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Review

The Conservation Varieties Regime: Its Past, Present and Future in the Protection and Commercialisation of Vegetable Landraces in Europe

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Abstract: In 1998, the European Union aimed to make the official Common European Catalogue of Plant Varieties more flexible and to mitigate the decline of agricultural biodiversity in European rural areas by introducing the Conservation Varieties Regime (CVR): a set of rules pertaining to local and/or traditional varieties cultivated in specific regions that are at risk of genetic erosion. This initiative was intended to permit the sale of those varieties that do not fully meet the distinctness, uniformity and stability (DUS) criteria required for the registration of standard varieties in the Common European Catalogue. In this review, we examine the impact of establishing the CVR 25 years after its first definition. As of the date of data collection, 191 conservation varieties were registered throughout Europe, representing only 0.88% of the total number of varieties included in the Common Catalogue. The most important countries are Spain, Italy and Croatia, which have, respectively, 57, 43 and 26 conservation varieties. The case study from Italy highlights that the CVR is poorly structured and is characterised by the initiatives of individual entities that take it upon themselves to protect and/or promote specific vegetable varieties. In this review, we discuss such data in relation to the protection and commercialisation of vegetable landraces in Europe. Overall, the CVR has failed to promote and enforce a dedicated market for all those varieties excluded from registration in the Common Catalogue due to DUS requirements.

Keywords: seed legislation; Common European Catalogue; conservation varieties; landraces; vegetable species

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1. Introduction

For centuries, the breeding work that farmers undertook resulted in numerous, valuable crops and landraces that were useful for agriculture and human nutrition. Such work favoured the development of an increasingly rich system of agricultural biodiversity, locally adapted and closely linked to socio-environmental conditions [1]. Since the second half of the last century, this system has been increasingly challenged by intensive farming practices and the use of varieties—so-called 'modern' varieties, e.g., F1 hybrids—specifically selected for their high productivity [2–4]. On the one hand, this has caused the abandonment and—in many cases—the loss of numerous varieties that had resulted from farmers' centuries-old selection work. On the other hand, it has resulted in an informal division of the agricultural world into two models: (i) the peasant system, which is mainly based on the adaptation and selection of varieties that evolve and change over time and in which genetic diversity is still managed by farmers and (ii) the industrialised system, in which farmers are clients of seed companies, which create new stable and uniform varieties that require the use of chemical inputs, irrigation and mechanisation [5–8].

The need to counter the erosion of Plant Genetic Resources for Food and Agriculture (PGRFA), protect farmers' rights and promote farmers' breeding efforts since farmers'

varieties are a useful resource for breeding in the formal seed system as well has led, over the years, to the creation of numerous international conventions and treaties. These include, for example, the Convention on Biological Biodiversity (CBD) and the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA). Such agreements define the rules for Access to Biodiversity and Sharing the Benefits (ABS) arising from their use, recognising an important role for farmers in the conservation, sustainable use and improvement of genetic resources [9–11].

In this international landscape, one of the most influential tools in terms of diversity management and conservation is seed-marketing regulations. In fact, such regulations—i.e., the set of laws and acts that regulate the commercial production and marketing of seeds and/or, in general, propagation materials—have a major impact on agricultural biodiversity since they impact breeding policies and programmes and, therefore, affect what farmers will cultivate or abandon [8,11,12]. In Europe, the two pillars of this legislation are registration and certification. This means that a variety must be registered in a catalogue for its seeds to be marketed and that the seeds should be certified by public authorities. The main criteria for registration are distinctness, uniformity and stability (DUS)—the three fundamental characteristics without which it is impossible to register varieties in the Common European Catalogue (CC) [13]. The adoption of these requirements has led to two different seed systems: a formal one promoted by current seed legislation and based on modern varieties resulting from specific breeding programmes conducted by public or private breeders and an informal one characterised by diversified varieties that are formally called "farmers' varieties". This term includes not only landraces but also all those new varieties resulting from farmers' breeding activities or from participatory programmes [7,14–16]. Indeed, the adoption of DUS has proven to be a real barrier to the marketing of many landraces because they are by definition "variable populations, however well identifiable, characterised by a specific adaptation to the environmental and cultivation conditions of a specific territory" [8,17–19].

To allow the marketing of these excluded varieties, the European Union introduced two exceptions to the existing seed regulations with Directive 95/98/EC: (i) varieties with no intrinsic value for commercial crop production, only for vegetables (modified as "Varieties Developed for growing under Particular Conditions" in successive Directives—VDPC) and (ii) conservation varieties, which include both agricultural species and vegetables. After ten years of negotiations, EU Directive 95/98/EC was implemented for the latter category via a dedicated directive on agricultural species (2008/62/EC), one on vegetable species (2009/145/EC), and one on mixture and fodder species (2010/60/EU). The complete definitions of conservation varieties and VDPC are presented in Table A1 [20].

For the CVR, three key elements can be identified in the definition that distinguish the varieties covered by this exception: (i) agricultural landraces and varieties with some degree of diversity, (ii) region of origin and (iii) risk of genetic erosion [17,21].

The concept of region of origin was implemented differently in different Member States. For some countries, such as Austria, the reference region may include the entire nation; for others, such as Belgium, it is not unusual to find very restricted areas of origin. In some particular cases, such as for the Italian conservation variety wheat 'Frassineto' and 'Sieve' (*Triticum aestivum* L. subsp. *aestivum*), it was also observed that the area of origin was modified after the registration of those varieties in the CVR [22]. Another critical point that emerged during implementation was the definition of the risk of genetic erosion [23], which was subject to different readings depending on the authority responsible for the evaluation of the application [21]. In Italy, for example, the Italian National Plan on Biodiversity of Agricultural Interest dedicated a chapter to the different interpretations at a regional level [17,18].

In addition to the critical issues just listed, some authors have pointed out that the definition of conservation varieties and the requirements for their registration are quite "static" and do not take into account the evolution of these resources in farmers' fields to adapt to specific environments [22,24]. Furthermore, this definition cannot include "new

population varieties" or "new farmers' varieties" bred by farmers or farming communities which, instead, could be useful to market as seeds [25].

Therefore, although the CVR allowed the marketing of some varieties beyond the commercial market, it has also presented critical issues and limitations, which also include the number of registered varieties, especially in the case of vegetable species [26–28].

In this regard, the Proposal for Regulation 2023/0227 (COD) of the production and marketing of Plant Reproductive Material (PRM) in the European Union, which was promulgated in July 2023 by the European Commission and updated by subsequent Legislative Resolution of the European Parliament, which was adopted on 24 April 2024, is significant. Its aim is to rethink the European Union's PRM legislation in light of the European Green Deal policies and related strategies: the Farm to Fork Strategy, the Biodiversity Strategy, and the EU Strategy on adaptation to climate change [27,29]. The Proposal identified CVR as "important for the conservation and sustainable use of plant genetic resources" [27]; for these reasons, the Proposal places a lot of emphasis on improving the CVR and proposes including new varieties bred for local conditions.

Given the objective of implementing the tools for the protection of agrobiodiversity defined by the European Union and the importance of the European Commission to CVR in this sense, the aim of this work is to analyse the impact of CVR 25 years after its creation. In particular, (i) an analysis of the vegetable varieties registered in CC was conducted, starting with an overview at the European level; (ii) a statistical and regulatory analysis was carried out in order to identify the strengths, weaknesses and applicability of the CVR with regard to its purpose of conserving vegetable landraces; (iii) Italy was considered as a case study in order to better analyse the effects of the CVR nationally; (iv) the reference legislation, including the European Commission's 2023 Proposal and its updates, was analysed to identify its limitations and advantages and better understand the current CVR and its possible future evolutions.

2. Methodology

The European Commission has a public database called the "Commission's Common Catalogue Information system where, as a public user (e.g., breeder, maintainer, farmer, title holder or citizen), it is possible to consult and read the list of agricultural plant and vegetable species that are registered in the CC and that can, therefore, be marketed throughout the EU [30]. Varieties are registered in the database after a technical examination by EU Member States and notification of the Commission. The database was consulted on 15 June 2023. The list of agricultural and vegetable varieties was extracted, including all information offered by the database. The following information was considered for data analysis: country, register subtype, UPOV species, denomination, variety status, registration date, end date, registration under the CVR, rootstock name and hybrid name. Only the plant species ("vegetables") data of registered varieties ("registered") were considered in the analysis performed, as dismissed varieties ("surrendered") were discarded. In particular, the varieties entered in the CC—also including varieties registered under the CVR—were analysed by connecting them first to the species they belonged to and second to the EU country of registration. Considering country and species as two different subsets of data, the data obtained for CC were finally compared with those obtained for the CVR.

To complete the analysis, a comparison was made between the varieties included in the CC or registered under the CVR in 2018—as derived from the 37th edition of the CC and presented in previous work [31]—and the dataset used for this article. To develop this comparison, the 2018 data had to be reworked because, in this edition, varieties were organised by common name and not by scientific name, contrary to their organisation in the 2023 dataset. This difference required an adaptation of the data to allow their analysis; in particular, the varieties that were identified as "Curly kale" in 2018 were subdivided into the two species *Brassica oleracea* L. convar. *acephala* (DC.) Alef. var. *sabellica* L. and *Brassica oleracea* L. var. *palmifolia* DC in 2023. All the corrections are shown in Table S1.

After this first set of analyses had been carried out, the Italian case was considered in detail. For this analysis, the Italian CVR data from the reference dataset included in the Commission's Common Catalogue Information system were considered. These data are slightly different from the data included in the Italian database of the Ministry of Agriculture, Food Sovereignty and Forestry (MASAF), which is responsible for the list. More specifically, the CC does not include—as of 15 June 2023—the following varieties, which are instead listed in the Italian register under the CVR: 'Borlotto di Gambolò' (*Phaseolus vulgaris* L.), 'Fiaschello battipagliese' (*Solanum lycopersicum* L.) and 'Rossina di Pescia' (*Lactuca sativa* L.). On the other hand, 'Riccio di Parma' (*Solanum lycopersicum* L.) is not listed within the CVR in the Italian Register, contrary to its listing status in the CC.

Furthermore, the Italian production data were analysed. In that context, in the absence of a dataset showing the production (expressed in hectares) of Italian conservation varieties, in order to evaluate the potential application of the CVR for commercialization of Italian vegetable landraces, it was decided that the maximum number of cultivable hectares allotted to each conservation variety—derived from Annex X of Legislative Decree 20/2021 [32]—would be compared with the number of hectares allotted to the same species in the reference area. To do this, the public-access database of the Italian National Institute of Statistics (ISTAT) was consulted, considering the 2022 production data for open-field vegetable species in Italy as a whole and by region. These data are collected by ISTAT following an estimation-type methodology. Estimates are made based on evaluations by local experts in the field who are located throughout the area, and the crops surveyed are different for each month and consider the phenological stage of cultivation. For this reason, when using ISTAT data, it is always preferable to use data from the year prior to the research. These data—the maximum number of cultivable hectares per conservation variety and the hectares cultivated in each Italian region and in all of Italy—were compared, approximating the region of origin of each conservation variety to the corresponding regional territory as there were no specific cultivation data for each province and/or municipality associated with the specific conservation variety registered.

3. Results

3.1. The European CC and CVR Scenario

As of the date of data collection, 21,593 varieties were registered in the CC, representing 66 vegetable species and 25 European countries. Concerning the CVR, 191 varieties were registered throughout Europe, representing 31 vegetable species and 18 European countries. The conservation varieties represent only 0.88% of the total number of the varieties included in the CC (Figure 1).

Considering the EU27 Countries, the only European Countries in the CC that did not have any registered varieties were Finland, Ireland and Malta; in contrast, Norway—not a member of the EU27 Countries but belonging to the European Free Trade Association (EFTA)—had 17 varieties registered in the CC. In terms of the CVR, the countries just listed were joined by Austria, Cyprus, the Czech Republic, Denmark, Luxembourg, Poland and Slovakia in the list of EU27 Countries with no registered varieties.

Regarding the varieties recorded in the CC according to the 2018 data [31], the most-represent species was tomato (*Solanum lycopersicum* L.), for which 4202 varieties have been registered (19.46% of the varieties registered in the CC), followed by pepper (*Capsicum annuum* L.), with 2517 varieties (11.66%), and lettuce (*Lactuca sativa* L.), with 2243 varieties (10.39%). Compared to the 2018 data, the species for which the greatest increase in absolute terms was recorded was *S. lycopersicum*, with 527 new varieties registered (+14.34% since 2018), *C. annuum* (301, +13.58%) and bean (*Phaseolus vulgaris* L.) (97, +8.61%). In percentage terms, there were increases in less-represented species: the number of gourd (*Cucurbita maxima* Duchesne) varieties increased from 75 to 130, for an increase of 73.33%; that of curly kale (*Brassica oleracea* L. convar. *acephala* (DC.) Alef. var. *sabellica* L.) varieties increased from 38 to 61—also considering the varieties that, after 2018, were reclassified as *Brassica oleracea* L. var. *palmifolia* DC.—for a percentage increase of 60.53%; and that of black radish

(*Raphanus sativus* L. var. *niger* (Mill.) S. Kerner) varieties increased from 61 to 93 (+52.46%). However, no species were reported for which there were significant reductions in the number of varieties registered in the CC. Overall, in 2023, 17 out of 66 vegetable species accounted for more than 80% of the varieties registered in the CC—exactly 84.42%—with the remaining varieties representing only 15.56% of the varieties registered in the CC (Figure 2). Table S1—available in the Supplementary Materials—shows the varieties registered in the CC by species.

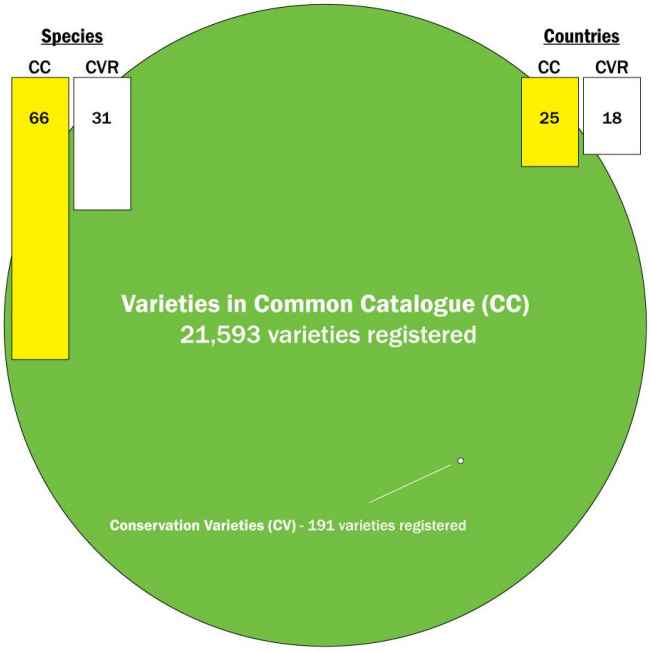

Figure 1. Graphic comparison of Common Catalogue varieties and conservation varieties registered in Europe. CVR = Conservation Varieties Regime.

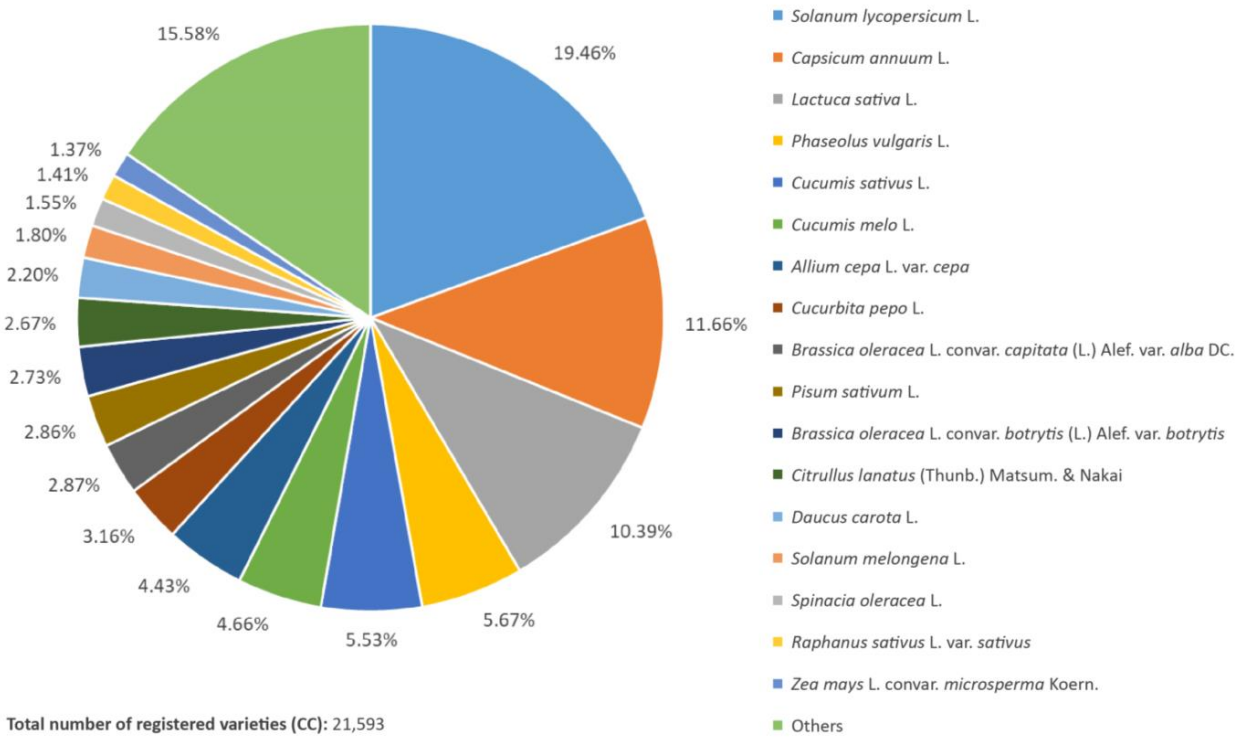

Figure 2. Varieties registered in the Common European Catalogue (CC) by species.

Regarding the 191 conservation varieties registered in Europe, the most-represented species was *P. vulgaris*, with 36 registered varieties (18.85%), followed by *S. lycopersicum* and *C. annuum*, with 35 (18.32%) and 28 (14.46%) registered varieties, respectively. The only other species with more than ten registered varieties was onion (*Allium cepa* L. var. *cepa*), with 15 varieties (7.85%) (Figure 3).

No relevant data could be found to enable a comparison of the numbers of conservation varieties registered in 2018 with the numbers of conservation varieties registered in 2023. The only interesting consideration was that, from 2018 to 2023, four new species were added to the CVR register, for a total of seven new varieties: specifically, varieties of melon (*Cucumis melo* L.), cucumber (*Cucumis sativus* L.), shallot (*Allium cepa* L. var. *aggregatum* G. Don) and savoy cabbage (*Brassica oleracea* L. convar. *capitata* (L.) Alef. var. *sabauda* L.) were added. The whole list of registered conservation varieties, classified by species, is available in Table S2 in the Supplementary Materials.

Notably, the CVR register did not include varieties belonging to so-called "hybrid" species or "rootstock" species such as, for example, the species identified with the UPOV code "CUCUM_MEL_MEF", which was defined in the CC as "hybrids between *Cucumis melo* L. subsp. *melo* var. *flexuosus* (L.) Naudin and *Cucumis melo* L. subsp. *melo*", or the "SOLAN_LHA" species, which was defined as "hybrids between *Solanum lycopersicum* L. and *Solanum habrochaites* S. Knapp & D.M. Spooner". The only exception was the Spanish conservation variety 'De Guernica' (*Cucurbita moschata* L.), which was listed in the 37th edition in the section dedicated to varieties belonging to "species and interspecific crossings for use as rootstocks" in the CC. This indication was difficult to confute in the 2023 dataset because the variety in question—as well as most of the varieties indicated in the 37th edition as "rootstock"—was neither indicated as a "hybrid" nor listed as "rootstock".

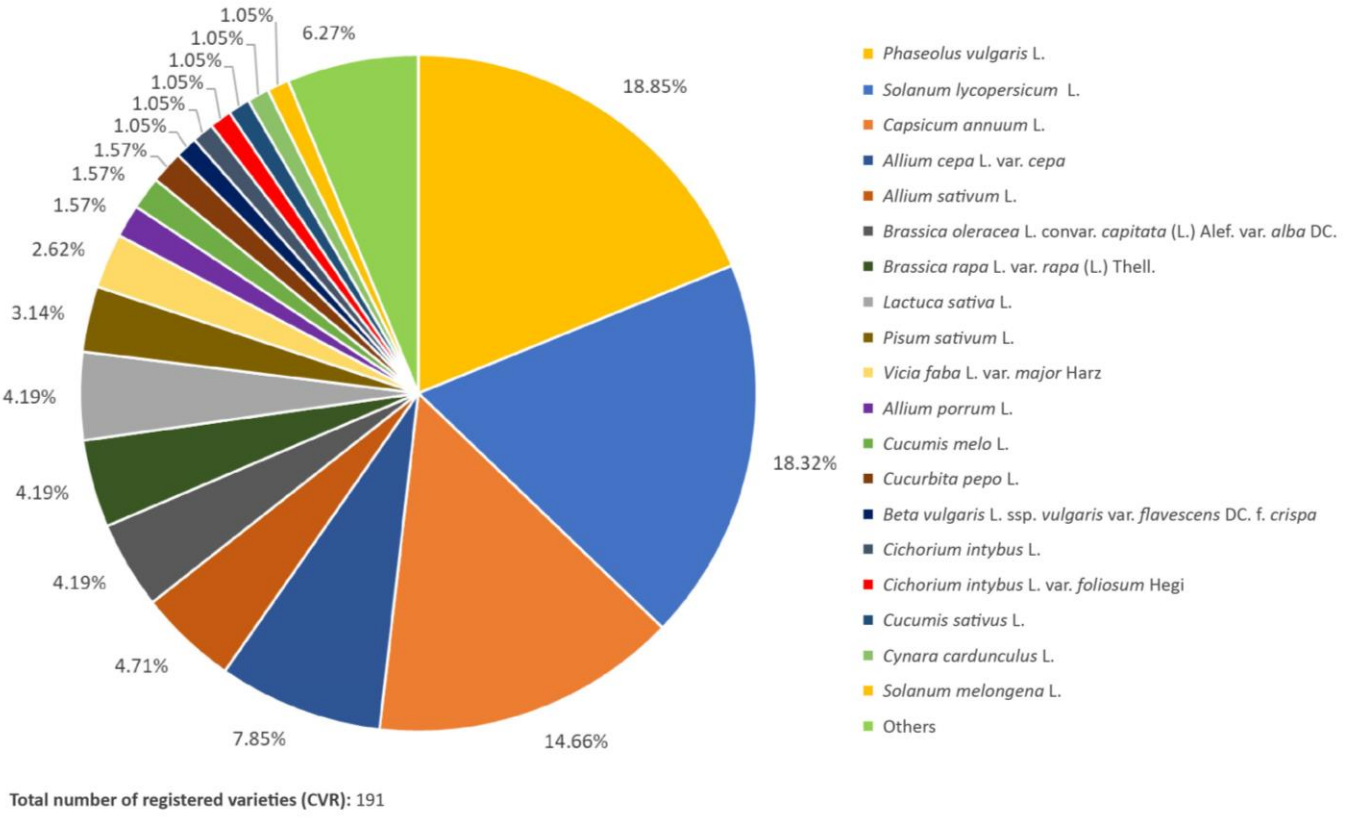

Figure 3. Conservation varieties registered in the Common European Catalogue by species. CVR = Conservation Varieties Regime.

Finally, Table 1 compares the numbers of varieties entered in the CC to the number listed as conservation varieties, broken down by species, considering only those species with a percentage of registered conservation varieties higher than 1%.

Table 1. Comparison of varieties registered as conservation varieties and in the Common European Catalogue (CC), broken down by species.

Species List (UPOV Name)	No. of Conservation Varieties (CVR)	No. of Conservation Varieties (CVR) (%)	No. of Varieties (CC)	No. of Varieties (CC) (%)
Phaseolus vulgaris L.	36	18.85%	1224	5.67%
Solanum lycopersicum L.	35	18.32%	4202	19.46%
Capsicum annuum L.	28	14.66%	2517	11.66%
Allium cepa L. var. *cepa*	15	7.85%	956	4.43%
Allium sativum L.	9	4.71%	144	0.67%
Brassica oleracea L. convar. *capitata* (L.) Alef. var. *alba* DC.	8	4.19%	620	2.87%
Brassica rapa L. var. *rapa* (L.) Thell.	8	4.19%	122	0.56%
Lactuca sativa L.	8	4.19%	2243	10.39%
Pisum sativum L.	6	3.14%	618	2.86%
Vicia faba L. var. *major* Harz	5	2.62%	117	0.54%
Allium porrum L.	3	1.57%	161	0.75%
Cucumis melo L.	3	1.57%	1007	4.66%
Cucurbita pepo L.	3	1.57%	682	3.16%
Beta vulgaris L. ssp. *vulgaris* var. *flavescens* DC. f. *crispa*	2	1.05%	77	0.36%
Cichorium intybus L.	2	1.05%	60	0.28%
Cichorium intybus L. var. *foliosum* Hegi	2	1.05%	110	0.51%
Cucumis sativus L.	2	1.05%	1195	5.53%
Cynara cardunculus L.	2	1.05%	83	0.38%
Solanum melongena L.	2	1.05%	389	1.80%
Others	12	6.00%	5066	23.46%

CVR = Conservation Varieties Regime.

In percentage terms, some species such as *P. vulgaris*, *C. annuum*, *A. cepa* var. *cepa*, *Allium sativum* L. (garlic), *Brassica oleracea* L. convar. *capitata* (L.) Alef. var. *alba* DC. (white cabbage) and other minor species were represented more often as conservation varieties than as entries in the CC. On the other hand, other species, such as *S. lycopersicum*, *L. sativa*, and *C. melo*, were more represented in the CC than they were as conservation varieties.

Observing the data concerning the country distribution of the varieties registered in the CC in Europe, the Netherlands' predominance was unequivocal, with 8552 registered varieties, that being more than one third (39.60%) of the registered varieties in the whole of Europe. The Netherlands was followed by France, with 2880 registered varieties (13.34%), Spain (1992; 9.22%) and Italy (1909; 8.84%), as already observed in previous work [2,31]. The group of countries with more than 1000 registered varieties also included Hungary (1298; 6.01%) and the Czech Republic (1181; 5.47%).

In terms of comparison between the 2023 data and the data reported in Santamaria and Signore (2021), the results obtained from countries such as Sweden, which almost tripled the number of varieties previously registered in the CC (+250%), Slovenia (+221%) and Austria (+168) were reported as significant. The Netherlands remained almost stable in terms of varieties registered (+1.58%), while the country that registered the most varieties in

the period under consideration was France, with 412 new varieties (+16.69%). In contrast, the case of Denmark, the representation of which decreased from 74 varieties registered in the CC in 2018 to only 18 varieties registered in 2023 (−75.68%), should be noted. Lastly, the entry of Luxembourg into the CC, which recorded its first variety within the CC during the enrolment period, and the exit of the United Kingdom from the CC because of Brexit (2020), should be noted. The complete list is available in Table S3 in the Supplementary Materials.

The situation was different when only varieties registered under the CVR were considered. In this category, Spain was the European country with the greatest number of registered varieties (57; 29.84%), followed by Italy (43; 22.51%) and Croatia (26; 13.61%). The Netherlands, which occupied 1st place in the previous classification regarding numbers of varieties recorded in the CC, was in 15th place (along with three other countries), with only one registered conservation variety. France also dropped in the ranking—from 2nd to 6th place—with eight registered conservation varieties. From 2018 to 2023, two new countries, the Netherlands and Lithuania, registered their first conservation variety, while the country with the greatest number of conservation varieties was Spain, with 19 new CVR registrations. There was a decrease in the number of CVR registrations for Romania and Portugal, with the loss of one variety each. The complete list can be found in Table S4 in the Supplementary Materials.

Table 2 shows a comparison of the varieties registered under the CVR and those in the CC, broken down by country, with the aim of highlighting the contribution of each country to the constituents of those two categories. The table includes the data from European countries with a percentage of CVR registrations over 2% and data from the Netherlands because this country is so highly represented among varieties registered in the CC.

Table 2. Comparison of varieties registered as conservation varieties and in the Common European Catalogue (CC), broken down by country.

Country	No. of Conservation Varieties (CVR)	No. of Conservation Varieties (CVR) (%)	No. of Varieties (CC)	No. of Varieties (CC) (%)
Spain	57	29.84%	1992	9.23%
Italy	43	22.51%	1909	8.84%
Croatia	26	13.61%	62	0.29%
Hungary	13	6.81%	1298	6.01%
Slovenia	10	5.24%	135	0.63%
France	8	4.19%	2880	13.34%
Germany	6	3.14%	621	2.88%
Sweden	6	3.14%	63	0.29%
Belgium	4	2.09%	299	1.38%
…	…	…	…	…
Netherlands	1	0.52%	8552	39.61%
…	…	…	…	…
Others	14	7.33%	3782	17.51%

CVR = Conservation Varieties Regime.

As might be expected, Spain and Italy were more strongly represented, by percentage, in varieties registered under the CVR than in varieties registered in the CC; this was truest of countries such as Croatia, Slovenia and Sweden, which recorded—as a percentage—more conservation varieties than varieties registered in the CC. The opposite situation applied to France and, above all, to the Netherlands, for which the percentages of varieties registered in the CC—calculated out of the total number of registered varieties—were much higher than the percentages of varieties registered under the CVR.

3.2. The Evolution of the CVR in Europe

Considering the date of registration of the European CVR, it can be shown that this scheme was not used until the definition of registration rules with Directive 2009/145/EC; in fact, almost all conservation varieties were registered after 2009, except for the varieties 'Nora' (*C. annuum*) and 'Carico Montañés' (*P. vulgaris*), both of which were registered in Spain.

According to Table 3, 2015 was the year in which the greatest number of varieties was registered (31, 16.23%), followed by 2021 (23, 12.04%) and 2017 (21, 10.99%). Following the same type of analysis as above, conservation varieties were listed by species and year of registration (Figure 4).

Table 3. Year of registration of European conservation varieties.

Registration Date	N° of CVR Registrations	N° of CVR Registrations (Progressive)
2006	1	1
2007	0	1
2008	1	2
2009	0	2
2010	10	12
2011	7	19
2012	7	26
2013	11	37
2014	15	52
2015	31	83
2016	19	102
2017	21	123
2018	14	137
2019	12	149
2020	10	159
2021	23	182
2022	9	191

CVR = Conservation Varieties Regime.

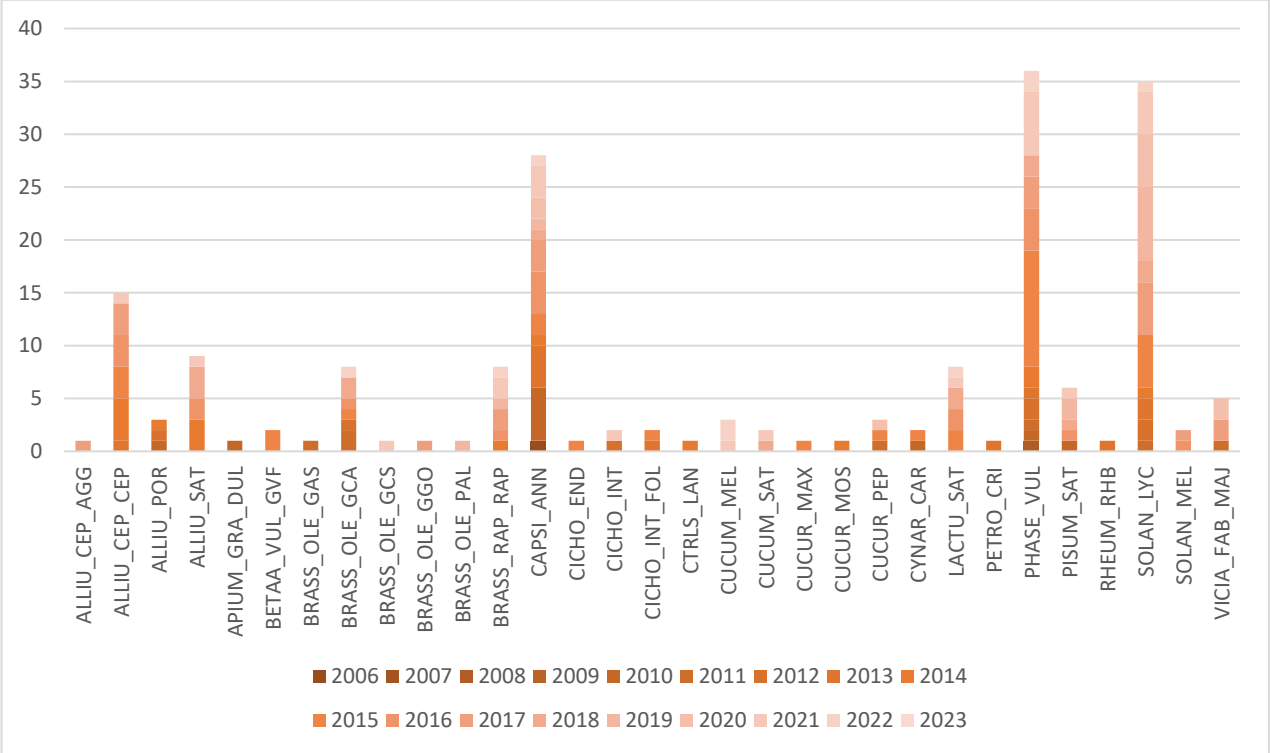

Figure 4. Conservation Varieties Regime: registrations by year and species.

The greatest numbers of years with associated entries occurred in the three most-represented species (*P. vulgaris*, *S. lycopersicum*, and *C. annuum*), for which conservation varieties were recorded for twelve, eleven and twelve years, respectively. Registrations of varieties of onion, the 4th-most-CVR-registered species, were instead all concentrated in the years from 2013 to 2017, with only one later entry, in 2021.

The cases of white cabbage (*B. oleracea* L. convar. *capitata* (L.) Alef. var. *alba* DC.) and turnip (*B. rapa* L. var. *rapa* (L.) Thell.), which, despite having only eight varieties entered, distributed these entries over a period of six years, were interesting.

Finally, the trend in CVR registrations by year and by European country, considering only European countries with a percentage of CVR registrations equalling at least 2% of the total CVR registrations, is shown in Figure 5.

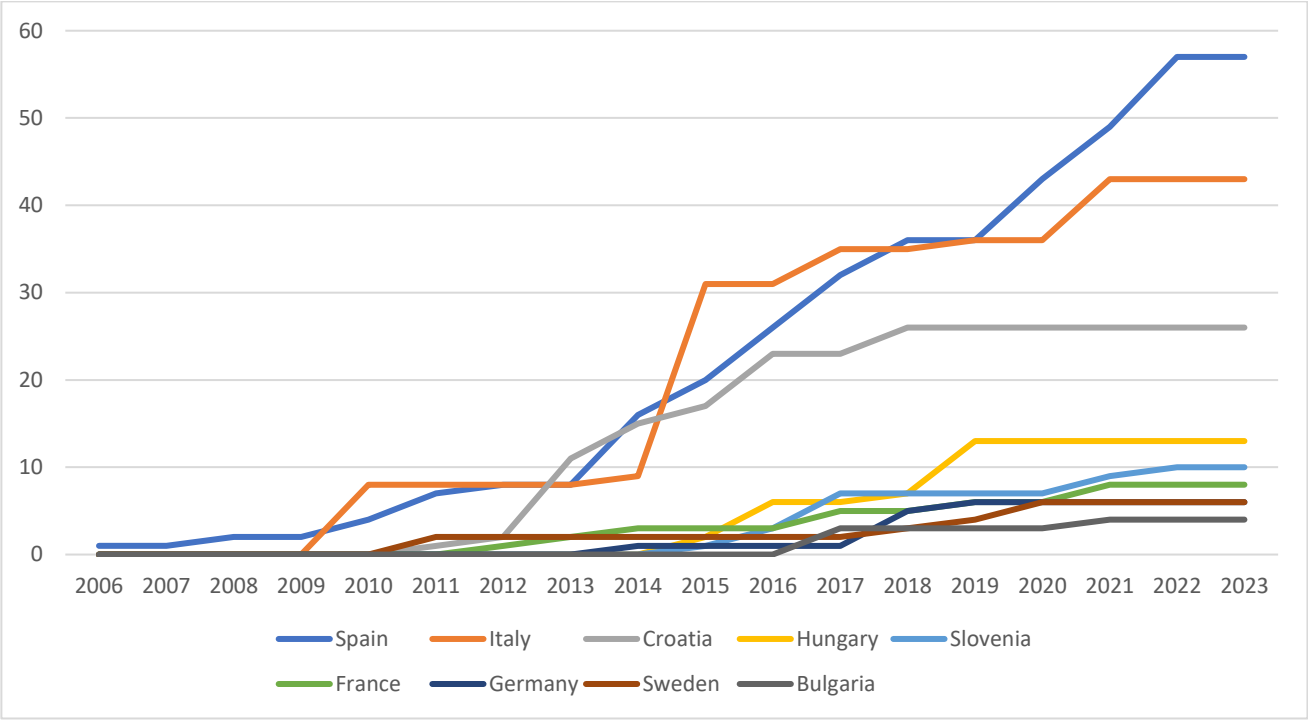

Figure 5. Conservation Varieties Regime registrations by year and country.

Considering the historical evolution of the CVR from 2006—the year of the first CVR registration—to the present, until 2010, Spain was the only European country with CVR registrations. In 2010, Italy produced eight of the 43 current CVR registrations, becoming the top European country for registered varieties. This supremacy endured for only three years because in 2013, Croatia, with a total of 11 registered varieties, established itself as the top country in Europe. Thereafter, the leading position alternated between Italy (from 2015 to 2019) and Spain (in 2014 and from 2020 to present days).

3.3. Case Study: Analysis of Italian CVR Registrations

In Italy, seed marketing is regulated by Legislative Decree No 20 of 2 February 2021: "Standards for the production for marketing purposes and the marketing of seed products in implementation of Article 11 of Law No 117 of 4 October 2019 for the adaptation of national legislation to the provisions of Regulation (EU) 2016/2031 and Regulation (EU) 2017/625". In this Decree, the regulatory provisions derived from the different European directives and national regulations have been summarised, including rules concerning the CVR.

Referring to the regulatory indications of Decree 20/2021, Table 4 was developed to summarise derogations and limits identified for the CVR under the current regulations [32–35].

Table 4. Exceptions and restrictions for Conservation Varieties Regime vegetables in Italian legislation.

Exceptions	Restrictions
Free registration in the National Registers and not subject to any official examination if the information submitted in the application is sufficient	Conservation-variety seeds may only be marketed if they are produced and sold in the area of origin (with exemptions)
Adoption of specific DUS criteria	The number of seeds marketed must not exceed the limits set by the regulations
Exceptions to the varietal denomination scheme governed by Regulation 637/2009/EC	Obligation for producers to notify the relevant administration (region or autonomous province) of the quantity of seeds marketed
Exceptions to the minimum requirements for varietal purity	Requirement to demonstrate historical connection to the area of origin and degree of genetic erosion to apply for registration
Official inspections carried out retrospectively and through surveys	
Exemption from demonstration of possession of the requirements and professional knowledge of (i) mechanical production/selection techniques and (ii) seed- and plant-health regulations concerning the seed categories for which authorisation to produce is requested	
Right to direct local sales and right to free trade within the "National network of biodiversity of agricultural and food interest"	

Italy has 43 CVR registrations. The first varieties—the 'Dorato di Rissone' (*A. graveolens* L. var. *dulce* (Mill.) Pers.) and the 'Quarantin di Casalborgone' (*Pisum sativum* L.)—were registered on 5 January 2010; the last varieties, all of which belong to the species *P. vulgaris* L., were registered on 23 July 2021. In terms of year, most Italian conservation varieties were registered in 2010, when eight varieties were registered, in 2015, when 22 varieties were registered and in 2021 (seven varieties).

In total, Italy has fifteen species represented among the CVR registrations; the most-represented species is *P. vulgaris* L., with 18 registered varieties, followed by *A. cepa* var. *cepa* (five CVR registrations) and *S. lycopersicum* L., with four CVR registrations (Table 5).

Table 5. Italian Conservation Varieties Regime (CVR) registrations by species.

Species	Number of CVR Registrations	Number of *CVR Registrations* (%)
Allium cepa L. var. *cepa*	5	11.63
Allium porrum L.	1	2.33
Apium graveolens L. var. *dulce* (Mill.) Pers.	1	2.33
Beta vulgaris L. ssp. *vulgaris* var. *flavescens* DC. f. *crispa*	2	4.65
Brassica oleracea L. var. *gongylodes* L.	1	2.33
Brassica oleracea L. var. *palmifolia* DC.	1	2.33
Capsicum annuum L.	3	6.98
Cichorium endivia L.	1	2.33
Cichorium intybus L. var. *foliosum* Hegi	1	2.33
Cucurbita maxima Duchesne	1	2.33
Cucurbita pepo L.	1	2.33
Cynara cardunculus L.	2	4.65
Phaseolus vulgaris L.	18	41.86
Pisum sativum L.	1	2.33
Solanum lycopersicum L.	4	9.30

Although Italy is the second-largest country in Europe in terms of CVR registrations, the numbers are not representative of the whole country. In fact, only seven Italian regions—Emilia Romagna, Lombardy, Piedmont, Sardinia, Sicily, Tuscany, and the Veneto—have CVR registrations. Of these, Tuscany is the most-represented territory, with 22 CVR registrations, which is more than half of the registered varieties in Italy (51.26%). Tuscany is followed by Piedmont (eight CVR registrations), Veneto (five CVR registrations), Lombardy and Sardinia (three CVR registrations each). Sicily and Emilia Romagna round out the ranking, with one CVR registration each. Figure 6 shows the map showing the Italian CVR registrations, categorised by area of reference and by species.

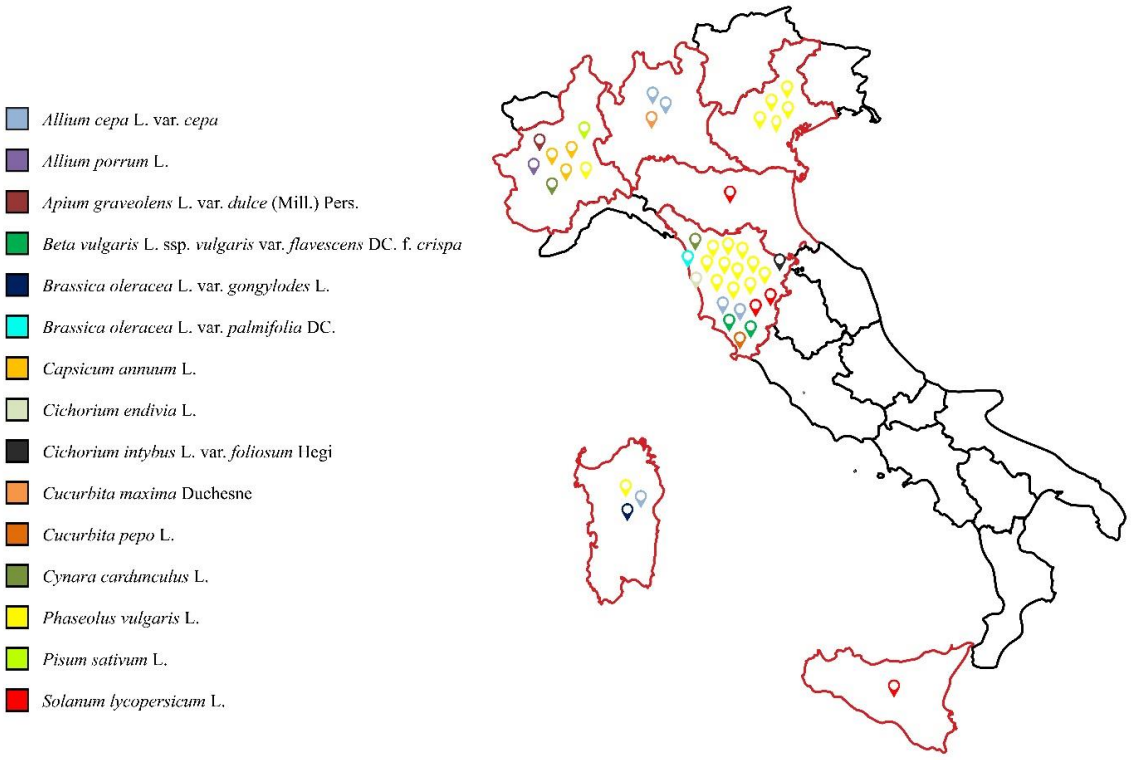

Figure 6. Italian Conservation Varieties Regime registrations categorised by area of reference and by species.

With reference to the variety maintainers identified for each CVR registration, the Italian situation is relatively varied. In fact, for all the Italian conservation varieties, seed companies or public or collective bodies (consortia, committees, associations, etc.) are identified as maintainers. Tuscany has a single maintainer for all the varieties for which a maintainer is indicated: a seed company called "Gargini Sementi di Alessandro Gargini & Giulio Godi s.n.c.". A similar situation applies in the Veneto, which, however, identifies a local consortium as the unique maintainer for the five conservation varieties. The situation is more varied in Piedmont, where public bodies are identified as maintainers—one conservation variety has a research body traceable to the Province of Turin, and the other is maintained by the Department of Agricultural, Forestry and Environmental Sciences of the University of Turin—and a research consortium. The situation in Emilia Romagna is also unique: here, the registered conservation variety is conserved by a private company, which, however, collaborates with research bodies as an experimental farm. Finally, in Sardinia, CVR registrations are conserved by a local committee aimed at safeguarding local biodiversity, while in Lombardy, the variety 'Dorata di Voghera' (*A. cepa* var. *cepa*) is conserved by a consortium called "*Consorzio produttori cipolla di Voghera*" (Voghera onion producers' consortium). This consortium was set up in 1990 and was the promoter of the variety's registration under the CVR in 2015 (Table 6).

Table 6. Italian Conservation Varieties Regime maintainers list.

Name	Type of Maintainer	N° of Varieties Being Maintained	Region
AZIENDA AGRARIA SPERIMENTALE STUARD S.C.R.L.	Private (with connection to public research programme)	1	Emilia-Romagna
COMITATO CUSTODI DELLA BIODIVERSITA DI ALGHERO (CCBA) "LO REVELLI"	Committee, consortium or association	2	Sardinia
CONSORZIO PER LA TUTELA DEL FAGIOLO DI LAMON	Committee, consortium or association	5	Veneto
CONSORZIO PRODUTTORI CIPOLLA DI VOGHERA	Committee, consortium or association	1	Lombardy
CRAB—CENTRO DI RIFERIMENTO PER L'AGRICOLTURA BIOLOGICA	Public	1	Piedmont
CRESO—CONSORZIO RICERCA E SVILUPPO PER L'ORTIFRUTTICOLTURA PIEMONTESE	Committee, consortium or association	6	Piedmont
DIPARTIMENTO DI SCIENZE AGRARIE, FORESTALI E ALIMENTARI UNIVERSITA DEGLI STUDI DI TORINO	Public	1	Piedmont
GARGINI SEMENTI DI ALESSANDRO GARGINI & GIULIO GODI SNC	Seed company	21	Tuscany
Not available	Not available	5	Lombardy (2), Tuscany (1), Sardinia (1), Sicily (1)

To conclude the analysis of the Italian case, the area (ha) available in each Italian region for each conservation variety was calculated, following the indications given by the legislation [32] (Table 7).

Table 7. Hectares potentially available for the cultivation for each conservation variety in Italy.

Species	Conservation Variety	IT Region (1)	Available Area for Conservation Variety (ha) (2)	Cultivated Area for Species (ha) (3)	Available Area for Conservation Variety (%) (4)
Allium cepa L. var. *cepa*	Dorata di Voghera	Lombardy	40	333	12.01%
Allium cepa L. var. *cepa*	Rossa di Breme	Lombardy	40	333	12.01%
Allium cepa L. var. *cepa*	Mitja Valmella	Sardinia	40	122	32.79%
Allium cepa L. var. *cepa*	Rossa a fiasco	Tuscany	40	187	21.39%
Allium cepa L. var. *cepa*	Rossa massese	Tuscany	40	187	21.39%
Allium porrum L.	Di Cervere	Piedmont	20	47	42.55%
Apium graveolens L. var. *dulce* (Mill.) Pers.	Dorato Rissone	Piedmont	10	18	55.56%
Beta vulgaris L. ssp. *Vulgaris* var. *flavescens* DC. f. *crispa*	Livornese da taglio	Tuscany	20	186	10.75%
Beta vulgaris L. ssp. *Vulgaris* var. *flavescens* DC. f. *crispa*	Verde da taglio lucchese	Tuscany	20	186	10.75%
Brassica oleracea L. var. *gongylodes* L.	Colatronxo	Sardinia	40	24	>100.00%
Brassica oleracea L. var. *palmifolia* DC.	Braschetta	Tuscany	40	74	54.05%
Capsicum annuum L.	Corno di Carmagnola	Piedmont	40	119	33.61%
Capsicum annuum L.	Cuneo	Piedmont	40	119	33.61%
Capsicum annuum L.	Quadrato di Carmagnola	Piedmont	40	119	33.61%
Cichorium endivia L.	Tardiva lucchese	Tuscany	10	39	25.64%
Cichorium intybus L. var. *foliosum* Hegi	Del Marzocco	Tuscany	40	178	22.47%
Cucurbita maxima Duchesne	Cappello da prete mantovana	Lombardy	40	n.a.	n.a.
Cucurbita pepo L.	Mora pisana	Tuscany	20	386	5.18%
Cynara cardunculus subsp. *scolymus* (L.) Hayek	Gobbo di Nizza Monferrato	Piedmont	40	n.a.	n.a.
Cynara cardunculus subsp. *scolymus* (L.) Hayek	Pieno inerme lucchese	Tuscany	40	657	6.09%

Table 7. *Cont.*

Species	Conservation Variety	IT Region (1)	Available Area for Conservation Variety (ha) (2)	Cultivated Area for Species (ha) (3)	Available Area for Conservation Variety (%) (4)
Phaseolus vulgaris L.	Bianco di Bagnasco	Piedmont	40	984	4.07%
Phaseolus vulgaris L.	Gioghedda	Sardinia	40	87	45.98%
Phaseolus vulgaris L.	Aquila	Tuscany	40	306	13.07%
Phaseolus vulgaris L.	Diecimino	Tuscany	40	306	13.07%
Phaseolus vulgaris L.	Fico di Gallicano	Tuscany	40	306	13.07%
Phaseolus vulgaris L.	Garfagnino	Tuscany	40	306	13.07%
Phaseolus vulgaris L.	Giallorino della Garfagnana	Tuscany	40	306	13.07%
Phaseolus vulgaris L.	Malato	Tuscany	40	306	13.07%
Phaseolus vulgaris L.	Mascherino	Tuscany	40	306	13.07%
Phaseolus vulgaris L.	Rosso di Lucca	Tuscany	40	306	13.07%
Phaseolus vulgaris L.	Schiaccione di Pietrasanta	Tuscany	40	306	13.07%
Phaseolus vulgaris L.	Stortino di Lucca	Tuscany	40	306	13.07%
Phaseolus vulgaris L.	Zolfino	Tuscany	40	306	13.07%
Phaseolus vulgaris L.	Calonega	Veneto	40	958	4.18%
Phaseolus vulgaris L.	Canalino	Veneto	40	958	4.18%
Phaseolus vulgaris L.	Spagnolit	Veneto	40	958	4.18%
Phaseolus vulgaris L.	Spagnolit nano	Veneto	40	958	4.18%
Phaseolus vulgaris L.	Spagnolo	Veneto	40	958	4.18%
Pisum sativum L.	Quarantin di Casalborgone	Piedmont	40	444	9.01%
Solanum lycopersicum L.	Riccio di Parma	Emilia Romagna	40	25,505	0.16%
Solanum lycopersicum L.	Pizzutello dell'Agro Ericino	Sicily	40	12,525	0.32%
Solanum lycopersicum L.	Canestrino di Lucca	Tuscany	40	2714	1.47%
Solanum lycopersicum L.	Pisanello	Tuscany	40	2714	1.47%

(1) Italian region in which the Conservation Varieties Regime "area of origin" is located; (2) maximum hectares available for the cultivation of the conservation variety, by regulation (source: Annex XI, Legislative Decree 20/2021); (3) cultivated hectares in each region for each species in 2022 (source: ISTAT); (4) percentage of hectares available for each conservation variety in the region of origin.

4. Discussion

This section provides an overview of the discussions and prospects regarding the CVR's possible evolution.

There is general agreement that the CVR scheme, introduced 25 years ago within the EU seed system in order to provide a means of protection and commercialization for so-called "old and traditional varieties", has not, to date, achieved the desired results [26,36,37]. This is reflected particularly in the small number of CVR registrations in the Community Register in recent years, which, when compared to the number of vegetable varieties registered within the CC, offers an indication of the limited impact that this scheme has had and still has in Europe.

In quantitative terms, the number of varieties registered under the CVR both by species and by European country matches what has been reported in previous works [31,38]. For example, regarding the country distribution of varieties registered in the CC and under the CVR, it is confirmed that the Netherlands, despite being only the fourth-ranked country in Europe for vegetable production—5.6 $\times$ 10^6 t, 7.00% of total production in Europe in 2021 [39]—is the most-represented country in terms of the number of registered vegetable varieties in the CC. This derives from the type of production system that has developed in the Netherlands, which consists of large infrastructure that strongly connects the activities of sorting, breeding and retailing [31,40]. In contrast, Spain and Italy, first in terms of horticultural production in Europe—13.5 $\times$ 10^6 t (18.00%) and 11.4 $\times$ 10^6 t (15.00%), respectively [39]—together account for slightly more than one fifth (22.67%) of the registered varieties in the CC. This is because both Mediterranean countries are

characterised by an entrepreneurial structure mainly made up of small and medium-sized enterprises (SME), where farmers prefer using local and traditional varieties, in part thanks to the great richness of agrobiodiversity in these countries [2,31].

Nevertheless, the comparison between the CC and the varieties registered under the CVR offers some insights. In the latter, there is more space—in percentage terms—for many varieties that play a marginal role in the CC, such as garlic (*A. sativum*), turnip (*B. rapa* var. *rapa*.), chard (*Beta vulgaris* L.) and artichoke (*Cynara cardunculus* subsp. *scolymus* (L.) Hayek). The CVR could therefore be a tool for protecting and promoting not only landraces at risk of erosion but also "minor" varieties, i.e., those that have been less attractive for breeding programmes either because of the difficulties in improving these varieties with Conventional Breeding Techniques (CBT) or because of a lack of market interest in them. In addition, the possibility of registering certain vegetable conservation varieties as rootstocks, as in the case of the Spanish variety 'De Guernica', has garnered considerable interest in terms of PRGFA conservation and protection plans. In fact, the genetic variability inherent to local varieties is a highly favourable factor, allowing numerous diseases and pests to be managed naturally when such varieties are used as rootstock. For example, the Italian varieties 'Barattiere' (*C. melo*) and 'Pomodoro di Manduria' (*S. lycopersicum*) are reported to be varieties that are resistant to, respectively, tomato leaf curl New Delhi virus (ToLCNDV) and tomato spotted wilt virus (RB-TSWV), two of the most problematic pathogens for their respective species [41–43]. Despite their important roles, however, neither of these two local varieties is present in the CC or registered under the CVR: registering them as useful rootstock conservation varieties could not only better protect these varieties but, above all, further promote good natural pathogen-management practices related to them.

However, what are the reasons for the CVR's low impact on the European seed market? Among the main reasons, some authors point out that the requirements for registration are still too stringent, although some exemptions from the DUS characteristics are recognised in the legislation [21,44]. Others consider the retrieval of historical information attesting to the historical and traditional link of the varieties with their region [17] as an obstacle to registration. In general, there was a lack of information among farmers, who often saw the CVR more as a threat than an opportunity because of the possible restrictions, including limitations on self-production of seed, quantity limits on marketing and the prohibition on the sale of propagation material outside the reference region [45].

Regarding the Italian case study, the national regulatory provisions are largely aligned with the provisions of European legislation. In reference Law 20/2021, the provisions of Directive 2009/145/EC are applied. Among these, the most significant in terms of promoting conservation are the adoption of specific DUS criteria and the exceptions to the minimum requirements for the marketing of conservation varieties, as well as the simplifications in terms of official monitoring. In addition to these, there are the regulatory provisions of Law 1096/71, which pertains to the right to the direct sale of plant propagative materials at the local level, and Law 194/2015, which pertains to the free marketing of conservation variety seeds within the "National Network of Biodiversity of Agricultural and Food Interest". Finally, a further exemption is contained in Art. 4 of the Ministerial Decree of 12 November 2009, according to which producers of conservation variety seeds are exempted from the obligation to demonstrate possession of the requirements and professional knowledge inherent to (i) mechanical production and breeding techniques and (ii) seed and phytosanitary standards relating to the categories of seeds for which production authorisation is requested.

In terms of potential restrictions, in addition to the previously identified critical issues regarding the registration of new varieties (Table 4), another potential problem identified by farmers is the quantitative limits imposed on the marketing of seeds of each variety. To confute this claim, the data in Table 7 were reported and analysed. If for some varieties, such as 'Riccio di Parma' (*S. lycopersicum*), the maximum quantities imposed by the regulations seem to be restrictive in terms of cultivation and marketing (a maximum quantity of seeds to cover only 0.16% of the hectares currently cultivated with tomatoes in Emilia-Romagna

could be marketed), for other varieties, this limit does not seem to exist. For example, the varieties 'Dorato di Rissone' (*A. graveolens* var. *dulce*.) and 'Braschetta' (*Brassica oleracea* L. var. *palmifolia* DC.), in Piedmont and Tuscany, respectively, could be sufficient to cover 55.56% and 54.05% of the hectares currently dedicated to the cultivation of the reference species in these regions. Additionally, for the 'Colatronxo' variety (*Brassica oleracea* L. var. *gongylodes* L.), the maximum number of hectares provided for in the regulations (40 ha) is even greater than the number of hectares currently used to cultivate turnip cabbage in Sardinia (24 ha). This shows that, in some territories and for certain species, these quantitative limits do not really represent limits, contrary to the perception of some farmers [45].

Moreover, other critical issues encountered for registration—such as the need to demonstrate the connection of the variety with the reference territory—could also be overcome by other regulatory instruments. For example, in Italy, it is possible to use the information contained in the National Register of Biodiversity of Agricultural and Food Interest, the Regional Registers of Autochthonous Genetic Resources—such as the one established in Apulia by Regional Law n. 39 of December 2013—or the list of Traditional Agrifood Products (TAP) [34,46] to demonstrate the traditional nature of certain varieties in terms of their historical link with the reference region. More specifically, to obtain recognition as a TAP, the product must be demonstrated to have been linked with the region for at least 25 years [47,48]. Therefore, if a product is recognised as a TAP, the link with the region has already been demonstrated; therefore, this information can be consulted and utilised for the CVR registration procedure.

Nevertheless, the use of the CVR in Italy has been and still is limited. In fact, out of the twenty regions in Italy, only seven have registered conservation varieties. Basilicata, Apulia and Lazio, which are rich in landraces and traditional vegetables [47], have never used this scheme to create a market for the seeds of endangered vegetable varieties.

In addition, Italy has only eight entities registered as maintainers for the 43 conservation varieties, of which one—the only registered seed company, operating in Tuscany—is responsible for the maintenance of almost half (48.83%) of the registered conservation varieties. The remaining conservation varieties are conserved—a maximum of 5–6 CVR registrations per entity—by consortia, associations or public bodies scattered across the country. Moreover, most Italian conservation varieties have been registered within a few limited periods; registrations are mainly distributed over four different years—2010 (8 varieties), 2015 (22), 2017 (4) and 2021 (7)—with two single registrations in 2014 and 2019.

Although Italy is the second-largest country in Europe in terms of CVR registrations, overall, it is true that its case study represents a context in which the CVR is poorly structured and characterised by the initiatives of individual entities that take it upon themselves to protect and/or promote specific vegetable varieties. Fifteen years after Directive 145/2009/CE on vegetable species, these results confirm that the CVR has not achieved the desired results and that, therefore, a revision, at least, of the legislation is necessary.

Proposal 2023/0227 (COD), which pertains to the production and marketing of plant and reproductive material in the European Union [27], takes action in this regard. As drafted by the EU Commission, this proposal introduces a clear contrast between the varieties eligible for registration in the CC—identified as varieties subject to the DUS criteria—and the conservation varieties, identified as varieties for which the DUS criteria are no longer required. So, for the CVR, the Proposal simplifies the registration procedure by requesting less documentation to proceed with the application for registration. Indeed, article 53 of the Proposal indicates as requirements for registration (i) an official recognised description, specifying the characteristics of the variety for the CVR; (ii) an indication of the initial region of origin; (iii) a denomination reflecting current regulatory requirements and (iv) the identification of a European maintainer. The official description shall be based, particularly, on the results of unofficial tests and knowledge gained from practical experience during cultivation. In addition, further simplifications derive from the Legislative Resolution of

the European Parliament of 24 April 2024, in which point (ii) of Art. 53 present in the Proposal was changed to "[. . .] an indication of its initial region of origin, when known, or the local conditions under which it has been newly bred". Basically, the new legislative text simplifies the work of registration promoters, requiring them to simply identify the specific local conditions where the variety is bred for cases in which a region of origin cannot be unequivocally demonstrated. The most important indication is contained in the new Article 53, par. 1, sub. 1a, which specifically states that the CVR registration must be free of charge for the proposer. Thirdly, it is stipulated that, if an application for registration is refused, the competent authority must notify the applicant of its decision, stating the reasons for the refusal (Article 53, par. 2, sub. 2).

Another change that the Proposal identifies for the CVR is the substitution of the new definition of conservation variety for the definition presented in the current regulation [20]. In fact, in the proposal, under letter 29 of art. 3, "a variety that is (a) traditionally grown or locally newly bred under specific local conditions in the Union and adapted to those conditions; and (b) characterised by a high level (changed to "satisfactory level" by the 2024 Parliamentary Resolution) of genetic and phenotypical diversity between individual reproductive units" is defined as a conservation variety. The term "newly bred" is better explained in the Parliamentary Resolution of 2024. Here, the indication that "newly bred varieties" means "[modern landraces] derived from on-farm selection or bred for adaptation to local conditions in the context of the sustainable use of plant genetic resources for food and agriculture" is added to the text present in the Proposal. In the Resolution, the new points "aa" and "ba" are also added to Art. 3, par. 1, point 29, specifying that a conservation variety cannot be an F1 hybrid variety and that a conservation variety, to be so defined, must not be "subject, as a whole or in genetic components, to intellectual property rights that limit its use for conservation, research, breeding, education, including on a farm by a farmer who uses the PRM grown on the farm, of that variety for those objectives".

Comparing this new definition with the definition contained in the Directive 2009/145/EC and its three key concepts—agricultural landraces and varieties, region of origin and genetic erosion risk [13,17,20,21]—it is possible to see that (i) the definition now includes either traditional landraces and new breeding varieties and (ii) the risk of genetic erosion is no longer present in the definition. According to the Proposal, a satisfactory grade of genetic diversity—typical of the landraces—and the ability to adapt to a specific territory is sufficient to identify a conservation variety.

Although this new definition includes more varieties than did the previous definition, it still has flaws. For example, there is the problem for species not included in the CC, species such as broccoli rabe (*Brassica rapa* L. subsp. *sylvestris* L. Janch. var. *esculenta* Hort) [31].

In commercial terms, this proposal contains an important step forward in article 26, which says that conservation-variety seeds should be produced and marketed in the European Union as standard seed, accompanied by an operator's label with the indication "conservation variety". Therefore, the burden of certification in the field has been removed, facilitating seed production and marketing. Furthermore, there is no direct reference in the Proposal to the obligation to produce and market PRM in the so-called "area of origin". This obligation was contained in previous legislation [20] that severely restricted the marketing of conservation varieties. Indeed, the article indicates how conservation varieties can be produced and marketed in the European Union as standard seeds.

Finally, it should be noted that, on 24 June 2024, the Belgian Council Presidency presented the interim status of the talks on various legislative proposals, based on what was discussed and published by the European Council on 18 June 2024 [49], to the meeting of EU Agriculture Ministers. Concerning the CVR, the document reported the results of a discussion centred around the addition of the definition of "newly bred conservation variety" under the definition of "conservation variety". Some EU Countries fear that this new definition would open a backdoor for the inclusion of commercial varieties that had not passed the DUS requirement. For this reason, the Council suggested not including the "newly bred conservation variety" under the definition of "conservation variety".

In conclusion, regarding biodiversity protection and farmer's rights, the Commission's Proposal and subsequent amendments seem to promote a clear direction toward sustainably using PRM and protecting the work of farmers who, for decades, have been developing breeding activities based on these resources. In fact, the introduction of the concept of "dynamic conservation" as the "preservation of genetic diversity within and between cultivated plant species, [including] both in situ conservation and ex situ conservation, with the aim of a sustainable use of plant genetic resources and agrobiodiversity" (art. 3, par. 1, point 35 of the Proposal as modified by the Parliament's Resolution) moves in this direction. So do the new important exceptions to the exchange of seeds, even for payment, between farmers (art. 30)—now allowed for small quantities—as well as the official, legislative recognition of the role of organisations and bodies (non-profit) that deal with dynamic conservation and seed marketing (art. 29). The European Council's advice published on 18 June, however, seems to apply some pressure to the brakes on this major opening of the seed market in Europe. On the one hand—as also written above—it suggests excluding the "newly bred conservation variety" from the "conservation variety" regime, and, on the other hand, it also proposes to remove Article 30, which concerns the free exchange of small quantities of seed between farmers, from the Proposal. The more conservative stance of the European Council and some delegations is based on the fear that the new regulations approved by the Commission on 24 April 2024 could undermine the European seed system, opening the way to "informal channels for marketing of PRM with no scrutiny whatsoever regarding its identity, quality, health" [50]. Other stakeholders, however, point out how, if the regulatory proposals made by the European Commission in April were confirmed, there would be more tools to promote, market and protect local varieties; these aims are objectives of the CVR [51–53].

5. Conclusions

More than twenty-five years after its introduction into European legislation, the CVR has failed to promote and enforce a dedicated market for all those varieties (landraces, new farmers' varieties, etc.) excluded from registration in the CC because of DUS requirements. The few CVR registrations in Europe and the improper use of this scheme—often used not by seed companies or other commercial entities but by public, research and associative organisations—required the intervention of the European Commission and, subsequently, of the Parliament. In line with the European Green Deal policies, Farm to Fork Strategy, Biodiversity Strategy, etc., these bodies proposed major changes to the commercialization system—and therefore to the protection system—for varieties that are representative of Europe's national and regional biodiversity.

At the moment, it is unclear what direction these reforms will take in the future, as there are different and opposing positions; on the one hand, there is the proposal to expand the definition and the market of conservation varieties, and on the other hand, there is a more conservative strategy, motivated by the desire to maintain a certain level of safety for the seed market.

In this regard, this study, analysing the CVR, has shown that such exceptions do not actually represent a threat to the European seed market, as they have a non-significant impact on the structured system defined by European seed legislation. Nevertheless, the exceptions defined within the CVR—like the VDPC regime, whose impact also deserves to be analysed—offer unique tools for the protection and promotion of European plant biodiversity. To confirm these assertions, it would be necessary to study more deeply the commercial impact that conservation varieties or VDPCs have on the European market, as well as the rate of farmers' use of seed of F1 hybrid varieties—or of varieties otherwise registered in the CC—and of seed falling under to the above-mentioned exemption schemes.

However, as stated above, it seems to be clear that the seed system should be improved and implemented to facilitate the achievement of the objectives defined for CVR and, more generally, for the protection and valorisation of European agrobiodiversity.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/horticulturae10080877/s1, Table S1: Registered varieties in Common Catalogue for species; Table S2: Conservation varieties registered, classified for species; Table S3: Vegetable varieties registered in Common Catalogue for countries; Table S4: Vegetable conservation varieties registered, classified for countries.

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Data Availability Statement: No new data were created or analyzed in this study.

Conflicts of Interest: The authors declare no conflicts of interest.

Appendix A

Table A1. Definition of conservation varieties and VDPC (EU Directive 2009/145/EC).

Waiver		Legislative Indication
Conservation Varieties (CVR)	i.	Definition: landraces and varieties that have been traditionally grown in particular places and regions and that are threatened by genetic erosion.
	ii.	Requirements: To be accepted under the CVR, a landrace or variety shall be interesting in terms of conserving plant genetic resources. To demonstrate distinctiveness and stability, candidate varieties should comply with the test protocols of the Community Plant Variety Office (CPVO) or with the technical questionnaires of the Guidelines of the International Union for the Protection of New Varieties of Plants (UPOV). In addition, in a departure from the standard used for other vegetable seeds, a minimum uniformity level of 90% is set (maximum off-type level = 10%). An official examination is not required. The following information is enough for the application: (a) a description of the conservation variety and its denomination; (b) the results of unofficial tests; (c) knowledge gained from practical experience during cultivation, reproduction and use by the applicant; (d) the indication of a region of origin in which the variety has historically been grown and to which it is naturally adapted.
	iii.	Production and marketing: A conservation variety may be produced and marketed only in its region of origin. The regulations in this regard provide two exceptions: (i) if it is not possible to produce the conservation variety in the region of origin, production may be carried out in another designated location; (ii) at the time of registration of the conservation variety, areas other than the region of origin that have a similar natural habitat may be designated as permitted regions in which to market the seed. The two exceptions are alternatives and are not complementary. CVR seeds may be marketed either as "certified seed of a conservation variety" or as "standard seed of a conservation variety", according to the fulfilment of the minimum conditions required by the tests. Annex I of the Directive indicates the quantitative restrictions for production and marketing of CVR seeds. For horticultural species, the restrictions were calculated as a percentage of the production provided for each species in the region of origin.
	iv.	Official tests: CVR seeds are subjected to official, ex post checks to assess the varietal identity and varietal purity via random inspections.

Table A1. *Cont.*

Waiver	Legislative Indication
Varieties developed for growing under particular conditions (VDPC)	i. Definition: varieties with no intrinsic value for commercial crop production but that were developed for growing under particular conditions. ii. Requirements: to be accepted as a VDPC, a variety shall have no intrinsic value for commercial production but must have been developed for growing under particular agro-technical, climatic or pedological conditions. To demonstrate distinctiveness and stability, candidate varieties should comply with the test protocols of the Community Plant Variety Office (CPVO) or with the technical questionnaires of the Guidelines of the International Union for the Protection of New Varieties of Plants (UPOV). In addition, in a departure from the standard used for other vegetable seeds, a minimum uniformity level of 90% is set (maximum off-type level = 10%). An official examination is not required. The following information is enough for the application: (a) a description of the conservation variety and its denomination; (b) the results of unofficial tests; (c) knowledge gained from practical experience during cultivation, reproduction and use by the applicant. iii. Production and marketing: VDPC can be marketed only as "standard seed", according to the fulfilment of the minimum conditions required. Annex II of the Directive indicates the quantitative restrictions for the production and marketing of VDPC seeds as maximum net weight per package expressed in grams (250, 25 or 5 g, depending on the species). iv. Official tests: VDPC seeds are subjected to official, ex post checks to assess the varietal identity and varietal purity via random inspections.

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