

# Marketing Farmers' Varieties in Europe: encouraging pathways with missing links for the recognition and support of farmer seed systems

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**Abstract:** Farmer seed systems come in many shades: conserving, producing, and using diverse plant material for different motives and purposes, whether the conservation or selection of locally adapted plant varieties and populations, or the safeguard of social bonds to secure economic stability and integration into rural communities. Strict seed marketing rules, by viewing any exchange of seeds as commercial exploitation, have first outlawed these farmer seed systems in Europe, before carving out limited space for them as derogations to the main regime that remains based on mandatory variety registration and certified seed production. Examining these spaces in the legislation, along with their practical implications on the ground, the article shows the conceptual shortcomings of the legislation to fully address all the characteristics of farmer seed systems, especially to recognize farmers' innovation. It exposes the need to carefully define, assess and adjust the underlying objectives of any legislative effort to register farmers' varieties or allow for their exchange, to fully represent and address the complex socio-economic values and diversity of farmer seed systems, and shows that the success of these endeavors lie in the truthful representation, but also the engagement of farmers and social actors that dynamically manage agrobiodiversity.

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## 1. Introduction

While all seeds used in production were saved and developed by farmers in the dawn of agriculture, they have gradually been replaced by seeds derived from public plant breeding, and then by the private sector, especially in industrial regions such as Europe [1]. This shift is attributed to rising public expenditure in breeding, but also to policies supporting private investment, such as intellectual property rights, or those ensuring the marketing of high-quality seed of uniform plant varieties, viewed as a prerequisite to achieve maximum outputs and good returns for farmers [2], food security and market transparency, palliating the informational asymmetry in the seed market [3]. While boosting agricultural productivity and setting the foundations of a strong seed industry, these policies have nonetheless neglected, and outlawed farmers' varieties [4]. These varieties, understood as encompassing both the novel products of farmer-led breeding (such as evolutionary populations), and the traditional or heirloom varieties conserved by farmers and gardeners, have slowly been integrated into European seed marketing legislation as derogatory regimes from the end of the 1990's, and even more prominently since 2008 [5]. However, the success of this integration has been limited in

practice, with quite few or no varieties registered in certain EU Member States, and relatively small uptake of seeds from registered farmers' varieties [6,7].

We posit that such dire acknowledgement and lack of success are mainly due to the inherent shortcomings of the regimes set out in Europe, which fail to address the entire range of farmers' innovation and their varieties, setting out inadequate and disproportionately restrictive criteria for their registration and production [8]. Farmers' varieties are indeed introduced as a derogation to conventional rules established for the needs of industrial crop production, rather than in a specifically tailored regime that could fully recognize the role of farmers as both stewards and developers of biodiversity. We also posit that the inadequacy of EU seed marketing rules to address farmer seed systems also stems from the underlying objectives of the legislation, which is geared towards static conservation of identified plant varieties, and fails to address the many functions of these systems, by viewing the registration of farmers' varieties solely as a means to ensure the conservation of agricultural genetic diversity, rather than empowering social actors engaged in the dynamic management of such biodiversity and responding to their specific needs and concerns.

## 2. Farmers' varieties: a diverse range of equally diverse plant material?

"Farmers' varieties", as products of plant breeding, selection, and exchange processes, encompass very different practical realities and result in different types of cultivars and seeds, in both agronomic and legal terms. They are nonetheless unarguably generated by farmer seed systems and circulate first and foremost within the complex and diverse networks that characterize these systems. Because farmer seed systems are embedded in social relations and institutions that constitute the social, economic and political fabric of rural life, it is challenging to provide a compellingly holistic account of their role in seed production, distribution and development [9]. Indeed, farmers play multiple roles in a modern seed system : not only as growers or multipliers for formal seed producers, but also as innovators through traditional variety selection, seed saving or more formalized participatory breeding and research programs; just as they are key actors for the on farm conservation of genetic material [10,11]. Long characterized through the seemingly derogatory expression of "informal seed systems", which is increasingly challenged due to the permeability that exists between the informal and formal sector (not least on account of seed marketing legislation), farmer seed systems are in essence networks created through social ties established during seed exchange and transfer events, organized either informally or in formal institutions [9,12].

Farmer seed networks are generally characterized by an alternative science system, low-input farming techniques, the flow of seeds within a network and an embeddedness in sociocultural systems, with contribute to the maintenance of evolutionary processes [13]. These networks conserve, manage and develop farmers' varieties, and thus encompass both a static, more traditional dimension, linked to historical and socio-cultural heritage, but also include a more dynamic dimension, which accounts for varietal selection and evolution processes that are carried out by these social networks and their actors. Farmers' varieties have many names: landraces, heirloom, or traditional varieties, dynamic or evolutionary populations. As a result, there is little consensus on what they truly incorporate [14,15]. They nonetheless all reflect 'dynamic populations of a cultivated plant that has historical origin, distinct identity and lacks formal crop improvement, as well as often being genetically diverse, locally adapted and associated with traditional farming systems' [16]. The term is thus used to identify both "old" varieties maintained, and exchanged by farmers for times immemorial [16], but also "new" varieties and populations selected, bred, produced and marketed by farmers, whether as individuals, or more often than not, within social networks [17].

On account of this dual complex nature, the many-faceted nature of farmers' varieties hits an expected wall faced with the understanding and definition of seed marketing legislation in Europe. Whether in the European Union (EU) or in Switzerland, a "plant

variety” is defined with reference to the legal concept that has given rise to the specific intellectual property rights regime that is plant variety protection, based on the International Convention for the Protection of New Varieties of Plants, first signed in 1961, then amended in 1978 and 1991 (UPOV Convention). As a result, the precept of a plant variety is centered around distinctiveness, uniformity, and stability (DUS), which are important criteria for industrial agricultural production focused on yield and productivity, but are fundamentally inadequate for farmers’ varieties, both old and new. Diversity and agroecological farmers and peasants, indeed tend to value and emphasize other criteria [18], just as organic and low-input farmers, which cannot rely on the same range of chemical inputs as their conventional counterparts, and therefore require different criteria to ensure higher production levels, with specific adaptation to the environment [19]. Farmers’ varieties, whether in their more traditional or modern evolutionary sense, have as a result been cast as outsiders in European seed policies, which has unmistakably failed to protect the development of farmer seed systems, or to recognize the collective innovation that they represent [20].

### 3. Pathways for addressing farmer seed systems and registering farmer’s varieties in Europe

European seed marketing rules put the emphasis on protecting farmers from low-quality seeds and potential unfair business practices of seed providers. They aim to address the information asymmetry that exists between the seed provider and its user, but have been shown to disproportionately focus on the technical rules, guidelines, procedures, protocols, and organizational mandates of public authorities, rather than viewing seed systems as a whole [8]. As a knowledge and input intensive market, the European continent, whether in the EU, its Member States or in Switzerland, has followed (if not led) this path through stringent seed marketing legislation aimed at ensuring the identity of seeds, their quality, and additional unconcealed objectives of agricultural productivity, as penned in the preambles of applicable EU legislation. Through a twist in tides at the end of 1990’s, both legislative frameworks have started to carve out some space for farmers’ varieties, in the shape of derogations to the mainstream regime, which continues to be based on mandatory pre-marketing registration guaranteeing distinctiveness, uniformity and stability, as well as mandatory seed lot certification ensuring seed quality through stringent controls [5].

#### 3.1. Farmers’ varieties in the European Union seed marketing legislation

Rules to be followed by operators wishing to market seeds in the EU are found in an astounding number of twelve species-specific Directives that date back to the 1960’s [21]. The main principles of European seed marketing legislation are set around the notion of mandatory variety or operator registration prior to the marketing of seeds (based on criteria ill-adapted to farmers’ varieties), coupled with strict seed production requirements through mandatory seed certification requirements (with the notable exceptions of standard vegetable seeds and propagating ‘CAC’ material for fruit and vine species). These Directives show notable difference between species and need to then be transposed into the national legal orders of EU Member States, which in effect leads to twenty-seven different legal regimes for the marketing of seeds in the EU [22]. In principle though, they all uphold strict rules for variety release, which is conditional to pre-marketing official tests carried out by public authorities to ensure the variety’s distinctiveness, uniformity, and stability, mirroring the standards and protocols initially envisaged for the grant of intellectual property rights. Once a variety is registered into a national catalogue, (and is automatically listed in the EU Common Catalogue for agricultural species and for vegetables, which opens the door to the EU common market), then its seeds need to comply with general quality requirements such as humidity and germination rates, but also often need to comply with stringent seed lot certification requirements, which uphold criteria set out

for world trade through the Seed Schemes of the Organization for Economic Cooperation and Development.

- **Scope of the legislation**

As a prelude, it should be noted that the EU seed marketing rules solely apply to species that are expressly listed in the Directives, regulated because of their commercial relevance for the EU. Species that are not in the scope of the seeds marketing legislation include quinoa, Khorasan wheat, parsnips, and all aromatic herbs. It should also be noted that certain species that are not regulated at EU level can be regulated at national level, which is for example the case of lentils in France.

Secondly, and most importantly, the EU seed marketing Directives only apply to the “marketing of seeds”, which is defined since 1998 in the seven main EU Directives (beet seed, fodder plant seeds, cereal seed, seed potatoes, oil and fiber plants, vegetable seeds and the common catalogue of agricultural plant species) as the ‘sale [...] aimed at commercial exploitation of seed to third parties, whether or not for consideration’. As a result, the Directives directly state that the ‘trade in seed not aimed at commercial exploitation of the variety [...] shall not be regarded as marketing’. The European Commission has recently made clear that, in their reading, the “Directives do not allow exchange of material between farmers because the definition of marketing covers any supply or transfer of seed for commercial exploitation” [6, p.10]. By prohibiting as a principle the key component of farmer seed systems, identified as the barter of seeds amongst farmers, the EU seeds marketing framework poses the greatest obstacle to the production and marketing of farmers’ varieties [24]. On account of advocacy efforts of social actors such as farmers, peasants and seed savers associations, numerous EU Member States have adopted a differentiated stance on the scope of the seed marketing legislation, allowing the transmission of seeds from farmers’ varieties against payment or in kind under certain conditions [7, p.41-42]. While Austrian seed laws allow the transmission of seed against payment and in kind in small quantities if the farmer or user does not trade in seed, Danish authorities ascertain that seed laws only apply to marketing of commercial and larger-scale agricultural and horticultural production, and French authorities recognize farmer seed exchange in the limits of mutual assistance [25], and have recently posited that seed marketing rules do not apply to the ‘the assignment, supply or transfer, whether free of charge or against payment of varieties belonging to the public domain to non-professional end-users not aiming at the commercial exploitation of the variety’ [26]. These interpretations are nonetheless contested by other EU countries, and the European Commission itself, as mentioned above. For instance, in Estonia and Poland, any exchange of seeds amounts to their marketing, and non-registered seeds cannot circulate, even in farmer seed systems.

Aside from these essential considerations with regards to their scope, the EU Directives have also carved official space for the registration of different types of farmers’ varieties into the EU Common catalogue (or in a parallel system for the future regime of organic heterogeneous material), thus opening the way for their formal marketing across the EU, albeit with considerable and bespoke limitations.

- **Conservation varieties and landraces**

The first derogatory regime that allowed the registration, marketing and production of certain types of farmers’ varieties in the EU relates to so-called “conservation varieties” established at the end of the 1990’s. A new legal category was created through Commission Directive 98/95, with a new goal for EU seeds marketing legislation, that of ensuring the conservation of genetic diversity by allowing the registration and thus theoretically the use of “varieties threatened with genetic erosion”. The legal text sets the tone by defining a landrace as “a set of populations or clones of plant species that are naturally

adapted to the environmental conditions of their region”, putting emphasis on the risk of losing them through human intervention or environmental change, without mentioning the seed systems or actors behind, nor the values attached to this material. At first only allowed for agricultural crop species, this departure from the initial goals of the EU seed marketing laws nonetheless implicitly acknowledged that these laws had contributed to the genetic erosion of agrobiodiversity. However, it had not led to a single variety registration ten years after its adoption by the European Commission [6].

While the main rationale and principles of the regime were maintained, the second attempt of the European Commission to allow the marketing of landrace seeds, Directive 2008/62, partially addressed the shortcomings of the previous text, notably by providing more guidance to public authorities with regards to procedural requirements to be followed in the registration process and subsequent controls. The Commission Directive 2008/62 defines landraces as “a set of populations or clones of a plant species which are naturally adapted to the environmental conditions of their region”, corresponding more to the definition of an “ecotype”, rather than a more-transdisciplinary approach to landraces [27]. The Directive authorizes Member States to adopt ‘their own provisions as regards DUS’, at least based on characteristics listed in the applicable UPOV technical questionnaires to be completed by applicants, yet establishing uniformity on the basis of off-types, with the possibility to waive official examination of the variety through public testing. The regime of conservation varieties thus offers the possibility to create lighter procedural requirements with regards to variety registration, while maintaining strong links to criteria set by the UPOV regime, as well as the obligations regarding seed production rules, through mandatory seed certification (except for seed potatoes). Another major caveat of this regime concerns geographical and quantitative restrictions set out in Commission Directive 2008/62, as seeds from conservation varieties may only be marketed in their region of origin, in which the variety has historically been grown and to which it is naturally adapted, just as the quantity of seeds marketed for each conservation variety cannot exceed the quantity necessary to sow 100 hectares, or 0.5% of the seed used in the same species in the country. Although conservation varieties find their way into the official catalogues of Member States and the EU, they thus do not make their way into the common EU seed market. One year later, the opportunity to register conservation varieties into the EU catalogue was extended to vegetable species through Commission Directive 2009/145. The legal instrument upheld the same tailored conditions, except for the opportunity to market standard seed awarded in parallel to the applicable regime for all vegetable seeds, where controls regarding seed quality lots can operate post-marketing. While the quantitative restrictions for conservation varieties of agricultural species are calculated with regards to their global acreage, these limits are set per package size for vegetable seeds.

Most of the applicants for the registration of conservation varieties listed up to now in the Common Catalogue are scientific and public bodies, followed by farmer associations, private citizens and a low number of seed companies [7]. The registration and use of conservation variety seeds depend on a variety of factors. The authorities’ viewpoint on the notion of the “region of origin” plays a considerable role. In certain countries like Belgium, these regions are very limited, allowing the sale of seeds solely within the institutional realities of the country, divided between its three official Regions. This may explain that, although public authorities do not require official examination of the varieties, and that the cost of registration itself is quite low, no agricultural landrace has been registered in the country, and only 2 vegetable varieties were registered by Flemish authorities. In other countries such as Austria, this criterion tends to extend to the entire national territory or covers areas large enough to allow the possibility to produce the seeds, which might explain why the seeds of 29 agricultural landraces are allowed to be marketed in the country. The highest numbers of conservation varieties in agricultural species are found in Sweden and Italy, which together account for almost half of the 353 conservation varieties of EU Common Catalogue, with respectively 74 and 70 varieties. These success stories may be explained by different factors, but the authorities’ flexibility towards the

notion of region of origin provides a first clue. Indeed, in Italy, adjustments were made to certain applications, as it has been the case for the Frassineto and Sieve varieties, for which Tuscany was initially indicated as the area of origin, but later amended to include all central and northern Italy, on account of advocacy efforts of local organizations. The existence, strength and dedication of farmers' associations or civil society organizations also plays an undeniable role in the functioning of uptake of this derogatory system for landrace registration and marketing. When a large interpretation of the notion of "region of origin" is coupled with relaxed controls from public authorities, the quantitative restrictions put upon the production and marketing of conservation varieties seem less problematic than at first sight.

The main hurdle stated by most crop diversity actors attempting to navigate the system and register conservation varieties relate to the strict dossiers that need to be put in place for such registration, with all the accompanying bureaucracy that it entails for small structures for limited benefits and marketing prospects, the stringency of seed lot certification for agricultural crops, and the maintained links with the concept of a plant variety derived from the UPOV system, rather than the populations that tend to be developed through participatory and evolutionary plant breeding [7]. Indeed, the derogatory regime imposes sensible burden for the registration of conservation varieties, through the need to demonstrate a strong link between the variety and its region of origin and to provide proof of the risk of genetic erosion, with little guidance to national authorities as to the actual implementation of its precepts. Not only does the regime only concerns agricultural crop and vegetable species, it also imposes significant quantitative and geographic restrictions for the marketing of seeds from conservation varieties. Furthermore, although there is a high number of landraces registered in the EU Common Catalogue, thus officially opening the doorway into the seed market, these numbers are not representative of their actual availability for use in fields. Indeed, national seed authorities interviewed for the recent study requested by the European Commission in 2021 admitted that "there [was] either no data available or that there [was] no, or a negligible level of, conservation variety production" [28].

It can nonetheless be said that the conservation variety regime provides greater legal space for the maintenance of existing crop genetic diversity [5] and may constitute an interesting entry point for a specific type of farmers' varieties, i.e. old varieties (whether because they have been deleted from the official catalogues or been traditionally maintained by farmers, gene banks or public institutes) that are relatively uniform and stable enough to make it through the requirements. But its limited framing, aimed to combat genetic erosion in specific regions, and its potent links with the main seed marketing regime it desires to derogate to, present considerable shortcomings with regards to the widening of seed offer to farmers for whom uniformity and stability are not essential, and also to the recognition of farmer innovation in seeds. The lack of inclusion of new genetically diverse varieties or populations into the conservation regime has been attributed to successful lobbying by the seed industry against what they considered a "back-door opportunity for the registration of new varieties that do not meet the regular standards" [3, p.205].

The reform process that was initiated in 2011 by the European Commission, through the publication of an "options and analysis paper"[29], and followed by a formal proposal for a single Regulation to replace all species-specific Directives in 2013 [30], but was rejected by the European Parliament in March 2014, and then withdrawn by the European Commission in March 2015, aimed to adjust the regime of conservation varieties. Registration was carved out on the basis of an "officially recognized description", for which DUS examination would have no longer been mandatory, nor would have stringent seed production rules of certification, as seeds from registered landraces would have been allowed to be sold as standard material (Preamble 39, Article 57 of the Proposal). Letting go of currently applicable quantitative restrictions, the proposed regime still maintained the geographical attachment to the region of origin of landraces, which would fallen under

the specific regime of ‘varieties with an officially recognized description’, the rationale of which remained the minimization of genetic erosion and its accompanying conservationist mindset (Preamble 36), mirroring to a great extent the shortcomings of the current regime.

- **Varieties with no intrinsic value for agricultural production**

In parallel to the new category of “conservation varieties”, Commission Directive 2009/145 established another pathway into the market for farmers’ varieties of vegetable species, coined “varieties with no intrinsic value for commercial crop production that have been developed under particular conditions”, otherwise known as ‘amateur’ varieties. Through far less restrictive criteria for registration, without any linkage to a specific region or origin, but more emphasis on the aspect of “non-commercial crop production”, with no geographical restrictions, this category for registration has led to a much more important number of registrations. While only 159 vegetable landraces are registered in the EU Common catalogue, one finds 812 varieties developed for growing under particular “agro-technical, climatic or pedological” conditions in the database. Even though the links with relevant UPOV technical questionnaires are also maintained for their registration, the application process is usually free of charge, based more on the description of the variety, rather than their official examination, and their seeds can be marketed as standard seeds, although in small packages, the maximum weight of which is set in the legislation. Unlike the conservation variety regime, seeds of “amateur varieties” can be marketed freely in small packages throughout the common EU market once registered in a national catalogue, a crucial element which considerably shifts the cost-benefit analysis of the regime.

The registration of “amateur varieties” tends to come from different actors than those using the conservation variety regime, entailing fewer public institutes, but rather comprising of small to medium size companies, usually specialized in the sale of seed in small quantities, and seed saving and conservation networks (which tend to gather gardeners more than professional farmers). The highest number of varieties is found in France (310), where the regime had been existing at national level for a long time, followed by Germany (148 varieties), and Austria (117 varieties); three countries where both specialized and organic seed companies, as well as gardener associations have a very strong presence. Due to the limited amount of information uploaded in the national and then EU catalogue with regards to amateur varieties, and the lack of data on the quantity of seeds produced, it is unfortunately not possible to assess if and how many of the registered amateur varieties are landraces, elder cultivars, heirloom varieties, or new varieties that are the product of participatory or organic plant breeding [7], or whether the high number of registrations actually translate into a higher availability of seeds. Nonetheless, as the regime breaks with the premise of agrobiodiversity conservation confined in regions of origin and recognizes the value of plant selection for other purposes than commercial crop production, it does present valuable opportunities for the recognition of the work carried out by social actors and farmers’ associations working with vegetable seeds, along with avenues for economic gains and uptake of these varieties, even if in limited amounts due to package size limitations. Indeed, the ‘amateur’ variety regime does provide marketing opportunities for farmers-breeders who also operate as seed multipliers, generally accompanied by a collaboration with larger associations or private companies but has a reduced impact on the potential uptake and use of these seeds by diversity and small-scale farmers in food production due to limitations on package size.

The aforementioned reform attempt in 2013 had proposed to replace this regime by a new category of ‘niche market material’, presented as ‘proportionate and sustainable rules for small scale activities [with seeds] adapted to local conditions and made available in small quantities (Explanatory Note of the Proposal 2013/0137) [30]. The proposal even expressly mentioned farmer-breeders and gardener-breeders as the main target group of

this regime, albeit with important caveats as to the size of the entities using the system, which had to be micro-enterprises to avoid abuse of the system (Preamble 27), and large uncertainties as to the true extent of the derogatory regime, the entire contours of which had to be carved in a so-called Delegated Act of the Commission, with little purview of the European Parliament (Article 36). The express mention of farmer innovation in this proposed niche market material regime was a considerable step forward, but we never got to see whether it would have truly broken with the tradition of UPOV technical questionnaires for variety registration, as all marketing modalities of this material were to be drawn after the adoption of the Regulation.

- **Temporary experiment on cereal populations**

Although promising an entry into the EU seed market for farmers' varieties, the aforementioned derogatory regimes did not break with the main premise of varietal uniformity in plant reproductive material, a premise which was rigorously criticized and disproved by researchers engaged in participatory plant breeding with farmers, based on diversity and populations [15]. Several large-scale research projects had been funded by the EU to study the impact of the strict rules for seed marketing rules on farmer seed systems. One of the first ones, coined "Farm Seed Opportunities", was designed inter alia to characterize the requirements of the different stakeholders with regards to the diversity of varieties derived from the on-farm conservation, management, breeding and of regional agricultural systems in Europe [31]. Coordinated by the French INRA, the project ran from 2007 until 2010, and helped prepare derogatory regimes to facilitate the certification and marketing of seed in the interest of conserving plant genetic resources. It was immediately followed by SOLIBAM (Strategies for organic and low-input integrated breeding and management), which ran from 2010 until 2014, more specifically focused on diverse plant populations and their resilience to stress [32]. The breeding efforts carried out together with social actors engaged in the conservation and dynamic management of agricultural biodiversity, and farmers associations led to the creation and development of populations of vegetables and cereals[33]. These populations could not however find their way into the EU seed market due to their heterogeneity and needed a considerable change of paradigm in the EU seed marketing legislation.

The rejected Commission Proposal of 2013 had foreseen the possibility to market "heterogeneous plant reproductive material", recognizing this material's contribution to the "increase the genetic variability of agricultural crops, the genetic resource basis and biodiversity in the Union, the sustainability of agriculture and to the adaptation to climate change" (Preamble 17 of the Proposal) [30]. The proposed regime broke with the DUS paradigm, as this material was described as not belonging to a variety, but was not further defined in the text, which rather delegated this task, along with the adoption of the modalities of registration, traceability, labelling, packaging, and seed production to the European Commission in a future Delegated Act (Article 14§3).

In parallel to this process, which ended by therejection of the entire reform proposal, a temporary experiment was launched in 2014 through Commission Implementing Decision 2014/150, based on 'new research in the Union on plant reproductive material that does not fulfil the variety definition as regards uniformity, [which showed] that there could be benefits of using diverse material, in particular with regards to organic production or in low input agriculture for example to reduce the spread of diseases' (Preamble). This experiment allowed the marketing of new populations of wheat, barley, oats, and maize developed by breeders and farmers. The experiment, which ran in six EU Member States (United Kingdom, Italy, France, Denmark, Germany, Netherlands) was extended until 28th February 2021, and aimed to gather information on potential ways forward to ensure the identification of these diverse populations. To that end, it allowed the marketing of non-certified seeds of material notified to public authorities which participated in the experiment.



Completely abandoning the UPOV technical questionnaires, registration was based on the description of the material, the breeding schemes used, the region of production, the degree of heterogeneity and characteristics of the population. All applicants and producers also had to be registered to ensure traceability and gather data, while quantitative restrictions were set to maximum 0,1 % of seed of the same species produced in that year in the participating Member State. The temporary experiment led to the registration of 35 populations (mostly of wheat), and to the marketing of 100 tons of seeds, staying nonetheless below commercial scale marketing, except for the Organic Research Centre's Wakelyns population in the United Kingdom and the SOLIBAM populations in France, Germany and Italy [34]. Although the experiment was extremely successful in reversing the dominant UPOV-led paradigm that determines access to the seed market in the EU, none of the official texts expressly referred to farmers' innovation, as the experiment was confined to so-called 'cross-composite populations', products of a limited number of techniques used in evolutionary breeding. The regime, and the key researchers and actors involved in its successful uptake, nonetheless led the way to a broader legislative approach to heterogenous material and diversity in the EU seed marketing realm, and thus to the recognition of the innovative work of farmers as breeders.

- **Organic Heterogeneous Material and Organic Varieties**

The latest change in the EU seed marketing rules which allows the marketing of farmers' varieties stems from the new EU Organic Regulation 2018/484 and its innovative provisions on seeds, which will enter into force on 1st January 2022. Building on research on diverse populations and the temporary experiment on cereal populations, and guided by the objective of boosting the supply and use of organic seeds in organic production, the Organic Regulation derogates from applicable seed marketing rules, allowing (a) the marketing of seeds from 'organic heterogeneous material' (Article 3§18, and 13), and (b) opening the way towards a temporary experiment to assess the criteria for the description, production and marketing of seeds from 'organic varieties' (Preamble 39, Article 3§19). While the latter concept remains a product of formal organic breeding (Annex II Part 1.8.4), focusing on the enhancement of genetic diversity, and will remain within the mainstream paradigm of variety registration based on DUS and VCU protocols, albeit with adapted criteria, the former may very well lay down a new era in the marketing of seeds from farmers' populations. It should be noted that these developments were fought mainly by the European Parliament, which had a strong mandate on seeds in the long negotiations of the Regulation and were initially met with sharp resistance from other European public authorities, as well as the seed industry [35].

Indeed, the Organic Regulation defines 'organic heterogeneous material' as a plant grouping, but not a plant variety in the sense of UPOV; and establishes a comprehensive derogation to conventional variety registration and seed certification mechanisms. Registration of such material is based on a dossier (with no official examination and testing), comprising of different elements that essentially identify and describe the material and its history of breeding or production. Commission Delegated Regulation 2021/1189, adopted on 7th May 2021, but entering into force 1st January 2022, lays down the details of this entirely novel notification regime of organic heterogeneous material, and the production rules for seeds of such material. The text explicitly posits that organic heterogeneous material may be the result of "on-farm management practices, including selection, establishing or maintaining the material", i.e., the product of farmer innovation and agrobiodiversity management techniques and the knowledge of all social actors which take part in farmer seed systems. With no quantitative or geographical restrictions for the marketing of this material's seeds, whether in acreage or package size, the absence of mandatory seed certification, and the relatively light-touch procedures for the notification of material, which do not refer to complex technical questionnaires but rather an informative dossier, this new regime breaks with the paradigmatic and procedural

complexities that had previously prevented farmers to market their seeds in all legality and certainty. With its inherent flexibility and proportionate obligations with regards to seed quality or labelling requirements, it is also perhaps the closest reflection of the attributes and values of farmer seed systems. However, the entire system quite naturally comes together with the strict requirements and controls of organic certification, even though the seeds may be marketed after one or two generation of multiplication in full organic conditions depending on the species ((Annex II Part 1.8.2, notwithstanding applicable conversion periods if the operator was not certified organic beforehand).

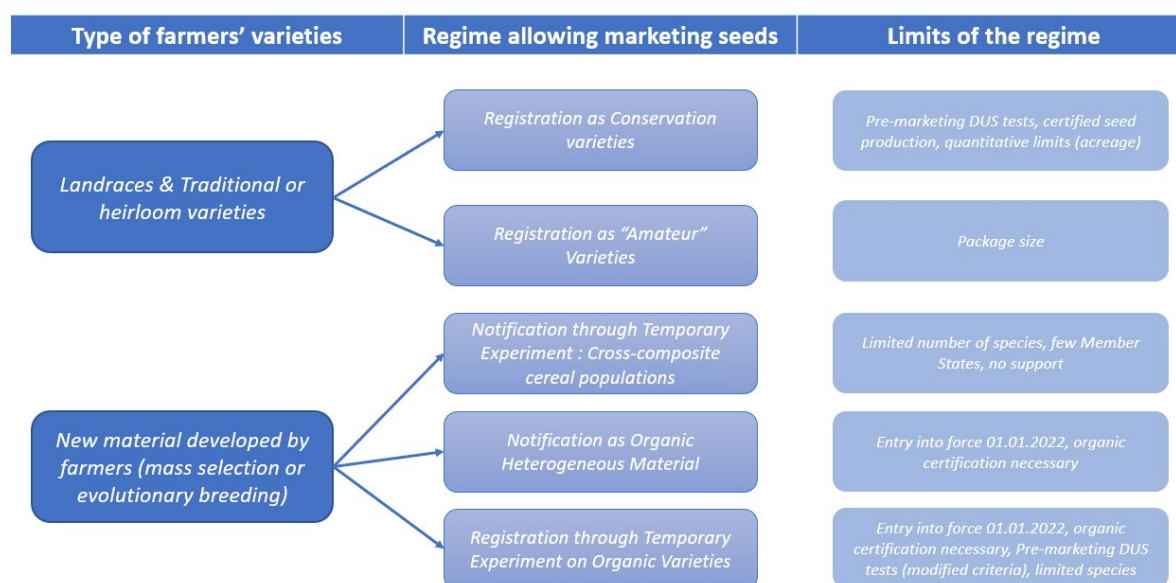


Figure 1. Different pathways for the registration of farmers' varieties in the EU

There are many ways in which seeds of different types of farmers' varieties may find their way into the market in the EU. Yet, the complexity of the regimes, drafted as derogations to mainstream rules and retaining their central paradigm, but also their inherent conceptual shortcomings, which view farmers' varieties as those at risk of genetic erosion needed to be conserved in certain regions, rather than the stand-alone product of farmer innovation and agrobiodiversity management practices, considerably constrict these opportunities' impacts on the support and development of farmer seed system and the diversity they represent. The recent changes seen in the legislation from 2014 onwards, which embrace diversity and heterogeneity, recognize the value of farmer-led innovation, and carve out a truly ad hoc marketing and production regime do show promise to palliate these shortcomings, but their true effects remain yet to be seen in practice.

### 3.2. Farmers' varieties in Switzerland

The Swiss conventional seed marketing regime is similar if not identical to the EU regime. Yet its stance on the registration of farmers' varieties is completely different, much more inclusive, flexible, and well-suited to the many needs and diversity of farmer seed systems. It should be first noted that the informal exchanges and sale of seeds between farmers are not viewed as commercial exploitation of seeds, nor is the sale of seeds in small packages, which can thus take place whether the variety is registered or not. The baseline for the recognition of farmer seed systems, and of its underlying social values, is thus already stronger in Switzerland compared to the EU. Yet the country has gone even further in such recognition, by carving out a specific and simple regime where both heirloom varieties and populations that are the product of farmer innovations can take their place.

In 2009 Switzerland reacted to activities that were initiated by the European Commission to change the existing EU seed marketing legislation. In parallel of the negotiations in the European Union, Switzerland started a process to change its existing “Ordinance on Seed and Planting Material of Field Crop and Fodder Plant Species and Vegetable Species of the Swiss federal department of commerce” dating from 1998, with the goal to harmonize it with the EU law. The process was led by the Swiss department of agriculture and accompanied by a public campaign called “Diversity for all” initiated by ProSpecieRara, a Swiss foundation for the conservation and recultivation of endangered cultivate plants and rare breeds. This campaign was supported by many different stakeholders like farmers-organizations, seed producers, breeders, and one of the largest supermarket chains in Switzerland (COOP) as well as some elected officials representing different political parties. After one year of consultations and discussions, the Swiss department of agriculture presented a new proposal that introduced several changes compared to the first draft and were finally adopted in 2010 [36].

In Art. 2 of the Ordinance, the new category of “niche variety” was introduced, with sub-categories of landraces, old varieties, ecotypes or “other varieties”. When registering a landrace or “local variety” (or an ecotype of forage plants), the applicant needs to indicate the origin (without any impact on its marketing) and attach its description or other information where available. For “old varieties”, defined as varieties that have not been included in any variety catalogue for at least 2 years, the applicant needs to attach an official description. The category of “other varieties” requires the applicant the attach a selection or breeding scheme, along with the related UPOV technical questionnaire, but with no official testing and some leniency in the implementation of the criteria. Indeed, the entire rationale of the regime of niche varieties is to allow the marketing of varieties without having to fulfil the requirements that normally ought to be fulfilled to be registered on the official national variety-catalogue (Value for Cultivation and Use, Distinctness, Uniformity and Stability). Even new selections or populations can be commercialized as “niche varieties” when the commercialized quantities do not exceed the amounts of those varieties that have been officially registered in the same species. The applicant must also declare that “to the best of their knowledge, the variety is not identical to any variety included in a Swiss or foreign variety catalogue, to any protected variety or any niche variety”.

Already in the old version of the ordinance the commercialization of seeds in little packages for amateurs was allowed without any registration in an official catalogue, as aforementioned. This approach was maintained, and the category of “niche varieties” remains solely relevant in a professional context where larger quantities of seeds are commercialized. Art. 29 of the Ordinance states that seeds of “niche varieties” are allowed to be commercialized without an official tag but with a sentence saying: “approved niche variety, seeds not certified”. The new legal framework also states that the Swiss department of agriculture “can” (but does not have to) determine quantitative restrictions. For field crops the department of agriculture defined a quantity of 0.1% per variety of the cultivated area in total for this specific species.

The approval of a niche variety needs a description that defines well the variety (no DUS or VCU testing needed) and the name of the seed producer. The place and way of seed propagation and how the commercialization process is organized. The registration fee (CHF 50.-) must be paid only once, and not every year. As of today, on the catalogue for approved niche-varieties, 41 vegetable varieties, 11 potato varieties, 7 cereal varieties and 4 maize-variety have been registered [37]. In an official submission, the Swiss authorities recognize that “the barriers for marketing old varieties are even high after granting the “Niche Variety”-status, as market-acceptance needs to be mediated along the complete value chain. For that reason, single farmers are not targeted by this regulation” [38]. The current intention is to also include the concept of niche varieties in the Fruit and Berry Planting Material Ordinance as part of the ongoing revision of the legal framework.

#### 4. Practical examples of variety registration strategies adopted by farmers and crop diversity initiatives in Europe

The uptake of derogatory regimes allowing the registration of farmers' varieties has been uneven throughout European territory. The engagement of social actors and farmers' associations in the registration process plays a key role in such uptake [7], but also depends to a large extent on the values that bring these actors together, which are as wide and diverse as the farmers' varieties they aim to conserve, manage and use: whether rooted in more liberal mindsets of seed freedom [39], to a deep contestation of regulatory regimes; just as their ties and cooperation with public researchers, and relationships with seed authorities [40]. Social actors involved in crop diversity management, whether farmer networks, seed saver organizations, or researchers, continue to be predominantly viewed as seed users or 'stakeholders mainly interested in biodiversity issues' by public authorities [41]. The level of dialogue between these social actors and national authorities therefore plays a key role in the recourse to the registration and uptake of farmers' varieties, raising trust in the system, and awareness on the activities and needs of these varied actors.

##### 4.2. Italy

As a network, Rete Semi Rurali has closely followed the pathway for registration of conservation varieties, trying to influence its implementation in Italy with the aim of opening new spaces for action for farmers. In particular, they have obtained a specific derogation for farmers who grow conservation varieties, allowing them to sell their seed with a simplified procedure compared to seed companies (Art. 19bis of the national law 1096/71 and Art.4 of the ministerial decree of 12 November 2009).

After a period of almost inactivity, with few applications for registration, the conservation variety regime started to get used more progressively. In the case of agricultural species, 80 conservation varieties have been registered or are in the process of being registered, broken down as follows: durum wheat (24), common wheat (23), maize (14), rice (13), rye (1), potato (2), spelt (1), and emmer monococcus (1) and dicoccus (2) (see table 1). In the case of vegetables, 42 conservation varieties were entered (Table 3) and 16 as having no intrinsic value (Table 2). So, if we look at the number of registered varieties, we could say that a good number of varieties are finding their way into the seed market, increasing the choices available to farmers and the diversity of the whole system. If we look at the seed production areas indicated in the applications for registration of agricultural species, we find that about 1,340 hectares are planned for a total production of about 2,500 tons of seed. These would be interesting numbers were it not for the fact that the reality is very different. In fact, moving from paper to the field, the 2018 data show that the total certified seed area for durum wheat, common wheat and rice was derisory at a paltry 64.96 hectares, and that in any case applications for certification concerned only 126.67 hectares. Out of the approximately 1,340 possible hectares, 126 hectares were applied for field inspection, of which about half were admitted for seed production. These numbers tell us that less than 5% of the potential of the seed that could be produced as conservation varieties was used and that there is a problem in the capacity of the actors to produce good seed if 50% of the fields were not found to be compliant. But another interesting fact emerges almost all the area affected by seed certification is in Sicily, 55 hectares out of the total, as if the rest of Italy was not yet affected by this phenomenon.

Even if there is as of today a relatively considerable number of conservation varieties registered in Italy, which points to a success story overall (80 for agricultural species, 58 for vegetables), this trend has also partly been driven by a rhetoric similar to the one which underlies the registration of landraces in regional agrobiodiversity registers: local, traditional, farmers' varieties are seen as a static resource, to be maintained untouched in their genetic identity by any possible variation [42]. While this rhetoric is sometimes driven by good intentions, it also has become functional to commercial interests: not unfrequently,

the registration of a conservation variety becomes a first step to branding and protecting a niche market for the end products from that variety, which hence becomes somewhat exclusive to the actors within that niche and very restricted geographical area. This reduces landraces' dynamic, ever-changing and adaptable nature, which determines their resilience and adaptability, to a static, commodity-based dimension, and sometimes even brings the resource at the border of the public domain in which it should be maintained [42].

Phenomena as the above led RSR to question a purely conservation-focused approach and to get more involved in dynamic management of on farm agrobiodiversity, including a strong focus on participatory research and seed system-wide innovation. On account of the network's participation into several EU research projects, including those mentioned above, and building upon the tools and relations accumulated throughout the years by the association, full advantage was taken of the temporary experiment allowing the marketing of populations in Italy. In constant dialogue with public authorities, RSR helped establish a baseline procedure for on farm certification of the populations not using the standard DUS criteria, and developed a transparent labelling system for the population seed presenting the participatory breeding process, the actors involved, and social rules associated to the seed packages, as well as the construction of a financial sustainability mechanism for RSR to reap some benefit from the sale of such seed, transitioning to a more self-sustaining research and development model for the future [42]. The association is now preparing to notify material of several other evolutionary populations in different species (tomato, courgette, bean, chickpea, maize, rice, oat) as Organic Heterogeneous Material, seen as a key tool to pave the way for more diverse and inclusive seed systems in organic agriculture.

#### 4.3. Switzerland

During the last 10 years working under the new Swiss ordinance mentioned above, ProSpecieRara was able to reintroduce about 50 varieties into different marketing channels. Most of them with the biggest supermarket chain in Switzerland that offers a large scale of organic vegetables. During all these years, ProSpecieRara never got in conflict with any quantitative or regional restrictions imposed by the actual directive described above. In general, ProSpecieRara construes, that for Switzerland all the involved parties have found a valuable solution that leaves seed savers communities as well as the labelling and marketing-organization ProSpecieRara has found enough freedom to operate to introduce landraces, old varieties, and neglected species under the umbrella of the category "niche varieties" back to the existing commercial value chain. Nevertheless, it would be desirable if niche varieties from Switzerland could also find their way into the European Variety Catalogue and thus be commercialized in the EU.

### 5. Shortcomings of existing pathways and ways forward toward a more inclusive regime

The criteria upheld by conventional seed marketing laws to determine access to the market and subsequent production rules, their interpretation by authorities and competent committees, along with associated costs, implementation and control mechanisms are not suited for the identification of varieties appropriate for small-holder farming in ecologically diverse conditions [43]. Although the EU Directives do not outright ban the production and marketing of farmer-produced seeds, they rarely integrate farmers' representatives in their technical expert groups and committees, all the while creating important hurdles for the development of community-based and small seed enterprises [24]. These entities are yet more likely to develop and market farmers' varieties or varieties more adapted to specific agro-ecological conditions, as opposed to the larger market segments commonly targeted by larger commercial entities. Faced with the reality of inappropriate standards and the inadequate opportunities for new entrants to the seed system,

such as social actors engaged in agrobiodiversity management, scholars have advocated for a different regulatory approach to seed marketing, shifting the role of public authorities towards technical and policy support for the development of a wider range of seed provision options, rather than ensuring the direct supervision of seed production [8].

These options undeniably exist in the European continent, but rarely address the variety of material conserved, managed and developed by farmers, nor do they adequately represent the dynamic social ties and values that bring them together [44]. The main goals of European seed marketing legislation remain rooted in the need to enhance agricultural productivity by providing high-quality seeds of uniform varieties. Farmers are first and foremost viewed as users of the seed marketing system, and then gradually recognized as stewards of agricultural genetic diversity. That is why the wider objectives of international agreements such as the International Treaty on Plant Genetic Resources for Food and Agriculture and the Convention on Biological Diversity are now also taken into account and cited in the legislation's preambles [17]. This explains the initial static approach of the EU towards farmers' varieties, literally coining landraces registered for marketing 'conservation varieties', before timidly making steps towards the inclusion of the products of farmer innovation into the realm of seed marketing. Indeed, the European Union has effectively only allowed populations of certain cereals to enter the market merely 6 years ago, and has now extended the opportunity in all species, also beyond the specific products that are cross-composite population, embracing the wide notion of evolutionary breeding and farmer selections, albeit solely in the context of organic agriculture, and with considerable reserve at first. Conversely, the space carved for farmer seed systems in Switzerland, not only through the strict definition of seed marketing, which does not outlaw the exchange, sale and use of seeds within farmer seed systems outside of formal commercial exploitation, but also through the concept of niche varieties, which encompasses both a static conservationist approach to prevent the loss of heirloom and traditional varieties, and a more dynamic approach allowing for the registration and marketing of newly developed varieties and populations, better reflects the need of farmer seed networks.

The future reform of the EU seed marketing acquis, which will lead to the publication of a proposal by the European Commission at the end of 2022 is a significant opportunity to palliate to the conceptual and practical shortcomings of currently applicable rules with regards to farmers' varieties, and mirror perhaps the Swiss approach. Preparatory documents submitted to the EU Member States explicitly mention the need to align the legislation to international law, but also to the general political objectives set out by the EU in its European Green Deal, and especially its Farm to Fork and Biodiversity Strategies [45]. The Commission's Farm to Fork Strategy specifically addresses the issue of seed security and diversity, announcing 'measures to facilitate the registration of seed varieties, including for organic farming, and to ensure easier market access for traditional and locally-adapted varieties' [46]. Although no official text has been put forward yet at the time of writing, the European Commission has published a so-called "Inception Impact Assessment" [47], which precedes the full impact assessment that any major legislative proposal needs to go through before it is submitted to the co-legislators of the EU, the EU Parliament and Council. This document outlines different policy options for the future reform, with very different potential impacts on farmer seed systems. While in a number of envisaged pathways towards reform, the mere exchange of seeds between farmers would amount to seed marketing, another option points to the establishment of an *ad hoc* regime for the exchange of seed between farmers or excluding seed conservation networks from the scope of the rules [45]. It is yet to be seen to which extent the current rules on the registration and marketing of conservation and amateur varieties will be reshaped, and whether they could offer a simple and efficient way into the market for the wide range of farmers' varieties, as it is the case in Switzerland. As shown by the case study of Italy, the participation of farmers and associated social actors from the beginning of any process related to the marketing of farmers varieties is key to build trust between public authorities and these actors, but also ensure engagement of these actors in the actual process of

registration and seed production. When the regime fails to reflect the needs and values of these actors, for instance by imposing criteria and language built for the needs of industrial plant breeders, by disproportionately limiting the scale of marketing opportunities, by focusing public authorities' role on the control of seed production rather than a supporting one, or by not providing enough guarantees against misappropriation, it is bound to be under-used by the very actors it was designed for. Without breaking with the current monopoly of the UPOV-led paradigm to open to door for seed marketing, and without acknowledging the complexity of farmer seed systems, the right to seeds and accompanying State obligations recognized in the art. 9 of the International Treaty on Plant Genetic Resources for Food and Agriculture and in the United Nations Declaration on the Right of Peasants and People Living in Rural Areas will not be fulfilled in the European continent.

## 6. Conclusions

Seed marketing rules of the European Union and Switzerland both start with the premise of ensuring high guarantees and procedural safeguards for developers and users of industrial crop production. About ten years ago, both have nonetheless carved out some room for farmers' varieties, whether more traditional landraces or more diverse new populations. Swiss authorities have favored a simpler and single regime for niche varieties, which provides enough flexibility to encompass the different needs of social actors engaged in the conservation, sustainable use, and dynamic management of agricultural biodiversity, with loose limits on the quantity of seeds to be marketed under the regime. Farmers and associated social actors in the EU on the other hand need to navigate a complex web of incomplete pathways into the market, putting emphasis on agrobiodiversity conservation, rather than social empowerment or the recognition of farmer innovation. Understanding the drive, needs and difficulties of the different actors which play a role in farmer seed systems and networks, preserving their specificities outside of the world of seed marketing, all the while constructing adequate pathways for the varieties conserved, managed, and developed by these actors into the market will be key in the way forward to a sustainable and just EU reform.

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## Data

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