GLOBAL CROP CONSERVATION AND USE METRICS

BEANS
(*Phaseolus* L.)

CROP TRUST

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Global crop conservation and use metrics

BEANS
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With support from

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International Treaty on Plant Genetic Resources for Food and Agriculture

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Description

This report provides an up-to-date overview of the global status of *ex situ* conservation of genetic resources of beans and their 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, trade, 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 beans (Crop Trust, 2014), but is primarily based on publicly available datasets, rather than a new survey of genetic resource collections and expert consultations.

Introduction and background on beans

Beans in the genus *Phaseolus* L. (Fabaceae) include five domesticated species: common bean (*Phaseolus vulgaris* L.), lima bean (*Phaseolus lunatus* L.), runner bean (*Phaseolus coccineus* L.), tepary bean (*Phaseolus acutifolius* A. Gray), and year bean (*Phaseolus dumosus* Macfad.), each with distinct agroecological adaptations and nutritional profiles. All of the domesticates, and their wild relatives in *Phaseolus*, are from the American tropics and subtropics (Freytag and Debouck 2002; Ramírez-Villegas *et al.*, 2010). Common beans were domesticated independently approximately 8000 years ago in both Mesoamerica and in the Andes (Bitocci *et al.*, 2012; Castro-Guerrero *et al.*, 2016). Common beans are by far the most widely cultivated and consumed worldwide, with lima beans also fairly widely distributed; the remaining three crops are more narrowly distributed, although tepary beans have been expanding in recent decades in Africa and Asia. Common beans are the most important grain legume for human consumption worldwide, and are second only to soybeans in economic importance among all leguminous crops.

Beans are rich sources of protein, vitamins, minerals, and fiber, especially significant in the diets of poorer populations in Africa and Latin America; they are affordable compared to animal protein and have a long storage life (Castro-Guerrero *et al.*, 2016). The immature pods are also widely consumed as a vegetable. Being legumes, *Phaseolus* beans contribute to soil fertility through nitrogen fixation.

Based on the most recently available production statistics from FAOSTAT, reporting for the year 2023, beans are cultivated in at least 109 countries on nearly 38 million total hectares worldwide, producing 30 million tonnes of dry and green beans at a value of over USD 20 billion (FAO, 2025). The largest producers include India, Brazil, Myanmar, Tanzania, China, USA, Uganda, Kenya, Burundi, Argentina, Mexico, Ethiopia, Mozambique, Rwanda, Cameroon, Angola, and Kazakhstan, each producing over 350,000 tonnes per annum. Global average yield (per hectare) of the crop is the highest among all grain legumes (FAO, 2025).

Table 1. Global status of bean production, trade, availability in food supplies, and public interest. Production, trade, and food supply statistics from FAOSTAT (2015 to 2018 average). For food supply metrics, FAOSTAT groups all *Phaseolus* beans as well *Vigna* beans together under one reporting name. 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, trade, or food supply. The evenness metric quantifies evenness of production, trade, or availability in food supplies across world regions, where 0 equals highly uneven and 1 equals completely even. The international interdependence metric quantifies degree of production, trade, 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)	36,353,324	107.25	0.33	0.93
Total production (tonnes)	56,333,960	71.25	0.27	0.97
Gross production value (current thousand USD)	30,300,569	88.25	0.37	0.96
Export quantity (tonnes)	4,630,467	48.25	0.39	0.95
Export value (current thousand USD)	4,546,656	51.25	0.36	0.94
Import quantity (tonnes)	4,235,536	84.75	0.50	0.93
Import value (current thousand USD)	4,590,240	99.50	0.45	0.94
Contribution to calories in food supplies (kcal/capita/day)	22.50	111.75	0.45	0.92
Contribution to protein in food supplies (g/capita/day)	1.45	134.75	0.46	0.93
Contribution to fat in food supplies (g/capita/day)	0.10	56.50	0.44	0.91
Contribution to food weight in food supplies (g/capita/day)	2.45	91.00	0.46	0.93
Number of public pageviews on Wikipedia over one year	210,860			

There is considerable international trade in beans (nearly 5 million tonnes per annum), with Myanmar, USA, Argentina, Canada, Uzbekistan, China, Ethiopia, India, and Tanzania reporting exporting over 100,000 tonnes each year (FAO, 2025). Among the 190 countries reporting importing beans, the top recipients include India, China, Mexico, USA, Viet Nam, Pakistan, Italy, Indonesia, Japan, UK, Türkiye, and Venezuela.

The global per capita dietary contribution of beans reported for the year 2022 – as measured in terms of both calories (24 kcal/capita/day) and protein (2 g/capita/day) – is the most significant among all pulses, and beans are a major contributor to calories in the food supplies of 110 countries and to protein in 130 countries. Production, trade, and food supply metrics all indicate that beans are widely utilized outside of their regions of origin, implying significant international interdependence with regard to bean genetic resources (Table 1).

Identity and composition of *ex situ* collections

Based on the data available in global genetic resource databases, bean germplasm collections are present in at least 192 institutions worldwide, collectively maintaining 194,392 accessions (Table 2, Table 3; Supplementary Table 1). This is considerably more than the number of accessions reported for the crops (186,674) in the major germplasm collections listed in *The Third Report on the State of the World's Plant Genetic Resources for Food and Agriculture* (FAO, 2025b).

The institutions are distributed globally, including large collections in Asia, Australia, the Americas, Europe, and Africa. The International Center for Tropical Agriculture (CIAT), the Western Regional Plant Introduction Station (USDA), Embrapa Arroz e Feijão as well as Recursos Genéticos e Biotecnologia (Brazil), the Leibniz Institute of Plant Genetics and Crop Plant Research (IPK) (Germany), the Centro Nacional de Recursos Genéticos (CNRG/INIFAP) (Mexico), and the N.I. Vavilov All-Russian Research Institute of Plant Industry (VIR) (Russian Federation), 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 several of the major bean collections without information on MLS status are in countries that are contracting parties to the Plant Treaty (such as USA, Brazil, and Bulgaria) and distribute samples using the Standard Material Transfer Agreement (SMTA).

The genus *Phaseolus* contains around 80 species and over 30 infraspecific taxa, native to the Neo-tropics and -subtropics (Freytag and Debouck 2002; Ramírez-Villegas *et al*., (2010). The progenitors of the five domesticates are known, and genepool concepts have been developed for the cultivated species (USDA, 2025). Common bean, runner bean, year bean, and tepary bean are included within the subgeneric group Vulgaris, while lima bean is more distantly related to the other domesticates (Lunatus group) (Delgado-Salinas *et al*., 2006).

Eighty-two taxonomic names, including 72 domesticated taxa and wild relatives, as well as hybrids and accessions only recognized to the genus level, are present in germplasm collections (Supplementary Table 2). The wild relatives represent only 3.2% of accessions as measured by pertinent (biological status) fields in the online databases (Table 3). Landraces make up the largest proportion of collections (52.1%), followed by improved varieties (12.2%) and breeding materials (4.4%); these percentages are estimates based on available data, noting that 27.7% of accessions do not have biological status data.

Bean germplasm has been collected from at least 151 countries, with approximately 12.1% of accessions originating from the primary regions of diversity (i.e. Mesoamerica and Andean South America) and 21.8% from primary and secondary (i.e. Central and East Africa, and Western Europe) regions; these statistics are also estimates, as 4.5% of bean landrace accessions and 3.2% of wild relative accessions do not contain information even of the country where the accession was collected. Comparing the total number of accessions worldwide to that of other grain legumes, beans have the largest global collection. Information on botanic garden collections from BGCI PlantSearch indicate that

Table 2. Major *ex situ* collections of bean 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)
COL003	International Center for Tropical Agriculture/ Centro Internacional de Agricultura Tropical (CIAT)	37,936	19.5%	19.5%	Not listed*	37,936	37,936
USA022	Western Regional Plant Introduction Station, USDA-ARS, Washington State University	17,660	9.1%	28.6%	17,265	0	0
BRA008	Embrapa Arroz e Feijão	17,044	8.8%	37.4%	Not listed	6,714	17,011
DEU146	Genebank, Leibniz Institute of Plant Genetics and Crop Plant Research (IPK)	9,003	4.6%	42.0%	8,990	9,010	9,003
BRA003	Embrapa Recursos Genéticos e Biotecnologia	7,892	4.1%	46.1%	7,818	0	0
MEX208	INIFAP, Centro Nacional de Recursos Genéticos (CNRG)	7,467	3.8%	49.9%	7,467	0	0
RUS001	N.I. Vavilov All-Russian Research Institute of Plant Industry (VIR)	6,543	3.4%	53.3%	6,543	0	0
USA974	Seed Savers Exchange	5,059	2.6%	55.9%	Not listed	0	0
HUN003	Centre for Plant Diversity	4,586	2.4%	58.2%	1,350	0	238
IND001	National Bureau of Plant Genetic Resources (NBPGR)	4,125	2.1%	60.4%	4,125	0	0
AUS165	Australian Grains Genebank, Agriculture Victoria	3,824	2.0%	62.3%	3,330	3,537	0
BGR001	Institute for Plant Genetic Resources 'K.Malkov'	3,823	2.0%	64.3%	1,252	0	0
KEN212	Genetic Resources Research Institute	3,621	1.9%	66.2%	3,621	1,033	3,601
PRT001	Banco Português de Germoplasma Vegetal	3,595	1.9%	68.0%	1,298	0	3,595
ESP004	Centro Nacional de Recursos Fitogenéticos	3,580	1.8%	69.8%	2,986	0	3,181
POL003	Plant Breeding and Acclimatization Institute	3,365	1.7%	71.6%	3,350	213	2,721
ECU023	Departamento Nacional de Recursos Fitogenéticos	3,292	1.7%	73.3%	3,231	24	3,280
ROM007	Suceava Genebank	2,889	1.5%	74.8%	986	223	222
JPN183	NARO Genebank	2,479	1.3%	76.0%	690	0	0
TUR001	Plant Genetic Resources Department	2,408	1.2%	77.3%	2,408	0	0
	Other institutions (n = 172)	44,201	22.7%	100%	18,092	5,173	13,214

*But known to maintain bean collections in long-term conditions

Table 3. Composition of *ex situ* collections of bean 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	194,392	
Number of institutions holding genebank collections	192	
Number of distinct taxonomic names in genebank collections	82	
Number of accessions of crop wild relatives (CWR) in genebank collections	6,236	3.2%
Number of accessions of weedy materials in genebank collections	816	0.4%
Number of accessions of landraces in genebank collections	101,307	52.1%
Number of accessions of breeding materials in genebank collections	8,494	4.4%
Number of accessions of improved varieties in genebank collections	23,713	12.2%
Number of accessions of other materials in genebank collections	3	0%
Number of accessions not marked with an improvement type in genebank collections	53,823	27.7%
Number of countries where germplasm has been collected for genebank collections	151	
Number of accessions in genebank collections from the primary region(s) of diversity	23,562	12.1%
Number of accessions in genebank collections from the primary and secondary region(s) of diversity	42,315	21.8%
Number of taxa in botanic garden collections	55	
Number of botanic gardens holding collections of crop or its wild relatives	100	

100 botanic gardens collectively conserve 55 species. All of these taxa are also conserved in genebank collections.

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. Assessing 85 wild *Phaseolus* taxa across the entire genus, Ramírez-Villegas *et al*. (2010) categorized 48 (56.5%) as high priority for further collecting due to lack of, or under-representation, in genebanks, with 17 taxa given medium priority, 15 low priority, and only five species considered adequately represented in *ex situ* collections. The 2014 Strategy also extensively discussed gaps for wild *Phaseolus*, with attention to breeding potential, phylogenetic representation, and threats to *in situ* populations, among other factors (Crop Trust, 2014). In a global *ex situ* conservation gap analysis of wild relatives of major crops, Castañeda-Álvarez *et al.* (2016), assessing six closely related common bean wild relatives, listed two (*Phaseolus albescens* McVaugh ex R. Ramírez & A. Delgado and *Phaseolus persistentus* Freytag & Debouck) as high priority and one further species (*P. dumosus* [wild type]) as medium priority for further collecting. For lima bean wild relatives, the authors listed two (*Phaseolus longiplacentifer* Freytag and *Phaseolus mollis* Hook. f.) as high priority and two (*Phaseolus augusti* Harms and *P. lunatus* [wild type]) as medium priority. Some progress has been made recently in filling recognized 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 103 seed samples of 11 bean wild relative taxa from four countries (including 42 samples of wild *P. lunatus*, 16 of wild *P. coccineus*, and 15 of wild *P. vulgaris*, among others) as well as the development of new varieties with introgressions from wild germplasm (Eastwood *et al.*, 2022).

The 2014 Strategy identified specific areas in several countries in Latin America, as well as in Africa and Asia, where landraces of common bean or lima bean were potentially undersampled (Crop Trust, 2008). Ramirez-Villegas *et al.* (2022) identified geographic gaps for common bean landrace groups in specific regions in Mesoamerica and in South America.

Multilateral System status of accessions in *ex situ* collections

The entire genus *Phaseolus* (excepting *Phaseolus polyanthus*, now a synonym of *P. dumosus*) is listed in Annex I of the Plant Treaty. Of the 194,392 accessions conserved globally, approximately 22% are held in an international institution (i.e., mainly CIAT), and are included in the MLS under Article 15 of the Plant Treaty or similar arrangements, with the remainder maintained in national and subnational collections (Table 4).

As of 2025, 73,898 accessions are formally included in the MLS according to the Plant Treaty's GLIS database, and 81,408 accessions have been assigned Digital Object Identifiers (DOIs). Per the relevant fields in the global genetic resources databases, 94,002 accessions (48.4% of world total) are listed as included in the MLS; this is likely an underestimate, noting that 31.5% of accessions do not have MLS status data. The discrepancies between the GLIS data and the global genetic resources databases indicate that several institutions have not registered or recently updated their registrations in the GLIS portal.

Table 4. Representation of bean 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	42,812	22.0%
Number of accessions in genebank collections in national or other institutions	151,580	78.0%
Number of accessions in genebank collections in Annex I	193,134	99.3%
Number of accessions with DOI (Plant Treaty GLIS 2025)	81,408	
Number of accessions included in the Multilateral System (MLS) (Plant Treaty GLIS 2025)	73,898	
Number of accessions included in the Multilateral System (MLS) (genebank collections databases)	94,002	48.4%
Number of accessions included in the Multilateral System (MLS) that are in international collections (genebank collections databases)	41,581	21.4%
Number of accessions not included in the Multilateral System (MLS) (genebank collections databases)	39,248	20.2%
Number of accessions without information regarding inclusion in the Multilateral System (MLS) (genebank collections databases)	61,142	31.5%

Storage conditions, regeneration status, and safety duplication

As expected for an orthodox seed crop, almost the entirety (96.8%) of bean accessions are conserved as seed, with over half (50.4%) of these accessions listed as conserved under long-term cold-storage conditions (Table 5). Information on storage in general is missing for 3% of all accessions, and on seed storage type (i.e., long, medium, or short term) it is missing for 31.6% of seed accessions.

Current regeneration status and needs cannot be directly derived from the global germplasm databases. 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 9,984 accessions regenerated during this time by reporting institutions, with 26,792 accessions identified as needing regeneration and 8,252 of these lacking funds to conduct the regeneration.

Analysis of the location of safety duplication sites of bean germplasm, as listed in Genesys, indicates that at least 53.7% 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. The actual extent of safety duplication of bean accessions worldwide, when also considering safety duplication within the same country, may be higher than this estimate, given that a number of national genebanks (such as the USA and Russian Federation), often provide safety backup of their collections in a different location within the country. Information from the SGSV database from 2024 indicated that 28% of total accessions worldwide were duplicated in Svalbard.

Table 5. Storage conditions of bean *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	188,180	96.8%
Number of accessions held in short-term seed storage in genebank collections	24	0.01%
Number of accessions held in medium-term seed storage in genebank collections	33,970	18.1%
Number of accessions held in long-term seed storage in genebank collections	94,802	50.4%
Number of accessions held in seed storage of undefined type in genebank collections	59,384	31.6%
Number of accessions held in field storage in genebank collections	507	0.3%
Number of accessions held in in-vitro storage in genebank collections	2	0%
Number of accessions held in cryo storage in genebank collections	1	0%
Number of accessions held as DNA in genebank collections	4	0%
Number of accessions held in other storage in genebank collections	0	0%
Number of accessions not marked with a storage type in genebank collections	5,917	3.0%
Number of accessions in genebank collections regenerated 2014–2019	9,984	19.7%
Number of accessions in genebank collections in need of regeneration 2014–2019	26,792	52.7%
Number of accessions in genebank collections in need of regeneration without budget for regeneration 2014–2019	8,252	16.2
Number of accessions safety duplicated out of the country in genebank collections	36,605	53.7%
Number of accessions in genebank collections safety duplicated in Svalbard	54,451	28.0%

Documentation, information systems, and research resources

A descriptor list for bean was published in 1982 and is available online (IBPGR, 1982), and a prioritized list of characterization and evaluation descriptors was published in 2009 (Bioversity International and CIAT, 2009). The World Vegetable Center published descriptors for the major domesticated bean species in 2015 (WorldVeg, 2015).

The estimated completeness of passport information for bean accessions listed in Genesys was 6.3 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. Three characterization and evaluation datasets are available via Genesys, covering a total of 38,500 accessions. Four metrics of the current degree of digital sequence information (DSI) for bean (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. Beans stand out compared to other grain legumes in terms of research resources in GBIF, having the largest numbers of specimens and observations.

Table 6. Documentation, information systems, and research resources for beans. 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	6.3
Number of genes as recorded in NCBI's Entrez database as of 2022	89,575
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	968,645
Number of proteins as recorded in NCBI's Entrez database as of 2022	1,158,574
Number of publications listed in Google Scholar with taxon name in title published between 2009 and 2019	8,220
Number of publications listed in PubMed Central with taxon name in text as of 2022	26,200
Number of research materials as recorded in GBIF (2025)	401,133

Germplasm distributions and varietal registrations and releases

Germplasm distribution and varietal development statistics for beans 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). Beans are among the most distributed grain legumes in both these datasets (Khoury *et al*., 2023) (Table 7). Information on varietal registrations and releases indicate that bean is second only to soybean in terms of varietal development.

Table 7. Bean 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	4,991.6
Average annual number of samples distributed worldwide as recorded in FAO WIEWS	7,017.5
Average annual number of samples distributed worldwide as recorded in the Plant Treaty Data Store	12,618.3
Number of countries receiving germplasm as recorded in the Plant Treaty Data Store	35.3
Evenness of distributions across world regions as recorded in the Plant Treaty Data Store	0.8
Average annual number of varietal registrations worldwide as recorded in UPOV's PLUTO	194.2
Average annual number of varietal releases worldwide as recorded in FAO WIEWS	110.8

Networks and partnerships

- CIAT continues to play a critical role in bean germplasm conservation and varietal development, maintaining active partnerships with national agricultural research organizations, other international centers, and several academic and industry institutions.
- The Pan Africa Bean Research Alliance (PABRA) is a consortium of African-owned regional bean networks consisting of over 350 partners and members across 30 countries.
- The European Cooperative Programme for Plant Genetic Resources (ECPGR) Grain Legumes Working Group was initiated in 1991 and remains active, particularly in bean germplasm characterization and evaluation through competitive calls.
- The USDA ARS has a pertinent Crop Germplasm Committee on *Phaseolus* (also here)
- The BEANS Meta Network (Better pulses for Environment, Agriculture, Nutrition and Societies) was launched in 2025 to transform Mediterranean food systems through the power of legumes. This initiative builds upon the MEDIET project, which highlighted the nutritional, health, and environmental benefits of faba beans, lentils, chickpeas, and dry beans.
- The Global Bean Project is a network that aims to increase the cultivation and consumption of legumes around the world.

Conclusions

Common bean continues to be a critically important grain legume worldwide and it is likely that it and several of its congeneric relatives, including lima bean and tepary bean, will grow in importance in future food systems for both human health and environmental sustainability. Bean genetic resources are bolstered by the activities of CIAT 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 also considerable amounts of associated research resources, and there has been significant activity in germplasm distributions and varietal development 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 fully include *Phaseolus* bean 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 GitLab repository. Extended methods are available here.

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Supplementary information

Supplementary Table 1: Full list of *ex situ* collections of bean 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 (2024) 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)
COL003	Centro Internacional de Agricultura Tropical	37,936	19.5%	19.5%	Not listed*	37,936	37,936
USA022	Western Regional Plant Introduction Station, USDA-ARS, Washington State University	17,660	9.1%	28.6%	17,265	0	0
BRA008	Embrapa Arroz e Feijão	17,044	8.8%	37.4%	Not listed	6,714	17,011
DEU146	Genebank, Leibniz Institute of Plant Genetics and Crop Plant Research	9,003	4.6%	42.0%	8,990	9,010	9,003
BRA003	Embrapa Recursos Genéticos e Biotecnologia	7,892	4.1%	46.1%	7,818	0	0
MEX208	INIFAP, Centro Nacional de Recursos Genéticos (CNRG)	7,467	3.8%	49.9%	7,467	0	0
RUS001	N.I. Vavilov All-Russian Research Institute of Plant Industry	6,543	3.4%	53.3%	6,543	0	0
USA974	Seed Savers Exchange	5,059	2.6%	55.9%	Not listed	0	0
HUN003	Centre for Plant Diversity	4,586	2.4%	58.2%	1,350	0	238
IND001	National Bureau of Plant Genetic Resources	4,125	2.1%	60.3%	4,125	0	0
AUS165	Australian Grains Genebank, Agriculture Victoria	3,824	2.0%	62.3%	3,330	3,537	0
BGR001	Institute for Plant Genetic Resources 'K.Malkov'	3,823	2.0%	64.3%	1,252	0	0
KEN212	Genetic Resources Research Institute	3,621	1.9%	66.1%	3,621	1,033	3,601
PRT001	Banco Português de Germoplasma Vegetal	3,595	1.8%	68.0%	1,298	0	3,595
ESP004	Centro Nacional de Recursos Fitogenéticos	3,580	1.8%	69.8%	2,986	0	3,181
POL003	Plant Breeding and Acclimatization Institute	3,365	1.7%	71.6%	3,350	213	2,721

ECU023	Departamento Nacional de Recursos Fitogenéticos	3,292	1.7%	73.3%	3,231	24	3,280
ROM007	Suceava Genebank	2,889	1.5%	74.7%	986	223	222
JPN183	NARO Genebank	2,479	1.3%	76.0%	690	0	0
TUR001	Plant Genetic Resources Department	2,408	1.2%	77.3%	2,408	0	0
UKR001	Institute of Plant Production n.a. V.Y. Yurjev of UAAS	2,214	1.1%	78.4%	1,027	0	0
MEX006	UACh, Banco Nacional de Germoplasma Vegetal (BANGEV)	1,756	0.9%	79.3%	503	0	0
UKR008	Ustymivka Experimental Station of Plant Production	1,687	0.9%	80.2%	675	0	0
SVK001	National Agricultural and Food Centre (NPPC), Research Institute of Plant Production (RIPP)	1,229	0.6%	80.8%	Not listed	0	1,229
CRI001	Centro Agronómico Tropical de Investigación y Enseñanza	1,152	0.6%	81.4%	1,152	1,152	1,152
CRI085	CATIE - Banco de Germoplasma (Colecciones Semillas Ortodoxas)	1,152	0.6%	82.0%	1,152	0	1,152
MEX131	UDG, Centro Universitario de Ciencias Biológicas y Agropecuarias (UDG-CUCBA)	1,151	0.6%	82.6%	Not listed	0	0
CZE122	Gene bank	1,143	0.6%	83.2%	1,143	85	1,143
PAK001	Plant Genetic Resources Program	1,107	0.6%	83.7%	113	0	139
SVN019	Crops and Seed Production Department, Agricultural Institute of Slovenia	1,100	0.6%	84.3%	424	965	70
ZMB030	SADC Plant Genetic Resources Centre	1,087	0.6%	84.9%	1,087	0	0
UGA132	Plant Genetic Resource Centre	1,027	0.5%	85.4%	521	0	520
UGA528	Uganda National Genebank	1,027	0.5%	85.9%	Not listed	527	0
CAN004	Plant Gene Resources of Canada, Saskatoon Research and Development Centre	1,001	0.5%	86.4%	1,001	0	1,001
ROM055	Research and Development Station for Vegetables - Bacau	873	0.4%	86.9%	4	0	0
BRA020	Embrapa Clima Temperado	860	0.4%	87.3%	Not listed	0	0

CHL028	Banco Base de Semillas INIA Intihuasi	814	0.4%	87.7%	814	0	0
CUB014	Instituto de Investigaciones Fundamentales en Agricultura Tropical	809	0.4%	88.2%	Not listed	0	0
LSO015	Lesotho National Plant Genetic Resources Centre	797	0.4%	88.6%	Not listed	0	0
TWN001	World Vegetable Center	797	0.4%	89.0%	635	545	714
COL017	Corporación Colombiana de Investigación Agropecuaria, AGROSAVIA	752	0.4%	89.4%	584	0	0
ARG1349	Banco Activo de Germoplasma del Noroeste Argentino (NOA)	749	0.4%	89.8%	Not listed	0	0
PRT102	Banco de Germoplasma - Universidade da Madeira	741	0.4%	90.1%	741	0	741
TZA016	National Plant Genetic Resources Centre	718	0.4%	90.5%	718	0	0
BEL014	Botanic Garden Meise	715	0.4%	90.9%	715	0	715
MEX194	Instituto de Investigación y Capacitación Agropecuaria, Acuícola y Forestal del Estado de México (ICAMEX)	661	0.3%	91.2%	Not listed	0	0
ARG1350	Banco Activo de Germoplasma de La Consulta	628	0.3%	91.5%	Not listed	0	0
MEX201	UACh, Centro Regional Universitario Sur (CRUS)	613	0.3%	91.9%	Not listed	0	0
VNM049	Plant Resources Center	613	0.3%	92.2%	7	0	0
AUT001	Austrian Agency for Health and Food Safety	611	0.3%	92.5%	605	0	610
LKA036	Plant Genetic Resources Centre	574	0.3%	92.8%	Not listed	0	0
ESP009	Consejo Superior de Investigaciones Científicas. Misión Biológica de Galicia	571	0.3%	93.1%	Not listed	0	240
GRC005	Greek Genebank, Institute of Plant Breeding and Genetic Resources	476	0.2%	93.3%	Not listed	0	0

ITA363	Dipartimento di Chimica, Biologia e Biotecnologie, Universitá degli Studi Perugia	476	0.2%	93.6%	475	0	0
ZAF062	RSA National Plant Genetic Resources Centre	476	0.2%	93.8%	474	0	0
ETH085	Ethiopian Biodiversity Institute	473	0.2%	94.0%	334	0	440
ITA395	CREA-Centro di Ricerca Cerealicoltura e Colture Industriali - Sede di Bologna	437	0.2%	94.3%	Not listed	0	0
MEX287	Banco de Germoplasma de Especies Nativas de Oaxaca (BAGENO)	412	0.2%	94.5%	Not listed	0	0
MDA010	Laboratory for Plant Genetic Resources	408	0.2%	94.7%	Not listed	0	0
NGA039	International Institute of Tropical Agriculture	378	0.2%	94.9%	Not listed	378	359
NIC014	Centro Nacional de Investigación Agropecuaria (INTA-CNIA)	371	0.2%	95.1%	Not listed	0	0
CUB030	Instituto de Investigaciones de Granos	352	0.2%	95.3%	Not listed	0	0
CHL099	Banco Base INIA Quilamapu	342	0.2%	95.4%	Not listed	0	0
ALB026	Plant Genetic Resources Center	325	0.2%	95.6%	325	69	308
GHA091	Plant Genetic Resources Research Institute	315	0.2%	95.8%	Not listed	282	278
BOL317	Estación Experimental de Toralapa	295	0.1%	95.9%	Not listed	0	0
SLV050	CENTA - Banco de Germoplasma	290	0.1%	96.1%	290	0	0
CRI077	Instituto Nacional de Innovación y Transferencia de Tecnología Agropecuaria	278	0.1%	96.2%	278	0	0
ETH013	International Livestock Research Institute	265	0.1%	96.3%	Not listed	266	265
ITA368	Banca del germoplasma autoctono vegetale regionale	226	0.1%	96.5%	193	0	0
MWI041	Malawi Plant Genetic Resources Centre	210	0.1%	96.6%	205	0	177
UKR007	Institute of Agriculture & Cattle-breeding of the Western Region	210	0.1%	96.7%	208	0	0

ZMB048	National Plant Genetic Resources Centre	209	0.1%	96.8%	209	168	209
GBR017	Henry Doubleday Research Association	206	0.1%	96.9%	Not listed	0	0
KEN214	Seed Savers Network Kenya	201	0.1%	97.0%	Not listed	0	0
BIH039	Institute of Genetic Resources, University of Banja Luka	192	0.1%	97.1%	103	0	0
NPL069	National Agriculture Genetic Resources Centre-Genebank	188	0.1%	97.2%	188	0	0
MEX069	UAAAN, Centro de Conservación de Semillas Ortodoxas, Región Norte (CC-SO)	168	0.1%	97.3%	Not listed	0	0
MKD007	Fabia CSB Bogdanci	167	0.1%	97.4%	Not listed	0	0
BDI003	Institut des Sciences Agronomiques du Burundi	165	0.1%	97.4%	Not listed	0	0
ROM023	University of Agricultural Sciences and Veterinary Medicine Timisoara	158	0.1%	97.5%	Not listed	0	0
ROM068	Research and Development Station for Vegetables Buzau	152	0.1%	97.6%	Not listed	0	0
SWE054	Nordic Genetic Resource Center	146	0.1%	97.7%	146	148	145
MMR015	Myanmar SeedBank	145	0.1%	97.8%		0	0
UKR004	Institute of Agriculture	134	0.1%	97.8%	43	0	0
AZE015	Genetic Resources Institute	132	0.1%	97.9%	Not listed	0	108
PHL129	Institute of Plant Breeding-National Plant Genetic Resources Laboratory	129	0.1%	98.0%	Not listed	0	0
PER012	Estación Experimental Agraria Baños del Inca	126	0.1%	98.0%	Not listed	0	126
ESP172	Cabildo Insular de Tenerife. Centro de Conservación de la Biodiversidad Agrícola de Tenerife	125	0.1%	98.1%	Not listed	0	110
MNG030	Institute of Plant and Agricultural Science	122	0.1%	98.2%	Not listed	0	20
ERI003	National Agricultural Research Institute	120	0.1%	98.2%	120	0	6
TJK027	National Center for Genetic Resources	115	0.1%	98.3%	96	0	115
ITA436	Istituto di Bioscienze e Biorisorse, Consiglio Nazionale delle Ricerche	112	0.1%	98.3%	4	0	0

COL029	Centro de Investigación La Selva, Corporación Colombiana de Investigación Agropecuaria	107	0.1%	98.4%	Not listed	0	0
CUB005	Instituto Nacional de Ciencias Agrícolas	102	0.0%	98.4%	Not listed	0	0
GRC100	CIHEAM Mediterranean Agronomic Institute of Chania	100	0.0%	98.5%	100	0	0
GBR004	Millennium Seed Bank - Royal Botanic Gardens Kew	97	0.0%	98.5%	Not listed	0	78
CHE001	Agroscope Changins	95	0.0%	98.6%	91	0	95
NZL001	Margot Forde Genebank, AgResearch Ltd	94	0.0%	98.6%	Not listed	0	0
SDN002	Agricultural Plant Genetic Resources Conservation and Research Centre	94	0.0%	98.7%	94	0	94
ESP016	Gobierno Vasco. Neiker-Tecnalia. Instituto Vasco de Investigación y Desarrollo Agrario	93	0.0%	98.7%	Not listed	0	93
EGY087	National Gene Bank	92	0.0%	98.8%	Not listed	12	92
CUB284	Centro de Investigaciones Agropecuarias	89	0.0%	98.8%	Not listed	0	0
CMR205	Ecogerm Farmers	87	0.0%	98.9%	Not listed	0	0
ARM005	Institute of Botany	84	0.0%	98.9%	20	0	24
AZE003	Research Institute of Crop Husbandry	82	0.0%	99.0%	Not listed	0	0
SRB002	Institute of Field and Vegetable Crops Novi Sad	80	0.0%	99.0%	Not listed	0	0
PER028	Estación Experimental Agraria Chincha	74	0.0%	99.0%	Not listed	0	74
UZB006	Uzbek Research Institute of Plant Industry	73	0.0%	99.1%	Not listed	0	0
NGA010	National Centre for Genetic Resources and Biotechnology	66	0.0%	99.1%	Not listed	69	0
ZWE049	Genetic Resources and Biotechnology Institute-Department of Research and Specialist Services	66	0.0%	99.1%	Not listed	28	0
GTM001	Instituto de Ciencia y Tecnología Agrícolas	65	0.0%	99.2%	Not listed	0	0
ARM059	Agrobiotechnology Scientific Center	63	0.0%	99.2%	59	0	15
AUT025	Referat Pflanzengesundheit und Spezialkulturen	63	0.0%	99.2%	63	0	63

ESP026	Generalidad Valenciana. Universidad Politécnica de Valencia. Escuela Técnica Superior de Ingenieros Agrónomos. Banco de Germoplasma	63	0.0%	99.3%	33	0	60
ESP027	Gobierno de Aragón. Centro de Investigación y Tecnología Agroalimentaria. Banco de Germoplasma de Hortícolas	61	0.0%	99.3%	2	0	53
MEX367	Facultad de Ciencias Naturales, Universidad Autónoma de Querétaro	61	0.0%	99.3%		0	0
SWZ015	National Plant Genetic Resources Centre	56	0.0%	99.4%	56	0	0
MEX263	SNICS, Depositario Nacional de Referencia de Semillas (DNRS)	53	0.0%	99.4%	Not listed	0	0
MKD001	Faculty of Agriculture, University Ss. Cyril and Methodius	53	0.0%	99.4%	Not listed	0	0
AUT005	Genebank Tirol	50	0.0%	99.4%	Not listed	0	50
BLR016	Republican Unitary Enterprise 'Research and Practical Center of the National Academy of Sciences of Belarus for Potato, Fruit and Vegetable Growing'	49	0.0%	99.5%	Not listed	0	0
HRV044	College of Agriculture at Križevci	45	0.0%	99.5%	21	0	13
LBN002	International Centre for Agricultural Research in Dry Areas	45	0.0%	99.5%	Not listed	3	3
ARM008	Scientific Centre of Vegetable and Industrial Crops	43	0.0%	99.5%	23	25	0
CUB251	Instituto de Investigaciones Agropecuarias Jorge Dimitrov	43	0.0%	99.6%	Not listed	0	0
CYP004	National (CYPARI) Genebank, Agricultural Research Institute, Ministry of Agriculture, Rural Development and Environment	37	0.0%	99.6%	10	0	35
USA971	Desert Legume Program	37	0.0%	99.6%	Not listed	0	0

CRI007	Escuela de Ciencias Agrarias, Universidad Nacional	36	0.0%	99.6%	Not listed	0	0
KGZ040	Bank-Laboratory of Plant Genetic Resources of the KR	35	0.0%	99.6%	34	0	35
UGA433	Rubaya Community Seedbank	31	0.0%	99.6%	Not listed	0	31
VNM132	Potato, Vegetable and Flower Research Center	31	0.0%	99.7%	Not listed	0	0
USA995	National Center for Genetic Resources Preservation	30	0.0%	99.7%	4	0	0
BLR011	Republican Unitary Enterprise 'Research and Practical Centre of the National Academy of Sciences of Belarus for Arable Farming'	29	0.0%	99.7%	17	0	0
GEO013	Niko Ketskhoveli Institute of Botany	29	0.0%	99.7%	Not listed	0	0
ITA393	CREA-Centro di Ricerca Genomica e Bioinformatica - Sede di Montanaso Lombardo	28	0.0%	99.7%	Not listed	0	0
ESP032	Principado de Asturias. Servicio Regional de Investigación y Desarrollo Agroalimentario	27	0.0%	99.7%	Not listed	404	20
ROM008	Agricultural Research and Development Station Simnic	25	0.0%	99.8%	Not listed	0	0
BGD003	Bangladesh Agricultural Research Institute	23	0.0%	99.8%	23	0	5
ITA391	CREA-Centro di Ricerca Orticoltura e Florovivaismo - Sede di Pontecagnano	23	0.0%	99.8%	Not listed	23	23
EST019	Estonian Crop Research Institute	22	0.0%	99.8%	22	0	22
GEO001	I.Lomouri Institute of Crop Science	22	0.0%	99.8%	Not listed	0	0
PNG004	Southern Regional Centre Laloki (NARI)	22	0.0%	99.8%	Not listed	0	22
UGA431	Nakaseke Community Genebank	22	0.0%	99.8%	Not listed	0	22
ARG1408	Instituto de Investigación y Desarrollo Hortícola Semillero	21	0.0%	99.8%	Not listed	0	0
BWA015	National Plant Genetic Resources Centre	20	0.0%	99.8%	20	0	0

ESP198	Comunidad de Madrid. Consejería de Medio Ambiente, Vivienda y Ordenación del Territorio. Instituto Madrileño de Investigación y Desarrollo Rural. Banco de Variedades Locales de Madrid	19	0.0%	99.9%	Not listed	0	19
MAR088	Centre Régional de la Recherche Agronomique de Settat	17	0.0%	99.9%	Not listed	0	0
UGA530	Kabohe Community Seedbank	17	0.0%	99.9%	Not listed	0	17
AZE005	Vegetable Growing Research Institute Public Leqal Entity	16	0.0%	99.9%	Not listed	0	0
CHL177	Banco Activo INIA La Platina	16	0.0%	99.9%	Not listed	0	0
CHL071	Banco de Germoplasma de Papa, Universidad Austral de Chile	14	0.0%	99.9%	14	0	0
CUB010	Estación Experimental de Pastos y Forrajes Indio Hatuey	14	0.0%	99.9%	Not listed	0	0
ROM019	Research and Development Institute for Vegetables and Floriculture Vidra	14	0.0%	99.9%	Not listed	0	0
GRC047	Vegetable Department, Institute of Plant Breeding and Genetic Resources	13	0.0%	99.9%	Not listed	0	0
URY003	INIA La Estanzuela	13	0.0%	99.9%	13	0	0
FRA098	Station de la Réunion, CIRAD-FLHOR	12	0.0%	99.9%	12	0	0
MDG002	Département de Recherches Agronomiques, FOFIFA	10	0.0%	99.9%	Not listed	0	10
TUR034	Field Crop Central Research Institute	10	0.0%	99.9%	10	0	0
HND029	Dirección de Ciencia y Tecnología Agropecuaria	9	0.0%	99.9%	Not listed	0	9
GBR006	Warwick Genetic Resources Unit	8	0.0%	99.9%	8	0	8
JOR105	National Agricultural Research Center	8	0.0%	100.0%	Not listed	8	8
GRC006	Plant Production Department, Institute of industrial and forage crops	7	0.0%	100.0%	7	0	0

PHL008	Bureau of Plant Industry, Department of Agriculture	7	0.0%	100.0%	Not listed	0	0
POL101	Research Institute of Horticulture	7	0.0%	100.0%	6	0	7
USA962	G.A. Marx Pea Genetic Stock Center, Western Regional Plant Introduction Station, USDA-ARS, Washington State University	7	0.0%	100.0%	Not listed	0	0
BRA142	Embrapa Meio Norte	6	0.0%	100.0%	Not listed	0	5
AZE014	Azerbaijan State Agrarian University	5	0.0%	100.0%		0	0
ESP200	Govern de les Illes Balears. Conselleria de Presidència. Direcció General d'Agricultura i Desenvolupament Rural. Institut de recerca i formació agrària i pesquera	5	0.0%	100.0%	Not listed	0	5
BEL002	Gembloux agro-biotech, Université de Liège, département des Sciences agronomiques, Phytotechnie tropicale et Horticulture	4	0.0%	100.0%	Not listed	0	4
NLD037	Centre for Genetic Resources, the Netherlands	4	0.0%	100.0%	4	0	0
PHL131	Bureau of Plant Industry-Baguio National Crop Research and Development Center	4	0.0%	100.0%	Not listed	0	0
QAT004	Biotechnology Center, Ministry of Environment	4	0.0%	100.0%	4	10	4
ROM077	Research and Development Station for Vegetables - Iernut	4	0.0%	100.0%	Not listed	0	0
ECU331	Granja experimental Socavón	3	0.0%	100.0%	Not listed	0	0
LBN020	Lebanese Agricultural Research Institute	3	0.0%	100.0%	3	6	0
THA300	Genebank, Department of Agriculture, Ministry of Agriculture and Cooperation	3	0.0%	100.0%	Not listed	0	0
ECU167	Banco de Germoplasma de la Universidad Técnica Particular de Loja	2	0.0%	100.0%	2	0	0

GRC102	Hellenic Mediterranean University	2	0.0%	100.0%	Not listed	0	0
HRV021	Agricultural Institute Osijek	2	0.0%	100.0%	2	0	0
ISR002	Israel Gene Bank for Agricultural Crops, Agricultural Research Organisation, Volcani Center	2	0.0%	100.0%	Not listed	0	0
LBY006	National Bank for Plant Genetic Resources	2	0.0%	100.0%	Not listed	0	0
LTU001	Lithuanian Institute of Agriculture	2	0.0%	100.0%	2	0	2
MLT003	Plant Protection Directorate, Veterinary and Phytosanitary Regulation Department	2	0.0%	100.0%	Not listed	0	0
ROM021	Research and Development Station for Plant Culture on Sands Dabuleni	2	0.0%	100.0%	Not listed	0	0
TTO010	Central Experiment Station, Research Division, Ministry of Agriculture, Land and Fisheries	2	0.0%	100.0%	Not listed	0	0
AZE004	Institute of Botany	1	0.0%	100.0%	Not listed	0	0
HRV045	Faculty of Agrobiotechnical Sciences Osijek, University J.J. Strossmayer in Osijek	1	0.0%	100.0%	Not listed	0	0
LVA009	Latvian State Forest Research Institute 'Silava'	1	0.0%	100.0%	1	0	1
MEX014	INIFAP, Campo Experimental Iguala (CEIGUA)	1	0.0%	100.0%	Not listed	0	0
PHL024	Bureau of Plant Industry-Davao National Crop Research and Development Center	1	0.0%	100.0%	Not listed	0	1
POL004	Poznanska Hodowla Roslin Plant Breeding 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)
Phaseolus vulgaris L.	151,114
Phaseolus vulgaris var. *vulgaris*	15,952
Phaseolus lunatus L.	6,428
Phaseolus coccineus L.	5,523
Phaseolus sp.	5,329
Phaseolus lunatus var. *lunatus*	3,999
Phaseolus acutifolius A. Gray	1,630
Phaseolus dumosus Macfad.	1,244
Phaseolus vulgaris var. *aborigineus* L. (Burkart) Baudet	486
Phaseolus coccineus var. *coccineus*	386
Phaseolus leptostachyus Benth.	292
Phaseolus hybr.	224
Phaseolus microcarpus Mart.	162
Phaseolus coccineus subsp. *coccineus*	142
Phaseolus filiformis Benth.	129
Phaseolus augusti Harms	114
Phaseolus acutifolius var. *acutifolius*	108
Phaseolus xanthotrichus Piper	89
Phaseolus coccineus var. *timilpanensis* Freytag	87
Phaseolus acutifolius var. *tenuifolius* A. Gray	86
Phaseolus montanus Brandegee	74
Phaseolus polystachios (L.) Britton et al.	73
Phaseolus leptostachyus var. *leptostachyus*	44
Phaseolus zimapanensis A. Delgado	44
Phaseolus costaricensis Freytag & Debouck	37
Phaseolus glabellus Piper	36
Phaseolus maculatus Scheele	36
Phaseolus ritensis M. E. Jones	36
Phaseolus oligospermus Piper	30
Phaseolus pedicellatus Benth.	29
Phaseolus grayanus Wooton & Standl.	28
Phaseolus hintonii A. Delgado	27
Phaseolus neglectus F. J. Herm.	26
Phaseolus vulgaris x *coccineus*	19
Phaseolus angustissimus A. Gray	18
Phaseolus lunatus var. *silvester* Baudet	18
Phaseolus parvulus Greene	18
Phaseolus marechalii A. Delgado	17
Phaseolus debouckii A. Delgado	16
Phaseolus coccineus x *vulgaris*	15
Phaseolus tuerckheimii Donn. Sm.	15

Phaseolus dumosus x *vulgaris*	14
Phaseolus rotundatus Freytag & Debouck	13
Phaseolus albiflorus Freytag & Debouck	12
Phaseolus vulgaris x *acutifolius*	12
Phaseolus vulgaris x *dumosus*	12
Phaseolus macvaughii A. Delgado	11
Phaseolus micranthus Hook. & Arn.	11
Phaseolus pluriflorus Maréchal et al.	11
Phaseolus esperanzae Seaton	10
Phaseolus magnilobatus Freytag & Debouck	10
Phaseolus costaricensis x *dumosus*	9
Phaseolus albiviolaceus Freytag & Debouck	8
Phaseolus polystachios subsp. *polystachios*	8
Phaseolus chiapasanus Piper	7
Phaseolus carterae Freytag & Debouck	6
Phaseolus altimontanus Freytag & Debouck	5
Phaseolus talamancensis Debouck & Torres Gonz.	5
Phaseolus jaliscanus Piper	4
Phaseolus macrolepis Piper	4
Phaseolus novoleonensis Debouck	4
Phaseolus vulgaris x *costaricensis*	4
Phaseolus lignosus Britton	3
Phaseolus maculatifolius Freytag & Debouck	3
Phaseolus pauciflorus Sessé & Moc. ex G. Don	3
Phaseolus salicifolius Piper	3
Phaseolus albescens McVaugh ex R. Delgad. & A. Delgado	2
Phaseolus coccineus var. *griseus* (Piper) Freytag	2
Phaseolus coccineus x *dumosus*	2
Phaseolus tenellus Piper	2
Phaseolus albicarminus Debouck & N. Chaves	1
Phaseolus coccineus var. *tridentatus* Freytag	1
Phaseolus costaricensis x *vulgaris*	1
Phaseolus hygrophilus Debouck	1
Phaseolus lunatus x *polystachyus*	1
Phaseolus nodosus Freytag & Debouck	1
Phaseolus oaxacanus Rose	1
Phaseolus perplexus A. Delgado	1
Phaseolus polystachios subsp. *sinuatus* (Nutt. ex Torr. & A. Gray) Freytag	1
Phaseolus reticulatus Freytag & Debouck	1
Phaseolus texensis A. Delgado & W. R. Carr	1
Phaseolus vulgaris x *parvifolius*	1

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