HUNGARY:
COUNTRY REPORT TO THE FAO INTERNATIONAL TECHNICAL CONFERENCE ON PLANT GENETIC RESOURCE
(Leipzig, 1996)

Budapest, June 1995
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:

<table>
<thead>
<tr>
<th>Type</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>private property</td>
<td>2,652,700 ha</td>
</tr>
<tr>
<td>cooperatives</td>
<td>2,306,100 ha</td>
</tr>
<tr>
<td>state property</td>
<td>1,163,500 ha</td>
</tr>
</tbody>
</table>

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
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 advise. 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 fulfill 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 westhof 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 ear-marked 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:

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

Hungary participates in EUFORGEN. National coordination is the responsibility of the University of Forestry and Timber Industry in Sopron.
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 Tapiozsele 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, feedback 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 transsilvanica
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 acutloba
Alchemilla crinita
Alchemilla glabra ssp. alpestris
Alchemilla gracilis
Alchemilla hungarica
Alchemilla hybridra
Alchemilla monticola
Alchemilla xanthochloria
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 excapus  
Astragalus vesicarius ssp. albidus  
Betula pubescens  
Carex brevicolli  
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 tommasinianus  
Cyclamen purpurascens  
Daphne cneorum agg.  
Daphne laur eola  
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 carniiolica
Scutellaria columnae
Sedum hillebrandtii
Sempervivum marmoreum
Sempervivum tectorum
Stachys alpina
Tamus communis
Taxus baccata
Telekia speciosa
Thalictrum aquilegiifolium
Thalictrum foetidum
Thalictrum minus ssp. pseudominus
Trapa natans
Trifolium subterraneum
Trifolium vesiculosum
Trigonella gladiata
Urtica kioviensis
Vaccinium oxyccoccos
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
Centaurium erythraea
Centaurium litterale 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 ruderal
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 borbasi
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 rhoes
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
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1. Institute for Agrobotany, Tápiószele
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, Kompol
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

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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
8. University of Agricultural Sciences, Debrecen, Research Centre,
9. University of Agricultural Sciences, Gödöllő,
10. University of Agricultural Sciences, Debrecen
11. University of Horticulture and Food Industry, Budapest
12. Vegetable Crops Research Institute, Station Kalocsa
13. Irrigation Research Institute, Szarvas
14. National Institute for Agricultural Qualification, Budapest
15. Sum total

*, Reference collection, temporarily unavailable for distribution
### Table 3 Summary of data on grape collections in Hungary

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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 Szigetsép
6. University of Horticulture and Food Industry, Budapest, Department of Breeding, Station Szigetsép
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