundaries and the proportions of the cultivars participating to the specific VQPRD;
- 2) The definition of the production limits as well as the maximum allowed planting density;
- 3) Rational growing techniques, as short pruning and limited fertilization;
- 4) Rational use of irrigation, with the intention of containing the yields.

3. Environmental effects and the role of the CMO

With regards to the main effects of the implementation of the Code of Practices are the following:

Landscape changes: Mainly due to the crop specialisation in certain regions which are more suitable for quality vineyards growing and are strictly delimited in the codes of practices (Toni, 2003) and where the restructuring and conversion measures have been implemented. This fact has reduced the richness of the landscape, with decrease of its refugium function for wild animal species (Aembac, 2004).

Higher level of mechanisation: As said above, the codes of practices do not forbid mechanisation of vineyards. The higher risks of soil erosion are mainly in the hilly areas, where the use of heavy machineries in the lane brings to soil compressing and the loss of humus, which together are responsible of the deterioration of soil structure.

Limitation of the intensification phenomenon: The implementation of the codes of practices brings to a rationalisation of the external inputs, as the yields are limited and the use of irrigation is allowed only in the in case of emergency.

Genetic erosion : One of the main negative effect of the quality wine regulation, together with the implementation of restructuring measures is the loss of genetic biodiversity, since the codes of practices have fostered the adoption of only a few number of varieties, which are the most demanded by the market. As matter of fact, in the last years there has been a trend to use 'international vine varieties' like Cabernet, Merlot and Chardonnay and to dismiss local vine varieties.

Results from the case study

The above standards features have an undoubted positive effect on the agro-environment since they limit the use of the inputs, as confirmed by the farmers producing within TGI areas.

Nevertheless, such result is not intentionally wanted since it is principally tied to obtain high quality wines. In fact, provisions/recommendations on the adoption of IPM and/or sustainable fertilisation plans and/or arrangement of the ecological infrastructure for pests and diseases prevention and/or other agro-ecological measures are not part of the quality wines standards.

4. Conclusion

Code of practices for quality wines could have some impact on agri-biodiversity, as there is a tendency to reduce the number of varieties employed in the vineyards. On the contrary, as there is a recognised inverse relation between yields and quality, the expansion of vineyard areas for quality wine is a brake to intensification.

Question 2 (V3) : What is the environmental impact of the regulated oenological practices ?

1. Practices evolution

1.1 By products of the wine production

In Italy, the Reg. CE 1493/99 and the following Reg.1622/2000 concerning the Code of oenological procedures are put into effect on the basis of the DM 30 July 2003. In Italy, distillation of the cellar's by-products (marc and dreg) is mandatory. All the by-products have to be sent to the distillery, after signing a withdrawal contract under strict control of the RSRFWS (U.O. 29, Service V, AFDRS). In doing so, we will refer to the by products of the distillation process.

1.2 Treatments and assessment/control methods at national level

With respect to the treatments, as said in the 1(Q2), the quantity and quality of by-products of wine production ranges sensitively in proportion to starting materials and the typology of the effected treatment. (APAT 1997). The most common treatments in order to mitigate the negative environmental effects (already described in 1Q1) have been implemented only by some big co-operatives, such as Caviro in the North of Italy (source CAVIRO www.caviro.it)

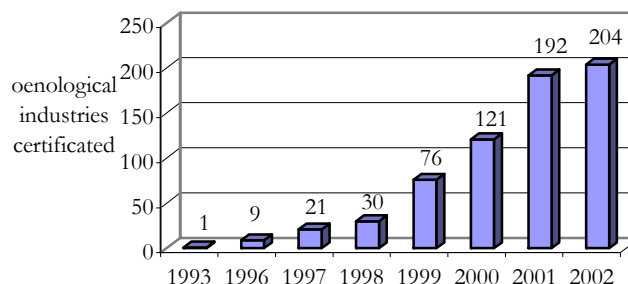
In Piemonte, there is a growing consensus on paying particular attention to the energetic consumption reduction, which is achieved through the following main strategies:

- Use of new machines and technologies (the flotation instead then centrifugation) whose energetic consumption per unit of treated product is about 60-70% less than with the conventional methods;
- Reduction in the quantity of product which is addressed to be refrigerated
- Reduction in the energetic dispersions

(www.regione.piemonte.it)

Besides the innovative treatments which are implemented at different levels, in Italy the diffusion of certification schemes within the oenological sector has occurred, as the following graph shows.

Graph 22 : Evolution of the certification schemes (ex ISO 9000) in Italy (number)



Source: Sincert data (Di Vita 2003)

Table 40 : Evolution of the certification schemes in Italy (number of factories) by region

Regions	Number of oenological industries	%
Veneto	44	21.5
Toscana	37	18.1
Piemonte	17	8.3
Emilia Romagna	16	7.8
Abruzzo	15	7.3
Sicilia	13	6.4
Campania	12	5.8
Puglia	11	5.4
Umbria, Marche	7	3.4
Lombardia	6	2.9
Calabria	5	2.5
Friuli V.G. , Lazio	4	2
Basilicata	3	1.4
Trentino A.A.	2	0.9
Sardegna	2	0.9
total	204	100

Source: Sincert data (Di Vita 2003)

Starting from the early 90's, the Italian vine growers and wine producers started to introduce Business Quality Insurance Systems by a voluntary approach to UNI EN ISO 9000, Vision 2000, Iso 14000 and EPD rules. It is not observed a significant adherence either to environmental management systems or to ISO 14000 certifications, referable to an adjustment to market measure provisions.

With respect to the assessment methods of the oenological treatments at national level, the Reg. 2729/00 sets that the authority in charge of the control activities are ICRF (*Ispettorato centrale repressioni frodi*) which belongs to the Italian military corps which has civil police duties (www.acciseonline.it organigramma funzioni ministero politiche agricole, source MIPAF).

Up to the CMO implementation, the national regulation didn't set any kind of sanctions for the breaking to the European regulations, whereas the National decree 260/2000 defines two kinds of sanctions which refers to the production of wine and to the distillation process (2002 Marengi -Vigne e vini 7,8 2002).

2. Environmental effects

The technological evolution and the adoption of more and more efficient technologies, in accordance with the indications in terms of oenological procedures have involved positive impacts on the environment (Piemonte regional government)

3. Role of the CMO

The interviewees are inclined to believe that the technological evolution is not conditioned by the community normative rule relating to the oenological procedures.

Results from Sicily case-study

Environmental certification schemes, as ISO14000 or EMAS are not currently adopted in Sicily by the cellars. The disposal of the wine making by-products is regulated by the law: cellars have their own purification plants, through which the proper disposal is carried out.

4. Conclusion

In Italy, distillation of the cellar's by-products (marc and dreg) has been mandatory. In doing so, any impacts of oenological treatments have to be linked to the impact of the distillation process as we refer to the same by products.

2.1.4. Wine – Theme 4: accompanying measures

Question 1 (V4) : Are the accompanying measures to preserve vineyards in certain regions effective in terms of a positive environmental impact ?

1. Context

The national framework does not contain any additional specific measures for the development of neither organic nor low inputs vineyards sector, which is fostered by the agro-environmental measures within the RDPs.

Table 41 : Implementation agri-environmental measures for vineyards. (1994-97)

	Area 2078 (Ha)	% on total invested surface			
		Italy	North	Centre	South and Islands
vineyards	105.009	17,6	19,5	8,7	18,2
total	734.796	11,3	16,2	11	6,8

Source: INEA elaboration on regional and provincial data.

Consumers tend to associate the level of quality to the territory from which it comes. Therefore, increasingly commercial reputation of a wine is linked to reputation of a territory. This has stimulated local administrations to encourage production practices respecting the landscape and the environment, and to develop tourist activities related to wine production.

Concerning the sensibility of the consumers towards these environmentally friendly practices, the Nonisma analysis shows that the 76% of consumers is willing to pay 10% more for a low inputs certified product, the 53% of consumers is willing to pay the 20% more, whereas the 24% is willing to pay till 50% more than a conventional one. (Nonisma on Eurisko data). According to our respondents⁸, the main bottlenecks encountered for a further spread of these methods is due to the communication difficulties to reach the final consumers.

2. Implementation

2.1 Areas of organic and integrated production crops

In 2003, in Italy there were about 31 thousand hectares of organic vineyard.

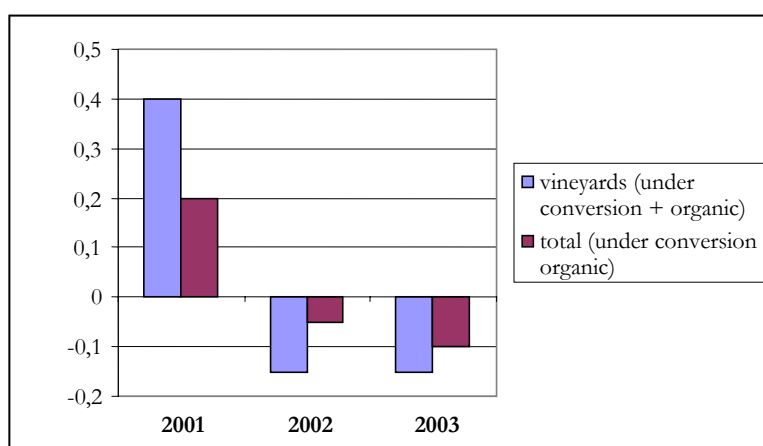
Table 42 : Evolution of organic vineyards area (ha)

	1999	2000	2001	2002	2003
vineyards	27.590	31.249	44.175	37.380	31.709

Source: SINAB

At the moment, there is a decreasing trend after a peak reached in 2001, and this negative trend is more marked compared to the other agriculture sectors:

⁸ INEA

Graph 23 : Reduction in organic areas (variation on the previous year %)

Source : Mipaf data

The main reason of this negative trend is related to the exit of many farmers who converted into organic forced by the Reg. 2078/92 subsidies. Furthermore, organic vine growing shows great difficulties in terms of technical and commercial management. One of the most important bottlenecks to the further spreading of organic wine production is related to the implementation of the Reg. (EU) 473/2002, which defines the strictly limits to the use of copper in organic vineyards.

However, organic wine suffers also of the bad reputation among consumers, as it is not considered possible to reach a high quality level of wine without using chemical inputs, and this turns into absence of premium prices.

A survey, carried out in 2005 by the *Centre Safe Crop*, a branch of the S.Michele all'Adige institute together with the Agronomic Institute of Bari shows more in depth the organic vineyards trend in two opposite rural areas: Trentino Alto Adige in the North part of Italy, and Puglia as representatives of the southern reality.

Table 43 : Organic vineyards area (ha) and production (tons) by relevant region

Region	Area (ha)	Production (t)
Trentino	9.702	114.400
Puglia	105.169	1.053.871

Source: Istat, 2004

In Puglia, starting from 2002 a remarkable decrease in organic vineyards sector has occurred; more specifically, this reduction trend involves the number of certified operators (-14,9%), the organic areas (-16,8%), the number of holdings (-17,0%) and the areas under organic conversion (-58,3%), whereas the processing farms are increasing of about 10% (Istat data). In Trentino the organic vineyards sector is more stable (Istat, 2003). However, it has been observed that in Puglia the rate between organic vineyards and conventional ones is higher (2%) than in Trentino (0,7%) (Pertot *et al.* 2005).

2.2 Environmental effects

From the respondents' opinions⁹ it emerges that the implementation of IPM schemes together with the practice of organic farming (that has been in fact supported by the payment of certification costs plus specific TA) has been both the most effective in mitigating the negative environmental impact of farming activity.

3. Environmental effects according to the implementation of agro-environmental measures

The intermediate evaluation of the AEM/RDP measures in Emilia Romagna uses a methodology which represents an attempt to quantify the environmental impacts of the application of the agro-environmental measures. The indicators of reduction in agro-chemical inputs and water use due to the application of agro-environmental measures has been fine-tuned by CRPV agency and promoted by Emilia Romagna government.

⁹ ISMEA; University of Pisa

The analysis has been focused on some crops, among them vineyards, and the analysis put in evidence the differences in practices between organic farming and conventional and between integrated farming and conventional ones.

More specifically the analysis has focused on:

○ *use of chemical inputs:*

Regarding the use of fertilisers) the data put in evidence significant reductions both for organic and integrated farming compared to the conventional methods(data available only for potassium products).

Concerning the use of pesticides, the difference between organic and conventional farming is not due only to the reduction in quantities and in number of applications, but is mainly due to the different toxicity, in compliance with the Reg. (EU) 2092/91.

The adoption of integrated or organic farming led to a substantial reduction in agro-chemical inputs, in terms of number of applications and in terms of class of toxicity.

Table 44 : Differences (kg/ha) in the quantities of fertilisers

	N		P2O5		K2O	
	integrated /conventional	Organic /conventional	integrated /conventional	Organic /conventional	integrated /conventional	Organic /conventional
	kg/ha	kg/ha	kg/ha	kg/ha	kg/ha	kg/ha
vineyards					-12,2 (-31,1%)	-10,6 (-25,3%)

Source: Agriconsulting 2003

Table 45 : Differences (kg/ha) in the quantities of fungicide (A1=integrated systems, B1 conventional systems; A2=organic systems; B2 conventional systems)

	fungicide (toxic)		fungicide (noxious)		fungicide (no toxic)		fungicide (Reg. 2092/91)	
	A1/B1	A2/B2	A1/B1	A2/B2	A1/B1	A2/B2	A1/B1	A2/B2
	kg/ha	kg/ha	kg/ha	kg/ha	kg/ha	kg/ha	kg/ha	kg/ha
vineyards	-0,073 (-100%)		-0,165 (-95,9%)	-0,751 (-100%)		-8,305 (-99,8%)	10,593 (+72,4%)	16,513 (+112,3%)

Source: Agriconsulting 2003

Table 46 : Differences (kg/ha) in the quantities of insecticide (A1=integrated systems, B1 conventional systems; A2=organic systems; B2 conventional systems)

	insecticide (toxic)		insecticide (noxious)		insecticide (no toxic)		insecticide (Reg. 2092/91)	
	A1/B1	A2/B2	A1/B1	A2/B2	A1/B1	A2/B2	A1/B1	A2/B2
	kg/ha	kg/ha	kg/ha	kg/ha	kg/ha	kg/ha	kg/ha	kg/ha
vineyards	-0,015 (-100%)			0,001		-0,071 (-45,8%)	0,009 (+900%)	0,729 (+14580,0%)

Source: Agriconsulting 2003

Table 47 : Differences (kg/ha) in the quantities of herbicides (A1=integrated systems, B1 conventional systems; A2=organic systems; B2 conventional systems)

	Herbicides (toxic)	
	A1/B1	A2/B2
	kg/ha	kg/ha
vineyards	0,304 (+323,4%)	-0,074 (-100%)

Source: Agriconsulting 2003

○ *use of irrigated systems*

Regarding the use of irrigation systems, from the study results that integrated production provides a decrease in the use of water, in comparison with the conventional systems. The organic methods led to a strong reduction of the irrigation water, by widely using drip irrigation systems.

Table 48 : Differences (% and mm) in the quantities of irrigation water (A1=integrated systems, B1 conventional systems; A2=organic systems; B2 conventional systems)

	Irrigation				Drip irrigation			
	A1/B1		A2/B2		A1/B1		A2/B2	
	Diff		Diff		Diff		Diff	
	%	mm	%	mm	%	mm	%	mm
vineyards	-22,1	-19,2	-100	-84,6	-100	-79,6	-100	-10

Source: Agriconsulting 2003

The environmental effects of the application of the agro-environmental measures has been promoted by the Regional Government of Emilia-Romagna and analysed by a research centre (CRPV) at regional level. The results are still in elaborations, but from the first analysis on the level and on the quality of agro-chemical inputs used and water of irrigation, significant differences between holdings (which benefit of the agro-environmental measures and the conventional ones) are emerging.. Regarding the use of pesticides, the implementation of agro-environmental actions has provided a substantial reduction in the utilisation of the more toxic products, by privileging the products which are allowed by the Codes of Practices of organic farming.

4. Role of the CMO

The CMO has fostered a strengthening of the link between wine and its territory, and as commercial reputation is increasingly linked to the quality of the territory, there has been a general interests showed by the Regional Governments (such as Emilia Romagna) in fostering the implementation of low inputs farming practices and the analysis of their impact on the environment. Unfortunately the implementation of organic methods in the wine – growing sector has showed big bottlenecks, due to both technical and marketing aspects.

2.1.5. Wine - Theme 5: environmental promotion

Question 1(V5). Has the promotion by Member States and regions of environmentally sound production techniques via producer organisations and inter-branch organisations been effective ?

1. Context

As said already before (see 1.6) in Italy there are not real producers organisations (PO), as defined by the art. 41 of the Reg. 1493/99.

The typology of inter-branch organisations might be represented by the large cooperatives social cellars (*cooperative cantine sociali*), that join the major part of the wine producers.

According to the interviewed sector leaders and the producers, there are not specific environmentally sound production techniques promoted by the producers associations and/or the inter-branch organisations. As matter of fact, producers associations/ inter-branch organisations do not have their own standards to regulate environmentally sound production.

List of the PO potential environmental measures:

- Organic and low inputs production: definition of specific code of Practices and technical assistance for low inputs production
- Activation of demonstrative projects aimed at using new environmental friendly techniques

2. Implementation

In order to assess the presence and quality of the environmental measures we will refer to the RDP AEM environmental measures. Other environmental-effective standards are those provided by the TGI/COD labels, as explained above, and within the restructuring and conversion plans.

The wine sector was essentially concerned by the following measures:

According to **EC Reg. 2078/92** the agro-environmental measures that have a potential link with the orchards are the following:

- A1 Pesticides reduction
- A2 Organic agriculture
- B1: Maintenance of extensive grape-yards;
- B1 + D1: Maintenance of extensive grape-yards in conjunction with other eco-compatible methods.

- D1¹⁰ Protection of the countryside and the landscape

According to **EC Reg. 1257/99**, the agro-environmental measures are interested by the *measure f*:

- F1a Methods of low inputs farming
- F1b Introduction and maintenance of the methods of organic agriculture
- F3 Restoring and/or maintenance of the traditional rural landscape, of natural and semi-natural areas

Within the context of the restructuring and conversion plans each region has the possibility of setting its own framework. From a general overview, the emphasis has been put on:

- the reconversion of the vineyards, by the exploitation of the autochthonous valuable grapevines and the adoption of the best international vines;
- the enticement of grape production in COD and TGI areas, encouraging black berry cultivars;;
- the ban to increase productivity; somewhat, all the supported interventions aim at reducing quantity in favour of quality;
- minimum planting density for black berry cultivars is 4.000 plants/ha; for white berry cultivars is 3.500 plants/ha. Only in case of re-grafting, the minimum density is 3.200 plants/ha.
- in any case, for what it concerns breeding form, planting density and maximum yield/ha, it has to be respected what it is provided by the concerned COD/TGI production standards;
- irrigation has to be exclusively utilised to maintain the physiological balance of the plant, and not as forcing technique; watering has to be carried out according to the climatic conditions, always paying attention not to increase the yield;
- soil tillage operations have to favour water harvesting and control weed population;
- NPK fertilisation is limited.
- permanent grass cover is suggested

3. Environmental effects

This part is dealt with in the question 1 theme 4

4. Role of CMO

Member states and regions' effort to implement agri-environmental measures in the vine growing sector have had some effectiveness, especially on reduction in chemical inputs. As matter of fact, as we have seen before, fertilisers and pests' use has decreased in the last years, and this effect can be attributed to the massive effort all regional governments in the implementation of programs introducing these practices and financing technical advice to producers through farmers' associations and cooperatives.

Results from the case study

According to the interviewed sector leaders and the producers, there are not specific environmentally sound production techniques promoted by the producers associations and/or the inter-branch organisations (as previously described). Namely, when more sustainable farming methods (i.e. methods that go beyond the usual good farming practices) are promoted within a producers organisation, this occurs as a consequence of an "external" requirement, as, for instance, the obligation to abide by the organic standards either the IPM Norms provided by the Region, to fulfil the RDP AEM environmental measures. Other environmental-effective standards are those provided by the quality wines labels, as explained above. Again, it is an external requirement.

In fact, producers associations/ inter-branch organisations do not have their own standards to regulate environmentally sound production.

¹⁰ *The measure D1 (protection of the countryside and the landscape) of the previous AEP pointed towards preservation of the traditional landscape as well as to prevent the soil from erosion. The measure was targeted to the permanent crops located on terraces, pushing the farmers to restore old pathways and soil protection structures; the use of herbicides was banned.

2.2. Horizontal questions

2.2.1. Horizontal – Theme 1

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.]

1. Context

Starting from 1982, a generalised reduction in vineyards area has occurred. However, two process in land use have taken place over this time:

- a tendency to abandonment of traditional cultivation systems in the hilly areas, not any more profitable.
- a process of concentration in specialised wine districts.

These aspects are related to the following evidences:

- growth of area cultivated with the purpose to produce quality wine;
- reduction of area cultivated with the purpose to produce not for quality wine.

According to *Corine Land Cover* data, in some regions, such as Veneto and Toscana a slight increase in vineyards area has occurred, as the following table shows:

Table 49 : Variation in land use. By relevant region

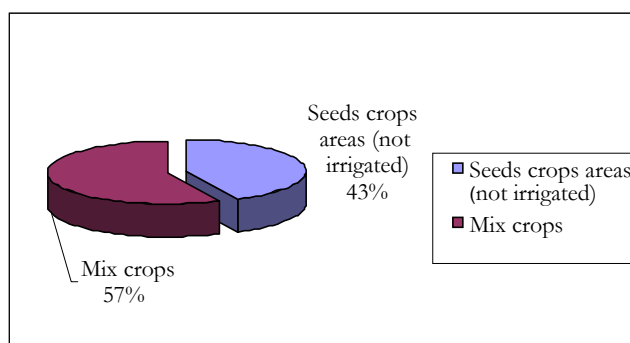
Region	Vineyards (ha) 1990	Vineyards (ha) 2000	Variation % 2000 - 1990
PIEMONTE	66.994,87	66.944,84	-0,1
VENETO	29.684,94	30.023,58	+1,1
EMILIA ROMAGNA	2.101,25	2.078,60	-1,1
TOSCANA	41.887,57	45.010,20	+7,5
PUGLIA	127.765,78	127.752,51	0,0
SICILIA	161.696,18	161.611,40	-0,1

Source: Corine Land Cover data

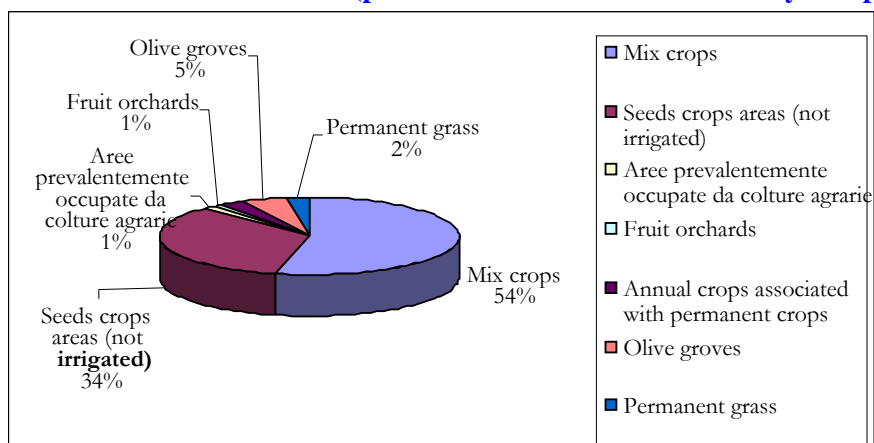
More in depth, if we look into the variation in land use, the following graphs show the trend in those regions where an increase in vineyards areas has occurred.

In Veneto, the vineyards area has increased of 604,74 ha, in Toscana 4.134,67 ha and in Sicilia 132,49 ha; in these regions, new plantations have replaced mainly with not irrigated seeds crops, mix crops systems, or olive and fruits orchards in Tuscany.

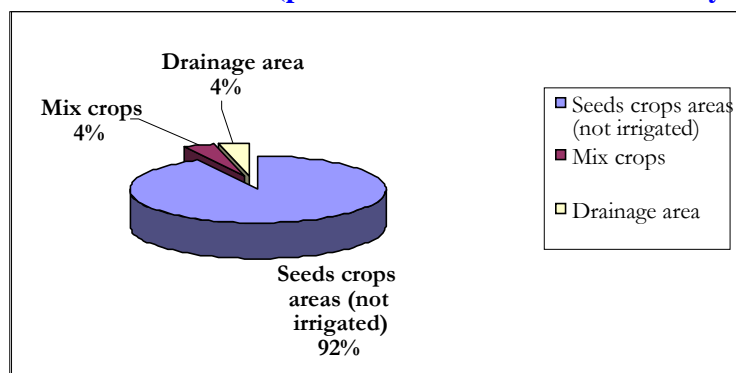
Graph 24 : Variation in land use in Veneto (previous land use before new vineyards plantation) in 1990



Source : Corine land cover data

Graph 25 : Variation in land use in Toscana (previous land use before new vineyards plantation) in 1990

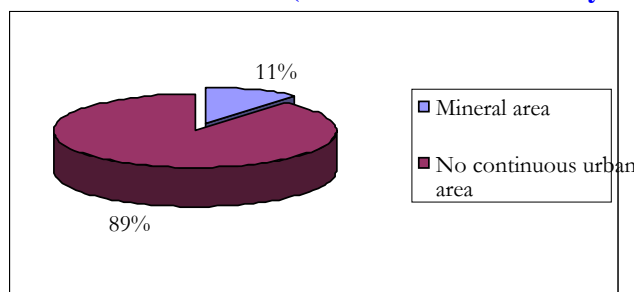
Source : Corine land cover data

Graph 26 : Variation in land use in Sicilia (previous land use before new vineyards plantation) in 1990

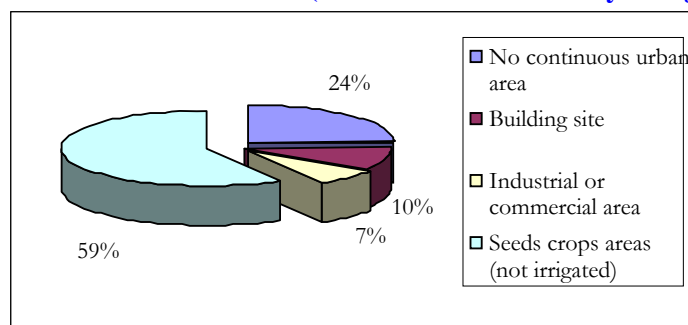
Source : Corine land cover data

On the other hand the phenomenon of the abandonment of vineyards represented the most common situation. In particular, the main changes in land use after the vineyards grubbed up have been the following:

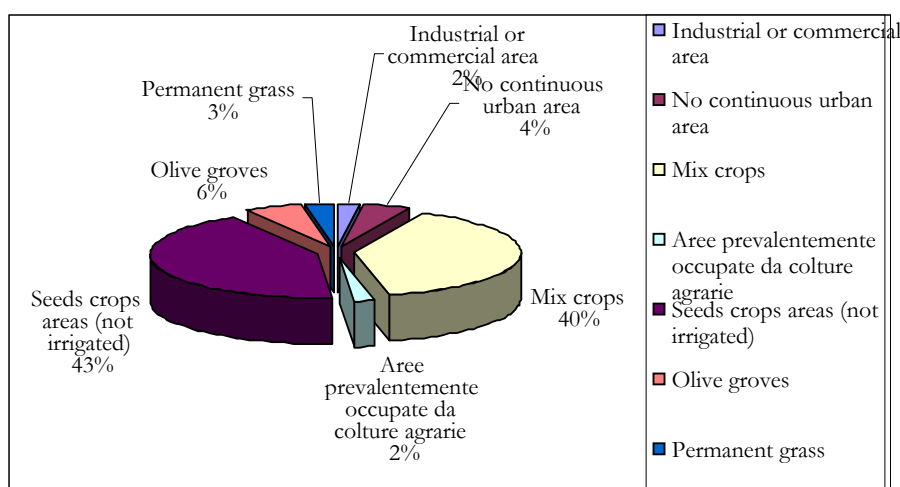
- In Piemonte, where the total grubbed up area was only 50 ha which was replaced by urban area
- In Veneto, the vineyards area (266,49 ha) became mainly seeds crops (59%) and urban or industrial areas (31%)
- In Tuscany, the ex vineyards (1008,83 ha) became seeds crops and mix crops (83%), urban and industrial areas (6%), permanent grass (3%) and new olive groves (6%).
- In Sicilia, the vineyards areas (145,37 ha) were replaced mainly by seeds crops (55%).

Graph 27 : Variation in land use in Piemonte (new land use after vineyards grubbed up) in 2000

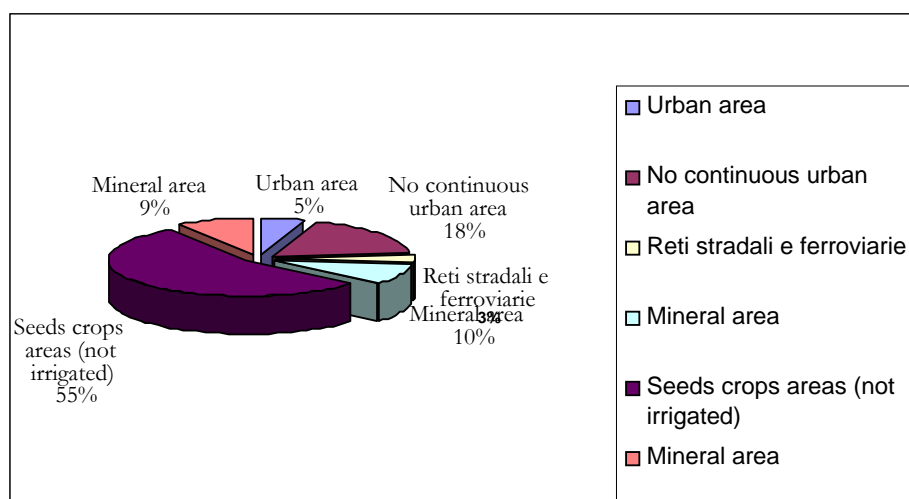
Source : Corine land cover data

Graph 28 : Variation in land use in Veneto (new land use after vineyards grubbed up) in 2000

Source : Corine land cover data

Graph 29 : Variation in land use in Piemonte (new land use after vineyards grubbed up) in 2000

Source : Corine land cover data

Graph 30 : Variation in land use in Sicilia (new land use after fruit orchards grubbed up) in 2000

Source : Corine land cover data

What emerges from the *Corine land Cover data*, is a general phenomenon of vineyards' abandonment, the environmental effects of which are obviously extremely negative as the consequence is an increase in urban or industrial areas.

With respect to the areas where the urbanisation did not occurred the vineyards were replaced mainly by not irrigated seeds crops systems.

2. Environmental effects

○ *Trend to abandonment of traditional cultivation systems in the more marginal areas*

The reduction has been largely more intense in the mountains (-59% farms and -53% area during the period 1982/2000) and in the plains than in the hills.

This phenomenon brings to the lost of the traditional planting systems, characterised by the combination of the vineyards with other crops ("mixed cropping"), which has been for a long time a peculiar feature of the Italian landscape. (Tempesta, 2003).

According to Tempesta, the typical patterns of alternative land use after the abandoned vines are the following:

- Tilled crops in the plains of Emilia and Veneto;
- Fruits in Trentino and in Romagna hills;
- Olive trees in Southern Italy

Part taken by CMO regulation: the *ban on planting new vines except in regions of growing demand* together with the *abandonment premia* have been a strong incentive to the abandonment phenomenon (thanks to the abandonment premia, about 106 thousands hectares have been grubbed up, mainly in Southern Italy and in the marginal areas) and it led to a market in planting rights, with a trend of transferring replanting rights from the southern regions to the Centre-North Italy.

Environmental impacts: There is a large consensus that the way abandonment has been managed has brought to a loss of agrobiodiversity (reduction of number of local varieties) and to a deterioration of landscape in areas where traditional systems of vine cultivation was an essential component of cultural landscapes.

○ *Process of concentration in specialised wine districts.*

Vineyard specialisation and concentration in the more profitable areas has occurred. As matter of fact, there has been a strong trend to set up vineyards into areas, which better fits with high quality wine production (Toni, 2003).

According to Calò, the average rate of vineyards replanting should be **3,3-3,5%**, as the average age of a vineyard plantation is around 25-30 years. According this evaluation methods, during the period 1997-2001, an effective increase of vineyards, which could be estimate with a rate of replanting > 3,3-3,5% occurred only in Trentino Alto adige (rate of replanting about 4,5%) and Abruzzo (3,9%), while the replanting rate in Toscana, Molise, Campania and Sicilia is substantially stable, and it is remarkably in decrease in the other Italian regions (among them, Piemonte, Liguria, Emilia-Romagna and the Southern regions) (Calò, 2005).

Furthermore, another important aspect to be considered is the evolution of varieties employed in the production process. Data show an outstanding reduction of diversity over the time. The category '*other varieties*' in fact groups together a lot of local varieties cultivated in traditional systems of cultivation, and this category has lost 4,5 % share between 2000 and 1982, and at the moment, each autochthonous variety represents only the 0,4-0,8% of the total vineyard orchards. On the contrary, some '*international*' varieties, such as Sangiovese, Chardonnay, Cabernet Sauvignon and have increased their share.

Part taken by CMO regulation: according to Ciccarelli (2005), the effects of the market pressures in stimulating quality productions has been much more remarkable than the effect of the CMO implementation (specifically the *restructuring and conversion of vineyards subsidies*), in driving the vineyards evolution pattern. It has been stressed that the CMO reform was realised in delay, as the Italian vine growers had already started to adequate their production, mainly driven by the market requirements.

Environmental impacts: this process of concentration has been the responsible of the reduction in the variety of landscape and increase land specialisation, with reduction of refugium functions for wild animals' species (Aembac, 2004).

Code of practices for quality wines could have some impact on agri-biodiversity, as there is a tendency to reduce the number of varieties employed in the vineyards. On the contrary, as there is a recognised inverse relation between yields and quality, the expansion of vineyard area for quality wine is a brake to intensification.

2.2.2. Horizontal – Theme 2

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 Comes for permanent crops differ with respect to their overall environmental impact.]

As shown above, the relevant measures of the CMO are the following:

Table 50 : Expenses of the CMO's measures (mio ECU/EUR)

	1996	1997	1998	1999	2000	2001	2002
Export subsidies	5,0	11,7	6,3	3,5	5,3	4,9	5,3
Private storage	10,1	22,3	21,0	15,9	22,2	25,9	31,9
Wine Distillation	25,2	75,5	87,2	71,8	81,4	95,9	120,2
By-products distillation	15,7	21,1	16,4	17,4	23,1	22,5	19,1
Grape must aids	101,1	107,1	69,0	106,1	114,7	84,3	90,0
Abandonment premia	153,8	103,0	1,8	2,5	0,0	-0,1	0,0
Restructuring and conversion actions	0	0	0	0	0	115,0	103,6
Others	-0,7	-0,7	0,0	-0,6	-0,2	-2,3	-0,1
Total	339,3	441,3	225,7	249,8	281,3	379,7	435,5

Source: INEA elaboration on European Commission data

We will take into consideration the most important two measures:

- **Abandonment premia** as an economic incentive to the abandonment and to change land use. The strength of the incentive has been higher in the more marginal areas, where the profitability of the wine production is lower.
- **Restructuring and conversion actions**: the incentive is strong in the regions oriented to quality production (Piemonte, Emilia Romagna, Toscana, Veneto in North Italy, and Puglia and Sicilia in the South Italy have been the regions that have benefited most from restructuring aids); the restructuring has proceeded along the following criteria:
 - specialised cropping;
 - relocation of vineyards in areas suitable for exposition and position to the sun; up-down ditching plantations are not rare in the steep areas.
 - use of certified clones;
 - reduction in yield per plant, sometimes compensated by a higher density plantation.
 - Increase in mechanisation level
 - Rationalisation of the agro-chemical inputs and water by adopting drip irrigation systems

The following tables show the evaluation of the impact of different CMO measures from our respondents¹¹:

Table 51 : Evaluation grid of the impact induced by abandonment premia

Nature of the impact	Impact on habitats and landscape		
Spatial scope	Local	Régional	National-Planétaire
Level	Primary	Secondary	Tertiary
Lasting	Short term	Middle term	Long term
Intensity	Moderate	Average	Strong
Reversibility	Réversible	More or less réversible	Irreversible
Sensitiveness	Low sensitive	Average sensitive	Very sensitive
Synthetic evaluation of the impact	Average negative → Loss of environmental diversity : the way of abandonment has been managed has brought to a loss of agrobiodiversity and to a deterioration of landscape in areas where traditional systems of vine cultivation was an essential component of cultural landscapes.		

¹¹ Ministry CMO sector (De Mattheis Teresa); INEA (Franca Ciccarelli); University of Pisa (Giancarlo Scalabrelli)

Table 52 : Evaluation grid of the impact induced by restructuring measures

Nature of the impact	Pollution of soil and ground waters		
Spatial scope	Local	Régional	National-Planétaire
Level	Primaire	Secondaire	Tertiaire
Lasting	Short term	Middle term	Long term
Intensity	Moderate	Average	Strong
Reversibility	Réversible	More or less réversible	Irreversible
Sensitiveness	Low sensitive	Average sensitive	Very sensitive
Synthetic evaluation of the impact	A trend to input reduction has occurred.		
Nature of the impact	Impact on habitats and landscape due to crop specialisation		
Spatial scope	Local	Régional	National-Planétaire
Level	Primary	Secondary	Tertiary
Lasting	Short term	Middle term	Long term
Intensity	Moderate	Average	Strong
Reversibility	Réversible	More or less réversible	Irreversible
Sensitiveness	Low sensitive	Average sensitive	Very sensitive
Synthetic evaluation of the impact	Average negative: loss of environmental diversity (refugium function)		

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

There is common agreement that compulsory by-product distillation is beneficial to the environment, as it avoids its spread into the environment. The environmental balance, however, should be drawn once the environmental impact of distillation production process.

The by-products of the distillation process, and therefore their environmental impact are quite different, depending on the specific technologies used. Furthermore, as the distillation activity is quite concentrated in few regions and in few distillation plants, obligatory distillation of by-products may displace and concentrate pollution. However, new technologies are improving the environmental impact of the process, as many processing units are applying to environment certification schemes. The voluntary delivering of wine to the distillation process is a practice mostly diffuse in the South Italy. In environmental terms, alcohol processing is an energy intensive production.

In Sicily, grape must is in large part processed into concentrated (water content diminution) and concentrated rectified (water content diminution and removal of anions/cations) must by the Sicilian recognised factories (see chapter 0.3.3); a minor part is processed by factories of centre-north Italy. Around three quarters of the concentrated rectified must is sold to cellars of north Italy, according to officials of the regional institutions.

According to the interviewed sector leaders, around the 80% of the Sicilian producers of low quality wines use concentrated grape must to increase the alcohol metric volume of their wine (not more than 2 degrees): this occurs almost every year, allowing the producers to receive the corresponding CMO premium. Therefore, many producers definitely maximized grape production through intensification (the higher the produced wine quantity, the higher the eligible amount for distillation), aiming at getting the highest yield, without interest in quality: this in part may explain the high spreading of the white berry high-producing cultivars, as Trebbiano, Catarratto, etc., bred with the “tendone” system and requiring high inputs (chapter 0.1.2.2).

The respondents agree that the CMO measure on wine distillation could have encouraged producers in increasing to use of inputs to boost production, with likely negative effects on the water/soil/biodiversity quality.

2.2.3. Horizontal – Theme 3 : subsidiary 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?

1. Context

Table 53 : Main environmental problems by CMO

PROBLEM	DESCRIPTION
Soil erosion	<ul style="list-style-type: none"> due to the use of heavy machineries fostered by restructuring plans can be avoided through the use of the permanent cover grass fostered by restructuring plans as well.
Water resources use	<ul style="list-style-type: none"> especially in some regions of Southern Italy for intensive low quality vineyards the risk is limited by the implementation of use of drip irrigation systems, which are fostered by codes of practices of quality wines and restructured plans
Landscape changes	<ul style="list-style-type: none"> due to the crop specialisation of wine-growing in certain quality wine regions where there is still the possibility to get new planting rights consists the process of marginalisation in the Southern regions
Biodiversity erosion	<ul style="list-style-type: none"> due to the use of only a few varieties, which are the most demanded from the market and defined in the codes of practices of quality wines

1.1. Identification of high damaged areas

If we look at the problem of the geographic concentration of the quality wine sector in certain areas the main risks are the development of monoculture systems, and the loss of the Italian richness of local varieties.

1.2. Inventory of the AEM measures

In Italy payments are not linked to any eco-conditionality rules as the national decree 15 September 2000, implementing the Reg. 1259/99, does not relate to the wine sector.

Only the producers benefiting by RDP AEM grants must comply with the regional GAP standard. AEM funds have been fundamental to favour the transition to integrated pest management and to organic vineyards cultivation.

AEM (EC Reg. 2078/92)	AEM (EC Reg. 1257/99)
<ul style="list-style-type: none"> A1 Pesticides reduction A2 Organic agriculture D1* Countryside and the landscape protection 	<ul style="list-style-type: none"> F1a Low input farming systems F1b Introduction and maintenance of the organic system F3 Restoring and/or maintenance of the traditional rural landscape, natural and semi-natural areas

The following table shows their take up rate in Italy.

Table 54 : National implementation of the measures A, B, D1 for vineyards. (1994-97)

	Area 2078 (Ha)	% on the total concerned area			
		Italy	North	Centre	South and Islands
vineyards	105.009	17,6	19,5	8,7	18,2
total	734.796	11,3	16,2	11	6,8

Source: INEA elaboration on regional and provincial data.

1.3. Statistic on the organic agriculture

See 4 Q1

2. Discussion

According to the evaluation report of the implementation of the Reg 2078/92 and Reg.1257/99 (INEA 1999 and DG AGRI 1999) the following remarks emerge:

- delays in approving and launching the programmes,
- increased attention among producers for the agro environmental issues, even if the implementation of the AEM has occurred mainly in mountainous and hilly areas, and has failed in the most intensive areas;
- positive impacts on the environment, which are linked of the decrease in pesticides and fertilizers use

Comparing the AEM measures with the measures taken within both the restructuring plans and the codes of practices of quality wines in specific regions, it is evident the lack of any measure related to the themes of the landscape changes and the biodiversity erosion, whereas they are part of the AEM EC Reg. 1257/99 (F3 restoring and/or maintenance of the traditional rural landscape, natural and semi-natural areas).

3. Conclusion et recommendations

The analysis of the evolution of vineyard area reveals that there has been a general decrease of the area cultivated to vine, and that the most relevant reduction has affected:

- table wine production
- southern regions
- mountain areas
- small vineyards

According to our interviews, *banning new plantations* together with *abandonment premia* have played a relevant role in stimulating this process of abandonment. Furthermore, there is a large consensus that the way abandonment has been managed has brought to a loss of agro-biodiversity (reduction of number of local varieties) and to a deterioration of landscape in areas where traditional systems of vine cultivation was an essential component of cultural landscapes.

At the same time, there has been a strong trend to set up vineyards into areas, which better fits with high quality wine production (Toni, 2003). This has led to restructuring of old vineyards according to criteria of quality and specialisation. As quality is linked to specific areas, the resulting process has been spatial concentration of the activity. Expert opinions stress that, in this case, the effects of the market pressures in stimulating quality productions has been much more remarkable than the effect of the CMO implementation (specifically the *restructuring and conversion of vineyards subsidies and CMO requirements for quality wines*), in driving the vineyards evolution pattern. We can say that the CMO reform was realised in delay, as the Italian vine growers had already started to adequate their production, mainly driven by the market requirements. Code of practices for quality wines could have some impact on agri-biodiversity, as there is a tendency to reduce the number of varieties employed in the vineyards. On the contrary, as there is a recognised inverse relation between yields and quality, the expansion of vineyard area for quality wine is a brake to intensification

The environmental impact of the implementation of CMO measures in the vineyards sector can be synthesised as follows:

Impact on soil: the impact of new plantations may be strong. In fact, farmers choose the layout of the vineyard according to position and sun exposition, not to morphology, and therefore many steep slopes are chosen as loci for planting new vineyards. So far, farmers have not found alternatives to up-down ditching plantations, and this is the main cause of soil erosion. It also seems that the practice of removal of soil cover is largely diffused, also if good cultivation practices recommend grass cultivation between the rows.

Impact on landscape: the shift to specialised vine growing has negative impacts on landscape related functions, particularly on diversity of the scenery. However, this aspect can be considered as highly subjective, as there is an increasing tourist movement related to wine and vine landscape.

Impact on biodiversity: crop specialisation has an impact on agri-biodiversity, as the number of cultivated varieties is reduced. Moreover, specialised fields reduce the refugium function for wild species. Refugium function is also reduced by removal of soil cover.

Impact on water and air pollution: there is an evident trend to input reduction. However, it should be taken into consideration that, as spatial concentration of vine growing is taking place, there could be a tendency to localised concentration in the use of fertilisers and pesticides as well.

APPENDICES

Annex 1 : List of people met or contacted

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

Annex 1 : List of people met

Flaminia Ventura, Capo della Segreteria Tecnica del MiPAF

Teresa De Mattheis Dirigente Dipartimento delle politiche di mercato Direzione Generale per le politiche agroalimentari Settore vino.

Silvia Nicoli, tecnico funzionario Dipartimento delle politiche di mercato Direzione Generale per le politiche agroalimentari Settore vino.

Franca Ciccarelli, settore vino ISMEA (telephonic contact)

Roberta Sardone, settore vino INEA

Riccardo Simoncini, coordinatore italia progetto aembac

Antonio La Rocca, tecnico Ufficio Repressioni Frodi (telephonic contact)

Giancarlo Scalabrelli , professore Viticoltura Università degli Studi di Pisa- Facoltà di Agraria

Stefano Tronfi, Ispettorato provinciale funzioni agricole, Regione Liguria

Roberto Barichello , Regione Liguria CAAR Sarzana (SP)

Annex 2 : Main bibliography identified in relation with the study

EUROSTAT, data bank

INEA (1997) – *Annuario dell'Agricoltura Italiana*, volume LI. Edizioni il Mulino. Roma

INEA (1998) – *Annuario dell'Agricoltura Italiana*, volume LII. Edizioni il Mulino. Roma

INEA (1999) – *Annuario dell'Agricoltura Italiana*, volume LIII. Edizioni il Mulino. Roma

INEA (2001) – *Annuario dell'Agricoltura Italiana*, volume LV Edizioni Scientifiche Italiane Roma

INEA (2002) – *Annuario dell'Agricoltura Italiana*, volume LVI Edizioni Scientifiche Italiane Roma

INEA (2003) – *Annuario dell'Agricoltura Italiana*, volume LVII Edizioni Scientifiche Italiane Roma

INEA (2004)- *Le Politiche Agricole dell'Unione Europea*. Rapporto 2002-03. Osservatorio delle Politiche Agricole dell'Ue. Roma

INEA – *Rica Italia 1997-2000- I quaderni della Rica*. Strutture e redditi delle aziende agricole.

INEA – *Rica Italia - I quaderni della Rica* serie storica 1992-95

INEA – *Rica Italia - I quaderni della Rica* serie storica 1993-96

INEA – *Rica Italia - I quaderni della Rica* serie storica 1994-97

INEA – *Rica Italia - I quaderni della Rica* serie storica 1995-98

INEA – *Rica Italia - I quaderni della Rica* serie storica 1996-99

INEA – *Rica Italia - I quaderni della Rica* serie storica 1997-2000

ISMEA -*Filiera vino*, edizioni 1998, 1999, 2000, 2001, 2002, 2003, 2004

ISTAT, data bank, www.istat.it

ISTAT (2004) – *Coltivazioni agricole, foresta e caccia*; periodo di riferimento 2000.

ISTAT (2000) – *Coltivazioni agricole, foresta e caccia*; periodo di riferimento 1997

ISTAT– *Statistiche dell'agricoltura, zootecnia e mezzi di produzione*, varie edizioni. Roma

Environmental impacts:

AA.VV *Trattamento ed utilizzazione agronomica de reflui e residui delle cantine di vinificazione*.

A.A.V.V., 2000. *Il vino e il vigneto, come cambia l'enologia*, *Ermes agricoltura* 3, pp. 3-33.

A.A.V.V., 2004. *Speciale vendemmia, note tecnico legislative , sottoprodotti e prestazioni viniche obbligatorie*, *Vinotizario* n.10.

A.A.V.V., 2005. "Dossier industria agroalimentare", *Agricoltura*.

A.A.V.V., *Risparmio energetico nell'industria alimentare*, on www.regione piemonte.it

Alail Carbonneau, De Biasi, 2004. *Stress idrico del vigneto e "irrigazione qualitativa"*, *L'informatore agrario* n.22, p.39.

APAT ONV, 1999. *Stima della produzione di rifiuti speciali di alcuni comparti industriali attraverso studi di settore*.

Bartolini D., 2005. *La gestione delle infestanti nel frutteto e nel vigneto*, *Ermes Agricoltura*, Luglio-Agosto.

Castaldi R., 2001 "Emas e iso 14001 in enologia" *vigne e vini* n. 4,

Catena M., *Product design within the wine industry in Italy*, www.coltiva.it

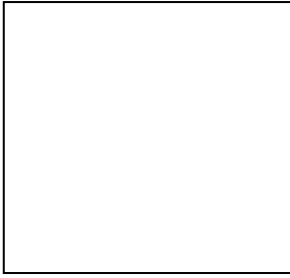
Ciccaralli F., 2005. *L'evoluzione del Vigneto Italia*, *L'informaore agrario* n.18, p. 77.

Di Vita G., 2003. *I certificate del vino*, *Vigne e vini* n°3.

- Franchi O., 2001. Direttore tecnico Cantine Bosco del Merlo - *Paladin & Paladin "Relazione"* tenuta al 56° Congresso Nazionale dell'Associazione Enologi Enotecnici Italiani.
- Gily M., 2004. *L'irrigazione a goccia nel vigneto* *Informatore agrario* n. 22, p. 31.
- Lante, Crapisi, Lomolino, Spettoli, 2001. *Soluzioni tradizionale ed innovative per la depurazione dei reflui di cantina*, *Industrie delle bevande* XXX Febbraio 2001
- Micheloni C., 2004. *La viticoltura biologica italiana*. <http://www.aiab.it/bioenoteca/viticoltura.php>
- Paoletti A., Francalanci L., 2004. *Problemi e prospettive del vino biologico*, *L'informatore agrario* n.33 p.28.
- Parente G., Venerus S., Bassi M., 1999. *Grasses as catch crops to reduce N leaching in orchards Stoffflüsse und ihre regionale Bedeutung für die Landwirtschaft*, 8. Gumpensteiner Lysimetertagung.
- Parodi Guido, 1999. *The oenological effluents*, *Vignevini* n.6.
- Pertot I., Vecchione A., Zulini L., Mescalchin E., Simeone V., Elbilali H., 2005. *Viticoltura biologica. La realtà di Trentino e Puglia*. *L'informatore agrario* n.18, p.67.
- Pivato, Tamiozzo, 2003. *L'impatto ambientale del prodotto vino*, *L'informatore agrario*.
- Tempesta G., 2003. *Evoluzione e linee di tendenza del vigneto Italia*, *Vignevini* 3, 4, 5.
- Tempesta G., Fiorilo M., 2003. Dossier *"Evoluzione del vigneto Italia-Centro"*, *Vigne e vini* nr. 4/2003.
- Toni B., 2003. *Vitigno o territorio?*, *Vigne e vini* 6/2003
- Vania E., 2004. *Teatro naturale* n°17 del 24 aprile 2004.
- Villimburgo, 2004. *Vino uono acqua doc*, *Vignevini* 1/2 2003

Web-sites

www.aembac.org
www.apat.it
www.osservatoriorifiuti.it
www.crpv.it
www.ilvinoinrete.it
www.greenplanet.com
www.teatronaturale.it
www.codicenologico.it
www.assodistil.it
www.caviro.it
www.bonollo.it
www.agea.gov.it
www.ambientediritto.it
www.aiab.it
www.crpv.it
www.ermesagricoltura.it (articoli vari rivista "agricoltura" annate 1997-2003)
www.inea.it
www.ismea.it
www.politicheagricole.it
www.sian.it
www.sinab.it



**OCM VIN
ETUDE DE CAS SICILIA**

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GLOSSARY

AEP: Agro-environmental Plan

AGEA: National Agency for Payment in Agriculture

COD: Controlled Origin Denomination

CORERAS: Consorzio regionale per la ricerca applicata e la sperimentazione

DOASR (Department of Agriculture of the Sicily Region)

GAP: Good Agricultural Practices

IPM: integrated pest management

IRVV: Istituto Regionale della Vite e Vino

LEDRS: Land and Environment Department of Regione Sicilia

OVS: Osservatorio Viticolo Siciliano

RDP: Rural Development Plan

RPRRG: Regional Plan for Restructuring and Reconversion of Grapeyards

RSRFWS: Regional service of repression of frauds in the wine sector

TGI: Typical Geographical Indication

UAA: utilised agricultural area

VQPRD: Quality wines produced in specified Regions

1. CONTEXT OF THE PRODUCTION OF WINE IN SICILY

1.1. Mains characteristics of grape and wine production in Sicily

1.1.1. Evolution of grape-wine and wine production and cultivated area in the period 1983-2003

Sicily has followed the national trend in the progressive decrease of grape cultivated area and wine-grape production: in fact, the Sicilian total grape area has decreased from 165.400 hectares (five-years period 1983-1987) to 141.200 hectares of the five-years period 1999-2003, marking a reduction of 14,6%.

Likewise, the average wine-grape yearly production (1.490.000 tons referred to the five-years period 1983-1987) dropped to 930.000 tons, as average of the five-years period 1999-2003 (Table 1).

It is also interesting to note how the average yields per hectare have decreased, from 1983 to 2003, of around the 29% (from 10,08 t/ha to 7,17 t/ha) (CORERAS, 2003).

Table 1: Total harvested production, cultivated area and average yield for grape wine. Period 1983-200 (adapted from CORERAS, 2003) (continued)

Year	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Harvested production (x 100 t)										
Agrigento	3.704	3.124	2.947	3.530	2.976	2.293	2.789	2.359	3.119	3.296
Caltanissetta	942	891	954	887	764	692	602	510	851	966
Catania	600	625	570	650	591	440	505	450	500	570
Enna	141	93	108	100	102	102	85	61	105	61
Messina	499	503	436	446	446	431	455	383	508	615
Palermo	2.094	2.264	1.817	2.114	2.227	1.450	1.449	1.359	1.987	1.850
Ragusa	362	438	328	429	347	273	268	246	383	383
Siracusa	385	305	228	280	262	153	150	93	208	226
Trapani	8.103	5.945	5.720	6.882	7.278	5.749	5.597	4.542	5.586	6.770
SICILY	16.829	14.186	13.108	15.317	14.994	11.582	11.900	10.004	13.248	14.736
Cultivated area (x 1.000 ha)										
Agrigento	38	38	38	38	38	38	40	39	38	37
Caltanissetta	9	9	9	9	9	9	9	9	9	9
Catania	11	11	11	11	11	11	11	11	11	11
Enna	3	3	3	3	3	3	3	3	3	2
Messina	8	8	6	6	6	6	5	5	5	5
Palermo	22	23	22	22	23	23	23	22	21	21
Ragusa	4	4	4	4	3	3	3	3	3	3
Siracusa	4	4	4	4	4	4	4	4	4	
Trapani	67	67	67	67	66	66	65	65	65	65
SICILY	167	168	165	164	163	164	163	161	160	157
Average yields (q/ha)										
Agrigento	97,5	82,2	77,6	92,9	78,3	60,3	69,7	60,5	82,1	89,1
Caltanissetta	104,7	99,0	106,0	98,6	84,9	76,9	66,9	56,7	94,6	107,3
Catania	54,5	56,8	51,8	59,1	53,7	40,0	45,9	40,9	45,5	51,8
Enna	47,0	31,0	36,0	33,3	34,0	34,0	28,3	20,3	35,0	30,5
Messina	62,4	62,9	72,7	74,3	74,3	71,8	91,0	76,6	101,6	123,0
Palermo	95,2	98,4	82,6	96,1	96,8	63,0	63,0	61,8	94,6	88,1
Ragusa	90,5	109,5	82,0	107,3	115,7	91,0	89,3	82,0	127,7	127,7
Siracusa	77,0	76,3	57,0	70,0	65,5	38,3	37,5	23,3	52,0	56,5
Trapani	120,9	88,7	85,4	102,7	110,3	87,1	86,1	69,9	85,9	104,2
SICILY	100,8	84,4	79,4	93,4	92,0	70,6	73,0	62,1	82,8	93,9

(continued)

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Harvested production (x 100 t)											
Agrigento	2.315	2.420	2.056	1.960	1.680	1.850	1.758	1.647	1.480	1.152	1.577
Caltanissetta	612	770	741	764	700	845	480	360	720	623	526
Catania	500	377	276	209	195	163	117	163	130	163	182
Enna	66	74	106	128	112	107	119	99	75	67	65
Messina	590	679	673	410	354	380	364	319	288	288	258
Palermo	1.918	1.681	1.841	2.038	1.857	2.159	1.725	1.595	1.760	1.683	1.980
Ragusa	581	588	627	534	561	495	470	387	166	162	143
Siracusa	286	190	296	222	185	250	194	194	137	158	129
Trapani	6.143	5.167	6.605	6.684	4.530	5.600	5.400	4.400	4.500	3.800	4.410
SICILY	13.010	11.945	13.223	12.951	10.174	11.848	10.627	9.164	9.256	8.096	9.270
Cultivated area (x 1.000 ha)											
Agrigento	36	34	32	34	31	29	29	29	29	29	27
Caltanissetta	9	7	7	7	7	7	7	7	7	7	7
Catania	11	10	9	9	7	7	7	7	7	7	7
Enna	2	2	2	2	2	2	2	2	2	2	2
Messina	5	5	5	5	5	5	5	5	5	5	5
Palermo	21	21	20	21	21	21	20	21	21	21	21
Ragusa	3	3	3	3	3	3	3	3	2	2	1
Siracusa	4	4	4	4	4	4	4	4	4	4	4
Trapani	66	67	57	63	66	66	65	64	66	66	65
SICILY	157	152	138	148	145	143	141	138*	138	138	138
Average yields (q/ha)											
Agrigento	64,3	71,2	64,3	57,6	54,7	63,4	60,6	56,0	55,0	48,0	65,0
Caltanissetta	68,0	110,0	105,9	109,1	101,6	121,0	67,2	50,4	114,4	105,0	100,0
Catania	45,5	37,7	30,7	23,2	30,0	25,0	18,0	25,0	20,0	25,0	28,0
Enna	33,0	37,0	53,0	64,0	68,0	65,4	73,0	60,9	50,0	47,0	51,3
Messina	118,0	135,8	134,6	82,0	70,0	75,0	72,0	63,0	60,0	60,0	60,0
Palermo	91,3	80,0	92,1	97,0	89,1	103,5	87,0	74,5	89,1	85,0	100,0
Ragusa	193,7	196,0	209,0	178,0	170,0	150,0	147,1	117,5	92,0	90,0	119,3
Siracusa	71,5	47,5	74,0	55,5	50,0	64,9	50,6	50,7	45	53,0	66,0
Trapani	93,1	77,1	115,9	106,1	68,6	84,8	83,1	68,8	73,8	62,3	67,9
SICILY	82,9	78,6	95,8	87,5	70,3	82,6	75,3	64,4	70,2	62,9	71,7

* data provided by the Sicilian Grape Register, differing from that one reported by the ISTAT 5th Agricultural Census (111.638 ha)

Table 2 shows, for year 2002, the distribution of grape holdings per class size, altimetric zones and production and irrigated area.

Total productive grape area counts 118.657,28 hectares. Total grape holdings are 79.660.

The 18% of the grape holdings are in mountainous area; the 62,4% on hilly areas and the 19,6% on plain areas.

It has to be emphasized the pulverization of the grape holdings: the 35% of the total number has an area lower than 1 hectare; the 55,8% has an area lower than 2 hectares.

Irrigation is mostly practised on hilly grapeyards. Irrigated area is the 32,3% out of the total grape area. Table 3 shows the evolution on irrigated holdings and area.

Table 2: Distribution of grape holdings per class size, altimetric zones and production and irrigated area (ha) (ISTAT 5th Agricultural Census, 2000)

area holding (ha)	mountain			hill			plain		
	nr. holdings	UAA grape	irrigated area	nr. holdings	UAA grape	irrigated	nr. holdings	UAA grape	irrigated
< 1	7.447	1.324,77	38,76	17.185	4.609,79	475,66	3.289	1.424,63	515,81
1-2	2.581	876,49	26,70	10.448	7.681,32	1.188	3.527	3.580,54	1.262,43
2-3	1.202	537,93	14,66	6.201	7.446,97	1.467,52	2.156	3.456,61	1.228,33
3-5	1.175	574,82	26,63	6.451	11.394,46	2.753,05	2.715	6.536,55	2.446,22
5-10	1.004	689,23	35,77	5.469	16.059,51	4.689,01	2.481	9.914,18	3.509,88
10-20	537	642,92	49,34	2.538	12.131,55	3.890,20	934	6.700,82	2.978,41
20-30	179	198,67	47,01	714	5.426,79	2.327,28	214	2.353,34	1.227,64
30-50	123	216,55	18,96	420	4.022,21	1.938,25	131	1.813,01	965,61
50-100	67	99,12	35,53	236	3.214,72	1.642,73	83	1.533,96	1.195,08
> 100	35	730,93	192,93	94	2.382,66	1.305,91	24	1.082,23	804,79
Total	14.350	5.891,43	486,29	49.756	74.369,98	21.677,61	15.554	38.395,87	16.134,20

Table 3: Number of grape holdings with irrigation and irrigated UAA (ha) (ISTAT Agricultural Census 1982, 1990 and 2000)

2000		1990		1982	
Holdings	Irrigated UAA	Holdings	Irrigated UAA	Holdings	Irrigated UAA
14.795	38.298,10	12.233	33.405,55	15.784	34.479,21

Grapeyards of the Sicilian provinces and grapevines assortment

As shown in Table 1, Trapani has been the first province for area extension of grape-yards, in the period 1983-2003. In the decade 1994-2003, Trapani kept the 45% of the regional total (64.500 hectares). For the same period, the amount of harvested grape wine represented alone the 47,9% of the total of the region (511.000 tons).

It is interesting to note that Trapani is the province with the largest grape-wine area and the highest wine production in Europe.

The Agrigento province is the second one, with 30.400 hectares on the average for 1994-2003 with 176.000 tons of harvested grape-wine. Palermo province marks the third position for the average area, with 21.000 hectares and average annual grape production of 183.000 tons.

As in Table 1, the most serious decrease of grape has occurred in the Trapani and Catania provinces.

Cultivars with white berry have been always prevailing on those with red berry, although over the last 5 years the red ones are supported by the policies of the Region and by a certain market demand. Table 4 shows the situation on year 2000, with white berry cultivars representing the 77% of the total grape wine cultivars in the region.

Table 4: Regional grape wine area on year 2000, classified per colour of the berry (Ficani, 2001)

	White	Red	Mixed*	Total	% white	% red	% mixed
Trapani	67.464,85	4.347,21	180,53	71.992,58	93,70%	6,00%	0,30%
Palermo	17.224,76	1.778,06	379,24	19.382,05	88,90%	9,20%	2,00%
Messina	123,65	293,05	139,88	556,57	22,20%	52,70%	25,10%
Agrigento	19.827,71	9.187,75	511	29.526,46	67,20%	31,10%	1,70%
Caltanissetta	981,53	5.269,25	125,57	6.376,35	15,40%	82,60%	2,00%
Catania	412,08	3.116,10	415,16	3.943,35	10,40%	79,00%	10,50%
Enna	156,66	326,94	96,39	579,99	27,00%	56,40%	16,60%
Ragusa	80,57	1.979,79	28,75	2.089,11	3,90%	94,80%	1,40%
Siracusa	80,4	3.672,96	107,71	3.861,07	2,10%	95,10%	2,80%
Sicilia	106.352,20	29.971,11	1.984,22	138.307,54	76,90%	21,70%	1,40%

* berry colour is not known

According the IRVV data, the main cultivated cultivars are the local ones "white common Catarratto", that represents the 46,7% of the total of the region and the "Nero d'Avola",

representing the 10,5%; the “Tuscan Trebbiano” represents the 12,3%. The remaining 30,5% is represented by other local cultivars, with a moderate share of international cultivars.

Such data explain well how the Sicilian grape-wine sector is still mainly targeted to high productivity, with important grape productions prominently destined to make low-medium quality wines, to be marketed in bulk at low price (CORERAS, 2003).

1.1.2. Characteristics of wine products in Sicily

Wine and grape must production decreased around of 50% in the period under study (from 13.060.000 hectolitres in 1983 to 6.553.000 hl in 2003) (Table 5).

Table 5: Wine and grape must production in the period 1983-2003 (x 1.000 hl)

1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
13.060	10.893	10.488	12.271	11.899	8.975	9.394	7.715	10.137	11.677	10.192

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
9.300	10.391	9.009	8.073	9.200	8.160	7.106	7.149	5.719	6.553

Production of grape must

The “mute” (not fermented) grape must is one key product of the Sicilian wine sector, that on the period 1991-1999 represented around the 23,5% of the entire wine regional production.

In fact, Sicily is traditionally the first producer of non-fermented must, that is the basis for wine production in several northern Italian region and France, as well (Ficani, 2001).

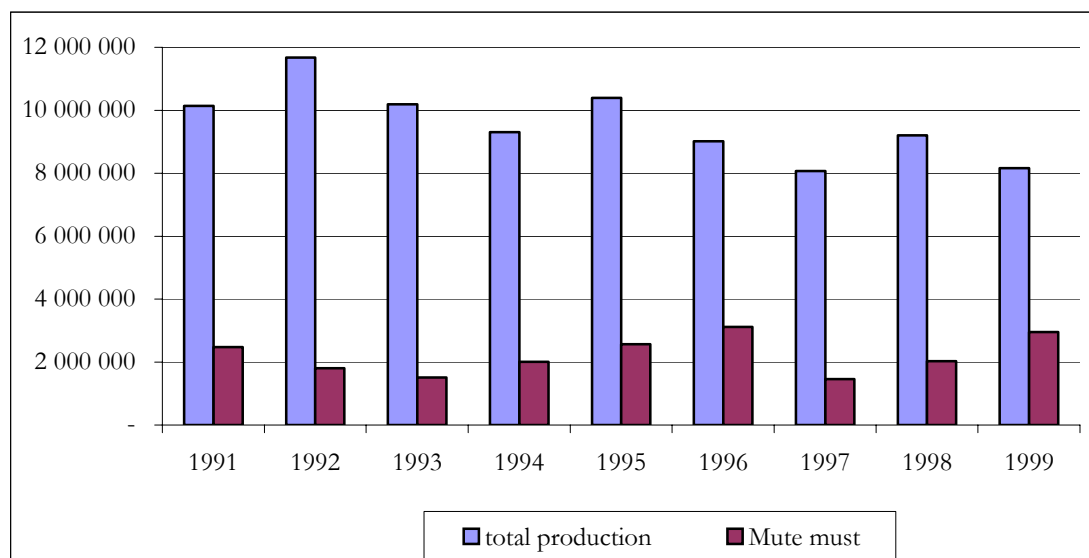
The major part of the mute must is produced by the associated bodies, i.e. the “cooperative cantine sociali” (cooperatives social cellars), and only a minor part by private structures that however are more oriented in producing wine, with higher added value (Table 6).

According to IRVV, from 1991 to 1999, an average amount of 220.000 tons of non-fermented must has been produced every year, the 90% of which made by the associated bodies.

As shown in Chart 1, Sicily has therefore progressively increased the ratio mute must/wine, rather than working in the necessary restructuring of the wine sector (Ficani, 2001).

Table 6: Mute must production in Sicily (q) (Ficani, 2001)

Year	Associated bodies	Private holdings	Total	% of total wine products
1991	2.248.430	224.843	2.475.264	24,4
1992	1.636.227	163.623	1.801.842	15,4
1993	1.372.194	137.219	1.511.406	14,8
1994	1.825.386	182.539	2.009.919	21,6
1995	2.330.457	233.046	2.565.498	24,7
1996	2.825.528	282.553	3.110.077	34,5
1997	1.325.498	132.550	1.460.045	18,1
1998	1.835.022	183.502	2.020.522	22,0
1999	2.682.215	268.222	2.952.436	36,2

Chart 1: Total wine production and mute must. Years 1991-1999 (q) (Ficani, 2001)

The wine production with TGI and COD quality label (V.Q.P.R.D. wines)

The major part of COD wines is located in the western Sicily with the “Marsala”, that on 2002 has represented more than the 48% of the total regional COD production.

When considering the average production of period 1998-2002, the COD Marsala takes the first position (59,1% of the total), followed by COD Alcamo (10,5%), COD Etna (5,8%) and COD Menfi (5%).

Table 7 presents the Sicilian CODs production from 1989 to 2002. To the CODs listed in the table, the “Mamertino” and “Erice” have to be added, which have been recognised on 2004.

Grape production for CODs wines has little increased from 1995 to 2002 (from 2 to 3,1%).

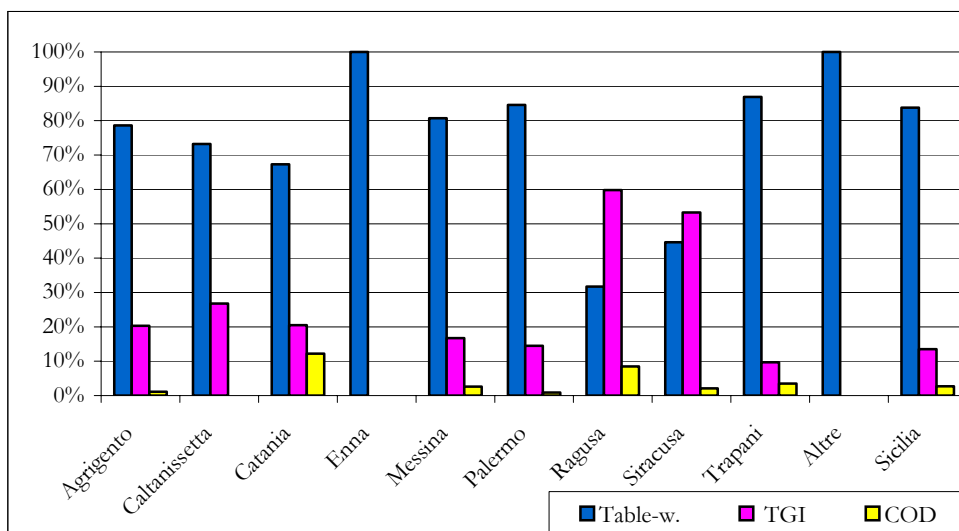
Table 7: COD wines production in Sicily from 1989 to 2002 (x 1000 HI)

COD name	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Average '98-'02
Alcamo	33	22,8	33,2	23,5	25,9	18,7	16,5	23,9	21,5	20,7	17,2	17,2	18,8	15,9	18,0
Cerasuolo di Vittoria	2	2	2,3	2,1	2,3	2,4	2,9	2,3	3,2	4,7	5,5	6,8	6,2	9,0	6,4
Contea di Sclafani									1	5,5	4,7	4,1	3,7	3,3	4,3
Contessa Entellina						0,8	1	2,7	2,7	3,1	3,5	3,4	5,8	4,5	4,1
Delia Nivolelli										2,9	0,7	5,3	8,3	3,0	4,0
Eloro							0	1	0,7	1,4	1	1,4	1,4	6,5	2,3
Etna	9,1	4,6	2,1	7,9	7,4	7	6	7,3	6,8	8,9	8,9	9,8	9,5	12,7	10,0
Faro	0	0	0	0,1	0	0,1	0,1	0,1	0,1	0,1	0,2	nd	nd	nd	-
Malvasia delle Lipari	0,4	0,3	0,4	0,5	0,4	0,4	0,3	0,4	0,3	0,6	0,5	nd	nd	nd	-
Marsala	165,4	154,6	109,5	68,9	88,1	119	94,8	120,1	124,5	134,1	114,3	93,9	89,4	74,3	101,2
Menfi									1,1	16,9	11,9	1,9	5,7	6,6	8,6
Moscato di Noto	0	0,3	0,4	0,8	1,1	0,9	0,5	0,2	0,3	0,4	0,2	0,2	0,2	2,1	0,6
Moscato Pass.di Pantelleria	3,5	2,5	2,3	1,6	3,5	5,7	5,4	3	3,8	6,4	8,9	9,5	8	8,0	8,2
Moscato di Siracusa									0	0	0	0	0,1	0,0	0,0
Sambuca di Sicilia									1	0,6	1,2	1	0,7	1,0	0,9
Santa M.Belice										0,6	0,4	0,5	0,6	0,4	0,5
Sciacca												0,6	0,2	0,7	0,5
Monreale													2,8	5,7	4,2
Riesi														0,0	0,0
Total COD Sicily	213,5	187,2	150,2	105,3	128,9	155,1	127,4	160,9	167	206,8	178,9	155,6	161,2	153,6	171,2
Total wine Sicily	9.394	7.715	10.137	11.677	10.192	9.300	10.391	9.009	8.073	9.200	8.160	7.106	7.149	5.719	7.466,8

There are six TGIs in Sicily: “Camarro”, “Fontanarossa di Cerda”, “Salemi”, “Salina”, “Sicilia” and “Valle Belice”. The grape production destined to TGI wines grew from 5,5% of the total regional grape production on 1995 to 27% of 2002.

Chart 2 presents the amount of harvested production per wine tipology (table-wine, TGI and COD), for year 1999.

Chart 2: Harvest declarations 1999 for the three wine typologies (Ficani, 2001 on data from IRRFV)



1.1.3. Production according to specific quality standards (organic and integrated farming)

Sicily plays a leading role in organic grape-wine production. Table 8 shows the evolution of the certified area from 1994 to 2003, highlighting the per cent incidence on the national organic grapeyard area. On 2003, the Sicilian grapeyard area reached the 37,1% of the Italian area, growing from 267 ha on 1994 to 14.278 of 2003.

Table 8: UAA of organic table in Sicily (ha) and incidence on the corresponding national UAA (CORERAS, 2004)

	1994	1998	1999	2000	2001	2002	2003
UAA organic grapeyards Sicily	267	3.916	5.520	10.885	14.837	11.431	14.278
% UAA national organic grapeyards	7,1	30,8	33,7	37,3	41,0	32,7	37,1

The ISTAT 5th Agricultural Census (2000) gives a figure of the grape holdings producing according to recognised quality standards (Table 9).

Table 9: Grape holdings producing according to recognised quality standards (ISTAT 5th Agricultural Census, 2000)

area holding (ha)	nr. holdings: Integrated production	nr. holdings: Organic production	nr. holdings: other production standards
< 0,2	278	141	12
0,2-0,3	95	61	19
0,3-0,5	157	90	32
0,5-1	199	162	132
1-2	231	223	267
2-3	151	170	170
3-5	236	244	212
5-10	245	294	233
> 10	125	184	96
Total	1.717	1.569	1.173

1.1.4. Characteristics of the wine producers in Sicily

As shown in Table 10, on 2002 there were 271 holdings dealing with grape processing into wine and must, the majority of which was localised in the Trapani province.

Table 10: Wine producers in Sicily (CORERAS on data Unioncamere of 2002)

Province	Nr. of processors
Agrigento	23
Caltanissetta	12
Catania	28
Enna	11
Messina	42
Palermo	42
Ragusa	7
Siracusa	5
Trapani	101
Total	271

Sicilian processing holdings are extremely small with respect to Centre-North Italy (each Sicilian wine holding employs on the average five people vs. the number of twelve of the Centre-North of Italy. However, the 75,5% of the wine holdings has a number of employee less than 5, ISTAT, 1996).

Four typologies of wine holding may be distinguished in Sicily, according to CORERAS:

1. holdings that process its own grape and bottle the resulting wine under their brand name, aiming at producing good quality wines. They are cooperatives and medium-small private enterprises;
2. holdings that process grapes or must purchased by outside parties. They bottle the wine under their brand name, with attention to customer's satisfaction and quality of the finished products. They are medium-large enterprises aiming at producing good quality wines;
3. holdings that above all amass and process the grape provided by their members. These structures usually produce huge amounts of loose wines (with no name) to be sold to retailers, to the extra-regional markets or to be sent to distillation. The share of wine that is bottled under the name of the holding is typically lower than the 10% out of the total production, with scarce bent to carry out new investments to improve technology and product quality;
4. holdings that bottle and market the loose wine that has been produced by outside parties.

Tradition and innovation in the growing techniques for table- and quality wines (VQPRD)

About tradition and innovation in the Sicilian wine sector, a rough distinction in two main groups of operators may be done.

a) The kind of holdings described by number 3) in the above list, namely the cooperatives social cellars that represent the traditional way of producing grape and making wine: they still represent the 80-85% of the total grape production of the region. Cooperatives fulfill the need to concentrate the pulverized production of the numerous small holdings (see Table 2, from where it emerges that the 55,8% of the total number of grape holdings has an area not wider than 2 hectares).

High-productive grapevines are mostly utilised by the social cellars, as Catarratto, Trebbiano and others; the plants are bred according to the expanded horizontal system of “tendone” (Figure 1), characterized by large dimensions and high inputs requirements, or the form of “alberello” (mono-tree, Figure 2). Planting density is in the range of 2.600-3.200 plants/ha; the yield is in the range of 18/22 t/ha.

Chart 3: "Tendone" and "Alberello" breeding systems



Figure 1. “Tendone” breeding system



Figure 2. “Alberello” breeding system

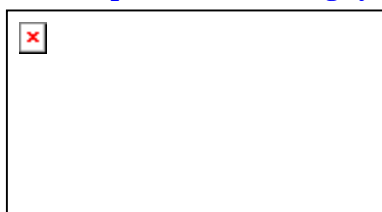
Attention for the quality of the oenological processes is generally scarce by the cellars operators. As stated above, these large associated structures carries out mainly the first processing into (loose) wine and must; they also arrange distillation. Bottling is carried out in a very minor part.

On 1996, the surveyed cooperatives social cellars by the ISTAT Census for the industrial sector, were 84, being the 28% of the wine Sicilian holdings, and the consortia to market the wine produced by the associated cooperatives were only 2.

b) An emerging group of operators, represented by individual and associated holdings, aim at producing grape and wine according to high quality procedures. They use innovative oenological techniques; market the wine under their brand name; participate to national and international wine fairs and carry out own marketing campaigns.

Such operators produce under the requirements of the COD and TGI quality labels. International grapevines are mainly utilised, as Cabernet Sauvignon, Merlot, Syrah, Chardonnay, Sauvignon Blanc; however, an important role is also played by the local Nero d’Avola, Inzolia and Grillo. The Sangiovese is also part of the group. Plants are bred according to the vertical “spalliera” system (Figure 3), characterized by smaller plants (planting density exceeds 4.000 plants/ha) with moderate inputs requirements and low productivity (10 to 16 tons/ha, in compliance with the corresponding VQPRD standards).

Chart 4: "Spalliera" breeding system



Processors of grape from organic agriculture

About organic processors, Ficani reports that on 2000/2001 there were 19 oenological certified holdings for production of wines and must from organic grape (Table 11).

CORERAS reports that total organic wine production comes to around 25.000 hectolitres. The 60% of which (14.800 hl) is produced in the province of Trapani; Palermo produces 4.440 hl.

Moderate production is made in the provinces of Catania, Caltanissetta, Messina and Agrigento.

Table 11: The organic processors surveyed on 2000/2001 (adapted from Ficani, 2001)

Holding	Municipality	Tot. grape area (ha)	Organic grape area	% organic	Years conversion	from
1	Mazara del Vallo (TP)	3.300	300,00	9,1	4	
2	Petrosino (TP)	4.500	77,25	1,7	6	
3	Marsala (TP)	2.100	14,00	0,7	1	
4	S. Ninfa (TP)	1.600	16,80	1,1	3	
5	Alcamo (TP)	1.700	90,00	5,3	1	
6	Marsala (TP)	2.515	14,24	0,6	1	
7	Castelvetrano (TP)	990	25,00	2,5	1	
8	S. Cristina Gela (PA)	40	40,00	100,0	7	
9	Partinico (PA)	10	10,00	100,0	7	
10	Cerda (PA)	15	11,20	74,7	4	
11	Mazara del Vallo (TP)	63	63,00	100,0	8	
12	Marsala (TP)	100	9,64	9,6	3	
13	S. Ninfa (TP)	1.000	300,00	30,0	1	
14	Comiso (RG)	3	3,00	100,0	5	
15	Trapani (TP)	7	7,22	100,0	4	
16	Zafferana Etnea (CT)	5	5,00	100,0	8	
17	Linguaglossa (CT)	10	10,00	100,0	8	
18	Mazara del Vallo (TP)	NO	NO	-	3	
19	Camp. di Mazara (TP)	NO	NO	-	3	

1.2. Level of implementation of the various measures of the CMO in Sicily

1.2.1. Effects of the previous CMO on the Sicilian wine sector

The previous CMO wine, in force from 1987 to the campaign 1999-2000 (EC Reg. 822/87 and 823/87), has reached in Sicily the main Community objectives, in terms of reduction of wine products surplus, as consequence of the decrease of the cultivated area and the average productivity (see Table 1).

An effect of the CMO effectiveness is that, from the campaign 1995-96 onward, the mandatory distillation was not applied anymore.

Nevertheless, the CMO encouraged in the southern regions, in particular in Sicily, the massive production of low quality wine.

Wine distillation

In fact, (optional/preventive) distillation in Sicily has been the outlet of large quantities of loose wine, barely suitable for the market. As a matter of fact, statistics show – between 1991-92 and 2000-01 – that distillation counted on the average the 32% of the total wine production (Table 12).

Table 11: Wine volumes destined to distillation in Sicily (CORERAS on ISTAT and IRVV data)

Campaign	Sicily (hl)	% on Sicilian wine total production	Sicily on Italy distillation %
1985/86	4.163.148	39,7	26
1986/87	4.360.066	35,5	21
1987/88	4.474.039	37,6	21
1988/89	3.232.478	36,0	22
1989/90	1.291.864	13,8	24
1990/91	1.412.211	18,3	26
1991/92	4.351.269	42,9	33
1992/93	3.528.070	30,2	24
1993/94	2.745.338	27,1	23
1994/95	751.150	8,1	21
1995/96	604.427	5,8	65
1996/97	1.139.020	12,6	28
1997/98	1.825.443	22,6	42
1998/99	1.643.363	17,9	50
1999/00	1.639.695	20,1	38
2000/01	1.868.097	26,3	37

Wine and grape must storage

Wine products storage shows the same tendency: from 1992/93 to 2001/02, Sicilian producers contributed for around the 40% to the total national storage (Table 13). In particular, over the period 1992-2001, the 63% of the stored musts, the 31% of the table wine and the 24% of the concentrated and rectified concentrated musts were represented by Sicily.

Table 12: Long term contracts for wine storage in Sicily (CORERAS on ISMEA statistics)

Campaign	Table wine	Mute must	Conc. and rectified conc. must	% on national storage		
				Table wine	Mute must	Concentrated and rectified must
1990/91	776.345	654.229	15.952	26	70	9
1991/92	771.227	792.980	25.581	20	65	12
1992/93	1.516.301	429.689	21.806	35	44	11
1993/94	1.013.029	600.035	32.989	29	61	14
1994/95	551.413	289.531	8.858	32	49	6
1995/96	827.850	564.555	39.579	39	67	17
1996/97	743.456	1.000.923	68.187	28	70	17
1997/98	464.852	727.438	52.949	23	73	16
1998/99	695.747	813.964	49.223	29	81	18
1999/00	895.788	1.120.082	70.174	36	70	19
2000/01	913.721	1.210.144	93.857	29	54	58
2001/02	1.328.359	907.832	123.143	33	61	62

By-products mandatory distillation

In Italy, distillation of the cellar's by-products (marc and dreg) is mandatory. All the by-products have to be sent to the distillery, after signing a withdrawal contract under strict control of the Repression of frauds in the wine sector Office (U.O. 29, Service V, AFDRS).

Table 14 presents the quantities of marcs and dregs produced and sent to the distilleries in Sicily, from 1992 to 2004.

Table 13: Distilled quantities of marcs and dregs, 1992-2004 (ADRS, U.P. 29 – Repression of frauds in the wine sector Office)

Campaign	Distilled marc and dregs (q)
1992/93	1.617.799,00
1993/94	1.410.604,00
1994/95	1.184.631,00
1995/96	1.160.664,00
1996/97	1.243.565,00
1997/98	1.066.080,00
1998/99	1.336.150,00
1999/00	1.643.879,24
2000/01	n.a.
2001/02	1.211.624,41
2002/03	1.012.602,43
2003/04	1.193.019,79

Uprooted grapeyards

From 1988 until 1997/98 (when the Region, in compliance with the EC Reg. 1429/96, decided not to support the measure anymore) 17.264 ha of wine grapeyards have been uprooted (Table 15).

Table grape-wine has been principally uprooted: only 82 hectares of grape for VQPRD wines have been uprooted over the period under study (Ciccarelli, Bacarella, 2005).

Table 15. Uprooted grape-wine areas 1988-1998 in Sicily (ha) (Ciccarelli, Bacarella, 2005)

	1988/ 89	1989/ 90	1990/ 91	1991/ 92	1992/ 93	1993/ 94	1994/ 95	1995/ 96	1996/ 97	1997 /98	Total	Share on national uprooted grapewine area
Sicily	513	2.779	2.274	2.146	2.146	1.727	3.494	1.754	108	323	17,264	16,2%
Italy	13.391	12.388	18.098	13.768	11.009	10.457	15.616	11.248	121	359	106.453	100%

1.2.2. Implications of the CMO reform in Sicily

The CMO reform, with the implementation of EC Reg. 1493/99, although still aiming at limiting the surplus, put the emphasis on:

- a) the introduction of the autoctonous and international grapevines, as demanded by the market;
- b) the V.Q.P.R.D. wines;
- c) the establishment of quality-oriented grapeyards, with high plantation density and suitable breeding forms.

The achievement of these targets was principally promoted through the reconversion and restructuring of the existing grapeyards.

The Sicily Region acknowledged the EC Reg. 1493/99 by issuing the Circular nr. 289 of 18/12/2000, where the main objectives of the reform together with the rules to manage the existing grapeyards, the new plantings and re-plantings were addressed.

In total, 1.648 hectares of new planting rights were assigned to Sicily through the CMO reform, that are being allocated according to restricted criteria, fixed by the above regional Circular, which established that the new planting rights could be granted in five specific circumstances:

- 1) utilisation of the new grapeyard for familiar use, only, with no sale of the grape;
- 2) experimentation;
- 3) growing mother-plants for production of propagation material;
- 4) land reassembling;
- 5) expropriation for public utility.

New planting rights could be also granted for V.Q.P.R.D. wines production, in case the demand should be higher than the offer.

About the issue of the re-planting rights, from mid 90's until 2003 a remarkable number of rights was transferred from Sicily to other Italian regions (especially Tuscany), where the grapeyard value was much higher than in Sicily (Table 16 shows data for 2000-2003).

Table 14: Re-planting rights transferred out of Sicily, campaigns 2000/01, 2001/02, 2002/03 (IRVV)

Province	Hectares
Agrigento	559,64
Caltanissetta	20,64
Catania	79,14
Enna	17,30
Messina	8,18
Palermo	386,84
Ragusa	100,1
Siracusa	29,40
Trapani	1.526,00
Total	2.727,24

Finally on 2003, the Region banned the extra-regional transfer of the rights: from that time the (partial or complete) transfer of rights is allowed only within the region, according to strict rules. Transferred rights may be used exclusively to plant grapeyards for V.Q.P.R.D. wines, or for nursery purposes (it is forbidden to harvest the grape). Furthermore, the re-planting right expires in case it is not used before the end of the 5th year after the uprooting.

On 2000, the Regional Reserve of Planting Rights has been established by the AFDRS, made up by the new planting rights, granted by the EU, and the still valid re-planting rights.

Planting rights are being assigned through periodic public notifications. For instance, with regional notification of December 2003, it was assigned an area of 250 hectares, distributed as follows:

- 100 ha, to plant new grapeyards for COD Etna wine production;
- 40 ha, to plant new grapeyards for COD Malvasia delle Lipari wine production;
- 50 ha, to plant new grapeyards for COD Moscato and COD Passito di Pantelleria wines production;
- 30 ha, to plant new grapeyards for COD Faro wine production;
- 30 ha, for planting projects utilising land confiscated to the “mafia”.

The regional Plan for restructuring and reconversion of grapeyards 2001-2006

For the campaign 2000/2001, the Region Sicily presented the regional Plan for restructuring and reconversion of grapeyards 2001-2006 to the Italian Ministry of Agriculture, to the AGEA and to the EU, for approval, in compliance with the provisions of the EC Reg. 1493/99 and 1227/2000, with the following general objectives:

1. improvement of the production conditions (adoption of more quality-oriented cropping systems; maintenance of grapeyards in suitable areas; incentive to bottling);
2. limitation to the productive potential;
3. preservation of agricultural landscape and environmental sustainability;
4. reinforcement of competition (mechanization; production costs reduction).

In particular, the emphasis has been put on:

- the reconversion of the grapeyards, by the exploitation of the autoctonous valuable grapevines and the adoption of the best international vines;
- the enticement of grape production in COD and TGI areas, encouraging black berry cultivars;
- the reorganization of the grapeyards spreading the breeding form “a spalliera” and “ad alberello” in order to facilitate mechanization;
- the replacement of the expanded breeding form “a tendone” with the form “a spalliera”.

The objective 3 of the above list has been particularly addressed by the following statements of the Plan:

- the ban to increase productivity; somewhat, all the supported interventions aim at reducing quantity in favour of quality;
- minimum planting density for black berry cultivars is 4.000 plants/ha; for white berry cultivars is 3.500 plants/ha. Only in case of re-grafting, the minimum density is 3.200 plants/ha.
- in any case, for what it concerns breeding form, planting density and maximum yield/ha, it has to be respected what it is provided by the concerned COD/TGI production standards;
- irrigation has to be exclusively utilised to maintain the physiological balance of the plant, and not as forcing technique; watering has to be carried out according to the climatic conditions, always paying attention not to increase the yield;
- all the allowed soil management practices have to refer to the GAP, as annex of the RDP (EC Reg. 1257/99);
- soil tillage operations have to favour water harvesting and control weed population;
- NPK fertilisation is limited.

Expenditure for the RPRRG 2001-2006 implementation

Eligible projects are financed with a contribution of the 57% of the total cost; in the minor Islands and in the COD Etna area the percentage reaches the 75%.

Irrigation schemes, even if part of the project, are not financed.

On the campaign 2000-2001, 3.509 hectares and 1.393 holdings were benefitted by the first public notification with a total expenditure of 22.222.741,80 Euro (Table 17).

Table 15: Campaign 2000-20001. Beneficiaries and payments granted within RPRRG (AFDRS)

Province	Beneficiaries	Expenditure (€)	%
Agrigento	355	4.669.774,64	21,0
Caltanissetta	7	224.998,16	1,0
Catania	2	17.810,02	0,1
Enna	0	-	-
Messina	1	27.334,17	0,1
Palermo	171	3.468.072,53	15,6
Ragusa	10	268.745,79	1,2
Siracusa	19	381.455,19	1,7
Trapani	826	13.003.613,51	58,5
AFDRS	2	160.937,79	0,7
Total	1.393	22.222.741,80	100

On the campaign 2001-2002, 3.363 hectares and 1.066 holdings were benefitted by the Plan with a total expenditure of 23.461.541,97 Euro (Table 18).

Table 16: Campaign 2001-20002. Beneficiaries and payments granted within RPRRG (AFDRS)

Province	Beneficiaries	Expenditure (€)	%
Agrigento	326	5.624.372,06	24,0
Caltanissetta	13	577.470,67	2,5
Catania	9	231.491,53	1,0
Enna	1	20.853,90	0,1
Messina	3	175.717,17	0,7
Palermo	80	2.499.992,50	10,7
Ragusa	11	269.364,75	1,1
Siracusa	17	416.678,56	1,8
Trapani	606	13.645.600,83	58,2
Total	1.066	23.461.541,97	100

On the campaign 2002-2003, 5.713 hectares and 1.721 holdings were benefitted by the Plan with a total expenditure of 41.695.727 Euro (AFDRS).

1.3. Institutional framework of wine production in Sicily

1.3.1. Institutions in charge of the management, controls and payment of the premiums

The Agriculture and Forests Department of the Regione Sicilia (AFDRS) is the unique institution in charge to manage the implementation of the CMO in the region.

In particular, the U.O. 23 (Wine sector) of the Service V is in charge of:

- RPRRG implementation and structural funds management;
- control/monitoring of grubbing out vineyards;
- recognition of VQPRD wines.

The U.O. 29 (RSRFWS) of the Service V is in charge of the following tasks:

- Control of wine adulteration
- Control of grape processing into wine
- Recognition of distilleries and factories producing concentrated rectified must.

The IRVV, beside research activities listed below, works in synergy with the AFDRS Offices in surveying wine storage as well as distillation. Grape must is also monitored and controlled.

The payments of the premiums are managed by the centralised AGEA, that is located in Rome. The regional Paying Agency of Sicily is forthcoming.

The AFDRS carries out administrative and field controls on the beneficiaries, to check proper implementation of the CMO measures and sends the approval to AGEA, that execute the payment. Cross-checking activities of controls are also carried out by AGEA itself in conjunction with the national Service of repression of frauds in the wine sector.

1.3.2. Associations of grape and wine producers in Sicily

Chapter 0.14 gives details on the typologies of the producers' organisations of Sicily.

In fact, there are not real producers organisations (PO), as intended for the fruit sector.

The cooperatives social cellars (*cooperative cantine sociali*), that join the major part of the grapevine producers, behave as inter-branch organisations. They withdraw the product from their members; process it into wine and market it. In addition, the cooperatives provide assistance to their members for the management of the various CMO measures, especially interventions within the frame of the RPRRG (support to projects design and implementation, to the application to AFDRS for premiums, etc.). Often the cooperatives present collective RPRRG projects, concerning all the members at once.

Usually, the cooperatives do not have specific production standards to be observed by the members, namely there is no a standard method characterizing the grape/wine production.

Only those holdings willing to produce TGI or COD wines have to refer to the corresponding set of standards, that present a few of references to environmental aspects of farming, as limited maximum productivity and limited planting density.

However, TGI/COD production standards do not account important restrictions of water/pesticides/fertilisers use.

1.3.3. Distilleries and factories for concentrated grape must production

Table 17: Recognised factories of concentrated rectified grape must in Sicily (AFDRS, 2005)

Company's name	Site
Bono & Ditta S.p.a	Campobello di Mazara, Trapani
Cadivin S.p.a.	Partinico, Palermo
Cantine Foraci s.r.l.	Mazara del Vallo, Trapani
CO.V.A.G. soc. coop a r.l.	Menfi, Agrigento
Enologica Cassarà s.r.l.	Alcamo, Trapani
Vallovin s.r.l.	Mazara del Vallo, Trapani
Vinicola Falcone	Campobello di Mazara, Trapani

Table 18: Recognised distilleries in Sicily (AFDRS, 2005)

Company's name	Site	Raw processed materials
DISTILLERIA BERTOLINO s.p.a.	Partinico, Palermo	Wine - Marcs - Dregs
DISTILLERIA F.LLI RUSSO DI SALVATORE E GIUSEPPE RUSSO s.n.c.	Santa Venerina, Catania	Wine - Marcs - Dregs
ENODISTIL s.p.a.	Palermo	Wine - Marcs - Dregs
GE.DIS. s.p.a.	Marsala, Trapani	Wine - Marcs - Dregs
GIOVI s.r.l.	Valdina, Messina	Marcs - Dregs
SOCIETA' VINICOLA MEDITERRANEA s.p.a.	Sciacca, Agrigento	Wine - Marcs - Dregs
TRAPAS s.r.l.	Petrosino, Trapani	Wine - Marcs - Dregs

1.3.4. Farmers unions

The three main national organisations, Coldiretti, Confagricoltura and Confederazione Italiana Agricoltori, have their branch-offices in Sicily.

1.3.5. Research and technical institutes, Institutes for statistics

- Istituto Nazionale Economia Agraria (INEA), regional office;
- Department of Horticultural Crops (DCA), University of Palermo;
- Department of Economy of the Agro-Forestry Systems (ESAF), University of Palermo;
- Department of Orto-Floro-Arbicoltura e Tecnologie Agroalimentari, University of Catania;
- Istituto Nazionale di Statistica (ISTAT), regional office;
- Regional Institute of the grape-wine and wine (IRVV).

The IRVV is the most important body dealing with the wine sector in Sicily. Main activities are:

- applied research on grape growing; development and testing of experimental fields of new grapevines;
- research on innovative oenological methods;
- advice to the AFDRS about regional legislation of the grape sector;
- analyses of Sicilian wines for certification and VPQRD wines recognition;
- promotion of the Sicilian wines in the national and international markets, by implementing advertisement and producers participation to wine fairs;
- relationships and link with the Service of Repression of food frauds.

1.4. CMO implementation context in Sicily

1.4.1. Eco-conditionality and links to CMO's subsidies

At the very early stage of the implementation of the principles of cross-compliance (eco-conditionality), according to the EC Reg. 1259/99, for the first time environmental requirements were introduced at national scale. Sicily too was concerned with this new approach.

Therefore, broad-spectrum measures were introduced, principally targeted 1) to prevent soil erosion in arable cropping systems and 2) to properly manage animal excreta and its recycling into the cultivated fields. Controls from the public authorities on the correct respect of such measures, however, have been rather mild and a very few number of infractions was pointed out.

Recently on 2004, Annex III and IV of the EC Reg. 1782/03 were the subject of the Decree 13/12/04, issued by the Italian Ministry of Agriculture. In the two annexes of the Decree, detailed norms to maintain the agricultural fields in good agronomic and environmental conditions were provided, to be implemented from the 1st of January 2005: when not properly applied, the concerned producer would undergo a per cent reduction of the CMO premium.

The Agriculture and Forestry Department of the Sicily Region, on February 2005, acknowledged the national Decree by issuing a regional Decree on eco-conditionality (D.D.G. 193 of 25/02/05) where the GAP norms provided by the national Decree were integrated with more site-adapted ones.

The additional details are in Annex 2 of the regional Decree (referring to Art. 5 EC Reg. 1782/03 and Annex IV) and concern Norm 1.1 (water management on sloping land); Norm 1.2 (crop residues management); Norm 4.1 (preservation of permanent pasture); Norm 4.2 (management of land put on set-aside). Actually, the regional Decree on eco-conditionality, likewise to the national one, does not specifically address permanent crops, except in Norm 4.4 where, in order to preserve traditional landscapes, it is forbidden to destroy existing terraces.

For the grape-wine sector, as stated above, the benefits of the RPRRG are linked to the full respect of GAP, a technical document that has been enclosed to the RDP, in compliance with EC Reg. 1257/99 (see below). In fact, when a project proposal of reconversion/restructuring is designed, to be eligible for financing clear links to the GAP document have to be included plus other environmental statements on sustainable soil tillage (see chapter 0.2.2.1). IPM methods however are not considered.

1.4.2. The Agro-environmental programme (AEP, EC Reg. 2078/92)

The Agro-environmental Programme (AEP) devised by Regione Sicilia has been approved by the Commission with Decision C (94) 2494 of October, 10th 1994. Subsequent modifications to the programme were endorsed with decisions C (96) 008 of January 30th 1996, C (97) 097 of January 29th 1997 and C (97) 3089 of November 14th, 1997.

General characteristics of AEP application in Sicily

Table 21 lists the AEP measures and its objectives.

Table 19: AEP measures implemented in Sicily

Measure	Objective
A1	Pesticides reduction
A2	Organic agriculture
B1	Extensification
B2	Keeping low productivity
C	Reduction of livestock density
D1	Protection of the countryside and the landscape
D2	Preserving animal breeds under risk of extinction
E	Upkeep of abandoned farmland
F	Twenty-year set-aside of arable land
G	Land management for public access and leisure activities

The measure B2 (keeping low productivity) has been implemented only in restricted areas with the aim to preserve particular autoctonous crops, usually grown extensively and located in vulnerable areas. Among the prescribed obligations there were the maintenance of the crop; limited nitrogen fertilisation, conservative practices, ban of herbicides, fire prevention.

The measure D1 (protection of the countryside and the landscape) pointed towards preservation of the traditional landscape as well as to prevent the soil from erosion. The measure was targeted to

the permanent crops located on terraces, pushing the farmers to restore old pathways and soil protection structures; the use of herbicides was banned.

The activation of the several AEP measures has occurred gradually. In the period 1994-97, five distinct measures have been activated, concerning around 70.000 hectares. Other five measures have been implemented in the period 1998/2000, after the last approved amendment of the AEP.

In particular on the year 1993/94, the sole measure A2 (organic agriculture) had been started.

In the following year, the measures A1 (reduction of pesticides), B1 (extensification of crop farming), E (upkeep of abandoned farmland) and F (twenty-year set-aside of arable land) have been also started.

It has to be underlined that the measure A1 has been purposely introduced due to the growing concern about the high use of pesticides as well as herbicides in the permanent and vegetable cropping systems. The measure was accompanied by a package of “technical norms”, namely the very first example of IPM formally applied in Sicily. Actually, the adoption of such production standards was compulsory for the beneficiaries of measure A1.

Measure A1 was particularly successful for permanent crops, whereas vegetable crops played a minor role, due to the inadequate level of compensation.

On 1998, the measures B2 (maintenance of low productivity), D1 (protection of the countryside and the landscape), D2 (preserving animal breeds under risk of extinction) and C (reduction of livestock density of cattle, sheep and goats) have been also started. On 1999, the measure G (land management for public access and leisure activities) has been also activated.

Chart 3 and Table 22 depict the evolution of the AEP implementation in Sicily, up to 1998: as it may be observed, the measures A1 (reduction of pesticides) and A2 (organic agriculture) play the leading role.

Chart 5: Implementation of EC Reg. 2078/92: share of UAA per AEP measure, on 1998

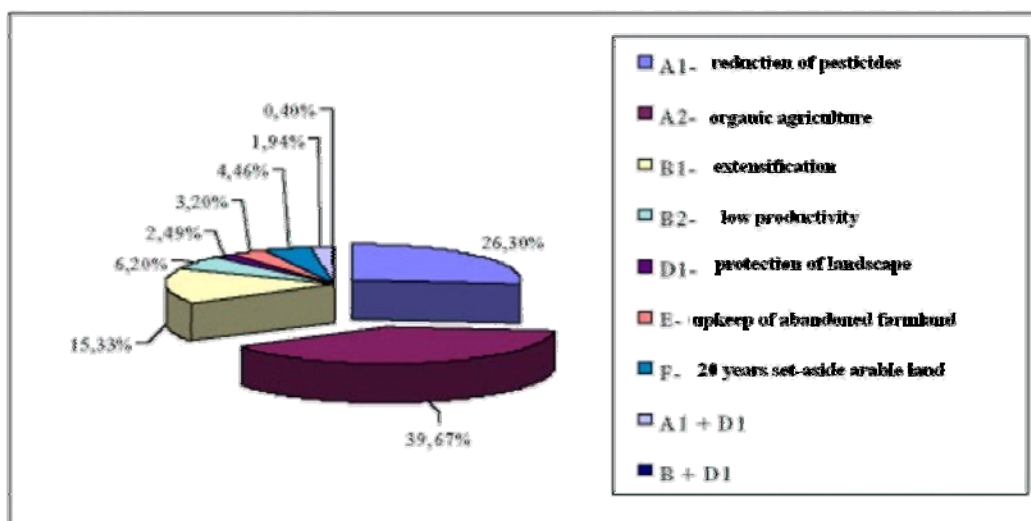


Table 20: Situation of EC Reg. 2078/92 implementation on year 1998

Measure/Action	Holdings	UAA (ha)	% UAA	Expenditure (lire x 10 ⁶)	% cost
A1- Pesticides reduction	13.550	58.394	26,30%	57.201,916	28,44%
A2- Organic agriculture	7.264	88.083	39,67%	77.933,556	38,75%
B1- Extensification	3.680	34.045	15,33%	20.432,038	10,16%
B2- Maintenance low productivity	5.925	13.774	6,20%	12.823,486	6,38%
D1- Protection of the countryside and the landscape	2.156	5.532	2,49%	5.894,674	2,93%
E- Upkeep of abandoned farmland	459	7.102	3,20%	3.999,752	1,99%
F- Twenty-year set-aside of arable land	1.331	9.910	4,46%	13.640,137	6,78%
A1 + D1	1.869	4.297	1,94%	7.756,559	3,86%
B + D1	341	888	0,40%	1.456,980	0,72%
C- Reduction of livestock density	1	7 UBA	-	3,639	0,00%
Total	36.576	222.025	100%	201.142,737	100%

The AEP and the wine sector

The grape-wine sector was essentially concerned by the following measures:

Measure A1: Pesticides reduction in fruit orchards and grape-yards;

Measure A1 + D1: Pesticides reduction in fruit orchards and grape-yards in conjunction with other eco-compatible methods;

Measure A2: Organic agriculture in fruit orchards and grape-yards;

Measure B1: Maintenance of extensive grape-yards;

Measure B1 + D1: Maintenance of extensive grape-yards in conjunction with other eco-compatible methods. The measure concerned grape-yards with “controspalliera” and “alberello” breeding forms;

Measure D1: Production methods suitable for the protection of the countryside and the landscape. Fruit orchards and grape-yards.

Table 23 and 24 presents statistics on expenditures and beneficiaries for the AEP measures implemented in the grape sector, for year 2001 and 2002, respectively.

Table 21: Holdings, area (ha) and payments (€) concerned by AEP measures for grapeyards on 2001 (CORERAS, 2004)

Nr. of holdings	Measure	Measure description	Area concerned by the measure	Total amount
1.343		Pesticides reduction in fruit orchards and grape-yards	8.453	4.082.145
4.648	Total A1		19.111	9.453.342
128		Pesticides reduction in fruit orchards and grape-yards in conjunction with other eco-compatible methods	340	287.003
735	Total A1+D1		1.792	1.813.672
1.247		Organic agriculture in fruit orchards and grape-yards	9.073	7.667.979
4.256	Total A2		53.908	24.523.463
67		Maintenance of extensive grape-yards	294	142.074
2.315	Total B1		20.564	6.293.544
11		Maintenance of extensive grape-yards in conjunction with other eco-compatible methods	20	17.295
11	Total B1+D1		20	17.295
122		Production methods suitable for the protection of the countryside and the landscape	170	82.322
890	Total D1		1.813	1.039.747

From the table it emerges that 2.918 grape holdings got the AEP support (the 22,7% of the total); on 18.350 ha (the 18,9% of the total) and for an amount of 12.278.818 Euro (around the 28,5% of the total spent for AEP on 2001).

Table 22: Holdings, area (ha) and payments (€) concerned by AEP measures for grapeyards on 2002 (CORERAS, 2004)

Nr. of holdings	Measure	Measure description	Area concerned by the measure	Total amount
799		Pesticides reduction in fruit orchards and grape-yards	5.328	2.573.359
2.555	Total A1		10.925	5.354.776
40		Pesticides reduction in fruit orchards and grape-yards in conjunction with other eco-compatible methods	134	113.675
270	Total A1+D1		760	800.115
852		Organic agriculture in fruit orchards and grape-yards	6.641	5.613.990
2.829	Totale A2		36.440	16.973.015
26		Maintenance of extensive grape-yards	153	73.860
1.366	Total B1		12.184	3.728.142
3		Maintenance of extensive grape-yards in conjunction with other eco-compatible methods	3	2.341
3	Total B1+D1		3	2.341
40		Production methods suitable for the protection of the countryside and the landscape	53	25.604
311	Total D1		650	375.637

From the table it emerges that 1.760 grape holdings got the AEP support (the 24% of the total); on 12.312 ha (the 20,2% of the total) and for an amount of 8.402.829 Euro (around the 30,9% of the total spent for AEP on 2002).

1.4.3. The Rural Development Plan (RDP, EC Reg. 1257/99: the Agro-environmental Measure “F”

The first release of the Sicilian Rural Development Plan (RDP) 2000-2006 has been approved by the Commission with Decision C (2001) 135 of January, 23th 2001.

The RDP has an overall financial budget of 560,8 millions of Euro. Nevertheless, the 77,8% of this amount (436,26 millions of Euro) was needed to pay the commitments taken by the past programming (AEP, EC Reg. 2078/92).

The measure concerned with the agro-environment is the “F” one. It has the general objective of spreading agricultural techniques and soil management methods that are ecologically compatible, by ensuring an acceptable income to the farmers. It is organised in six actions:

- F1a – Methods of integrated farming
- F1b – Introduction and maintenance of the methods of organic agriculture and livestock
- F2 – Extensive fodder systems, upkeep of the landscape and soil erosion prevention
- F3 – Restoring and/or maintenance of the traditional rural landscape, of natural and semi-natural areas
- F4a – Set-aside of arable crops for environmental purposes
- F4b- Breeding local animal breeds under risk of extinction.

The RDP and the wine sector

The grape-wine sector is essentially concerned by the actions F1a, F1b and F3.

In particular, action F3 is limited to the traditional grapeyards localised on old terraces in the minor Islands, having an “alberello” (small tree) breeding form.

Table 25 and 26 presents statistics on expenditures and beneficiaries for the RDP action under the F measure implemented in the grape sector, for year 2001 and 2002, respectively.

Table 23: Holdings, area (ha) and payments (€) concerned by the RDP-AE F measure for grapeyards on 2001 (CORERAS, 2004)

Nr. of holdings	Action	Action description	Area concerned by the measure	Total amount
16		Methods of integrated farming	107	44.554
167	Total F1A		1.650	695.789
57		Organic farming	1.092	657.267
948	Total F1B		25.786	10.294.062

Table 24: Holdings, area (ha) and payments (€) concerned by the RDP-AE F measure for grapeyards on 2002 (CORERAS, 2004)

Nr. of holdings	Action	Action description	Area concerned by the measure	Total amount
11		Methods of integrated farming	82	34.411
123	Total F1A		1.150	497.720
23		Organic farming	240	144.439
657	Total F1B		18.901	7.509.331

From the tables it emerges that 107 grape holdings got the RDP F measure support (the 5,6% of the total); on 1.521 ha (the 3,2% of the total) and for an amount of 880.671 Euro (around the 4,6% of the total spent for the F measure on 2001 and 2002).

Tables 23, 24, 25 and 26 highlight that the number of holdings, area and spent money relative to the old programming (1994-1999, AEP) are significantly more than those relative to the new one (2000-2006, RDP): 4.678 vs. 107 holdings; 30.662 vs. 1.521 ha; 20.681.647 vs. 880.671 Euros. This has to be principally attributed to the low budget allocated in favour of the F measure, which led the regional administration to restrict the premiums exclusively to those holdings having the 50% (at least) of the farm area sited on “priority areas”, namely environmentally more vulnerable areas, as parks and protected areas, natural reserves, SIC (EC Dir. 438/92 “Habitat”), ZPS (EC Dir 409/79 “Birds”), highly vulnerable areas for water pollution (EC Dir 91/676), etc.

1.4.4. GAP and Technical Norms on IPM

According to the EC Reg. 1257/99 and 1750/99, the beneficiaries of the F measure have to go further the “usual good farming practices” (GAP), i.e. the “standard practice that a reasonable farmer would follow in the region concerned”.

The regional administration, in conjunction with the Italian Ministry of Agriculture, developed the GAP, tailored on the Sicilian farming systems, as technical annex to the RDP (Annex ?).

Besides general considerations, applicable to all the crops, specific chapters of the GAP document are dedicated to the table-grape and grape-wine, grown under rainfed and irrigated conditions.

GAP norms have to be applied by the applicants of measure F on the whole farmland, also in the areas that not benefit by the premium. GAP norms are also mandatory for getting the CMO subsidies as provided by the RPRRG.

For the sub-measure F1a (Methods of integrated farming) one way “to go further” the GAP is the mandatory application of the “Technical Norms on IPM”, where specific sections are dedicated to table grape and wine grape (Annex ?). Such IPM Norms had been also used as technical reference for the measure A1 (see above). Here the Norms have been widened and updated: the latest release dates back to April 2005 (Gazzetta Ufficiale della Regione Siciliana, nr. 15 of April, 8th 2005). Moreover, cover crops and conservative soil tillage are also mandatory methods that go beyond the GAP.

For the sub-measure F1b (Introduction and maintenance of the methods of organic agriculture and livestock), the obligation to abide by the EC Reg. 2092/91 on organic agriculture, namely to

undergo the control and certification system, certainly involves more than the mere application of GAP. Specific standards for organic cultivation of grape have not been however devised.

1.4.5. Structural measures for the support of the grape/wine sector in Sicily

The Operational Plurifund Programme (OPP) (1994-1999)

The OPP 1994-1999 has been the first significant public programme to carry out investments in the Sicilian agricultural grape and wine holdings, through the following measures:

- Measure 8.3 “Improvement of the production holdings of the grape/wine sector, with particular regard to COD, CODG and TGI areas”. At the date of December 31, 2000, 22.778.821 Euros had been spent, involving 3.091 hectares of vineyards. It has to be underlined that part of the applications that could not be financed by this measure, due to lack of financial coverage, has been subsequently financed by the RPRRG, in order to ensure continuity to the reconversion process of the Sicilian grape/wine sector.
- Measure 11.2 “Contribution for implementation, empowerment and modernization of structures for the processing and marketing of agricultural products”. Investments in obsolete processing plans aiming at costs reduction and wine quality improvement have been supported, with a total expenditure of 91.774.390 Euros. Continuity to this measure has been given by the measure 4.09 of the ROP 2000-2006.

The Regional Operational Programme ROP (2000-2006)

The Axis IV “Local systems of development” of the ROP Sicily provides two measures that mostly concern, among others, the grape/wine sector.

The measure 4.09, “Improvements of processing and marketing conditions”, aims at modernizing and empowering the regional food sector, through ex-novo construction and/or upgrading of processing/packaging plans. Voluntary certification schemes for quality (ISO 9000) and environment (ISO 14000) are also financed by this measure.

For the wine sector Table 27 presents the projects that were admitted on 2001 to the ROP contribution, for a total expenditure of 12.753.677 Euros.

Table 25: Measure 4.09, ROP 2000-2006, 2001 expenditure and admitted projects (adapted from CORERAS, 2004)

Company	Project location	Province	Expenditure (€)
SANTA NINFA	SANTA NINFA	Trapani	891.828
PATRIA	CASTIGLIONE DI	Catania	5.073.518
CORBERA	S.M. BELICE	Agrigento	688.521
LA VITE	PARTANNA	Trapani	593.573
AURORA V. DEI TEMPLI	FAVARA	Agrigento	905.865
EUROPA	PETROSINO	Trapani	3.052.415
MONTE OLIMPO	SAMBUCA DI SICILIA	Agrigento	1.547.957
Total expenditure			12.753.677

Table 28 presents the projects that were admitted on 2002 to the ROP contribution, for a total expenditure of 28.848.277,52 Euros.

Table 26: Measure 4.09, ROP 2000-20006, 2002 expenditure and admitted projects (adapted from CORERAS, 2004)

Company	Project location	Province	Expenditure (€)
SETTESOLI	S.M. BELICE	Agrigento	7.727.445,97
CASA VINICOLA FEOTTO DELLO JATO	S. GIUSEPPE JATO	Palermo	2.636.352,81
PRIMAVERA	FULGATORE-ERICE	Trapani	4.237.528,86
FEUDO DEI PRINCIPI DI BUTERA	BUTERA	Caltanissetta	3.200.014,38
MADONNA DEL PIRAINO	SALAPARUTA	Trapani	463.079,38
RINASCITA	PACECO	Trapani	7.655.182,39
LA VITE	RIESI	Caltanissetta	1.861.682,45
S. FRANCESCO	MAZARA DELVALLO	Trapani	1.066.991,28
Total expenditure			28.848.277,52

The measure 4.13, sub-measure B, “Support to the establishment, EU recognition and control of regional quality products” aims at supporting the development of quality regional products of certified geographical origin. Therefore, the support to TGI, COD and organic wines is part of the target of the aid.

Feasibility studies and consultancies to implement voluntary certification schemes for quality (ISO 9000/HACCP) and environment (ISO 14000) are also financed by this sub-measure.

The total amount available for the measure for the whole period (2000-2006) is 30.000.000 Euro.

At the end of 2002 however only one project has been admitted to contribution, for an amount of 460.200 Euros.

2. ANSWER TO EVALUATION QUESTIONS

2.1. Wine – Theme 1: supply control

Question 1(VI). What is the environmental impact of the ban on planting new vines except in Regions of growing demand?

Detailed answer

As shown in Table 1, the Sicilian grape area has decreased from 165.400 hectares (five-years period 1983-1987) to 141.200 hectares of the five-years period 1999-2003, marking a reduction of 14,6%.

From 1988 until 1997/98, 17.264 ha of wine grapeyards have been uprooted with the support of the CMO measure (Table 14). After the campaign 1995-96, the rate of uprooted area dropped after the Region's decision to stop this measure.

On 2000, the Regional Reserve of Planting Rights has been established by the AFDRS, made up by the new planting rights, granted by the EU, plus the re-planting rights.

The replanting right expires after 5 years from the uprooting, which affects its market cost (the oldest, the less expensive).

According to the interviewed researchers, when the new grapeyard to be planted on the basis of the acquired replanting rights takes the place of an already existing old one, the limited time (5 years or less) at one's disposal does not allow the producer to put into practice all the soil-improving agronomic techniques (e.g. green manuring, organic fertilisation, rest, etc.) necessary to recover fertility for a new 20-25 years grape cycle.

In addition to that, projects presented in the frame of the RPRRG have to be implemented in the two years-time following the approval, which further shrinks the time for the concerned soil to be recovered through appropriate interventions.

As a consequence of the above, the present system of replanting rights management - in conjunction with RPRRG rules - is likely to impoverish the soil quality, especially in marginal areas where soils are particularly prone to be depleted.

Other researchers stated that the ban's removal would probably allow the plantation of grape trees on marginal areas, where the permanent crop would play a role of soil protection, and this would represent an environmental improvement since such areas are presently neglected or even abandoned. However, according to other respondents, marginal areas were the first to be uprooted between 1988/89 and 1995/96, when the corresponding CMO measure was in force, due to their low profitability.

Farmers with market-oriented holdings stated that uprooting/replanting grape plants is a common practice within the farm area, a sort of rotational renovation that keeps the grapeyard in conditions of good qualitative productivity: usually, the plants are replaced at 20-25 years of age.

Small holdings that belong to large cooperatives social cellars (so, with quality not being the first target) tend not to follow this pattern, due to the high investments costs. Grapeyards are exploited at the most of their potential (over 30 years).

Several small farmers, members of cooperatives, stated they would enlarge their grapeyard, in case of the ban's removal: this would allow them to save the money to purchase the (new or re-planting) rights.

Any respondents stated that the ban led to significant changes in the farming practices (as fertilization, crop protection, cultivars assortment, level of productivity, etc.): for instance, change of cultivars or grapeyard reconversion were rather driven by (new) market options and/or RPRRG requirements/incentives.

Question 2 (VI) : What is the environmental impact of the by-products distillation mechanism, and other market measures like aid for the use of concentrated grape must ?

Detailed answer

In Italy, distillation of the cellar's by-products (marcs and dreg) is mandatory. All the by-products have to be sent to the distillery, after signing a withdrawal contract under strict control of the RSRFWS (U.O. 29, Service V, AFDRS).

Table 14 presents the quantities of marcs and dregs produced and sent to the distilleries in Sicily, from 1992 to 2004.

Table 27: Distilled quantities of marcs and dregs, 1992-2004 (ADRS, U.P. 29 – RSRFWS)

Campaign	Distilled marc and dregs (q)
1992/93	1.617.799,00
1993/94	1.410.604,00
1994/95	1.184.631,00
1995/96	1.160.664,00
1996/97	1.243.565,00
1997/98	1.066.080,00
1998/99	1.336.150,00
1999/00	1.643.879,24
2000/01	n.a.
2001/02	1.211.624,41
2002/03	1.012.602,43
2003/04	1.193.019,79

Chapter 0.3.3 gives the list of operating distilleries in Sicily. As it may be observed, the major part is in the Trapani province, where the highest wine production occurs.

Distances between the cellars and the distilleries range from 10 to 50 km at most, so not representing a problem under environmental terms.

As reported by the interviewed actors, cellar's by-products are transferred to the distillery after 7-10 days of their production, on the average. Legs are distinguished in liquid and solid ones. The distillery also arranges the extraction of tartaric acid and separation of grape seeds, that in turn will be processed elsewhere for oil production.

The distillery by-products are usually burned by the distillery itself to generate energy.

To this regard, as reported by the local environmental NGO and by the concerned officials of the LEDRS, the emission of polluting smokes and smells from the distilleries activity has been a focus problem in Sicily for several years, especially when big plans are concerned where massive amounts of by-products are continuously processed.

Such pollution problems, that are not properly tackled by the management since state-of-the-art technologies for the disposal are not being adopted, easily turn into street protests by the local citizens, supported by the environmental NGOs: this, in some circumstances, led to the temporary sequestration of (part of) the plan by the judicial Authority, with consequential social discomfort.

Wine distillation has been always playing an important role in the economy of the Sicilian wine sector (see chapter 0.2.1.1.).

COD wines cannot not benefit by this CMO measure. On the other hand, the large cooperatives social cellars, characterized by massive production of low quality wines, have been largely applying to the "optional distillation", which represents each year the 12-15% of their total wine production. As confirmed by cooperatives leaders, over the last 5 years the CMO aid for distilled wine has been higher than the market price of the wine itself, making distillation much profitable than the sale of the wine.

Therefore, many producers definitely maximized grape production through intensification (the higher the produced wine quantity, the higher the eligible amount for distillation), aiming at getting the highest yield, without interest in quality: this in part may explain the high spreading of the

white berry high-producing cultivars, as Trebbiano, Catarratto, etc., bred with the “tendone” system and requiring high inputs (chapter 0.1.2.2).

Under this aspect, therefore, the respondents agree that the CMO measure on wine distillation could have encouraged producers in increasing to use of inputs to boost production, with likely negative effects on the water/soil/biodiversity quality.

The above may also in part explain why the COD wines have not been so much successful (see chapter 0.1.2.3), although 21 different CODs have been so far recognised: in fact, no CMO distillation premiums are granted.

About the production of grape must, chapter 0.1.2.1 gives the figures for Sicily, underlining the importance of such a production for the wine sector. The grape must is then in large part processed into concentrated (water content diminution) and concentrated rectified (water content diminution and removal of anions/cations) must by the Sicilian recognised factories (see chapter 0.3.3); a minor part is processed by factories of centre-north Italy. Around three quarters of the concentrated rectified must is sold to cellars of north Italy, according to officials of the regional institutions.

According to the interviewed sector leaders, around the 80% of the Sicilian producers of low quality wines use concentrated grape must to increase the alcoholmetric volume of their wine (not more than 2 degrees): this occurs almost every year, allowing the producers to receive the corresponding CMO premium. The practice of “enrichment” is carried out under the control and authorization of the RSRFWS.

However, this practice has not directly effects on the environment, according to the respondents.

2.1.1. Wine – Theme 2: structural measures

Question 1 (V2) : What are the environmental effects of abandonment premia?

Detailed answer

From 1988 until 1997/98 - when the Region, in compliance with the EC Reg. 1429/96, decided not to support the measure anymore -, 17.264 ha of wine grapeyards have been uprooted (Table 14). The provinces of Caltanissetta, Agrigento and Ragusa were the most interested by the permanent abandonment.

Table grape-wine has been principally uprooted: only 82 hectares of grape for VQPRD wines have been uprooted over the period under study (Ciccarelli, Bacarella, 2005).

Unquestionably, as stated in chapter 0.1.1, the drop of wine-grape production occurred from 1983 to 2003 is partly due to the massive grabbing out of the highly productive table grapeyards (1.490.000 tons, average of 1983-1987 to 930.000 tons, average of 1999-2003). Decrease of wine production over the same period is likely to be linked to the same cause (chapter 0.1.2).

Table 15. Uprooted grape-wine areas 1988-1998 in Sicily (ha) (Ciccarelli, Bacarella, 2005)

	1988/ 89	1989/ 90	1990/ 91	1991/ 92	1992/ 93	1993/ 94	1994/ 95	1995/ 96	1996/ 97	1997 /98	Total	Share on national uprooted grapevine area
Sicily	513	2.779	2.274	2.146	2.146	1.727	3.494	1.754	108	323	17.264	16,2%
Italy	13.391	12.388	18.098	13.768	11.009	10.457	15.616	11.248	121	359	106.453	100%

The aid for the abandonment was not linked to any environmental precautions/restrictions: it was assigned to any applicants and calculated on the last 5 years production of the grapeyard to be grabbed out.

According to the interviewed professionals and researchers, grapeyards have been mostly uprooted in marginal areas (on steep slopes; bad soils, etc.) in the period 1980-2000. Actually, the abandonment interested the less productive grapeyards, preserving mainly the most yielding ones, given the prevailing target of quantity of the Sicilian wine sector.

This fact had two distinct negative consequences:

1. very marginal fields were abandoned for good, thus with no protection against soil erosion and exposed to fire;
2. grapeyards in marginal areas are the best ones to produce quality, but these were the first to be uprooted.

Some farmers stated that abandoned areas were cultivated with arable crops (wheat); others reported that vegetable crops and olive groves took the place of the removed grapeyards. Others, finally, reported that the land was definitively abandoned: only in this case, in fact, negative environmental effects on soil conservation were emphasized by the respondents.

Detailed information on crop successions (and its environmental consequences) at regional scale is not available.

Question 2 (V2): What are the environmental effects of restructuring and conversion of vineyards (variety conversion, relocation, adoption of new production techniques)?

Detailed answer

Chapters 0.2.2.1 and 0.2.2.2 give details on the contents and implementation of the Sicilian RPRRG.

The area concerned by the Plan represents, until campaign 2002-2003, the 9,1% of the total grape-wine areas of Sicily: this limited impact has to be taken into account when weighing the importance of this CMO measure within the frame of the whole Sicilian wine sector.

The provisions that are likely to play an effect on the agro-environment, as indicated in the RPRRG 2001-2006, are the following:

- Productivity cannot exceed certain fixed amounts. In fact, all the supported interventions aim at reducing quantity in favour of quality. To this regard, the reconverted/restructured grapeyards have to abide by the TGI/COD standards that allow a maximum yield of 10 tons/ha (COD) and 16 tons/ha (TGI), on the average;
- For what it concerns the breeding system and the planting density, it has to be respected what it is provided by the concerned TGI/COD production standards. Namely, vertical breeding forms of “alberello” and “spalliera” are supported, whereas the expanded “tendone” form is not;
- Irrigation has to be exclusively utilised to maintain the physiological balance of the plant, and not as forcing technique; watering has to be carried out according to the climatic conditions, always paying attention not to increase the yield;
- All the soil management practices have to refer to the GAP, as annex of the RDP (EC Reg. 1257/99);
- Soil tillage operations have to favour water harvesting and control weed population;
- NPK fertilisation is limited.

It has to be emphasized that irrigation schemes are not financed by the Plan, in order not to encourage productivity increase.

As stated above, RPRRG benefits are for IGT/COD areas only, hence all the growing techniques of the improved grapeyards have to abide by the corresponding VQPRD production standards.

The overall objective of the RPRRG is to encourage the modernization of the regional grapeyard, supporting the replacement of the old cultivars, more quantity-oriented, with the more market-demanded ones, allowing to obtain good quality products, even if less productive.

Innovative cultivation methods are chiefly encouraged, fully suitable for mechanization.

For instance, the RPRRG introduced the “re-grafting” method that was unknown in Sicily until a few years ago, allowing to renovate young grapeyards at lower costs than replacing the whole plant.

Most of the interviewed producers benefitted by the Plan, reconverting their grapeyard with international grapevines and with the autoctonous “Nero d’Avola”; all of them stated that the only relevant aspect, dealing with the environmental theme, was the limitation of productivity.

Professionals and researchers agreed that the innovative changes addressed by the RPRRG, in terms of less productive grapeyards for quality wines, are leading to a lower impact on the agro-environment, due to the lesser amounts of needed inputs (agro-chemicals).

However, the intense boost to mechanization brought by the Plan on one hand allows to reduce production costs, but on the other hand is likely to increase soil erosion, e.g. through planting along the lines of steepest slope. Actually, the provision to apply soil management methods that enhance water harvesting has not been respected on large scale, so far. Field trials on cover crops cultivation on grapeyards are being carried out by the Horticulture and the Agronomy Departments of the University of Palermo, with good outcomes (Gristina L. and alii, 2005). However, the major part of the interviewed farmers showed a sceptical attitude toward such an innovative technique, which means that much educational/demonstrative work has still to be done.

Finally, a certain negative impact on the landscape evolution might be due to the kind of poles the use of which is highly encouraged, made up by pre-compressed cement and suitable for mechanized harvest. This kind of poles is not biodegradable and pose problems for their disposal in the mid-term.

However, these effects can be properly evaluated at the end of the five-years period of the RPRRG.

2.1.2. Wine – Theme 3: other regulatory measures and especially those for quality wines produced in specified Regions

Question 1 (V3): What are the environmental impacts of the CMO requirements for quality wines produced in specified Regions? [in particular those concerning: traditional conditions of production, cultivation methods, yield per hectare and demarcation of production]

Detailed answer

Chapters 0.1.2.2 and 0.1.4.1 present the evolution and the current situation of VQPRD in Sicily.

As stated above, COD wines have not been quite successful so far, showing a very low growth rate (on 2002, COD wines in Sicily represented just the 3,1% of total regional production), although at present there are twenty-one different CODs in Sicily.

Figures about TGI wines are more promising, since on 2002 TGI wines represented the 27% of total production: TGI “Sicily”, according to some respondents, has a stronger name/image on the national/international market, rather than the COD ones that are almost unknown.

Several COD and TGI production standards have been examined (the standards of the COD “Marsala”, the most represented COD in Sicily - 59,1% of total COD wine production - are annexed here) and discussed with the relevant respondents (professionals, directors of big collective cellars, researchers).

From the interviews it emerged that TGI/COD standards do not involve clear statements regarding environment preservation.

Common focus points of the standards are:

- 1) The characterization of the geographical boundaries and the proportions of the cultivars participating to the specific VQPRD;
- 2) The definition of the production limits as well as the maximum allowed planting density;
- 3) Rational growing techniques, as short pruning and limited fertilization;
- 4) Rational use of irrigation, with the intention of containing the yields.

As stated in answer to question 2 (V2), the above standards features have an undoubted positive effect on the agroenvironment since they limit the use of the inputs, as confirmed by the farmers producing within TGI areas.

Nevertheless, such result is not intentionally wanted since it is principally tied to obtain high quality wines. In fact, provisions/recommendations on the adoption of IPM and/or sustainable

fertilisation plans and/or arrangement of the ecological infrastructure for pests and diseases prevention and/or other agroecological measures are not part of the TGI/COD standards.

As confirmed by the producers, growing techniques of table-wines are not disciplined by any standards, thus in many areas the use of inputs is still very high in order to maximize the production of low quality wine, to be sold as loose product or destined to distillation (see above chapters). According to the respondents' opinion, the market only is able to change this attitude of the producers toward high yielding methods of farming.

Question 2 (V3): What is the environmental impact of the regulated oenological practices ?

Detailed answer

Environmental certification schemes, as ISO14000 or EMAS are not currently adopted in Sicily by the cellars.

The disposal of the wine making by-products is regulated by the law: cellars have their own purification plants, through which the proper disposal is carried out.

There are not available data/studies to assess the environmental impact of the regulated oenological practices.

2.1.3. Wine – Theme 4: accompanying measures

Question 1 (V4): Are the accompanying measures to preserve vineyards in certain Regions effective in terms of a positive environmental impact?

Detailed answer

Chapters 0.4.2 and 0.4.3 show figures on the evolution of the environmental-friendly grape-wine productions in Sicily.

The EU AE policies have been very successful, with high number of holdings that converted their farming methods to the standards of integrated or organic agriculture.

However, such a large amount of raw material, that in the case of organic production does benefit by the extra value of an international certification, only in a minor part has been processed in finished products bringing a corresponding environmental label.

In the particular case of the organic grape, Sicily has been the bigger producer at national scale; however, the wine certified as "organic" in 2000 amounted to around 25.000 hectolitres (only the 0,35% of the total wine production of the same year), with 19 certified processors.

About the consumers' liking of organic wine in Sicily, a survey carried out in 2001 (Ficani, 2001) on a sample of 400 consumers, reports that the vast majority of the Sicilian consumers does not know the product "Sicilian organic wine". Moreover, the organic wine consumers stated that seldom purchase the organic wine, only in particular cases.

About the grape from integrated farming, there are not Sicilian wines that report it on the label, also because it does not exist a real certification system for integrated productions.

About COD/TGI wines, it has been already explained that production of COD wines is still very low in Sicily. On the contrary, TGI wines grew from 5,5% of the total regional grape production in 1995 to 27% in 2002, proving the growing interest by consumers toward this kind of product.

2.1.4. Wine - Theme 5: environmental promotion

Question 1(V5). *Has the promotion by Member States and Regions of environmentally sound production techniques via producer organisations and inter-branch organisations been effective ?*

Detailed answer

Chapters 0.1.4 and 0.3.2 attempt to provide a classification of the typologies of wine holdings in Sicily.

It has to be clear that in Sicily there are not real producers organisations (PO), as intended for the fruit sector.

The typology of inter-branch organisations might be represented by the large cooperatives social cellars (*cooperative cantine sociali*), that join the major part of the grapewine producers. However, only a small number of them close the cycle, by also arranging the bottling and the marketing of the finished products, for the reasons explained above.

According to the interviewed sector leaders and the producers, there are not specific environmentally sound production techniques promoted by the producers associations and/or the inter-branch organisations (as previously described). Namely, when more sustainable farming methods (i.e. methods that go beyond the usual good farming practices) are promoted within a producers organisation, this occurs as a consequence of an “external” requirement, as, for instance, the obligation to abide by the organic standards either the IPM Norms provided by the Region, to fulfill the RDP AEM environmental measures. Other environmental-effective standards are those provided by the TGI/COD labels, as explained above. Again, it is an external requirement.

In fact, producers associations/ inter-branch organisations do not have their own standards to regulate environmentally sound production.

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.]*

Data are not available to properly address this question.

2.2.2. Horizontal – Thème 2 : adequate spending level and method

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

Data are not available to properly address this question.

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

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

Data to give an answer to this question are in Chapter 1.4.

APPENDICES

Annex 1: List of people met

Annex 2: Main bibliography identified in relation with the study

Annex 1 : List of people met

Sector leaders (professionals, AFRS officials, farmers unions leaders, certification bodies for organic agriculture leaders, AP leaders, researchers)

Gioacchino Genchi, responsible of the Office for Preservation from acoustic, atmospheric and electromagnetic pollution, Service 3, LEDRS, Palermo

Giovanni B. Ficani, agronomist e general manager of the “Cantine Europa” cooperative social cellar, Trapani

Antonino Scuderi, responsible of ICEA, certification body on organic agriculture, Catania

Antonino Mastropaolo, Office for the Interventions in organic farming and livestock, Service IV - U.O. 18 AFDRS, Palermo

Donatella Manzo, agronomist and responsible of the Quality Improvement of Food Products Office, AFDRS, Palermo

Ferdinando La Motta, agronomist and responsible of the Agricultural Assistance Center (CAA) of the farmer union Coldiretti, Palermo

Giuseppe Greco, agronomist and extensionist of the ESA (Agricultural Development regional body), Palermo

Ida Agosta, director of INEA, Palermo

Alberto Forte, researcher agronomist of CORERAS, Palermo

Lucio Gristina, Professor of Horticulture, University of Palermo

Rosa De Gregorio, AEM-RDP responsible, Service IV - U.O. 17 AFDRS Palermo

Salvatore Taranto, regional director of the farmer union Confagricoltura, Palermo

Tommaso La Mantia, Professor of Horticulture, University of Palermo

Gianfranco Lombardo, agronomist and technical director of the Conte Tasca D’Almerita s.p.a., Palermo

Giovanni Dara Guccione, agronomist free-lance, Palermo

Francesca Salvia, Studies Office, IRVV, Palermo

Giorgio Riccobono, Distillation Office, IRVV, Palermo

Giuseppe Bursi, CMO wine responsible, Service V – U.O. 23, AFDRS, Palermo

Rosario Di Lorenzo, Professor of Grape wine horticulture, University of Palermo, Palermo

Vincenzo Nizza, agronomist and member of the Board of Directors of the Cantina Sociale San Francesco (cooperative social cellar), Trapani

Giuseppe Messina, secretary of Lega Ambiente Sicily, Palermo

Annex 2: Main bibliography identified in relation with the study

AA.VV. (2004). La distilleria Bertolino e la qualità dell'aria nel comune di Partinico – Relazione presentata all'Ass.to Territorio e Ambiente, Regione Sicilia dal D.to di Palermo dell'ARPA, il 19/10/2004. Vol I e II.

Ciccarelli F., Bacarella S. (2005). La Vitivinicoltura nel Mezzogiorno. Master Management Filiera Vitivinicola. Palermo

Forte Alberto. La filiera vitivinicola in Sicilia, Rapporto 2003. CORERAS, Palermo

Giovanni Battista Ficani (2001). La produzione vinicola italiana: il caso del vino biologico in Sicilia Dottorato di Ricerca in Economia e Politica Agraria – XIV ciclo. Anno Accademico 2000-2001. Università di Palermo

RDP 2000-2006 of the Sicily Region

Intermediate evaluation of the RDP 2000-2006 of the Sicily Region

Complemento di Programmazione PROGRAMMA OPERATIVO REGIONALE SICILIA 2000-2006

D'Amico M., La Via G. (2000): *Organic products consumption in Sicily*, 13th International Scientific Conference IFOAM 2000 "The world grows organic", 21 August–2 September, Basel (CH)

D'Amico M., La Via G. (2001): *Il mercato dei prodotti biologici in Sicilia: problemi e prospettive*, Tecnica Molitoria, agosto, n. 8

Lo Scenario Economico dell'Agricoltura Biologica, ISMEA 2004

Lo Stato Dell'irrigazione In Sicilia, INEA 1993

ISTAT (2000), 5th Agricultural Census

La Filiera del Vino e delle Uve da Tavola in Sicilia (2001), IRVV, Palermo

The RPRRG 2001-2006, AFDRS, Palermo

COD Standards "Marsala"

Gristina L. and alii (2005). Management of subterranean clover, annual medic and vetch for Sicilian vineyard sustainability. Dipartimento Agronomia Ambientale e Territoriale, University of Palermo. Advanced in Geocology, 36, CATENA Ed.