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REVIEW ARTICLE

# A review of the cultural significance of traditional orchards using examples from selected European countries

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**Abstract**

*Abstract* Traditional orchards are one of the most well-known examples of multifunctional farming. They have a long history of providing different fruits and combining various other agricultural activities, such as extensive animal farming, with cultural significance that reflect the different regional landscapes of Europe.

*Objectives* This study investigates the extent of traditional orchards and addresses their cultural significance and their contribution to the Sustainable Development Goals in the context of multifunctional agricultural landscapes.

*Method* The presented work combines an expert survey conducted in ten EUCALAND network member countries by means of both a standardised and a more detailed questionnaire to compare and summarize the situation of traditional orchards in these countries.

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*Results* The results show that traditional orchards are diminishing on the European scale but still have huge significance in many regions. Provisioning ecosystem services, such as fruit production, are valued in terms of disease resistance and genetic diversity which is likely to be of increasing importance in the context of future climate change and concerns over food security. The most important drivers for maintaining traditional orchards appears to be based on cultural ecosystem services and the benefits they provide to society, including the preservation of traditions and regional identity, attractive places for recreation, aesthetic appreciation, inspiration for artists. The examples of best practices from the contributing countries all reveal the close connection of these orchards to local communities and to often specific traditional knowledge.

*Conclusion* The presented review of the current situation for these important components of the agricultural landscape as well as country-specific management characteristics has the potential to inspire other countries to maintain their traditional orchards.

**Keywords** Traditional orchards · Ecosystem services · Questionnaire · EUCALAND

## Introduction

Orchards are defined as intentional plantations of fruit or nut-producing trees or shrubs that are managed for food production (Core project 2022). Traditionally these were often managed as agroforestry systems with high-growing fruit trees over permanent pasture that was grazed or, in rare cases, over arable land. Typically, the trees would be large-crowned, strong-growing, and of different ages and sizes and comprise different fruit varieties and species reflecting natural conditions, such as climate, soils, altitude and exposure. In some places, roadside or hedgerow fruit and nut trees were planted close to villages as additional food (Kruse Schmidt 1999). These are challenging to maintain and fruit may not be harvested due to traffic pollution concerns but provide linear landscape features. Traditional orchards combined with grazing is appreciated by many farmers as it means less requirement for chemicals (Forejt and Syrbe 2019) and provides shade for animals—a key consideration for warming climates (Masters et al. 2023).

The cultivation of fruit trees dates back to ancient civilizations such as the Greeks and Romans (Spulerova et al. 2015; Måge 2016). These were known for their advanced horticultural practices and introduced many fruit tree varieties to different parts of their empires (Janick 2005). While the primary reason for fruit cultivation was for food over time orchards have become part of regional identity, with different places known for specific fruit varieties, with the cultivation of heirloom and traditional varieties valued for preserving genetic biodiversity (Thanopoulos et al. 2024). Orchards have associated values beyond mere economic productivity with the cultural diversity of orchards reflected in the nomenclature used to describe them in different countries (Forejt and Syrbe 2019). Scientific advances as well as changing fashions and food preferences have evolved over time, perhaps most rapidly in recent decades resulting in fundamental change in the appearance and management of orchards (Helland-Hansen and (Ed.) 2004; Måge 2016; Petrovic et al. 2016).

Extensive tall tree orchards have been an important element of the central European landscape since the Middle Ages with Monasteries playing a significant role in preserving and cultivating fruit tree varieties in many countries (Måge 2016; Santruckova et al. 2020). The Renaissance period saw a renewed interest in horticulture and gardening, with orchards often included in the design of larger gardens, emphasising the combined aesthetic and functional aspects of fruit cultivation (Pastore 2013). European horticulturists and scientists began systematically studying and cataloguing fruit varieties in the eighteenth and nineteenth centuries, when the science of pomology gained

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prominence. Organizations and societies were established to promote the exchange of knowledge and to improve cultivation. New varieties were developed through selective breeding and hybridization, leading to increased diversity in orchards. The twentieth century witnessed further advancements in fruit cultivation, with a focus on disease-resistant varieties, climate-smart pest management, and sustainable orchard management (Roquer-Beni et al. 2021; Bouri et al. 2023). The move from traditional to intensive production agricultural systems, including orchard management (Jain 2012; Izakovicova et al. 2022), reflected improvements in transport and storage methods, allowing wider distribution opening up the market economy. However the decline in profitability of farming in less productive areas, particularly of traditional produce, also influenced abandonment, exacerbated by removal of price controls and increased availability of import of cheaper imported fruit (Kuemmerle et al. 2008; Bakker et al. 2011; Lieskovsky et al. 2014).

Traditional orchards of tall, scattered apple, pear and stone fruit trees grown either from cuttings (vegetative propagation) or from seed have been largely replaced by intensive plantations comprising small trees grafted onto dwarfing rootstocks enabling all operations from pruning to harvesting from the ground, known as the Dutch system (Helland-Hansen, 2004). While this greatly increases productivity some of the attributes of traditional orchards, for example their contribution to landscape character and local distinctiveness, preservation of historical landuse and associated wildlife has been lost (Forejt and Syrbe 2019). While fruit cultivation is considered an agricultural practice and so subject to land use planning regulations it is difficult to distinguish data regarding traditional orchards from the available European scale statistics although the difference is recognised in the policies of specific countries relating to agricultural subsidies. The best example of protection is from England, where traditional orchards are protected under the National Planning Policy Framework (NPPF) as a category of ancient woodland and ancient and veteran trees. In many other countries, old/regional fruit varieties are protected, with introduction of new varieties regulated, for example, in Slovakia by the Act on the Conservation of Plant Genetic Resources for Food and Agriculture. In several countries (Czechia, Germany, Slovakia) cutting trees in open landscapes is regulated based on their age and size.

While several previous studies have focused on traditional orchards (Hammel and Arnold 2012; Keech 2017; de Paz et al. 2023; Philipp and Zander 2023), little attention has been paid to their cultural significance in the multifunctional agricultural landscape. Orchards are a form of agriculture producing a crop for home consumption or selling for income. The significance of traditional orchards had decline in this respect but their value can be expressed using the ecosystem service framework which is a method of classifying and evaluating non-market benefits. The Millennium Ecosystem Assessment, published in 2005 (MEA 2005), divided ecosystem services into four categories summarised below:

- Provisioning services, or the supply of goods of direct benefit to people, and often with a clear monetary value, such as timber from forests, medicinal plants, and fish from the oceans, rivers and lakes.
- Regulating services, the range of functions carried out by ecosystems which are often of great value but generally not given a monetary value in conventional markets. They include regulation of climate through the storing of carbon and control of local rainfall, the removal of pollutants by filtering the air and water, and protection from disasters such as landslides and coastal storms.
- Cultural services, not providing direct material benefits, but contributing to wider needs and desires of society, and therefore to people's willingness to pay for conservation. They include the spiritual value attached to particular ecosystems such as sacred groves, and the aesthetic beauty of landscapes or coastal formations that attract tourists
- Supporting services, not of direct benefit to people but essential to the functioning of ecosystems and therefore indirectly responsible for all other services. Examples are the formation of soils and the processes of plant growth.

Biodiversity is not regarded as an ecosystem service itself, but rather as a prerequisite underpinning each of them (Demestihas et al 2017). A recent paper by Daelemans et al. (2025) has compared the effect of organic and conventional management of apple

orchards on invertebrates and concluded that, while organic farming provides some benefits its effects are inconsistent across taxa, and the presence of semi-natural habitats in the surrounding landscape seems more important for biodiversity in general. For an overview of the ecosystem services associated with orchards was completed by Demestihas et al. (2017) however this focused on fruit tree plantations rather than traditional orchards, the focus of this research.

This research has been carried out by the Euca-Land expert network that focuses on the cultural and agricultural landscapes of Europe to promote their recognition and preservation of their cultural heritage (EUCALAND 2024). Orchards were the focus of a recent scientific workshops on agricultural landscapes, convened by the network and it was decided to investigate the role of traditional orchards in the agricultural landscape in more depth to address the following questions.

## Research questions

- Where are traditional orchards?
- What are the factors affecting the persistence of traditional orchards and how are they protected?
- What are the ecosystem services associated with traditional orchards?
- To what extent are the public aware of their cultural significance?

The overall rationale was to see if there are examples of 'best practice' that could be shared to facilitate wider appreciation of traditional orchards and the ecosystem services they provide and so ensure these are continued into the future.

## Method

Members of the Eucaland network came together for an in-depth workshop (their 10th) focusing on the cultural heritage significance of orchards in the agricultural landscape on orchards. This was held at the Nürtingen-Geislingen University, School of Landscape Architecture, Environmental and Urban, Germany, 20–21 March 2018. This led to the development of an extensive questionnaire with responses collated in March 2024 to gain country-level information about orchards in Europe, for example statistics, policies/subsidies for protection of existing orchards and encouraging new plantings, factors affecting profitability and innovations, both traditional and recent to encourage appreciation and conservation of orchards. While the questionnaire invited responses on both recent/planation orchards and traditional

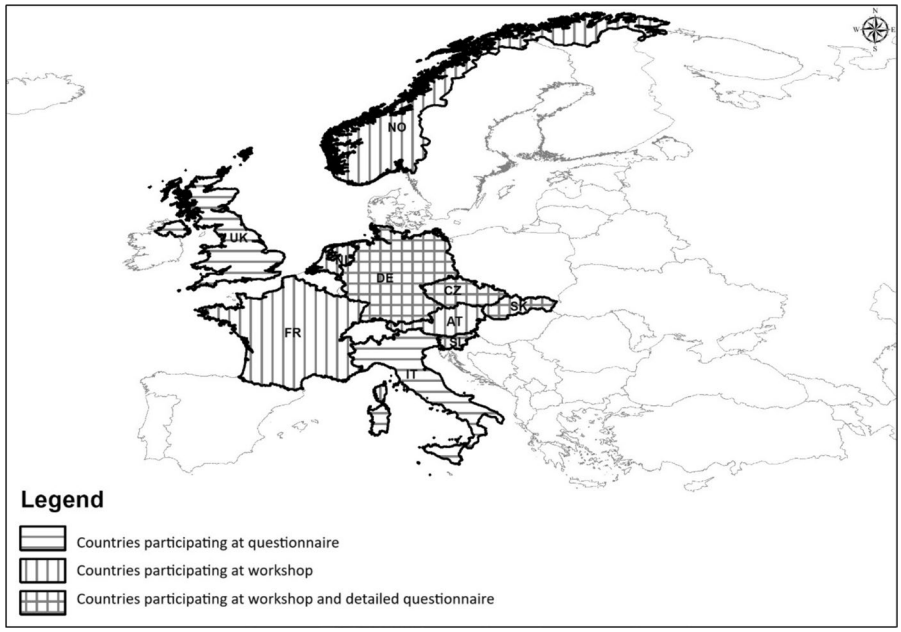


**Fig. 1** Map of contributing countries to the orchard's analysis

ones, denoted landscape type A and B respectively, this paper focus solely on traditional orchards providing an evaluation of the responses received relating to this landscape type. The situations in the ten countries involved (see Fig. 1) – varies enormously and the results of the wide-ranging questionnaire have, for the purpose of this paper, been analysed from the perspective of the value of traditional orchards and their associated ecosystem services.

The original questionnaire was updated based on suggestions from respondents and was sent to the whole Eucaland network of experts: approximately 30 individual or institutional members, whose research focuses on the typology of both agricultural landscapes and traditional agricultural landscapes. Detailed responses were then received from six countries with the responses either from an individual expert or as a result of discussions by teams of experts. Together with the workshop participants, this study evaluates traditional orchards in ten European countries (Fig. 1) that represents a broad sample of different scales of fruit production in Europe. The main sections of the questionnaire focused on:

- The management status of traditional orchards,
- Support for traditional orchards,
- Drivers for maintenance of traditional orchards that reflect the benefits of demand for ecosystem services,
- Ecosystem services of traditional orchards (provisioning, regulating, supporting, and cultural) and
- Lesson learnt: examples from the different countries involved in this research that could be used for others concerned about the traditional orchard to learn from.

Some questions were open, while others offered a list of options derived from brainstorming at the workshop rating various orchard benefits on a scale of 1 to 5. The questionnaires were completed based on their knowledge, national sources, databases, and the literature review. The accuracy of the information

**Table 1** Definitions of traditional orchards

| Country | Definition | Reference |
|---|---|---|
| England | Open-grown fruit trees within herbaceous vegetation. The defining feature is habitat structure rather than vegetation type, topography, or soils. Traditional orchards are structurally and ecologically similar to wood-pasture and parkland, with open-grown trees set in herbaceous vegetation, but they are generally distinguished from these Priority Habitat complexes by the following characteristics: the species composition of the trees, these being primarily in the *Rosaceae* family; the usually denser arrangement of the trees; the small scale of individual habitat patches; and the wider dispersion and greater frequency of occurrence of habitat patches in the countryside | Documentation and – UK Habitat Classification Documents V2.01 2023 |
| Germany | Orchard meadows are protected as biotopes according to the Federal Nature Conservation Law but without a more detailed definition of orchard meadows. There is no uniform nationwide legal definition, but individual federal states have defined orchard meadows in their federal statutes. The following characteristics are largely consistent across the federal states: a minimum area (e.g. 2,500 $m^2$); extensive undergrowth used as grassland or arable land; fast-growing, tall trees of different ages, different varieties, and species on the same piece of land. In contrast to semi- or low-stemmed plantations, orchard meadows are characterized by significantly higher structural diversity, biological diversity, and identifiability of the individual trees | (Henle et al. 2024) |
| Slovenia | Extensive orchards or orchard meadows, with a minimum area size of 1000 $m^2$, which are not suitable for intensive cultivation. This is usually a plantation of high-stemmed fruit trees grown on a lush substrate or from seed, with a density of more than 50 trees per hectare. One or more different types of fruit can grow in an extensive or meadow orchard. The orthophoto shows that the trees in extensive or meadow orchards are planted individually or in rows. If the trees are planted in rows, the distance between the individual trees and the distance between the rows is greater than in intensive orchards. In most cases, the trees have large canopies that are usually not uniform in shape and size | MKGP 2013 |

**Table 2** Examples of the diversity of traditional orchards in some European countries

| | |
|---|---|
| Austria | The Marillen (an of apricot) is a famous national heritage and basis for many specific products |
| Czechia | Orchards were an important part of a local economy in areas with less favorable conditions for more intensive agriculture |
| England | Apples, pears, damsons, plums Cobnuts (a type of hazel) |
| France | Wine production |
| Germany | Cistercian monks grew mostly apples in the thirteenth century; Huguenots promoted new in the 16th–seventeenth century and Prussian kings in the 18th–nineteenth century by Prussian kings – these introduced law requiring planting fruit trees in the east and to replace vineyards destroyed by phylloxera in the south |
| Italy | Popular chestnuts and Wine production |
| Netherlands | Dominant apples, pears, plums and cherries |
| Norway | Apples are mentioned in a regional law from1270s; with pear, cherry, and plum trees planted later (Lunden 2002). Along the Hardangerfjord and inner fjord districts of Sogn and Nordfjord in Western Norway have suitable climates for fruit production despite their northern location (Moen 1999) |
| Slovakia | Natural conditions in the Považský region are prerequisite for the special and extraordinary taste of plums. Other regions have a predominance of apple trees, with less frequent pears,, and cherry trees. Other varieties, including *Mespilus amelanchier, Cydonia oblonga, Morus alba, Prunus domestica syriaca,* are relatively rare (Spulerova et al. 2015) |
| Slovenia | In the Southwest there is a tradition of cherries sold throughout the Habsburg Monarchy |

obtained from the questionnaires was supplemented with appropriate references, where there was appropriate published material.

## Results

Although ten European countries were engaged in this research not all representatives provided information on each topic or responded to every part of the questionnaire. The analysis of the situation of traditional orchards showed many similarities but also specific national features. Only three of the ten countries had specific definitions for traditional orchard (Table 1).

The range of orchard crops traditionally grown in the ten countries is given in Table 2.

## Management of traditional orchards

Where traditional orchards remain, these are frequently unmanaged or abandoned. The reasons for this, revealed by questionnaire responses, are varied but often related to rural depopulation—particularly in remote locations—land use change, and former agricultural holdings being inherited by non-farmers or sold as holiday homes. Low farm-gate prices for fruit and competition on the open market from cheaper imports have reduced economic viability, particularly for older, traditional orchards, which are more labour intensive as they are not on dwarfing rootstocks so the taller trees are more difficult to harvest, prune, and spraying efficiently. This, combined with lack of pest and disease resistance, is a disincentive for managers and young workers who can make a better living from more intensive systems of fruit growing. See Table 3 and Fig. 2.

More detailed exploration of this issue added more different reasons for the abandonment (the falling into an unmanaged state) of orchards, with the responses from the different countries given in Figure 2.

### Support for traditional orchards

Traditional orchards are specific landscape features and a component of place identity and regional distinctiveness. Despite the generally unfavourable market economics there are some areas (e.g. Považie or Poloniny region in Slovakia) famous for fruit production, where traditional orchards have been restored and older fruit varieties preserved as part of communities growing interest in their local heritage (Bocková, 2024).

**Table 3** Examples of decrease in area of traditional orchards in individual countries

| | |
|---|---|
| Czechia | The increase of imported fruit and fruit products from Poland and Mediterranean countries has caused a decline of domestic fruit production and orchards (Bičík et al. 2015) |
| England | 90% of traditional orchards have been lost since the 1950s to neglect, development or conversion to intensive modern orchards which contribute a negative impact on biodiversity. Furthermore, 45% of the remaining orchards surveyed in England were found to be in declining condition as a habitat. By far the most common reason for this is lack of replacement tree replanting, meaning these remaining old orchards will quickly disappear unless action is taken. https://ptes.org/campaigns/traditional-orchard-project/traditional-orchard-decline |
| Germany | In Baden-Württemberg, the south-western federal state of Germany, which is particularly rich in orchard trees, the area reduced by 17% between 2008 and 2018 (Borngräber et al. 2020). In "The Altes Land" (Northern Germany), traditional orchards with 300 trees/hectare have been replaced by intensive plantations with 3000 trees/hectare forming the largest connected European fruit growing area (Dippel et al. 2018) |
| Slovakia | Less than 50% of traditional orchards are still regularly managed, mostly situated close to dispersed settlements, where fields are mainly managed by elderly residents who preserve their traditions and way of life (Lieskovsky et al. 2014; Zarnovican et al. 2017) |
| Slovenia | The Franciscean Cadaster at the level of cadastral municipalities covering all of Slovenia and incorporating it into a geographic information system has provided an opportunity for detailed studies of land-use changes spanning two centuries which pointed to decline of traditional orchards (Gabrovec and Kumer 2019) |

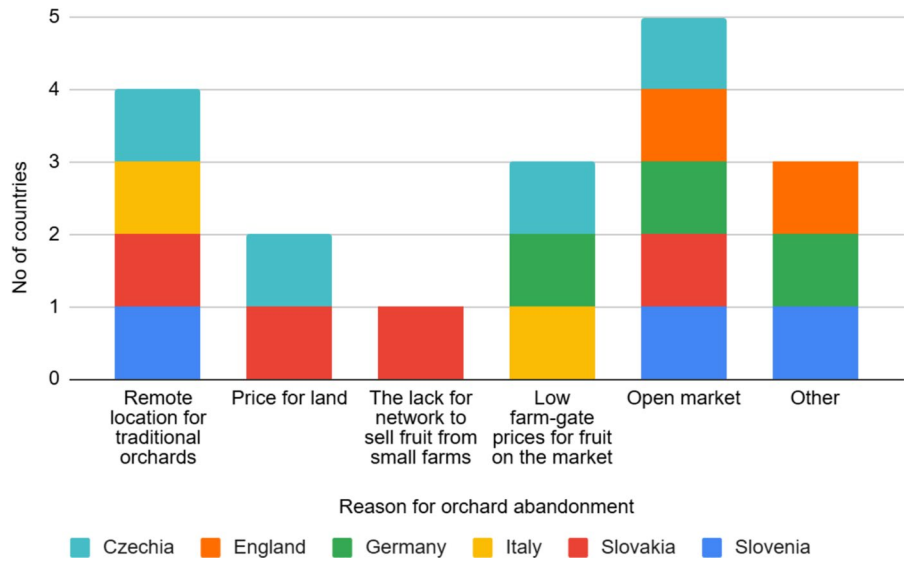


**Fig. 2** Main reasons for decline in traditional orchards

Agri-environmental schemes, the income support measures that form the first pillar of the Common Agricultural Policy (CAP) in the European Union (EU) have been found to be only partially effective in maintaining biodiversity in traditional orchard meadows. However, research carried out in Austria has revealed that, where there are no agri-environmental measures this is likely to lead to loss of semi-natural landscape elements such as orchard meadows and hedges, and promote farmland intensification (Schonhart et al. 2010). The Rural Development Programs (RDP), making up the 'second pillar' of the CAP, reinforce the 'first pillar' of income supports and market measures by strengthening the social, environmental and economic sustainability of rural areas.

Some examples of different subsidies and support measures are provided in Table 4.

## Drivers for maintenance of traditional orchards

While the origin of traditional orchards, whether of fruit or nuts, was to provide food, either for

**Table 4** Examples of different subsidies and support measures for orchards in individual countries

| Country | Subsidy or support measure |
|---|---|
| Austria | • Agri-environmental measures for orchard meadows |
| Czechia | • Specific government support for orchard meadows (for traditional, high-grown orchards) has been provided in a single measure supporting organic farming<br>• Orchard establishment, as well as fruit tree avenues and preservation/restoration of traditional orchards, and heritage varieties may be supported by municipalities or local associations |
| England | • England is no longer in the EU and so not included in the CAP. There are some instruments for re-establishment of traditional orchards in specific areas with a historic industry, but this tends to be short-term<br>• Some traditional orchards are in support schemes based on delivery of public goods (habitat, wildlife or public access rather than fruit) |
| Germany | • Baden-Württemberg, Bavaria, and some other federal states, a maximum of 20% of the orchards are supported through CAP measures. Others are either less than the minimum area, have non-farming owners (so are not eligible for support) or find the application process too complicated<br>• Specific government support for orchard meadows (for traditional, high-grown orchards) has been provided focused on individual activities for example the health of old trees, planting, grassland management<br>• New planting |
| Italy | • Integrated production, regional quality labelling and collective brandling; organic agriculture<br>• New planting |
| Slovakia | • Subsidies for integrated production and/or for organic agriculture |
| Slovenia | • Funding for protection against hail and irrigation of intensive orchards |

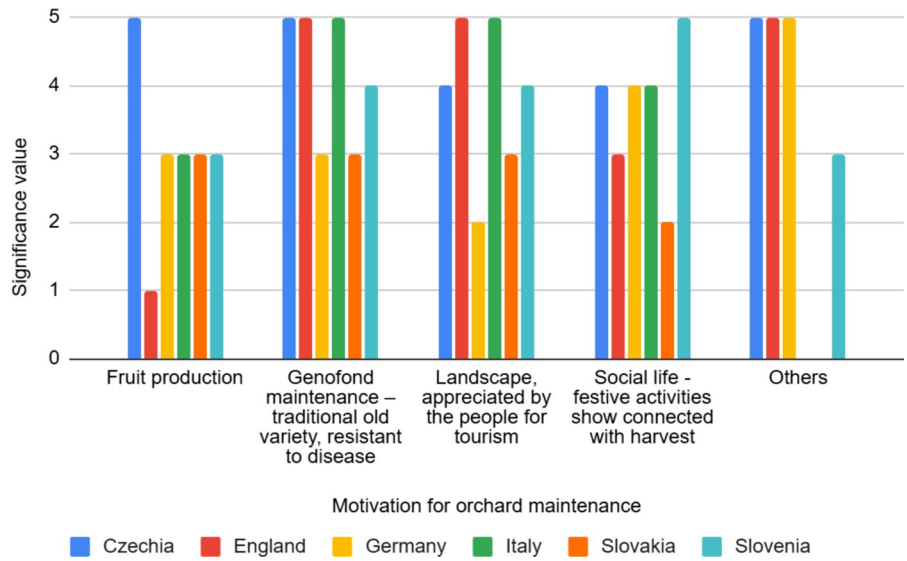


**Fig. 3** Motivations for retaining traditional orchards (from 0—no important, 1—low important, to 5—very important)

consumption or market this is no longer the sole motivation for retaining them. This has largely been replaced by wider benefits, or public goods they provide to society. The questionnaire asked respondents to identify the significance of different aspects provided by traditional orchards valued in their country using a 5-point scale. The results are presented in Fig. 3.

The principal reasons given for retaining traditional orchards by the 6 countries that responded were fruit production and genetic diversity (genofond maintenance) which scored an average of 4.2 on the 5-point scale, as well as cultural benefits such as access for recreation and social life. Traditional orchards as a landscape type, an attribute

appreciated for tourism scored 3.8. Additional reasons included in the 'other' category are listed below:

- Ecological significance
- Regulatory ecosystem services: protection of orchard trees is important for soil stabilisation, and erosion control, especially on terrace edges and landslide prone areas
- Production of fruit and alcoholic beverages (e.g. Slovenia)
- Ecologically important as priority habitats, particularly trees with veteran features (England) or landscape features contributing to biodiversity (Czechia)
- Historical—they may be locally important as remnants of the past (e.g. Kent is known as the Garden of England) or represent traditional orchard regions having community benefits (Czechia).

Further discussions in the workshop focused on the ecosystem services provided by traditional orchards and details have been collated from the questionnaire responses. These are given in the following sections, using the different categories as headings (note: regulating and supporting services are reported together).

## Provisioning ecosystem services associated with traditional orchards

Traditional orchards are not considered highly productive when compared to intensive plantations the exceptions being cider and perry orchards in England, France and Germany. However, they have been important for community food security for centuries, providing a sustainable source of high-quality fruit and nuts, the basis for products such as juice and dried fruit (Henle et al. 2024). Fruit is now mainly used as raw material for the fruit juice industry and traditional processing on family farms into juice, alcoholic beverages, dried fruit, vinegar, jams, or pies (Tojnko et al. 2011). As few pesticides or mineral fertilises are used traditional orchard produce is comparable to that from organic agriculture as a sustainable food production system (Herzog 1998; Fess and Benedito 2018). This is the basis of initiatives promoting local fruit products, e.g.

- Traditional Slovenian Breakfast (*Tradicionalni slovenski zajtrk*) promoting home-grown food, especially apples and honey organized once a year in schools,
- Support through the promotion at local farms (Italy),
- Specific marketing on the basis of ecological production by direct selling from wooden huts, especially cherries (Netherlands) and processing

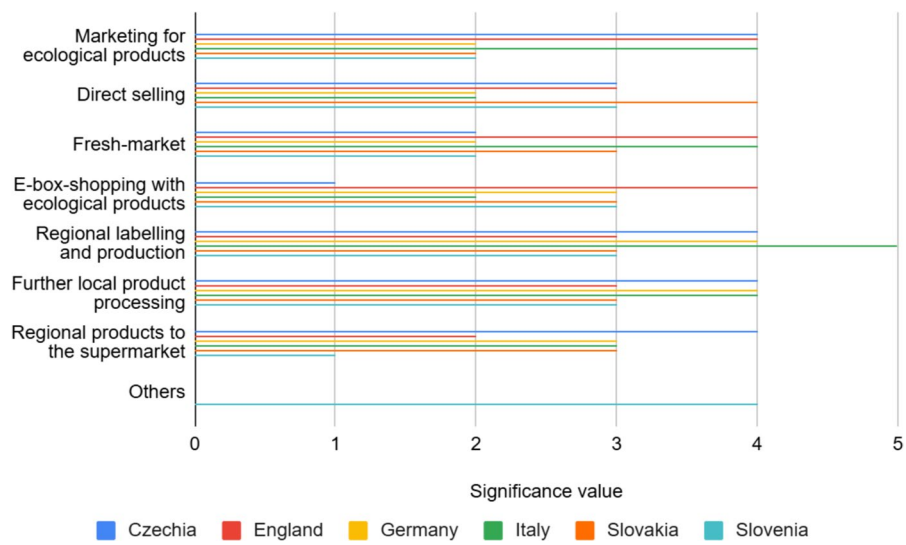


**Fig. 4** Examples of support for fruit production from traditional orchards in responding countries (estimated values from 0—no important, 1—low important, to 5—very important)

of second-grade fruit into, for example juice and alcoholic beverages,
- Farmers' markets and box schemes (England, Germany),
- Marketing and support for regional production (Slovakia) by direct farm sales, farmer's markets, e-box shopping marketing as "honest food" with ecological products, with fruit collected from the farm,
- Rewarding the additional production costs of environmentally friendly production with a higher price for cider fruit harvesting and local cider production in cooperation with local processors in order to create local supply chains (England, Germany; Keech 2017)
- Regional labelling of fruit/fruit-based products, and support for organic agriculture (Czechia) (Fialová and Chromý, 2022).

The significance of various initiatives that support fruit production in individual countries is shown in Fig. 4 with the highest significance value for regional labelling and production (4.2), as well as links to the supermarket network that promote the sale of regional products.

Pick Your Own (PYO) has increased in popularity obviating the need for harvesting and marketing fruit by the producer. Examples were given of these initiatives in France (city of Paris and other regions), the yellow ribbon initiative in Germany, in Goriška Brda (Western Slovenia, close to the Italian border, popular for cherries) and the Vipava Valley (Vipavska dolina—peaches and apricots); in the Danube Lowland, Slovakia, apples. Urban fruit trees where people can harvest fruit are promoted by the Fruitmap application (https://www.fruitmap.org/) which is growing in popularity for example in Czechia, France, Germany, the Netherlands, and Slovakia.

## Regulating and supporting ecosystem services associated with traditional orchards

Traditional orchards are often islands of biodiversity, particularly where they remain as remnants within the urbanized landscape and so have great potential to provide a variety of regulating and supporting services (Demestihas et al. 2017). They include a range of local and landscape features, that promote plant and insect diversity, combining to form a pollinator-friendly habitat (Eeraerts et al. 2021). Some remain as semi-natural habitat and can provide refuges for rare species of fauna and flora, particularly when the orchards include older fruit cultivars, which are durable and resistant to infections (Bignami et al. 2003), so require fewer pesticides and fertiliser. These traditional orchards are worthy of restoration and conservation due to their overall natural, botanical, and historical values including the genetic resource they contain (Bence et al. 2011). Traditional high-grown fruit trees can be part of diverse hedgerows and provide shade over crops in rows as well as planted in orchard blocks providing shelter and food for wildlife

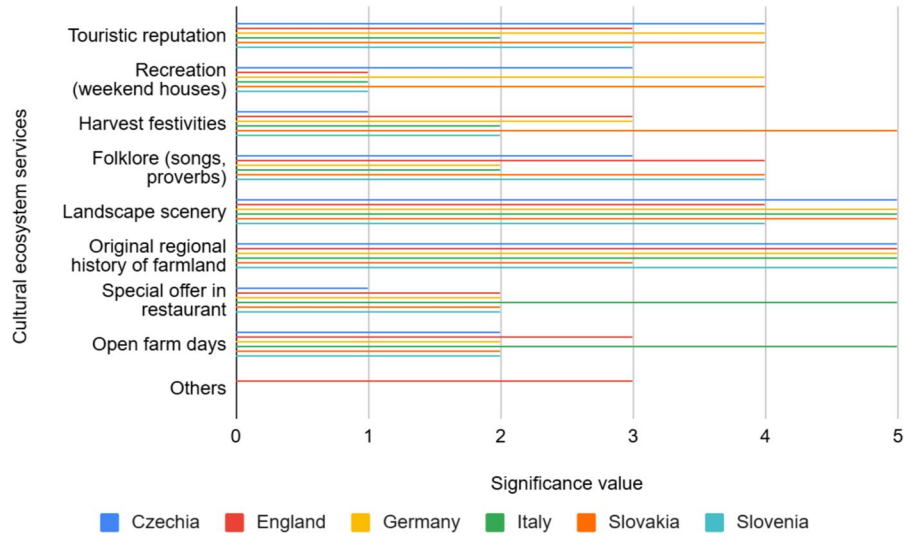


**Fig. 5** Cultural benefits of orchards (estimated values from 0—no important, 1—low important to 5—very important)

as well as contributing to climate regulation, carbon storage, local rainfall infiltration, air quality and protection from soil erosion and landslides in the same way as other long lived trees in agricultural landscapes (Demestihas et al. 2019; Crous-Duran et al. 2020; Messina et al. 2023). The role of orchards in soil stabilisation is particularly important when they are planted on terrace edges in areas prone to landslides, examples from traditional ecological knowledge were provided by respondents from Slovenia and Slovakia.

## Cultural ecosystem services associated with traditional orchards

The significance of traditional orchards in providing cultural ecosystem services is increasingly recognised as they can be the focus of socio-cultural interactions with the natural environment for recreation, aesthetic appreciation, and inspiration for artists. As a traditional form of agriculture, they are evidence of economic history demonstrating how this contributes to local landscape character and regional identity as well as to tourism in some areas. The significance given by respondents to different cultural attributes of traditional orchards in their countries is shown in Fig. 5.

The landscape scenery of traditional orchards is rated highly with both trees in blossom and fruit inspiring many artists, for example the blossoming apple tree painted by Ivan Grohar (Slovenia) and featuring in folk songs (e.g. in Czech, "*Stojí hruška v širém poli*", a pear-tree stands in fields, "*Dozrávajú hrušky ovesňačky"*, pears are ripening; in Slovak, "*Červené jabĺčko*" red apple and *Čerešničky, čerešničky, čerešne*, cherries, cherries. Orchard landscapes are increasingly appreciated by tourists (Netherlands), attracting people to visit during blossom time (England) and for autumn harvest festivities, with fruit markets, thanksgiving ceremonies with decorated churches (Slovakia), and specific festivals, for example the Kozjansko apple festival (Slovenia, Praznik Kozjanskega jabolka). These may include traditional cuisine offered in restaurants and farm open days (Italy). In France, agritourism includes open farm days and in Normandy, whole meals are produced with each course based on apples. European Orchard Day, in April, has become the focus for many different traditional blossom celebrations to come together in one event (Germany: "Tag der Streuobstwiese," 2024).

Orchard tourism in regions with a fruit-growing tradition has also led to the establishment of specific routes, for example between Javor and Janče (Sadna cesta med Javorom in Jančami) east of Ljubljana, and the Brkini Hills fruit road (Brkinska sadna cesta) in southwestern Slovenia. In Italy, the "Via della Frutta Antica'' is a route for those interested in the many ancient fruit trees along the Via Nova, which connects Pieve (Primiero San Martino di Castrozza) with the Gobbera Pass in Trentino ("La Via della Frutta Antica," 2024). The mid-winter blessing of orchard trees (wassailing) has recently been revived in traditional apple and pear growing parts of England.

Changes in land use and out migration have resulted in some areas with scattered settlements and traditional orchards becoming the focus for recreation with holiday/leisure homes (e.g. in Czechia and Slovakia). The area of active farmland, including traditional orchards, has significantly decreased with those remaining retained for their aesthetic value. Six districts in one of the largest orchard areas in Germany have combined to market the region as an orchard paradise ("*Streuobstparadies*") offering various recreational activities.

The socio-environmental axis provides an opportunity for education and for increasing awareness of the cultural (and other ecosystem services associated with traditional orchards, and their continued importance. Respondents to the questionnaire provided examples of how this has – and is – being done, these are listed below:

- forming new associations to promote stewardship and traditional management practices raising awareness by training (Czechia, Italy, and Slovakia)
- providing courses for enthusiastic amateurs wanting to learn how to care for fruit trees and maintain them (England, France, Germany, Slovenia)
- providing technical know-how: specialist hobby courses are becoming more popular, focusing on tree cutting, planting, and grafting to propagate older cultivars (England, Slovakia).

**Table 5** The examples of best practices from the individual countries

| Country | Best practices and initiative for promotion of traditional orchards |
|---|---|
| Czechia | • In some regions, especially protected landscapes, traditional orchards and fruit trees are of interest to nature conservation authorities as components of local distinctiveness and ecological value<br>• Orchards are mentioned in discussions about reintroducing silvo-pastoral systems<br>• Prague, the capital city of Czechia, has a special program for the management of old orchards to protect biodiversity, landscape character, and for recreation |
| England | • Traditional orchards are included in 'Keepers of Time', the Government policy document for ancient and native woodland and trees (Forestry Commission and Natural England 2022). As individuals or in groups traditional orchard trees and are exceptionally valuable for their biodiversity, cultural value, and heritage value. They are irreplaceable habitats with features, such as branch death and hollowing that contribute to their biodiversity, cultural, and heritage value<br>• Numerous projects raise awareness of importance for landscape character<br>• The National Fruit Collection at Brogdale, Kent ("Brogdale Collections: National Fruit Collection Heritage Orchards [WWW Document], 2025) preserves the genetic resource |
| France | • Best practice focuses on awareness-raising of the importance of traditional orchards<br>• Some villages have planted fruit, such as grapes, strawberries, raspberries, and apples in containers on the streets and public places, for example in front of railway stations. People can help themselves when passing by<br>• Around Paris and other big cities, the demand for urban gardening is growing often combined with social work, healthcare, or education. These gardens, ranging in size from containers to huge areas shared by many families, may be supported by private organisations, and tended by school classes, retirement homes, or private individuals |
| Germany | • Orchard cultivation was included in the 2021 German UNESCO Commission's list of intangible cultural heritage, an application supported by over 1.3 million people ("Immaterielles Kulturerbe—Hochstamm Deutschland e.V.," 2024). The rationale is that orchards protect diversity of fruit varieties and shape cultural landscapes as they are the result of agricultural and cultural development so directly linked to human knowledge. They are species-rich biotopes home to numerous animal and plant species. At the core of orchard cultivation is the labour and time-intensive care and management of the orchard meadows as well as fruit processing, both utilising traditional craft techniques. Orchard cultivation involves customs and rituals, such as tree planting to mark the birth of children. being born and public events such as orchard fruit, cider, and fruit blossom festivals<br>• There are several collections in Germany that aim to preserve the gene pool, particularly important in the context of climate change. Around 750 apple and 250 pear varieties preserved in the Kompetenzzentrum Obstbau Bodensee (Sortengärten am Kompetenzzentrum Obstbau Bodensee [WWW Document] 2024). These collections are used for research into disease resilience and fruit quality<br>• The National Agency for Nature Conservation recently published an overview of orchards in Germany, including analysis of their cultural meaning and importance for biodiversity (Henle et al. 2024) |
| Italy | • The Baumgart project ("Baumgart Projekt Südtirol," 2024) aims to communicate the value of traditional orchards through outreach, communication, and education activities such as photo competitions, and awards for the best extensive orchard, targeted at farmers and the public with the aim of creating an interregional network to prevent the decline continuing in South Tyrol, a cultural landscape in the Alpine region (Strobl 2022). As a result, citizens can discover the fruits of these orchards and their processed products opening up new taste experiences and great culinary potential<br>• The aesthetic value of traditional orchards is an important factor, especially for farm holidays (agritourism)<br>• In the upper region of Friuli Venezia Giulia and the Natisone valley (on the border with Slovenia), some historic traditional orchards host ancient varieties such as the yellow apple of Priuso, the golden rust, winter red, sweet striped, and the zeuka. These are ancient apples resistant to major diseases (Slow Food FVG 2019) |
| Netherland | • Some of the old orchards are preserved for reasons of landscape and biodiversity. Much work done by volunteers. Profit from growing interest in local products |
| Norway | • Fruit production is important for the income of fruit-growing farmers and the development of businesses such as the Lerum company in the Sogn region, which began berry concentrate production in 1907 and currently produces a large range of fruit and berry products, including jams. There has bene recent development of niche fruit-based products, for example, cider<br>• Fruit trees are an important component of attractive cultural landscapes, for example in the Hardanger region with fruit tree blossom in May an important element of the regional identity and a tourist attraction (Torvestad 2005) |

**Table 5** (continued)

| Country | Best practices and initiative for promotion of traditional orchards |
|---|---|
| Slovakia | • A group of young people have formed 'The Fruit Tree Association' (FTA—in Slovak: združenie ovocinárov) for those interested in fruit growing and nature-friendly farming in the countryside. Since 2012, they been actively volunteering preserving diversity of fruit varieties trying to discover traditional names and promote them, taking graft wood (scions) from parent trees and grafting them onto seed-grown, high-growing rootstocks. They have developed their skills and experience in a 12-hectare orchard also used for grazing and producing quality organic apples. The origin of the FTA was to meet the demand for new planting of long-lived fruit trees, pruning mature trees, and for public education about fruit growing |
| • Slovenia | • A national project to revitalise the Meadow Orchards and Orchard Gardens of Slovenia started in 1998 in the Kozjansko Regional Park, eastern Slovenia. An orchard survey took place between 2000 and 2006, resulting in an inventory of the types and varieties of fruit trees in the Kozjansko Regional Park revealing many different varieties of apples and pears although some were represented by a single tree. Educational workshops were held on spirit making, preparing juice and vinegar, renewal pruning, grafting fruit trees, and other annual orchard tasks<br>• The Kozjansko Apple Festival (Praznik kozjanskega jabolka) has been organized every second weekend in October, since 1999, focusing on older apple varieties<br>• A nursery has been created in Podsreda, where the park administration is located, to preserve old and almost forgotten varieties. Currently 60 different ones are stocked, with scions sold for grafting onto high-growing (rather than dwarfing) rootstocks |

Initiatives to promote traditional orchards and the services they provide.

Respondents were asked if there were any projects or initiatives in their country aimed to conserve traditional orchards and raise awareness of the many ways in which they are important. The results are provided in the following Table 5.

## Discussion

Our results reflect the weakness of government support for traditional orchards in many European countries and the continuing increase of unmanaged traditional orchards (de Paz et al. 2023) and the difficulty of selling agricultural products from extensive farming (Keech 2017; Philipp and Zander 2023). Traditional orchards are often maintained thanks to strong family traditions, the initiative of activists and enthusiastic people seeking a healthier lifestyle, or those motivated by food safety concerns and environmental issues (FAO 2020). This is enabled by the extensive pool of traditional knowledge that is preserved in families and in associations. It provides an opportunity to learn what worked well in the past and share traditional ecological knowledge, and develop cooperation through societies and associations, as happened in the past. These activities have important consequences: traditional orchard managers feel proud and honoured, and so are motivated to continue their activities, inspiring others to follow their example. This in turn helps to initiate more research due to greater awareness of the importance of traditional orchards for the range of benefits they provide. Recognition by UNESCO also fosters local pride and sense of place, local, rural, and national identity. An important factor in this is to increase financial benefit from traditional orchards so that their maintenance, preservation, restoration, or even new plantings will be profitable for the owner. Box schemes and other examples of direct selling can help but do not on their own constitute a viable living. One option could be to combine orchards with transhumance, as in the rural area of Lower Vogelsberg region, in Hesse, Germany, and to pay for the landscape management the herders do (Dreer and Kruse 2022). Traditional orchards and site-specific fruit varieties might be preserved through the promotion of principles of multifunctional use of agricultural land. This is an appeal to politicians and the CAP to react so that small orchards and those maintained by private individuals are eligible for subsidies.

Traditional orchards provide many benefits in a multifunctional agricultural landscape. Plieninger et al. (2013) investigated how ecosystem services of cultural landscapes, such as those of traditional orchards, can be preserved. They found that it is helpful to foster local people's connection to cultural landscapes, build social capital, and align

consumption patterns with local food production. The case study of orchard meadows in Germany points to the need to understand the loss of biodiversity associated with traditional agricultural systems and that this is the consequence of multiple drivers, including government policies and cultural attitudes (Hammel and Arnold 2012). Research focused on an integrated modelling framework to evaluate farm profitability and effectiveness of Austrian agri-environmental measures for orchard meadows found that productivity and current market prices for fruit are not sufficient for site maintenance (Schoenhart et al. 2011). Important issues for promotion of fruit production are: advertising measures or marketing messages tailored to the target group; communication of additional benefits of the products and the systems depending on the consumer group, e.g. ethical messages; value chain management; and collaboration in the value chain. Qualitative research in Germany shows that many consumers have a positive view of orchard meadows even when they are not familiar with typical products, as they appreciated naturalness, taste, local origin, and biodiversity preservation (Philipp and Zander 2023). Keech (2017) examined three models of orchard conservation in England and Germany, revisiting Jens Beckert's social order of markets theory. This explored how social enterprises aim for environmental order through market interventions, identifying challenges and revealing the environmental outcomes of their engagement in dynamic market fields. European Orchard Day has run since 2021, with the aim of connecting orchard stakeholders and highlighting the cultural landscape and its products. In 2024, over 200 hosts across Europe invited stakeholders, consumers, and citizens to experience orchards (Tag der Streuobst-wiese [WWW Document], 2024).

In addition to their intrinsic biodiversity value, derived from the age of the trees and role in organic agriculture (Daelemans et al. 2025) traditional orchards can also play an important role as linking elements in biotope networks, an aim that predates the creation of the European Green Deal (EUROPEAN COMMISSION 2019). Article 10 of the Habitats Directive refers to the promotion of "connecting landscape elements" and mandates Member States to create landscape features in fragmented and transformed cultural landscapes. Emphasis is placed on the importance of functional and spatial coherence in nature conservation to enable the migration and spread of species and genetic exchange and thus improve the ecological coherence of the Natura 2000 protected area network. This requires a functional ecological network, and as orchards are present both within villages and on the outskirts on very different soils, providing habitat for many different species, they can play this stepping stone role linking biotopes. This would support the requirements for ecological coherence in EU directives (EEC 1992), international conventions and agreements (e.g. (CBD , 2011, 2018, 2020) and political declarations of intent (e.g. the Declaration of the EU Council of Ministers to stop the decline in biodiversity by 2010).

## Conclusion

This study has provided a description of the state of traditional orchards in a sample of European countries and the information presented here can to help raise awareness of the importance of this landscape type for ecosystem services and identify practices that help to maintain traditional orchards. One of the ways in which this could be done would be by policies supporting for traditional orchards, as is found in England. Provisioning ecosystem services, such as fruit production, are valued in terms of disease resistance and genetic diversity which is likely to be of increasing importance in the context of future climate change and concerns over food security. Initiatives in many of the responding countries are promoting this but there is no evidence of a network for information exchange which could, for example, enable propagation material to be shared.

Traditional orchards, even if diminishing in extent on the European scale, still have huge significance in many regions. People are very attached to their traditional orchards and everything that is related to extensive fruit growing and production. They understand the value of biodiversity and the other ecosystem services they deliver. Nevertheless, especially in those regions where the decline was drastic within the twentieth century, financial support for this kind of agriculture is often dependent not on farmers, as would have been the case historically, although some continue to manage orchards as hobbies, but on the public to help maintain them. In the countries

involved in this research, traditional orchards are not included in agricultural support schemes.

The most important drivers for maintaining traditional orchards appears to be based on cultural ecosystem services and the benefits they provide to society, including the preservation of traditions and regional identity, attractive places for recreation, aesthetic appreciation, inspiration for artists, and this is the basis for many other new initiatives promoting the attractiveness of traditional orchards not merely to local people but also as part of the tourism industry.

Another interesting result of this study is that statistics are available at international (European) level, enabling an overview of the most important countries in terms of fruit production and the distribution of fruit crops in Europe. The position for statistics on traditional orchards was very different between countries and sometimes even within a single country. Further research is needed, for example, on the exact number of species associated with traditional orchards, the potential for these orchards in mitigation of climate change, and, conversely, the likely impact of climate change on traditional orchards and the delivery of the ecosystem services they provide.

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**Data availability** The datasets generated during the current study are available from the corresponding author on reasonable request.

**Declarations**

**Competing interests** The authors declare no competing interests.



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