UNIVERSITY OF WEST LONDON
The Career University

UWL REPOSITORY

repository.uwl.ac.uk

The current state of peas in the United Kingdom; diversity, heritage and food systems

Lara, Szymon Wojciech ORCID logoORCID: https://orcid.org/0000-0002-1120-2092 and Ryan, Philippa (2025) The current state of peas in the United Kingdom; diversity, heritage and food systems. Plants, People, Planet.

http://dx.doi.org/10.1002/ppp3.70001

This is the Published Version of the final output.

UWL repository link: https://repository.uwl.ac.uk/id/eprint/13284/

Alternative formats: If you require this document in an alternative format, please contact: open.research@uwl.ac.uk

Copyright: Creative Commons: Attribution 4.0

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

Take down policy: If you believe that this document breaches copyright, please contact us at open.research@uwl.ac.uk providing details, and we will remove access to the work immediately and investigate your claim.

Rights Retention Statement:

Received: 7 August 2024 | Revised: 23 December 2024 | Accepted: 5 January 2025

DOI: 10.1002/ppp3.70001

Plants People Planet PPP Open Access

OPINION

The current state of peas in the United Kingdom; diversity, heritage and food systems

Szymon Wojciech Lara [1,2] | Philippa Ryan [1]

[1]Royal Botanic Gardens, Kew, Richmond, London, UK

[2]London Geller College of Hospitality and Tourism, University of West London, London, UK

Correspondence
Szymon Wojciech Lara, Royal Botanic Gardens, Kew, Richmond, London, TW9 3AE, UK.
Email: s.lara@kew.org; szymon.lara@uwl.ac.uk

Societal impact statement

Landraces and traditional pea varieties hold great potential for enhancing agrobiodiversity and promoting pulse consumption, offering a rich historical and cultural resource for the UK food system. Unfortunately, many traditional pea varieties are lost, and those surviving are mostly in seed banks or used only by small-scale growers. Minor pea cultivars and landraces are overlooked by wider food systems, making it difficult to integrate them into modern value chains. Reintroduction challenges include complex phenotypic traits, legislative hurdles and limited access to genetic resources and information.

Summary

Peas (*Lathyrus oleraceus* Lam. *syn Pisum sativum* L.) are one of the oldest UK pulse crops and are still an important part of the food systems today. Despite the United Kingdom having a rich history of crop diversity and being a centre of crop trade since the Victorian era, historic pea varieties have been largely lost. Most currently grown pea cultivars are of commercial use with little or no historical significance. In general, most UK landraces (including those of peas) today, are maintained *ex situ* in seedbanks. Varieties with a long UK heritage are arguably well-suited to local conditions, but their cultivation is needed to enable their ongoing adaptation to climate change. Globally, many crops still have cultivated landraces; however, their use can be largely limited to local food systems. In the United Kingdom especially, there are legislative rules and frameworks such as the National Lists and Plant Breeders' Rights that increase the complexity of *in situ* maintenance of landraces and possibly de-incentivise their wider use across the food systems today. These findings highlight the importance of underutilised varieties and neglected crops in sociocultural contexts.

KEYWORDS

agrobiodiversity, archives, biocultural, history of peas, *Lathyrus oleraceus* Lam, pea landraces, *Pisum sativum* L

This is an open access article under the terms of the Creative Commons Attribution License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.
© 2025 The Author(s). *Plants, People, Planet* published by John Wiley & Sons Ltd on behalf of New Phytologist Foundation.

1 | INTRODUCTION

The decrease in biodiversity and agrobiodiversity is one of the greatest threats to food and nutrition security globally (Antonelli et al., 2020). This decrease is linked to unsustainable farming and the homogenisation of food systems (Thrupp, 2000; Williams et al., 2020). The Food and Agriculture Organisation (FAO) of the United Nations (UN) has highlighted the importance of diversifying diets and the need to create more resilience based practices for food production and consumption, such as the wider use of underutilised and neglected crops and varieties (FAO, online, 2022a, 2022b; Mayes et al., 2012).

Currently, the United Kingdom imports around 46% of its food, mainly in the form of processed products and food commodities. Many vegetables and other crops are also imported, despite existing home production, and there is a connection between increasing imports and decreasing food self-sufficiency (DEFRA - UK Food Security Report, 2020; Lang, 2020). Globally, the United Kingdom has the longest history of modern agricultural development and arguably for losing its local agricultural and dietary diversity. This process of crop diversity loss has accelerated since the 'Green Revolution' and continues due to unsustainable agricultural practices, oriented on maximisation of calorie outputs and added-value chains, centred on commodity crops, especially wheat, barley, oats, potatoes and sugar beet (Cusworth et al., 2021; DEFRA - Food Statistics Pocketbook, 2023; DEFRA - UK Food Security Report, 2020).

The UK food system can become more resilient and secure with the use of neglected crops through diversification and increasing agrobiodiversity, for which *heritage* and *traditional* cultivars, including *landraces* possess promising characteristics (Mayes et al., 2012; Mustafa et al., 2019). Peas (*Lathyrus oleraceus* Lam. syn *P. sativum* L.) play a significant role here, as natural nitrogen fixers and sustainable alternatives to animal and soy protein. We note that although the *Pisum* genera has been changed to *Lathyrus*, we still follow the original naming because of its common application across the food systems. Despite the rich reservoirs of UK pea cultivars and *landraces*, insignificant numbers are used at small scales, with most traditional accessions being overlooked by the food systems' stakeholders and public sector institutions (Maxted et al., 2014a; Raggi et al., 2022).

Many non-commercial crop species, their varieties or wild edible relatives/species are often in a very general sense, subcategorised under words like 'underutilised' and 'forgotten' (Azam-Ali et al., 2001; Ulian et al., 2021) There are also differences between advocating for improved versus non-improved varieties and on historically grown versus novel species. For example, in agri-research and development, terms like underutilised species (and similar terms like *orphan*), often refer to species that have not been commercialised, and have potential for development and improvement. In this context, underutilised species might be chosen and focused on to create new commercial hybrid varieties (Bhowmik et al., 2021), whereas, in other instances, the focus can be on conserving the genetic diversity of crops grown as landraces.

From a UK perspective, broad bean, for example, is discussed as an underutilised species because it is mostly grown for food by allotment holders, although interestingly, it is a major commercial crop in other parts of the world (Robinson et al., 2019; Semba et al., 2021). Other crops that have little or no history of cultivation in the United Kingdom can also be introduced as novel underutilised species should they potentially suit UK climates and, in this context, may also be targeted for improvement (within agri-development). In other parts of the UK agri-food-sector, non-improved varieties from both the United Kingdom and abroad are targeted more for their associated heritage value, such as bere barley (*Hordeum vulgare* L.) but only form marginal roles in the wider food systems (Assan., 2023; Lara et al., 2023; Mahon et al., 2016; Raggi et al., 2021; Villa et al., 2005).

The agri-food sector poses some important challenges to the diversification of existing food systems with *minor* crops and *landraces*, for several reasons, such as their lack of agronomic uniformity, emergence of spontaneous sensory characteristics and limited access to genetic material (Gibson, 2009; Westling et al., 2024). Access to seeds is crucial in the revival and diversification process. The UK agri-food system is homogenised, and despite a good level of diversity within the species and varietals available to growers, most are of commodified (e.g., improved nature) and *traditional* varieties are overlooked. In the case of *P. sativum* L., there are many interesting varietals and cultivars that once were cultivated and could potentially be revived, however, are generally ignored (due to many factors such as yield and biotic/abiotic stresses) by growers. Many barriers to their revival also occur due to accessibility, availability and usability of available genetic material and information. Legislation also creates barriers, often preventing growers from accessing, maintaining or selling *landraces* and other *underutilised* varieties.

Benefits of valorising *landraces* and other traditionally maintained cultivars within food systems includes potentially helping to conserve agrobiodiversity through increased awareness and 'conservation through use' (Kor et al., 2022). Such approaches are better known outside of the United Kingdom where *landrace* diversity persists more, but there are 'pockets' in the United Kingdom, where some *landraces* (including *P. sativum* L.) are cultivated (Martin et al., 2023; Maxted et al., 2014b). Maintaining *landrace* diversity has local implications—as long grown *landraces* can naturally have useful adaptive traits and global implications because only through *in situ* conservation can *landrace* crops keep adapting to new climates.

Traditional crop varieties can also be viewed as part of cultural heritage. Outside of the United Kingdom, the heritage context of *traditional* crops is often the platform for their conservation or revival, particularly within local cultural food systems where they are still grown (Burton et al., 2024; Faye, 2020; Kuhnlein et al., 2009). In the United Kingdom, such heritage based conservation is comparatively rare due to the long history of agricultural industrialisation and patchy survival of *landraces*, but revitalisation of *landraces* or other *heritage* varieties could be advanced through raising awareness of their agroecological and nutritional benefits (Borelli et al., 2020; Chable et al., 2020). Promoting heritage and landrace varieties could perhaps go in line with recent legislative attention given to improving food sovereignty in policy, although this has yet to be addressed properly. Utilising *traditional* varieties provides an opportunity to food

producers to use the heritage context of historic varieties to help promote the use of peas in diets and via this route to aid wider UK and international campaigns that aim to increase consumption of pulses as sustainable sources of protein (Environmental Change Institute, 2024; SDG2 Advocacy Hub, 2024; United Nations, 2016).

2 | DATA SOURCES

The data presented throughout this manuscript have been sourced from several online platforms available to the public. These included seedbanks' websites, gene banks' electronic databases, the National Archives digital databases and various other platforms. The URLs and further information have been included as notes (see Notes S1).

The screening and shortlisting of evidence were standardised for each of the platforms. The electronic search engines (versions available as of article writing date) have been utilised with no time restraints, but with the use of key words put into a Boolean Code: *pea**, *garden-pea**, *petit pois*, *Pisum sativum*, *legum**, *lathyrus** and *green pea**.

Most of the information retrieved here was of quantitative nature, including old lists of agricultural crops, their formally recognised statuses and names with corresponding changes to the lists over time.

All the data have been analysed using IBM SPSS Statistics v29. software programme and consisted of descriptive statistical analysis with data presented graphically.

Additionally, each database has been contacted electronically to confirm data retrieved and to ask for any additional information that could be shared.

2.1 | Ethical approval was not required for this opinion article as all data have been available in the public domain

3 | THE CHANGING NATURE OF PEA USE IN BRITAIN

Peas, along with broad beans, are the oldest grown food pulses in the United Kingdom, with charred seeds recovered from the archaeological record since prehistory, and with finds mostly noted from the Middle Bronze Age onwards (1500 BC), (Treasure & Church, 2017). More is known about the use of peas culturally from historical time frames (Treasure et al., 2019; Treasure & Church, 2017). In his book titled 'Forgotten Fruits' (2009), Christopher Stocks talks about the cultural significance of peas in Europe and their special place on the British pallet. Historically, dried peas would be the main form of pea storage and consumption, such as the *Carling Pea*. 'Carlin' peas are a visibly distinctive variety that are usually dried and are deemed to be one of the oldest surviving strains of peas in England and consequently may be considered to be *forgotten* or *underutilised*. 'Carlin' peas (1562) were traditionally eaten on 'Carlin Sunday' during Lent within the Christian calendar (Weaver, 1997), and forthwith, children were commonly served hot Carlin peas at the end of church service, highlighting their biocultural significance (Albala, 2017). Similarly, 'Carlin' peas are used in a traditional Lancashire dish made often around November 5th ('Bonfire Night') and, thus, contribute to a rich variety of festive, religious and everyday uses (Weaver, 1997). Stocks (2009) mentions the use of dried peas in dishes such as 'peas porridge' and how that dish has likely to have evolved into one of today's most popular pea products, the mushy peas. The same author also suggests that peas, or 'petit poi's', have been introduced in their fresh form to the United Kingdom by Charles II after his exile in France, beginning the trend of French pea varieties finding their way through to the United Kingdom and therefore more often onto the British plates. These changes led to the 'golden age of peas' in 19th century Britain (Garden Trust, 2021). Apart from carling pea, another popular variety that was initially derived from a marrowfat pea called *Knights' White Dwarf*, was *The Champion of England*, likely developed in 1843 and popularised across Kent. This pea was quickly up taken by growers across the United Kingdom, especially after its recognition in the 1876 edition of the *Journal of Horticulture* which also influenced uptake of *The Champion of England* in the United States and Canada (Stoke, 2008). The author also mentions another Victorian pea called *The Prince Albert* which usage was documented and popularised by *The British Cultivator and Agricultural Review* magazine in 1842. Other cultivars such as *Alderman* (1891), *Duke of Albany* (1881), *Tutankhamun* (1922) and *Kelvedon Wonder* (1925) are just a handful examples of the 'commercial' pea diversity that was available in 19th and early 20th century Britain (Stoke 2008). Many of these 'traditional' varieties (likely very innovative at the time of introduction) have found their way through to the 21st century, such as the mentioned *Duke of Albany* maintained by the Heritage Seed Library (HSL) and John Innes Centre Germplasm Research Unit (GRU) seed bank, whereas others are maintained *in situ* by allotment holders (Alexander, 2022). Despite the United Kingdom being the centre of crop trade during the Victorian era, the historic crop diversity decreased significantly overtime, likely due to the United Kingdom being industrialised the earliest and longest.

Today, most commercial pea production sites (see Figure 1) are located in the East and Northeast, and the end-use of peas has changed significantly over the past 80 years, with most pea yield currently being used for animal feed (Green & Foster, 2005; Heath, 1987; Hinton, 1973; Holmesi et al., 2018; PGRO - Processors and Growers Research Organisation, n.d.). The use of pea and pea-derived products is similar to that of soy, where over 76% of global production goes into animal feed and only around 20% are used for direct human consumption; however, there are incentives to change that, which could mean that in the near future, United Kingdom might diversify the uses of homegrown peas and other legumes (JIC, 2023; Mahon et al., 2018). Still, consumer trends show that peas and other legumes are limited to just a handful of uses, and their colloquial image of 'poor man's food' has remained to this day (Affrifah et al., 2023; Lyon et al., 2003; Maphosa & Jideani, 2017).



FIGURE 1 Where UK peas are currently grown. Each dot represents a separate location. Locations vary in size and yield outputs. Source: UKCEH Land Cover® plus: Crops. Access provided by ECI, Food Systems Transformation Group, University of Oxford in October 2023.

4 | THE STATE OF FORMALLY RECOGNISED PEA CULTIVARS IN THE UNITED KINGDOM TODAY

To get a better understanding of the importance of peas in the UK agri-food sector today, it is worth looking into commercial vegetable crop data, such as the *National Lists* (NL) accompanied by descriptive data found in their monthly *Special Gazettes*. These show the monthly breakdown of crops that have been awarded the NL status by the end of each consecutive month, meaning that the listed varietals could be legally marketed across the United Kingdom. The total figure of listed vegetable crops has increased by 7.18% between August 2020 and February 2024 to around 8255 with approximately 372 being peas (*Pisum sativum* L.). These figures suggest that accessibility and availability of *P. sativum* L., varieties is more common than of other leguminous crops such as *Phaseolus vulgaris* L. (common bean) and *Phaseolus coccineus* L., (runner bean). Furthermore, the ratio between *P. sativum* L. and total number of listed vegetable crops has changed *positively* over the past 3 years, and therefore, there is a tendency for further growth, meaning that commercially driven pool of *P. sativum* L., diversity is likely to continue to grow in the near future. This goes in line with the UK and global *pea* market trends (Grand View Research, 2023; Tulbek et al., 2024). Nevertheless, other data points presented in this paper suggest that the real diversity of *P. sativum* L., is rather limited as shown by Scholten et al. (2009) in their report, this applies specifically to the *traditional* or *landrace* type, which are not formally recognised on the databases available. The lack of recognition on these databases highlights the diminished sociocultural roles that these traditional varieties play in the United Kingdom today due to higher availability of elite cultivars.

The total number of *P. sativum* L. varieties that have ever been listed on the National Lists equals to 1318, but the total number of applications that have been registered since 1968 only show a total of 1237, (see Figure 2). This means that around 81 varieties have been registered either via the application route, but that information has not been recorded or those varieties have been registered without prior approval. Varieties that have been in use prior to the introduction of these lists could now have been lost, especially if their use was *minor*, which can be the case for many landraces. Scholten et al. (2009) states that 'at the time of the introduction of the National Lists, exemptions were allowed from listing as well as exemption from the DUS (distinct, uniform and stable) standards in order to facilitate continuation of older pre-1972 vegetable varieties on the lists. This mechanism for retention was the so-called B-list, which comprised varieties marketed as 'standard seed' in contrast to A-list or certified and/ or standard seed. Thus, the archival data on commercial crops is constrained to the date of the introduction of the NL. These lists are formal recognitions of the varieties and cultivars available to large scale users and are likely not aimed for potential smallhold growers. This also likely disincentivises current users from registering landraces and other traditional varieties, which further impacts the sociocultural status of these crops.

Out of the total number of registered pea varieties, only around 372 still hold their 'awarded' status today and can therefore be marketed legally in the United Kingdom, as shown in Figure 1, this suggests that new cultivars may have improved agri-food characteristics and have therefore replaced the older ones (Sholten et al., 2004; Zeven, 1999). The remaining have either been deleted from the national lists or their applications have been withdrawn at some point

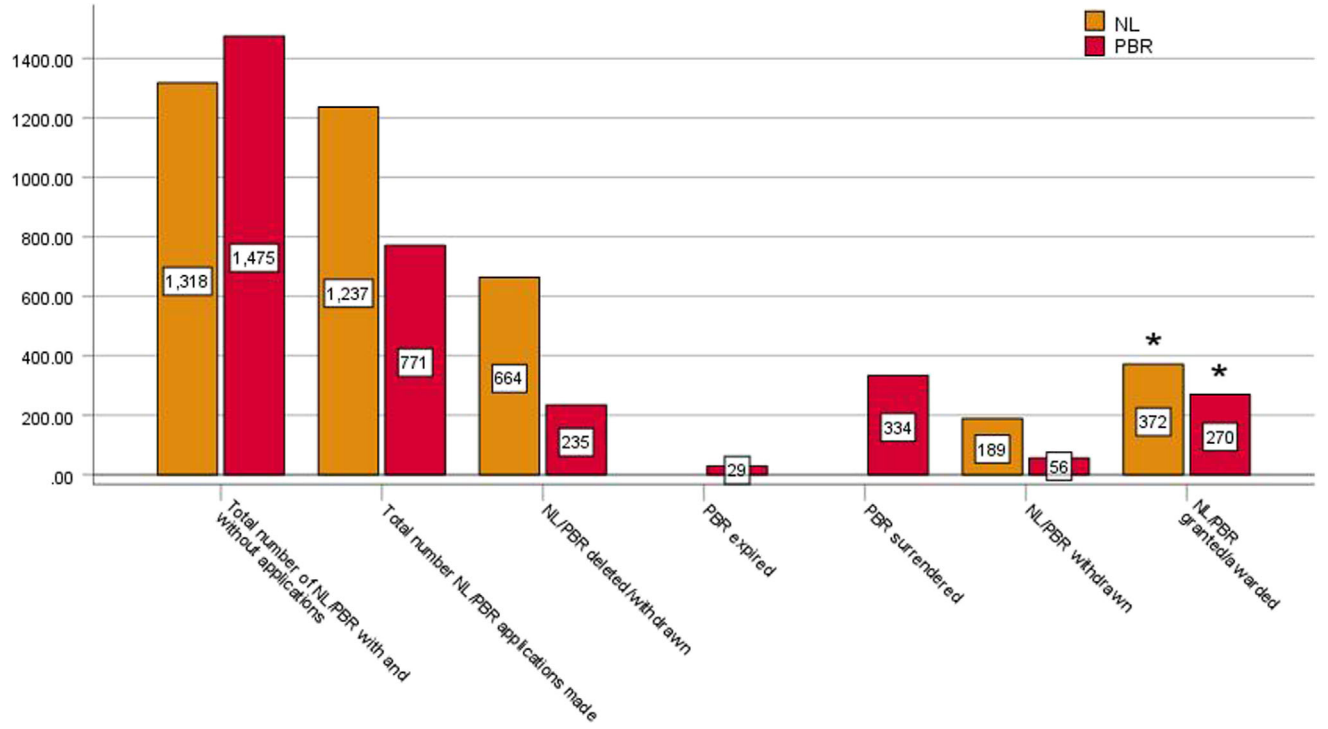


FIGURE 2 This bar chart shows the combined quantitative data on *Pisum sativum* L. varieties as archived on both the National Lists (NL) and the plant Breeder's rights (PBR) between 1968 and 2024. Currently, awarded/granted varieties for NL and PBR are marked with asterisks. Please note that no NL varieties have been found for 'expired' and 'terminated' categories, only PBR.

over the past several decades, likely due to similar reasons. The growers, maintainers and owners have been motivated to register their *P. sativum* L., cultivars and varietals primarily for commercial reasons, meaning that some minor pea *varieties*, including landraces, could have been overlooked due to legislative issues or simply their low commercial statuses.

The total number of *P. sativum* L., varieties ever registered for Plant Breeders Rights in the United Kingdom over the past several decades, equals to around 1475 (also shown in Figure 2). As with the NL, some of the PBR listed vegetable crops have entered the system either with unregistered application or with no application at all. Although, the difference stands at 704 of *P. sativum* L., varieties where applications have not been registered and probably not made, only around 270 remain listed with PBR where the owner/maintainer of the cultivar is entitled to royalties from end users. As with the NL, the remaining varieties have been removed from the PBR lists due to a mix of reasons, with the most common one being *surrender*, where the breeder has given up their rights to the cultivar. The second biggest cause of disappearance from the database is *termination* or *withdrawal* by either 'owner' or DEFRA (Department for Environment, Food and Rural Affairs).

Interestingly, within the total PBR application figures presented above, there are 169 transfers that have been made from the EU list database between June 1998 and December 2020. At the time of writing, 90 of those transfers have been *granted* and 76 have been *surrendered*. The *surrenders* all happened in December 2023, and there is no mention of any *traditional* or *landrace* varieties, which may further incentivise the lack of their formal recognition. In any case, the lack of formal recognition signifies that there is little *ex situ* of United Kingdom formally recognised pea *landraces* left, one of the UK's oldest pulse crops; meaning that the traditional diversity is largely lost as mainly commercial grade cultivars survive with some traditional varieties maintained *in situ* only. The sociocultural and biocultural status of traditional pea varieties is also neglected from a colloquial perspective, with their history and food heritage only being known by the general public and drawn on in marketing in occasional cases, most notably for the carling pea.

Common name varietal 'groups' have been used across the NL and PBR databases to organise the different vegetable crops (including peas) into groups of similar end-uses (see Figure 3). As it can be seen on the graph above, *wrinkled pea* (used mainly for dry market) is the most popular group, followed by *spring field pea* (mainly animal feed supply) and *generic pea (all kinds of uses)*. *Sugar pea* and *round pea* (mainly frozen and fresh markets), together with *winter pea (mainly animal feed supply)* are the smallest of all the listed groups. All of the vegetable-crop varieties have been assigned to *P. sativum* L., and have also been accompanied by colloquial/common names, probably given by the breeder or owner and the documentation available on the archives shows each of those names distinctively. The names of the actual plant breeders, maintainers and owners, together with some contact information, are listed in the mentioned *Special Gazettes*

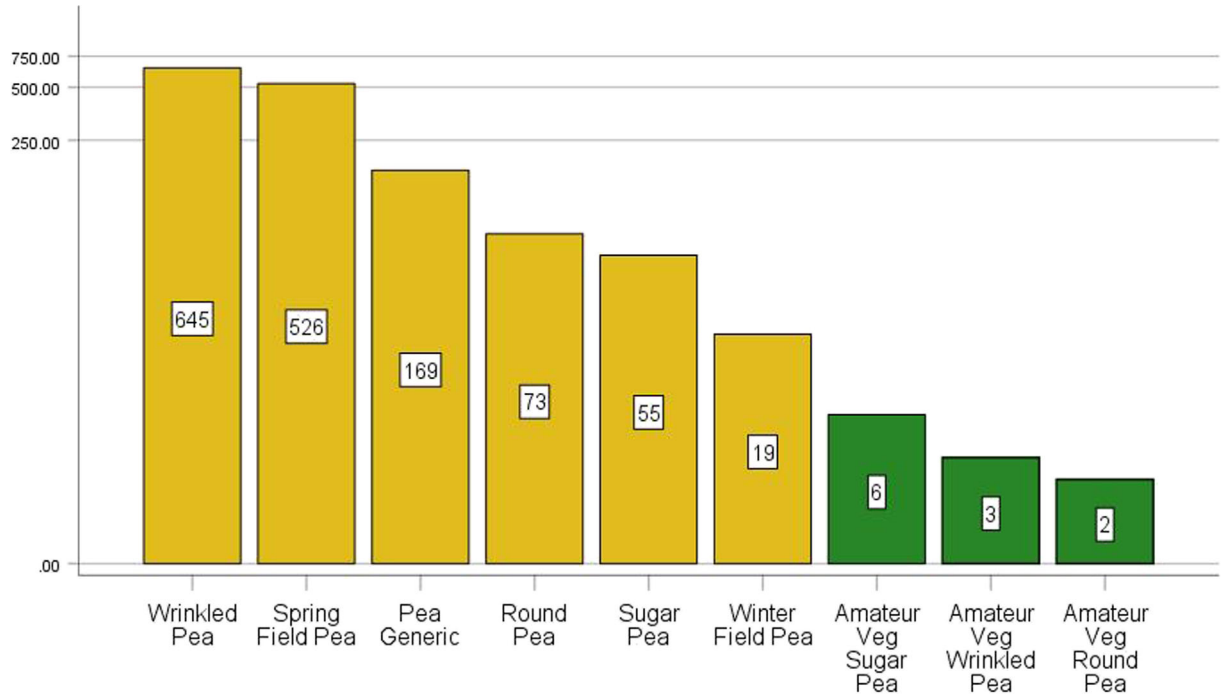


FIGURE 3 This bar chart shows the breakdown of different 'group names' for *Pisum sativum* L., as listed on the National Archives between 1968 and 2024. Green bars represent the so called 'amateur' cultivars, which are likely to be traditional varieties.

released monthly; however, there is limited access to pre-2020 gazettes.

The data also show 11 *P. sativum* L. varieties, coded as *Amveg* or *Amateur*, are likely to be of *heritage* significance, involving small-scale producers, allotment holders and gardeners; hence, their 'amateur' prefix but their true statuses—as *landraces*, *heritage* varieties, and geographic origin—cannot be confirmed. These are likely to be varieties being sold in small quantities with no intrinsic commercial value. Furthermore, their NL statuses have been awarded between September 2011 and June 2022, but no applications toward PBRs have been filed, suggesting that their end-use purpose is more likely to be of uncommercial or small-scale nature, potentially disincentivising wider use and being unlikely to indicate the presence of any historical varieties. All these have also been registered on the NL lists, with applications directly from within the United Kingdom and have not taken part of the EU transfer, but some of their common/approved names could suggest their origin is from outside of the United Kingdom, such as 'Opal creek snap' pea or 'Latvian soup' pea. Winch (2007) states that there are other common names for these peas, such as 'Russian' or 'Ukrainian' or 'Latvian' but still accompanied by the category name 'Soup Pea', which could suggest their common origin.

Despite the relatively high diversity of formally recognised peas on the NL and PBR, the number of *traditional*, *heritage* or *landrace* varietals originating in the United Kingdom seems to be low. Seedbanks and germplasm institutions are likely to contain more of these formally unrecognised and *forgotten* cultivars and varieties; however, information on their sociocultural significance is largely lost and does not seem to exist as cultural knowledge within the general UK society.

5 | THE STATE OF UK PEA LANDRACES AND TRADITIONAL CULTIVARS TODAY

Out of the 710 best known global gene/seed banks, from across 103 countries and 17 international/regional centres, 37% of the accessions are described as *landraces* and *traditional* varieties followed by breeding and research material (27%), advanced and improved cultivars (19%) and finally, wild forms (17%), (Dierig et al., 2014; Maxted et al., 2014a). The Genesys database indicates that there are approximately 68,641 *P. sativum* L. accessions maintained at various locations around the globe with around 2796 having a GBR provenance, of which 168 are 'historical' accessions. There are gene banks around the globe maintaining traditional UK *P. sativum* L., varieties and cultivars, but *in situ* cultivation is also needed to enable their ongoing adaptation to the UK climate today and in the future. Most recent statistics by EU PVP (2023) from 2016 indicate that farm saved seeds fluctuated between 30% and 55% of total seed use for the major crops across UK farmers, which is similar for most European nations; however, *traditional* and *landrace* varieties are not likely to be part of that process. The same data also show that there are over 600 crop and plant seed maintainers in the United Kingdom alone; however, an overarching proportion of these are 'agents or public sector

organisations', which engage in *maintaining* of commercial and recognised cultivars or seed production through formal breeding programmes (Maxted et al., 2014a). Most of these organisations do not maintain pea accessions or only store a handful, such as the Warwick UK Vegetable Seedbank.

There are three main UK seedbanks (the HSL, the JIC and Science and Advice for Scottish Agriculture [SASA]) and multiple small and micro 'seed banks' that redistribute the *underutilised* or less commercialised varieties or cultivars of crops to farmers, gardeners, home growers and allotment holders; the latter also rely on seed swapping at events like 'Seedy Sunday' (Maxted et al., 2014a). These seedbanks currently hold around 327 *landrace* varieties of crops and plants of mixed origin, most of which are only grown for research and maintenance purposes (Maxted et al., 2014c, 2014d). *Landraces* are grown and maintained by small-scale growers but also are 'managed' by organisations like SASA or JIC for conservation and adaptation purposes. It is however difficult to distinguish between different accessions and their duplicates, as the UKVGB (UK Plant Genetic Resources Group - Vegetable Gene Bank) operates on a decentralised approach. Therefore, some of these accessions might be duplicates stored at different seedbanks. Smýkal et al. (2013) suggests that at least 20% of all accessions are likely to be duplicates, which further reduces the realistic crop diversity.

The Millennium Seed Bank Partnership (MSBP) is the biggest UK-based seedbank with over 99 thousand different accessions stored but is focused on wild plants. There are around 1562 wild *P. sativum* L., *ex situ* accessions stored, with use for future pea cultivation through crop development programmes (Breman et al., 2021).

The John Innes Centre's GRU seedbank is the main reservoir of pea accessions in the United Kingdom. With around 58,297 accessions, 4876 are classified as 'traditional', but those have been grouped together and not categorised into distinctive groups of *landraces* versus other *heritage* varieties. This is likely to be the biggest reservoir of this type of pea accessions anywhere in the United Kingdom. Around 3000 of those have recently been duplicated for backup storage at the Svalbard Global Seed Vault in Norway. Interestingly, majority of these *traditional P. sativum* L., accessions seem to have foreign passport data, with only 61 being categorised with GBR origin.

Another common resource of *P. sativum* L., within the United Kingdom is the HSL governed by Garden Organic with frequent fluctuations in the number of seed accessions, as HSL is predominantly commercial driven. Of around 800 accessions available to the public, only around 64 are classified as *traditional* or *landrace*. Once again, their true identify is not presented in a clear format, and there could be *heritage* varietals categorised under the same group as some *landraces*. Currently, there are 28 *P. sativum* L., accessions, all of which are categorised as *traditional* and with UK passport data. Interestingly, these UK *traditional* varietals are accompanied with growers' descriptions, but those are often limited to generic or inconsistent commentary, for example, on flavour, height and yield.

SASA contains over 4261 pea accessions and have a total of 11,445 different vegetable-crop accessions. Information on the statuses of those *P. sativum* L. accessions is limited. The accessions are however likely to be commercial types as they are used as reference material for DUS trials, and although there are some landraces of oats and barley maintained on the Scottish Isles, the Scottish Landrace Protection Scheme (SLPS) does not cover peas (Mahon et al., 2018).

Maxted et al. (2014b) indicated that by 2014 there have been at least 327 *heritage* varieties or *landraces* maintained by the three key seedbanks at various locations across the United Kingdom. The authors have also highlighted the number of pea *landraces* maintained across the United Kingdom to around 98 and suggested that some of those actively cultivated accessions might be from countries other than the UK. Nevertheless, the figures have probably changed since then, and the data presented earlier on is likely to be more accurate. A recent study by Raggi et al. (2022) indicates that there are currently 25 known *landrace* varieties of major crops in the United Kingdom, which are grown across 264 different 'landrace conservation' sites; however, the total number of landraces in the United Kingdom is unknown, and the actual status of *in situ landrace* and *traditional P. sativum* L., diversity has been estimated to be around 98 (Maxted et al., 2014b). These conservation sites likely form the only formally recognised landrace cultivation areas; however, they have little connection to the biocultural heritage of pea varieties due to their core objective of cultivar/variety preservation.

6 | DISCUSSIONS

In many parts of the world, regionally *indigenous* crops and other *traditional* crops grown within cultural food systems can be a focal point for valorisation or research and investment. As such, 'Indigenous and Traditional Crops' are also key terms used, especially in culturally framed research and initiatives (with *traditional* referring to non-native crops that have become adopted at some stage within cultural food systems) (Kuhnlein et al., 2009). The UK scenario is different as there are no Indigenous UK crops. Peas, along with broad beans, are however the oldest pulse crops grown in the United Kingdom (and amongst the oldest UK crops in general) meaning that they have a greater capacity than later crop introductions for locally adapted varietal diversity. Due to the long history of UK industrialisation of food and farming systems however, there are far fewer surviving *traditional crops* and *landrace* diversity than in many of our European neighbours, such as Italy (Negri & Torricelli, 2003).

Terms such as *ancient*, *heritage* and *heirloom* are popular with the public, marketing and food industries in the United Kingdom. And in these contexts, these terms can refer especially to varieties that predate those developed within agribusiness—*traditional cultivars* and *landraces*. Some of which can be found in old texts, such as horticultural periodicals and old recipe books, hence their connection to biocultural heritage. Some early mentions of peas can be found via online searches using digitalised collections of such documents, for example, the *Early Modern Recipes Online Collective* (https://emroc.hypotheses.org/) or *The Sifter* (https://thesifter.org/); nevertheless,

the information on those old varietals is rather limited and often obscure, making it difficult to identify the specific cultivars or *landraces* in modern seed bank collections.

Moreover, seed banks that preserve these old varieties often lack vital information on the accessions, such as the true age of the varieties, due to limited historical data, dating back only to the accession point in time, but not beyond that. This is important for the crop's passport data as the geographical location of the origin of the crop is only limited to the country, sometimes 'donor' country when sourced from exterritorial entities. Therefore, specified location data are not available, often posing barriers to the correct identification of the nature of the crop, especially when working with unique *landraces* that poses very localised sets of characteristics. Pea *landraces* that are currently cultivated in the United Kingdom, despite their high sociocultural significance, might disappear from current food systems due to problems with variety registration (Cooper & Cadger, 1990). DEFRA runs the UK National Lists where new varieties of plants can be added if meeting DUS criteria and as stated by Maxted et al. (2014b) registration of agricultural crops also requires satisfactory value for cultivation and use (VCU), which could be a challenge for small enterprises pursuing *landrace* pea cultivation, especially when the cultivars originated at 'unofficial' sources like the allotments and gardens, which in fact are the nation's reservoirs for agrobiodiversity (SASA- Scottish landraces, 2023). This could be the reason why so little 'traditional' varieties of *P. sativum* L. have been registered on the NL and on PBR. Although likely not possessing the traits capable competing with *improved* cultivars, these varieties could be utilised from the perspectives of improving diversity within elite varieties. Furthermore, possible reintroduction of these *minor* cultivars could be restricted by limited accessibility to seeds as most seed banks would share between 10 to 100 seeds per accession, with unspecified revival rates. Although important from organisational perspectives, these elements could work against the preservation of biocultural heritage within the contexts of utilisation of *traditional* varieties of crops. Conservation through wider adoption and use is likely to realistically impact the levels of agrobiodiversity and perhaps promote these crops through capitalisation of their sociocultural traits.

7 | CONCLUSIONS

Peas have been vital components of UK diet for centuries; however, their diversity has decreased significantly across the entire farm to fork chain. Alongside the homogenisation of the British plate, where New World crops are preferred more now than ever, the food usability of peas, in most cases, has been limited to dietary accompaniments and animal feed production. The sociocultural changes are visible across national archives, which present the true status of the UK vegetable-crop diversity, highlighting the overreliance on commercial cultivars of *P. sativum* L., and lack of formal recognition of *traditional* varietals and *landraces*. With improvements in agri-food technologies, demand for sustainable foods and growing desire for agri-botanical heritage preservation, *landraces* and *traditional* cultivars should be considered for revival back into the major food systems. Historical significance of these *heritage* crops is conserved in archives, seedbanks and by small-scale growers across the country. These are however mainly maintained *ex situ*, meaning that those varieties, if not being grown in farmers' fields, are no longer adapting to the UK climate. There are many barriers that potentially dis-incentivise growers from relying on and maintaining *traditional* varieties and *landraces* of peas, such us the unclear legislative rules and limited access to genetic material. Further work should be carried out through mapping the phylogenetic diversity of peas to assess actual size of the existing reservoir for improving future agrobiodiversity.

AUTHOR CONTRIBUTIONS

Conceptualization: Szymon Wojciech Lara. *Methodology*: Szymon Wojciech Lara and Philippa Ryan. *Software*: Szymon Wojciech Lara and Philippa Ryan. *Validation*: Szymon Wojciech Lara and Philippa Ryan. *Formal analysis*: Szymon Wojciech Lara. *Investigation*: Szymon Wojciech Lara and Philippa Ryan. *Resources*: Szymon Wojciech Lara. *Data curation*: Szymon Wojciech Lara and Philippa Ryan. *Writing—original draft preparation*: Szymon Wojciech Lara. *Writing—review and editing*: Szymon Wojciech Lara and Philippa Ryan. *Visualization*: Szymon Wojciech Lara and Philippa Ryan. *Supervision*: Philippa Ryan. *Project administration*: Szymon Wojciech Lara. All authors have read and agreed to the published version of the manuscript.

ACKNOWLEDGEMENTS

The authors acknowledge the input from colleagues and research staff from the mentioned public institutions received throughout the manuscript preparation.

CONFLICT OF INTEREST STATEMENT

The authors declare that there are no known competing financial interests or personal relationships between the authors, and the authors of the articles included in the article and the institutions that could have appeared to influence the work reported in this paper.

DATA AVAILABILITY STATEMENT

The historical data that support the findings of this study are available in the National Archives at https://www.nationalarchives.gov.uk/. Seedbank data were derived from the following resources available in the public domain at: (1) https://apps.kew.org/seedlist/SeedlistServlet, (2) https://www.seedstor.ac.uk/search-browsecollections.php), (3) https://www.gardenorganic.org.uk/seedlist, (4) https://www.sasa.gov.uk/variety-testing/variety-collections, (5) https://www.aber.ac.uk/en/ibers/core-capabilities/research-facilities/genetic-resources-biobank/, (6) https://warwick.ac.uk/fac/sci/lifesci/wcc/genebank and (7) https://www.genesys-pgr.org/.

ORCID

Szymon Wojciech Lara https://orcid.org/0000-0002-1120-2092
Philippa Ryan https://orcid.org/0000-0001-6645-9744

REFERENCES

Affrifah, N. S., Uebersax, M. A., & Amin, S. (2023). Nutritional significance, value-added applications, and consumer perceptions of food legumes: A review. *Legume Science*, *5*(4), 192. https://doi.org/10.1002/leg3.192

Albala, K. (2017). *Beans: A history* (pp. 65–75). Bloomsbury Publishing.

Alexander, A. (2022). *The seed detective: Uncovering the secret histories of remarkable vegetables*. Chelsea Green Publishing.

Antonelli, A., Smith, R. J., Fry, C., Simmonds, M. S., Kersey, P. J., Pritchard, H. W., Abbo, M. S., Acedo, C., Adams, J., Ainsworth, A. M., & Allchin, B. (2020). State of the World's Plants and Fungi (Doctoral dissertation, Royal Botanic Gardens [Kew]; Sfumato Foundation).

Assan, N. (2023). Socio-cultural, economic, and environmental implications for innovation in sustainable food in Africa. *Frontiers in Sustainable Food Systems*, *7*, 1192422. https://doi.org/10.3389/fsufs.2023.1192422

Azam-Ali, S. N., Sesay, A., Karikari, S. K., Massawe, F. J., Aguilar-Manjarrez, J., Bannayan, M., & Hampson, K. J. (2001). Assessing the potential of an underutilized crop–A case study using Bambara groundnut. *Experimental Agriculture*, *37*(4), 433–472. https://doi.org/10.1017/S0014479701000412

Bhowmik, P., Konkan, D., Polowick, P., Hodgins, C. L., Subedi, M., Xiang, D., Yu, B., Patterson, N., Rajagopalan, N., Babic, V., & Ro, D. K. (2021). CRISPR/Cas9 gene editing in legume crops: Opportunities and challenges. *Legume Science*, *3*(3), 96. https://doi.org/10.1002/leg3.96

Borelli, T., Hunter, D., Padulosi, S., Amaya, N., Meldrum, G., de Oliveira Beltrame, D. M., Samarasinghe, G., Wasike, V. W., Güner, B., Tan, A., & Koreissi Dembélé, Y. (2020). Local solutions for sustainable food systems: The contribution of orphan crops and wild edible species. *Agronomy*, *10*(2), 231. https://doi.org/10.3390/agronomy10020231

Breman, E., Ballesteros, D., Castillo-Lorenzo, E., Cockel, C., Dickie, J., Faruk, A., O'Donnell, K., Offord, C. A., Pironon, S., Sharrock, S., & Ulian, T. (2021). Plant diversity conservation challenges and prospects—The perspective of botanic gardens and the millennium seed Bank. *Plants*, *10*(11), 2371. https://doi.org/10.3390/plants10112371

Burton, G., Gori, B., Camara, S., Ceci, P., Conde, N., Couch, C., Magassouba, S., Vorontsova, M. S., Ulian, T., & Ryan, P. (2024). Landrace diversity and heritage of the indigenous millet crop fonio (*Digitaria exilis*): Socio-cultural and climatic drivers of change in the Fouta Djallon region of Guinea. *Plants, People, Planet*, 1–15. https://doi.org/10.1002/ppp3.10490

Chable, V., Nuijten, E., Costanzo, A., Goldringer, I., Bocci, R., Oehen, B., Rey, F., Fasoula, D., Feher, J., Keskitalo, M., & Koller, B. (2020). Embedding cultivated diversity in society for agro-ecological transition. *Sustainability*, *12*(3), 784. https://doi.org/10.3390/su12030784

Cooper, S. R., & Cadger, C. A. (1990). Germination of *Vavilovia formosa* (Stev.) Davis in the laboratory. *Pisum Newsl*, *22*(5).

Cusworth, G., Garnett, T., & Lorimer, J. (2021). Agroecological break out: Legumes, crop diversification and the regenerative futures of UK agriculture. *Journal of Rural Studies*, *88*, 126–137. https://doi.org/10.1016/j.jrurstud.2021.10.005

DEFRA, U. (2020). The Path to Sustainable Farming: An Agricultural Transition Plan 2021 to 2024. UK DEFRA, pp. 1–66.

DEFRA, U. (2023). Food statistics in your pocket. UK DEFRA, Office for National Statistics. pp. 1–33.

Dierig, D., Blackburn, H., Ellis, D., & Nesbitt, M. A. R. K. (2014). Curating seeds and other genetic resources for ethnobiology. *Curating biocultural collections: A handbook* (pp. 107–125).

Environmental Change Institute. (2024). Beanmeals: systemic innovation from fork-to-farm. Retrieved December 23, 2024, from https://www.eci.ox.ac.uk/beanmeals

EU PVP Catalogue. (2023). Navigation Path European Commission food, farming, fisheries food safety plants plant reproductive material plant variety catalogues & databases EUPVP - common catalogue EUPVP - Common Catalogue Information System (no date) EUPVP - COMMON CATALOGUE - Varieties of agricultural plant and vegetable species. Retrieved February 3, 2024, from https://ec.europa.eu/food/plant-variety-portal/

FAO. (2022a). The State of Food and Agriculture 2022. FAO. Retrieved February 27, 2024, from https://www.fao.org/publications/sofa/2022/en/

FAO. (2022b). Promoting neglected and underutilized crop species. Newsroom. Retrieved March 3, 2024, from https://www.fao.org/newsroom/detail/Promoting-neglected-and-underutilized-crop-species/en

Faye, J. B. (2020). Indigenous farming transitions, sociocultural hybridity and sustainability in rural Senegal. *NJAS—Wageningen Journal of Life Sciences*, *92*(1), 1–8. https://doi.org/10.1016/j.njas.2020.100338

Gibson, R. W. (2009). A review of perceptual distinctiveness in landraces including an analysis of how its roles have been overlooked in plant breeding for low-input farming systems. *Economic Botany*, *63*(3), 242–255. https://doi.org/10.1007/s12231-009-9086-3

Grandviewresearch.com. (2023). Pea protein market size & share|industry report, 2023–2030. Retrieved March 12, 2024, from https://www.grandviewresearch.com/industry-analysis/pea-protein-market

Green, K., & Foster, C. (2005). Give peas a chance: Transformations in food consumption and production systems. *Technological Forecasting and Social Change*, *72*(6), 663–679. https://doi.org/10.1016/j.techfore.2004.12.005

Heath, M. C. (1987). Grain legumes in UK agriculture. *Outlook on Agriculture*, *16*(1), 2–7. https://doi.org/10.1177/003072708701600101

Hinton, W. L. (1973). Outlook for peas in Britain and Europe. Agricultural Enterprise Studies in England and Wales, Economic Report No, 18.

Holmesi, H. F., Sylvester-Bradley, R., Costelloz, K., Vickers, R., Belcher, S., Wallace, J., & Berry, P. M. (2018). What is the potential yield of peas and how can it be achieved?

JIC—John Innes Centre. (2023) Innovative pea protein project aims to break Soya Habit. Retrieved March 12, 2024, from https://www.jic.ac.uk/news/innovative-pea-protein-project-aims-to-break-soya-habit/

Kor, L., O'Hickey, B., Hanson, M., & Coroi, M. (2022). Assessing habitat connectivity in environmental impact assessment: A case-study in the UK context. *Impact Assessment and Project Appraisal*, *40*(6), 495–506. https://doi.org/10.1080/14615517.2022.2128557

Kuhnlein, H. V., Erasmus, B., & Spigelski, D. (2009). Indigenous peoples' food systems: the many dimensions of culture, diversity and environment for nutrition and health. Food and Agriculture Organization of the United Nations (FAO).

Lang, T. (2020). *Feeding Britain: Our food problems and how to fix them* (pp. 252–265). Penguin UK.

Lara, S. W., Tsiami, A., & Cross, P. (2023). Discovering and mapping colloquial terminologies describing underutilized and neglected food crops—A comprehensive review. *Food*, *12*(12), 2428. https://doi.org/10.3390/foods12122428

Lyon, P., Colquhoun, A., & Alexander, E. (2003). Deskilling the domestic kitchen: National tragedy or the making of a modern myth? *Food Service Technology*, *3*(3–4), 167–175. https://doi.org/10.1111/j.1471-5740.2003.00078.x

Mahon, N., Crute, I., Di Bonito, M., Simmons, E. A., & Islam, M. M. (2018). Towards a broad-based and holistic framework of sustainable intensification indicators. *Land Use Policy*, *77*, 576–597. https://doi.org/10.1016/j.landusepol.2018.06.009

Mahon, N., McGuire, S., & Islam, M. M. (2016). Why bother with bere? An investigation into the drivers behind the cultivation of a landrace barley. *Journal of Rural Studies*, *45*, 54–65. https://doi.org/10.1016/j.jrurstud.2016.02.017

Maphosa, Y., & Jideani, V. A. (2017). The role of legumes in human nutrition. *Functional Food Improve Health Through Adequate Food*, *1*, 13. https://doi.org/10.5772/intechopen.69127

Martin, P., Russell, J., Wishart, J., Brown, L. K., Wallace, M., Iannetta, P. P., & George, T. S. (2023). Back to the future: Using ancient bere barley landraces for a sustainable future. *Plants, People, Planet*. https://doi.org/10.1002/ppp3.10432

Maxted, N., Scholten, M., Ford-Lloyd, B., Allender, C., Astley, D., Vincent, H., & Kell, S.P. (2014a). *Landrace conservation strategy for the United Kingdom* (p. 18). Birmingham: The University of Birmingham.

Maxted, N., Scholten, M., Ford-Lloyd, B., Allender, C., Astley, D., Vincent, H., & Kell, S. P. (2014b). *Landrace conservation strategy for the United Kingdom* (p. 47). Birmingham: The University of Birmingham.

Maxted, N., Scholten, M., Ford-Lloyd, B., Allender, C., Astley, D., Vincent, H., & Kell, S. P. (2014c). *Landrace conservation strategy for the United Kingdom* (p. 44). Birmingham: The University of Birmingham.

Maxted, N., Scholten, M., Ford-Lloyd, B., Allender, C., Astley, D., Vincent, H., & Kell, S. P. (2014d). *Landrace conservation strategy for the United Kingdom* (pp. 8–9). Birmingham: The University of Birmingham.

Mayes, S., Massawe, F. J., Alderson, P. G., Roberts, J. A., Azam-Ali, S. N., & Hermann, M. (2012). The potential for underutilized crops to improve security of food production. *Journal of Experimental Botany*, *63*(3), 1075–1079. https://doi.org/10.1093/jxb/err396

Mustafa, M. A., Mayes, S., & Massawe, F. (2019). Crop diversification through a wider use of underutilised crops: A strategy to ensure food and nutrition security in the face of climate change. *Sustainable Solutions for Food Security: Combating Climate Change by Adaptation*, 125–149. https://doi.org/10.1007/978-3-319-77878-5_7

Negri, V., & Torricelli, R. (2003). *The Italian landrace conservation strategy* (pp. 15–17). The University of Birmingham.

PGRO - Processors and Growers Research Organisation. (n.d.) Growing combining peas. Retrieved January 15, 2024, from https://www.pgro.org/growing-combining-peas/

Raggi, L., Caproni, L., & Negri, V. (2021). Landrace added value and accessibility in Europe: What a collection of case studies tells us. *Biodiversity and Conservation*, *30*(4), 1031–1048. https://doi.org/10.1007/s10531-021-02130-w

Raggi, L., Pacicco, L. C., Caproni, L., Álvarez-Muñiz, C., Annamaa, K., Barata, A. M., Batir-Rusu, D., Díez, M. J., Heinonen, M., Holubec, V., & Kell, S. (2022). Analysis of landrace cultivation in Europe: A means to support *in situ* conservation of crop diversity. *Biological Conservation*, *267*, 109460. https://doi.org/10.1016/j.biocon.2022.109460

Robinson, G. H. J., Balk, J., & Domoney, C. (2019). Improving pulse crops as a source of protein, starch and micronutrients. *Nutrition Bulletin*, *44*(3), 202–215. https://doi.org/10.1111/nbu.12399

Scholten, M., Green, N., Campbell, G., Maxted, N., Ford-Lloyd, B., Ambrose, M., & Spoor[1], B. (2009). 15. Landrace inventory of the UK. European landraces on-farm conservation, management and use, (15), p.161.

SASA - Scottish landraces. (2023). Scottish Landraces|SASA (Science & Advice for Scottish Agriculture). Retrieved March 1, 2024, from https://www.sasa.gov.uk/variety-testing/scottish-landraces

Scholten, M., Maxted, N., & Ford-Lloyd, B. V. (2004). *UK National Inventory of plant genetic resources for food and agriculture* [Unpublished Report]. Defra, London, UK.

SDG2 Advocacy Hub. (2024). Beans is How. Retrieved December 23, 2024, from https://sdg2advocacyhub.org/beans-is-how/

Semba, R. D., Ramsing, R., Rahman, N., Kraemer, K., & Bloem, M. W. (2021). Legumes as a sustainable source of protein in human diets. *Global Food Security*, *28*, 100520. https://doi.org/10.1016/j.gfs.2021.100520

Smýkal, P., Coyne, C., Redden, R., & Maxted, N. (2013). Peas. In *Genetic and genomic resources of grain legume improvement* (pp. 41–80). Elsevier Inc. https://doi.org/10.1016/B978-0-12-397935-3.00003-7

Stocks, C. (2009). Forgotten fruits: The stories behind Britain's traditional fruit and vegetables. *Random House*, 139–149.

The Garden Trust. (2021). Peas, perfect peas. Retrieved February 12, 2024, from https://thegardenstrust.blog/2016/10/29/peas-perfect-peas/

Thrupp, L. A. (2000). Linking agricultural biodiversity and food security: The valuable role of agrobiodiversity for sustainable agriculture. *International Affairs*, *76*(2), 265–281. https://doi.org/10.1111/1468-2346.00133

Treasure, E. R., & Church, M. J. (2017). Can't find a pulse? Celtic bean (*Vicia faba* L.) in British prehistory. *Environmental Archaeology*, *22*(2), 113–127. https://doi.org/10.1080/14614103.2016.1153769

Treasure, E. R., Gröcke, D. R., Caseldine, A. E., & Church, M. J. (2019). Neolithic farming and wild plant exploitation in western Britain: Archaeobotanical and crop stable isotope evidence from Wales (c. 4000–2200 cal BC). In *Proceedings of the prehistoric society* (Vol. 85, pp. 193–222). Cambridge University Press.

Tulbek, M. C., Wang, Y. L., & Hounjet, M. (2024). Pea—A Sustainable Vegetable Protein Crop. In *Sustainable protein sources* (pp. 143–162). Academic Press.

Ulian, T., Pritchard, H. W., Casas, A., Mattana, E., Liu, U., Castillo-Lorenzo, E., Way, M., Aranda, P. D., & Lira, R. (2021). Neglected and underutilized species of Mexico: status and priorities for their conservation and sustainable use. In *Orphan crops for sustainable food and nutrition security* (pp. 118–127). Routledge. https://doi.org/10.4324/9781003044802-10

United Nations. (2016). World Pulse Day. Retrieved December 23, 2024, from https://www.un.org/en/observances/world-pulses-day#:~:text=Origin&text=Recognizing%20their%20value%2C%20on%2020,Year%20of%20Pulses%20(IYP

Villa, T. C. C., Maxted, N., Scholten, M., & Ford-Lloyd, B. (2005). Defining and identifying crop landraces. *Plant Genetic Resources*, *3*(3), 373–384. https://doi.org/10.1079/PGR200591

Weaver, W. (1997). *Heirloom vegetable gardening: A master Gardener's guide to planting, growing, seed saving, and cultural history* (286). Owls Books/Henry Holt.

Westling, M., Leino, M. W., Wennström, S., & Öström, Å. (2024). Sensory variation of landrace peas (*Pisum sativum* L.): Impacts of variety, location, and harvest year. *Food Science & Nutrition*, *12*, 6498–6508. https://doi.org/10.1002/fsn3.4287

Williams, B. A., Grantham, H. S., Watson, J. E., Alvarez, S. J., Simmonds, J. S., Rogéliz, C. A., Da Silva, M., Forero-Medina, G., Etter, A., Nogales, J., & Walschburger, T. (2020). Minimising the loss of biodiversity and ecosystem services in an intact landscape under risk of rapid agricultural development. *Environmental Research Letters*, *15*(1), 014001.

Winch, T. (2007). *Growing food: A guide to food production* (pp. 150–168). Springer Science & Business Media.

Zeven, A. C. (1999). The traditional inexplicable replacement of seed and seed ware of landraces and cultivars: A review. *Euphytica*, *110*, 181–191. https://doi.org/10.1023/A:1003701529155

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Lara, S. W., & Ryan, P. (2025). The current state of peas in the United Kingdom; diversity, heritage and food systems. *Plants, People, Planet*, 1–10. https://doi.org/10.1002/ppp3.70001