GLOBAL CROP CONSERVATION AND USE METRICS

GRASSPEA
(*Lathyrus* L.)

CROP TRUST

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Global crop conservation and use metrics

GRASSPEA
(*Lathyrus* L.)

With support from

CROP TRUST

International Treaty on Plant Genetic Resources for Food and Agriculture

Federal Ministry of Agriculture, Food and Regional Identity

Description

This report provides an up-to-date overview of the global status of *ex situ* conservation of genetic resources of grasspea and its wild relatives, including key metrics on:

- the identity and composition of genebank collections;
- the Multilateral System (MLS) status of accessions in these collections;
- storage, regeneration, and safety duplication status;
- documentation, information systems, and research resources;
- germplasm distribution; and
- varietal registrations and releases.

The report also includes global statistics on crop production and availability in food supplies, as well as information about crop networks and partnerships. It is meant to provide an update to some of the information presented in the Global Conservation Strategy for grasspea (Crop Trust, 2007), but is primarily based on publicly available datasets, rather than a new survey of genetic resource collections and expert consultations.

Introduction and background on grasspea

Grasspea (*Lathyrus sativus* L., Fabaceae), also known as blue sweet pea, chickling vetch, Indian pea, Indian vetch, or white vetch, was likely domesticated in the Balkan peninsula or in the Near East around 6000 BCE, and may be among the first domesticated crops in Europe (Yegrem *et al.*, 2024). The grain legume is now cultivated mainly in South Asia and Ethiopia, and to a more limited extent in West and Central Asia as well as in southern Europe. Its hardy penetrating root system enables the crop to grow in a wide range of soil types. Grasspea is resilient to both drought stress and water-logging, and thus serves as a survival food during famine periods, particularly in Bangladesh, India, Nepal, and Ethiopia. The grain legume is very high in protein and micronutrients (Yegrem *et al.*, 2024). However, its importance as a food security crop is complicated by the presence of β-ODAP or BOAA, neurotoxins that can cause lathyrism when the grain (particularly in raw and green/unripe form) is consumed excessively, especially under severe drought conditions. The toxicity results in irreversible paralysis, characterized by lack of strength in, or inability to move, the lower limbs (Crop Trust, 2007). The crop is also cultivated for animal feed and forage, and has a very high nitrogen fixation rate. Several industrialized countries, including Australia, Spain, Italy, and Canada, plant grasspea in rotation between major cereals (Yegrem *et al*., 2024).

Global cultivation and consumption statistics are rather limited for grasspea, with FAOSTAT placing the crop within generalized categories both in production metrics (“Pulses, nes”) and food supply metrics (“Pulses, Other”); estimates derived from these statistics are reported in Table 1. Yegrem *et al*. (2024) report that India is the top producer (384,800 tonnes per annum), followed by Bangladesh (232,500 tonnes), and Ethiopia (202,126 tonnes).

Table 1. Global status of grasspea production, availability in food supplies, and public interest. Production and food supply statistics from FAOSTAT (2015 to 2018 average). The crop is placed within generalized categories both in production metrics ("Pulses, nes") and food supply metrics ("Pulses, Other"). For production, the value for "Pulses, nes" was divided evenly among crops within the general category to estimate a production value. For food supply, the value for "Pulses, Other" was divided among crops within the general category using a weighted average based on crop production statistics (Khoury *et al*., 2023). Number of countries refers to the count of countries where the crop is reported as within the top 95 percent of crops in terms of contribution to production or food supply. The evenness metric quantifies evenness of production or availability in food supplies across world regions, where 0 equals highly uneven and 1 equals completely even. The international interdependence metric quantifies the degree of production or availability in food supplies outside of the primary region of diversity of the crop, where 0 equals low estimated international interdependence and 1 equals high estimated international interdependence. Wikipedia metric is public pageviews over one year (2019) of the taxon name of the crop. All values from Khoury *et al.* (2023).

Metric	Global value	Number of countries where significant contributor	Evenness of contribution across world regions	Estimated international interdependence
Harvested area (ha)	82,353	2.50	0.26	0.95
Total production (tonnes)	62,700	0.00	0.37	0.94
Gross production value (current thousand USD)	43,005	0.00	0.24	0.94
Contribution to calories in food supplies (kcal/capita/day)	0.52	0.00	0.50	0.98
Contribution to protein in food supplies (g/capita/day)	0.03	5.25	0.51	0.98
Contribution to fat in food supplies (g/capita/day)	0.00	0.00	0.47	0.98
Contribution to food weight in food supplies (g/capita/day)	0.05	0.00	0.50	0.98
Number of public pageviews on Wikipedia over one year	43,447			

Identity and composition of *ex situ* collections

Based on the latest data in global genetic resource databases, germplasm collections of grasspea and its wild relatives (i.e. genus *Lathyrus*) are present in at least 103 institutions worldwide, collectively maintaining 23,151 accessions (Table 2, Table 3; Supplementary Table 1). The institutions are well distributed globally, including large collections in Asia, Australia, the Americas, Europe, and Africa. The International Centre for Agricultural Research in Dry Areas (ICARDA), along with the National Bureau of Plant Genetic Resources (NBPGR) (India), the Banco Activo INIA Carillanca (Chile), the Bangladesh Agricultural Research Institute, and the Australian Grains Genebank, collectively maintain over half of documented accessions. Reported information on the status of accessions under the Multilateral System of Access and Benefit Sharing (MLS) of the International Treaty on Plant Genetic Resources for Food and Agriculture (Plant Treaty), as recorded in the Global Information System (GLIS) as well as in pertinent fields in Genesys and FAO WIEWS (Table 2; Table 4), likely underestimate the degree to which accessions are currently included in the MLS, as many of the grasspea collections without any information on MLS status are in countries that are contracting parties to the Plant Treaty (such as Chile, Bangladesh, and the USA) and distribute samples using the Standard Material Transfer Agreement (SMTA).

Based on a genebank stakeholder survey process, the 2007 Strategy identified 21,227 grasspea accessions maintained worldwide (Crop Trust, 2007). The major collections were largely the same as those currently listed in Genesys and FAO WIEWS, although several

Table 2. Major *ex situ* collections of grasspea genetic resources. Top 20 institutions listed in descending order by total number of accessions. Number of accessions and storage condition information from Genesys and FAO WIEWS (2024), with supplementary information as noted. Multilateral System (MLS) status from Plant Treaty GLIS (2025) and from Genesys and FAO WIEWS (2024).

Institution Code	Institution name	Number of accessions	Percent of total	Cumulative percent	Number of accessions in long term storage (-18-20 C)	Number of accessions included in MLS (from Plant Treaty GLIS)	Number of accessions included in MLS (from genebank collections databases
LBN002	International Centre for Agricultural Research in Dry Areas (ICARDA)	4,468	19.3%	19.3%	Not listed*	4,356	4,357
IND001	National Bureau of Plant Genetic Resources (NBPGR)	2,661	11.5%	30.8%	2,661	0	0
CHL150	Banco Activo INIA Carillanca	1,620	7.0%	37.8%	Not listed	0	0
BGD003	Bangladesh Agricultural Research Institute	1,561	6.7%	44.5%	1,561	0	0
AUS165	Australian Grains Genebank, Agriculture Victoria	1,477	6.4%	50.9%	1,094	1,095	1,376
GBR004	Millennium Seed Bank - Royal Botanic Gardens Kew	1,449	6.3%	57.2%	Not listed	0	268
UKR008	Ustymivka Experimental Station of Plant Production	1,301	5.6%	62.8%	196	0	0
RUS001	N.I. Vavilov All-Russian Research Institute of Plant Industry (VIR)	1,207	5.2%	68.0%	1,207	0	0
USA022	Western Regional Plant Introduction Station, USDA-ARS, Washington State University (USDA)	871	3.8%	71.8%	868	0	0
ETH085	Ethiopian Biodiversity Institute	646	2.8%	74.6%	622	0	586
POL003	Plant Breeding and Acclimatization Institute	583	2.5%	77.1%	540	0	377
ESP004	Centro Nacional de Recursos Fitogenéticos	529	2.3%	79.4%	436	0	396
DEU146	Genebank, Leibniz Institute of Plant Genetics and Crop Plant Research	515	2.2%	81.6%	514	390	390
HUN003	Centre for Plant Diversity	405	1.8%	83.3%	86	0	6

Institution Code	Institution name	Number of accessions	Percent of total	Cumulative percent	Number of accessions in long term storage (-18-20 C)	Number of accessions included in MLS (from Plant Treaty GLIS)	Number of accessions included in MLS (from genebank collections databases
BGR001	Institute for Plant Genetic Resources 'K.Malkov'	374	1.6%	85.0%	336	0	0
ARE003	International Center for Biosaline Agriculture	254	1.1%	86.1%	Not listed	254	254
CHL171	Banco de Semillas SAG Magallanes	236	1.0%	87.1%	236	0	0
PAK001	Plant Genetic Resources Program	194	0.8%	87.9%	147	0	168
NZL001	Margot Forde Genebank, AgResearch Ltd	186	0.8%	88.7%	Not listed	0	0
PRT001	Banco Português de Germoplasma Vegetal	176	0.8%	89.5%	138	0	176
	Other institutions (n = 83)	2438	10.4%	100%	1,167	293	995

*But documented in the 2007 Strategy as maintaining collections in long-term conditions (Crop Trust, 2008)

other collections listed in the 2007 Strategy are not currently reported in the global genetic resource databases, including the Universite de Pau, IBEAS (France, 4,477 accessions), the Institute National Agronomique (Algeria, 437 accessions), and the Aegean Agricultural Research Institute (AARI) (Turkey, 363 accessions), among others. The 2007 Strategy recognized ICARDA, the Universite de Pau, NBPGR, the Bangladesh Agricultural Research Institute, and VIR as among the largest and most diverse collections, while also noting diversity in the collections in Ethiopia, Nepal, Portugal, Spain, and Türkiye.

The genus *Lathyrus* comprises approximately 160 species, native primarily to temperate regions of the world, with around 78 species originating in Asia, 52 species in Europe, 30 in North America, 24 in tropical East Africa, and 24 in temperate South America (Crop Trust, 2007). Along with grasspea, the genus contains several other species – including *Lathyrus cicera* L., *Lathyrus ochrus* (L.) DC., and *Lathyrus clymenum* L. – that are also cultivated as a pulse, but to a much lesser and more geographically limited extent than grasspea. It also contains at least one edible tuber species (*Lathyrus tuberosus* L., and over a dozen species with ornamental value or used for livestock forage or feed (Crop Trust, 2007).

Genepool assignments for grasspea include five species (*Lathyrus amphicarpos* L., *Lathyrus blepharicarpus* Boiss., *L. cicera*, *Lathyrus pulcher* J. Gay, and *Lathyrus setifolius* L.) in the secondary genepool, and 18 species in the tertiary genepool, with the remaining members of the genus considered more distantly related (Yunus and Jackson, 1991; USDA, 2025).

Data compilation for this report on grasspea genetic resources included all species in *Lathyrus*. Along with grasspea, 97 taxa as well as accessions only recognized to the genus level are present in germplasm collections (Supplementary Table 2). These include large collections of *L. cicera*, *Lathyrus aphaca* L., *L. ochrus*, and *L. clymenum*, all with over 500 accessions conserved worldwide. Landraces make up the largest proportion of collections

Table 3. Composition of *ex situ* collections of grasspea genetic resources. Main *ex situ* collections data from Genesys and FAO WIEWS (2024). Primary and secondary regions information from Khoury *et al*. (2023) and subsequent research for this summary. Botanic gardens data from BGCI PlantSearch (2024).

Metric	Number	Percentage
Total number of accessions in genebank collections	23,151	
Number of institutions holding genebank collections	103	
Number of distinct taxonomic names in genebank collections	99	
Number of accessions of crop wild relatives (CWR) in genebank collections	5,494	23.7%
Number of accessions of weedy materials in genebank collections	106	0.5%
Number of accessions of landraces in genebank collections	8,022	34.7%
Number of accessions of breeding materials in genebank collections	2,628	11.4%
Number of accessions of improved varieties in genebank collections	437	1.9%
Number of accessions of other materials in genebank collections	5	0.02%
Number of accessions not marked with an improvement type in genebank collections	6,459	27.9%
Number of countries where germplasm has been collected for genebank collections	93	
Number of accessions in genebank collections from the primary region(s) of diversity	5,237	22.6%
Number of accessions in genebank collections from the primary and secondary region(s) of diversity	8,298	35.8%
Number of taxa in botanic garden collections	124	
Number of botanic gardens holding collections of crop or its wild relatives	219	

(34.7%), followed by wild relatives (23.7%), breeding materials (11.4%), and improved varieties (1.9%) (Table 3); these percentages are estimates based on available data, noting that 27.9% of accessions do not have biological status data.

Lathyrus germplasm has been collected from at least 93 countries, with approximately 22.6% of accessions originating from the primary region of diversity of grasspea (i.e. Southern Europe, the Mediterranean, and West Asia) and 35.8% from primary and secondary (i.e. East Africa and South Asia) regions; these statistics are also estimates, as 23.6% of grasspea landrace accessions and 10% of wild relative accessions do not contain information even of the country where the accession was collected. Information on botanic garden collections from BGCI PlantSearch indicate that 219 botanic gardens collectively conserve 124 *Vicia* taxa; comparing these to genebank collections, 35 are only present in botanic gardens.

Aside from the taxa that appear to be entirely missing from, or with very small representation in, germplasm collections, the global genetic resources databases do not offer insights on diversity gaps, but published research has indicated specific priority species and geographic regions for further collecting for conservation. Shehadeh et al. (2013) found that only six of 36 assessed species were adequately sampled for *ex situ* conservation. First priorities for further collecting were *L. amphicarpos*, *Lathyrus belinensis* Maxted & Goyder, *Lathyrus chrysanthus* Boiss., *Lathyrus hirticarpus* Mattatia & Heyn, *Lathyrus hirsutus* L., and *Lathyrus marmoratus* Boiss. & Blanche. The authors also prioritized *Lathyrus lentiformis* Plitmann, *Lathyrus lycicus* (potentially *Lathyrus lycius* Boiss. & Heldr.), *Lathyrus phaselitanus* Hub.-Mor. & P. H. Davis (syn. *Lathyrus lycius* Boiss. & Heldr. subsp. *phaselitanus* (Hub.-Mor. & P. H. Davis) Ponert), *Lathyrus trachycarpus* (Boiss.) Boiss., *Lathyrus tremolsianus* Pau (syn. *Lathyrus pulcher* J. Gay, and *Lathyrus undulatus* Boiss., as none of these more distant relatives were represented at all in *ex situ* collections.

In a global *ex situ* conservation gap analysis of wild relatives of major crops, Castañeda-Álvarez *et al.* (2016), assessing five grasspea wild relatives, listed one – *Lathyrus pseudocicera* Pamp – as of medium priority for further collecting. Some progress has been made recently in filling these gaps, including via the Adapting Agriculture to Climate Change:

Collecting, Protecting and Preparing Crop Wild Relatives project (Crop Trust, 2025), which resulted in the collecting of 306 seed samples of 28 grasspea wild relatives from nine countries (including 7 samples of *L. amphicarpos*, 38 of *L. hirsutus*, 8 of *L. marmoratus*, and 8 of *L. pseudocicera*) as well as the development of new varieties with introgressions from wild germplasm (Eastwood *et al.*, 2022).

The 2007 Strategy stakeholder meeting identified Egypt, Iraq, Iran, Tunisia, Greece, and Turkey as countries where landraces of *L. sativus*, *L. cicera*, or *L. ochrus* were potentially undersampled (Crop Trust, 2007), while also noting specific regions of Russia, Iraq, Bangladesh, India, Ethiopia, Afghanistan, and Spain as priorities for further collecting. The 2007 Strategy also noted that gaps in passport data made full identification of gaps challenging. Ramirez-Villegas *et al.* (2022) identified potential geographic gaps for grasspea landrace groups in specific areas across Europe, in West and South Asia, and in North Africa.

Multilateral System status of accessions in *ex situ* collections

The genus *Lathyrus* is listed in Annex I of the International Treaty on Plant Genetic Resources for Food and Agriculture (Plant Treaty) and is thus included in its Multilateral System of Access and Benefit Sharing (MLS). Of the 23,151 accessions conserved globally, approximately one-fifth are held in international institutions (i.e., ICARDA), and included in the MLS under Article 15 of the Plant Treaty, with the remainder maintained in national and other collections (Table 4).

As of 2025, 6,388 accessions are formally included in the MLS according to the Plant Treaty's GLIS database, and 6,799 accessions have been assigned Digital Object Identifiers (DOIs). Per the relevant fields in the global genetic resources databases, 9,349 accessions (40.4% of world total) are listed as included in the MLS; this is likely an underestimate, noting that 49.9% of accessions do not have MLS status data. The discrepancies between the GLIS data and the global genetic resources data indicates that several institutions have not registered or recently updated their registrations in the GLIS portal.

Table 4. Representation of grasspea accessions in international and national institutions, number of accessions with DOIs, and representation of accessions in the Multilateral System of Access and Benefit Sharing of the International Treaty on Plant Genetic Resources for Food and Agriculture. Main *ex situ* collections data from Genesys and FAO WIEWS (2024). DOI and MLS data from Plant Treaty GLIS (2025).

Metric	Number	Percentage
Number of accessions in genebank collections in international institutions	4,882	21.1%
Number of accessions in genebank collections in national or other institutions	18,269	78.9%
Number of accessions in genebank collections in Annex I	23,151	100%
Number of accessions with DOI (Plant Treaty GLIS 2025)	6,799	
Number of accessions included in the Multilateral System (MLS) (Plant Treaty GLIS 2025)	6,388	
Number of accessions included in the Multilateral System (MLS) (genebank collections databases)	9,349	40.4%
Number of accessions included in the Multilateral System (MLS) that are in international collections (genebank collections databases)	4,771	20.6%
Number of accessions not included in the Multilateral System (MLS) (genebank collections databases)	2,254	9.7%
Number of accessions without information regarding inclusion in the Multilateral System (MLS) (genebank collections databases)	11,548	49.9%

Storage conditions, regeneration status, and safety duplication

As expected for an orthodox seed crop, almost the entirety (at least 94.9%) of grasspea accessions are conserved as seed, with over half (53.8%) of these accessions listed as conserved under long-term cold-storage conditions (Table 5). Information on storage in general is missing for 5.1% of all accessions, and information on seed storage type (i.e., long, medium, or short term) is missing for 21.1% of seed accessions.

Current regeneration status and needs cannot be directly derived from the global germplasm databases. The 2007 Strategy listed proportions of collections in need of regeneration per institute. Regeneration status varied substantially across institutions, but for many, over 25% of accessions were in need of regeneration (Crop Trust, 2009). FAO WIEWS reporting for the *Third State of the World's Plant Genetic Resources for Food and Agriculture* (FAO, 2025b) for the years 2014 to 2019, documented 1,699 accessions regenerated during this time by reporting institutions, with 754 accessions identified as needing regeneration and 68 of these lacking funds to conduct the regeneration.

Analysis of the location of safety duplication sites of grasspea germplasm, as listed

Table 5. Storage conditions of grasspea *ex situ* collections, regeneration status, and safety duplication status. Main *ex situ* collections data from Genesys and FAO WIEWS (2024). Regeneration status information from FAO WIEWS (2024); data from 2014 to 2019. Safety duplication out of the country data based only on Genesys (2024) data. Svalbard Global Seed Vault data from SGSV portal (2024).

Metric	Number	Percentage
Number of accessions held in seed storage in genebank collections	21,967	94.9%
Number of accessions held in short-term seed storage in genebank collections	0	0%
Number of accessions held in medium-term seed storage in genebank collections	5,524	25.2%
Number of accessions held in long-term seed storage in genebank collections	11,809	53.8%
Number of accessions held in seed storage of undefined type in genebank collections	4,634	21.1%
Number of accessions held in field storage in genebank collections	9	0.04%
Number of accessions held in in-vitro storage in genebank collections	0	0%
Number of accessions held in cryo storage in genebank collections	32	0.1%
Number of accessions held as DNA in genebank collections	64	0.3%
Number of accessions held in other storage in genebank collections	0	0%
Number of accessions not marked with a storage type in genebank collections	1,175	5.1%
Number of accessions in genebank collections regenerated 2014–2019	1,699	57.1%
Number of accessions in genebank collections in need of regeneration 2014–2019	754	25.4%
Number of accessions in genebank collections in need of regeneration without budget for regeneration 2014–2019	68	2.3%
Number of accessions safety duplicated out of the country in genebank collections*	1,891	30.9%
Number of accessions in genebank collections safety duplicated in Svalbard	4,992	21.6%

*ICARDA passport data list accessions under one institute code (LBN002) even though it has two main sites (in Lebanon and in Morocco) which enable safety duplication outside of the country of the main collection; thus this metric may underreport the proportion of accessions duplicated outside of country for this institute.

in Genesys, indicates that close to a third of accessions listed are safety duplicated in an active collection (i.e., apart from potentially being duplicated at the Svalbard Global Seed Vault [SGSV]) outside of the country of the main collection (Table 5). The actual extent of safety duplication of grasspea accessions worldwide, when also considering safety duplication within the same country, may be higher than this estimate, given that ICARDA's collections conserved in the Lebanon site and duplicated at the site in Morocco are not included in this estimate (because they have the same INSTCODE), and a number of national genebanks (such as the USA and Russian Federation) typically provide safety backup their collections in a different location within the country. Information from the SGSV database from 2024 indicated that approximately 21.6% of total accessions worldwide were duplicated in Svalbard.

The 2007 Strategy listed proportions of collections safety duplicated per institute for some of the surveyed institutes. While many of the collections were well duplicated, the data indicated that some of the largest collections were insufficiently duplicated, including those in ICARDA, NBPGR, Australia, USDA, and IPK, among others. The stakeholder meeting process included further planning for safety duplication of unique accessions both in other institutions outside of the country as well as in the SGSV. This included aiming to fully duplicate ICARDA's grasspea collection in Svalbard, which turned out to be particularly important due to the evacuation of ICARDA's Aleppo site in 2014 (Simon, 2020).

Documentation, information systems, and research resources

A descriptor list for grasspea was published in 2000 and is available online (IPGRI, 2000). The estimated completeness of passport information for grasspea accessions listed in Genesys was 7.3 on a scale of 0 (no data) to 10 (complete data), which indicates that much data is available, but also that there are gaps that it would be valuable to fill. One grasspea characterization and evaluation dataset is available via Genesys, covering 270 accessions. Four metrics of the current degree of digital sequence information (DSI) for grasspea (from the National Center for Biotechnology Information (USA) database), two metrics of published literature on the crop (Google Scholar and PubMed Central), and one metric of the degree of research resources such as herbarium specimens (from the Global Biodiversity Information Facility - GBIF), are listed in Table 6.

The stakeholder meeting for the 2007 Strategy identified several priorities for grasspea documentation and information systems (Crop Trust, 2007). To build on the 2000 descriptors, which were deemed adequate, the group identified the most important characterization and evaluation descriptors for the crop. The meeting also prioritized better integrating databases for grasspea. The current Genesys and FAO WIEWS databases offer some essential taxonomic, institutional, and passport data, and Genesys now holds some characterization data for the crop, but a dedicated online information system including accession-level characterization and evaluation data for grasspea germplasm collections remains a gap.

Table 6. Documentation, information systems, and research resources for grasspea. Passport data completeness index (PDCI) from Genesys (2024), based on the methods outlined in van Hintum *et al*. (2011). Global Biodiversity Information Facility data from GBIF (2025). All other metrics data from Khoury *et al*. (2023).

Metric	Number
Passport data completeness index (range 0-10) as a median value across accessions in genebank collections	7.3
Number of genes as recorded in NCBI's Entrez database as of 2022	109
Number of genomes as recorded in NCBI's Entrez database as of 2022	1
Number of nucleotides as recorded in NCBI's Entrez database as of 2022	123,870
Number of proteins as recorded in NCBI's Entrez database as of 2022	6,503
Number of publications listed in Google Scholar with taxon name in title published between 2009 and 2019	537
Number of publications listed in PubMed Central with taxon name in text as of 2022	867
Number of research materials as recorded in GBIF (2025)	2,097,028

Germplasm distributions and varietal registrations and releases

Germplasm distributions and varietal development statistics for grasspea are listed in Table 7. Germplasm distribution data from FAO WIEWS and the Plant Treaty Data Store reflect different reporting scopes: FAO WIEWS primarily reports distributions from national genebanks, while the Plant Treaty Data Store includes all transfers made under the SMTA, encompassing distributions made by genebanks as well as by breeding programs and other organizational types (Khoury *et al.*, 2025) (Table 7).

Table 7. Grasspea germplasm distributions and varietal registrations and releases. FAO WIEWS distributions data is annual average over years 2014 to 2019. Plant Treaty Data Store distributions data is annual average over years 2015 to 2021. Evenness metric quantifies evenness of germplasm distributions across world regions, where 0 equals highly uneven and 1 equals completely even. International Union for the Protection of New Varieties of Plants (UPOV) PLUTO data is annual average over years 2014 to 2018. FAO WIEWS varietal releases data is annual average over years 2015 to 2019. All metrics data from Khoury *et al*. (2023), with Plant Treaty Data Store additions for more recent years (2019 to 2021).

Metric	Number
Average annual number of accessions distributed worldwide as recorded in FAO WIEWS	369.1
Average annual number of samples distributed worldwide as recorded in FAO WIEWS	574.9
Average annual number of samples distributed worldwide as recorded in the Plant Treaty Data Store	1,793.4
Number of countries receiving germplasm as recorded in the Plant Treaty Data Store	23.1
Evenness of distributions across world regions as recorded in the Plant Treaty Data Store	0.7
Average annual number of varietal registrations worldwide as recorded in UPOV's PLUTO	0.8
Average annual number of varietal releases worldwide as recorded in FAO WIEWS	3.5

Networks and partnerships

- ICARDA continues to play a critical role in grasspea germplasm conservation and varietal development, maintaining active partnerships with national agricultural research organizations, other international centers, and several academic and industry institutions.
- The European Cooperative Programme for Plant Genetic Resources (ECPGR) Grain Legumes Working Group was initiated in 1991 and remains active, particularly in germplasm characterization and evaluation through competitive calls.
- The Global Bean Project is a network that aims to increase the cultivation and consumption of legumes around the world.
- The Fernand Lambein Fund supports an annual International Lathyrus Day.
- Several *Lathyrus* networks have existed historically, including the International Network for the Improvement of Lathyrus sativus and the Eradication of Lathyrism (1989) and the Lathyrus Genetic Resources Network (LGRN) (1999). At the time of the 2007 Strategy, the LGRN was active and the Strategy recommended that it be expanded, and that all countries with important collections be invited to participate (Crop Trust, 2007). Very little information is currently available online that might indicate the persistence and level of activity of this network over the past two decades.

Conclusions

Grasspea continues to be a priority grain legume due to its importance for food security and its challenges related to lathyrism. Its genetic resources are bolstered by the activities of ICARDA as well as several major collections in national agricultural research organizations. Available data indicates that there has been some significant progress made in placing accessions under the MLS of the Plant Treaty, safety duplication, and information systems over the past two decades, there are considerable amounts of associated research resources, and there has been significant activity in germplasm distributions for the crop. These data also indicate that further efforts are needed to fill gaps in existing collections through collecting of wild relatives and landraces, to more comprehensively list all major grasspea collections in global genetic resources databases (e.g. the Universite de Pau, IBEAS, France collection), to more fully include grasspea germplasm collections under the MLS of the Plant Treaty, to make the information accompanying accessions more complete and/or more accessible in online databases, and to address regeneration and safety duplication backlogs.

Methods and materials

Primary data sources for the metrics reported in this summary include: Genesys; World Information and Early Warning System on Plant Genetic Resources for Food and Agriculture of the Food and Agriculture Organization of the United Nations (FAO WIEWS); Botanic Gardens Conservation International PlantSearch database (BGCI PlantSearch); Global Information System of the International Treaty on Plant Genetic Resources for Food and Agriculture (Plant Treaty GLIS); Data Store of the International Treaty on Plant Genetic Resources for Food and Agriculture (Plant Treaty Data Store); Svalbard Global Seed Vault portal (SGSV portal); International Union for the Protection of New Varieties of Plants (UPOV) PLUTO database; FAOSTAT; National Center for Biotechnology Information's Entrez database (NCBI Entrez); Google Scholar; PubMed Central; Wikipedia; and the Global Biodiversity Information Facility (GBIF). Some of these data were acquired from literature/databases including Khoury *et al*. (2023) and Khoury *et al*. (2025). Data processing, metric calculation, and table generation were conducted in R, with code available on this GitHub repository. Extended methods are available here.

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Supplementary information

Supplementary Table 1: Full list of *ex situ* collections of grasspea genetic resources, in descending order by total number of accessions. Number of accessions and storage condition information from Genesys and FAO WIEWS (2024), with supplementary information as noted. Multilateral System (MLS) status from Plant Treaty GLIS (2025) and from Genesys and FAO WIEWS (2024).

Institution Code	Institution name	Number of accessions	Percent of total	Cumulative percent	Number of accessions in long term storage (-18-20°C)	Number of accessions included in MLS (from Plant Treaty GLIS)	Number of accessions included in MLS (from genebank collections databases)
LBN002	International Centre for Agricultural Research in Dry Areas	4,468	19.3%	19.3%	Not listed*	4,356	4,357
IND001	National Bureau of Plant Genetic Resources	2,661	11.5%	30.8%	2,661	0	0
CHL150	Banco Activo INIA Carillanca	1,620	7.0%	37.8%	Not listed	0	0
BGD003	Bangladesh Agricultural Research Institute	1,561	6.7%	44.5%	1,561	0	0
AUS165	Australian Grains Genebank, Agriculture Victoria	1,477	6.4%	50.9%	1,094	1,095	1,376
GBR004	Millennium Seed Bank - Royal Botanic Gardens Kew	1,449	6.3%	57.2%	Not listed	0	268
UKR008	Ustymivka Experimental Station of Plant Production	1,301	5.6%	62.8%	196	0	0
RUS001	N.I. Vavilov All-Russian Research Institute of Plant Industry	1,207	5.2%	68.0%	1,207	0	0
USA022	Western Regional Plant Introduction Station, USDA-ARS, Washington State University	871	3.8%	71.8%	868	0	0
ETH085	Ethiopian Biodiversity Institute	646	2.8%	74.6%	622	0	586
POL003	Plant Breeding and Acclimatization Institute	583	2.5%	77.1%	540	0	377
ESP004	Centro Nacional de Recursos Fitogenéticos	529	2.3%	79.4%	436	0	396
DEU146	Genebank, Leibniz Institute of Plant Genetics and Crop Plant Research	515	2.2%	81.6%	514	390	390
HUN003	Centre for Plant Diversity	405	1.8%	83.3%	86	0	6
BGR001	Institute for Plant Genetic Resources 'K.Malkov'	374	1.6%	85.0%	336	0	0

Institution Code	Institution name	Number of accessions	Percent of total	Cumulative percent	Number of accessions in long term storage (-18-20°C)	Number of accessions included in MLS (from Plant Treaty GLIS)	Number of accessions included in MLS (from genebank collections databases)
ARE003	International Center for Biosaline Agriculture	254	1.1%	86.0%	Not listed	254	254
CHL171	Banco de Semillas SAG Magallanes	236	1.0%	87.1%	236	0	0
PAK001	Plant Genetic Resources Program	194	0.8%	87.9%	147	0	168
NZL001	Margot Forde Genebank, AgResearch Ltd	186	0.8%	88.7%	Not listed	0	0
PRT001	Banco Português de Germoplasma Vegetal	176	0.8%	89.5%	138	0	176
ETH013	International Livestock Research Institute	155	0.7%	90.1%	Not listed	155	155
MAR088	Centre Régional de la Recherche Agronomique de Settat	141	0.6%	90.7%	Not listed	0	0
AZE015	Genetic Resources Institute	135	0.6%	91.3%	41	0	125
CAN004	Plant Gene Resources of Canada, Saskatoon Research and Development Centre	123	0.5%	91.9%	123	0	123
ISR002	Israel Gene Bank for Agricultural Crops, Agricultural Research Organisation, Volcani Center	109	0.5%	92.3%	37	0	0
NPL069	National Agriculture Genetic Resources Centre-Genebank	100	0.4%	92.8%	100	0	0
ARM005	Institute of Botany	97	0.4%	93.2%	86	0	92
CYP004	National (CYPARI) Genebank, Agricultural Research Institute, Ministry of Agriculture, Rural Development and Environment	94	0.4%	93.6%	18	0	31
PRT102	Banco de Germoplasma - Universidade da Madeira	78	0.3%	93.9%	78	0	78
LBN020	Lebanese Agricultural Research Institute	77	0.3%	94.3%	77	77	6

Institution Code	Institution name	Number of accessions	Percent of total	Cumulative percent	Number of accessions in long term storage (-18-20°C)	Number of accessions included in MLS (from Plant Treaty GLIS)	Number of accessions included in MLS (from genebank collections databases)
GBR016	Genetic Resources Unit, Institute of Biological, Environmental & Rural Sciences, Aberystwyth University	75	0.3%	94.6%	Not listed	0	2
BLR011	Republican Unitary Enterprise 'Research and Practical Centre of the National Academy of Sciences of Belarus for Arable Farming'	73	0.3%	94.9%	56	0	0
CZE122	Gene bank	73	0.3%	95.2%	73	0	73
CHL028	Banco Base de Semillas INIA Intihuasi	72	0.3%	95.5%	72	0	0
ERI003	National Agricultural Research Institute	68	0.3%	95.8%	68	0	0
ITA436	Istituto di Bioscienze e Biorisorse, Consiglio Nazionale delle Ricerche	68	0.3%	96.1%	3	0	0
GRC100	CIHEAM Mediterranean Agronomic Institute of Chania	58	0.2%	96.4%	58	0	0
ARM059	Agrobiotechnology Scientific Center	54	0.2%	96.6%	2	0	2
SVK001	National Agricultural and Food Centre (NPPC), Research Institute of Plant Production (RIPP)	53	0.2%	96.8%	4	0	53
GRC005	Greek Genebank, Institute of Plant Breeding and Genetic Resources	45	0.2%	97.0%	Not listed	0	0
ESP172	Cabildo Insular de Tenerife. Centro de Conservación de la Biodiversidad Agrícola de Tenerife	41	0.2%	97.2%	Not listed	0	31
DEU502	Botanical Garden of the University of Osnabrück	40	0.2%	97.4%	Not listed	0	40

Institution Code	Institution name	Number of accessions	Percent of total	Cumulative percent	Number of accessions in long term storage (-18-20°C)	Number of accessions included in MLS (from Plant Treaty GLIS)	Number of accessions included in MLS (from genebank collections databases)
BLR014	State research institution 'Institute of Experimental Botany of the National Academy of Sciences of Belarus'	31	0.1%	97.5%	31	0	0
JPN183	NARO Genebank	31	0.1%	97.6%	2	0	0
ITA363	Dipartimento di Chimica, Biologia e Biotecnologie, Universitá degli Studi Perugia	29	0.1%	97.8%	29	0	0
KEN212	Genetic Resources Research Institute	28	0.1%	97.9%	28	17	17
BGD028	Bangladesh Institute of Nuclear Agriculture (BINA)	25	0.1%	98.0%	Not listed	0	0
CUB005	Instituto Nacional de Ciencias Agrícolas	24	0.1%	98.1%	Not listed	0	0
ALB026	Plant Genetic Resources Center	21	0.1%	98.2%	21	0	21
LTU001	Lithuanian Institute of Agriculture	21	0.1%	98.3%	Not listed	0	0
ROM055	Research and Development Station for Vegetables - Bacau	21	0.1%	98.4%	Not listed	0	0
SWE054	Nordic Genetic Resource Center	21	0.1%	98.5%	21	23	20
TUN029	Banque Nationale de Gènes de Tunisie	21	0.1%	98.5%	21	0	17
DEU515	Botanischer Versuchs- und Lehrgarten der Universitaet Regensburg	19	0.1%	98.6%	Not listed	0	19
BLR026	The Polessye Institute of Plant Growing	18	0.1%	98.7%	18	0	0
DEU022	Botanical Garden Berlin-Dahlem	18	0.1%	98.8%	Not listed	0	18
DEU626	Pädagogische Hochschule Karlsruhe	18	0.1%	98.9%	Not listed	0	18
URY003	INIA La Estanzuela	17	0.1%	98.9%	17	0	0
SVN019	Crops and Seed Production Department, Agricultural Institute of Slovenia	16	0.1%	99.0%	Not listed	0	2
DEU101	Federal Plant Variety Office (Bundessortenamt)	15	0.1%	99.1%	15	0	0

Institution Code	Institution name	Number of accessions	Percent of total	Cumulative percent	Number of accessions in long term storage (-18-20°C)	Number of accessions included in MLS (from Plant Treaty GLIS)	Number of accessions included in MLS (from genebank collections databases)
ESP027	Gobierno de Aragón. Centro de Investigación y Tecnología Agroalimentaria. Banco de Germoplasma de Hortícolas	15	0.1%	99.1%	Not listed	0	7
ROM007	Suceava Genebank	15	0.1%	99.2%	Not listed	0	0
TUR034	Field Crop Central Research Institute	15	0.1%	99.3%	15	0	0
ARG1350	Banco Activo de Germoplasma de La Consulta	14	0.1%	99.3%	Not listed	0	0
BIH039	Institute of Genetic Resources, University of Banja Luka	11	0.0%	99.4%	10	0	0
ESP109	Junta de Castilla y León. Instituto Tecnológico Agrario de Castilla y León. Centro de Investigación de Zamadueñas	11	0.0%	99.4%	Not listed	0	1
LBY006	National Bank for Plant Genetic Resources	10	0.0%	99.5%	Not listed	0	0
SRB002	Institute of Field and Vegetable Crops Novi Sad	10	0.0%	99.5%	Not listed	0	0
USA971	Desert Legume Program	10	0.0%	99.6%	Not listed	0	0
ITA391	CREA-Centro di Ricerca Orticoltura e Florovivaismo - Sede di Pontecagnano	9	0.0%	99.6%	Not listed	9	9
TJK027	National Center for Genetic Resources	9	0.0%	99.6%	8	0	9
ARM010	Armenian Botanical Society	8	0.0%	99.7%	Not listed	0	0
AZE003	Research Institute of Crop Husbandry	7	0.0%	99.7%	Not listed	0	0
ECU023	Departamento Nacional de Recursos Fitogenéticos	7	0.0%	99.7%	5	0	2
AUS167	Australian Pastures Genebank	5	0.0%	99.7%	5	5	5
GRC006	Plant Production Department, Institute of industrial and forage crops	5	0.0%	99.8%	5	0	0

Institution Code	Institution name	Number of accessions	Percent of total	Cumulative percent	Number of accessions in long term storage (-18-20°C)	Number of accessions included in MLS (from Plant Treaty GLIS)	Number of accessions included in MLS (from genebank collections databases)
BEL002	Gembloux agro-biotech, Université de Liège, département des Sciences agronomiques, Phytotechnie tropicale et Horticulture	4	0.0%	99.8%	Not listed	0	4
GRC044	Balkan Botanic Garden of Kroussia, Institute of Plant Breeding and Genetic Resources	4	0.0%	99.8%	Not listed	0	0
GRC102	Hellenic Mediterranean University	4	0.0%	99.8%	Not listed	0	0
HRV021	Agricultural Institute Osijek	4	0.0%	99.8%	4	0	0
TWN001	World Vegetable Center	4	0.0%	99.9%	4	4	4
USA151	National Arboretum-Germplasm Unit, USDA/ARS	4	0.0%	99.9%	Not listed	0	0
BRA003	Embrapa Recursos Genéticos e Biotecnologia	3	0.0%	99.9%	3	0	0
ESP117	Gobierno de Canarias. Consejería de Agricultura, Ganadería, Pesca y Medio Ambiente. Instituto Canario de Investigaciones Agrarias. Jardín de Aclimatación de La Orotava	3	0.0%	99.9%	Not listed	0	0
AUT001	Austrian Agency for Health and Food Safety	2	0.0%	99.9%	2	0	2
GEO013	Niko Ketskhoveli Institute of Botany	2	0.0%	99.9%	Not listed	0	0
JOR105	National Agricultural Research Center	2	0.0%	99.9%	Not listed	2	2
LVA009	Latvian State Forest Research Institute 'Silava'	2	0.0%	99.9%	2	0	2
USA974	Seed Savers Exchange	2	0.0%	99.9%	Not listed	0	0
AUT060	HBLFA Raumberg-Gumpenstein	1	0.0%	99.9%	1	0	0
AZE004	Institute of Botany	1	0.0%	99.9%	Not listed	0	0

Institution Code	Institution name	Number of accessions	Percent of total	Cumulative percent	Number of accessions in long term storage (-18-20°C)	Number of accessions included in MLS (from Plant Treaty GLIS)	Number of accessions included in MLS (from genebank collections databases)
CRI001	Centro Agronómico Tropical de Investigación y Enseñanza	1	0.0%	100.0%	1	1	1
ESP133	Región de Murcia. Instituto Murciano de Investigación y Desarrollo Agrario y Alimentario. Fruticultura	1	0.0%	100.0%	1	0	1
ESP200	Govern de les Illes Balears. Conselleria de Presidència. Direcció General d'Agricultura i Desenvolupament Rural. Institut de recerca i formació agrària i pesquera	1	0.0%	100.0%	Not listed	0	1
HRV041	Faculty of Agriculture, University of Zagreb	1	0.0%	100.0%	Not listed	0	0
ITA368	Banca del germoplasma autoctono vegetale regionale	1	0.0%	100.0%	1	0	0
KGZ040	Bank-Laboratory of Plant Genetic Resources of the KR	1	0.0%	100.0%	1	0	1
LTU010	Botanical Garden, Vilnius University	1	0.0%	100.0%	Not listed	0	0
MLT001	Argotti Botanic Gardens & Resource Centre, University of Malta	1	0.0%	100.0%	Not listed	0	0
MLT003	Plant Protection Directorate, Veterinary and Phytosanitary Regulation Department	1	0.0%	100.0%	Not listed	0	0
POL101	Research Institute of Horticulture	1	0.0%	100.0%	Not listed	0	1
UKR019	Research Station of Medicinal Crops	1	0.0%	100.0%	Not listed	0	0
UKR068	Krasnohrad Experimental Station	1	0.0%	100.0%	Not listed	0	0

*But documented in the 2008 Strategy as maintaining collections in long-term conditions (Crop Trust, 2008)

Supplementary Table 2: Full list of taxonomic names in *ex situ* genetic resource collections, in descending order by number of accessions conserved. Germplasm data from Genesys and FAO WIEWS (2024).

Taxon	Number of accessions (from genebank collections databases)
Lathyrus sativus L.	14,750
Lathyrus cicera L.	1,287
Lathyrus aphaca L.	838
Lathyrus ochrus (L.) DC.	695
Lathyrus clymenum L.	635
Lathyrus L.	564
Lathyrus inconspicuus L.	374
Lathyrus hirsutus L.	363
Lathyrus sylvestris L.	297
Lathyrus hierosolymitanus Boiss.	272
Lathyrus pratensis L.	254
Lathyrus annuus L.	250
Lathyrus tingitanus L.	249
Lathyrus odoratus L.	233
Lathyrus gorgoni Parl.	202
Lathyrus nervosus Lam.	190
Lathyrus latifolius L.	166
Lathyrus tuberosus L.	155
Lathyrus sphaericus Retz.	146
Lathyrus blepharicarpus Boiss.	145
Lathyrus nissolia L.	112
Lathyrus pseudocicera Pamp.	107
Lathyrus marmoratus Boiss. & Blanche	84
Lathyrus magellanicus Lam.	55
Lathyrus niger (L.) Bernh.	44
Lathyrus japonicus Willd.	42
Lathyrus chloranthus Boiss.	41
Lathyrus vernus (L.) Bernh.	36
Lathyrus miniatus M. Bieb. ex Steven	34
Lathyrus rotundifolius Willd.	33
Lathyrus cassius Boiss.	30
Lathyrus cirrhosus Ser.	29
Lathyrus amphicarpos L.	28
Lathyrus angulatus L.	28
Lathyrus laxiflorus (Desf.) Kuntze	25
Lathyrus linifolius (Reichard) Bässler	25
Lathyrus setifolius L.	25
Lathyrus palustris L.	22
Lathyrus japonicus subsp. *maritimus* (L.) P. W. Ball	21
Lathyrus ciliolatus Sam. ex Rech. f.	20
Lathyrus basalticus Rech. f.	15
Lathyrus gloeospermus Warb. & Eig	15
Lathyrus heterophyllus L.	14
Lathyrus chrysanthus Boiss.	13
Lathyrus vinealis Boiss. & Noë	12
Lathyrus davidii Hance	11
Lathyrus lentiformis Plitmann	11
Lathyrus neurolobus Boiss. & Heldr.	11
Lathyrus roseus Steven	10

Taxon	Number of accessions (from genebank collections databases)
Lathyrus stenophyllus Boiss. & Heldr.	9
Lathyrus aureus (Steven ex Fisch. & C. A. Mey.) D. Brândza	8
Lathyrus digitatus (M. Bieb.) Fiori	8
Lathyrus graminifolius (S. Watson) T. G. White	7
Lathyrus cilicicus Hayek & Siehe	6
Lathyrus grandiflorus Sm.	6
Lathyrus laevigatus (Waldst. & Kit.) Gren.	6
Lathyrus spathulatus Čelak.	6
Lathyrus pannonicus (Jacq.) Garcke	5
Lathyrus pisiformis L.	5
Lathyrus ochraceus Kitt.	4
Lathyrus ochroleucus Hook.	4
Lathyrus paranensis Burkart	4
Lathyrus cyaneus (Steven) K. Koch	3
Lathyrus grimesii Barneby	3
Lathyrus pannonicus subsp. *varius* (Hill) P. W. Ball	3
Lathyrus bauhini Genty	2
Lathyrus hallersteinii Baumg.	2
Lathyrus hirticarpus Mattatia & Heyn	2
Lathyrus incurvus (Roth) Willd.	2
Lathyrus komarovii Ohwi	2
Lathyrus littoralis (Nutt.) Endl. ex Walp.	2
Lathyrus nigrivalvis Burkart	2
Lathyrus saxatilis (Vent.) Vis.	2
Lathyrus szowitsii Boiss.	2
Lathyrus venetus (Mill.) Wohlf.	2
Lathyrus venosus Muhl. ex Willd.	2
Lathyrus vestitus subsp. *laetiflorus* (Greene) Broich	2
Lathyrus belinensis Maxted & Goyder	1
Lathyrus boissieri Širj.	1
Lathyrus decaphyllus Pursh	1
Lathyrus eucosmus Butters & H. St. John	1
Lathyrus filiformis (Lam.) J. Gay	1
Lathyrus holochlorus (Piper) C. L. Hitchc.	1
Lathyrus hygrophilus Taub.	1
Lathyrus japonicus subsp. *japonicus*	1
Lathyrus japonicus var. *japonicus*	1
Lathyrus ketzkhovelii Avazneli	1
Lathyrus nevadensis S. Watson	1
Lathyrus nevadensis subsp. *nevadensis*	1
Lathyrus occidentalis (Fisch. & C. A. Mey.) Fritsch	1
Lathyrus pallescens (M. Bieb.) K. Koch	1
Lathyrus palustris subsp. *palustris*	1
Lathyrus pancicii (Jurišić) Adamović	1
Lathyrus pubescens Hook. & Arn.	1
Lathyrus pusillus Elliott	1
Lathyrus quinquenervius (Miq.) Litv.	1
Lathyrus subandinus Phil.	1
Lathyrus vernus subsp. *vernus*	1
Lathyrus vestitus Nutt.	1

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