



EUROPEAN CONFERENCE ON QUALITY IN OFFICIAL STATISTICS 2024 ESTORIL - PORTUGAL



EUROPEAN CONFERENCE ON
QUALITY IN OFFICIAL STATISTICS
2024 ESTORIL - PORTUGAL

Organic farming in Italy: comparison and integration among sources for improving data consistency

Roberto Gismondi, Chiara Gnesi, Pietro Nurzia

ISTAT - ITALY



eurostat 

The conference is partly
financed by the European Union



OUTLINE

1. Organic farming in the EU (2)
2. Main data sources in Italy (2)
3. Comparisons at the macro-level (3)
4. Comparisons at the micro-level (1)
5. The logistic model (3)
6. Estimation of organic production (2)
7. Conclusions (1)

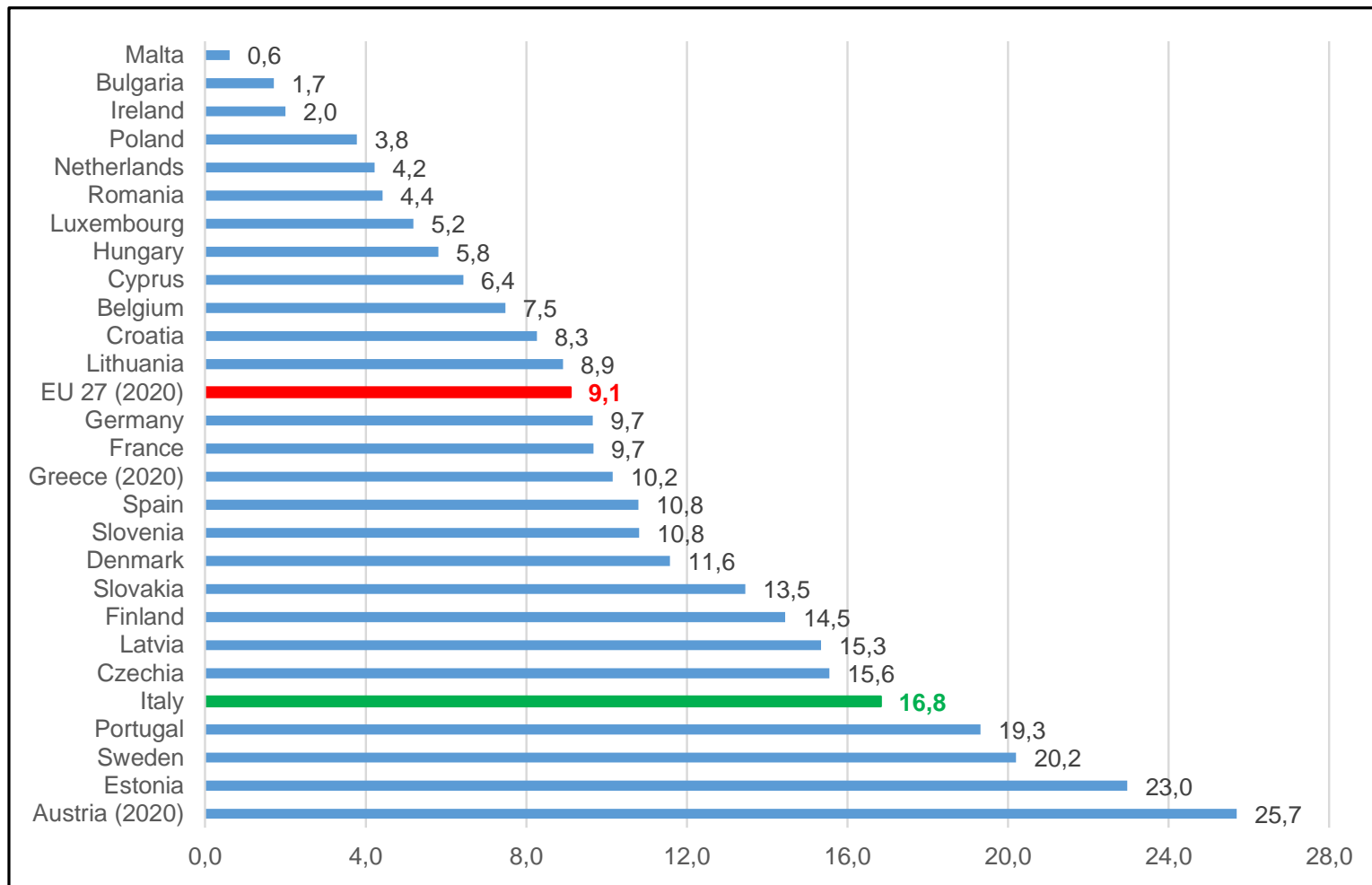


1. Organic farming in the EU

- ❑ Organic farming does not use synthetic **chemical products** to fertilize land or to fight weeds, animal parasites, and plant diseases
- ❑ Organic agriculture is supported by the CAP (2023-2027) which aims at converting **at least 25%** of European agricultural areas within 2030
- ❑ The importance of having timely and reliable statistics on organic farming is also underlined by the entry into force of the **SAIO Regulation** (EU) 2022/2379
- ❑ The data on organic farming disseminated annually by EUROSTAT (ruled by an ESS Agreement) started in 2013 and is currently updated to **2022**
- ❑ In 2022, there were over **402 thousand organic farms in the EU**, 58,9% more than in 2013. **20,5% of them are Italian**



% share of organic agricultural surfaces on total by Country in the EU - 2021



Source: elaboration on EUROSTAT data



2.1 The Ministry of Agriculture administrative data

- ❑ The bodies that carry out checks and certify organic production are authorized by **MASAF** (Ministry of Agriculture, Food Sovereignty and Forestry)
- ❑ Data on organic farming distinguish between **surfaces** already "converted" to organic or still "in the process of being converted". **No data on organic production are available**
- ❑ The MASAF source is used for providing the yearly data requested by the **ESSC 2020/42/6/EN**, which is going to be replaced by the SAIO Regulation
- ❑ Access to MASAF microdata **is not possible** at the moment, because: 1) the farmers provided data for administrative reasons and their use for statistical purposes may conflict with the original arrangements; 2) confidentiality problems



2.2 The ISTAT structural surveys

- ❑ The seventh general census of agriculture found its regulatory basis, at the European level, in **Regulation (EU) 2018/1091**
- ❑ To simplify the farmers' response process, the census questionnaire, referring to the date of 1 October 2020, **did not ask** farmers to indicate the use of the organic practice **for each plant species**
- ❑ The main question only asked **how many hectares are cultivated using organic farming**. Consequently, data relating to the hectares of surface operated with organic practices for each plant species **were estimated**
- ❑ Between the 2 censuses of 2010 and 2020, ISTAT measured the evolution of organic farming based on sample surveys conducted in 2013 and 2016 (**Integrated Farm Statistics Surveys - IFS**)



Agricultural surfaces under organic farming using ISTAT or MASAF data, % and absolute differences by geographical areas – The years 2010, 2013, 2016, 2020

Geographical area	ISTAT vs MASAF %				ISTAT vs MASAF (000 ha)			
	2010	2013	2016	2020	2010	2013	2016	2020
Organic area (000 ha)	1.252	1.356	1.566	2.331	1.114	1.317	1.796	2.095
Italy	+12,4	+3,0	-12,8	+11,3	+138	+39	-231	+236
Northwest	+41,5	+2,8	-24,0	+51,4	+22	+2	-22	+56
Northeast	+31,0	+25,3	+2,6	+41,4	+33	+28	+4	+108
Centre	-5,9	+12,8	-14,0	+7,7	-16	+37	-53	+38
South	+30,9	-2,0	-20,1	+10,8	+108	-9	-131	+75
Islands	-2,6	-4,4	-5,7	-7,7	-9	-19	-29	-41

Source: elaboration on ISTAT and MASAF data



Estimation of organic agricultural surfaces using MASAF or ISTAT data – 2020

SPECIES	Agricultural surfaces (ha)		Average % weight	ISTAT vs MASAF %	ISTAT vs MASAF
	MASAF	ISTAT			
Cereals	333.563	354.003	15,5	+6,1	+20.440
Protein cultures	47.057	68.284	2,6	+45,1	+21.227
Root plants	3.494	6.361	0,2	+82,0	+2.867
Industrial crops	43.076	42.127	1,9	-2,2	-949
Fodder crops	426.885	430.124	19,4	+0,8	+3.239
Other arable land	29.471	16.722	1,0	-43,3	-12.749
Vegetables	69.070	37.799	2,4	-45,3	-31.271
Fruit	39.119	37.798	1,7	-3,4	-1.321
Nuts	53.097	47.449	2,3	-10,6	-5.648
Citrus fruits	35.517	30.376	1,5	-14,5	-5.141
Vineyards	117.378	108.345	5,1	-7,7	-9.033
Olives	246.503	224.826	10,6	-8,8	-21.677
Other	650.377	926.880	35,6	+42,5	+276.503
TOTAL	2.094.607	2.331.092	100,0	+11,3	+236.485

Source: elaboration on ISTAT and MASAF data



3. Comparison between MASAF and ISTAT data – Reasons for discrepancies

1. Farms falling below a series of census entry **thresholds** were not observed
2. While the administrative source refers to the situation as of 31 December, the census measurement refers to **1 October**
3. The census questionnaire asked farms to indicate whether they practiced organic farming without the details concerning the **plant species**
4. The respondent may declare a situation **not consistent** with the administrative process
5. The census was carried out during the **COVID-19 pandemic** when many farms were inactive and often the managers were not found. In some periods, direct interviews were even prohibited by the national law



4. Comparison between MASAF and ISTAT data – Micro-level

- ❑ We used the microdata supplied by the Italian Integrated Administrative and Control Authority (**IACS**), which match exactly with the MASAF data
- ❑ Record linkage was based on the **VAT/fiscal Code**. Linked farms were **957.650**

**Concordance between the MASAF and the ISTAT sources as regards the organic farming practice.
Number of farms, the year 2020**

	ISTAT	ABSOLUTE FIGURES			% FIGURES (TOTAL=100)		
		Organic	Not organic	Total	Organic	Not organic	Total
MASAF	Organic	46.026	13.103	59.129	4,8	1,4	6,2
	Not organic	39.364	859.157	898.521	4,1	89,7	93,8
	Total	85.390	872.260	957.650	8,9	91,0	100,0

Source: elaboration on ISTAT and MASAF data



5. The logistic model

- ❑ Logistic regression is used for modeling the probability of an event (dependent variable **Y**) through a series of explanatory **X**-variables
- ❑ In this context, the **Y** binary variable is equal to 1 if the farm is **classified as organic by one source and as not organic by the other**, and is equal to 0 otherwise
- ❑ If p is the probability that **Y** takes the value 1 in the presence of a given vector **X** of explanatory variables, the ratio between the probabilities p and $(1-p)$ is called **odds ratio** and is equal to 1 if and only if $p=0,5$
- ❑ The odds ratios that are more different from one identify the farms' features that **influence more** the probability that a farm is discordant



5. The logistic model

Structural farm features:

- Legal status
- Territory (by regions: Tuscany used as benchmark)
- Size (UAA, ALU, AWU)

Farm manager features:

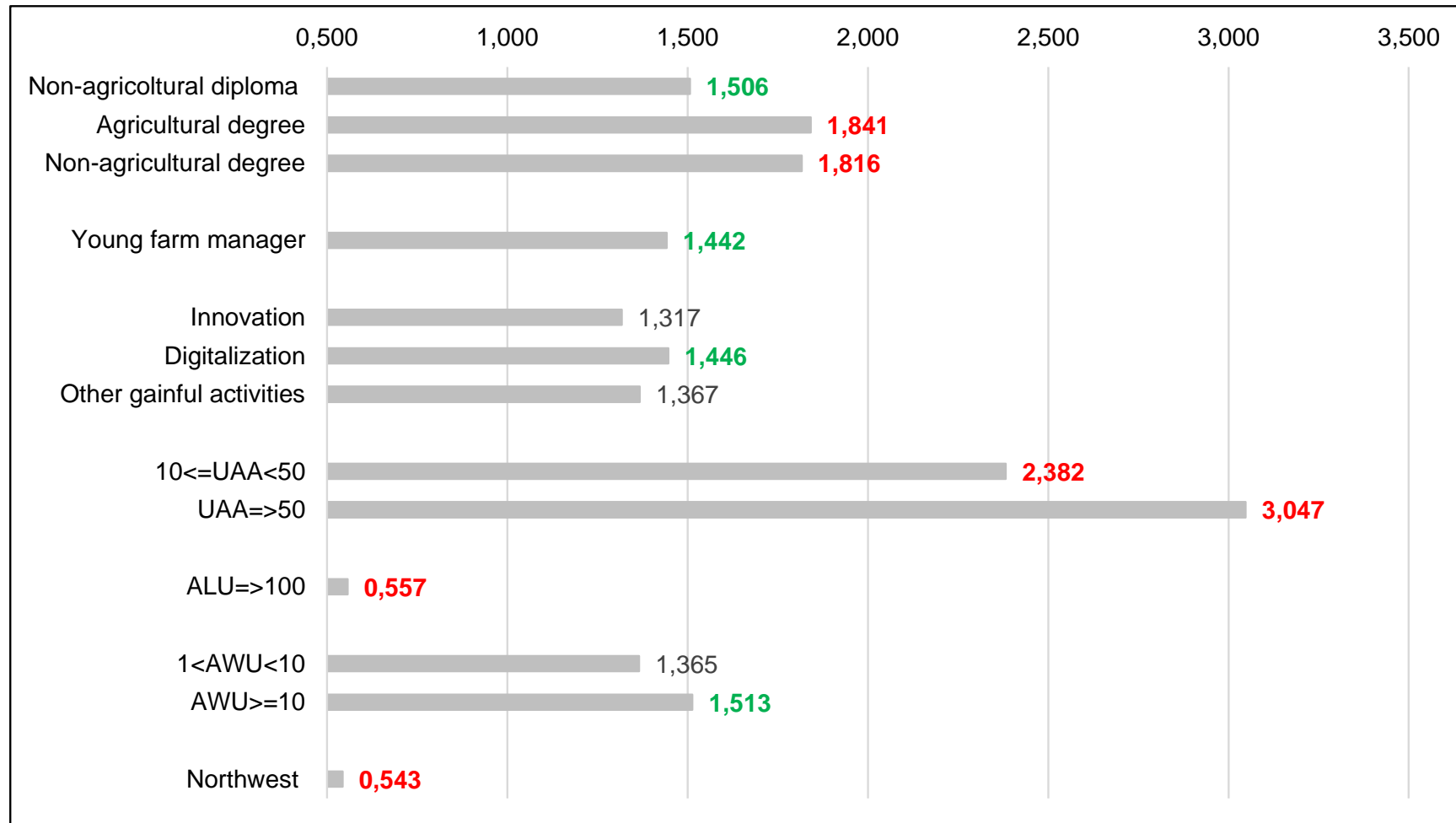
- Age
- Gender
- Education

Modernization:

- Innovation (investments in the last 3 years)
- Digitalization
- Other gainful activities



Odds ratios derived from the logistic model. The most significant variables



Source: elaboration on ISTAT and MASAF data



6. Estimation of organic production

- ❑ The **Farm Accountancy Data Network (FADN)** is an annual sample survey established by the European Economic Commission in 1965
- ❑ The survey provides data both on agricultural surfaces and **yield per hectare** for farms that use organic farming
- ❑ Data on yields (**quintals of production per cultivated hectare**) were extracted for **41 vegetal varieties** from the FADN
- ❑ The varieties examined represent **13 species**. The weight of their surfaces is **70%** of those for which the SAIO Regulation requires organic production
- ❑ Organic production is estimated through the **product** between the organic yield from FADN and the organic surface derived from the MASAF or the ISTAT sources



Estimation of organic production using MASAF, ISTAT and FADN data – 2020

SPECIES	Estimated production(quintals)		Average % weight	ISTAT vs MASAF %	ISTAT vs MASAF
	MASAF	ISTAT			
Cereals	12.808.819	13.593.714	6,1	6,1	784.895
Protein cultures	2.414.024	3.502.946	1,4	45,1	1.088.922
Root plants	1.014.308	1.846.460	0,7	82,0	832.151
Industrial crops	8.137.056	7.957.762	3,7	-2,2	-179.294
Fodder crops	38.291.585	38.582.101	17,8	0,8	290.517
Other arable land	40.054.036	22.726.843	14,5	-43,3	-17.327.193
Vegetables	79.154.220	43.318.170	28,3	-45,3	-35.836.050
Fruit	8.750.920	8.455.454	4,0	-3,4	-295.466
Nuts	807.074	721.218	0,4	-10,6	-85.857
Citrus fruits	6.524.473	5.579.992	2,8	-14,5	-944.481
Vineyards	12.230.788	11.289.505	5,4	-7,7	-941.282
Olives	6.409.078	5.845.475	2,8	-8,8	-563.603
Other	21.722.592	30.957.787	12,2	42,5	9.235.195
TOTAL	238.318.974	194.377.427	100,0	-18,4	-43.941.547

Source: elaboration on ISTAT and MASAF data



7. Main conclusions

- ❑ Organic farming is **spreading rapidly**, in Italy as well as in Europe
- ❑ As regards 2020, the MASAF administrative source produced estimates on the number of organic operators and their agricultural surfaces **different** from those derived from the agriculture census (ISTAT)
- ❑ The comparative analysis evaluated **discrepancies** and their possible causes
- ❑ Furthermore, we proposed a simple methodology for estimating **organic crops production**, an indicator requested by SAIO
- ❑ Looking ahead, we need to continue **comparing the two sources** and removing the obstacles that prevent their convergence
- ❑ It is more and more important to access the **administrative databases**



EUROPEAN CONFERENCE ON
QUALITY IN OFFICIAL STATISTICS
2024 ESTORIL - PORTUGAL



INSTITUTO NACIONAL DE ESTATÍSTICA
STATISTICS PORTUGAL

eurostat 

The conference is partly
financed by the European Union

THANK YOU!

