Agriculture and Human Values (2024) 41:1825–1840
https://doi.org/10.1007/s10460-024-10581-4

Saving, sharing and shaping landrace seeds in commons: unravelling seed commoning norms for furthering agrobiodiversity

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Accepted: 15 April 2024 / Published online: 28 June 2024

Abstract

One of the major challenges facing agricultural and food systems today is the loss of agrobiodiversity. Considering the current impasse of preventing the worldwide loss of crop diversity, this paper highlights the possibility for a radical reorientation of current legal seed frameworks that could provide more space for alternative seed systems to evolve which centre on norms that support on-farm agrobiodiversity. Understanding the underlying norms that shape seed commons are important, since norms both delimit and contribute to what ultimately will constitute the seeds and who will ultimately have access to the seeds and thus to the extent to which agrobiodiversity is upheld and supported. This paper applies a commoning approach to explore the underpinning norms of a Swedish seed commons initiative and discusses the potential for furthering agrobiodiversity in the context of wider legal and authoritative discourses on seed enclosure. The paper shows how the seed commoning system is shaped and protected by a particular set of farming norms, which allows for sharing seeds among those who adhere to the norms but excludes those who will not. The paper further illustrates how farmers have been able to navigate fragile legal and economic pathways to collectively organize around landrace seeds, which function as an epistemic farming community, that maintain landraces from the past and shape new landraces for the present, adapted to diverse agro-ecological environments for low-input agriculture. The paper reveals how the ascribed norms to the seed commons in combination with the current seed laws set a certain limit to the extent to which agrobiodiversity is upheld and supported and discusses why prescriptions of "getting institutions right" for seed governance are difficult at best, when considering the shifting socio-nature of seeds. To further increase agrobiodiversity, the paper suggests future seed laws are redirected to the sustenance of a proliferation of protected seed commoning systems that can supply locally adapted plant material for diverse groups of farmers and farming systems.

Keywords Seed commons · Farming norms · Commoning · Commons · Environmental governance · Landrace cultivation · Landrace seeds · Landrace varieties · Agrobiodiversity · Heritage seeds · Seed swapping · Crop diversity · Socio-nature · Bio-cultural commons

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Introduction

Seeds are the cornerstone of global food systems and human survival. Seeds and particularly landrace seeds convey keys to agrobiodiversity and they can be seen as repositories not only of genetic diversity but also of certain forms of farming knowledge and practices, reflecting, e.g., historical breeding practices and farming techniques (Zeven 1998).

Farmers access to seeds and knowledge about landraces, i.e., genetically diverse varieties with a historical origin, has eroded substantially over the past 70 years (Camacho Villa et al. 2005). These developments have been attributed to greater reliance on a smaller number of crops and to the introduction of modern plant breeding, including hybrid varieties, patents and supportive public policies, which have resulted in high yielding varieties conditioned by high nutrient availability. However, these developments have also constrained farmers ability to save and develop their own varieties and contributed to the narrowing of agrobiodiversity (Fowler and Mooney 1990; Fitzgerald 1993; Serpolay et al. 2011; Kloppenburg 2014; Wattnem 2016; Batur et al. 2021). Seeds have shifted from being a resource controlled by farmers to be increasingly controlled by a few multinational plant breeding and agrochemical companies (Kloppenburg 2010; Lammerts van Bueren et al. 2018). Currently four companies control more than half of the world's seed sales and the same companies account for more than 60% of global agrochemical sales (ETC Group 2022; Howard 2021). This concentration has been accompanied with a strong focus on the developments of a few commercial crops, grown in high yielding and high-input agricultural systems, while alternative farming systems such as organic low-input agricultural systems have suffered a lack of suitable varieties (Kloppenburg 2010; Ortman et al. 2023).

The past decades have however, witnessed a resurgence for cultivating landrace cereals in Europe and North America (see e.g., Mazé et al. 2021a; Varia et al. 2021; Martin et al. 2023; Ortman et al. 2023). This resurgence has been attributed to a response to lack of varieties adapted to organic or low-input conditions (Wolfe et al. 2008), but also to growing concerns that agrobiodiversity[1] is decreasing and to a general will to democratise plant breeding (Montenegro de Wit 2016, Kloppenburg 2014). Alongside this resurgence, farmers, scientists and NGOs have experimented with and developed sophisticated seed networks and participatory breeding programmes including, e.g., freelance crop breeding (Deppe 2021), and the Open Source Seeds Initiative[2] (Kloppenburg 2014), which are advanced as alternatives to patent-protected-seeds[3]. Some of these networks also function as new forms of seed commons, where farmers not only store and share seeds with an historical origin, but also experiences on how to cultivate, process and propagate new landrace seeds for the present (and the future) (see e.g., Kloppenburg 2004; Mazé et al. 2021b; Tschersich 2021).

Parallel to these developments new policies and international treaties for seed protection, most notably the Convention of Biological Diversity (CBD) and the International Seed Treaty (ITPGRFA) have been launched, in attempts to promote agrobiodiversity and safeguard farmers rights to seeds and related knowledge[4]. In the EU, however, these new treaties and policies have had limited effect on agrobiodiversity and EUs seed legislation have been criticised for its limited space to address the complex socio-economic values and diversity of farming systems (Batur et al. 2021). According to EUs seed legislation, new seed varieties must be registered before they can be sold commercially and to register seeds, any new variety must comply to the so called DUS-criteria of seed distinctiveness, uniformity and stability. The DUS-criteria, which will be further discussed, have had performative effect on farmers' abilities to collectively develop and protect seeds in commons.

Diverse forms of seed commons have been studied earlier, including their governance and organizational structure and their contributions to sustainable farming and biodiversity (e.g., Kloppenburg 2014; Frison 2018; Sievers-Glotzbach and Christinck 2021). Recent studies that apply a commoning approach to seeds, includes, e.g., Montenegro de Wit's (2019) work on the Open Source Initiative for creating protected seed commons in the US, Mazé et al. (2021a) study on seed commons in France and Sievers-Globatach et al.'s (2020) comparative study on different seed commons in Germany and the Philippines. These studies show among other things the importance of paying attention to seed commons as particular knowledge and network commons where knowledge on seed saving and cultivation is passed on and transmitted through farmer networks as well as to the seeds.

Less attention has, however, been paid to the underpinning norms and processes that shape and protect particular seed commons. Understanding the processes and norms that shape and protect seed commons are crucial for managing

[1] Agrobiodiversity is a term that includes genetic diversity, but also farming and landscape level diversity (Pautasso et al. 2013; Zimmerer et al. 2019).

[2] The Open Source Seed Initiative (OSSI) is a US based organization that has developed a mechanism through which plant breeders can designate new crop varieties they have bred as an open source. This mechanism is advanced as an alternative to by large agriculture companies.

[3] For an overview of the recent developments of different participatory plant breeding models in the Global North, see Colley et al. (2021)

[4] For a more in-depth political and legal analysis of the Seed treaty, the CBD and EU's seed legislation, see e.g. Sherman 2022; Batur et al. 2021; Adhikari et al. 2021; Tschersich 2021; Frison 2018 & 2016; Coolsaet et al. 2015 and Halewood et al. 2012.

and maintaining agrobiodiversity. Norms both delimit and contribute to what ultimately will constitute the seeds and who will ultimately have access to the seeds and thus to the extent to which agrobiodiversity is upheld and supported. Moreover, seeds and seed commons are not just merely fixed "goods" with certain fixed (de jure) characteristics, but can rather be seen as shifting social-natural and relational resources (as opposed to 'rational' in an economic sense) that are constructed around particular norms that both facilitate and restrict farmers access to seeds.

In order to attend to the shifting socio-nature of seeds and its institutional ramifications, this paper explores the underpinning norms behind a Swedish seed commoning system for landrace cereals. The paper discusses the potential for furthering agrobiodiversity in the context of wider legal and authoritative discourses on seed enclosure and highlights why design principles and legal frameworks in respect to seed commons and agrobiodiversity are difficult at best. The paper argues that more attention is needed to understand the continuously changing socio-nature of seeds and the unanticipated outcomes that emerge in commoning processes around seeds. The paper further suggests future legal frameworks to be redirected to the facilitation of proliferation of a diversity of protected seed commoning systems, revolving around norms promoting agrobiodiversity.

The paper is organised in five sections. Firstly, a theory section where we explain our commoning approach and define central concepts for the study, which is followed by a data and methods section. Thirdly, the paper provides a brief background and context to the seed commons association of *Allkorn* and its transformation from a participatory plant breeding research project to a farmer and member driven seed commons. Fourthly, the paper investigates how the commoning processes around landrace seeds are characterised by certain norms and farming practices that contribute to agrobiodiversity, through the co-production of new landrace varieties but also to certain norms that determine who will have access to the seeds. The section also highlights how the commoning processes emerge in a legal grey zone and to wider authoritarian narratives of seed enclosures, and in relation to a growing international call for seed- and food sovereignty. Finally, the paper summarizes the results and discusses the potential for furthering agrobiodiversity and seed commons protection when considering the shifting socio-nature of seeds in light of wider legal and authoritative discourses on seed enclosure.

Conceptualising seeds, commons and commoning

Much of what has been written on commons generally departs from Ostrom's nominal work on common pool resources and in response to the flawed theory of the tragedy of the commons (Hardin 1968). Ostrom (1990 and 2000) showed, by combining game-theory and case studies, how informed individuals could avoid the tragedy of the commons and undertake successful collective action to protect commons resources without requiring the intervention of the state or through private property rights. Ostrom's work has been criticized from a critical institutional perspective for not paying enough attention to contextual factors shaping commons, e.g., how commons are shaped by ideals and norms in the intersection of history, politics and contemporary narratives (Sandström 2008; Cleaver 2002, 2012; Cleaver and De Koning 2015). Recent work on the commons emphasises, for example, that institutions that govern resources (such as seed commons) are not just rules and laws shaped by means of reducing transaction cost (Ostrom 1990), but rather shaped through socio-natural relationships, which are imbued with inequities and power relations that impact whether and how individuals get access to commons resources (see, e.g., Sandström 2008; Cleaver 2012; Singleton 2017). Sievers-Glotzbach et al. (2020a) identify four shared characteristics of seed commons (1) collective responsibility; (2) protection from private enclosure; (3) collective, polycentric management of seeds and/or varieties; and (4) sharing of knowledge and practical skills relating to breeding, seed management as well as cultivation and use.

Furthermore, seeds are not pure common pool resources (i.e., it is costly to exclude others from the resource and the use of the resource affects the possibility for others to use the same resource), nor are they pure examples of so called cultural commons, e.g., digital and knowledge commons, where e.g. the use of information does not necessarily affect the possibility for others to use the same source of information. They are somewhere in between (see also Sievers-Glotzbach et al. 2020 a and b). Seeds can thus instead be seen as bio-cultural resources, as they are as much human-made "cultural" products as they are "natural" resources. They have co-evolved through centuries of human and natural selection pressures that have contributed to the domestication, and evolution of genetically distinct populations of those crops.

As a consequence, seeds cannot (per-se) be easily translated into the type of resource dilemma of overexploitation that are often associated with common pool resources. In light of the current agrobiodiversity loss, it is not the overuse of different seeds varieties (e.g. landraces) that are

threatened. What is threatened is instead their underuse and the very social-fabric of the seeds themselves (the seed commons), i.e. the diversity of norms, knowledge and practices that collectively uphold seed diversity, including the socio-ecological milieus' and moral economies in which they are embedded.

Moreover, seeds are not merely material resources with specific user's rights attached. Instead, seeds and the associated collective practices of seed management can be seen as a process of commoning and reinvention that are formed to suit not only current needs but future needs as well (cf. Sandström 2008; Cleaver 2012; Sandström et al. 2017). Seeds can in this regard be seen as inherent emergent bio-cultural and relational resources that continuously co-evolves with the surrounding material and immaterial (social) milieu. Thus, seeds are not merely stable resources inherited with certain fixed attributes, but can rather be seen as a dynamic field of socio-ecological practice that is embedded in social relations and norms though processes of commoning (cf. Sandström 2017; Balázs and Aistara 2018; Mazé et al. 2021b).

In order to attend to the co-evolving nature of seeds and associated norms that constitute seed commons, this article applies a commoning approach (Bollier and Helfrich 2012; Sandström 2017; Mazé et al. 2021a) to illustrate the continuously evolving and embedded socio-natures of seeds. Montenegro de Wit (2019) argues that (seed) commons can be understood as a tripartite relationship between a resource, a community and a set of social protocols (norm systems) that are constantly formed and reshaped. The notion of norms is assumed to be important for the insights they can provide for highlighting shared beliefs about behaviour, e.g., certain farming norms in relation to, e.g., seed propagation and cultivation. Norms are contingent on context, social groups and historical circumstances. They regulate behaviour and creates boundaries that allow for differentiation between those belonging to a specific social setting and resource (seed) system and those that do not. Thus, they are distinct from, e.g., ideas, attitudes and values, which can be held privately, and which do not necessarily concern behaviour.

The above conceptualisation of seeds, commons and commoning allows us to critically reflect not only on how access to seeds is relational and guided by particular norms of farming, but also how the resource (the seeds) and the commons itself is constantly evolving in the intersection of certain negotiated norms and practices in relation to changing diverse socio-ecological environments. Framing the analysis in this way makes it possible to elucidate how, for example, various administrative, economic and legal struggles over seed crops (landraces) intertwine, and how certain norms ascribed to, e.g., landrace cultivation and seed performance co-evolves over time. It also assists to explain, which will be further discussed, why it is so difficult to design institutions and legal frameworks for seed commons protection.

Data and methods

In order to explore the underpinning norms behind seed commoning and its potential for furthering agrobiodiversity, an interview study with farmers on 37 farms where landraces were grown was carried out between 2019 and 2022[5]. We also conducted participatory observations at meetings at the Swedish landrace seed association *Allkorn*, where the farmers were affiliated. All interviewed farmers were organic, and all farmers cultivated landrace cereals on a commercial basis and earned their main income from farming. About half of the farmers kept livestock and in total the farmers grew more than 40 different varieties of landrace cereals, managing between 2 and 14 different landraces in their crop-rotation on a regular basis. The farm size ranged from a few hectares to 600 hectares with most farms in the range of 30–80 hectares. All farms were located in the southern part of Sweden (below latitude 62) of which a majority of the farms were situated in mixed agriculture-forest landscapes, with only a few farms on the more fertile agricultural plains. About half of the farmers stated their farms being located on marginal agricultural land with less fertile soils and all farmers sold their products either to small scale mills specialised in landrace cereals and/or directly to consumers through e.g. farm shops, farmers' markets and artisanal bakers.

We interviewed 39 men and 6 women and (of which 8 interviews were carried out with several persons present e.g., husband and wife, parent and grown up children). The interviews were semi-structured, using open-ended questions, where we asked questions about, e.g., what landraces the farmers grew, how they had received access to the seeds and their motives for cultivating landrace cereals. A majority of the interviews took place at the farm and in connection with the interviews we also walked around the farm together with the farmers, where we visited agricultural fields and buildings connected with the landrace cereal production, e.g., mills, silos, barns and farm shops. The interviews were conducted in connection with a research project that carried out on-farm experiments with landrace rye which involved repeated visits over a two-year period, thus providing opportunities for continued discussion with the farmers on issues such as procedures for seed saving and seed sharing practices.

[5] The main part of the interviews was carried out in the autumn 2020, and the farms were re-visited during 2021 and 2022.

In order to broaden our understanding on how the seed commons of Allkorn is shaped and operates we also participated in eight events arranged by the Allkorn seed association, including conferences, on farm workshops, seminars and annual meetings. Farmers that we discussed with during these events were both professional farmers and hobby farmers, of which several of the hobby farmers were so called "back-to-the-landers", with little prior experience in agriculture (cf. Sandström 2023). We also followed the Allkorn Facebook group, where farmers discussed issues related to seed saving and exchanged seeds and equipment. All interviews were recorded and transcribed and the Allkorn meetings were recorded in field notes.

In order to reveal patters with regards to specific farming norms that encircle the commons for cultivating landrace cereals, the material was analysed abductively, inspired by a qualitative content analysis approach (Bryman 2016). Several of the farming norms embedded within the seed commons of Allkorn were disclosed in statements where farmers talked about their motives of cultivating landrace cereals and when they discussed issues related to seed exchange and seed propagation. When reading through the transcriptions and field notes, several recurring themes could be discerned that we perceived as representative and revealing common patterns with respect to farmers' norms and seed practices. These text sections were coded by using different colours and categorized under four themes. Illustrative quotes from the different themes were subsequently selected and translated from Swedish to English as presented in the results section further below.

The Allkorn seed association

In Sweden, the seed association Allkorn, meaning approximately "grains for all", was founded in 1995 and it is the major organisation for landrace cereal seed exchange and seed propagation in the country. The association started as a participatory plant breeding project initiated by an organic plant breeder connected to the Swedish University of Agricultural Sciences, in collaboration with farmers with an interest in growing landrace cereals. Landrace seeds were collected from both the Nordic Genetic Resource Centre (NORDGEN[6]) and from farmers that were still cultivating landraces, but also from community seed banks in Europe (mostly from the Nordic countries, Germany, the Czech republic and Georgia). In the beginning the organisation mainly comprised a handful organic farmers, but today (2023), the association has more than 450 members including hobby farmers, bakers, researchers and others with an interest in supporting landrace cultivation. Of these members, about 40–50 farmers can be considered as commercial farmers, the majority of whom are included in this study. Currently, the market for landrace cereals constitutes a limited niche market where landrace grains contributes with a negligible share of the total grain market in the country.

An important aim of Allkorn is to facilitate farmers' access to landraces that suit their local farming conditions. In order to facilitate local adaptation of landraces to specific farming conditions, Allkorn encourages members to develop their own farm-varieties by cultivating so-called evolutionary mixes comprising a blend of varieties from Swedish and several other European landrace sources that are grown together and successively evolve into locally adapted landrace populations[7] (Döring et al. 2011). When the landrace is considered to have adapted to the local conditions of the farm, a procedure that usually takes some years of cultivation and selection, farmers often name the locally adapted landrace after their farm or after the region, they originate from[8].

Another initiative that Allkorn members are engaged in is the development of a common seed bank (*Bruksgenbanken)*. The seeds that Allkorn propagate and maintain in the seed bank originate from the collection made by the founder (who has now retired) and include hundreds of different landrace varieties of bread wheat, rye, barley, oats, emmer wheat, einkorn wheat and spelt wheat. The seeds are stored in a container with a cooling system located at one of the member's farm, and revived on a regular basis by the members. The members receive seeds from several different landraces, propagate them and resubmit a similar amount as they received to the seed bank, keeping the rest of the seeds for their own use for further propagation. The quantities of seeds revived through the seed bank are generally rather small (0.5–50 kilos, often 1–10 kg per farmer).

Some of the most engaged farmers in Allkorn also propagate in-situ seed banks on a larger field scale, a task that is rotated between a handful of farmers every year (one farmer per year). The members of Allkorn can apply for taking out

[6] NordGen is a governmental sponsored institution under the Nordic Council of Ministers, working as gene bank and knowledge centre to promote the conservation of genetic resources within plants, farm animals and forestry. Allkorn cooperates with the NordGene and at times they invite officials from NordGen to attend their conferences and meetings. However, the Allkorn farmers do not use seeds from the Nordic genebank that very much any longer. At times individual farmer's order very small batches of seeds from the NordGen to propagate for themselves, but it generally takes several years before they have enough seeds to be sown on a commercial scale.

[7] Evolutionary mixes consist of a mixture of different landraces varieties. The high genetic diversity of the evolutionary mixtures enables them to adapt to varying conditions, and are considered by the farmers to make them more robust and therefore suitable in organic farming (see also e.g. Ceccarelli and Grando 2020.

[8] Personal communication with Hans Larsson, founder of Allkorn.

larger quantities of a certain landrace, and sometimes at Allkorn meetings all members who attend receive a small batch of a landrace. Another common way to access seeds is by exchanging seeds through personal networks and through more organised regional networks. The regional networks are often engaged in propagating and maintaining "their own" regional landrace varieties, which usually are maintained and stored on one or a few farms locally.

Besides propagating and facilitating access to landrace seeds, Allkorn arranges courses, field walks and conferences for their members, where they share experiences, knowledge and advice on how to cultivate landrace cereals. Allkorn also has a member's magazine (named *Mångfald*, meaning "diversity"), a homepage with a market place function, and a social media platform.

Underpinning norms for commoning the seeds

When investigating the underpinning norms of the seed commoning system of Allkorn, it is possible to distinguish the following four interlinked overarching themes, which will be further elaborated below.

i) Cultivating biodiversity in common(s).
ii) Cultivating freedom in commons.
iii) Protecting the commons and common concerns.
iv) Sharing and caring for seeds in reciprocity.

Within these themes it is possible to discern a set of underpinning norms that function as lines of inclusion and exclusion of who should have access to landrace seeds, which contributes to what does and does not constitute the resource (the seeds), and who participates in the seed commons and who does not. These norms often become salient in, e.g., narratives when farmers talk about the legal manoeuvre-room for seed exchange and in farmers' discussions about appropriate ways to store, propagate, grow and market landraces.

I) Cultivating diversity in common(s)

Maintaining and improving agrobiodiversity is at the heart of the seed commoning processes of Allkorn, both a genetic diversity *within* landraces and *of available* landraces. In the portal paragraph of the association's statutes, it is stated that the organisation should "*promote the production and development of a diversity of locally adapted varieties of cereals and other types of seeds for organic cultivation*" (Allkorn, § 2, 2022). The focus of Allkorn is the promotion of landraces, a term that is used by the farmers that embraces both evolutionary mixes and varieties that were released before 1950, since these varieties are considered as genetically diverse, and particularly interesting for organic cultivation under low input conditions. The aim is to both conserve landraces in-situ and to develop new landraces.

A high genetic diversity enables, in the farmers' descriptions, landrace populations to adapt to place-specific agro-ecological environments and farming practices. This adaptability of the landraces allows the farmers to apply less intensive cultivation methods in terms of, e.g., weed management or low-till strategies, measures that in turn enhances the general biodiversity at the farm, both in the soil and in creating a more diverse weed flora of less competitive weeds[9]. The ambitions of farmers to enhance agrobiodiversity at farm scale is thus related to a strong norm to maintain a large heterogeneity within the different landrace varieties, and to an overriding norm and practice of performing low-input organic farming (see also Ortman et al. 2023). The cultivation of landraces contributes in this way to generate agrobiodiversity at many different levels, from genes to varieties and crop species, from farming methods to landscape composition (see also Pautasso et al. 2013).

The appreciation and importance of the diversity *within* landraces can further be illustrated by the following story when visiting a farmer with a farm shop that was filled from floor to roof with bags of flour, pasta, and other landrace cereal products.

"*Here is my newest variant*", says W and points at a bag of wheat. It is a bag with evolutionary wheat developed by the farmer himself to suit the conditions of the farm. The bag is decorated with a picture of a wheat plant, where all of the kernels of the ear are painted with different colours. "*It's like the Pride flag see, celebrating diversity!*" (Field notes, farm visit Farmer W).

The norms about agrobiodiversity in connection to landrace cereal cultivation do however not comply well with the current legal framework of seed exchange. According to current legislation, seeds of most landraces can only be sold in Sweden if the seeds are registered on the so called EU list of conservation varieties, with exception for a few species, like emmer wheat (Commission Directive 2008/62/EC). In order to register landraces as a conservation variety, farmers have to show that the landraces are homogenous, uniform and have a historical background originating from a certain area (se also Batur et al. 2021). The landrace must also be preserved in the Nordic Gene Bank.

In our interviews, farmers state that they are reluctant to formally register their landrace cereals and no farmer has yet registered any landraces on the list (Swedish board of Agriculture 2022). When asking farmers why they do not register their landrace cereal seeds, they often state that it

[9] A diverse weed flora of less competitive weeds is more preferred than a weed flora of a few dominating weeds.

is pointless, since landrace cereal seeds generally are too heterogeneous and dynamic to comply with the EU regulations. The fact that landrace cereals are dynamic and characterised by high genetic diversity thus makes the bureaucratic demands of homogeneity and uniformity contradictory to the nature of landraces according to the farmers (see also Gustafsson 2022; Ortman et al. 2023).

Instead "free seed exchange" is forwarded by the farmers as a necessary condition for promoting agrobiodiversity and genetic diversity of landrace seeds. One farmer expressed the following when asked about his views of the current seed legislation:

> *Well, we believe in…a free seed exchange between [growers]…that's what creates the diversity, that there are no restrictions.* (Farmer Z1)

The argument of free seed exchange as a prerequisite for genetic diversity and agrobiodiversity at field and farm scale is also salient in particular farming practices related to on-farm seed propagation of new seed varieties. As mentioned before, a common seed propagation practice is the cultivation of so-called evolutionary mixes, comprising a diverse blend of different landrace varieties. Farmers who use these mixtures describe how high genetic diversity within the evolutionary mixture enables seeds to evolve into a robust landrace population that is adapted to farm specific conditions as well as to different farming practices. Through such seed commoning practices, the farmers in the Allkorn seed association are not just involved in maintaining historical landrace varieties from the past, but also in the co-production of new landrace varieties that are adapted to suit diverse socio-ecological environments and farming practices.

In order to circumvent the regulation, farmers exchange landrace seeds in small quantities with each other through the network of Allkorn, something that is considered as a legal exception according to officials from the Swedish Board of Agriculture, as long as it is not done on a commercial basis. In this way, farmers can avoid the difficulties they associate with seed registration, while at the same time exchange seeds in accordance with the seed law. However, several of the interviewed farmers are worried about the long-term consequences of only being allowed to share small amounts of seed with each other. Some farmers argue that even the current system of exchanging small amounts of seeds with each other could threaten the genetic diversity of the landrace varieties in the long run, since small initial amounts of seeds means that there will be fewer kernels that can be passed on to the next generation, causing genetic drift (see also, e.g., Hysing et al. 2008).

II) Cultivating freedom in commons(s)

"Free seed exchange" is a recurring expression used by the farmers. Beyond appearing in expressions as a prerequisite for maintaining and developing landrace diversity and agrobiodiversity at the farm, "free seed exchange" also appears in relation to narratives about the legal framework and multinational agri-food businesses.

Farmers often talk about seed exchange as a legal grey zone, and they describe that there are no clear guidelines on what is considered as legal or illegal seed exchange.

> *It's almost illegal, and it's probably only thanks to the fact that I'm a member of Allkorn, and maybe if I was part of a research project, that you can get by. It's a bit illegal to deal with seeds and everything. (Farmer L)*

Although the current legislation allows exchange of small quantities of seeds in restricted networks, or as part of research projects, some farmers circumvent the current legislation by selling larger quantities of seeds as animal feed:

> *I always sell my seeds as feed, and if someone is stupid enough to sow the feed grain, that's not my business, right? (winks) (Farmer B during informal talk & walk around the field).*

Other farmers acquire larger quantities of landrace seeds by exchanging seeds for services:

> *I swapped [seeds] with a farming colleague, I helped him with the silage pressing and he gave me seeds, that's how I received my landrace rye.* (Farmer P)

This hedging of the seed regulations enables some farmers to access larger quantities of landrace seeds.

There is a widespread notion among the farmers that landraces should be regarded as a common good and in general farmers oppose the idea of being registered as an "owner" of the seeds, with the argument that landrace seeds should be free to distribute and that no one should have the right to claim private ownership over seeds. During a meeting concerning landrace seed registration between representatives of Allkorn and the Swedish Board of Agriculture, the chairperson of Allkorn stated the following:

> We don't want it to be like Finland, where the old farmers sit on their landrace seeds and refuse to share it, just because they have registered it.

According to the farmers, officials from Swedish Board of Agriculture have a more accepting attitude towards landrace

seed exchange since the changes in the EU seed legislation from 2008 (Commission Directive 2008/62/EC)[10]. "*At least it is not as illegal as it used to be*" (Farmer B), as one farmer commented when being asked about his view of the current seed legislation. Other farmers comment with relief on the change of attitude from the government since the introduction of the EU seed law from 2008:

> *…we almost had to hide our seed storages before, but now there's a different attitude (Farmer D).*

> *Before we weren't allowed to spread the old varieties at all, but now it is allowed to do it a little. (Farmer X1)*

For some farmers that have been engaged in Allkorn for a long time "free seed exchange" and the cultivation of landrace cereals is talked about as a means of feeling like a free farmer. Such expressions are often salient in relation to discourses about multinational agrifood businesses that are depicted as powerful actors that threaten farmers' independence and access to seeds:

> *It is very important that the freedom is kept, we are cultivating a freedom in this (Farmer W).*

> *And the fun thing, which we are very happy about, is that there is not any big company owning this [the seeds]. Sometimes you even feel like a free farmer, and that feels very good. (Farmer X1)*

> *One driver is that this [landrace cultivation] is an another way of doing it, and the enormous power that the seed companies have, the enormous concentration of power that has occurred over the past 30 years… Three big companies own… I kind of become ignited by that, we become serf farmers to a few large companies that control everything!* (Farmer W)

> *We have lost the power over it [the seeds] (…) But now I have taken it back! I want to have control over what I sow, I don't want any multinational company controlling my seeds so they can sell pesticides and everything…* (Farmer D).

> *We don't think about that in Sweden, that we should be free. We talk about India that they [farmers in India] should be free– it is so important globally, that these varieties… should not be genetically modified or be owned by anyone. (Farmer X2)*

The above quotes bring to light the farmers right to exercise self-control over the seed resource and stress the importance they give to being independent of multinational seed companies. They also contest the skewed power imbalances concerning seed control, but also what such power imbalances may imply for farmers' sense of "freedom". Allkorn is indirectly portrayed as an antipode to conventional multinational seed breeding companies and as an institution that facilitates farmers' seed sovereignty and sense of freedom.

Some of the quotes contain similar arguments about the right to seeds that are brought forward by the global food sovereignty movement and references and comparisons are made to what farmers are doing in India. The seed commoning processes are in this way also framed and developed in relation to a broader discourse on food and seed sovereignty found in the Global South. Being independent from large seed suppliers has according to the founder of Allkorn also been an important motivation for the formation of Allkorn since its inception[11]. As a result of this trajectory, some of farmers of the Allkorn not only contest the balance of power with regards to seed laws and seed control, but also question more radically the ontological assumptions of the underpinning norms of the current conventional seed system, which are expressed as posing an existential threat to some of these farmers (see also Demeulenaere 2014).

From the quotes, it is, however, also possible to disclose a somewhat paradoxical attitude towards the various expressions of "free seed exchange". One the one hand, farmers claim that seed exchange should be free for anyone, but on the other hand, farmers' want the seeds to be "controlled" by themselves, within the seed commons of Allkorn. Free seed exchange in this context means that the landraces should be freely exchanged among peers within their community, their seed commons, who adhere to similar norms of farming.

III) Protecting the commons and common concerns

Besides norms that serve to facilitate farmers' access to landrace seeds and to increase agrobiodiversity, the seed commoning processes of Allkorn also encompass a set of norms that serve to protect the seed commons by ways of constraining and restricting other farmers' access to landrace seeds. These norms relate to (i) certain norms of farming, (ii) concerns of losing important seed traits and (iii)

[10] If landrace seeds are handled on non-commercial basis (hobby level) in restricted networks and follow routines that keep the seeds healthy, seed exchange is accepted and even regarded as a positive measure to conserve landraces in situ according to officials from the Swedish Board of Agriculture (personal communication, Swedish Board of Agriculture).

[11] Personal communication with Hans Larsson, the founder of Allkorn, May 2020.

concerns about competition, seed appropriation and free-riding behaviour.

Despite fairly strong arguments concerning "free seed exchange", the cultivation of landraces and access to landrace seeds is in reality only reserved for a few. Allkorn only exchanges seeds with farmers who are organic, which is also reflected in the statutes of the association mentioned earlier. On a closer scrutiny, it turns out that some farmers in addition to the organic farming criteria also only exchange seed with farmers sharing particular ideals and norms with regards to organic farming, sometimes described by the farmers as "outstandingly organic farming" (*spjutspetsekologiskt lantbruk*) (see Ortman et al. 2023). Such norms are salient in narratives that portray conventional farming, but also so called conventionalised organic farming (Darnhofer et al. 2010; Chongtham et al. 2017) as a threat to the kinds of organic farming members of the Allkorn seed commons are involved in. These norms often appear in relation to arguments about landrace cereals having agronomic traits that are best suited for organic farming characterised by low or with no external application of external sources of nutrients. Conventional farming and conventionalised organic farming is described by the farmers as relying too heavily on purchased fertilisers not suited for landrace cereal production.

> *Everyone have seen that organic winter wheat is impossible - short varieties, you have to fertilise like crazy. We saw that it [modern varieties] didn't work well for organic, but on the other hand the landraces do…* (Farmer B).

> *I thought– this isn't right!… since I am organic, I don't have access to as much nitrogen and stuff that you can use to push [increase yield]… So I thought: What the hell, I need old varieties that have been bred without doping agent like pesticides and mineral fertilisers. And that is how I started [landrace cultivation].* (Farmer D)

The farmers emphasise that landraces should be grown in circular and self-sufficient organic systems, characterised with low intensity weed management, intercropping and low-till strategies.

A common saying among the Allkorn members is that "*one should not fertilize the crop, but fertilize the soil* (Farmer E), which means focusing on building up organic matter in the soil, instead of providing easily accessible nutrients directly to the plant. Another common statement is that crop rotations should be diverse. One farmer told us during a farm walk: '*A diverse crop rotation takes care of most of the weed problems, and with the landraces I can really diversify*' (Farmer F). Cultivating landrace cereals without external fertilizer applications and with diverse crop rotations thus constitute an integral norm and practice for the members of the Allkorn seed commons. It is also important for the farmers that the landraces continue to be preserved and adapted to suit particularly low-input extensive organic farming systems, as the seeds are exclusively developed for these purposes. If landraces were to be cultivated in conventional or conventionalised organic farming systems, farmers fear that the landraces over time may lose these morphological traits. Farmers are thus generally reluctant to share seeds with conventional farmers:

> *I am rather strict with that they [farmers] should do things organically. So it isn't anyone [I share seeds with]. (Farmer D)*

Other farmers describe how they discourage both conventional farmers and conventionalised organic farmers to grow landrace cereals by arguments that it is not worthwhile them to grow landrace, since landraces do not respond enough to mineral fertilizers[12]. Besides agronomic arguments for keeping conventional (and conventionalised organic) farmers out from the seed exchange, there are also economic incentives to why farmers want to keep the seeds within their seed commons. One farmer described his line of reasoning in the following way when being approached to share his seeds with conventional farmers:

> *There are conventional farmers phoning me wanting seeds. They say, can you help me with that…getting a free ride.* (Farmer D)

Farmers who earn a living from landrace cereals and who market their landrace products as an organic, healthy and authentic niche product also express worries that 'their' landrace cereal products potentially could be watered-down if similar products were marketed by conventional farmers. The reluctance to share seeds with conventional farmers are thus also related to concerns that larger conventional farmers could saturate the market and outcompete their farming businesses. One farmer who markets his own landrace products in a cooperative together with some other farmers stated the following:

> *…there was one [farmer], he grew 400 hectares [of landrace spelt] ten years ago, and that was equal to the total national cultivation. It [the price] went from 10 SEK (approx. 1 EUR) per kilo to 2 SEK (approx. 0,2*

[12] There have been some few instances when farmers have shared seeds with their conventional neighbour farmers, but on these occasion it have always been with farmers cultivating landraces in regions dominated by marginal farming lands with poor soils.

EUR), it ruined the market totally for several years. It would be the same if Lantmännen [large agricultural cooperative] would take this, they would outcompete us totally. And that is why it is so important that farmers, us small ones, that we keep control. (Farmer B)

The above quote illustrates the importance for the farmers to keep control over the seed resource and how seed control is intertwined with concerns of losing market shares for landrace cereal products. This is also a reason why some farmers are reluctant to formally register "their" seeds and commence selling landrace seeds on a larger scale. Some of the more active farmers in the Allkorn association also express concerns that the whole landrace commoning system could become appropriated and jeopardized by large scale commercial seed actors (agribusinesses) if Allkorn let go of their seed control.

The worst thing that can happen would be if the big players take it, like Lantmännen [Sweden's largest cereal supplier]. It was like that with Öland's landrace wheat. If they want to take it, they will knock us out like this (snaps his fingers). (Farmer B)

Farmers who have built their businesses on landrace cereal production describe at times the difficulties involved in receiving and propagating landrace seeds as something positive, since the time-consuming work with seed propagation tends to keep less committed farmers away from landrace cereal production, thereby reducing the risk for competition and free-riding behaviour:

If you have done this journey [with seed propagation], you somehow feel that they have to do the same, instead of getting it [the seeds] handed on a plate. Yes, the more different it is from the Lantmännen-system [the conventional seed system] the higher value difference there is. Allkorn makes some seed propagation, not anything big, but maybe on an appropriate scale, so that the ones [farmers] who want to start-up have to work a bit for it. (Farmer M)

The current scale of Allkorn's seed propagation and seed sharing scheme is, from the above quote, described as being at an appropriate level that can buffer against free-riding behaviour while allowing entrance to new landrace cereal farmers, without jeopardizing the existing value difference between conventional cereal farming and landrace farming. Through the current scale of seed propagation in combination with current legal framework for landrace seed exchange, the seed commoning system of Allkorn is in this way kept within a limited group of organic farmers.

The norms that keep the seed commoning system together are further based on norms of what organic farming should be like, and are intimately intertwined with certain farming practices on how sustainable agriculture should be achieved by, e.g., promoting seed varieties adapted for low input organic farming practices on marginal soils. The boundaries that encircle the seed commoning processes are also embedded in particular farming norms that relate to concerns that landraces varieties could be appropriated by large-scale conventional farmers. This could result in current landrace farmers being outcompeted, but also jeopardize important morphological seed traits, such as the ability to adapt to place specific conditions suited for low-in-put organic farming. By restricting seed access to a particular group of organic farmers, the farmers can also attain higher market prices for their landrace products. The borders of who should be "in or out" of the landrace seed commons of Allkorn are thus kept and upheld by a set of norms that relate to (i) particular organic farming norms (ii) agronomic properties of the landrace seeds, (iii) current legal framework on landrace seed exchange and to (iv) market incentives.

IV) Sharing and caring for seeds in reciprocity

The seed commoning processes of Allkorn are also characterized and shaped by reciprocal relationships and norms, which become noticeable when farmers talk about how they manage the seeds and share knowledge about seed management. A commonly expressed view is that sharing and caring for the seeds is part and parcel of a whole perspective of cultivating landraces. *It's part of this whole thing about landraces– to share*, as one farmer stated (Farmer D), when describing how he not only exchanges and gives away batches of seeds for free, but also provides advice on how to cultivate, store and propagate landrace seeds and indeed a whole perspective on how to perform low-input organic farming. This farmer (D) is also one of several experienced farmers that act as a knowledge and seed hub for other farmers with an interest in cultivating landraces. He provides both seeds and advice, gives talks at Allkorn events, and is active on social media groups, discussing seed propagation and landrace cultivation. These 'seed hub farmers' typically cultivate many different landraces, and often propagate new landraces from very small quantities, sometimes from only a few ears. They then give away, sell or swap the seeds with other farmers, either through the Allkorn association or through their own personal networks. In addition, they often provide advice to farmers that receive the seeds, often informally over a cup of coffee in connection to the seed exchange, but also in connection to courses arranged by Allkorn.

A substantial part of the knowledge exchange also occurs over social media (the Allkorn Facebook page). Besides serving as a platform for knowledge and seed exchange, the Facebook page functions as a marketplace for seed management equipment (e.g., rinsing machines, drying and storing equipment). Farmers often experience difficulties in finding suitable equipment, with the implication that seeds are insufficiently rinsed. In order to overcome this, farmers with suitable equipment often assist new landrace growers with seed rinsing and drying on their own farms. Such reciprocal and epistemic tendencies towards one another in relation to, e.g., knowledge exchange and technical assistance are also salient when it concerns how the members of the Allkorn association work with issues related with seed borne diseases. Over the years, the members in the seed commons of Allkorn have developed certain norms and practices for how to maintain the quality of the landrace seeds. Several of these norms and practices relate to minimising the risk for seed borne diseases. It is, however, a relatively common experience among the farmers that the seeds they receive through the seed exchange are infected and seed disease control is a recurring subject conferred at Allkorn events, in social media, and when farmers exchange seeds with each other.

If the problems with seed borne diseases would escalate further, farmers fear the authorities might restrict the seed exchange, which could pose a threat to the entire seeds commoning system of Allkorn. In addition, if seeds are treated wrongly, the viability and indeed an entire landrace could disappear.

> *We have to analyze and treat the common bunt otherwise we are screwed, because they [the authorities] are surely talking about us spreading seeds without any control at all, and that is not the case.* (Farmer D)

To establish good seed disease control is considered as a critical issue for Allkorn. In order to prevent spreading seed borne diseases, the members of Allkorn arrange courses, on-farm visits and conferences on seed health related issues. The more experienced farmers often express a particular responsibility to teach and disseminate knowledge on how to handle issues related to seed borne-diseases and they often provide advice about the importance of continuous testing of the seeds, having diverse crop rotations etc. to avoid diseases appearing and spreading.

> *The problem is the seed borne diseases… We who are active have to teach the others, that is what I see as my most important job, to share that knowledge. (Farmer D)*

What circulates is thus not only bags of seeds, but also knowledge about the best way to cultivate and treat them, and even stories about their previous "social life" in the network (seed provenance). Cultivation of landrace cereals thus requires sharing of experiences and observations of their agronomic behaviour over time and across different places. In this regard, the concept of "community of practices" coined by Wenger (1999) illustrates well the social and practical dimensions of this collective, reciprocal learning and norm shaping process (see also Demeulenaere 2012; Balázs and Aistara 2018). The mutual engagement of people in the common endeavour of landrace cultivation translates into the creation of a joint repertoire of norms, of what it means to be a landrace farmer and to be part of the seed commons, in terms of obligations to the seeds, to agrobiodiversity and to other fellow farmers.

Concluding discussion

In line with, e.g., Bollier and Helfrich (2012); Demeulenaere (2014); Sandström et al. (2017) and Montenegro de Wit (2019) this study emphasises (seed) commons as dynamic field of socio-ecological practice. It shows how a seed commoning system for landrace cereals co-evolves and functions as an epistemic community that contributes not only to maintain landraces from the past, but also with the shaping of new landraces for the present (and future) that are adapted to suit diverse agro-ecological environments for low input organic agriculture. The paper illuminates how landrace seed commoning processes are shaped by a set of norms that are characterised by a common;

- belief that landrace seeds should be exchanged freely among peers.
- interest in developing new seeds suitable for low-input organic agriculture derived from farmers' experiences of cultivating and propagating them.
- belief that free seed exchange among peers is a prerequisite for new varieties to emerge that are adapted to place specific agro-ecological environments and farming practices.
- negative experiences with conventional seed breeding practices (e.g., not providing varieties suitable for organic farming) and legal framework of seed exchange.
- practice of sharing and caring for the seeds through reciprocal relationships.
- concern that the landraces can be appropriated by conventional farmers and commercial seed suppliers.

The above norms both delimits and contributes to what will constitute the seeds and who will ultimately have access to

the seeds and the extent to which agrobiodiversity is upheld and supported. The paper shows how farmers develop and navigate their seed commons in a grey zone of what is legally accepted. This legal grey zone has opened a fragile leeway in which farmers can operate and share seeds with each other that facilitates both the conservation and the emergence of new landraces that are suited for extensive organic farming. The seed commoning processes have further partly developed in resistance not just against past and current legal frameworks of seeds, but also in response to a critique that the current seed supply system is dominated by a few global commercial seed actors that mainly develop and supply seeds suited for conventional agricultural systems. The farmers of the Allkorn seed association thus not only contest the balance of power in seed laws, but also question more radically the underpinning norms and ontological assumptions behind those laws (see also Demeulenaere 2014) and the economic epistemic thinking which they have been subjected to.

Similar attempts of forging a leeway with regards to legal claims concerning seed governance and agrobiodiversity have been reported in several other contexts. For example the Open Source Seed Initiative in the US (Kloppenburg 2014; Montenegro de Wit 2019) and the evolution of alternative models for seed innovation among farmers' groups in France (Demeulenaere 2012, 2014; Mazé et al. 2021a) and Germany (Tschersich 2021; Sievers-Glotzbach et al. 2020 a & b). These seed commoning initiatives seem to likewise have developed around certain organic farming norms and in response to a broader call for agrobiodiversity, seed- and food sovereignty, and to a critique that current seed legislation is not adjusted for the seeds that farmers propagate and want to cultivate on their fields.

However, these seed commoning initiatives also illuminate some differences compared to the Swedish Allkorn case concerning how farmers collectively organise and protect their seeds as commons from outside appropriation. For example, in Sievers-Glotzbach et al. 2020a, b; Tschersich (2021) and Tschersich et al. (2023) case-studies on vegetable and flower seed commons from Germany, farmers register their varieties on the EU-conservation list in the name of a non-profit association (*Kultursaat*) to limit misappropriation and to ensure these varieties remain as "common property". In the Allkorn case, farmers do not register their landrace varieties at all, but instead protect their seeds from outside appropriation by (only) sharing seeds among peers that share similar norms about farming. These differences in the way farmers protect their seed commons and seeds can partly be explained by, e.g., different genetic expressions of the seeds themselves, but also to different propagation strategies farmers' use. Some vegetable seeds are for example more stable and robust, which makes them easier to register under the EU variety list, compared to landrace cereals, which generally are more unstable and heterogeneous and thus almost impossible to register according to current EU rules. Moreover, the Allkorn cereal farmers also perceive seed heterogeneity as a precondition for developing new landraces that can co-evolve in relation to place specific farm conditions, whereas, e.g., vegetable farmers may rather want to develop a stable variety with a certain morphological expression (e.g., a black carrot) that can suit several different farming environments. In the Swedish Allkorn case, farmers also resist the very idea of registering landraces and sharing their seeds to "whoever", since they fear that large-scale conventional farmers could outcompete them on the relatively limited niche market for landrace cereals and free ride on their long-standing effort of propagating new land race seeds. In the German case, farmers are mainly hobby farmers and may thus not be that troubled if commercial growers would take advantage of "their" seeds.

The above comparative reflections shed light not only on diverse ways of protecting seed commons, but also illuminate the complexities and difficulties of developing legal frameworks and viable markets that suits all kinds of seed commoning arrangements for different types of cultivars, propagation strategies and farming backgrounds. Given the contextual complexity involved in seed propagation, genetic and market complexity and the shifting socio-nature of seeds, it is thus possible to envisage several institutional and legal frameworks for the governance and protection of seed commons. Individual seed networks, farm and farming conditions, seed genetics and the shifting socio-natures of seeds are highly variable and contextual and thus difficult to predict. Institutions for seed governance (commons) take the specific forms they do through the collective norms people ascribe to and develop in relation to the shifting socio-natures of seeds. Seed commons can thus be viewed as a product of the interplay of all these varied factors and circumstances, rather than the result of codified principles of institutional evolution and design as forwarded by, e.g., Ostrom (1990). Such an understanding helps to explain why prescriptions of "getting institutions right" for seed governance are difficult at best, and it suggests that more attention is needed to understand the contingencies and unanticipated outcomes that might appear in commoning processes around seeds. It also brings to the fore the idea that what is needed is not one single legal framework that fits all seed commoning arrangements, but rather governance frameworks and support mechanisms that facilitates a proliferation of a diversity of protected commons that promotes agrobiodiversity.

From the interviews, it is also possible to disclose a somewhat paradoxical stance towards farmers' claims on "free seed exchange". On the one hand, farmers assert that seed exchange should be "free" for anyone interested in

farming, while on the other hand, landrace seeds developed by the farmers in commons, can only be accessed by farmers adhering to similar norms of organic farming (particularly extensive organic farming practices). Despite rather strong statements about "free seed exchange", the cultivation and sharing of landrace seeds is, thus, in reality only reserved for a few. Farmers underpinning norms of extensive organic farming act in this sense as a boundary of who should be "in or out" of the seed commons. These boundaries are justified with arguments that if seeds were shared within a broader farming community, there is a risk that "their" landraces would be appropriated by conventional plant breeding companies and free-riding behaviour, with the risk of losing important traits that the farmers value. Farmers' statements about free seed exchange do thus not necessarily translate into neo-liberal ideas of individual property claims, but rather into a defence of farmers' collective rights to propagate and manage seeds in commons (see also Kloppenburg 2014) and highlights the challenges associated with establishing agricultural agrobiodiversity rich niche markets within the regnant neoliberal economic model. The commoning processes around landrace seeds are, in this way, embedded within a particular moral economy and part and parcel of a broader global shift in the legal claims of seeds, from individual rights to collective rights, and from liberty rights to claim rights– although farmers' rhetoric's around "free seed exchange" at a first glance point in another direction.

In this respect, the seed commons of Allkorn shares many characteristics with other social movements and seed commoning initiatives in its attempts to express a cause and to make themselves heard by a wider audience in the shaping of a new collective identity. It also shares specific characteristics with, for example local communities concerned with forest and nature conservation, especially concerning how they position themselves as stewards of agrobiodiversity (cf. Sandström 2008). Historically, international agrobiodiversity governance has been considered as a tradeoff between, easier access to genetic resources and the recognition of rural communities' contributions to biodiversity conservation, which is supposed to be put into practice through complicated mechanisms of benefit sharing (cf. Frison 2018; Montenegro de Wit 2017). Regardless of the actual effects of these mechanisms, the members of the Allkorn association and various other seed commons initiatives around the world have seized on the opportunities opened by this rhetoric to make themselves heard and forge a leeway to develop new ways of organizing around seeds. Farmers involvement in these seed commoning processes has a performative effect on the way actors present themselves (as, e.g., a "community" as "farmers") and on the way they build their discourses as agrobiodiversity stewards, which in turn also translates into certain norms and practices on what a good farmer is (Saunders 2016).

The recent changes in the EU seed legislation (from 2021), which opens up for sale of heterogeneous organic seeds, partly responds to farmers' criticism of the EU requirements on seed distinctiveness, uniformity and stability (DUS-criteria). This legislation has not yet been implemented in Sweden, and it is an open question how the seed commons of Allkorn and other seed commons in the EU will be affected. The new legislation could entail an opening for commercial organic plant breeders to sell heterogeneous landraces on large scale, which could fundamentally change current seed commoning systems in Sweden and across Europe. Potentially the new legislation could imply a more accessible seed system that could increase overall agrobiodiversity, where the quality and health of the seeds could be better ensured (and protected). Seed commons constructed around farming norms that favour low-input organic systems could, however, also potentially be jeopardized, if landrace seeds become more accessible to a more open organic seed market, with the risk of outcompeting seed commoning systems based on low-input organic farming practices.

Despite farmers' critique against the current legal framework from 2008 (Commission Directive 2008/62/EC), this framework has allowed a leeway enabling the seed commons of Allkorn to operate more openly. The legal restrictions concerning commercial sale of landrace seeds, in combination with the underpinning norms of Allkorn (e.g., extensive organic farming, cultivating for enhancing agrobiodiversity, control mechanisms for keeping the seeds healthy) has facilitated the continuation of new landrace to co-evolve that allows sharing seeds among those who adhere to the norms of the seed commons, but exclude those who are not. In this way the seeds association of Allkorn can be regarded as a protected common, although a fragile one. The current legal framework has in this way indirectly and unintentionally contributed to the shaping of an epistemic seed commoning system that facilitates increased agrobiodiversity, although on a very limited scale.

Considering the current impasse of preventing the worldwide loss of agrobiodiversity and the shifting socio-nature of seeds, this study highlights the possibility for a more radical reorientation of current legal seed frameworks to provide more space for alternative seed commoning systems to evolve that centres on norms that actively support on-farm agrobiodiversity. What is needed is thus not the recreation of an open-access commons with no legal support system, nor continued legal support for private seed enclosures, but a legal framework that actively facilitates the proliferation of a diversity of protected seed commons, revolving around norms promoting agrobiodiversity that can supply locally

adapted plant material for diverse groups of farmers and farming conditions.

Acknowledgements This work is part of the project "Sustainable food from heritage cereals" and was funded by the Swedish Research Council (Formas, project 2018–02393). We thank all the farmers that generously took their valuable time to answer and discuss our questions. A particular gratitude goes to the board members of Allkorn for facilitating contacts to the farmers and for inviting us to meetings, events and activities. In addition, we also thank the anonymous reviewers who provided constructive feedback to the paper. Any errors remain ours.

Funding Open access funding provided by Swedish University of Agricultural Sciences.

Declarations

Conflict of interest All authors declare that they have no conflicts of interest.

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