

***Territoires du vin***

ISSN : 1760-5296

: Université de Bourgogne

6 | 2014

Territori del vino in Italia

## Evolution of ampelographic platform in Italy

Article publié le 01 mars 2014.

**Luigi Bavaresco, Mario Pecile Carmelo Zavaglia**

DOI : 10.58335/territoiresduvin.836

 <http://preo.ube.fr/territoiresduvin/index.php?id=836>

Le texte seul, hors citations, est utilisable sous [Licence CC BY 4.0](https://creativecommons.org/licenses/by/4.0/) (<https://creativecommons.org/licenses/by/4.0/>). Les autres éléments (illustrations, fichiers annexes importés) sont susceptibles d'être soumis à des autorisations d'usage spécifiques.

Luigi Bavaresco, Mario Pecile Carmelo Zavaglia, « Evolution of ampelographic platform in Italy », *Territoires du vin* [], 6 | 2014, publié le 01 mars 2014 et consulté le 20 mars 2026. Droits d'auteur : Le texte seul, hors citations, est utilisable sous [Licence CC BY 4.0](https://creativecommons.org/licenses/by/4.0/) (<https://creativecommons.org/licenses/by/4.0/>). Les autres éléments (illustrations, fichiers annexes importés) sont susceptibles d'être soumis à des autorisations d'usage spécifiques.. DOI : 10.58335/territoiresduvin.836. URL : <http://preo.ube.fr/territoiresduvin/index.php?id=836>

La revue *Territoires du vin* autorise et encourage le dépôt de ce pdf dans des archives ouvertes.

PREO

PREO est une plateforme de diffusion [voie diamant](#).

# Evolution of ampelographic platform in Italy

## *Territoires du vin*

Article publié le 01 mars 2014.

6 | 2014

Territori del vino in Italia

Luigi Bavaresco, Mario Pecile Carmelo Zavaglia

DOI : 10.58335/territoiresduvin.836

 <http://preo.ube.fr/territoiresduvin/index.php?id=836>

Le texte seul, hors citations, est utilisable sous [Licence CC BY 4.0](https://creativecommons.org/licenses/by/4.0/) (<https://creativecommons.org/licenses/by/4.0/>). Les autres éléments (illustrations, fichiers annexes importés) sont susceptibles d'être soumis à des autorisations d'usage spécifiques.

---

### INTRODUCTION

THE NATIONAL AND REGIONAL VINEYARDS.

THE ACREAGE FOR THE PRODUCTION OF PDO WINE

THE EVOLUTION OF ACREAGE GROWN WITH WINE PRODUCING  
VARIETIES

CONCLUSION

---

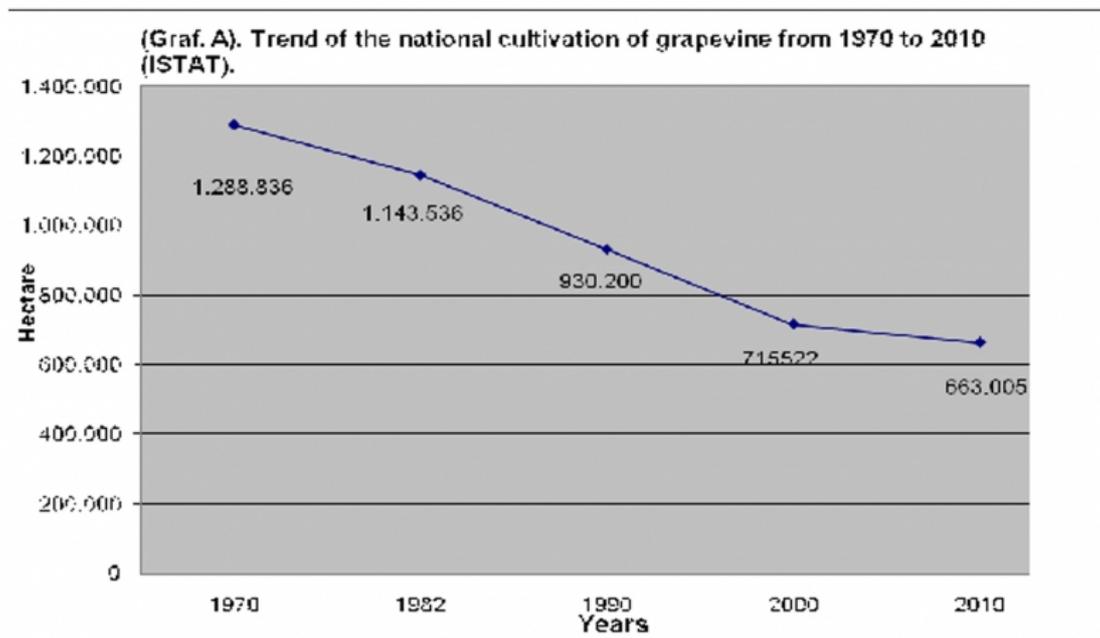
## INTRODUCTION

- 1 Grapevine cultivation in Italy can be traced back to ancient times and covered the entire peninsula adapting to a very large number of environmental conditions. Currently, compared to pre-phylloxera age, the number of cultivated varieties has certainly reduced, but still remains substantial. In fact, in the National Register of vine varieties 472 grape varieties for wine production and 129 for table grapes are recorded.
- 2 The purpose of this paper is to analyze briefly the main changes in the cultivation of vine in the period 1970 - 2010, on the grounds of official data of the decennial censuses made by ISTAT (National Insti-

tute of Statistics). In the first part data will be provided on the progress of the national and regional acreages devoted to vine for table and wine production. Due to the fact that production of table varieties is less important in comparison to wine varieties and that the table varieties grown are the more and more foreign varieties that change quickly, in the second part we will analyze the main patterns of national acreage in respect to vine varieties for wine production only.

## **THE NATIONAL AND REGIONAL VINEYARDS.**

- 3 Since the early '70s, the areas under vines have had a negative trend with a sharp decline to the present day. In fact, the over 1.288.836 hectares (wine and table varieties) surveyed by ISTAT in 1970 shifted to 663.005 in 2010, a decrease of 625.831 hectares equal to 50% of the initial vine growing area. This decline has been continuous and had a higher incidence in the 70-82 decade, with the loss of about 145.300 hectares, and then in 1990-2000 decade with other 214.678 hectares that were withdrawn from the production area. The phenomenon has continued according to the last ISTAT (2000-2010) survey, but with a little slower trend, to the point that in this period only 50.000 hectares of vineyard area were lost; that is an annual quota of about 5.000 hectares, compared with more than 20.000 of the previous decade and 15.000 in the period 70-82 (Graph. A and Table 1).



REGIONS	Years									
	1970		1982		1990		2000		2010	
	Hectares	%	Hectares	%	Hectares	%	Hectares	%	Hectares	%
Piemonte	97.508	7,58	74.563	6,52	61.734	6,64	52.887	7,39	46.570	7,02
Valle d'Aosta	968	0,08	947	0,08	691	0,07	515	0,07	463	0,07
Liguria	10.831	0,85	7.378	0,65	5.279	0,57	2.391	0,33	1.565	0,24
Lombardia	35.578	2,77	30.683	2,68	25.873	2,78	22.048	3,08	23.185	3,50
Provincia Bolzano	5.476	0,42	5.157	0,45	5.086	0,55	4.809	0,67	5.291	0,80
Provincia Trento	10.919	0,85	8.709	0,76	8.587	0,92	9.051	1,26	10.386	1,57
Veneto	116.501	9,04	95.699	8,37	80.635	8,67	73.726	10,30	77.806	11,74
Friuli-Venezia Giulia	21.760	1,69	21.529	1,88	17.805	1,91	17.800	2,49	19.332	2,92
Emilia-Romagna	87.730	6,85	85.590	7,48	67.497	7,26	59.988	8,38	55.914	8,43
Toscana	121.364	9,47	89.979	7,87	70.487	7,58	58.446	8,17	59.955	9,04
Umbria	22.076	1,72	22.955	2,01	17.986	1,93	14.226	1,99	12.503	1,89
Marche	21.822	1,70	32.021	2,80	26.179	2,81	19.703	2,75	16.838	2,54
Lazio	106.154	8,61	71.207	6,23	51.362	5,52	29.524	4,13	16.798	2,53
Abruzzo	38.479	4,05	40.709	3,56	40.824	4,39	34.890	4,88	32.496	4,90
Molise	8.893	0,71	9.187	0,80	8.037	0,86	5.883	0,82	5.177	0,78
Campania	50.950	4,00	48.793	4,27	39.123	4,21	29.251	4,09	23.257	3,51
Puglia	190.487	17,80	185.044	16,18	144.533	15,54	110.434	15,43	107.187	16,17
Basilicata	16.980	1,40	18.803	1,64	13.118	1,41	8.694	1,22	5.549	0,84
Calabria	27.785	2,21	37.576	3,29	23.797	2,56	13.801	1,93	9.978	1,50
Sicilia	157.719	13,01	187.141	16,37	173.746	18,68	121.266	16,95	113.848	17,17
Sardegna	65.393	5,20	69.866	6,11	47.821	5,14	26.190	3,66	18.906	2,85
<b>ITALY</b>	<b>1.215.372</b>	<b>100</b>	<b>1.143.536</b>	<b>100</b>	<b>930.200</b>	<b>100</b>	<b>715.522</b>	<b>100</b>	<b>663.005</b>	<b>100</b>

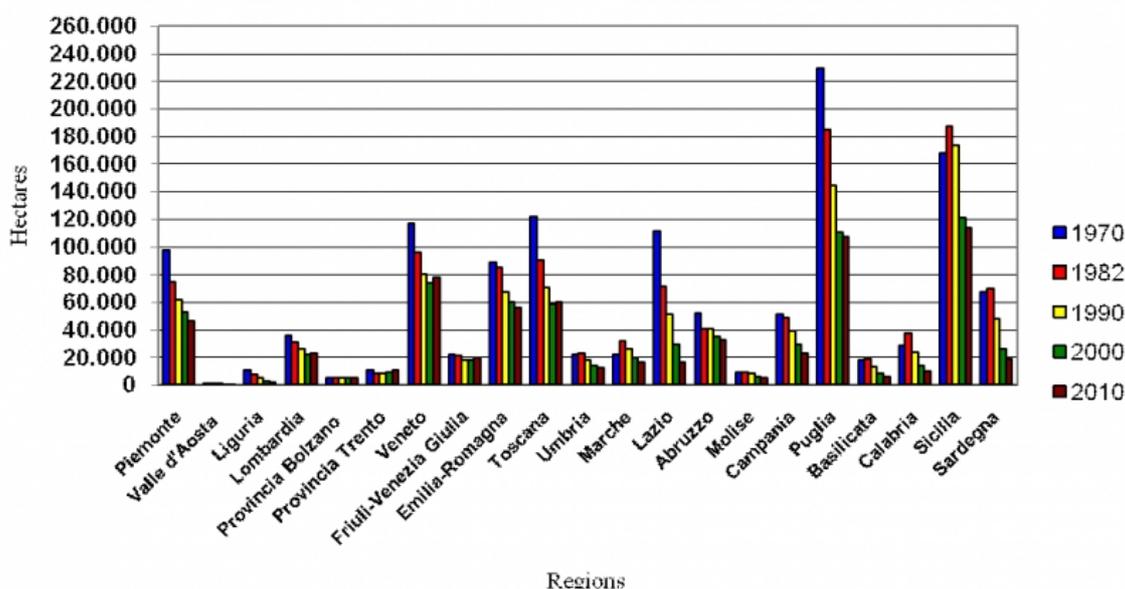
Tab. 1 Trend of regional areas under vine from 1970 to 2010 (ISTAT).

- 4 The reasons of this reduction, which interested the whole country, are due to many factors, such as: a) the type of economic development, where the incidence of the agricultural sector on the entire

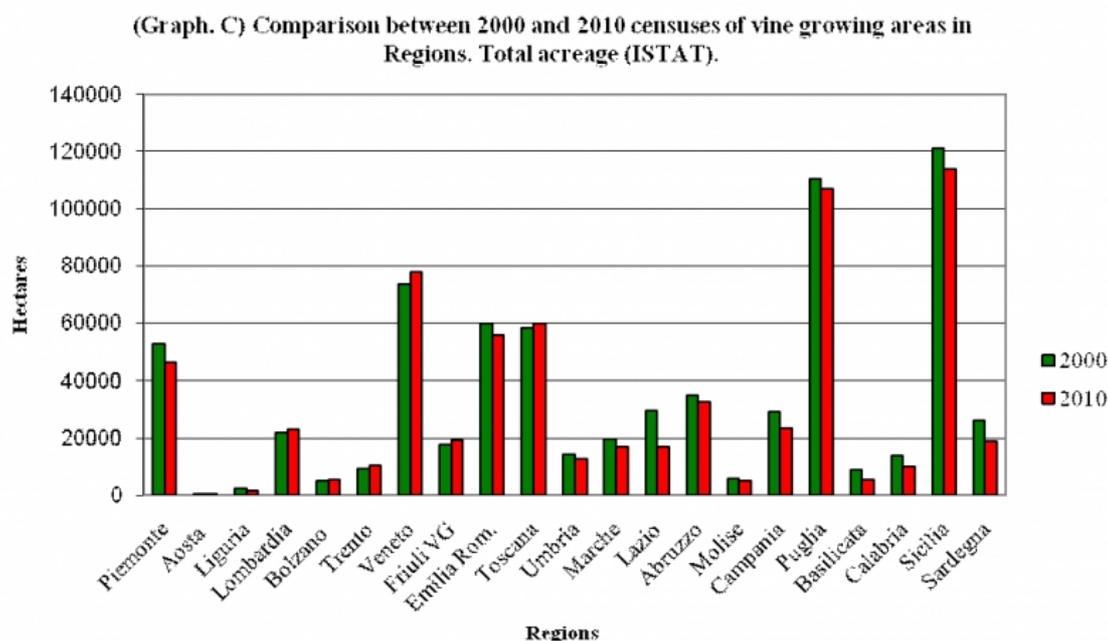
economy, from the 60s, has been gradually decreasing in respect to industry and services sectors; b) the specialization of farms whose productions have been increasingly market-oriented; c) the wine policies, at European and national level, that first encouraged the abandon of areas under vines and later promoted the conversion and renovation of existing vineyards; d) the evolution of consumer tastes that are increasingly oriented to the use of neutral and less alcoholic drinks which have certainly given a blow to consume of wine, which in turn is passed from over 100 liters. per capita of the '60 to 40 liters of today.

- 5 Continuing the analysis on the pattern of areas under vines in the last decade, but on a regional basis (Graph. B), we note that, especially in some regions, this has taken different and extremely positive trends in terms of increase in wine-growing areas such as the Veneto, Friuli V.G., Toscana, Lombardia and of the Provinces of Trento and Bolzano. In all other cases, the regional area planted to vineyard has been affected by a steady decline, although there were also available for these Regions incentives for preventing the abandon of wine-growing areas and to upgrade and enhance the wine production .

(Graph B) Trend of regional acreage for table and wine grapes from 1970 to 2010 (ISTAT)

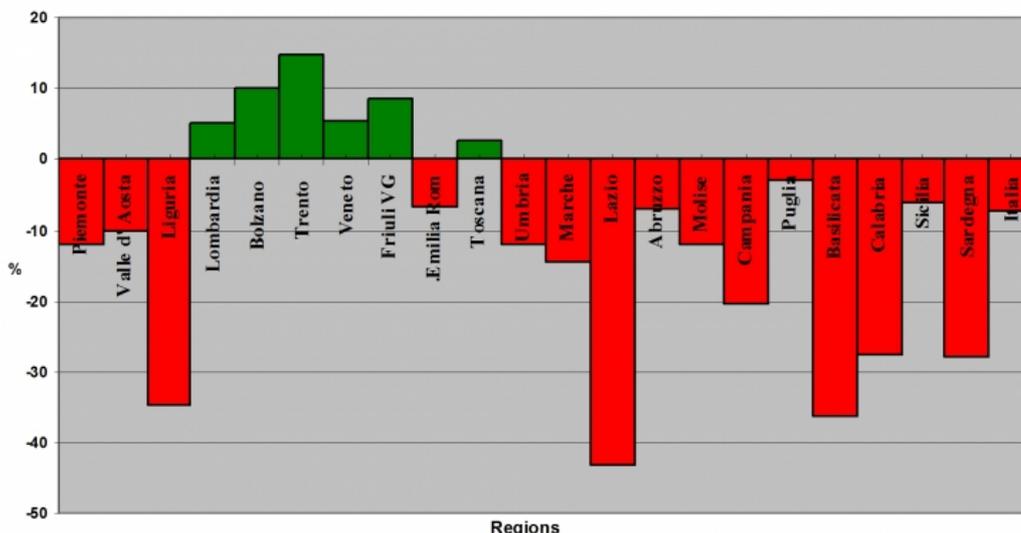


- 6 Likely the Regions mentioned above, where the wine industry was already growing due to increased demand for the products of those areas, have been able to take advantage of these measures especially in the last decade (Graph. C), and this has helped to accelerate and in some cases strengthen their supply curve. An example of this is the increase in the areas planted with the varieties Pinot Grigio and Glera in Veneto and Friuli Regions.



- 7 Graph C. shows the areas under vine in 2000 and in 2010. It makes clear what earlier stated and how this increase in surface has interested primarily a well-defined wine-growing area of the Country, which includes more Regions that are almost homogeneous by climatic conditions and dedicated to the cultivation of vine varieties that give a "footprint" very significant to their wines. By contrast, in areas where occurred a sharp decline, which continued, albeit in a more subdued way even in the last decade, the autochthonous varieties have been an opportunity for a recovery of the cultivation and the same time have contributed to help preventing the erosion of the wine growing area (Graph. D).

(Graph. D) Variation in percentage of the regional acreage under vine of 2010 in respect to year 2000.

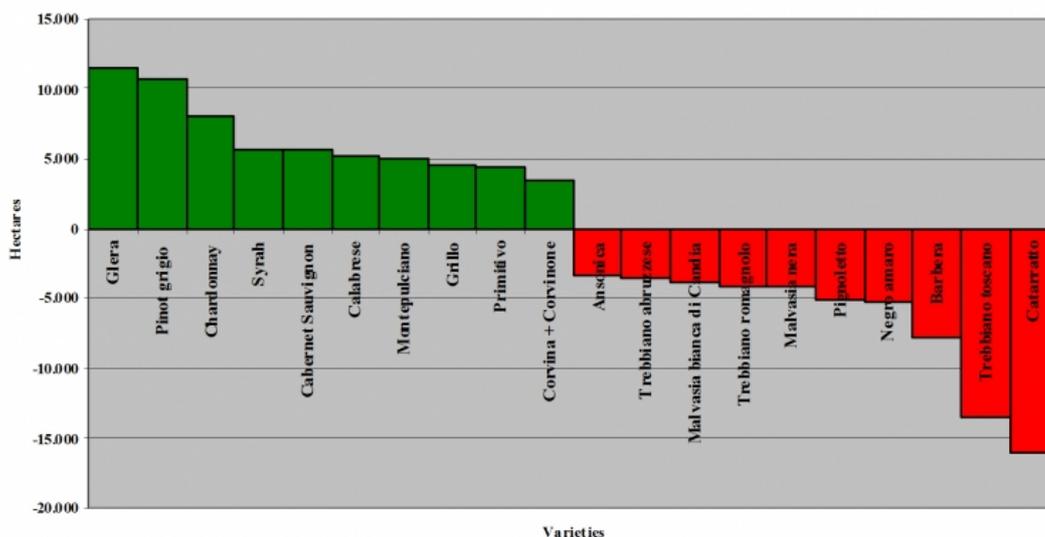


- 8 On such basis, one can easily deduce that the loss of potential production that has affected our country, and which will be later explained in more detail, is not necessarily the same in all varieties. In fact reduction of the size of some of them is in line with the general decline registered for the country. This is the case of Trebbiano romagnolo, Trebbiano toscano, Malvasia bianca di Candia , etc. Other varieties, however, show a sharp increase such as Glera and Pinot grigio; others a consolidation associated with a slight but continuous growth. This is what happens with some autochthonous varieties such as Aglianico, Pecorino, Fiano, Falanghina etc.
  
- 9 While Italy has seen over the last 50 years a steady erosion of areas under vines reaching in 2010 about 663.005 hectares, is also very interesting to wonder if the current acreage can be deemed to be balanced with the marketing of wine even if over the past decade it has been subject to an average annual decrease of approximately 5.000 hectares that in percentages corresponds to slightly less than 10 % of the total acreage. Most likely, given the nature of wine market and complexity of exchanges that take place on a global scale , the national vineyard, can be considered balanced for the simple reason that now the growers are specialized and have all the tools to cope with the changes of market in a relatively short time. A major obstacle that is, paradoxically, a limitation to the adaptation of production struc-

tures to the needs of the market, is represented by the EU wine policy that imposes very severe constraints on the establishment of new vineyards, with consequences that heavily condition not only the growth and diversification of global supply but also its flexibility in response to changes in the demand for the relevant wine products.

- 10 The graph E shows the varieties that between 2000 and 2010 increased and decreased more than 3.000 hectares. It 's interesting to note that in respect to 2000 census, the increase in the total area of the 10 varieties that have increased their acreage accounts for 63.807 hectares, while it amounts to 66.835 hectares for those 10 for which the cultivated area is reducing; in practice nearly the same figure.

(Graph. E). The top ten varieties for wine production that account for an increase or reduction of more than 3.000 hectares between 2000 and 2010.



## THE ACREAGE FOR THE PRODUCTION OF PDO WINE

- 11 Italy is one of the leading wine producing countries in the world and every year it compete with France for the first place.
- 12 The production of wines with a designation of origin, however, is steadily increasing and, to date, it accounts for 73 Denomination of Controlled and Guaranteed Origin (DOCG) wines, 336 Denomination

of Origin (DOC) while IGT (Typical Geographical Indication) wines are 118.

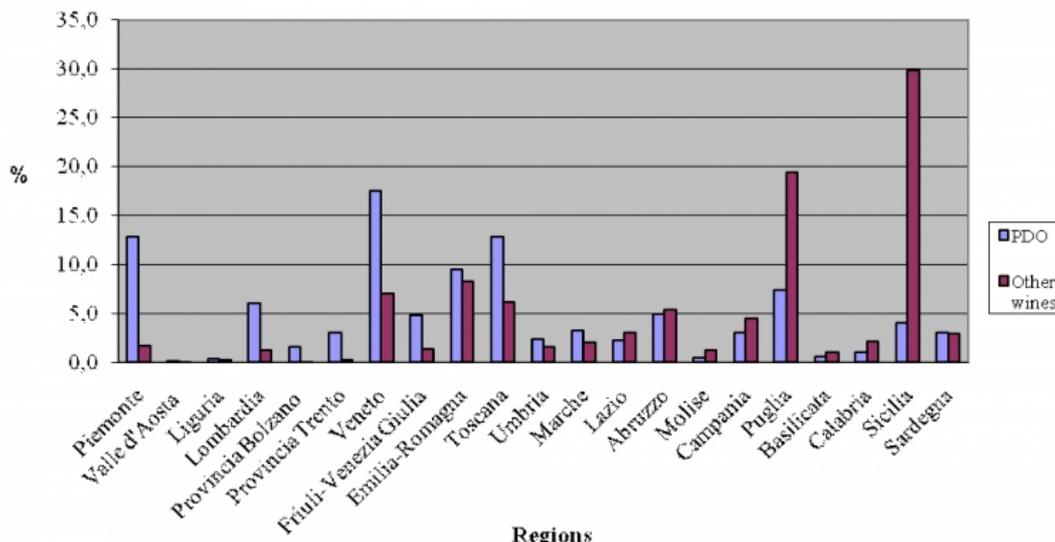
- 13 Italian traditional terms DOCG and DOC correspond to EU PDO (Protected Denomination of Origin) term, and IGT to PGI (Protected Geographical Indication) term also envisaged by EU regulations.

Tab.2. Trend of acreage under vine in Italy for PDO and other wines production between 2000 and 2010 (ISTAT).

REGIONS	Year 2000				Year 2010							
	PDO wines		Other wines		Total		PDO wines		Other wines		Total	
	Hectares	%	Hectares	%	Hectares	%	Hectares	%	Hectares	%	Hectares	%
Piemonte	39.436	16,8	13.196	3,0	52.632	7,8	40.989	12,8	5.328	1,7	46.317	7,4
Valle d'Aosta	225	0,1	284	0,1	509	0,1	301	0,1	162	0,1	463	0,1
Liguria	774	0,3	1.571	0,4	2.345	0,3	848	0,3	690	0,2	1.538	0,2
Lombardia	15.426	6,6	6.569	1,5	21.996	3,3	19.194	6,0	3.895	1,3	23.089	3,7
Prov. Bolzano	4.627	2,0	178	0,0	4.805	0,7	5.119	1,6	163	0,1	5.282	0,8
Prov. Trento	7.753	3,3	1.264	0,3	9.016	1,3	9.478	3,0	898	0,3	10.377	1,7
Veneto	33.413	14,3	40.223	9,1	73.636	10,9	56.042	17,5	21.602	7,1	77.644	12,4
Friuli-V.G.	12.936	5,5	4.820	1,1	17.755	2,6	15.177	4,7	4.073	1,3	19.250	3,1
Emilia-Rom.	24.633	10,5	35.279	8,0	59.912	8,9	30.433	9,5	25.364	8,3	55.796	8,9
Toscana	34.798	14,9	23.473	5,3	58.271	8,6	40.962	12,8	18.877	6,2	59.839	9,6
Umbria	5.441	2,3	8.762	2,0	14.203	2,1	7.512	2,3	4.978	1,6	12.491	2,0
Marche	7.142	3,1	12.517	2,8	19.659	2,9	10.376	3,2	6.369	2,1	16.745	2,7
Lazio	8.691	3,7	20.280	4,6	28.971	4,3	7.072	2,2	9.329	3,1	16.401	2,6
Abruzzo	10.106	4,3	23.379	5,3	33.484	5,0	15.843	4,9	16.347	5,4	32.189	5,1
Molise	868	0,4	4.998	1,1	5.866	0,9	1.209	0,4	3.945	1,3	5.154	0,8
Campania	4.589	2,0	24.456	5,5	29.045	4,3	9.515	3,0	13.670	4,5	23.185	3,7
Puglia	9.918	4,2	75.041	17,0	84.959	12,6	23.642	7,4	59.117	19,4	82.760	13,2
Basilicata	1.316	0,6	6.392	1,4	7.708	1,1	1.585	0,5	3.278	1,1	4.863	0,8
Calabria	2.705	1,2	10.806	2,4	13.511	2,0	3.189	1,0	6.595	2,2	9.783	1,6
Sicilia	4.154	1,8	107.485	24,3	111.638	16,5	12.835	4,0	91.234	29,9	104.068	16,6
Sardegna	4.655	2,0	20.970	4,7	25.625	3,8	9.537	3,0	3.928	2,9	13.465	3,0
ITALY	233.605	100	441.940	100	675.546	100	320.859	100	304.841	100	625.700	100

- 14 Comparing to 2000, the Controlled and Guaranteed Designations of Origin increased by almost three times, the Controlled Designations of Origin by 25% and the Typical Geographical Indications by 15%. The latter, while representing production of high quality that can be compared, in some respects, to the ones of the other two categories, if only for their origin and the close link with the territory, account for a significant share of Italian wine-growing area and contribute significantly to its qualification. For the purposes of the official statistics, however, so far, this category of products is included in the group of "other wines", as shown in Table 2 and Graph F below.

(Graph. F). Trend of the regional acreage for PDO and other wines production between 2000 and 2010. Percentage of the entire acreage for wine production (ISTAT).



- 15 Analyzing the trend of the acreage in relation to the different kinds of wines, it appears (Table 2) that there has been a significant increase in the qualification of wine production and the surface for the production of wines with Controlled Designation of Origin moved by under 35 % in 2000 to 51 % in 2010. And this demonstrates the sensibility that growers and wine makers have had to react to the spurs coming from the market and to technological innovations, with the transformation and upgrading of the productions that have affected our winemaking sector in the last two decades.
- 16 Going more in depth, we note that, as absolute value, the hectares of vineyards intended for qualified productions increased by 37% from 233.605 in 2000 to 320.859 in 2010, that is an increase of 87.254 hectares. It is a very important result particularly if it is compared to other types of wines whose surfaces have, however, suffered a decline in the same decade of 42 %, that is 137.099 hectares. The latter figure also includes 50.000 hectares lost with the general contraction of the wine-growing area, but it clearly shows and confirms the dynamics of production that are increasingly oriented towards the wines of high quality.

- 17 As to the geographical concentration of production with Controlled Designation of Origin, the highest score is northern and central Italy (73% of the total area), while in the southern Italy, between 2000 and 2010 it was registered the greatest percentage of increase that for some designations has doubled (Table 3 ). The phenomenon can be explained by gap existing, since the second half of the last century, between viticulture and oenology of the two areas which still now have very different socio-economic and structural characteristics .

Table 3. Trend of the regional acreage for PDO and Other wines production between 2000 and 2010 (ISTAT).

REGIONS	Year 2000					Year 2010				
	PDO wines		Other wines		Total Hectares	Doc e Docg		Other wines		Total Hectares
	Hectares	%	Hectares	%		Hectares	%	Hectares	%	
Piemonte	39.436	74,0	13.196	25,1	52.632	40.989	88	5.328	12	46.317
Valle d'Aosta	225	44,2	284	55,8	509	301	65	162	35	463
Liguria	774	33,0	1.571	67,0	2.345	848	55	690	45	1.538
Lombardia	15.426	70,1	6.569	29,9	21.996	19.194	83	3.895	17	23.089
Provincia Bolzano	4.627	96,3	178	3,7	4.805	5.119	97	163	3	5.282
Provincia Trento	7.753	86,0	1.264	14,0	9.016	9.478	91	898	9	10.377
Veneto	33.413	45,4	40.223	54,6	73.636	56.042	72	21.602	28	77.644
Friuli-Venezia Giulia	12.936	72,9	4.820	27,1	17.755	15.177	79	4.073	21	19.250
Emilia-Romagna	24.633	41,1	35.279	58,9	59.912	30.433	55	25.364	45	55.796
Toscana	34.798	50,7	33.473	49,3	58.271	40.962	68	18.877	32	59.839
Umbria	5.441	38,3	8.762	61,7	14.203	7.512	60	4.978	40	12.491
Marche	7.142	36,3	12.517	63,7	19.659	10.376	62	6.369	38	16.745
Lazio	8.691	30,0	20.280	70,0	28.971	7.072	43	9.329	57	16.401
Abruzzo	10.106	30,2	23.379	69,8	33.484	15.843	49	16.347	51	32.189
Molise	368	14,8	4.998	85,2	5.366	1.209	23	3.945	77	5.154
Campania	4.589	15,8	24.456	84,2	29.045	9.515	41	13.670	59	23.185
Puglia	9.918	11,7	75.041	88,3	84.959	23.642	29	59.117	71	82.760
Basilicata	1.316	17,1	6.392	82,9	7.708	1.585	33	3.278	67	4.863
Calabria	2.705	20,0	10.806	80,0	13.511	3.189	33	6.595	67	9.785
Sicilia	4.154	3,7	107.485	96,3	111.638	12.835	12	91.234	88	104.068
Sardegna	4.655	18,2	20.970	81,8	25.625	9.537	52	8.928	48	18.465
ITALY	233.605	34,6	441.940	65,4	675.546	320.859	51	304.841	49	625.700

Table 3. Trend of the regional acreage for PDO and Other wines production between 2000 and 2010 (ISTAT).

- 18 At the level of regions , it can be seen that in over half of these (12 regions and 2 autonomous provinces ) the percentage of qualified vineyards swings between 97% and 52% of their total surface, while in 7 other regions this percentage is between 30 and 50%. Only in Sicily, this percentage is low and reaches 12%. But if we think that such percentage is equal to 12.835 hectares, we note that even in this region

there was an important and significant increase of the qualified vineyards. Such surface will be set to increase over the years, given the remarkable consistency of the wine-growing area of this region.

- 19 A large number of varieties, both autochthonous and international, that can bring forth the best of their characteristics thanks to the peninsular territory which provides a different type of soil and climate environments, contribute to the production of this rich category of quality wines.

## THE EVOLUTION OF ACREAGE GROWN WITH WINE PRODUCING VARIETIES

- 20 The wine grape varieties currently more grown are presented in graph G, while table 4 shows the trend of the top 20 varieties since 1970.

(Graph. G). First top 20 varieties for wine production grown in Italy according to 2010 census (ISTAT).

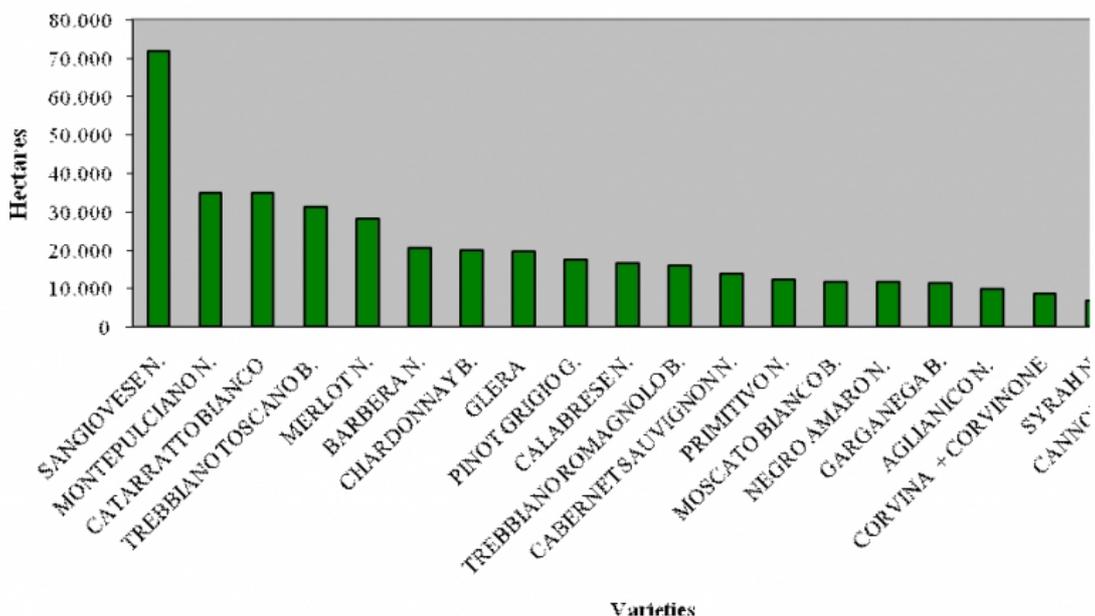


Table 4. First 20 wine grape varieties acreage from 1970 to 2010 (ISTAT)

VARIETY	1970	1982	1990	2000	2010
SANGIOVESE N.(1)*	87.158,41	103.944	88.320,92	70.112,06	71.668,2
CATARRATTO BIANCO (3)*	86.552,79	81.470	74.773,42	50.794,29	34.794,24
TREBBIANO TOSCANO B. (2)*	60.224,63	60.559	61.528,86	44.537,27	25.301,52
BARBERA N.	81.214,66	62.757	4.7120,92	28.366,24	20.523,88
MERLOT N.	52.961,95	48.176	31.872,3	25.615,5	28.041,7
MONTEPULCIANO N.	26.182,06	34.646	31.008,48	29.828,27	34.824,27
NEGRO AMARO N. (18)	42.622,11	38.421	31.387,14	16.759,96	11.491,6
PRIMITIVO N.	47.665,17	31.693	17.249,88	7.951,06	12.233,59
TREBBIANO ROMAGNOLO B.	22.315,56	25.828	21.257,43	20.032,84	15.893,47
CALABRESE N.	15.896,12	19.685	14.182,78	11.409,76	16.595,01
AGLIANICO N. (6)*	16.588,41	15.011	13.042,45	9.892,07	9.910,42
GARGANEGA B.	13.763,32	12.484	13.048,29	11.636,95	11.291,74
MOSCATO BIANCO B.	10.888,29	12.536	13.533,14	13.279,96	11.506,38
MALVASIA BIANCA DI CANDIA B. (20)*	20.274,06	25.793	23.152,23	8.787,52	
NERELLO (10)*	18.461,7	20.254	19.594,26		
MALVASIA BIANCA LUNGA B.	17.608,26	11.460	9.341,12		
CANNONAU N. (9)*	13.840,29	15.682	12.525,34		6.347
NURAGUS B.	18.506,92	16.072			
RABOSO (13)*	13.111,36				
UVA DITROIA N.	10.839,79				
ANSONICA B.		13.739	12.711,31	9.518,05	
DOLCETTO N.		11.807	10.415,77	7.349,83	
TREBBIANO ABRUZZESE B.			11.950,79	8.693,42	
CHARDONNAY B.				11.773,06	19.709,4
GLERA (4)*				8.143,37	19.621,2
CABERNET SAUVIGNON N.				8.042,33	13.724,48
CORVINA + CORVINONE (5)*					8.406,23
SYRAH N.					6.738,77
PINOT GRIGIO G.					17.281
TOTAL	676.675,86	662.019	55.8016,85	402.524,01	395.904,1
TOTAL ACREAGE	1.215.372,43	1.063.330	862.386	675.545	625.999
%ACREAGE TOP 20 VS. TOTAL	56	62	65	60	63

\* See footnotes under table 5.

- 21 These varieties account for over half the national vineyard. Moving from 1970 to 2010 the area planted with these varieties increased 56 to 64 % compared to the total area devoted to wine grapes. Logically the list includes 29 varieties as some of them that were among the most cultivated in the early decades, later went down in the rankings, while others in the more recent decades are among the top twenty.
- 22 There is, however, a core of 13 varieties that fall into this group in all 5 censuses: Sangiovese, Trebbiano toscano, Catarratto (bianco e lucido), Barbera, Merlot, Montepulciano, Negro amaro, Trebbiano romagnolo, Primitivo, Aglianico, Garganega, Calabrese and Moscato. Among these 13 varieties, only Merlot is an international variety, the others are autochthonous varieties spread across many regions (Sangiovese, Trebbiano toscano, Moscato, Montepulciano) or localized mainly in certain quality wine-growing areas: Sicily (Catarratti and Calabrese), Piedmont (Barbera) Puglia (Primitivo and Negroamaro), Basilicata

(Aglanico), Garganega (Veneto) and Trebbiano romagnolo (Emilia Romagna).

- 23 For all these varieties, there is a trend towards reduction since 1970 in line with the general reduction of the acreage under vine. Some of them, however, Sangiovese, Merlot, Montepulciano, Primitivo and Aglianico show a reversal of this trend in the period 2000-10, that is an increase in the area planted. The area planted with the variety Garganega is essentially stable since 1982.
- 24 Sangiovese steadily, from 1970 to 2010, accounts for about 10% of the national vineyard confirming its supremacy due to the wide geographical spread. Trebbiano, Barbera and Catarratti, however grown on large extent, continue to lose ground especially against more quality effective varieties. Some of the remaining top varieties showed a steady reduction: Malvasia Bianca di Candia, Malvasia bianca lunga, Dolcetto, Nerello. Others appear only in 1970 among the top 20: Uva di Troia, Raboso (Piave and Verona). Nuragus, variety grown in Sardegna, is recorded just in the censuses of 1970 and 1982; while Cannonau (together with the synonyms Alicante and Tocai rosso) is spread in Sardegna and other Regions is recovering in 2010 after a decline between 1970 and 1982. Ansonica, Dolcetto and Trebbiano abruzzese appear, as losing ground, among the top 20 between 1982 and 2000. Also interesting are the data on the varieties listed among the top 20 just in the last or the last two decades. Such varieties are expanding. Calabrese, expanding since 1990, shows between 2000 and 2010 an increase in acreage of 45% Chardonnay, during the same period, an increase of 67%, Cabernet Sauvignon 70%. Finally after 2000, among the top 20 varieties it can be found: Pinot Grigio, Corvina (and Corvinone), Glera and Syrah. Such data confirms the tendency to strengthen the quality viticulture through the expansion of the cultivation of international grapes in areas already structured for the production of quality wines and for export, and the strengthening or expansion of native grape varieties in their areas of origin always for the production of quality wines.
- 25 Finally the table 5 shows the data of the wine-growing areas of the first 100 varieties, among the more than 300 under cultivation. These varieties account for 75 (1970) to 90% (2010) of the viticultural heritage, so highlighting the national trend of viticulture for wine pro-

duction to the progressive reduction of the number of varieties under cultivation. We move now to some comments on the changes of vineyards of varieties which acreage is lower than that of the group of the top 20 and which expansion or reduction are more dependent on the regional outcome of the viticulture. The data of the 1970 census distinguishes the culture of vine in: “main crop” when the only culture practiced is vine, “mixed main crop” when vine is grown together with other herbaceous or woody crops but is the most important crop on the basis of the value of the annual production and in “secondary crop” when the vine is grown together with other herbaceous or woody crops but is the less important crop on the basis of the value of the annual production. In the present work the data concerning the “secondary crop” are not considered because they refer to small areas (gardens...) grown for personal use. In subsequent censuses the vineyard area is divided into areas for the production of wines with PDO and for the production of other wines.

- 26 A group of international varieties which acreage is growing can be emphasized. Pinot Noir has an increasing trend since 1970 mainly in areas with designations of origin. Sauvignon keeps its position with a slight increase between 1990 and 2010. It is grown for 68% in areas for wine with PDO. Similar trend is evident from the Gewürztraminer (Traminer aromatico) steadily expanding since 1970 and mainly in areas with a designation of origin of northeastern Italy. Between 2000 and 2010, nearly triples the area under cultivation. The Viognier variety recently introduced from France is classified in the Regions of Lazio, Piedmont, Sicily, Tuscany, Umbria and under observation in the Province of Bolzano. It is primarily grown for the production of wines without a protected designation of origin.
- 27 Then there is a group of local grape varieties that substantially keeps the area cultivated: Nebbiolo with an area of approximately 5.000 hectares. 91% of them for production of Protected Designation of Origin. The same can be said for Lambrusco salamino which acreage is 75% intended for PDO wines.
- 28 Ancellotta keeps its positions since 1982 equally divided between wines with Protected denomination of origin and not. Cortese is stable since 1990. Another group of native varieties shows an expansive trend. Lambrusco Maestri, grown in more Regions, after a de-

cline since 1970 is catching surfaces mainly for production of non-designation wines. Grillo, Sicilian grape variety, is expanding since 2000 mainly for the production of non PDO wines. Instead Croatina, Vermentino along with Fiano and Falanghina from Campania, Gaglioppo from Calabria and Lambrusco grasparossa grown in more regions expand mainly in areas for wines with a designation of origin. Also noteworthy is the Pecorino whose surface is even increased ten-fold between 2000 and 2010. It is cultivated in Abruzzo (mainly for non PDO wines) and Marche (usually for PDO wines). The Moscato giallo grape variety is present in many regions. Its surface area has greatly increased between 2000 and 2010. We will see in the next years if the trend continues or if it is just a momentary event.

- 29 Sagrantino is also growing steadily since 1970. It has tripled in the last decade its surface and is mainly cultivated in order to produce PDO wines. It is a native grape of Umbria, its main area of cultivation. Similar trend can be seen for Arneis, native grape of Piedmont, in steady expansion since 1970 mainly in areas for PDO wines. There is also a large group of varieties for which there is a reduction in the area of cultivation. Among them Carignano and Rondinella are in steady decline since 1970; Grecanico dorato Sicilian grape, after three decades of growth, decreases from 2000 to 2010.
- 30 Among the international grape varieties Cabernet Franc (and Carmenerre) and Pinot Blanc slow down.

Evolution of ampelographic platform in Italy

Table 5. More important wine varieties grown in Italy from 1970 to 2010 (ISTAT)\*

VARIETY	Main crop 1970	Main crop 1970	Total 1970	PDO 1982	Other 1982	Total 1982	PDO 1990	Other 1990	Total 1990	PDO 2000	Other 2000	Total 2000	PDO 2010	Other 2010	Total 2010
SANGIOVESE D.O.P.G.	45.547.004	41.811.324	87.358.328	71.193.000	101.844.000	173.037.000	27.881.644	69.612.208	97.493.852	32.119.374	79.999.498	112.118.872	42.399.714	29.249.491	71.649.205
MONTEPULCIANO N.	10.083.994	9.098.074	19.182.068	4.782.000	24.446.000	29.228.000	17.740.000	20.224.448	37.964.448	9.127.764	20.699.512	29.827.276	18.434.444	16.339.828	34.774.272
CATARRATO BIANCO D.O.P.G.	78.499.884	10.053.414	88.553.298	4.649.000	50.221.000	54.870.000	3.004.488	17.989.844	21.994.332	888.736	49.805.064	50.693.800	3.499.224	31.089.012	34.582.824
TREBBIANO TOSCANO D.O.P.G.	29.049.674	31.174.864	60.224.538	11.187.000	43.386.000	54.573.000	11.615.668	49.131.204	60.746.872	10.615.688	33.921.024	44.537.712	9.201.004	31.898.000	41.095.712
MERLOT N.	42.878.864	7.083.004	49.961.868	3.327.000	30.849.000	34.176.000	5.999.116	24.273.184	30.272.300	8.016.896	17.949.524	26.016.500	12.203.384	18.816.824	28.041.700
BARBERA N.	72.823.354	8.589.314	81.412.668	13.387.000	49.420.000	62.807.000	12.732.424	34.348.404	47.080.828	16.263.016	12.101.216	28.364.232	11.999.184	4.524.724	20.523.908
CHARDONNAY B.	%	%	0,024	12,004	170,004	182,004	3.364,024	2.815,564	6.180,124	7.684,564	4.088,004	11.778,064	11.353,214	8.924,124	19.709,404
GLESA D.O.P.G.	4.517.524	1.828.844	6.346.368	2.033.000	3.998.000	6.031.000	2.997.136	4.179.232	7.176.368	3.993.872	8.145.376	12.139.248	31.699	19.821.208	
PINOT GRIGIO G.	92.644	77.274	169.918	1.299.000	892.000	1.891.000	2.277.500	835.876	3.113.376	4.268.000	1.842.204	6.095.204	11.599.844	5.771.184	17.371.028
CALABRESI N.	14.801.894	1.294.234	16.096.128	7.208	19.628.000	19.635.200	17.336	14.845.448	14.862.784	529.864	10.389.072	11.409.936	2.133.284	14.443.424	16.583.708
TREBBIANO ROMAGNOLO B.	21.724.184	591.384	22.315.568	2.611.000	22.317.000	25.928.000	3.155.184	18.102.244	21.257.428	4.404.000	15.028.844	20.032.844	9.452.514	2.020.944	11.893.474
CABERNET SAUVIGNON N.	775.994	81.834	857.828	877.000	1.000.000	1.877.000	918.216	1.485.088	2.403.304	4.201.832	3.941.204	8.042.316	4.883.164	7.039.324	11.724.488
PRIMITIVO N.	41.821.134	6.044.024	47.865.158	349.000	31.327.000	31.676.000	149.808	17.079.888	17.249.696	794.176	1.154.804	1.949.680	6.743.464	4.485.112	11.234.576
MOSCATO BIANCO B.	9.247.184	1.521.114	10.768.298	8.788.000	7.748.000	16.536.000	10.443.416	3.089.816	13.533.232	10.687.808	2.612.248	13.299.884	10.582.064	944.324	11.526.388
NEGRAMARON B.	39.204.514	7.415.804	46.620.318	2.938.000	38.421.000	41.359.000	1.543.276	30.043.872	31.587.148	2.376.776	14.333.184	16.709.868	8.930.844	5.551.784	14.491.632
CARGANEA B.	11.959.864	1.802.724	13.762.588	1.289.000	12.484.000	13.773.000	7.779.976	2.272.232	10.052.208	7.913.424	11.619.816	9.192.296	2.089.112	11.281.408	
AGLIANICO N.	6.097.174	10.493.244	16.590.418	1.393.000	15.511.000	16.904.000	1.014.216	12.028.204	13.042.420	2.308.504	7.989.872	9.892.376	1.144.414	4.746.012	8.938.428
CORVINA - CORVINONE D.O.P.G.	2.894.884	1.838.924	4.733.808	4.479.000	526.000	5.005.000	4.133.448	184.936	4.498.384	4.568.324	391.244	4.959.568	1.358.114	3.601.454	4.959.608
SYRAH N.	87.134	81,54	168,674	%	22,004	22,004	26,004	77,004	102,134	237,804	801,134	1.038,844	1.044,414	4.874,834	6.738,774
CANNONAU D.O.P.G.	11.647.974	2.172.224	13.820.198	1.501.000	14.131.000	15.632.000	1.928.800	10.094.444	12.023.244	1.499.544	5.661.514	7.161.074	1.500.004	2.474.944	3.449.948
GRILLO B.	2.374.204	1.100.234	3.474.438	874.000	3.327.000	4.201.000	420.476	1.828.832	2.249.308	132.816	1.873.736	1.809.216	723.214	5.899.204	6.294.418
ANSONICA B.	6.652.794	1.584.194	8.236.988	%	13.739.000	13.739.000	148.816	12.064.504	12.711.216	873.476	8.844.488	9.518.004	799.284	6.332.214	6.132.518
DOCGETTO N.	%	482,824	482,824	4.053.000	7.832.000	11.885.000	4.379.088	8.819.712	10.413.776	3.182.876	1.887.164	7.149.832	3.309.714	816,634	6.122.388
CRETANA B.	1.044.044	298.144	1.342.188	1.478.000	4.328.000	5.806.000	2.012.216	2.474.448	4.486.664	2.037.236	1.242.874	3.289.424	889.184	4.889.212	
NEBBIOLO N.	3.427.884	409.834	3.837.718	3.532.000	2.742.000	6.274.000	3.211.388	3.891.204	7.102.592	4.023.714	4.888.004	8.911.718	491.114	9.102.832	
TREBBIANO ABRUZZESE B.	1.189.254	1.440.004	2.629.258	1.007.000	6.241.000	7.248.000	1.533.896	10.414.808	11.950.704	1.543.244	7.150.184	8.693.424	1.422.214	2.883.274	5.086.598
VERMENTINO B.	3.824.874	3.221.714	7.046.588	458.000	4.266.000	4.724.000	1.837.800	2.897.176	4.534.376	1.749.244	1.782.414	3.314.828	3.693.564	1.358.114	4.541.678
PINOT NERO N.	1.271.334	1.771.874	3.043.208	1.483.000	632.000	2.115.000	2.143.000	2.834.116	804.136	3.538.264	2.687.504	6.245.768	3.314.384	4.233.894	8.898,6
LAMBRUSCO SALAMINO N.	2.939.194	1.354.994	4.294.188	2.883.000	2.982.000	5.865.000	2.808.704	2.287.204	4.877.808	2.377.888	1.891.132	4.272.804	1.748.894	1.231.114	3.003.908
MALVASIA BIANCA DI CANDIA D.O.P.G.	12.618.684	7.457.434	20.076.118	4.330.000	21.465.000	23.795.000	5.181.816	17.860.844	23.152.216	3.137.836	8.649.896	8.787.324	2.224.164	2.492.404	4.785.544
TREBBIANO GIALLO D.O.P.G.	2.916.004	1.211.254	4.127.258	399.000	4.033.000	4.443.000	274.444	4.499.824	4.774.448	809.784	3.492.016	4.281.184	1.120.004	3.748.000	
ANGELICO N.	1.189.254	1.440.004	2.629.258	1.007.000	6.241.000	7.248.000	1.533.896	10.414.808	11.950.704	1.543.244	7.150.184	8.693.424	1.422.214	2.883.274	
UVADI TROIA N.	6.438.174	4.381.624	10.819.798	632.000	5.053.000	5.685.000	4.666.384	2.563.354	3.031.738	534.214	1.247.754	1.781.864	1.462.144	1.110.344	2.572.488
RONDINELLA N.	2.180.204	1.286.254	3.466.458	2.386.000	833.000	3.441.000	2.310.676	464.394	2.975.064	2.388.784	283.334	2.874.114	2.351.444	127.844	2.479.288
MALVASIA N. (17)	4.880.124	1.436.734	6.316.858	358.000	10.392.000	10.750.000	320.844	7.995.974	8.316.814	485.844	5.761.864	6.447.704	501.924	1.782.874	2.284.798
MALVASIA BIANCA LUNGA B.	8.441.934	9.166.334	17.608.268	4.205.000	7.255.000	11.460.000	2.464.904	6.876.224	9.341.128	1.532.444	3.208.884	4.741.328	1.289.554	949.214	2.238.768
LAMBRUSCO MAESTRI N.	3.212.074	2.487.144	5.699.218	357.000	4.996.000	4.953.000	242.988	2.158.894	2.401.874	419.944	1.039.396	1.459.336	606.434	1.616.254	2.222.688
SCHIAVON D.O.P.G.	6.799.294	894.444	7.693.738	4.710.000	2.538.000	7.248.000	3.746.800	1.082.404	4.829.204	2.486.644	1.009.204	3.695.844	1.301.684	333.924	1.835.608
CILEGRIANO D.O.P.G.	2.382.824	1.602.624	3.985.448	148.000	5.886.000	6.034.000	220.128	4.880.664	5.100.792	261.832	2.815.936	3.077.688	235.808	1.594.124	1.829.912
FRANCESCO D.O.P.G.	1.766.432	2.018.444	3.784.876	289.000	2.497.000	2.726.000	372.224	1.335.924	1.708.148	1.033.924	986.834	2.040.754	1.314.084	447.884	1.761.968
PIGNONETTO B.	%	0,064	0,064	178,000	178,000	225,474	394,714	530,184	661,294	6.129,154	6.790,444	1.281,444	421,814	1.707,254	
CARGANEA N.	3.337.444	346.674	3.684.118	216.000	3.527.000	3.743.000	206.834	2.297.824	2.504.654	497.018	1.341.514	1.748.534	1.049.714	1.644.814	
LAMBRUSCO DI SORBARA N.	1.472.074	326.554	1.798.628	1.119.000	1.049.000	2.168.000	929.588	663.444	1.593.032	1.136.574	323.334	1.459.884	1.324.694	281.044	1.605.738
RIESLING ITALICO B.	1.618.384	261.024	1.879.408	1.128.000	899.000	2.027.000	1.433.314	726.244	2.159.554	1.673.044	357.314	2.030.358	1.488.884	163.514	1.652.398
REFOSCO D.O.P.G.	585.114	316.844	901.974	481.000	1.152.000	1.633.000	542.616	528.114	1.070.728	663.554	522.144	1.185.698	1.002.184	563.234	1.565.418
ALBANA B.	5.650.344	1.768.134	7.418.478	1.410.000	5.172.000	6.582.000	1.386.600	3.176.974	4.563.974	1.071.434	1.729.524	2.808.954	821.734	701.024	1.522.758
ZIBIBBO B. (19)	%	%	0,004	%	%	%	1.620,000	416,024	2.036,024	469,004	700,000	1.169,000	697,214	823,334	1.520,544
GRECHETTO B.	497.444	613.644	1.111.088	335.000	568.000	903.000	356.724	593.114	949.834	677.584	526.104	1.203.604	1.142.934	358.384	1.501.318
BRACHETTO N.	177.124	34.064	211.188	43.000	116.000	159.000	140.888	127.024	287.888	1.275.414	2.746.404	1.551.814	1.276.654	183.164	1.459.818
TRAMENAROMATICO R.	210.564	10.494	221.058	264.000	186.000	450.000	297.816	132.088	429.894	422.784	137.134	559.894	1.213.624	194.804	1.408.428
MONICA N.	6.739.414	1.221.274	7.960.688	2.140.000	8.339.000	10.479.000	785.434	3.443.274	6.228.704	329.994	2.578.674	2.908.664	501.924		

	1970	1980	1990	2000	2010	1970	1980	1990	2000	2010	1970	1980	1990	2000	2010	
MASCATO GIALLO B.0	377.594	86.844	464.439	23.004	224.004	237.004	104.734	237.044	343.774	188.384	171.964	360.344	456.624	370.374	826.994	
GRECONE B.0	2.996.484	1.827.794	4.814.474	708.004	4.210.004	4.918.004	22.864	3.203.144	3.226.004	116.914	2.924.004	3.040.714	239.204	267.414	826.614	
VERDUZZO FRIULANO B.0	1.652.034	397.824	2.049.934	707.004	1.673.004	2.380.004	406.924	1.190.314	1.797.434	409.744	1.048.444	1.458.384	334.374	433.634	807.204	
TEROLDEGO N.0	733.884	86.134	820.014	515.004	84.004	409.004	408.594	86.984	595.544	544.914	143.344	499.254	606.334	190.114	796.344	
VERDECA B.0	7.492.934	763.714	8.256.644	3.793.004	2.747.004	6.540.004	1.526.724	2.442.204	3.988.924	1.348.234	917.184	2.263.414	1.70.654	524.804	795.454	
FRAPPATO N.0	%	37.424	37.424	49.004	719.004	748.004	14.114	774.214	792.324	93.084	495.064	785.144	192.134	540.204	752.334	
VERDUZZO TREVIGIANO B.0	2.945.694	195.34	3.140.994	550.004	1.942.004	2.492.004	494.594	2.080.464	2.575.034	289.504	1.444.604	1.714.104	94.234	614.234	708.484	
PIEDROSSO N.0	794.614	3.711.154	4.585.764	28.004	2.383.004	2.413.004	91.574	1.246.594	1.338.144	169.344	943.604	1.031.144	333.874	344.744	494.614	
CESANESE (16)0	2.783.084	3.834.924	6.622.004	694.004	3.085.004	3.739.004	438.424	1.854.114	2.292.534	285.084	806.344	1.091.424	255.244	424.134	679.374	
LAGREIN N.0	493.944	13.254	597.194	350.004	60.004	410.004	325.104	49.834	374.954	428.414	48.804	477.414	628.674	24.834	633.504	
ORTUGO B.0	203.54	10.394	214.494	63.004	206.004	249.004	219.874	140.414	380.284	370.364	155.554	525.914	529.724	81.174	610.894	
MOLINARA N.0	1.421.074	875.914	2.296.984	1.480.004	479.004	1.939.004	1.337.334	293.694	1.631.244	1.119.414	228.434	1.347.844	524.634	70.014	394.644	
MALVASIA DEL LAZIO B.0	3.073.174	3.364.384	8.437.554	605.004	5.239.004	5.844.004	670.464	3.411.934	4.082.334	591.424	2.034.184	2.623.604	295.354	295.114	590.464	
CODA DI VOLPE BIANCA B.0	542.414	1.332.574	1.874.984	9.004	1.511.004	1.520.004	182.464	993.544	1.176.004	151.184	875.674	1.024.854	222.684	331.974	554.634	
MAGLIOCO CANINO N.0	%	%	%	4	545.004	2.022.004	2.567.004	10.994	1.550.404	1.561.394	76.304	540.044	616.344	87.454	451.154	538.604
MONTE B.0	1.487.944	1.015.144	2.503.104	%	1.443.004	1.463.004	499.404	725.424	1.224.824	397.664	562.144	1.159.804	367.524	149.004	530.524	
VERACCIA DIS. GIBBANO B.0	184.344	207.894	392.244	472.004	371.004	843.004	751.014	137.314	888.324	730.484	33.434	785.914	438.044	23.724	511.744	
DIRELLA B.0	657.34	422.234	1.079.524	%	924.004	924.004	408.904	577.834	946.734	408.734	314.354	723.104	343.354	126.194	449.544	
RISLING RENANO B.0	214.264	85.334	299.594	153.004	120.004	243.004	281.534	97.014	378.544	327.384	296.154	423.734	245.374	200.704	446.274	
CABERNET FRANC. CARMENERE (7)0	4.240.904	556.184	4.797.084	194.004	2.317.004	2.313.004	189.464	2.246.424	2.435.914	61.984	406.774	466.754	156.264	284.014	440.274	
BIANCO D'ALESSANO B.0	3.547.994	282.984	3.830.874	3.200.004	743.004	3.941.004	801.004	791.444	1.492.444	490.394	276.794	967.184	281.124	138.124	419.244	
MALVASIA DI LIPARI B.0	457.054	148.044	785.094	8.004	173.004	179.004	25.884	95.774	121.654	76.854	55.884	132.734	37.304	15.604	52.804	
TOTAL FIRST 1000	686.796.394	240.026.614	826.725.804	208.142.404	704.347.004	906.489.804	183.681.464	688.449.114	772.110.604	216.317.324	374.431.634	689.748.854	298.982.424	264.679.834	666.92.430	
TOTAL ITALY	810.367.524	328.047.084	1.138.404.624	209.794.404	863.634.004	1.063.330.004	196.882.004	671.634.004	862.380.004	233.666.004	441.940.004	678.448.004	320.889.004	304.840.004	626.639.004	
%FIRST 100VS.TOTAL ITALY	%	%	76.60%	%	%	86.26%	%	%	89.63%	%	87.30%	%	%	99.46%		

Table 5c. More important wine varieties grown in Italy from 1970 to 2010 (ISTAT).

# CONCLUSION

31 The changes to the acreage of the vine varieties for wine production are described by the means of the data supplied by the decennial censuses of agriculture. Availability of records concerning a period of time of 40 years allows to perceive the trends of viticulture that, obviously, are linked to those of production of wine. The national vineyard continues to shrink but at a slower pace in comparison to the past decades. Anyway such reduction, that depends also on the grape and wine producing structures and on the stiffness of the EC rules as for the enlargement of the acreage devoted to vine, affects in different ways the varieties under cultivation. Generally speaking the varieties that give back revenue, replace the less interesting under the economical point of view. The varieties more grown are the autochthonous ones. Some of them have been the same all along the decades considered. Some other are emerging since 2000 and, due to the actions for bettering the PDO of the concerned wines, are widening their growing area. The occurrence and enlargement of the

cultivation of some foreign varieties, mainly of French origin, is registered mostly in Regions where the production of PDO wines is already well established. In general the Italian viticulture strongly tends towards a steady improvement of wines obtained either by autochthonous and international varieties.

---

ISTAT (Istituto Nazionale di Statistica):  
Censimento dell'Agricoltura Italiana:  
1970, 1982, 1990, 2000, 2010.

Antonio Calò, Davide Gaeta, Carmelo  
Zavaglia, Moreno Antoniazzi: Evolu-  
zione del vigneto Italia - volume II°.  
Vittorio Veneto (TV), TIPSE, 2008, 407.

Gianfranco Tempesta, Monica Fiorilo,  
Matteo Marengi. "Vigneto Italia". Alba,  
Wine pass, 2013, 66.

Bavaresco L. (2004) - Evoluzione della  
piattaforma ampelografica italiana. In-  
formatore Agrario, 48: 57-59.

---

### English

By the means of the data of the decennial censuses of agriculture it was commented the evolution of the Italian viticulture from 1970 to 2010 either as for the national and regional acreage and as for the changes of the surfaces occupied by the wine producing varieties. It continues to rely mainly on native varieties and on some quality effective foreign varieties. Italian viticulture is in general reducing its acreage but there is an increase of the surface cultivated with varieties for production of PDO wines at the expenses of varieties for production of non PDO or less appreciated wines.

---

### Luigi Bavaresco

CRA. Consiglio per la Ricerca e la Sperimentazione in Agricoltura. Centro di  
Ricerca per la viticoltura. Conegliano  
[luigi.bavaresco@entecra.it](mailto:luigi.bavaresco@entecra.it)

IDREF : <https://www.idref.fr/240407172>

ORCID : <http://orcid.org/0000-0002-1278-6587>

### Mario Pecile

CRA. Consiglio per la Ricerca e la Sperimentazione in Agricoltura. Centro di  
Ricerca per la viticoltura. Conegliano  
[mario.pecile@entecra.it](mailto:mario.pecile@entecra.it)

**Carmelo Zavaglia**

CRA. Consiglio per la Ricerca e la Sperimentazione in Agricoltura. Centro di  
Ricerca per la viticoltura

[carmelogiorgio.zavaglia@entecra.it](mailto:carmelogiorgio.zavaglia@entecra.it)