

GEORGOFILI- FIDAF 13-14/11/2024

Razionalizzazione dei sistemi colturali e zootecnici per la
salvaguardia ambientale

Viticoltura da vino e riduzione degli impatti ambientali

Oswaldo Failla

Georgofilo

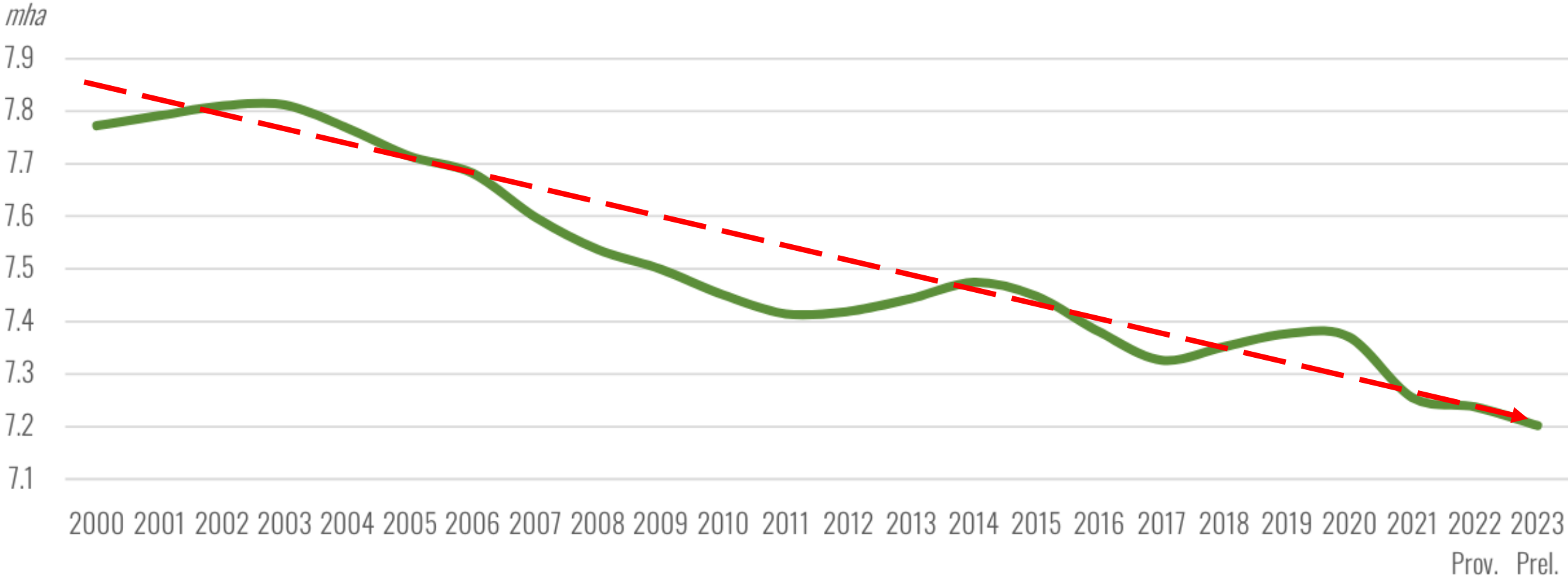
Dipartimento di Scienze Agrarie ed Ambientali, Università degli Studi di Milano

UNA BREVE PREMESSA



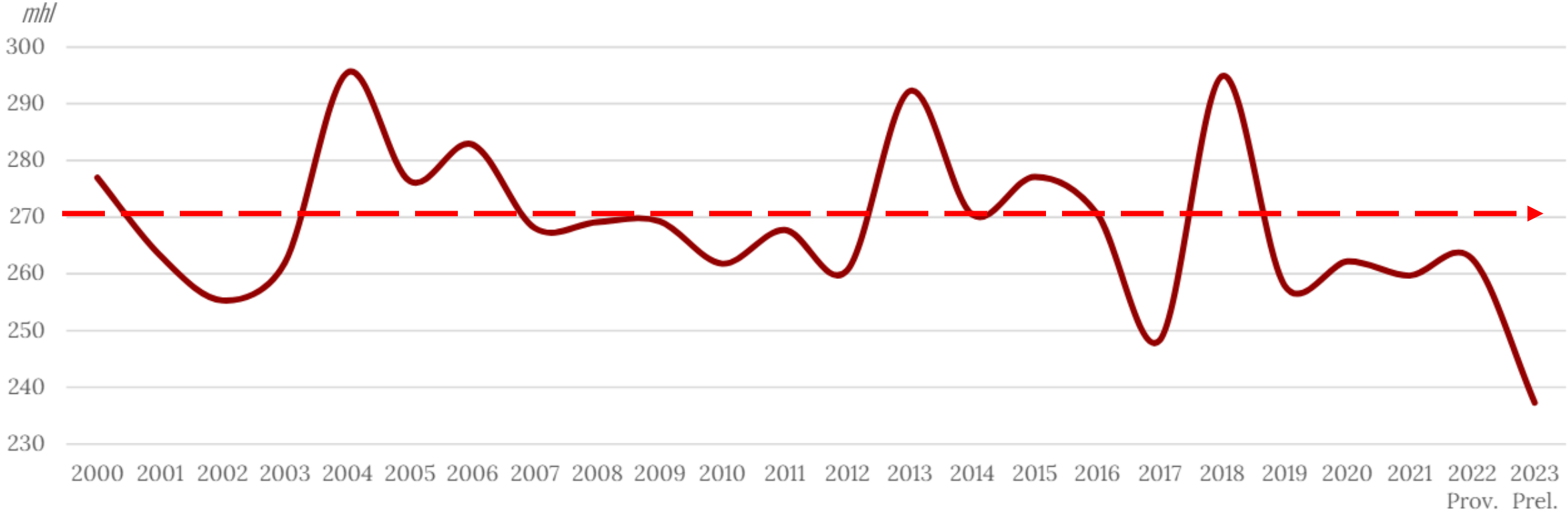
RIDURRE GLI IMPATTI SENZA IMPATTARE SULLA
ECONOMIC VIABILITY DEL SETTORE

Figure 1 • Evolution of world vineyard surface area



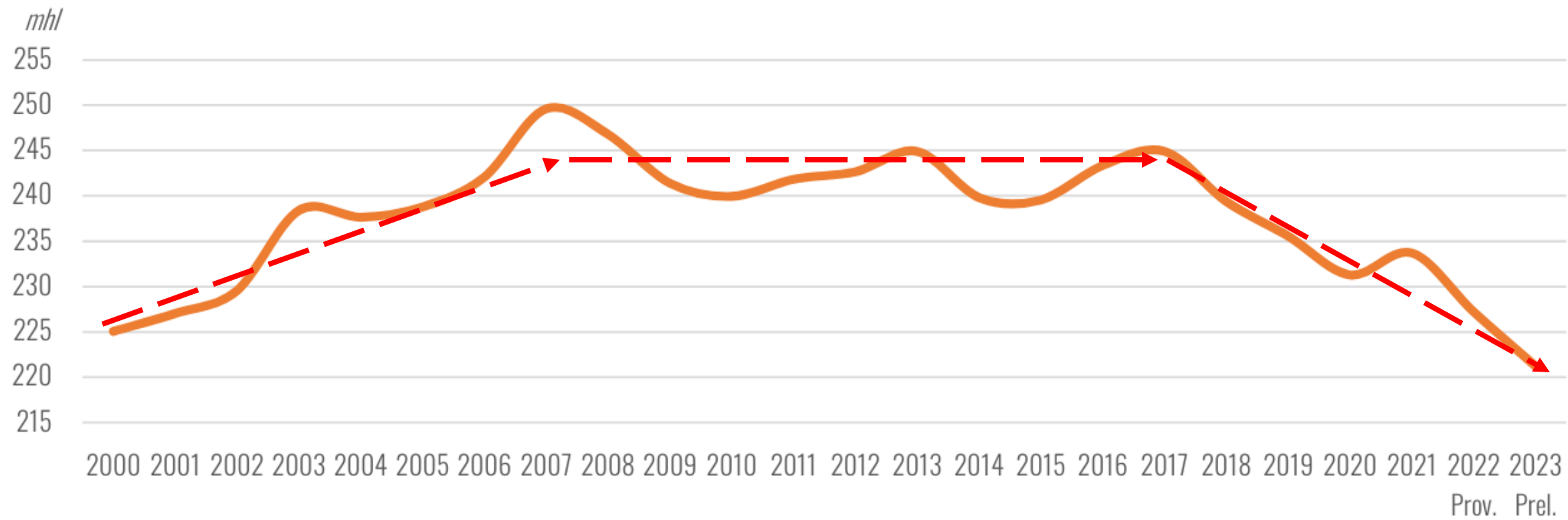
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Figure 2 • Evolution of world wine production (juices and musts excluded)



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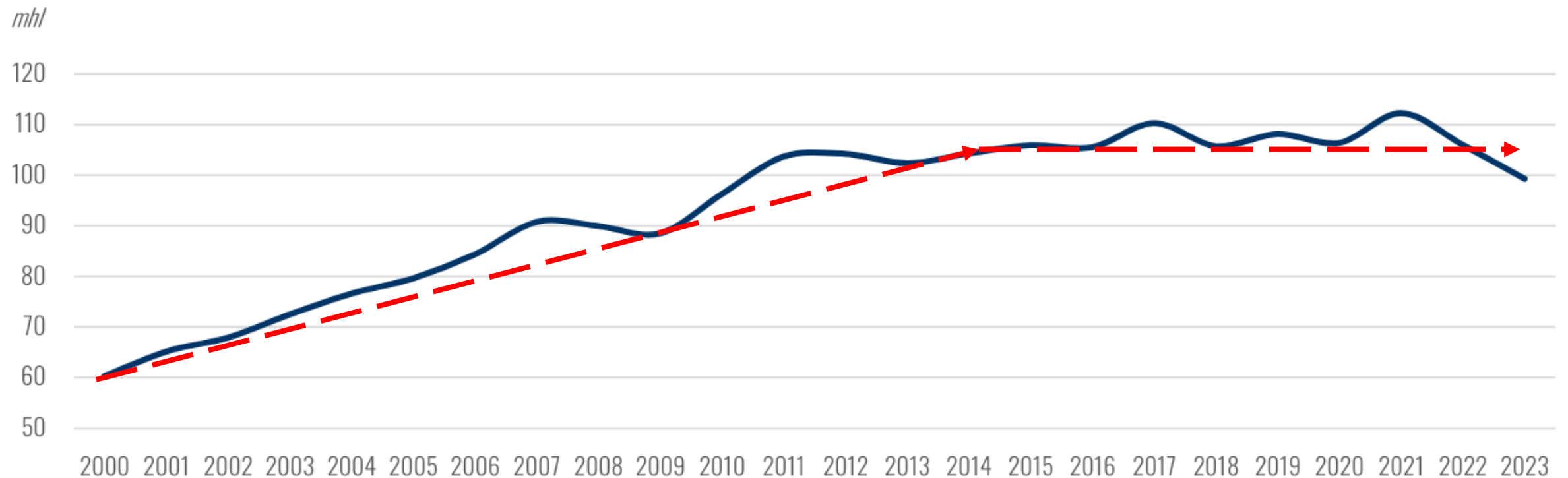
Figure 3 • Evolution of world wine consumption



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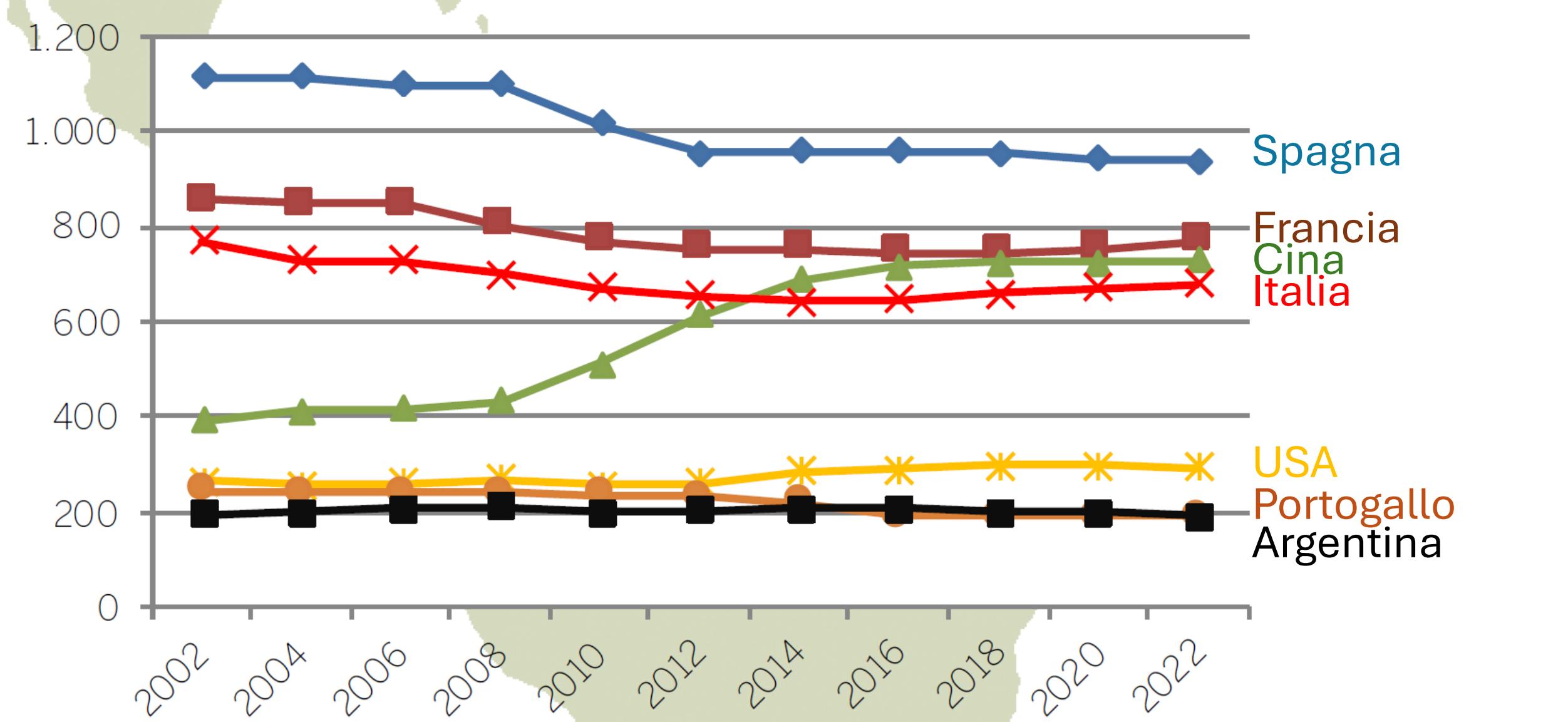
40% ca. della produzione mondiale di vino è oggetto di commercio internazionale

Figure 4 • Evolution of international trade in wine by volume

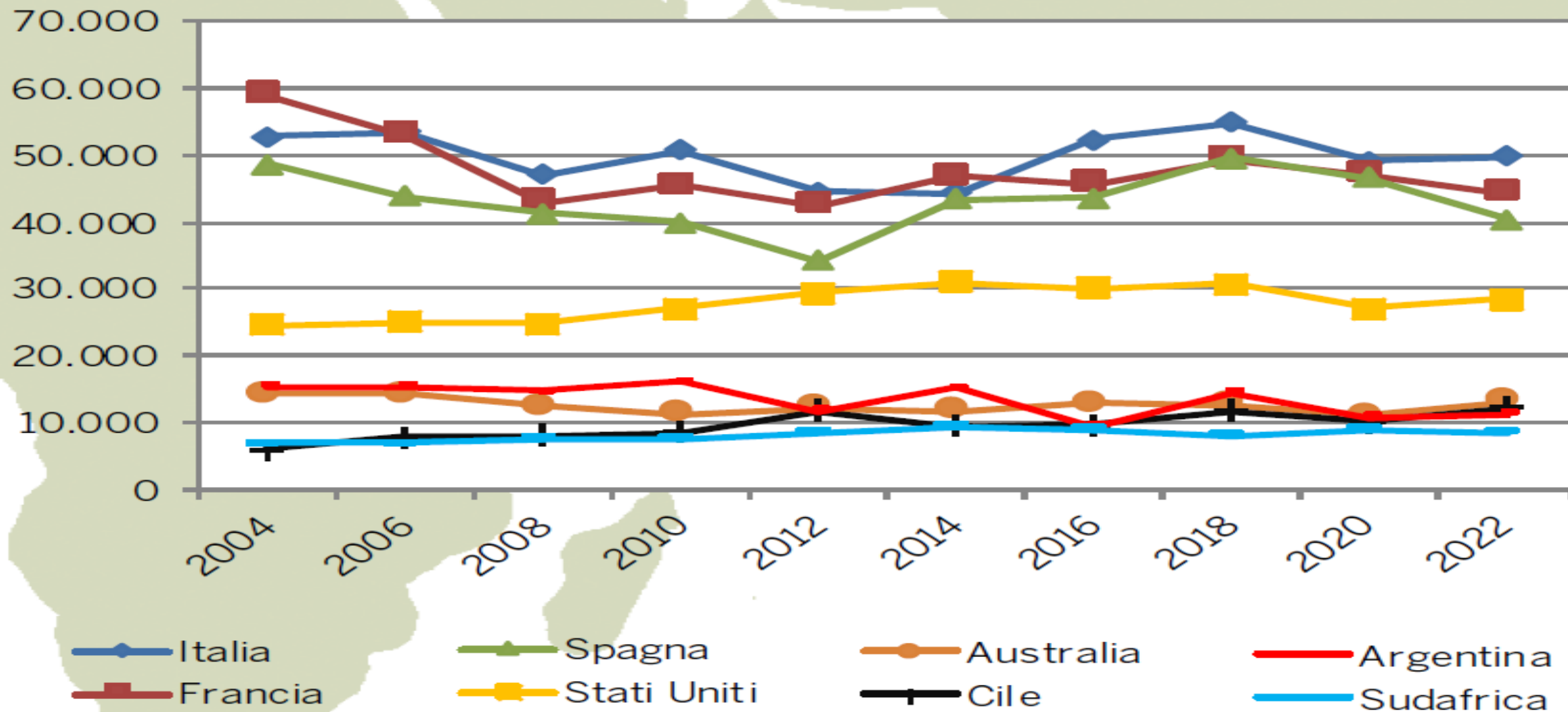


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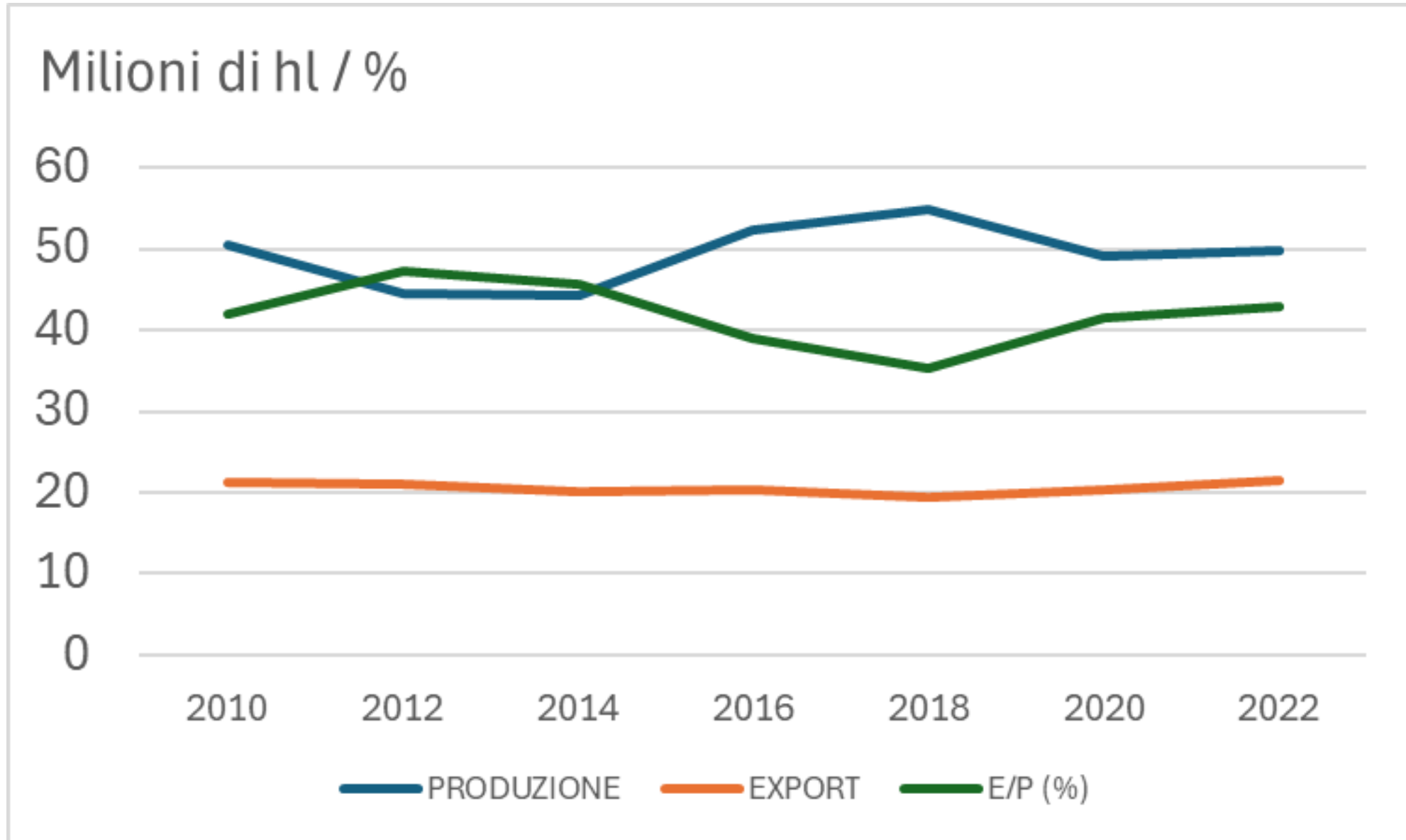
TREND DELLE SUPERFICI DEI MAGGIORI PRODUTTORI MONDIALI



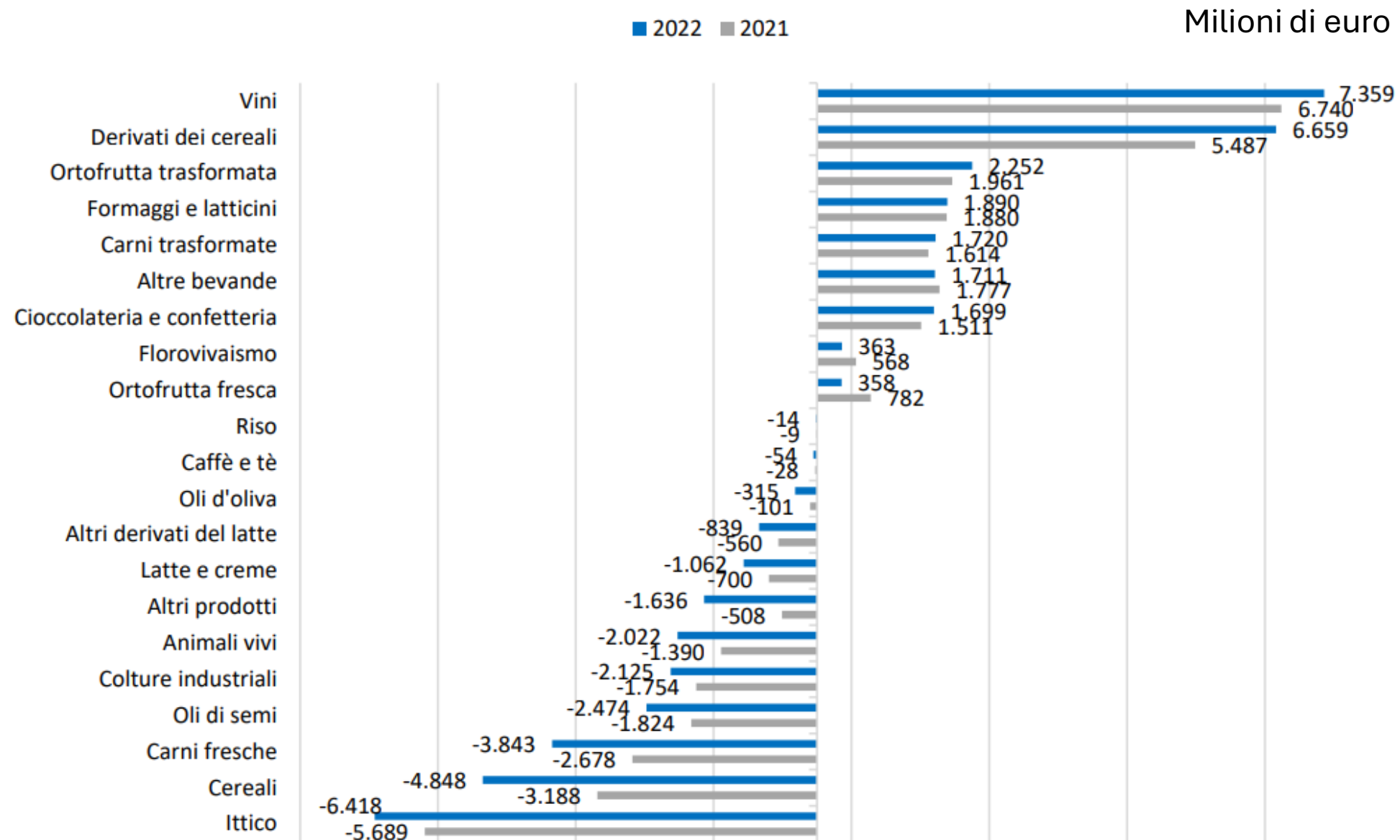
EVOLUZIONE PRODUZIONE PER PAESI (.000 hl)



TREND DELLE PRODUZIONI E DELL'EXPORT IN ITALIA



Saldo commerciale per comparti produttivi



Fonte: elaborazioni Ismea su dati Istat

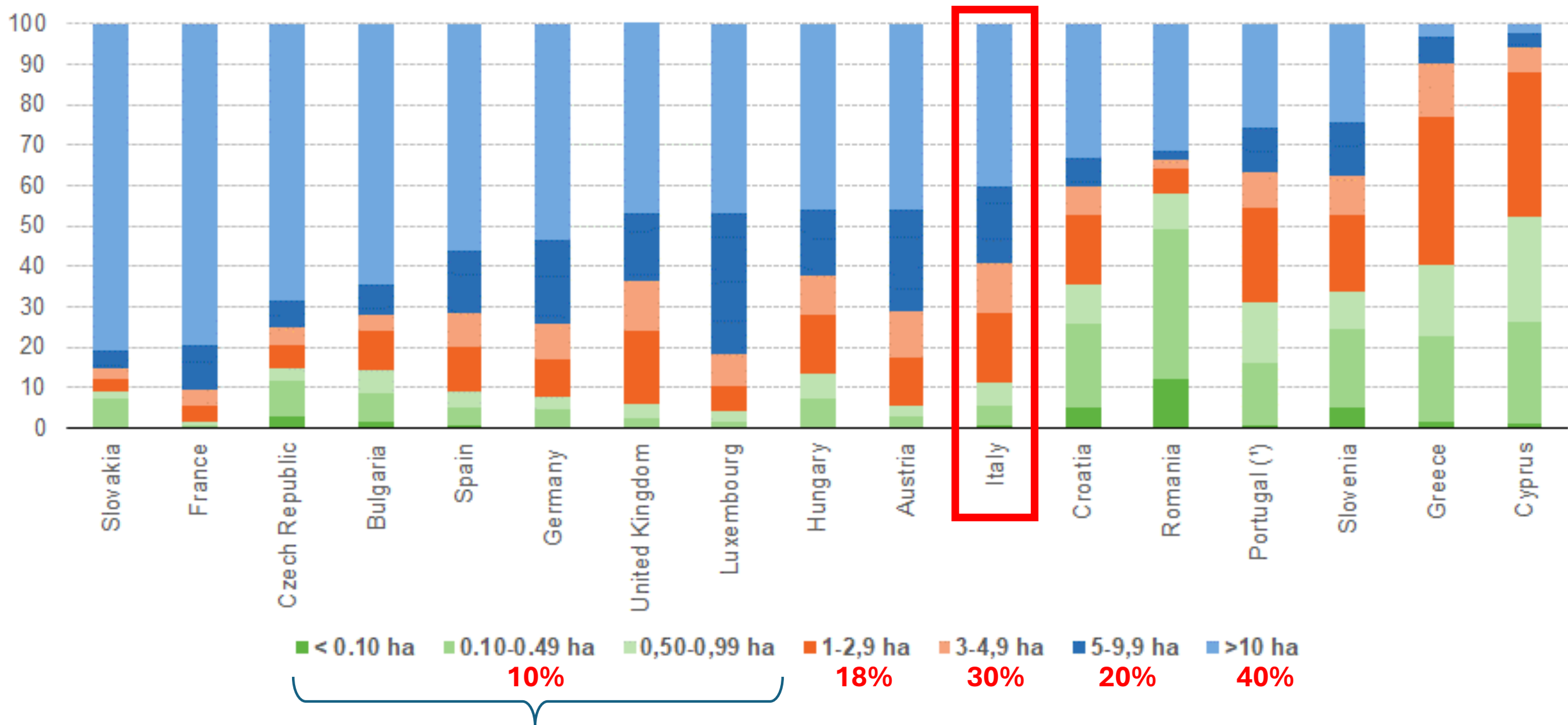
ISMEA, 2023

Key variables on vineyard holdings, 2020

	Area under vines (ha)	Vineyard holdings (number)	Average area under vines (ha per holding)
EU	3 194 614	2 227 672	1.43
Belgium	–	–	–
Bulgaria	60 169	44 289	1.36
Czechia	18 099	16 541	1.09
Denmark	–	–	–
Germany	103 554	35 093	2.95
Estonia	–	–	–
Ireland	–	–	–
Greece	103 058	193 284	0.53
Spain	910 859	483 749	1.88
France	792 565	75 153	10.55
Croatia	17 628	33 377	0.53
Italy	688 985	302 686	2.28
Cyprus	7 613	13 740	0.55
Latvia	–	–	–
Lithuania	–	–	–
Luxembourg	1 294	279	4.64
Hungary	62 108	26 279	2.36
Malta	–	–	–
Netherlands	–	–	–
Austria	46 273	12 098	3.82
Poland	–	–	–
Portugal	173 254	114 220	1.52
Romania	180 683	844 015	0.21
Slovenia	15 363	28 498	0.54
Slovakia	13 108	4 371	3.00
Finland	–	–	–
Sweden	–	–	–

– Not applicable.

Source: Eurostat (online data code: vit_t1)

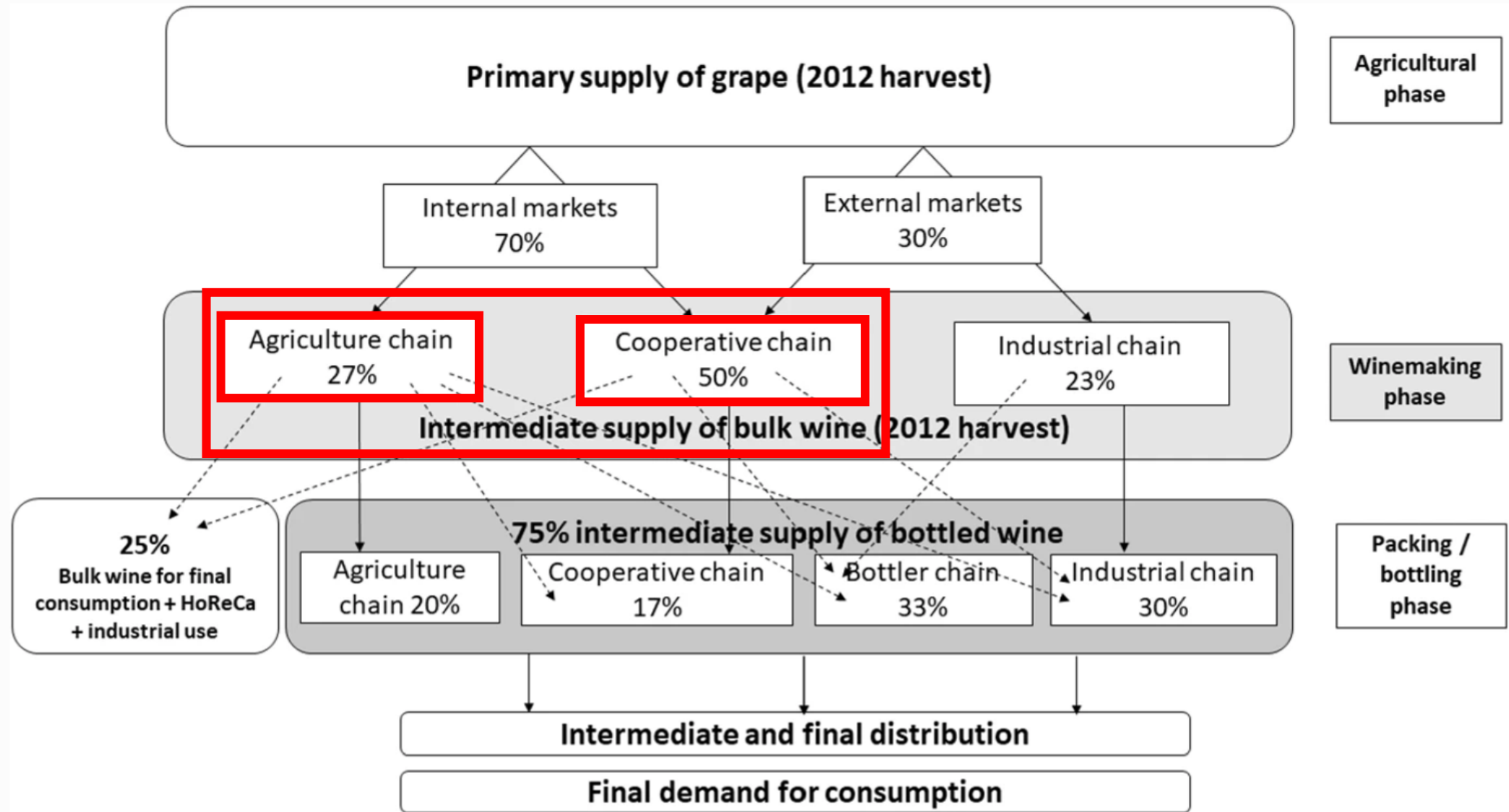


Note: Ranked on the share of ">10 ha".

(*) Região Autónoma dos Açores (PT20) and Região Autónoma da Madeira (PT30): not included.

Fig. 1

From: [The Italian Wine Sector: Evolution, Structure, Competitiveness and Future Challenges of an Enduring Leader](#)



Source: For winemaking phase (Mazzarino and Corsi 2015). For bulk wine (ISMEA 2019). For packing/bottling phase (Malorgio et al. 2011)

Value chain structure of the Italian wine industry (volume shares)

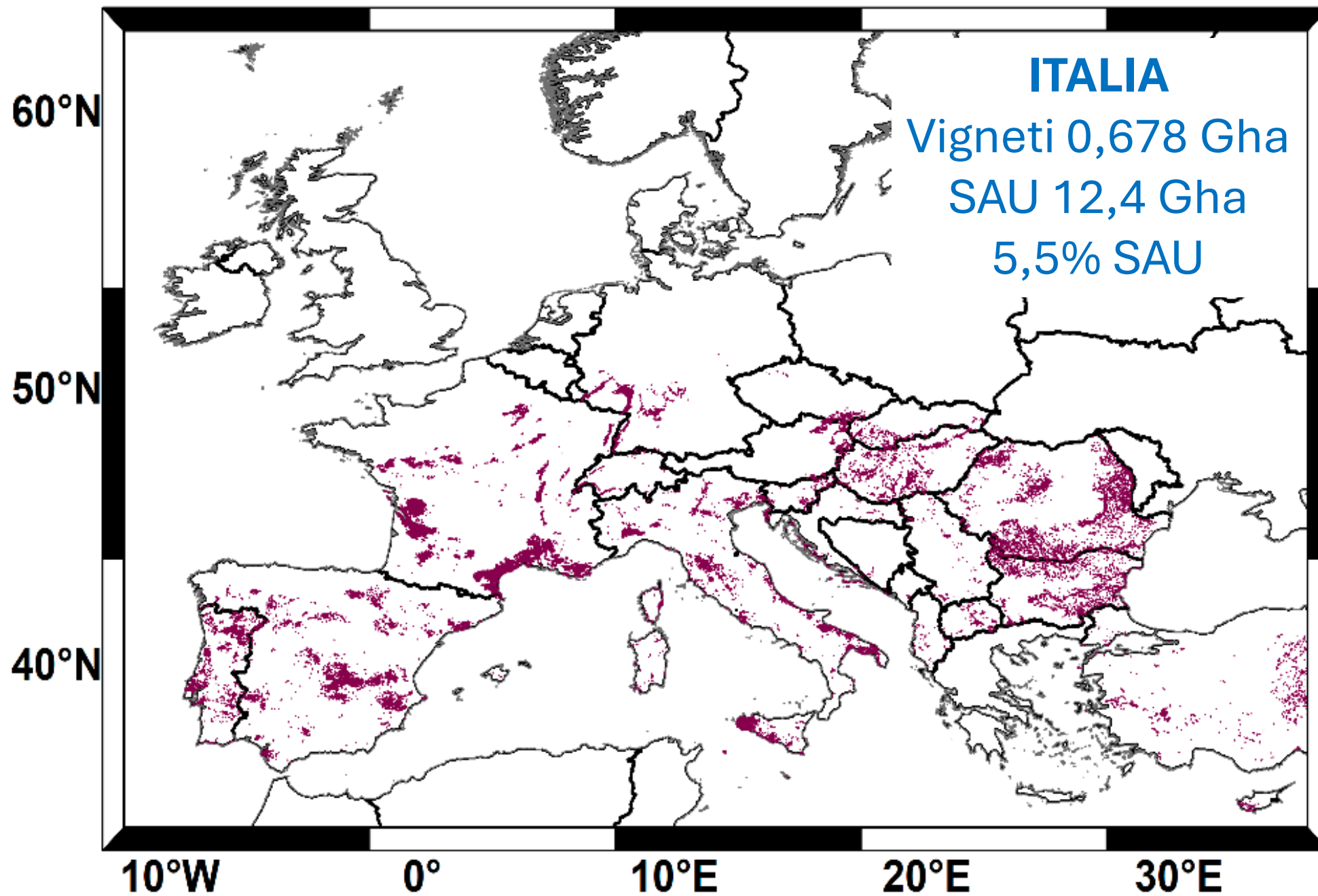
UNA STIMA DELL'IMPATTO IN TERMINI DI GHG A LIVELLO GLOBALE

Settore vitivinicolo globale: 2% GHG dell'agricoltura (0,3% globale)

Superfici a vigneto: 0,5% SAU globale

Incidenza relativa *apparente*: 4 x

Rugani, B., Vázquez-Rowe, I., Benedetto, G., Benedetto, E., 2013. A comprehensive review of carbon footprint analysis as an extended environmental indicator in the wine sector. J. Clean. Prod. 54, 61-77.



I PRINCIPALI DISTRETTI VITICOLI ITALIANI

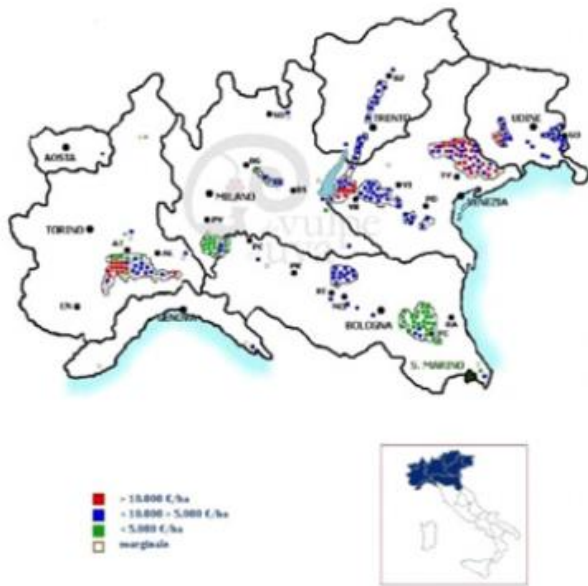


Figure 8. Italian wine districts GSP/ha – north.



Figure 9. Italian wine districts GSP/ha – centre.



Figure 10. Italian wine districts GSP/ha – south A.

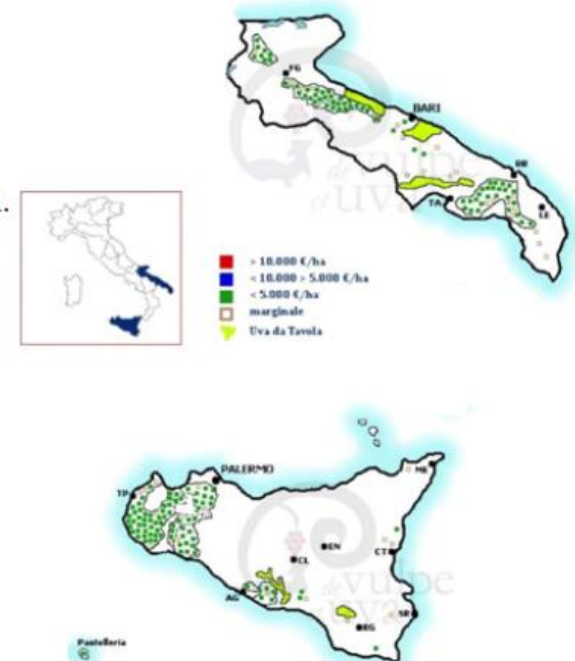


Figure 11. Italian wine districts GSP/ha – south B.

UN'INDAGINE LCA IN EUROPA

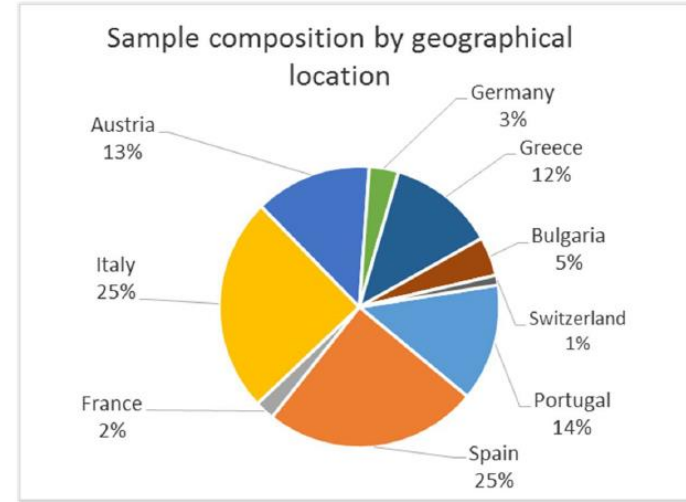


Fig. 1 – Distribution of the 89 winery sample in the different EU wine production countries

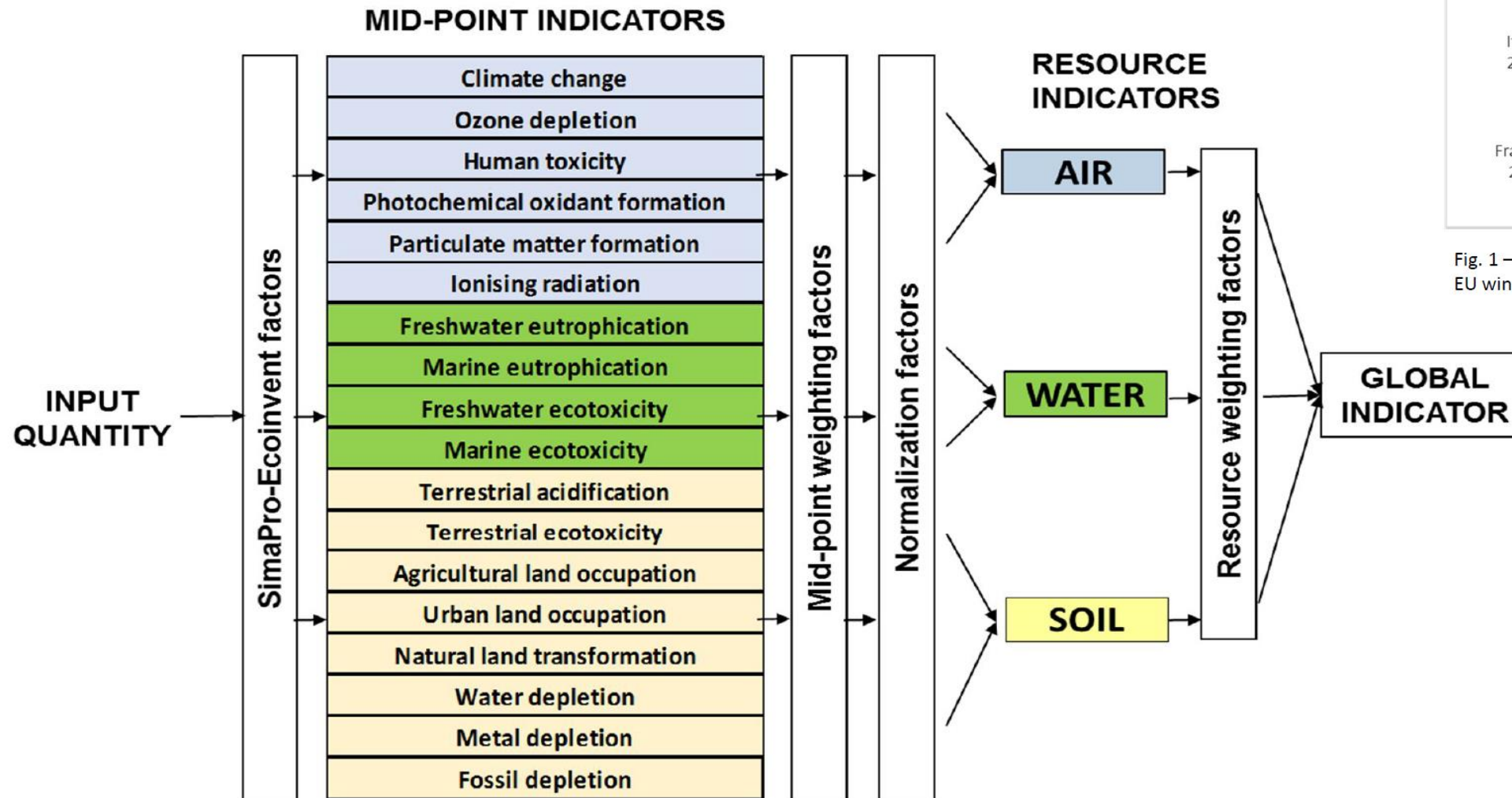
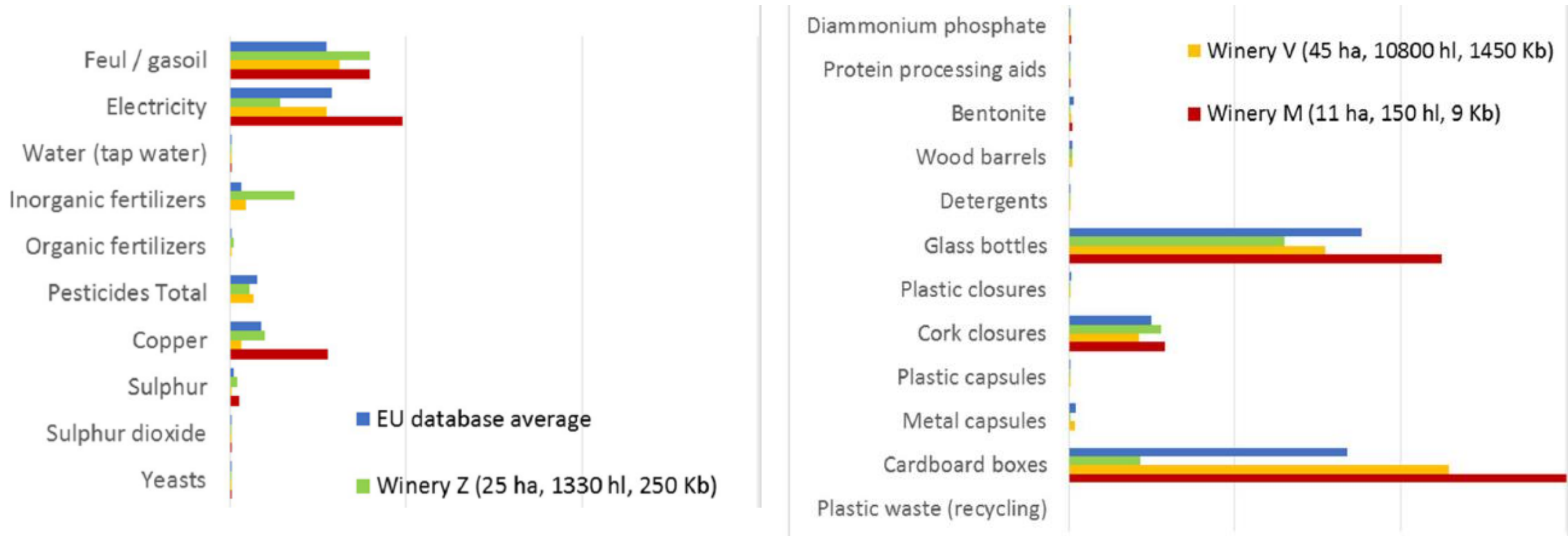
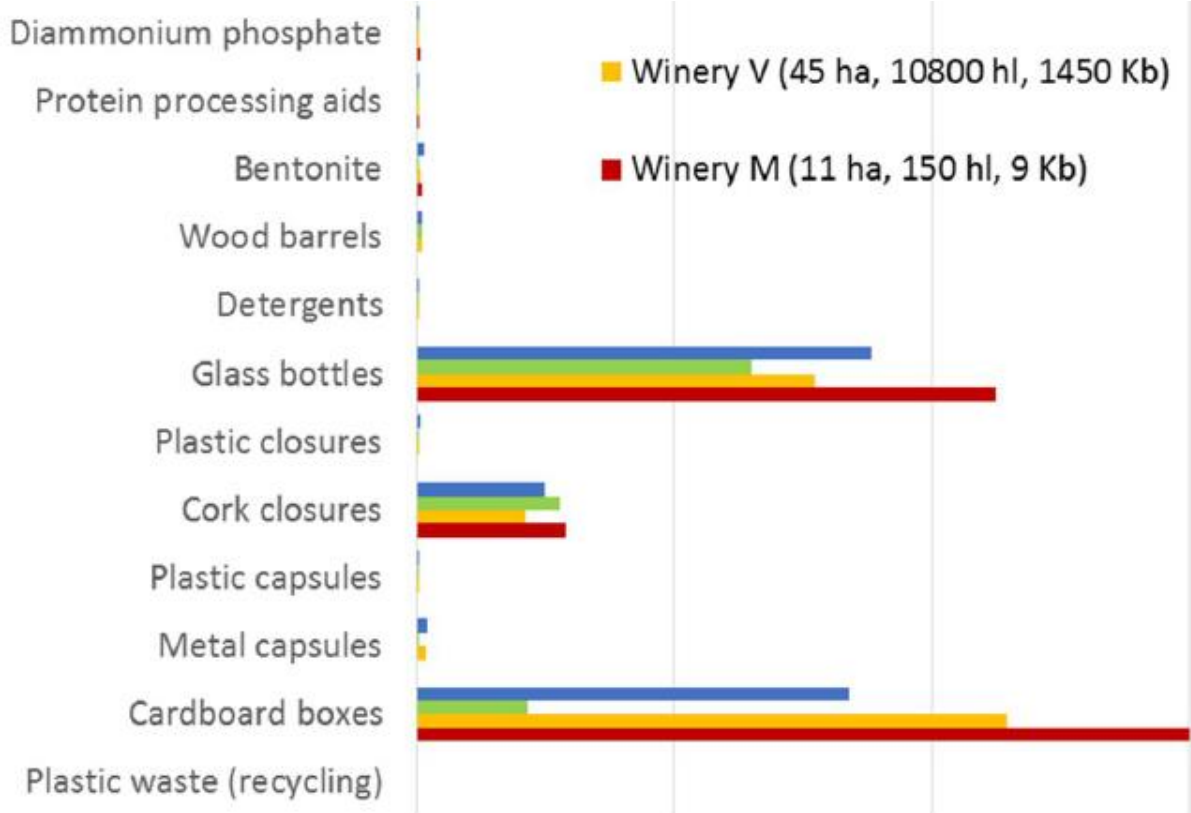
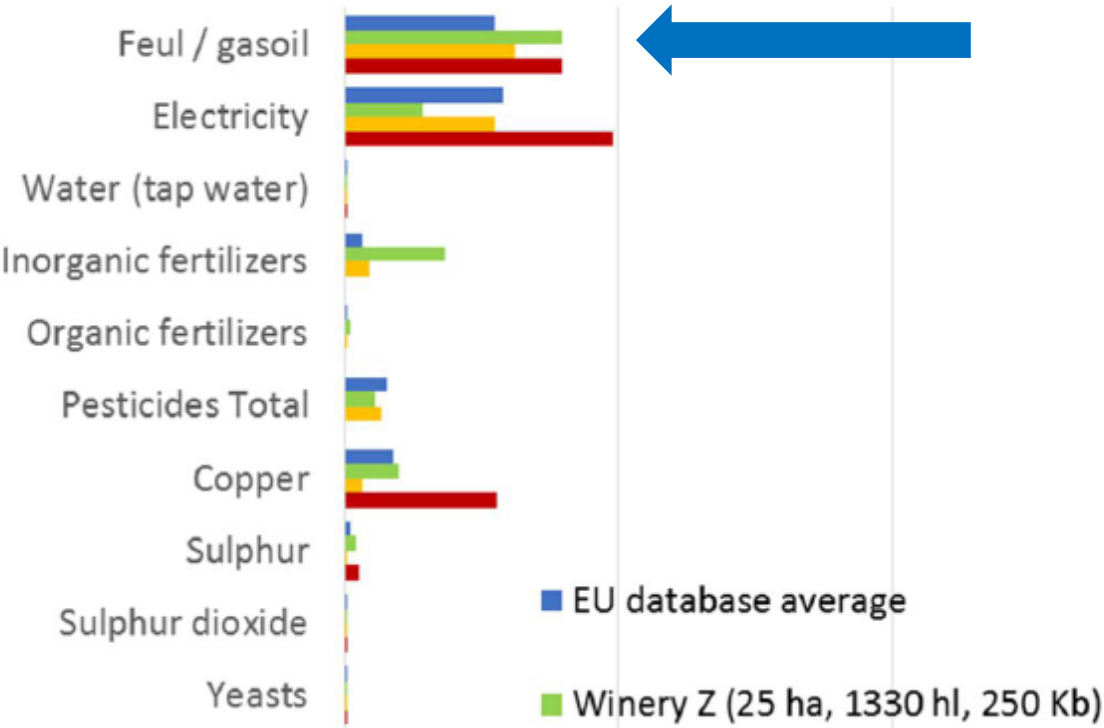


Fig.2 – Diagram of the calculation of global indicator value for each input.

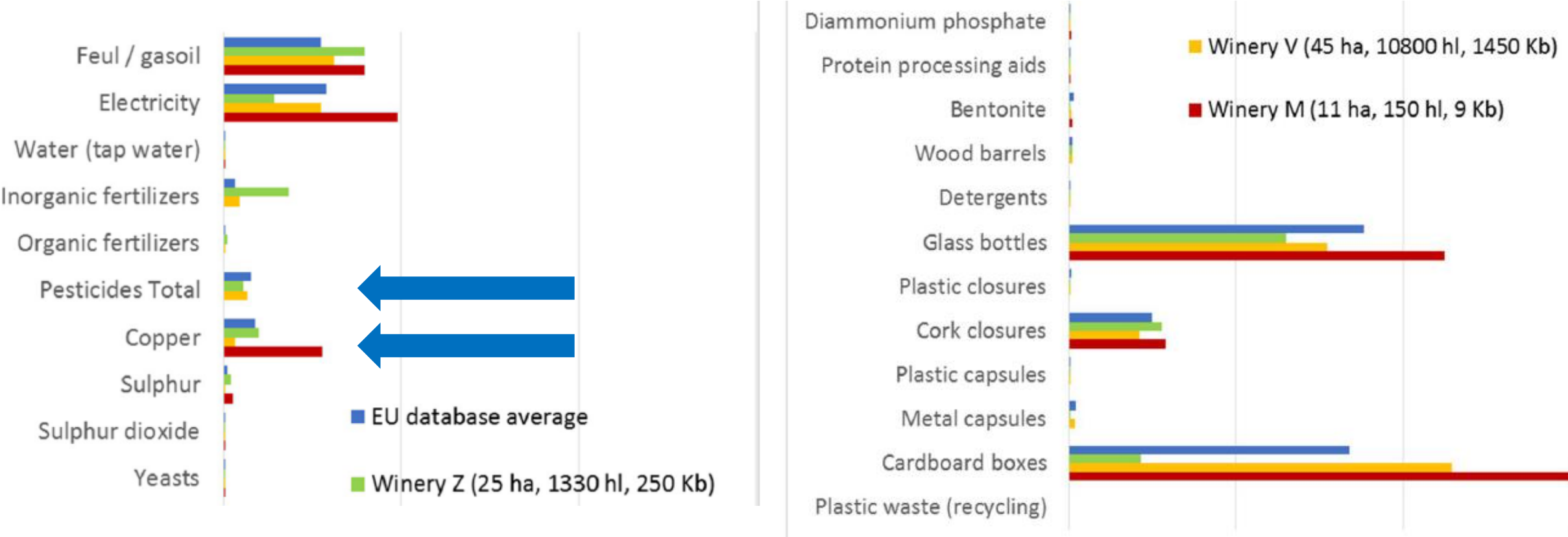
STIMA DEGLI IMPATTI AMBIENTALI



STIMA DEGLI IMPATTI AMBIENTALI



STIMA DEGLI IMPATTI AMBIENTALI



The use of plant protection products in the European Union

Data 1992-2003

2007 edition

Figure 1.2.1: Evolution of PPP use on arable and speciality crops in the EU-15 from 1994 to 2003 (in tonnes of AS)

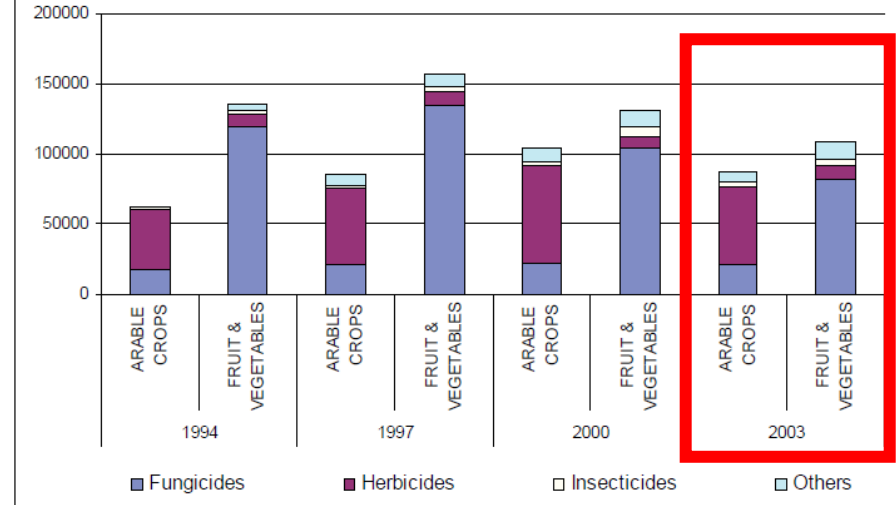
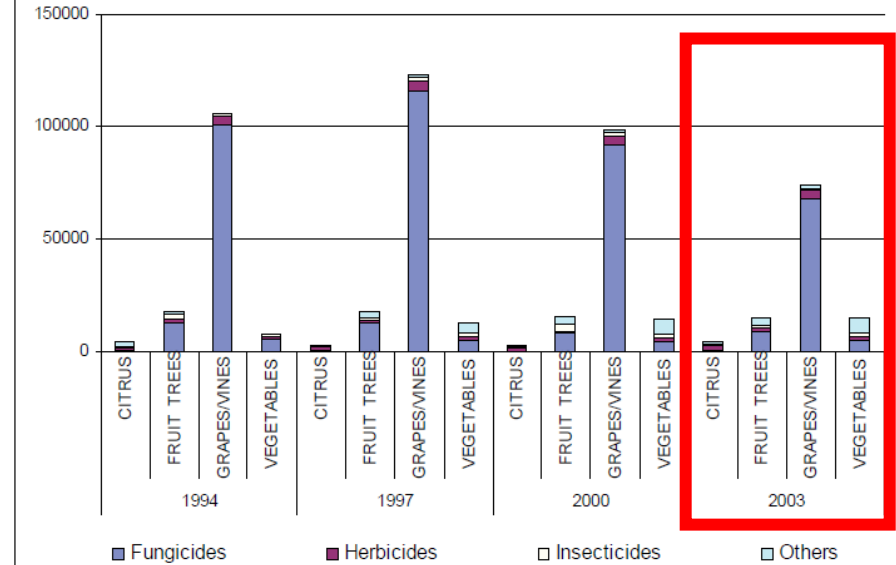


Figure 1.2.2: Evolution of PPP use on speciality crops in the EU-15 from 1994 to 2003 (in tonnes of AS)



Although only 5% of the European agricultural area is devoted to grapevine cultivation, approximately 70% of all fungicides applied in Europe are used to control fungal diseases in viticulture [6].

Eisenmann B, Wingerter C, Dressler M, Freund C, Kortekamp A, Bogs J. Fungicide-Saving Potential and Economic Advantages of Fungus-Resistant Grapevine Cultivars. *Plants (Basel)*. **2023** Aug 30;12(17):3120. doi: 10.3390/plants12173120. PMID: 37687364; PMCID: PMC10489737.

[6] Muthmann R., Nadin P. *The Use of Plant Protection Products in the European Union*. Office for Official Publications of the European Communities; Luxembourg: 2007.

*A large proportion of all PPP is applied on speciality crops like fruit and vegetables. This is due to the importance of vineyards, where fungicides (**mainly sulphur**) play a major role (Figure 1.2.2).*

MAP OF COPPER CONCENTRATIONS IN EUROPEAN UNION AGRICULTURAL TOP SOILS (UPPER 20 CM) PUBLISHED 03 DEC 2019 MODIFIED 20 SEPT 2024



European
Environment
Agency

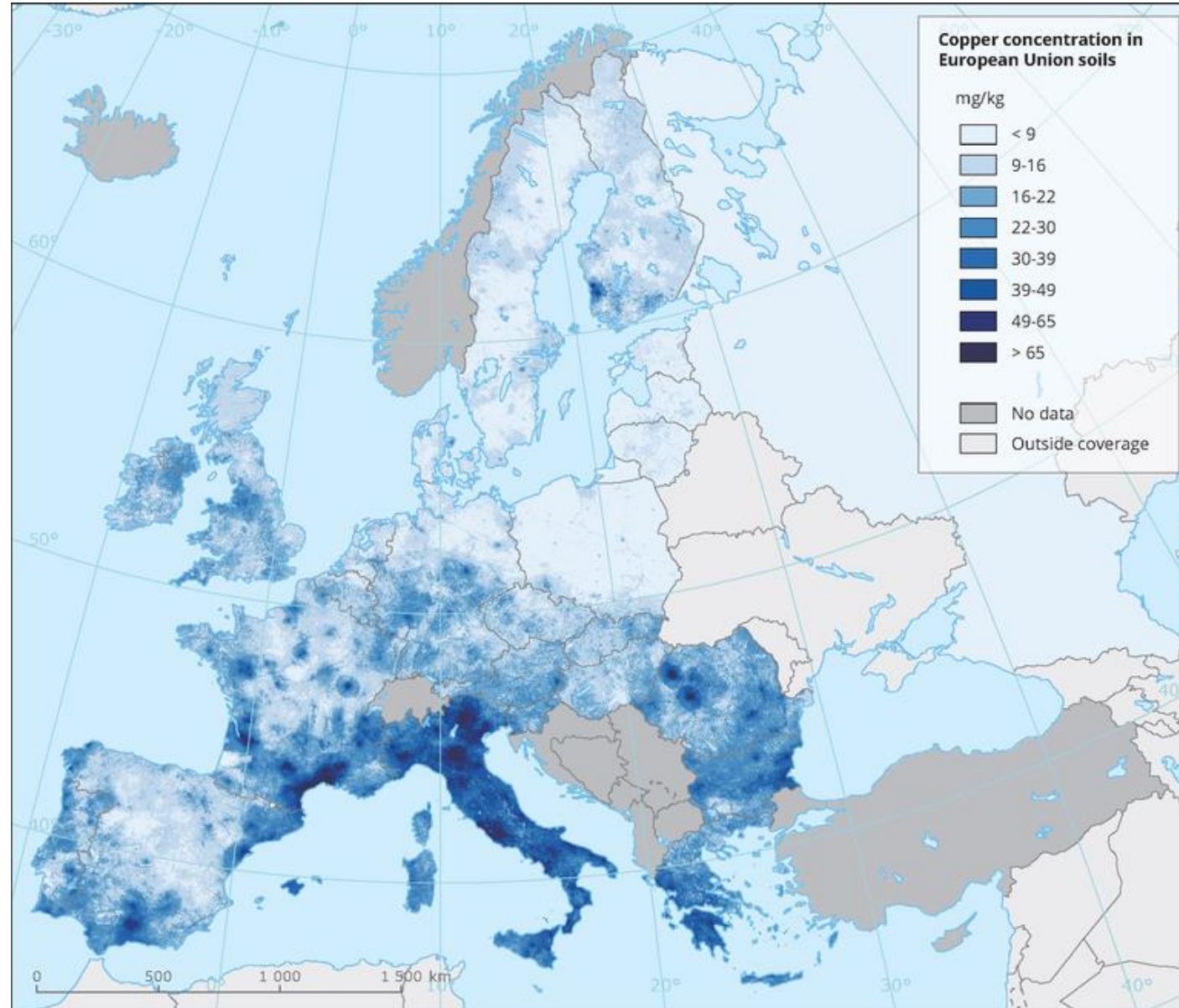
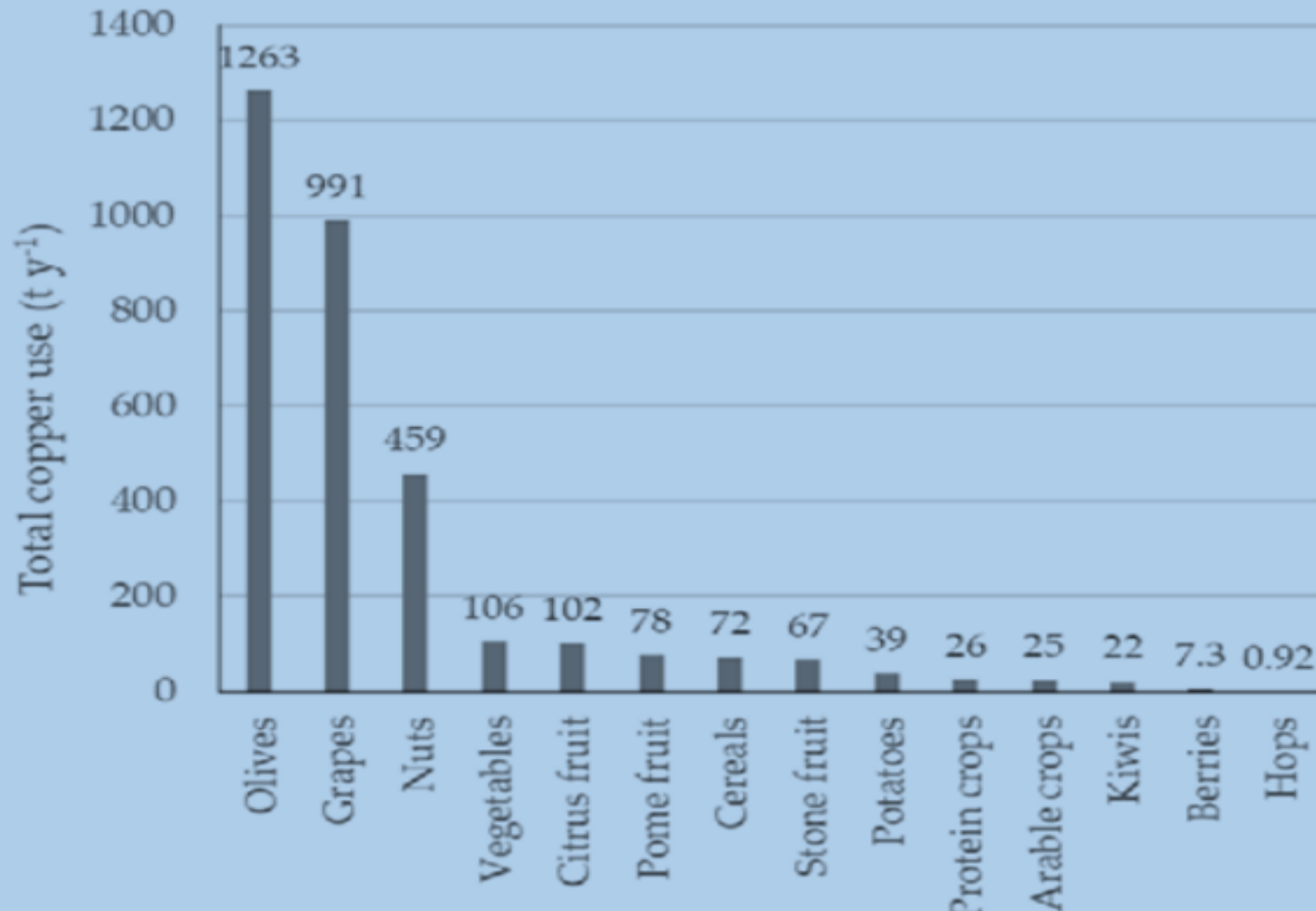
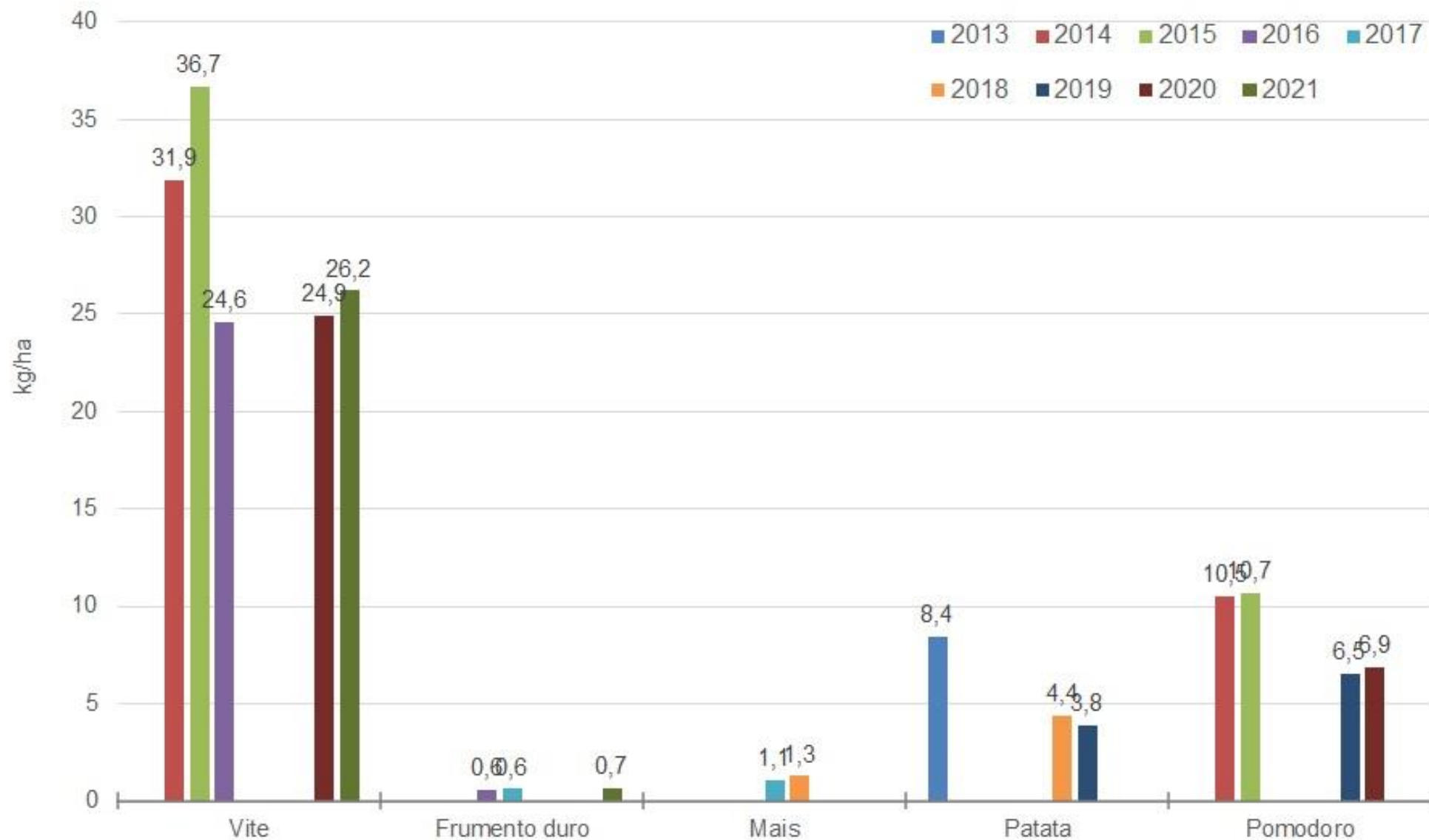


Figure 4. Total estimated copper consumption ($t\ y^{-1}$) in organic farming in the 12 surveyed European countries. Crops were aggregated into crop categories (for details, see Supplementary Materials).



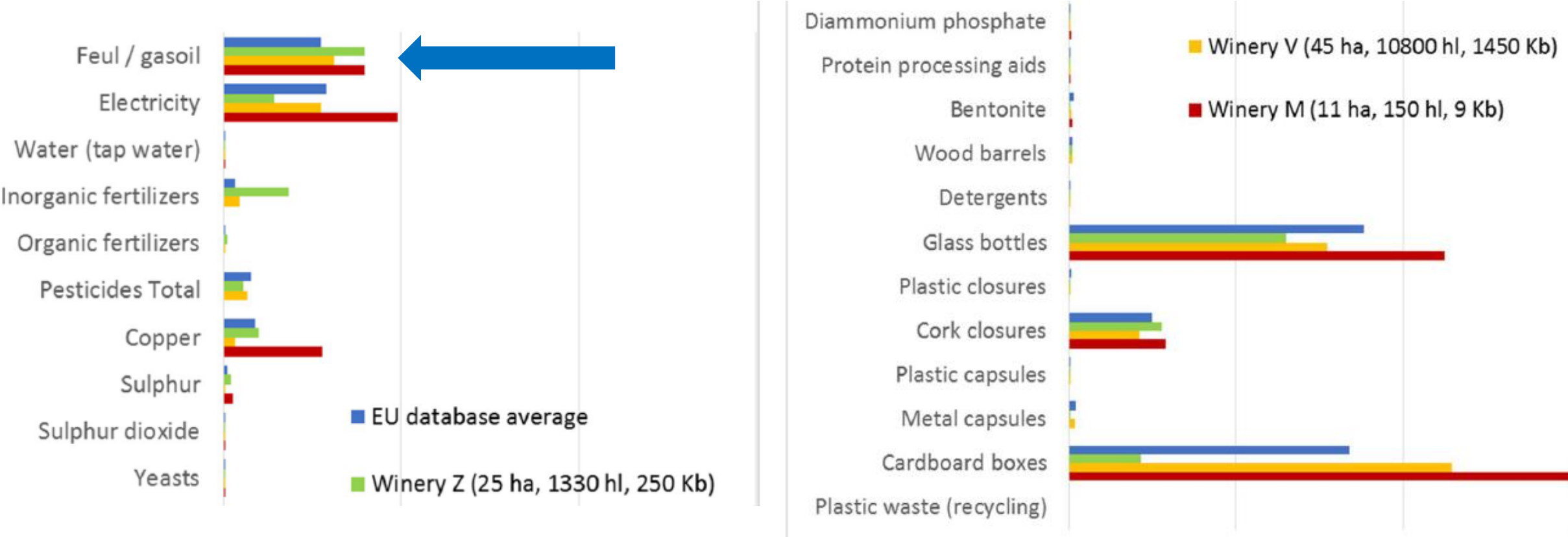


Data aggiornamento scheda: 2023-12-31

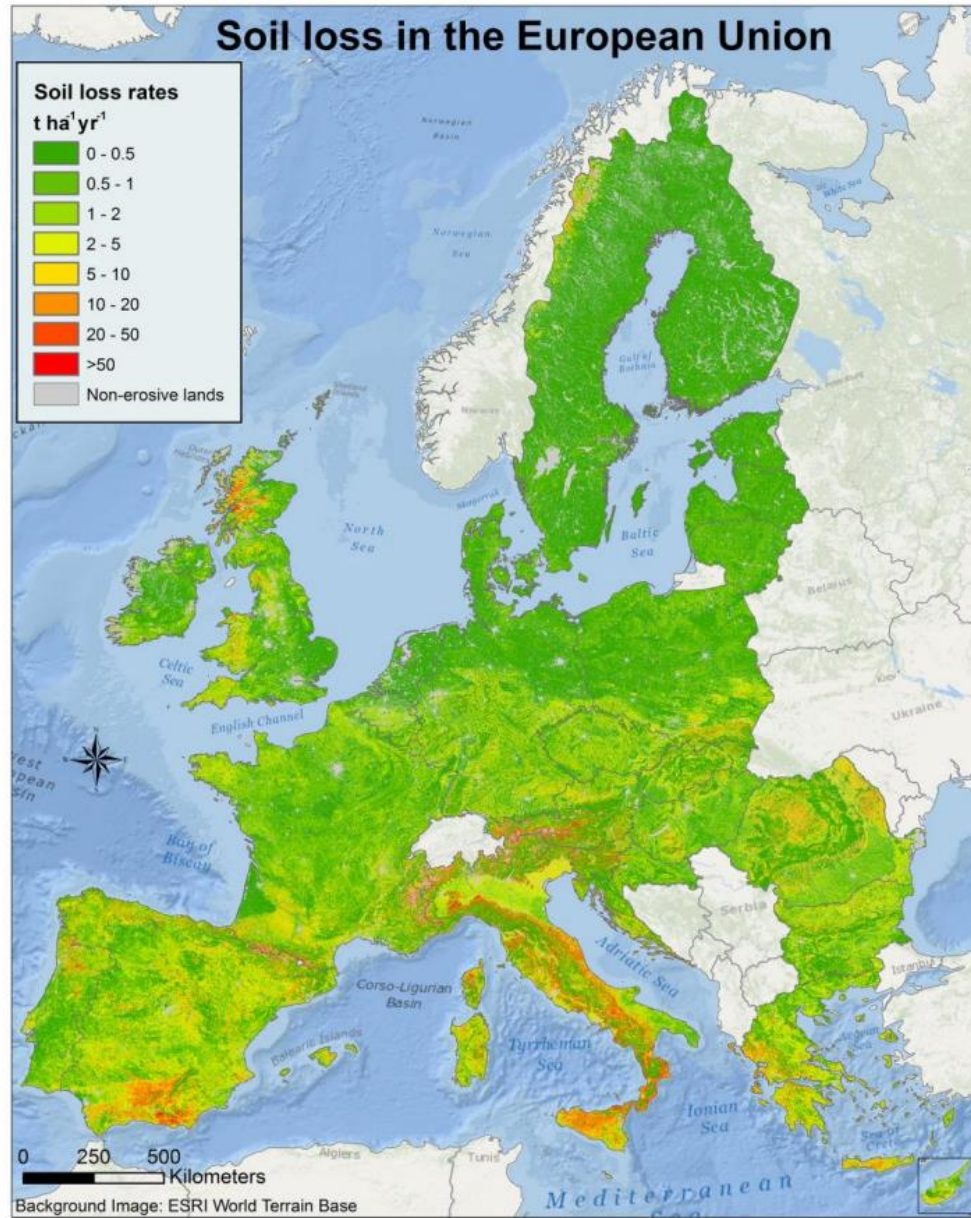
Autori: Valter BELLUCCI (ISPRA), Sonia ROSSI (ISTAT), Giovanni SERI (ISTAT)

<https://indicatoriambientali.isprambiente.it/it/agricoltura/utilizzo-di-prodotti-fitosanitari-su-singola-coltivazione>

STIMA DEGLI IMPATTI AMBIENTALI

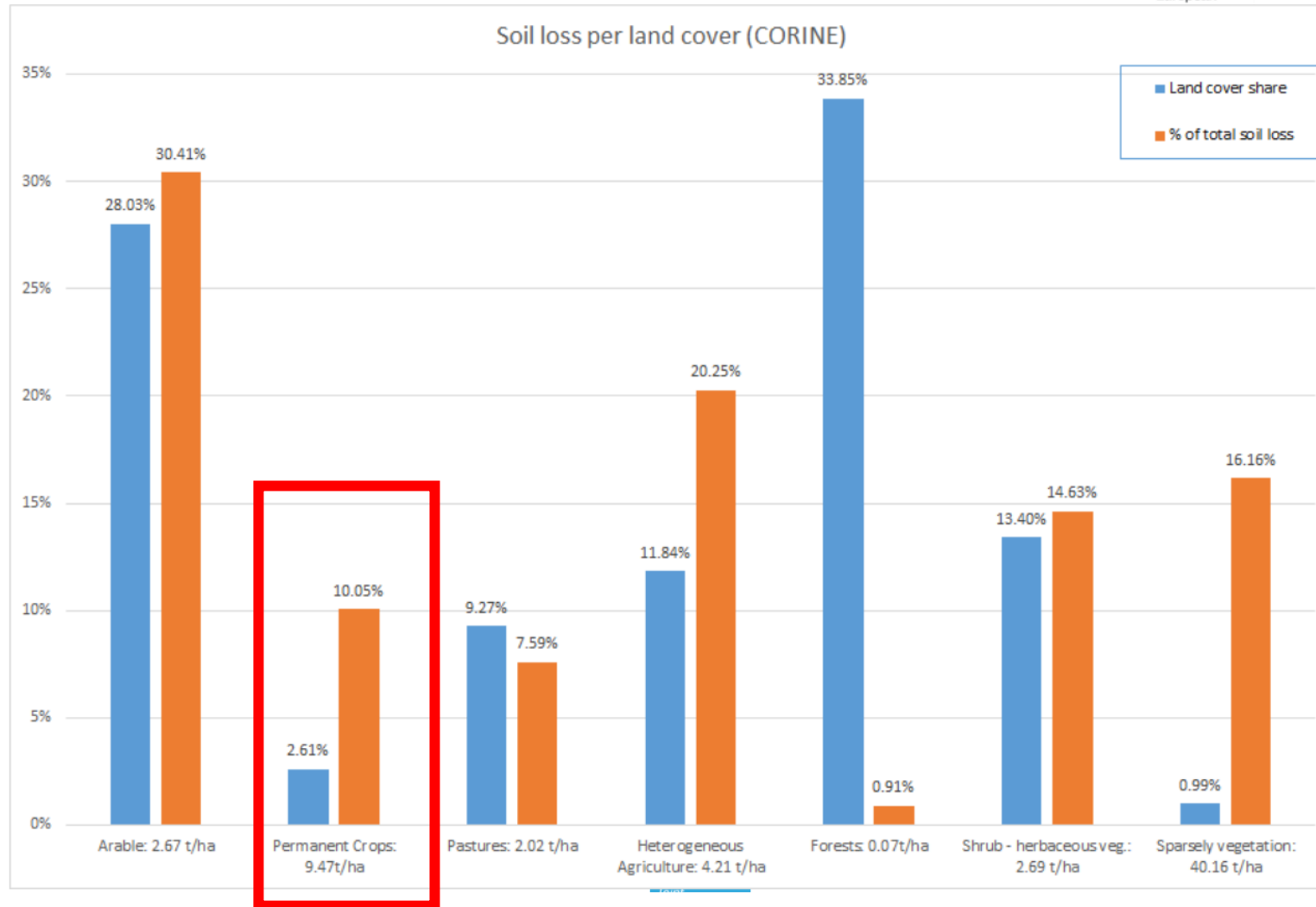


EU Soil loss Map with RUSLE2015

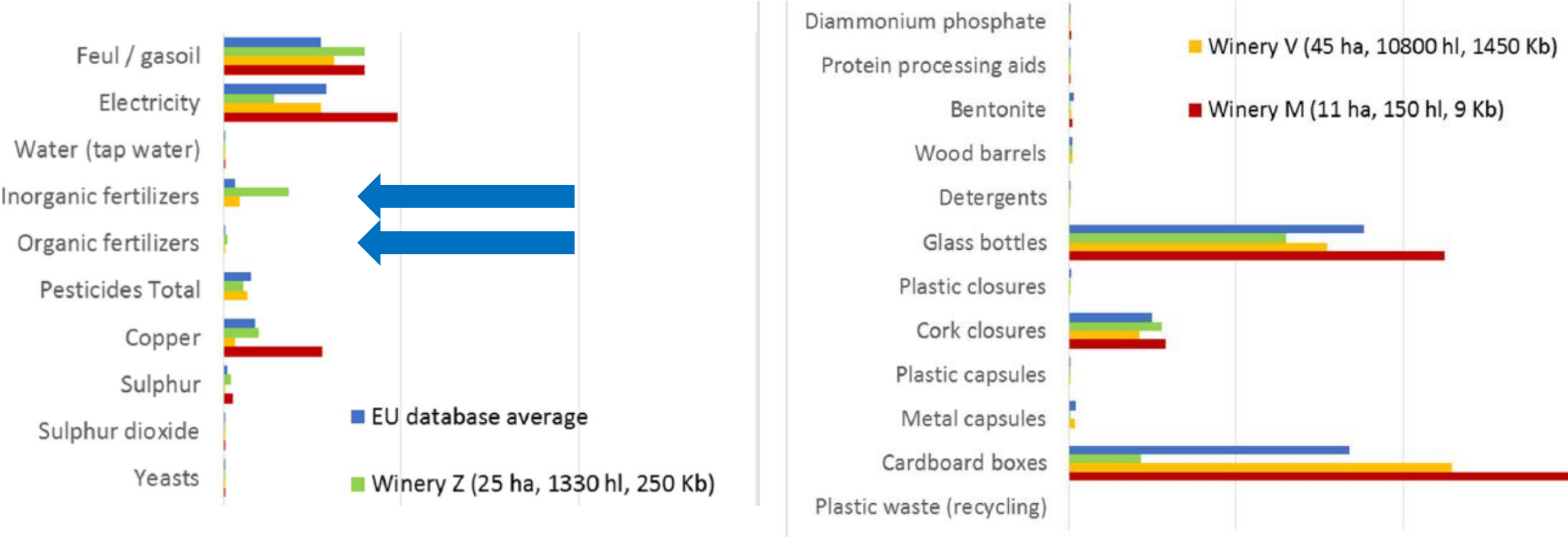


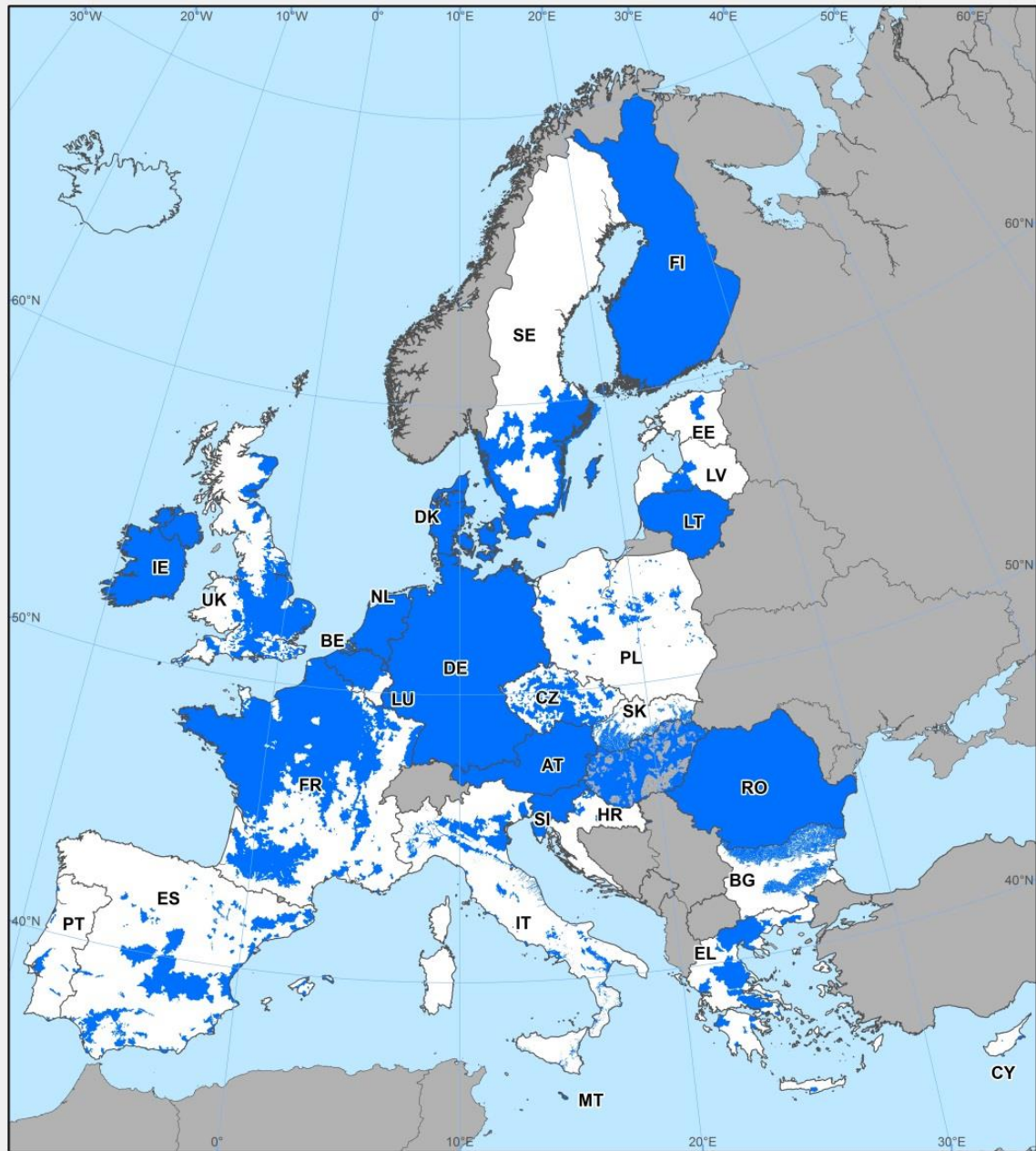
- Average EU-28: **2.46 $t\ ha^{-1}\ yr^{-1}$** (in the erosive prone areas: 91% of EU)
- Total Soil loss: **970 Mt annually**
- Spatial resolution: **100m**
- Reference year: **2010**
- **24%** of EU lands have rates $>2\ t/ha$
- **5.2%** of EU lands suffers from severe erosion ($>10\ t/ha$ – c.a 1mm of soil)

EU Soil loss Map with RUSLE2015



STIMA DEGLI IMPATTI AMBIENTALI





Nitrates Directive (91/676/EEC)

Map of Nitrate Vulnerable Zones
2015

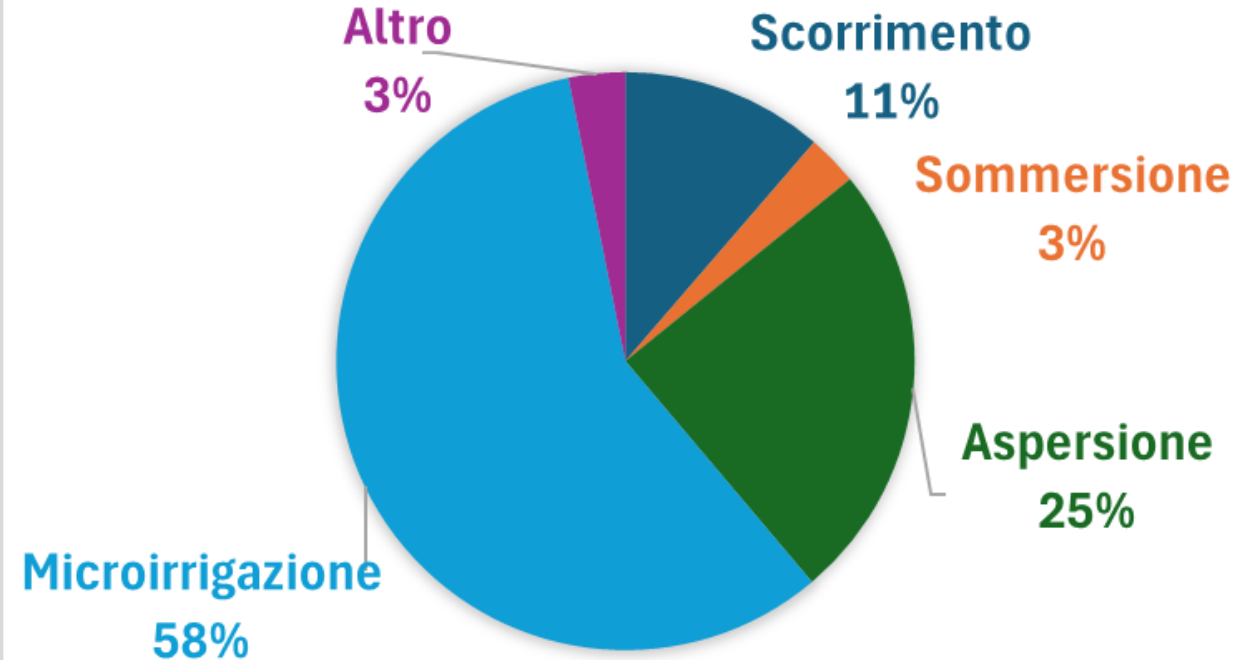
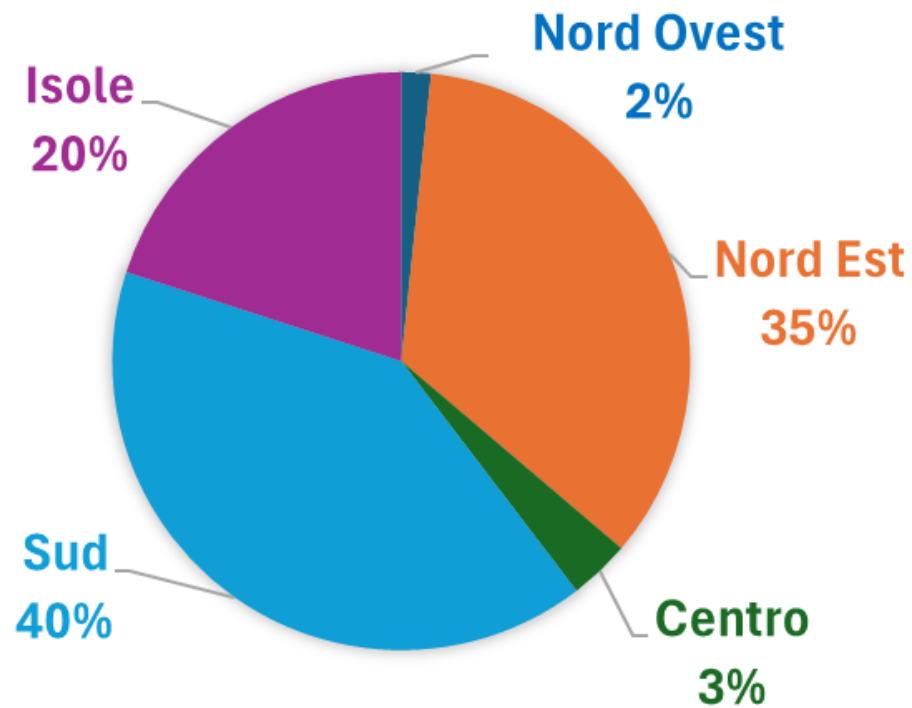
NVZ Status
 NVZs designation
 non-EU countries

0 200 400 800 Kilometers

Sources : DG ENV, Member States reports on Nitrates Directive Implementation
 Coordinate Reference System: ETRS89 Lambert Azimutal Equal Area
 Cartography : JRC, 03/2017
 © 2017 Copyright, JRC, European Commission



VIGNETI IRRIGUI ca. 200.000 ha (ca. 30% VITICOLTURA ITALIANA)



RIDURRE L'IMPATTO

RIDURRE GLI INTERVENTI IN CAMPO

RIDURRE I TRATTAMENTI ANTIPARASSITARI

RIDURRE L'USO DEL RAME (E DELLO ZOLFO)

INERBIMENTO CONTROLLATO (AGRICOLTURA CONSERVATIVA)

CONCIMAZIONE AZOTATA «MIRATA» (tempo e spazio)

IRRIGAZIONE A DEFICIT IDRICO CONTROLLATO

RIDURRE L'IMPATTO

RIDURRE GLI INTERVENTI IN CAMPO

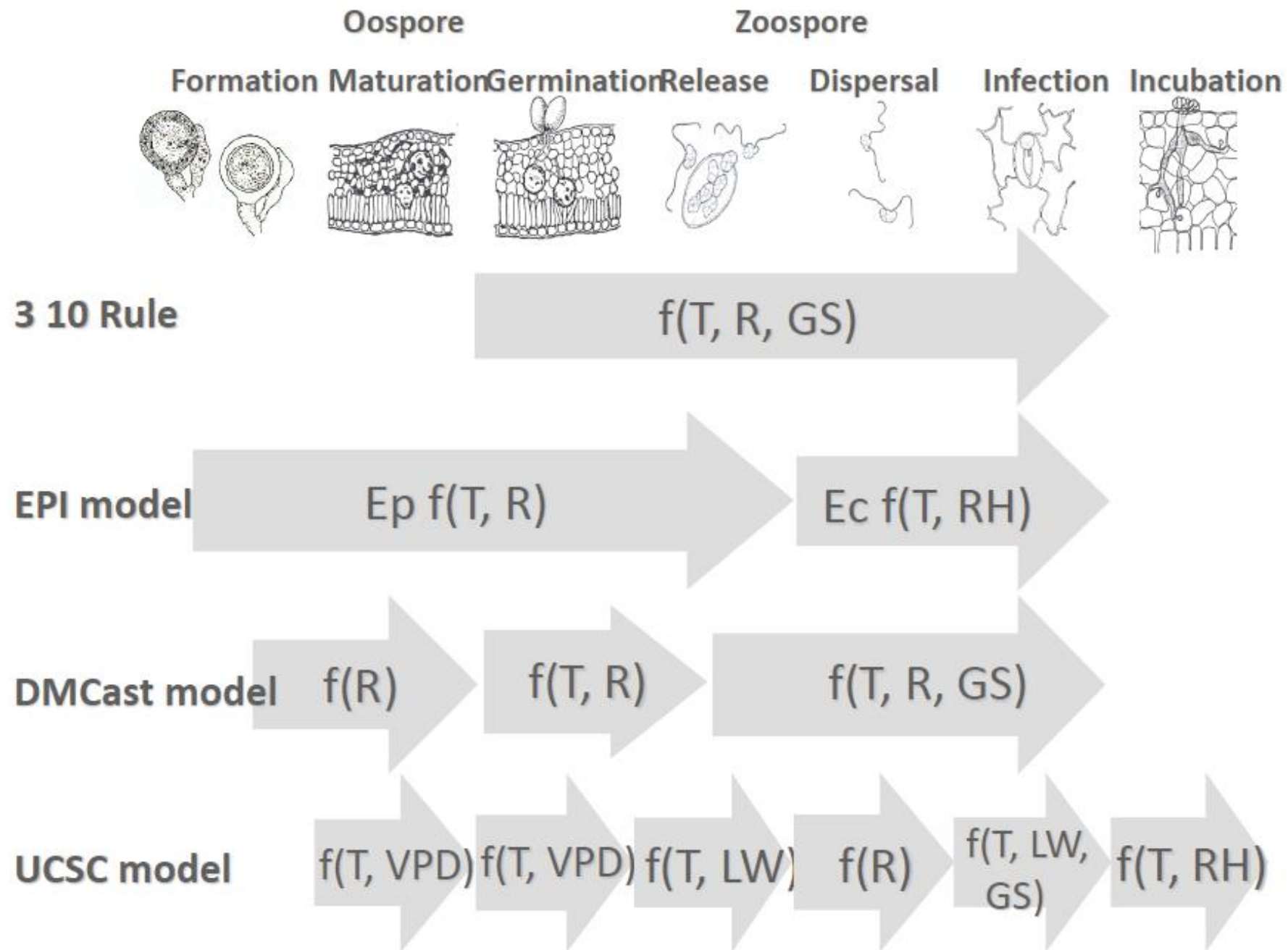
RIDURRE I TRATTAMENTI ANTIPARASSITARI

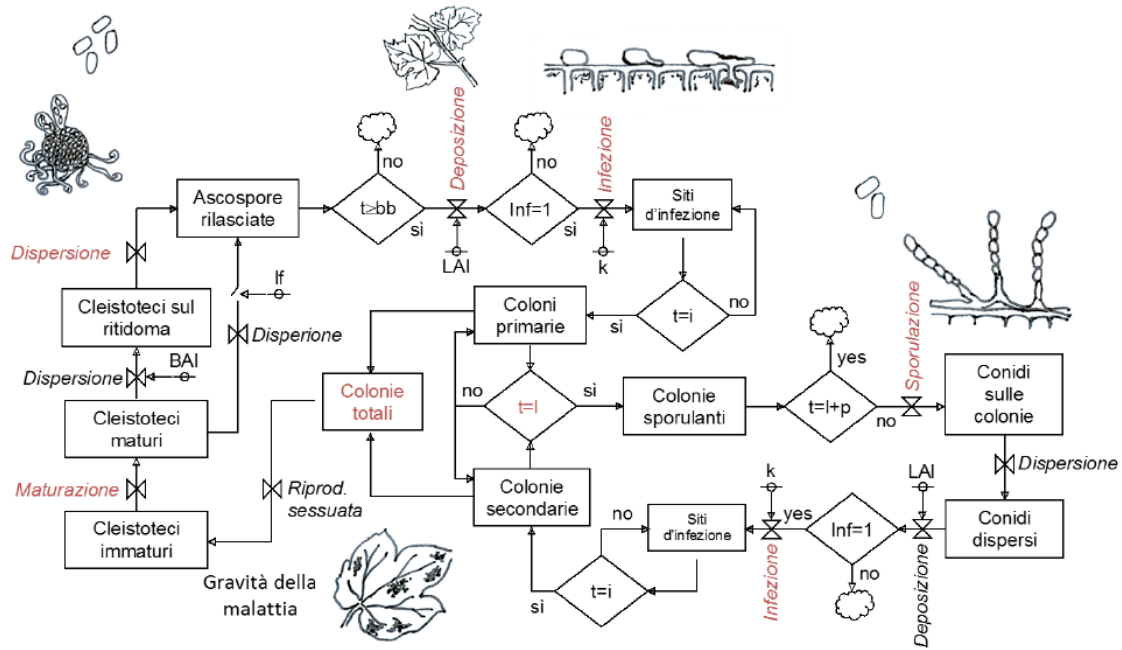
RIDURRE L'USO DEL RAME (E DELLO ZOLFO)

INERBIMENTO CONTROLLATO

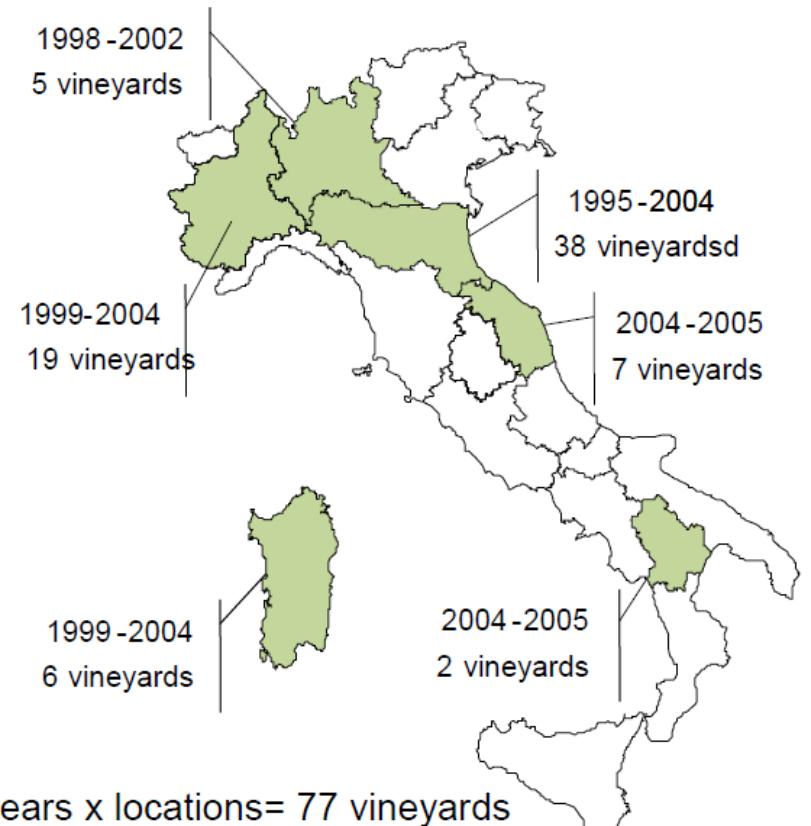
CONCIMAZIONE AZOTATA «MIRATA» (tempo e spazio)

IRRIGAZIONE A DEFICIT IDRICO CONTROLLATO





		simulated	
		No	Yes
observed	No	74%	10%
	Yes	0%	17%



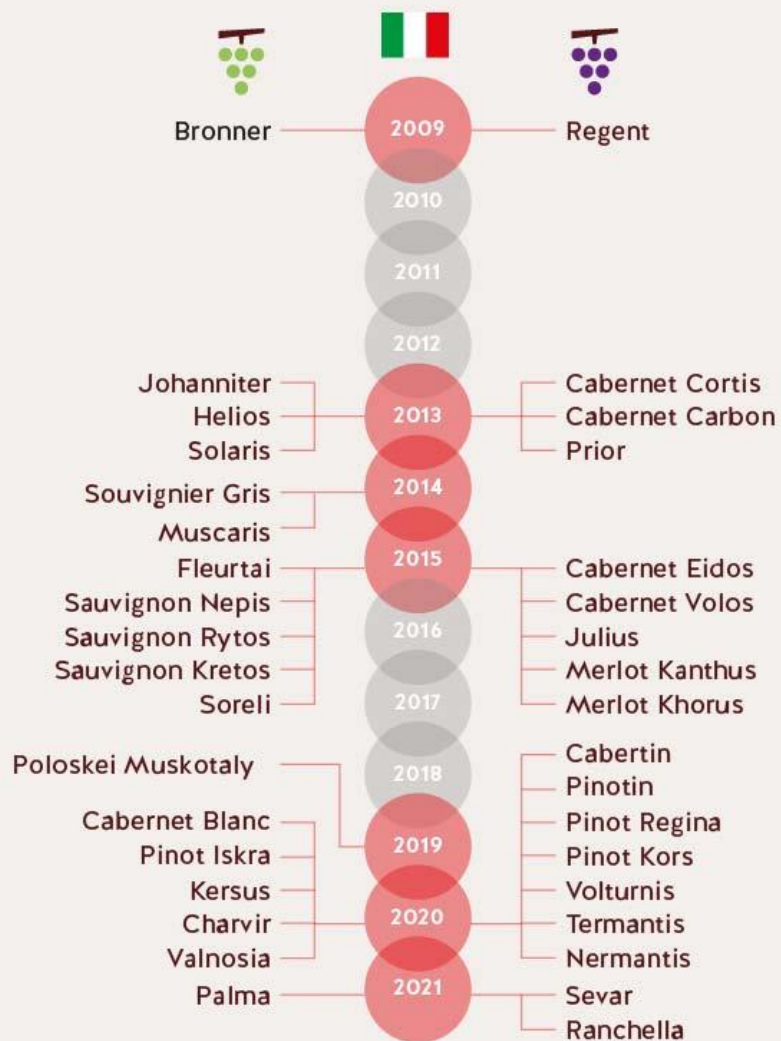






vinievitiresistenti.it

VARIETÀ DI VITI RESISTENTI ALLE MALATTIE (PIWI) ISCRITTE NEL REGISTRO NAZIONALE DELLE VARIETÀ DI VITE



CRISPR vines make their field debut in Italy

Testing of Chardonnay edited to resist downy mildew starts today near Verona, while the prosecco variety awaits its turn in the greenhouse



— *The president of the influential farmers' association Coldiretti, Ettore Prandini, formerly very hostile to GMOs, as he plants an edited vine with his own hands in the Verona experimental field on Sept.*

INERBIMENTO ?

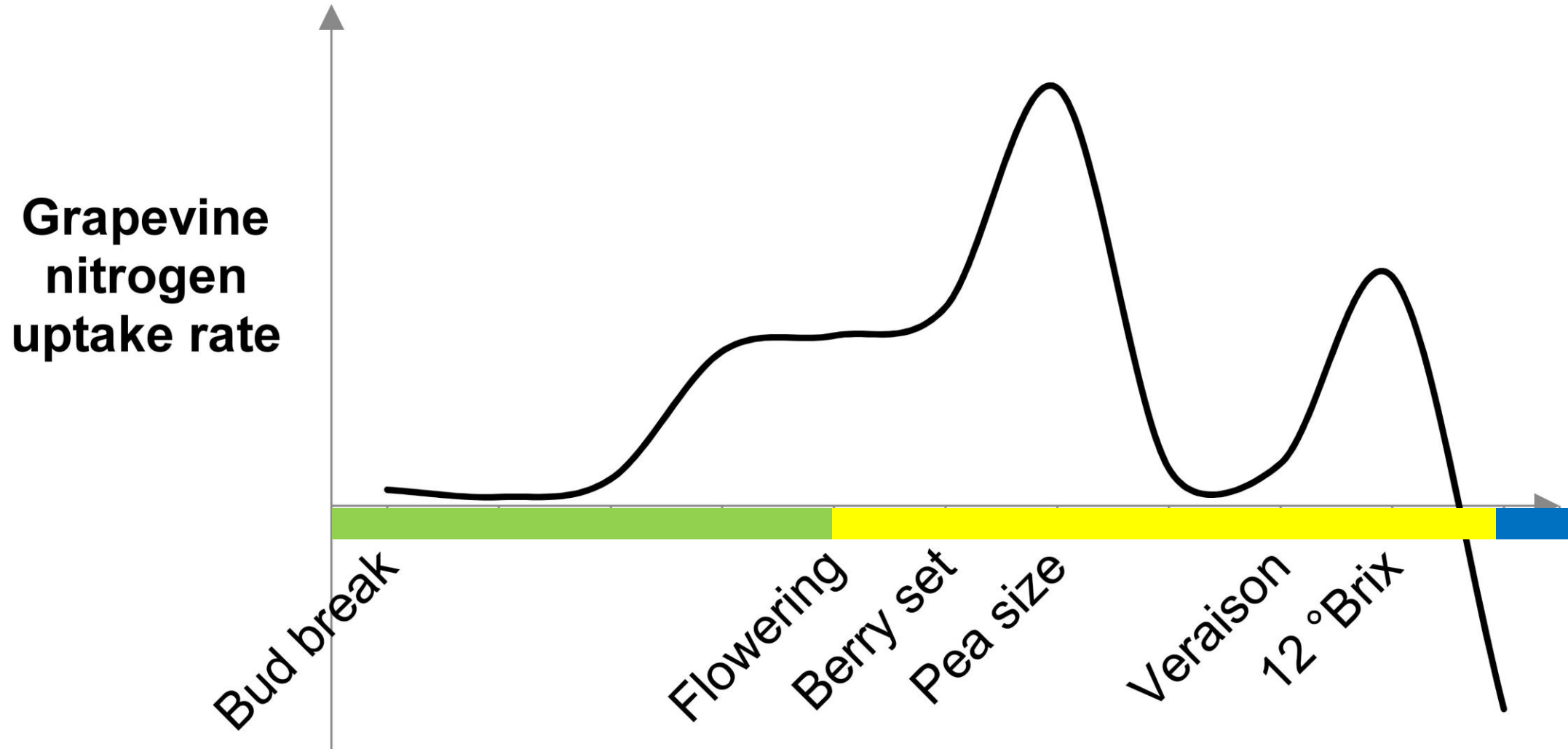


INERBIMENTO CONTROLLATO / DI PRECISIONE



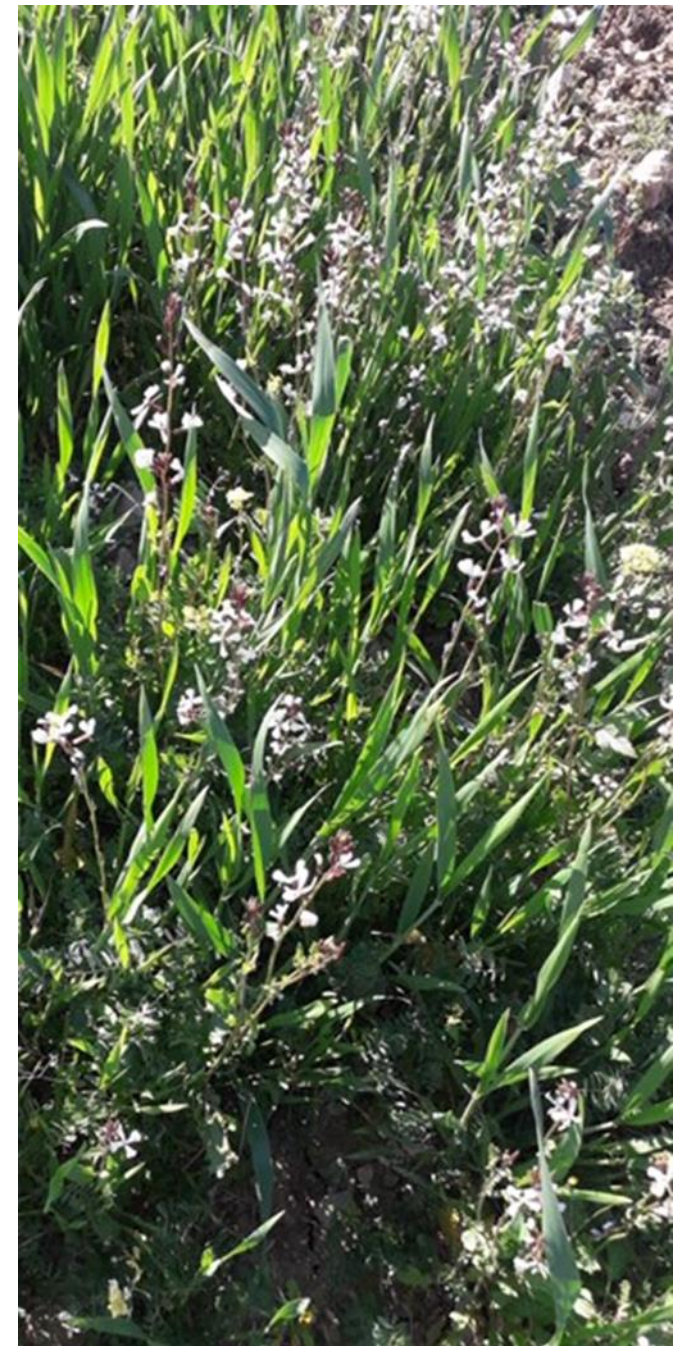
L'Informatore Agrario n. 32/2024 Gestione di precisione del suolo nei vigneti del Piceno di D. Bianchi, B. Cavenago, L. Brancadoro

Annual evolution of the N uptake rate of grapevine

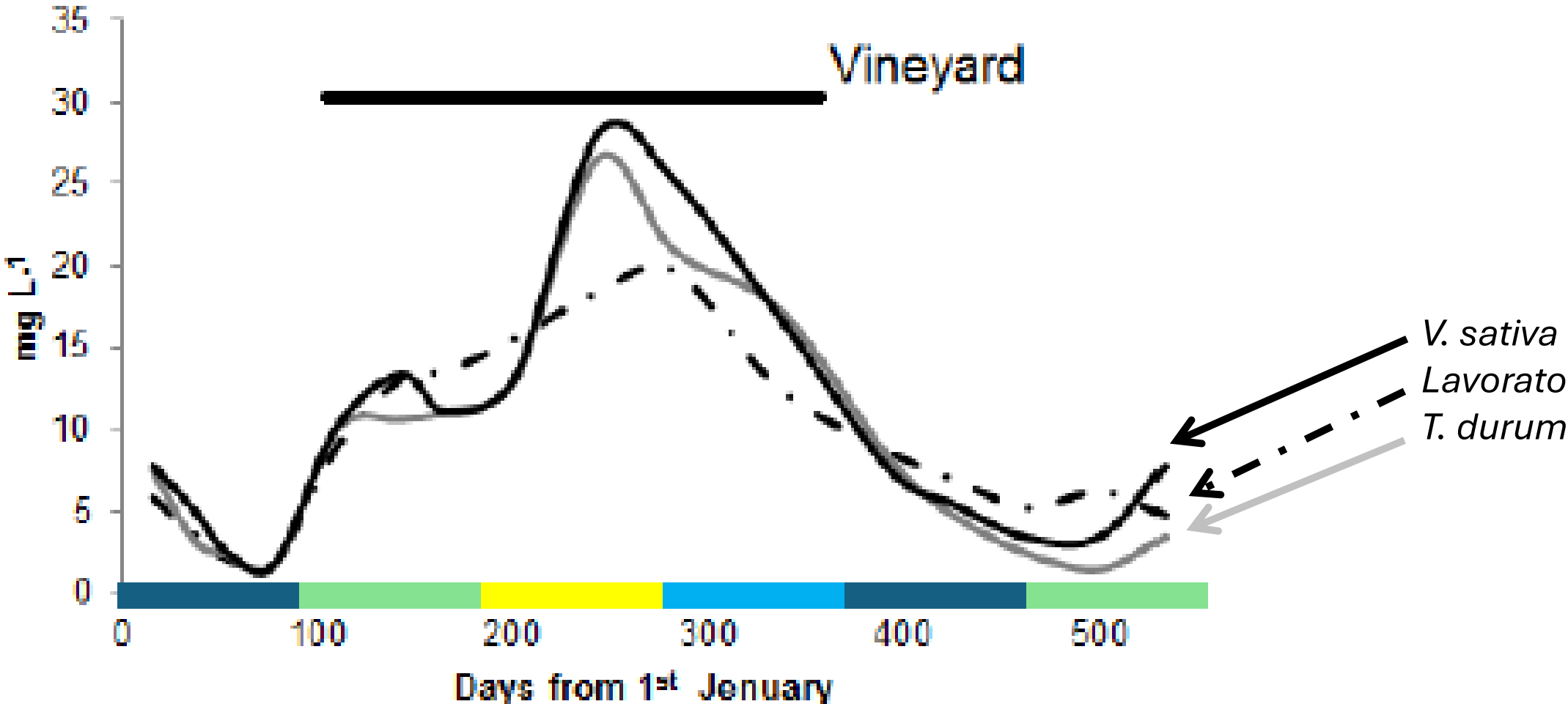


from Löhnertz, 1988)

SOVESCIO ?

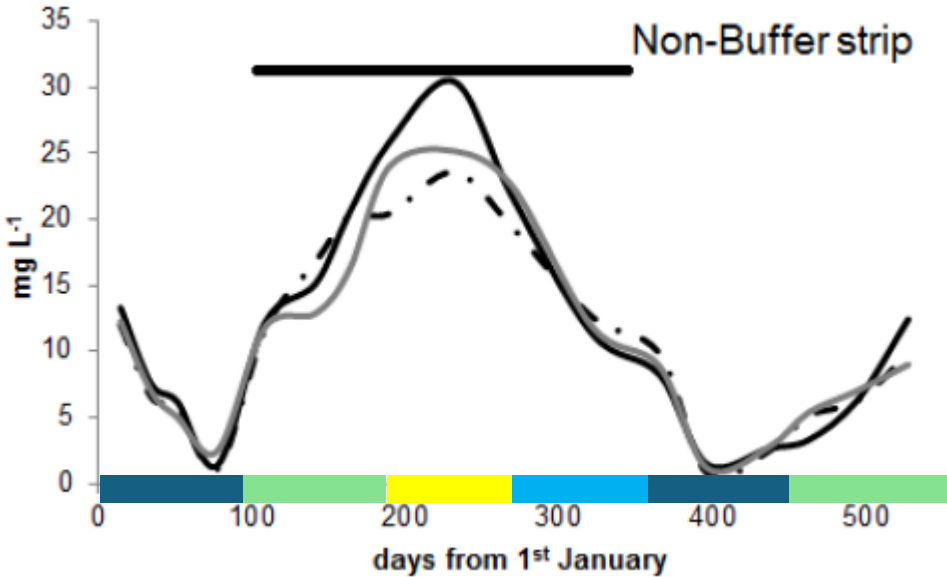
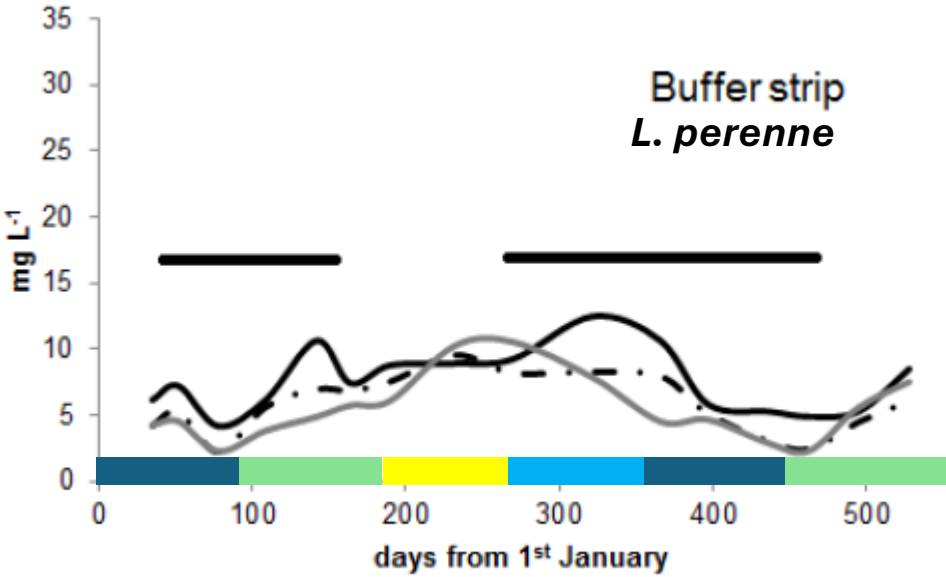


DINAMICHE NITRATO AMBIENTE MEDITERRANEO

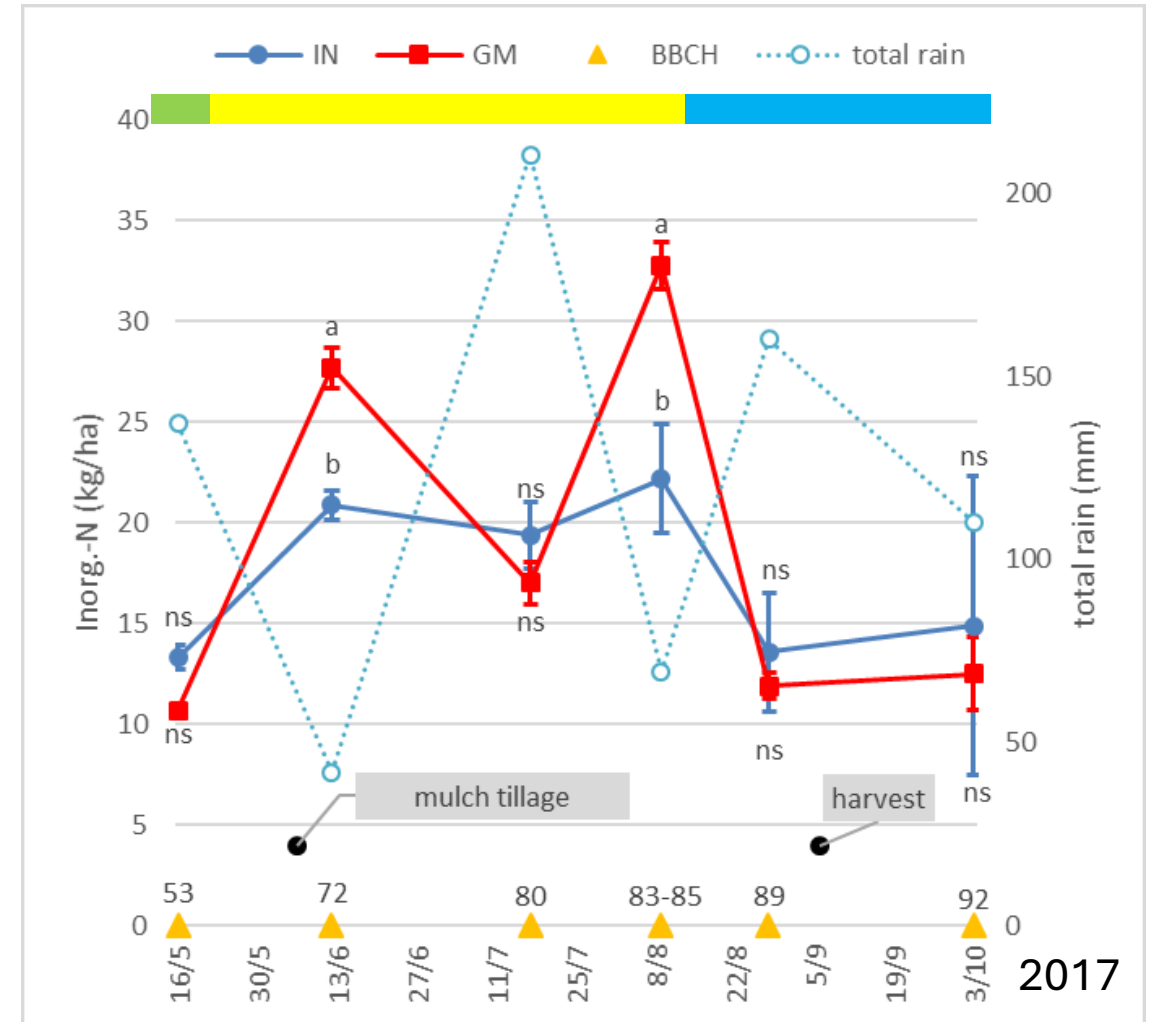
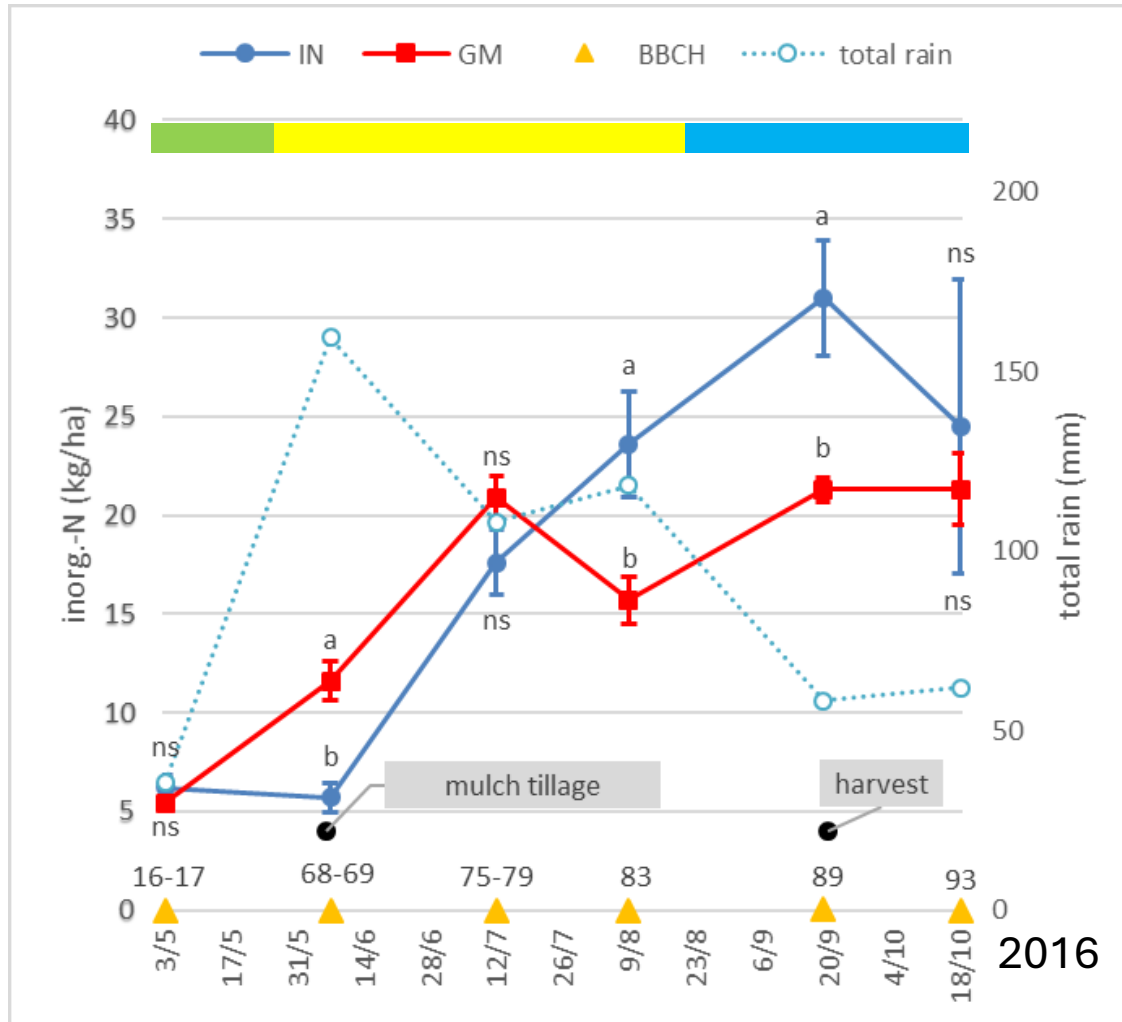


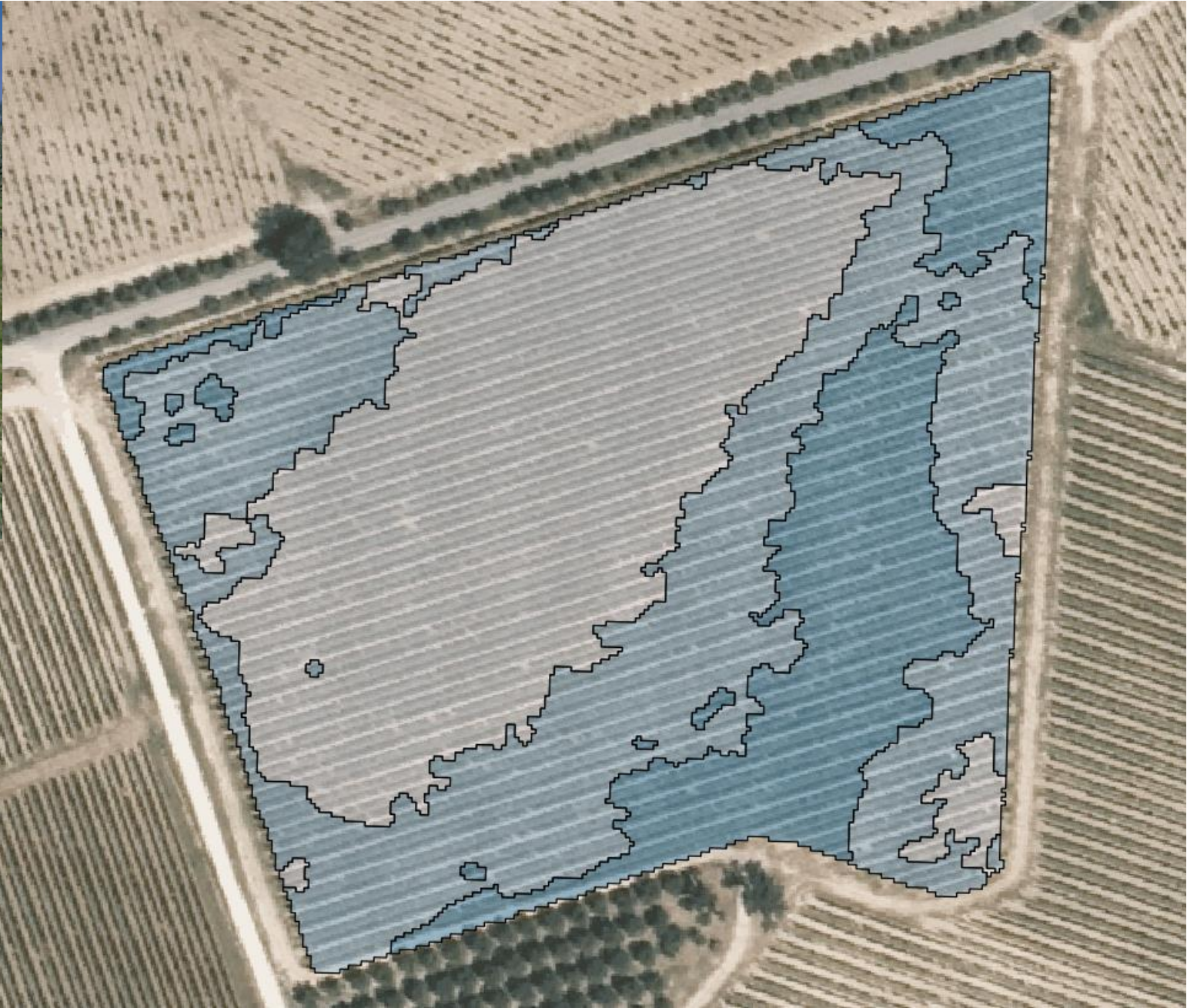
A. Novara et al. 2013 Soil nitrate control in a Mediterranean vineyard, SED, 5, 257–279

DINAMICHE NITRATO AMBIENTE MEDITERRANEO



DINAMICHE NITRATO AMBIENTE CONTINENTALE UMIDO





19.4 kg/ha (N)
25.1 kg/ha (N)
49.7 kg/ha (N)



(a)



(b)

Figure 3. Working configuration during the fertilizer application: (a) The Greenseeker sensor system; (b) The fertilizer spreader.

Sozzi et al. 2023 Variable-rate fertiliser application to manage spatial variability in a hilly vineyard of Prosecco PDO. DOI: 10.3920/978-90-8686-947-3_26. Conference: 14th European Conference on Precision Agriculture



Chains shredder

ROTARY BRUSH



Mechanical weeding



Seeder

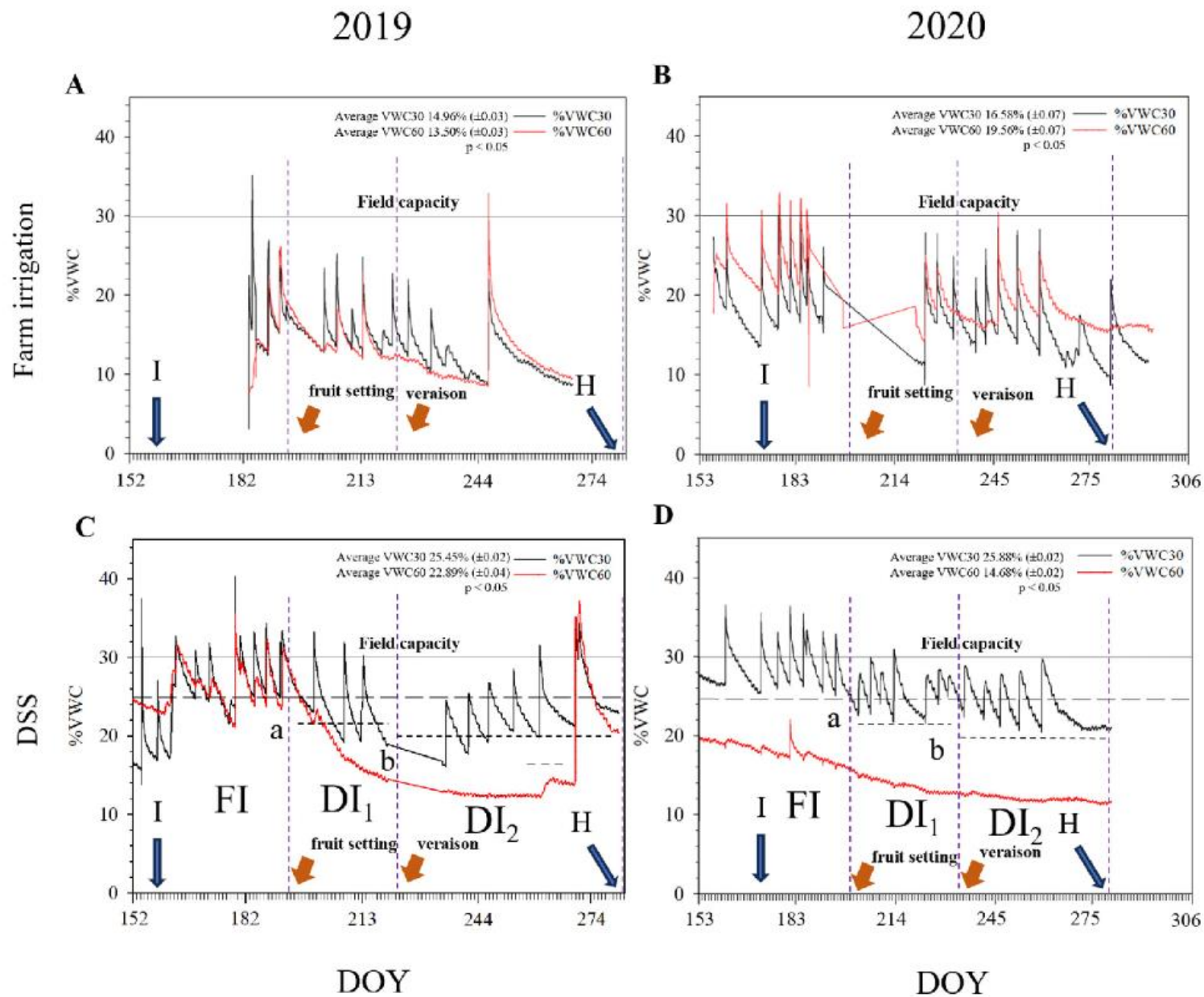


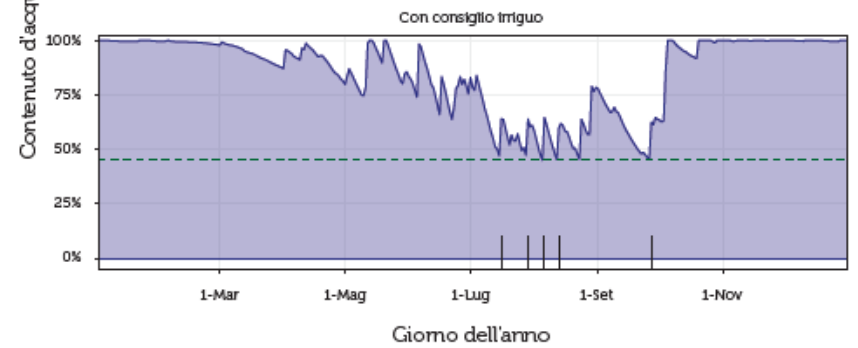
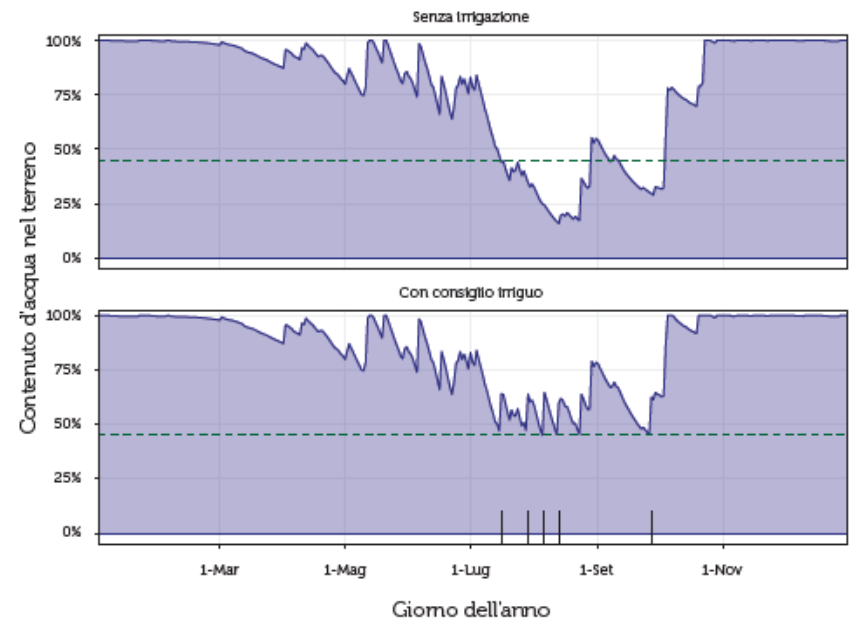
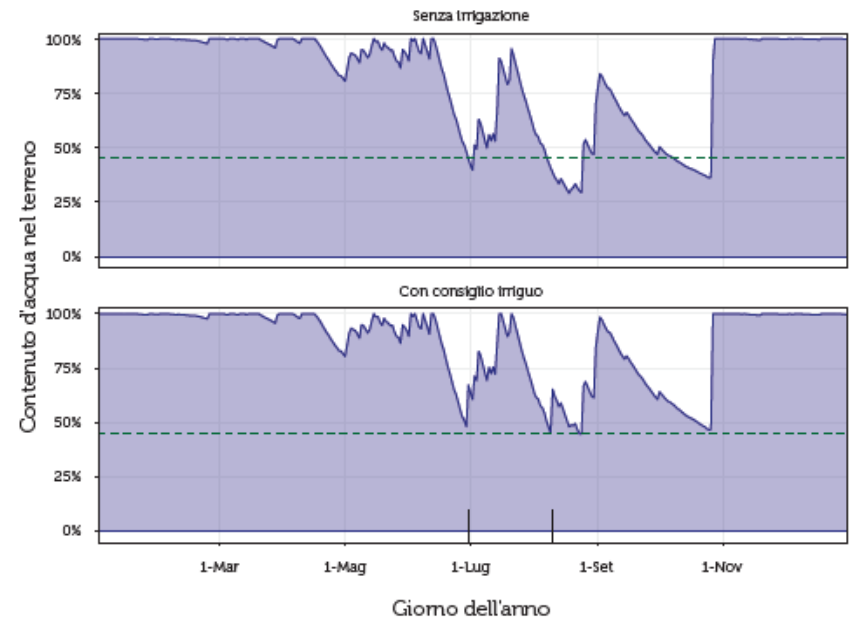
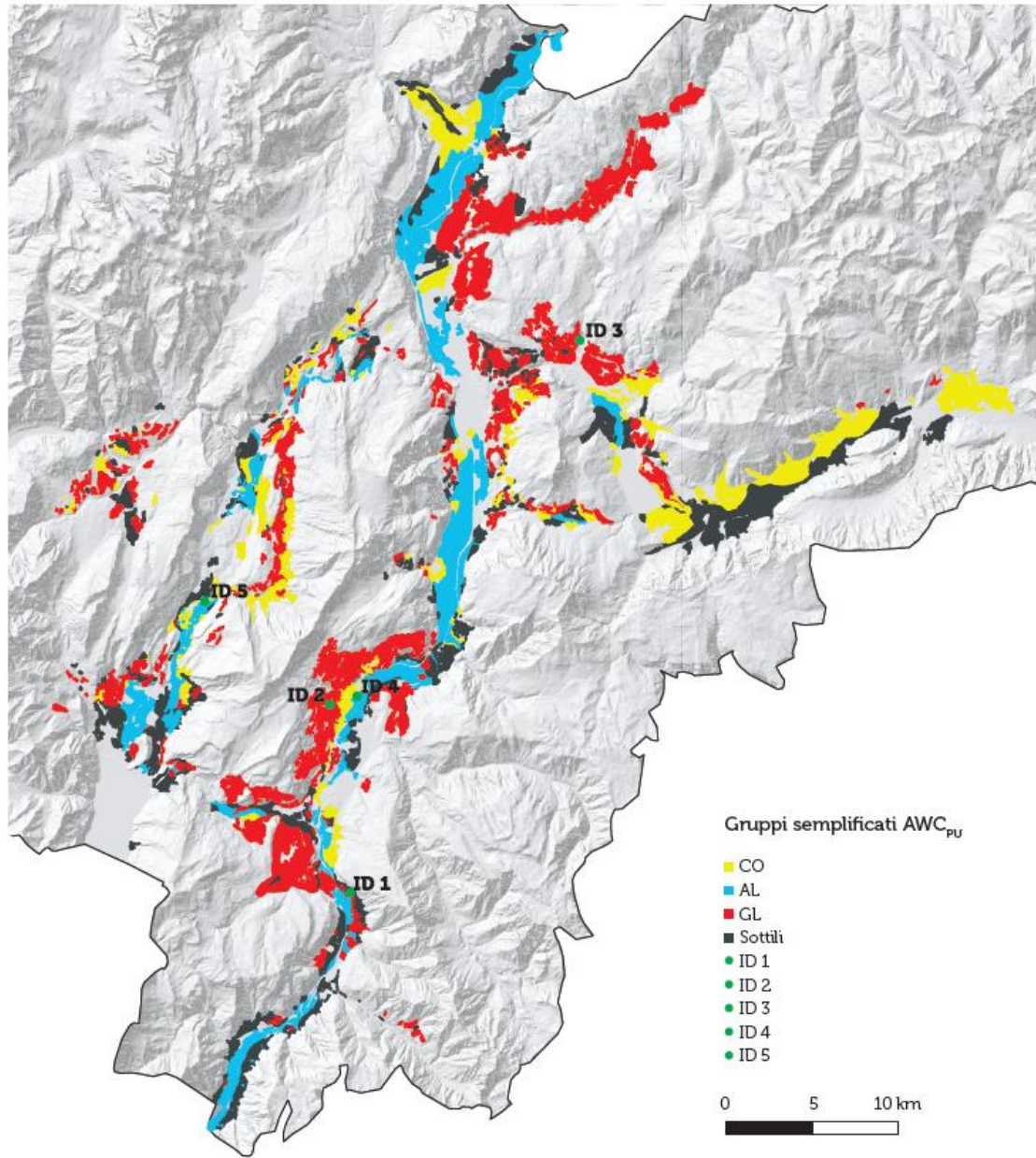
Roller for mulching

Soil Aerator



Fonte: M. Bogoni, 2024





I SUOLI DEI VIGNETI TRENTINI

DALLA ZONAZIONE
AGLI STRUMENTI DI GESTIONE

A cura di
GIACOMO SARTORI
DUTLIO PORRO



Consorzio di Tutela



PROSECCO SUPERIORE
DAL 1876

Rapporto di Sostenibilità
del Conegliano Valdobbiadene
Prosecco DOCG

