



HUNGARY:

COUNTRY REPORT TO THE FAO INTERNATIONAL TECHNICAL CONFERENCE ON PLANT GENETIC RESOURCE

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Note by FAO

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CHAPTER 1

Introduction to Hungary and its Agricultural Sector

Hungary occupies a total area of 93,036 square km on the south-eastern part of Central Europe in the Carpathian Basin. This area belongs to a secondary diversity centre for a number of Old and New World crops and show a considerable diversity of ecosystems and natural vegetation.

Her climate is under the influences of Mediterranean, Atlantic and Continental effects, which result in a fluctuating climate relatively well protected against quick changes by the surrounding high mountains (Alps, Charpathian mountains, Dinarids).

Primary agricultural production contributes about 6% to the national GDP, although Agriculture and Food Industry plays a considerably higher role in the Hungarian Economy, representing an approximately 20 % share in the national GDP and in the value of exported commodities both.

Main crops grown in Hungary include wheat, maize, forages, a number of temperate vegetables, fruits, grape, medicinal and aromatic plants. A relatively high proportion of the country used as agricultural land and the forest area is relatively modest (18%).

The Hungarian Economy is in a transitional phase from a centrally planned system toward market economy. Privatization is in progress altering considerably the country's ownership structure. In 1994, the distribution of Agricultural land was the following:

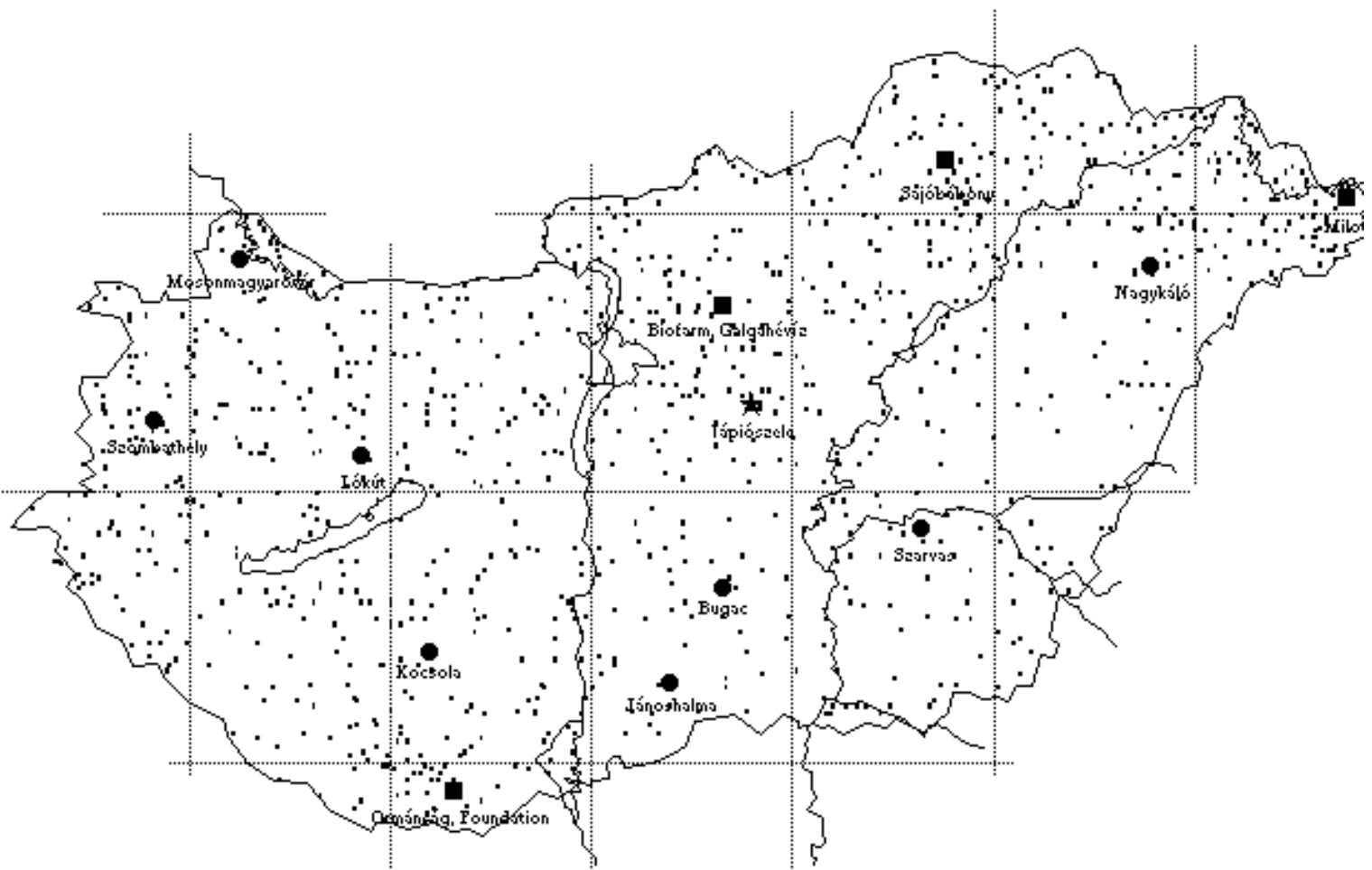
private property	2,652,700 ha
cooperatives	2,306,100 ha
state property	1,163,500 ha

Hungarian Agriculture has a long tradition and contributes to the world production with an overall 1.5%, which is higher than its share in the global arable land. In the case of certain commodities the Hungarian production represents an even higher proportion (red pepper - 10%, apple - 4.4% etc.) in the overall world production. Large farms (cooperatives and state farms) performing simplified



intensive farming were characteristic to Hungarian Agriculture from 1960 to 1990. Since 1990 dramatic changes have been taking place, including the reduction of average farm size, changes in ownership structure, and considerable decrease in input and overall production (app. 30-35 %).

FIG.1. MAP OF HUNGARY



- Collection Site
- Multiplication district
- „On farm” conservation site
- ★ Institute for Agrobotany, Tápiószele



CHAPTER 2

Indigenous Plant Genetic Resources

Hungary is rich in indigenous plant genetic resources. Her territory belongs to a secondary centre of crop diversity, where a number of local types and landraces developed even in relatively recently introduced New World crops as well (green and red peppers, tomato, maize etc.). The Natural Flora is especially rich source of wild fruits, medicinal plants (including diverse chemotaxa), forage grasses and legumes, and some crop wild relatives (*Aegilops*, *Lactuca*, *Daucus*, *Secale*, *Vitis*, *Prunus*, *Pyrus* etc.).

A great variation of local types of temperate fruits and grapes are still grown in so called “restricted garden areas”, and backyards. In the Eastern part of the country, semi-natural fruit forests (walnut, plum) are still exist and maintained in restricted protected areas.

A considerable part of the existing variation has been explored and collected since the late fifties and preserved in collections and gene banks (see map Fig. 1.).



CHAPTER 3

National Conservation Activities

3.1 *IN SITU* CONSERVATION ACTIVITIES

A major part of the indigenous species of Agricultural importance is protected by law. Many of these species occur also in nature reserve areas, like national parks, protected areas and landscape reserve districts (see lists attached – App. 1-3.). The Institute for Agrobotany developed a backyard multiplication system for the regeneration of Hungarian landraces and local types near their places of origin. The network involves nearly 100 collaborators (farmers) in different parts of the country. Recently, collaboration has started with NGOs (Ormánság Foundation, Galgafarm) on the field of dynamic maintenance of landraces and on the spot selection programme.

3.2 *EX SITU* COLLECTIONS

Genetic resources activities are supported from an Agricultural Fund under the supervision of the Ministry of Agriculture.

The main conditions of obtaining financial support are the following:

- applicants should possess unique germplasm not duplicated in existing germplasm collections,
- the material should be made freely available,
- a basic set of passport and/or collecting information should be supplied to the national database designated by the Ministry of Agriculture,
- after multiplication of the accessions the applicants should arrange for long-term preservation of the material in a Ministry-designated long-term seed store or in a genebank plantation,
- supported genetic resources activities should be conducted in accordance with international standards (FAO/IBPGR standards for genebanks, IBPGR descriptor lists).



A Technical Advisory Council has been created to set up priorities and decide on technical matters, standardized methodology and provide scientific advice. The Technical Advisory Council is supported by crop committees responsible for specific crop groups (field crops, vegetables, medicinal and aromatic plants, ornamental plants, fruits, grapes, forest trees, and micro-organisms). The Seed Act approved and filed in 1996 defined crop genetic resources conservation as centrally funded state responsibility. The regulation of national activities has been revised and completed in accordance to international recommendations (FAO/IPGRI Gene Bank Standards, FAO Global Plan of Action). A Crop Gene Bank Council was established in 1996 to replace the Technical Advisory Council backed up by 8 working groups for different crop categories.

Crop genetic resources activities are coordinated by the Institute for Agrobotany, which Institute also provides Secretariat support for the Crop Gene Bank Council.

The main activities of the Institute include:

- exploration and collection of germplasm of field and vegetable crops with special emphasis on Hungarian local material,
- multiplication and regeneration of germplasm to obtain a sufficient amount of high quality seed for medium and long-term conservation, evaluation and distribution,
- isoclimatic regeneration of Hungarian landraces close to their original places,
- characterization and evaluation of germplasm collections according to internationally accepted descriptor lists,
- documentation of passport and evaluation data of the PGR maintained by the Institute and other Institutes in Hungary,
- medium and long-term conservation of germplasm in cold stores and using meristem cultures in the case of vegetatively propagated crops,
- long-term conservation of Hungarian base collection of seed-propagated crops,
- distribution of germplasm together with relevant information to users in Hungary and worldwide,
- participation in the IPGRI ECP/GR programme and coordination of the Hungarian activities.

The Institute for Agrobotany has developed long term storage facilities for a central base collection for seed propagated plant. The computer hardware facilities have been updated to suit to the development of a national crop genetic resources database. Base collections for vegetatively propagated species are also being developed in existing gene bank plantations.



3.3 STORAGE FACILITIES

Both medium and long-term storage facilities are available at the Institute for Agrobotany, where facilities to host the National Base Collection for seed propagated crops has also been developed. Storage of seed samples is done according to FAO/IPGRI Gene Bank Standards (seed moisture content 4-7 %, 0 degree C in Active and -20 degrees C in Base collection stores. The available storage capacity can accommodate up to 100,000 seed samples. Medium term storage facilities are also available in institutions participating in the national crop genetic resources programme, or storage of seed samples is provided as a back up service by the Institute for Agrobotany.

3.4 DOCUMENTATION

Documentation of collections for Passport information has been completed according to FAO/IPGRI Genebank Standards. A summary of holdings in different germplasm collections is presented as attachments. Evaluation of collections and documentation of evaluated data is in progress. Descriptors have been selected in certain crops for inclusion into the central data base. A part of the Passport information on the field and vegetable crop collection has been made accessible through INTERNET. The Hungarian national programme scientists have been participating in the development of European Central Crop Databases, and the European central databases for Trifolium, Bromus and other perennial forage legumes are hosted and maintained by the Institute for Agrobotany.

3.5 FOREST GENETIC RESOURCES

3.5.1 Natural and semi-natural forests

As a basic principle, primarily the natural reproduction of forests is considered and preferred in forest regeneration, similarly to most countries having up-to-date forest management system. This approach automatically ensures the maintenance of species diversity, genetic variation within the components of the forest ecosystem and its balance with the local ecological conditions.



In countries where forest management is diversified and developed, in order to fulfil the demand for wood, as well as to support the afforestation of sites where the original ecological conditions have changed to such an extent that native species are not able to find their living conditions any more, there is a need for forest management (wood production) of plantation or quasi-plantation type, too.

In such cases, artificial plantation or direct seed sowing is necessary, that requires the production of propagative material and its delivery from a distance from the target area. Genetic properties and provenance of the propagative material will basically determine the start position of the projected forest and influence the quality and quantity of expected yield for several decades (20 to 120 years depending on the species and purposes of use), forest specialists are to decide on the proper source of propagation material - on locality and parent forest stand level alike.

Guidelines have been developed on the basis of research carried out by forest geneticists and considering the experiences of practising foresters to assist making proper decisions and avoiding any serious mistake in selecting propagative material for plantations planned. It is generally suggested, that the propagation material should be obtained primarily from the same region or super-region, whenever possible, or from other places with ecological conditions similar to the projected area.

There are such provenance districts or specific stands of particular species, however, where the potential productivity of genotypes is higher than that of the local populations nearby the place of the plantation to be established (for example westerhof spruce, Sudeten larch, Slavonian robur oak, etc). Utilization of such provenances like these with verified advantages and inherited outstanding characteristics should be considered even in larger distances from the original place of occurrence.

Inside any provenance district, those stands are selected for seed propagation and collecting which have better than average health condition and growth vigour, and these favourable characteristics are predictably heritable (selected and earmarked seed producing stands).

It is the responsibility of the State Supervision of Propagation Material within the National Institute of Agricultural Quality Testing (Budapest), that propagation material well adapted to the local environment, durable, and the same time, forming ecosystems of high level of diversity, producing improved volume and good quality of wood and timber and/or contribution to the maintenance and improvement of the advantageous effect of forest plantations on the local environment will be available for Agroforestry.



In the case of forest plantations, the above aims can be achieved by using pure, identified, relatively homogenous subspecies or selected types. In quasi-natural forests or quasi-plantations, the goal can be realized by using healthy, stable, resistant propagation material well adapted to the local ecological conditions and having good qualitative and quantitative characteristics for timber production, originating from carefully chosen mother stands or populations.

Seed production stands in Hungary include:

<i>Quercus robur</i> - Oak	1,686 ha
<i>Quercus petraea</i> - Sessile oak	510 ha
<i>Quercus rubra</i> - Northern red oak	35 ha
<i>Quercus cerris</i>	299 ha
<i>Fagus sylvatica</i> - European beech	933 ha
<i>Carpinus betulus</i> - Hornbeam	22 ha
<i>Robinia pseudoacacia</i> - Black locust	348 ha
<i>Fraxinus excelsior</i> - Ash	64 ha
<i>F. angustifolia</i> ssp. <i>pannonica</i>	35 ha
<i>Juglans nigra</i> - Black walnut	71 ha
<i>Cerasus avium</i> - Wild cherry	23 ha
<i>Alnus glutinosa</i> - Alder	23 ha
<i>Tilia cordata</i> - Basswood	5 ha
<i>Tilia tomentosa</i> - Silver basswood	37 ha
<i>Pinus sylvestris</i> - Scots pine	105 ha
<i>Pinus nigra</i> - Austrian pine	116 ha
<i>Pinus strobus</i> - Eastern white pine	5 ha
<i>Picea abies</i> - Norway spruce	40 ha
<i>Larix decidua</i> - European larch	47 ha
<i>Abies alba</i> - Fir	27 ha

Hungary participates in EUFORGEN. National coordination is the responsibility of the University of Forestry and Timber Industry in Sopron.



CHAPTER 4

Utilization of Crop Genetic Resources

Crop Genetic Resources collections are used for different purposes including development of new cultivars, crop research and education at different levels. It is very difficult to monitor the actual utilization of distributed germplasm samples, since the development of cultivars may take relatively long time and the breeders not necessarily document their raw material collections or such information is not readily available. Since the establishment of the first cold seed store at Taposzele in 1973, approximately 80,000 samples have been distributed to users worldwide.

There are several documented cases for the successful utilization of genetic resources samples supplied from genetic resources collections:

- Tetraploid red clover cultivars bred from polycross progeny of several ecotypes collected in Western part of Hungary.
- Winter planted pea cultivar developed using a gene bank accession with high cold tolerance.
- Alfalfa cultivars developed from Hungarian landraces.
- Grasses and forage legumes cultivars developed using gene bank accessions.
- Vegetable cultivars (green and red peppers, onion, white cabbage, Phaseolus bean) bred from Hungarian landraces.
- Prunus cultivars released as selected clones from local types.
- Selected grape clones of traditional cultivars and varieties.
- Medicinal plant cultivars selected from different chemotaxa.

In addition to the utilization in cultivar development, genetic resources collections have been used in Hungary for basic and applied research, which resulted in the development of genetic lines, clones to be considered as raw material for the production of hybrids and cultivars. This type of material is also preserved as genetic resources if justified by the Gene Bank Council.



CHAPTER 5

International Collaboration

Hungary participated in the COMECON cooperative programme which was coordinated by the Vavilov Institute. Hungary participates in the FAO Commission and Undertaking, and was one of the supporting country and signatories of the establishment of IPGRI. The Hungarian National Programme participates in IPGRI ECP/GR and EUFORGEN. As an active participant organized several working group meeting and hosts some European Central Data Bases (Trifolium, other perennial forage legumes and Bromus). Extensive collaboration has been also developed on a bilateral basis with about 600 institutions holding genetic resources collections of crops and crop wild relatives.

Hungary is interested in the further development of international collaboration on the basis of free accessibility of genetic resources collection. Some obligation taken by the recipients of the germplasms supplied considered as important conditions such as the acknowledgement of the source of the material whenever used to produce cultivars or publications, feed back of evaluation results and data, and avoiding any restriction put on the material supplied (e.g. direct release and registration, licensing or other form of protection without the written permission from the supplier).

It is believed that the FAO Global Plan of Action will contribute to a great extent to the further development of an effective international collaboration on crop genetic resources for food and agriculture.

Strictly protected species of Agricultural importance in Hungary

Achillea horanszkyi
Adonis transsylvanica
Angelica palustris
Astragalus dasyanthus
Colchicum hungaricum
Crambe tataria
Digitalis lanata
Digitalis ferruginea
Dracocephalum austriacum
Dracocephalum ruyschiana
Ephedra distachya ssp. monostachya
Erysimum pallidiflorum



Strictly protected species of Agricultural importance in Hungary

Linum dolomiticum
Achillea horanszkyi
Adonis transsylvanica
Angelica palustris
Astragalus dasyanthus
Colchicum hungaricum
Crambe tataria
Digitalis lanata
Digitalis ferruginea
Dracocephalum austriacum
Dracocephalum ruyschiana
Ephedra distachya ssp. monostachya
Erysimum pallidiflorum
Linum dolomiticum
Onosma tornense
Paeonia officinalis ssp. banatica
Primula auricula ssp. hungarica
Primula farinosa ssp. alpigena
Pulsatilla patens
Pulsatilla pratensis ssp. hungarica
Pyrus magyarica
Salvia nutans
Vincetoxicum pannonicum

Achillea crithmifolia
Achillea ptarmica
Aconitum anthora
Aconitum moldavicum
Aconitum variegatum ssp. gracile
Aconitum vulparia
Acorus calamus
Adonis vernalis
Agrostemma githago
Alchemilla acutiloba
Alchemilla crinita
Alchemilla glabra ssp. alpestris
Alchemilla gracilis
Alchemilla hungarica
Alchemilla hybrida
Alchemilla monticola
Alchemilla xanthochlora
Alkanna tinctoria



Strictly protected species of Agricultural importance in Hungary

Allium carinatum
Allium moschatum
Allium paniculatum
Allium sphaerocephalon
Allium suaveolens
Allium victorialis
Amygdalus nana
Anemone sylvestris
Anemone trifolia
Apium repens
Armoracia macrocarpa
Arnica montana
Asperula taurina ssp. leucanthera
Astragalus asper
Astragalus contortuplicatus
Astragalus exscapus
Astragalus vesicarius ssp. albidus
Betula pubescens
Carex brevicollis
Carlina acaulis
Centaurea sadlerana
Ceterach officinarum
Cicuta virosa
Colchicum arenarium
Coronilla coronata
Coronilla elegans
Coronilla emerus
Coronilla vaginalis
Crataegus nigra
Crocus albiflorus
Crocus heuffelianus
Crocus reticulatus
Crocus tommasianus
Cyclamen purpurascens
Daphne cneorum agg.
Daphne laureola
Daphne mezereum
Dictamnus albus
Diphasiastrum complanatum
Drosera rotundifolia
Echium russicum
Epilobium angustifolium
Equisetum hyemale



Strictly protected species of Agricultural importance in Hungary

Equisetum variegatum
Erysimum crepidifolium
Erysimum odoratum
Festuca amethystina
Festuca dalmatica
Festuca pallens ssp. *hungarica*
Gentiana asclepiadea
Gentiana ciliata
Gentiana cruciata
Gentiana pneumonanthe
Gentianella austriaca
Gentianella livonica
Geranium sylvaticum
Globularia cordifolia
Helichrysum arenarium
Helleborus purpurascens
Hepatica nobilis
Hippophae rhamnoides
Hypericum barbatum
Hypericum elegans
Hypericum maculatum
Inula helenium
Iris arenaria
Iris graminea
Iris pumila
Iris sibirica
Iris spuria
Iris variegata
Isatis tinctoria
Jovibarba hirta agg.
Lamium orvala
Lathyrus linifolius ssp. *montanus*
Lathyrus pallescens
Lathyrus palustris
Lathyrus pannonicus
Lathyrus pisiformis
Lathyrus transsylvanicus
Leucojum aestivum
Leucojum vernum
Linum flavum
Linum hirsutum
Linum tenuifolium
Lonicera caprifolium



Strictly protected species of Agricultural importance in Hungary

Lonicera nigra
Lycopodium annotinum
Lycopodium clavatum
Medicago orbicularis
Medicago rigidula
Menyanthes trifoliata
Nymphaea alba
Onosma arenaria agg.
Onosma visianii
Orchis coriophora
Orchis laxiflora
Orchis mascula
Orchis militaris
Orchis moric
Orchis pallens
Orchis purpurea
Orchis simia
Orchis tridentata
Orchis ustulata
Parnassia palustris
Petasitea albus
Peucedanum arenarium
Peucedanum officinale
Peucedanum verticillare
Phlomis tuberosa
Phyllitis scolopendrium
Pisum elatius
Plantago maxima
Platanthera bifolia
Poa pannonica
Polygala major
Polygonatum verticillare
Polygonum bistorta
Primula elatior
Primula vulgaris
Prunella grandiflora
Pulmonaria angustifolia
Pulsatilla grandis
Pulsatilla pratensis ssp. *nigricans*
Pulsatilla pratensis ssp. *zimmermannii*
Pyrola chlorantha
Pyrola media
Pyrola minor



Strictly protected species of Agricultural importance in Hungary

Pyrola rotundifolia
Pyrus nivalis
Quercus farnetto
Rhamnus saxatilis
Ribes alpinum
Ribes nigrum
Ribes petraeum
Rosa pendulina
Rubus saxatilis
Ruscus aculeatus
Ruscus hypoglossum
Scopolia carniolica
Scutellaria columnae
Sedum hillebrandtii
Sempervivum marmoreum
Sempervivum tectorum
Stachys alpina
Tamus communis
Taxus baccata
Telekia speciosa
Thalictrum aquilegifolium
Thalictrum foetidum
Thalictrum minus ssp. pseudominus
Trapa natans
Trifolium subterraneum
Trifolium vesiculosum
Trigonella gladiata
Urtica kioviensis
Vaccinium oxycoccos
Vaccinium vitis-idaea
Valeriana sambucifolia
Valeriana tripteris
Vicia oroboides
Vicia sparsiflora
Vinca herbacea
Viola collina
Vitis sylvestris
Achillea asplenifolia
Achillea colina
Achillea millefolium
Achillea pannonica
Aegilops cylindrica
Agrimonia eupatoria



Strictly protected species of Agricultural importance in Hungary

Agropyron caninum
Agropyron intermedium
Agropyron repens
Agrostis canina
Agrostis capillaris
Agrostis vinealis
Allium angulosum
Allium atropurpureum
Allium atroviolaceum
Allium carinatum
Allium flavum
Allium montanum
Allium oleraceum
Allium rotundum
Allium ursinum
Allium vineale
Alopecurus geniculatus
Alopecurus myosuroides
Alopecurus pratensis
Althaea officinalis
Anthoxanthum odoratum
Anthyllis vulneraria ssp. alpestris
Anthyllis vulneraria ssp. polyphylla
Anthyllis vulneraria ssp. vulneraria
Arrhenatherum elatius
Artemisia absinthium
Artemisia vulgaris
Asparagus officinalis
Astragalus austriacus
Astragalus cicer
Astragalus glycyphyllos
Astragalus onobrychis
Astragalus varius
Atriplex acuminata
Atriplex littoralis
Atriplex oblongifolia
Atriplex patula
Atriplex prostrata
Atriplex rosea
Atriplex tatarica
Atropa bella-donna
Avena fatua
Brassica elongata



Strictly protected species of Agricultural importance in Hungary

Brassica rapa ssp. campestris
Briza media
Bromus arvensis
Bromus commutatus
Bromus erectus
Bromus inermis
Bromus japonicus
Bromus mollis
Bromus pannonicus
Bromus racemosus
Bromus ramosus
Bromus secalinus
Bromus squarrosus
Bromus sterilis
Bromus tectorum
Camelina alyssum
Camelina microcarpa
Camelina rumelica
Cannabis sativa ssp. spontanea
Carum carvi
Centaureum erythraea
Centaureum littorale ssp. uliginosum
Cerasus fruticosa
Cerasus mahaleb
Chamomilla recutita
Cichorium intybus
Coronilla varia
Crataegus monogyna
Crataegus oxyacantha
Cynodon dactylon
Cynosurus cristatus
Dactylis glomerata
Dactylis polygama
Daucus carota ssp. carota
Festuca altissima
Festuca arundinacea
Festuca drymeia
Festuca gigantea
Festuca heterophylla
Festuca ovina
Festuca pratensis
Festuca pseudodalmatica
Festuca pseudovina



Strictly protected species of Agricultural importance in Hungary

Festuca rubra
Festuca rupicola
Festuca tenuifolia
Festuca vaginata
Festuca valesiaca
Festuca x stricta
Festuca x wagneri
Fragaria vesca
Fragaria viridis
Frangula alnus
Galega officinalis
Glycyrrhiza echinata
Gypsophila paniculata
Herniaria glabra
Herniaria hirsuta
Hordeum geniculatum
Hordeum murinum
Hyoscyamus niger
Juniperus communis
Lactuca perennis
Lactuca quercina
Lactuca saligna
Lactuca sarriola
Lactuca viminea
Lathyrus aphaca
Lathyrus hirsutus
Lathyrus latifolius
Lathyrus niger
Lathyrus nissolia
Lathyrus pratensis
Lathyrus sphaericus
Lathyrus sylvestris
Lathyrus tuberosus
Lathyrus vernus
Lepidium campestre
Lepidium crassifolium
Lepidium graminifolium
Lepidium perfoliatum
Lepidium ruderale
Linum austriacum
Linum catharticum
Linum perenne
Linum trigynum



Strictly protected species of Agricultural importance in Hungary

Lolium perenne
Lolium remotum
Lolium temulentum
Lotus angustissimus
Lotus borbasii
Lotus corniculatus
Lotus tenuis
Malus sylvestris
Malva neglecta
Malva sylvestris
Marrubium vulgare
Medicago arabica
Medicago falcata
Medicago lupulina
Medicago minima
Medicago prostrata
Medicago x varia
Melilotus alba
Melilotus altissima ssp. macrorhiza
Melilotus dentata
Melilotus officinalis
Melissa officinalis
Onobrychis arenaria
Ononis spinosa
Padus avium
Panicum capillare
Papaver argemone
Papaver dubium
Papaver hybridum
Papaver rhoeas
Pastinaca sativa ssp. pratensis
Phleum paniculatum
Phleum phleoides
Phleum pratense
Plantago altissima
Plantago lanceolata
Poa angustifolia
Poa annua
Poa badensis
Poa bulbosa
Poa compressa
Poa nemoralis
Poa palustris



Strictly protected species of Agricultural importance in Hungary

Poa pratensis
Poa remota
Poa trivialis
Portulaca oleracea
Primula veris
Primula veris ssp. inflata
Puccinellia limosa
Puccinellia peisonis
Quercus petraea
Quercus robur
Raphanus raphanistrum
Ribes rubrum ssp. sylvestre
Ribes uva-crispa
Rosa caesia
Rosa canina agg.
Rosa corymbifera agg.
Rubus caesius
Rubus idaeus
Rumex acetosa
Rumex thyrsiflorus
Sambucus nigra
Secale sylvestre
Setaria pumila
Setaria verticillata
Setaria viridis
Sinapis arvensis
Tanacetum vulgare
Taraxacum officinale agg.
Tetragonolobus maritimus
Thymus glabrescens
Thymus pannonicus
Thymus praecox
Thymus pulegioides
Tilia cordata
Tilia platyphyllos
Trifolium ochroleucon
Trifolium alpestre
Trifolium angulatum
Trifolium arvense
Trifolium aureum
Trifolium campestre
Trifolium diffusum
Trifolium dubium



Strictly protected species of Agricultural importance in Hungary

Trifolium fragiferum
Trifolium medium
Trifolium micranthum
Trifolium montanum
Trifolium ornithopodioides
Trifolium pannonicum
Trifolium patens
Trifolium pratense
Trifolium repens
Trifolium retusum
Trifolium rubens
Trifolium striatum
Trifolium strictum
Trigonella monspeliaca
Trigonella procumbens
Tussilago farfara
Valeriana collina
Valeriana officinalis
Veratrum album
Verbascum densiflorum
Verbascum phlomoides
Vicia angustifolia
Vicia biennis
Vicia cassubica
Vicia cracca
Vicia dumetorum
Vicia grandiflora
Vicia hirsuta
Vicia lathyroides
Vicia lutea
Vicia narbonensis ssp. serratifolia
Vicia pannonica
Vicia pisiformis
Vicia sepium
Vicia sylvatica
Vicia tenuifolia
Vicia tetrasperma
Vicia villosa



Species	Accessions
<i>Aegilops cylindrica</i>	5
<i>Agropiron cristatum</i>	2
<i>Agrostis canina</i>	1
<i>Agrostis stolonifera</i>	5
<i>Allium sphaerocephalon</i>	1
<i>Allium vineale</i>	1
<i>Alopecurus myosuroides</i>	1
<i>Alopecurus pratensis</i>	18
<i>Avena fatua</i>	4
<i>Bromus erectus</i>	14
<i>Bromus mollis</i>	2
<i>Bromus tectorum</i>	1
<i>Camelina alyssum</i>	1
<i>Dactylis glomerata</i>	78
<i>Dactylis polygma</i>	2
<i>Daucus carota</i>	2
<i>Digitalis grandiflora</i>	1
<i>Elymus caninus</i>	1
<i>Elymus hispidus</i>	2
<i>Elymus repens</i>	3
<i>Festuca arundinacea</i>	58
<i>Festuca gigantea</i>	1
<i>Festuca heterophylla</i>	2
<i>Festuca rubra</i>	12
<i>Festuca rupicola</i>	12
<i>Festuca vaginata</i>	3
<i>Lactuca serriola</i>	3
<i>Lathyrus nissolia</i>	1
<i>Linum austriacum</i>	1
<i>Linum perenne</i>	1
<i>Lolium multiflorum</i>	1
<i>Lolium perenne</i>	17



Species	Accessions
<i>Lolium temulentum</i>	1
<i>Lotus borbasii</i>	2
<i>Lotus corniculatus</i>	110
<i>Medicago sativa</i>	400
<i>Medicago sativa subsp.falcata</i>	8
<i>Medicago lupulina</i>	2
<i>Medicago minima</i>	1
<i>Medicago x varia</i>	3
<i>Melilotus dentata</i>	1
<i>Melilotus officinalis</i>	1
<i>Onobrychis arenaria</i>	4
<i>Phleum phleoides</i>	1
<i>Phleum pratense</i>	8
<i>Poa bulbosa</i>	1
<i>Poa compressa</i>	1
<i>Poa pannonica</i>	1
<i>Poa pratensis</i>	27
<i>Poa trivialis</i>	1
<i>Rumex acetosa</i>	26
<i>Rumex confertus</i>	1
<i>Rumex crispus</i>	1
<i>Secale sylvestre</i>	4
<i>Trifolium fragiferum</i>	5
<i>Trifolium hybridum</i>	6
<i>Trifolium pannonicum</i>	1
<i>Trifolium pratense</i>	210
<i>Trifolium repens</i>	50
<i>Vicia dumetorum</i>	1
<i>Vicia cracca</i>	1
<i>Vicia grandiflora</i>	13
<i>Vicia hirsuta</i>	1
<i>Vicia pannonica</i>	6
<i>Vicia sepium</i>	1
<i>Vicia tetrasperma</i>	1
<i>Vicia villosa</i>	80
Total	1,238



Table 1 Field crops

Crop	1	2	3	4	5	6	7	8	9	10	11	12	13	14*	15
Barley	4080					128	508							158	4874
Common millet	250	1						37						1	289
Foxtail millet	191													2	193
Maize	2580	15				51	1310			30		817		1520	6323
Oat	2933					1	80							20	3034
Rice	434												330	11	775
Rye	355					1	180	15						10	561
Sorghum	985							350						87	1422
Triticale	105	229						170						8	512
Wheat	7111	25		1725		5	1840	129				505	56	266	11662
Other grain crops	218	10				21							6		255
Wild relatives of grain crops	28						380								408
Bean	3763	22	176					150	663					432	5206
Broad bean	364	45						123						13	545
Chickpea	702	1				1							27	8	739
Lentil	625												27		652
Lupin	450	1						165						8	624
Pea vine	308	1												2	311
Soybean	871	103				4							11	44	1033
Other pulses	228					39			10				1		278
Alfalfa	1292	27				231		59					76	39	1724
Bird's foot trefoil	356							10					7	4	377
Clovers	403												71	13	487
Red clover	1076	24				3							9	8	1120
Sainfoin	166	1				2									169
Vetch	619							35						9	663
Other <i>papilionaceus</i> plants	110	1				2								2	115
Beets	287													56	343
Castor	91														91
Flax	492													30	522
Hemp	192					66									258
Jerusalem artichoke	54														54
Poppy	1392	1				14									1407
Potato	457				463			99							1019
Rape	56													52	108
Sunflower	1362	16		234				165						573	2350
Sweet potato	26														26
Other industrial plants	219	5									128			22	374
Grasses	2012	12				15								43	2082
Other crops	3														3
Total:	37246	540	176	1959	463	584	4298	1507	673	30	128	1322	621	3441	52988

1. Institute for Agrobotany, Tápíószele

2. Pannon University of Agricultural Sciences, Mosonmagyaróvár

3. Pannon University of Agricultural Sciences, Faculty of Agronomy, Keszthely

4. Cereal Research Institute, Szeged

5. Pannon University of Agricultural Sciences, Department for Potato Research, Keszthely

6. University of Agricultural Sciences Gödöllő, „Fleischmann Rudolph” Agricultural Research Institute, Kompolt

7. Agricultural Research Institute of the Hungarian Academy of Sciences, Martonvásár

8. University of Agricultural Sciences, Debrecen, Research Centre, Nyíregyháza

9. Vegetable Crops Research Institute, Station Budapest

10. Vegetable Crops Research Institute, Station Kecskemét

11. Tobacco Research Institute, Debrecen

12. University of Agricultural Sciences, Debrecen

13. Irrigation Research Institute, Szarvas

14. National Institute for Agricultural Qualification, Budapest

15. Sum total

*, Reference collection, temporarily unavailable for distribution


Table 2 Vegetable crops

Crop	1	2	3	4	5	6	7	8	9	10	11	12	13	14*	15
Pea	1259			759			153	571	1				92	233	3068
Paprika	991	869				109	1					451		309	2730
Tomato	1979		33											261	2273
Eggplant	3													2	5
Cucumber	266	489												297	1052
Muskmelon	275										144			19	438
Watermelon	300				55						73			94	522
Cucurbits	1246	10					2							25	1283
Other cucurbits	65														65
Cabbages	95													299	394
Carrot	190		50											184	424
Celery	71													36	107
Radish	355													48	403
Root vegetables	172		14		239					49				132	606
Onions	460	444			442	55	2							93	1496
Lettuce	540					59	1							60	660
Garden sorrel	100													4	104
Spinach	133													10	143
Other vegetables	87						6								93
Total:	8587	1812	97	759	736	223	165	571	1	49	217	451	92	2106	15866

1. Institute for Agrobotany, Tápiószele
2. Vegetable Crops Research Institute, Station Budapest
3. Vegetable Crops Research Institute, Station Kecskemét
4. Vegetable Crops Research Institute, Station Újmajor
5. Vegetable Crops Research Institute, Station Makó
6. Pannon University of Agricultural Sciences, Keszthely
7. Pannon University of Agricultural Sciences, Mosonmagyaróvár
9. University of Agricultural Sciences, Gödöllő,

- 1.1. University of Horticulture and Food Industry, Budapest
- 1.2. Vegetable Crops Research Institute, Station Kalocsa
- 1.3. Irrigation Research Institute, Szarvas
- 1.4. National Institute for Agricultural Qualification, Budapest
- 1.5. Sum total
- *, Reference collection, temporarily unavailable for distribution
8. University of Agricultural Sciences, Debrecen, Research Centre,
10. University of Agricultural Sciences, Debrecen



Table 3 Summary of data on grape collections in Hungary

No.	Maintainer of collection	Grouping of accessions					Total
		1. <i>Vitis vinifera</i>	2. Interspecific hybrids	2.1 Direct producer hybrids	3. Root-stocks	4. <i>Vitis</i> species	
1	2	3	4	5	6	7	8
1	Pécs	889	65	22	31	16	1,023
2	Kecskemét	705	333	36	33	17	1,124
3	Eger	344	234	45	31	2	656
4	Badacsony	202	13	1	0	0	216
5	Szigetcsép	53	14	0	0	0	67
6	Szigetcsép	95	153	0	0	22	270
7	Nagyréde	79	15	0	0	0	94
8	Keszthely	180	54	3	114	4	355
9	Debrecen	83	25	3	24	0	135
10	Tarcal	164	13	1	34	1	213
11	Budapest	107	41	1	14	0	163
1-11	Total	2,901	960	112	281	62	4,316

1. Transdanubian Viticulture and Oenology Research Institute, Pécs
2. Viticulture and Oenology Research Institute, Kecskemét
3. Viticulture and Oenology Research Institute, Eger
4. Transdanubian Viticulture and Oenology Research Institute, Station Badacsony
5. University of Horticulture and Food Industry, Budapest, Department of Viticulture, Station Szigetcsép
6. University of Horticulture and Food Industry, Budapest, Department of Breeding, Station Szigetcsép
7. University of Horticulture and Food Industry, Budapest, Department of Viticulture, Station Nagyréde
8. Pannon University of Agricultural Sciences, Keszthely
9. Research Station of Tokaj Commercial House, Tarcal
10. University of Agricultural Sciences, Debrecen
11. National Institute for Agricultural Quality Control, Budapest