



CYPRUS:

COUNTRY REPORT TO THE INTERNATIONAL CONFERENCE AND PROGRAMME ON PLANT GENETIC RESOURCE

(Leipzig, 1996)

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Nicosia, December 1995





Note by FAO

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CHAPTER 1

Introduction to Cyprus and its agricultural sector

Cyprus lies in the north-eastern corner of the Mediterranean sea, on the cross-roads of Europe, Asia and Africa. It is situated between 34° 34' - 35° 42' N and 32° 16' - 34° 34' E covering an area of 9,251 square kilometres.

Cyprus is divisible into three geomorphological zones, the Troodos mountains, the Kyrenia or Pentadactylos Range and the Mesaoria plain separating the two uplands.

The Troodos Mountains underlain by the Troodos massif or Troodos Igneous Complex, or Troodos Ophiolite Complex, occupy the south - central part of the island and cover an area of about 3,200 square kilometres. They rise to a maximum height of 1951 m on Mount Olympus which occupies the central part of the range. The Troodos Ophiolite is interpreted as being a slice of ancient oceanic crust and mantle of the Earth that was formed by seafloor spreading process, that was subsequently thrust upward by the advancing African plate and later uplifted to its present position. The composition and the layered sequence of rocks that constitute the Troodos Ophiolite, are generally the same as those known to underlie the present ocean beds (Panayiotou, 1983).

The Kyrenia or Pentadactylos Range runs parallel to the north coast at an average distance of 8 km inland and rises to elevations of over 1,000 m. This elongated range, the width of which rarely exceeds 5 km, is considered as a part of the greatest mountain belt of the world, the Alpine belt which extends from the Pyrenees to the Himalayas. Geologically the range is made of a succession of mostly allochthonous sedimentary formations ranging from Permian (250 m.y.) to Middle Miocene (15 m.y.).

The Mesaoria plain is formed by a succession of Upper Cretaceous (c. 70 m.y.) to Pleistocene (c. 1 m.y.) sedimentary rocks. Its northern half is underlain by highly folded Kythrean Flysch and has a characteristic hummocky topography, while the southern part consists of a sequence of generally under-formed gently inclined rocks of the *Circum Troodos* Sedimentary Succession.

In Cyprus the coasts are almost everywhere low and shelving. Sea-cliffs are extremely rare. In many places the shores are rocky or stony but sandy bays are



found all around the island. Many areas of the Coastal belt are fertile and are tilled almost to the edge of the sea.

The central Troodos Massif, and to a lesser extent the long narrow Kyrenia mountain range, play an important part on the Meteorology of Cyprus. The predominantly clear skies and high sunshine amounts give large seasonal and daily differences in temperature between the sea and the interior of the island which also cause considerable local effects especially near the coasts (Anonymous, 1986).

The climate of Cyprus is an intense Mediterranean one with cool, wet rather changeable winters, from November to mid March, and hot, dry summers from May to mid September, separated by short Spring and Autumn seasons of rapid change in weather conditions.

The mean daily temperature in January is 10°C in the central plain and 3°C in the higher parts of the Troodos mountains, with an average minimum temperature of 5°C and 0°C respectively. Frosts are rarely severe but are frequent in Winter and Spring. In July and August the mean daily temperature ranges between 29°C on the central plain and 22°C on the Troodos mountains, while the average maximum temperatures for these months range between 36°C and 27°C, respectively. The temperatures in the open sea are above 22°C during the months from June to November rising to 27°C in August. In January, February and March the average sea temperature falls to 16° - 17°C.

The average annual total precipitation increases up the south-western windward slopes from 450 millimetres to nearly 1,100 millimetres at the top of the central massif. On the leeward slopes, figures decrease steadily northwards and eastwards to between 300 and 350 millimetres in the central plain and the flat south-eastern parts of the island. The narrow ridge of the Kyrenia range produces a relatively small increase of rainfall to nearly 550 millimetres along its ridge at about 1,000m.

Autumn and Winter rainfall, on which agriculture and water supply generally depend, is somewhat variable. The average rainfall for the year as a whole is about 480 millimetres (average rainfall for the period 1951-1980), but it was as low as 182 millimetres in 1972-73 and as high as 759 millimetres in 1968/69.

Snow occurs rarely in the lowlands and on the Kyrenia range but falls frequently every winter above 1,000 metres, usually commencing in the first week of December and ending by the middle of April.

Rainfall during the summer contributes little or nothing to water resources and agriculture. The small amounts which fall are rapidly absorbed by the very dry soil and soon evaporate due to high air temperature and the low relative humidity.



1.1 LAND USE AND OWNERSHIP

After the Turkish invasion of 1974 which resulted in the occupation of 38% of the country's territory, only 62% of its area is under the control of the Government. The country's total population is estimated at 706,000 but in the Government controlled area only 611,000 (1992 data).

Out of a total government controlled area of 575,000 ha only 140,000 ha are considered to be suitable for agricultural use. The rest, which accounts for 76% of the total area consists of arid, uncultivated and forest land and developed areas. The area under Government control is divided into four agro-economic zones based on variations in elevation, soil, rainfall, cropping pattern and other features associated with agricultural production. These are the Coastal, Dryland, Vines and Mountains zones. The Coastal zone extends along the south coast and includes to a large extent irrigated crops, mainly citrus, table grapes and vegetables. The Dry-land zone extends over the central plains and all the hilly areas. Farms in this zone are mainly rainfed and the predominant crops are cereals, fodder, olives and some vines. Most of the livestock and mixed farming enterprises are found in both the Coastal and Dry land zones. The Vines zone is almost exclusively rainfed and includes mainly vines while the last zone includes all the mountainous areas and it is covered by irrigated fruit crops.

In general, the predominant crops in rainfed lands are cereals (41% of the total crop area), fodder crops (10%), wine grapes (19%) and olive trees (5%). Of the irrigated crops most important are citrus (16%), vegetables (7%) and fruit trees (2%).

Agricultural land is privately owned. The great majority of farms (98%) are small privately owned family enterprises. No significant differences exist among agro-economic zones in farm ownership. The remaining 2% of the farms belong to private companies, the state, the church or are joint holdings, cooperative enterprises, or community farms. State farms are experimental or demonstrational, aiming at improving farmers' knowledge on new technology. These are government supported non-profit-making enterprises.

Tradition of inheritance of farm land from parents to children has led to a severe fragmentation of farms. As a result, the size of holdings was reduced remarkably and Cypriot agriculture is based on small-scale farming which, in most cases, does not provide the farm family with sufficient farm income. Thus, out of a total of 48,000 holdings, 54% have size below 2 ha (mean size is 0.9 ha and they represent only 11% of the agricultural land). Another 20% of the holdings are also undersized (2-4 ha) and 24% of the farms are medium sized (4-20 ha). Overall, the mean farm size is about 4 ha. Most farms depend on rainfall, there-



fore, holdings are not labour intensive and have relatively low agricultural income.

The small farm size, the high degree of fragmentation, the fact that each farmer deals with more than one (sometimes up to 10) crops, and the dependency of agriculture on imported inputs, leads to inefficient use of resources and high production costs.

1.2 SUPPLY OF INPUTS

Cyprus agriculture is mostly based on imported inputs which are channelled in the market through co-operative or private suppliers and for some inputs by the Government. However, it is a policy in Cyprus that the government intervention takes place only where the private or co-operative sectors are not able to provide their services.

With regard to seed supply there exist two different channels of distribution i.e., the private companies and the government. Private companies import and provide farmers with hybrids for most of the vegetable crops. The Government, through the operation of a seed production centre, produces and sells to farmers locally produced certified seed of high quality for both agronomic and vegetable crops. On the other hand, seed potato is provided by the Potato Marketing Board which is a semi-governmental body regulating production and distributing on a monopolistic basis all food potatoes produced in Cyprus.

1.3 IMPORTANCE OF AGRICULTURE AND ITS POSITION IN THE CYPRUS ECONOMY

Like all developing countries, Cyprus has an important agricultural sector which has always been considered as the backbone of the country's economy. In the years between 1960 and 1974 agriculture was the largest single contributor to the country's Gross Domestic Product (GDP). The sector's share of GDP was ranging between 18 and 22% and about 36% of the economically active population was employed in agriculture, while prior to Independence its share was even higher. All available indicators were showing that the importance of agriculture was increasing. Agricultural output in 1974 nearly doubled compared to that of 1960 and value added originating from agriculture was increasing at an average annual growth rate of about 8%.



The sector's upward trend was brought to an abrupt end after the Turkish invasion of 1974 and the resulted occupation of 38% of the country's territory. This caused extensive losses and agriculture suffered its most severe blow. Losses amounted to 56% of the agricultural resources and around 50% of the rural population were displaced. In spite of the measures taken by the Government which aimed at reactivating all unemployed resources, and the remarkable recovery that has taken place, the sector lost its leading position in the economy to the secondary and tertiary sectors of construction, trade and services. Per capita GDP fell by 19% in real terms in 1974 and a further 16% in 1975. Since then the relative contribution of agriculture to GDP, employment and foreign exchange earnings has tended to decline.

Thus, the proportion of GDP from agriculture dropped from 16.9% in 1975 to 9.6% in 1980 and 5.7% in 1994. Employment fell also to 17.0% in 1980 and 12.5% in 1994. The above fall was, however, a reflection of the growth in the other sectors at a remarkably faster pace.

The absolute value of agricultural production continued increasing. Gross output and value added at current market prices almost doubled during the last decade. Agricultural products still remain an important element in total domestic exports, although in relative terms their importance in export value dropped from 36% in 1975 to 21% in 1993.

Most significant export commodities are potatoes and citrus with a share of 48% and 32% respectively of the value of agricultural exports in 1993. Major export market for agricultural products is the European Union accounting in 1993 for 82.7 % and 62% of the export value of raw and processed agricultural products respectively.

Agriculture is also the main supplier of the agro-industries which are the leading industries of the manufacturing sector in terms of value added (30% of the GDP of the manufacturing sector). Agricultural processing industries rely mostly on locally produced raw agricultural products. About 23% of the agricultural output is sold to local industries for processing.

The most important agricultural products used by the industrial sector are cereals, grapes, citrus, nuts, milk and forestry products. The remaining agricultural production is allocated to exports (10.5%), retained by the farmers to be used as an input for agricultural production (8.3%) and for final consumption (56.9%).



CHAPTER 2

Indigenous Plant Genetic Resources

The vegetation of Cyprus is formed by typical Mediterranean types; the coniferous forest, the maquis, the garigue and the batha vegetation, while more localized communities occur around salt marshes, sand dunes, stone walls and mountain streams.

In order to highlight the Genetic Diversity of Cyprus and to contribute to the Conservation of Biodiversity and of the endemic and rare flora, Della (in press) computerized and presented the existing information of the Cyprus flora in Checklist format. Plants were identified as being Native or Naturalized, Cultivated, Endemic, Rare, Very rare, Rare endemic, Very rare endemic, Questionable and Erroneous (records). Families and taxa recorded in the “Flora of Cyprus” were listed in Appendices (I-XI) while new records were listed in five Appendices (Ia, IIIa, IVa, IXa, and Xa) as Additions to the corresponding lists.

Considering the new information, a total of 1,760 taxa (*sp.* + co-operative. + var. + f. + hybrids) were recorded in Cyprus as native or naturalized and 375 taxa as cultivated. From the native taxa 134 were recorded as endemics.

The forest land covers 21% of the total area of the island, 19% being State-owned forest, while the remaining 2% belongs mainly to Monasteries and Communities.

The commonest of the conifers in the island is *Pinus brutia Tenore*, while *Pinus nigra ssp. pallasiana* (D. Don.) Holmboe forms the forest up to the top of Chionistra. The endemic *Cedrus brevifolia* (Hook. f.) Henry dominates an isolated patch in the Paphos forest.

Most of the endemics occur on the igneous rocks of the Troodos mountains, while a great amount of endemics are also found on the calcareous Kyrenia Range. The ecosystem under *Pinus nigra* is very important.



2.1 FOREST GENETIC RESOURCES

***Pinus brutia* Tenore** (Calabrian pine): *Pinus brutia*, the most important forest tree in Cyprus, covers an area of 114,304 ha out of which only 43,222 ha are considered as productive. The natural distribution of this tree ranges from sea - level up to 1400 m elevation and it is growing on sedimentary and igneous formations, almost throughout Cyprus. The growing stock and the annual increment of the productive forests are equal to 3,055,000 m³ (over-bark) and 46,500 m³ (over-bark) respectively.

Pinus brutia natural forests are healthy and they don't suffer from any serious pests or diseases. Fire is the greatest enemy of *P. brutia* forests.

Proper management together with the correct application of the marking rules, specially prepared for this *species*, secure the protection, conservation and naturalness of *P. brutia* forests.

***Pinus nigra* ssp. *pallasiana* (D. Don.) Holmboe** (Troodos pine or Black pine): *Pinus nigra* ssp. *pallasiana* forms the forest from 1,200 m up to the top of Chionistra. In a zone 1,200 m to 1,400 m it occurs in mixed stands with *Pinus brutia*.

Pinus nigra forest covers an area of 4,642 ha and its growing stock is estimated to 417,284 m³ over-bark. The area where *Pinus nigra* is naturally distributed was declared as a National Forest Park in 1992.

The *species* is not in any danger from serious pests or diseases, but it is threatened by fires. Natural regeneration is absent on exposed sites, due to the adverse soil conditions prevailing in the area.

The *Pinus nigra* genetic resources are secured through the protection and conservation measures taken by the Forestry Department.

***Cedrus brevifolia* (Hook. f.) Henry** (Cyprus Cedar): The present natural distribution of Cyprus Cedar, which is endemic to Cyprus, ranges from 900 - 1,400 m in elevation and is confined in the Tripylos area of the Paphos Forest. Cyprus Cedar stands cover an area of about 856 ha and is associated with other trees and shrubs such as *Pinus brutia*, *Platanus orientalis*, *Quercus alnifolia*, *Arbutus andrachne* and *Acer obtusifolium*.

The Cyprus Forest Service, in its efforts to protect and expand cedars, has declared the area (Tripylos) a nature reserve. In the period from 1962-1974 more than 160,000 young trees were planted in different regions of the Cyprus mountains.



The main aim of these plantations is the protection and conservation of the existing natural stands as well as the expansion of cedar. Furthermore, the artificial stands are used as experimental plantations for obtaining data regarding performance, adaptability and appropriate silvicultural treatments as well as Genetic Reserves.

Quercus alnifolia Poech (Golden Oak): It is an evergreen shrub or small tree up to 10 m, endemic to Cyprus. It is distributed on the Troodos range, forming mixed stand with *Pinus brutia*, *Pinus nigra* and *Cedrus brevifolia*, covering an area of 21,110 ha. According to the 1983-84 inventory for Golden Oak, the growing stock was estimated as being equal to 831,512 m³ (overbark).

This *species* is not in any danger from pests or diseases and it is considered as fire resistant because after a fire it sprouts again.

Other forest trees of minor importance, include, *Platanus orientalis* (Plane), *Alnus orientalis* (Alder), *Cupressus sempervirens* (Cypress) and *Quercus infectoria* ssp. *veneris* (Oak).

The Plane and the Alder which form mixed stands along streams and rivers are effectively protected in the State Forests, but they are in danger of disappearing from riverbeds above which water dams have been constructed.

Natural distribution of the Cypress is restricted on very steep slopes along streams or rivers in the Paphos district, Madhari area and on Pentadactylos mountain. It is not in any danger of disappearing because it is widely planted by the Forestry Department, as well as by private individuals.

The distribution of the oak is restricted to private lands in which fellings are carried out every year systematically and for this reason the tree is in a great danger of disappearing from the Cyprus natural environment.

2.2 OTHER WILD SPECIES AND WILD RELATIVES OF CROP PLANTS

Amongst Cyprus's natural vegetation, a number of aromatic, medicinal and other useful plants are being exploited in their wild form i.e. *Origanum* spp. (*Origanum dubium* Boiss.) the "Rigani" or "Riganis" of the Cypriots has long been valued as the source of a valuable aromatic oil. It is harvested, dried, packed and sold as an aromatic substance for food. Likewise the sage, *Salvia fruticosa* Mill., the "Spatzia" of the Cypriots, is collected from the wild and it is used as a medicinal plant for tea preparation against sore throats and colds. *Thymus capitatus* (L.) Hoffsgg. et Link the "Throumbi", or "Thymari" is collected and is used as



an aromatic in cooking. The tender shoots and the fruit of the wild caper, *Capparis spinosa* L. var. *canescens* Cosson are consumed, preserved in vinegar as appetizers. *Foeniculum vulgare* Mill. and *Glycyrrhiza glabra* L. are also being collected and used as aromatics and *Sideritis sp.* is used for tea preparation.

Aromatic and medicinal plants of Cyprus are gathered and grown in the Botanical Garden at Athalassa (near Nicosia) Government Nursery for *ex situ* conservation, evaluation and utilization. A number of the above *species* are already grown on a commercial scale, as well as improved (introduced) cultivars.

Among the wild shrubs which are partly used for their aromatic fruits are: Lentisk (*Pistacia lentiscus* L.) and Terebinth (*Pistacia terebinthus* L.). *Laurus nobilis* L. (laurel) is gathered or grown for its aromatic leaves and fruit. The leaves are used as aromatics and the oil from its fruit in cosmetology.

An interesting plant of economic importance is *Rhus coriaria* L. (Sumach) an erect or spreading shrubs to about 2 m high which grows on stony mountainsides and in vineyards from 600-1,800 m. Leaves of *Rhus coriaria* which is an industrial plant rich in tannin, are collected every year and exported.

The carob tree, *Ceratonia siliqua* L. the “Charoupia” or “Teratsia” of the Cypriots which is grown in the wild is also cultivated for its fruit.

Wild progenitors of ornamental *species* such as *Tulipa spp.*, *Narcissus spp.*, *Anemone spp.*, *Cyclamen spp.*, *Orchis spp.*, *Ophrys spp.*, *Fritillaria spp.* etc. exist among the wild vegetation of Cyprus. Unfortunately their numbers are rapidly decreasing from the continuous developmental activities, the herbicides and the inconsiderate exploitation. Seed of a number of Cyprus trees and shrubs, such as *Nerium oleander* L., *Myrtus communis* L., *Laurus nobilis* L., is gathered by the Forestry Department and plants are provided to be grown in Municipal or private gardens as ornamentals.

Wild relatives of cereal and leguminous crops, such as *Hordeum spp.*, *Aegilops spp.*, *Avena spp.*, as well as *Vicia spp.*, *Medicago spp.*, *Trifolium spp.*, *Lathyrus spp.*, as well as of grasses occur in abundance in Cyprus.

2.3 LANDRACES (“FARMERS” VARIETIES) AND OLD CULTIVARS

The artichoke local variety “Kiti” is in fact a population as all the local Cyprus varieties. The majority of the plants of “Kiti” artichoke are very early in production and high yielding. The farmers still use it because of its earliness, the high yield and the good quality of characteristics.



Lagenaria siceraria (Mol.) Standley (Water bottle), the “Nerokoloko” or “Krasokoloko” of the Cypriots. Its fruits have a bottle shape. When ripened are used in pottery and for wine storage. It is a vine, growing well in dry and warm climates. Resistant to viruses, *Verticillium* and *Fusarium spp.*

Lagenaria siceraria (Mol.) Standl., the “Kreatokoloko” of the Cypriots, with long, cylindrical fruits. It grows well in warm and dry climates as a vine. It is resistant to several viruses *Verticillium* and *Fusarium spp.* Its fruit is used in cooking (stuffing).

Luffa cylindrica Roem (Loofah), the “Elifi” of the Cypriots. Fruit shape is cylindrical. It is a vine, growing well in dry and warm climates. Its fruit when ripened and properly treated are used for scrubbing during bathing.

Lagenaria and *Luffa spp.* are still propagated by some people because of their value and use. They are not in imminent danger of genetic erosion.

The bush beans var. “Morphou” are used as green/white (fresh) seed and also as dry seed. Although they are susceptible to bean mosaic virus and other viruses, they are grown by the farmers because of their good quality characteristics.

The cow-pea var. “Argaka” is used as fresh and as dry seed preferred by the farmers for their good quality.

Sweet pepper “local” has sweet tender fruit of excellent quality. It is however, susceptible to several viruses, has rather low yield especially when it is grown in plastic houses during the winter. Growers prefer this cultivar because of its excellent quality.

The Cyprus Government encourages their use by seed multiplication and selling at cost price.

Introduced, high yielding uniform cereal varieties were released during the recent years replacing almost completely the local germplasm. Relicts of the old durum wheat varieties “Kyperounda”, “Tripolitiko” and “Famira” might only be found in semi-mountain vine areas of Paphos, where the improved varieties are not competitive and mechanization cannot be practised. However, barley local varieties disappeared from farmers fields.

Local varieties of pulses are still the main varieties grown. However, improved chickpea, cowpea, and common bean varieties were recommended for cultivation and were released. Selected Local faba beans were also recommended for cultivation and were released.



The area under cultivation is decreasing rapidly exposing local germplasm to the danger of genetic erosion or even extinction. Cultivation of lentil, chickpea and ochrus vetch (*Lathyrus ochrus*) is minimal. The main reasons for this are the shortage and high cost of labour and the lower prices of imported pulses.

As regards forage legumes, the cultivation of bitter vetch *Vicia ervilia* (L.) Willd. and of chickling vetch (*Lathyrus sativus* L.) is also minimal and local germplasm has almost disappeared. *Vicia sativa* L. is still grown on a large scale. However, detrimental to the local germplasm was the drought during 1991, which destroyed the crop and resulted in the import of seed of a foreign variety, for sowing in the 1991/92 growing season.

A considerable amount of variation still exists in fruit trees and nuts in Cyprus. The local olive tree variety is the main variety grown, used for the production of olive oil and the preservation of green as well as of ripened (black) olives. Although introduced cultivars have been released and grown on a commercial scale during the recent years, Cypriots have a preference to the local olives preserved in traditional ways (seasoned with salt).

Seven loquat varieties namely “Morphou”, “Agrotis”, “Late Odou”, “Goudi”, “Meneou 1”, “Meneou 2”, “Karantoki”, are grown in Cyprus.

There are two important local citrus varieties, the lemon variety “Lapithiotiki” and the mandarin variety “Arakapas”. “Lapithiotiki” is the main lemon variety in Cyprus and it is early, productive and resistant to mal-seco disease. Arakapas is one of the main mandarin varieties in Cyprus and it is productive with good quality of fruit.

There are two local varieties of hazelnuts grown commercially in Cyprus. These are the Long and Round Local.

There is a number of local fig varieties grown in Cyprus namely “Vartica”, “Vazanata”, “Antelunica” and “Tillirisima”.

There are three local varieties of pomegranate, the “Chocolate”, the Sotirkatica and “Ftanoflia”.

There is only one variety of walnuts grown in Cyprus. The main local variety of apricots in Cyprus is Kaisia.

As regards plums, wild forms are still found in some places and old cultivars are still grown in the old orchards. There are two groups of local varieties grown, the “Janera” with yellow colour and “Marabelles” with red colour of fruit.

There is a tremendous variation in local almond germplasm.



CHAPTER 3

National Conservation Activities

3.1 IN SITU CONSERVATION ACTIVITIES

Wild relatives of crops such as *Hordeum spp.*, *Aegilops spp.*, *Vicia spp.*, *Medicago spp.*, *Trifolium spp.*, *Avena spp.*, *Lathyrus spp.*, and others occur in abundance in Cyprus. However no direct measures have been taken as yet for their conservation in their natural habitat. There are no measures for conservation of land races/traditional varieties of crops either.

Table 1. Crops collected

name	Commonname	Local name	No. of acc.	Year of coll.	Collecting organizations	Institutions holding
<i>Desf.</i>	durum wheat	Sitari	80	1978	IBPGR/ARI	ARI, GL Bari, ICAR
<i>are L.</i>	barley	Krithari	26	1978	IBPGR/ARI	ARI, GL Bari, ICAR
<i>ar. major</i>	faba bean	Koukia	101	1980	ARI/IBPGR	ARI, GL Bari, ICAR (Radrikow, Poland)
<i>a L.</i>	chickpea	Revithi	28	1984	ARI/IBPGR/ICARDA	ARI, GL Bari, ICAR
<i>s (L.) DC.</i>	ochrus vetch	Louvana	12	1984	ARI/IBPGR/ICARDA	ARI, GL Bari, ICAR
<i>s L.</i>	chickling vetch	Phavetta	19	1984	ARI/IBPGR/ICARDA	ARI, GL Bari, ICAR
<i>Medik.</i>	lentil	Phaki	19	1984	ARI/IBPGR/ICARDA	ARI, GL Bari, ICAR
<i>L.</i>	field pea	Pizelia	6	1984	ARI/IBPGR/ICARDA	ARI, GL Bari, ICAR
<i>) Willd.</i>	bitter vetch	Rovi	15	1984	ARI/IBPGR/ICARDA	ARI, GL Bari, ICAR
	common vetch	Vikos	67	1984	ARI/IBPGR/ICARDA	ARI, GL Bari, ICAR
<i>a L.</i>	alfalfa, lucerne	Midhiki, Triphilli	29	1984	ARI/DA	ARI
<i>aris L.</i>	haricot bean	Phasolia	6	1990	ARI	ARI
<i>lata L.</i>	cowpea	Louvia	8	1990	ARI	ARI



Table 2. Wild relatives and other plants collected

Wild plants	No. of accessions	Year of collection	Collecting Organizations	Organizations holding collections
Aegilops spp.	166	1983	IBPGR/ARI	Kyoto Japan, GL Bari Italy, NSGC USA, ARI (part)
Beta spp.	39	1986	IBPGR/ARI	ARI, Hellenic Sugar Industry, Greece
Wild forages	41	1987	WADA/ARI	WADA/ARI
Aromatic and useful plants	7	1987	ARI	ARI, DA, Cyprus
Wild forages	100	1988	IBPGR/ARI	ARI
Aegilops spp.	53	1989	ICARDA/ARI/IBPGR	ARI, ICARDA
Endemic and rare plants	200	1987 ongoing	ARI	ARI
Grasses	73	1993	ARI	ARI
Miscellaneous	60	1986 ongoing	ARI	ARI

The State Forests are managed and protected by the Forestry Department in accordance with the existing Forest Law. Important ecosystems which were declared as National Forest Parks or Nature Reserves are protected by law, as well as very old trees. Plants within the State Forest are also reasonably protected.

Nineteen taxa, eighteen of which are endemics, proposed in the Convention of Bern in 1979 (reviewed in Strasbourg during 1992) are also protected by law.

Legislation for the protection of Nature is under preparation by the Cyprus Government in accordance with E.U. relevant regulations and directives.

3.2 *Ex Situ* Collections

In the framework of cooperation with the IBPGR the ARI organized a number of collecting missions. Germplasm collected is conserved at the Cyprus Agricultural Research Institute's (CYPARI) Genebank, which, in fact, is the National Genebank of Cyprus.

The CYPARI Genebank which contains mainly indigenous material, was established in 1985 and it was funded by the Cyprus Government and the IBPGR. The on-going costs are funded by the Cyprus Government. The germplasm collected, the collecting organizations, the Institutes holding duplicate collections, as well as other details are shown in Tables 1 and 2.



All the material in the CYPARI Genebank is important. Most of the local varieties of cereals food and forage legumes collected have already disappeared from farmers fields.

In Cyprus the material conserved in the CYPARI Genebank is only used by the staff of the Genebank and in the plant breeding programme of the ARI.

The Genebank does not obtain material from outside the country, but provided many times material to be utilized by other countries. As shown in Tables 1 and 2 there are duplicate collections in International Centres to be used by other countries. However researchers at the ARI and plant breeders are provided with International Nurseries or Yield Trials for testing under Cyprus conditions and for local use.

The collections at the ARI (at least most of the collected material) represent the diversity which existed in the field at the time of collecting.

Collection planning was based on priorities as set out upon initiation of the Genetic Resources Programme at the ARI i.e. the collecting of the remaining genetic variability in cereals, food and forage legumes before extinction. Faba beans were given priority because of the need for immediate evaluation and utilization.

3.3 STORAGE FACILITIES

Germplasm collected in the framework of cooperation with IBPGR, ICARDA and other organizations is conserved in the CYPARI Genebank (Tables 1 and 2).

Until 1985 germplasm was stored under normal environmental conditions, in paper bags. Accessions were gradually grown for regeneration / multiplication in order to maintain seed viability according to IBPGR standards (>85%). In the collection of cereals (wheat and barley) spikes collected in the field during 1978 were multiplied, each one separately as variation was detected within each accession.

Each cereal accession is represented by a number of samples, progenies of single spikes. About 7,500 samples represent the 80 accessions of durum wheat and about 3,500 samples represent the 26 accessions of barley. For monitoring seed viability a bulk is maintained for each accession consisting of a small amount of seed from each line. In order to maintain the original accession a spike from each line was collected during regeneration and all the spikes of each accession separately, were bulked together and multiplied. Upon completion of the CYPARI



Genebank (0 - 4°C, 50% R.H.) seed was gradually cleaned and transferred in hermetically sealed laminated foil bags. For monitoring seed viability germination tests are carried out every year, during October, before the next growing period.

In addition to the germplasm collected by the Genetic Resources Programme of the ARI, 100 accessions of different crop plants were given by the breeding programme and are kept in the CYPARI Genebank.

There are field genebanks of olives, citrus, loquats, figs, pomegranates, hazelnuts, walnuts, pistachios. The collections are either at stations belonging to the ARI or the Department of Agriculture. There is no Botanical garden in Cyprus as yet. However, there are some botanical collections at the Department of Forest and the Department of Agriculture.

3.4 DOCUMENTATION

Documentation of genetic resources collections is in its majority kept manually. However, for a number of samples, the passport, characterization and evaluation data are kept in the VAX mini computer. All data concerning the genetic resources activities will be computerized as soon as the proper software and training is made available.

3.5 EVALUATION AND CHARACTERIZATION

From the material conserved in the CYPARI Genebank only a part has as yet been evaluated (by the Genebank staff) as follows:

Barley (*Hordeum vulgare* L.): A study was conducted at the University of Birmingham during 1979 on 10 barley accessions. Each accession was represented by ten families, each family corresponding to a collected spike. Each family was represented by three replications. A total of 43 morphological and physiological characters were considered. A great deal of variation was shown to exist (Della, 1979) between and within the barley accessions for most of the qualitative and quantitative characters under study.

Wheat (*Triticum durum* Desf.): Characterization/preliminary evaluation was also completed for about 1,500 lines, representing 14 accessions of Kyperounda



local durum wheat collected in 1978. The Kyperounda lines were grown in the field during 1984-85 with Karpasia as check at every 20 lines. In the laboratory, lines were characterized/preliminarily evaluated in respect of 10 descriptors, according to the IBPGR Revised Descriptors of Wheat (Anonymous, 1981). Data were recorded on five spikes from each line while one spike from each line was properly mounted in order to maintain herbarium specimens.

With the exception of growth class (all Cyprus wheat were classified as spring wheats), a considerable amount of variation was presented regarding all other characters under study.

Faba beans: *Vicia faba* L. var. *major*: The collection of faba beans was grown during 1980/81 under irrigation and during 1981/82 under rainfed conditions for characterization/preliminary evaluation. In total 38 descriptors were studied and a great amount of variation was presented.

3.6 REGENERATION

For monitoring seed viability germination tests are carried out every year, during October, before the next growing season.

The effort is to maintain material with seed viability > 85% according to the IBPGR standards. Material is grown according to priorities depending on the land available and other commitments of the Genebank staff. For the regeneration of the material, land is provided in the ARI Stations. A permanent cage in the Athalassa ARI station belongs to the Genebank. Late material, especially the local cereal landraces if grown outside a cage could be totally destroyed by birds, since until ripening all the adjacent fields grown with improved varieties would have already been harvested.

Viability tests are carried out at the Seed Production section of the Department of Agriculture since there is no seed testing Laboratory at the ARI.

There are no difficulties with the regeneration of cereal lines or of the self-pollinated crops. However, regeneration of cross-pollinated *species* is a problem and most of the cross-pollinated material has not been regenerated as yet.

The regeneration carried out is supervised by the head of the Genebank. The regeneration history is recorded manually.

Fresh seed is never combined with old material which it replaces.



3.7 FOREST GENETIC RESOURCES

The main native forest species (*Pinus brutia*, *Pinus nigra*, *Cedrus brevifolia*) occur mainly in natural stands.

Pinus brutia is the most important forest tree in Cyprus and therefore all experimental work carried out by the Research Section of the Forestry Department refers to this tree.

Pinus brutia forests have been divided into the following three altitudinal zones:

- a. 0 - 500 m
- b. 500 - 1,000 m
- c. 1,000 - 1,500 m (growing limit of *P. brutia*)

A number of trees were selected in each zone. These trees are protected and used for seed collection and for vegetative propagation.

The Forestry Department has established a Tree Bank for the protection and conservation of the best genetic material of *Pinus brutia*. The same material was used for the establishment of six seed orchards.

A provenance trial including 14 provinces of *Pinus brutia* was established in Stavrovouni area. This experiment is still under study.



CHAPTER 4

In-Country Uses of Plant Genetic Resources

4.1 USE OF PGR COLLECTIONS

Faba beans:

Selected faba bean germplasm was tested in yield trials during 1981-1987 under both irrigated and dryland conditions. Significant differences among the accessions in agronomic traits studied, such as grain yield, 1,000 grain weight, time to flowering, plant height and protein content, have been obtained. A high yielding, early flowering and large seeded population of the Local cultivar was recommended to be released to the farmers (Della, 1990). A programme for breeding faba beans for the canning and freezing industry was initiated in 1987 in cooperation with Wye college, U.K., using the Cyprus landrace which was crossed and backcrossed with white-flowering, white-seeded varieties (Della, 1991). Selfing, selection and inter-crossing was followed and an adapted white flowering, white seeded variety was developed. This variety is being tested in yield trials since 1993.

Four barley land races from the CYPARI collection were provided for evaluation and use by the plant breeders. These land races are not grown any more by the farmers. It was shown that, there is genetic variation within these land races which could be exploited by plant breeding in order to increase yield and adaptation of barley to the hot and dry climate of Cyprus.

Fruit trees

In addition to annual crops, there is a considerable variation in germplasm of fruit trees mainly olives, almonds and figs. There are germplasm collections in Cyprus for olives, citrus, loquats, figs, pomegranates. Research work is carried out on olives, loquat, citrus, hazelnuts and figs. Selected germplasm of fruit trees is multiplied and is provided to the farmers.

A collection of 31 different clones of the local olive variety was established at Zyghi (ARI) station during 1987 and is under evaluation for yield, oil content, preservation of green and black fruits, rooting of cuttings, suitability for mechanical harvesting and resistance to drought and diseases.



Local loquat varieties along with introduced varieties were tested at Akhelia station and local varieties Morphou and Karantoki were the best varieties in terms of yield.

Lapithiotiki is the main lemon variety in Cyprus. It is early, productive and resistant to mal-seco disease. Arakapas is one of the main mandarin varieties. It is productive with good quality of fruit. The ARI has freed the lemon variety Lapithiotiki from exocortis viroid and other pathogens (using the shoot-tip grafting method) and research is continuing in order to free Arakapas mandarin. A rootstock-scion trial has been established at Akhelia Station in order to evaluate the performance of the lemon variety Lapithiotiki on fifteen rootstocks.

Two local varieties of hazelnuts, the Long local and the Round local are being tested along with other introduced varieties.

There is a number of local fig varieties grown in Cyprus, the most important ones being Vazanata and Vartica. There are also three local varieties of pomegranate, the most important one being the Chocolate variety. There is also a local variety of Walnuts.

Regarding apricots, plums and almonds no collection or clonal selection of the local germplasm has been carried out as yet.

4.2 CROP IMPROVEMENT PROGRAMMES AND SEED DISTRIBUTION

Plant breeding in Cyprus is conducted only at the Agricultural Research Institute. No private or foreign companies are involved in breeding activities. The aim of this work is to produce barley and durum wheat varieties, suitable for the dry and hot climate of Cyprus. Crosses are made between local land races, improved varieties introduced from International Centres (ICARDA, CIMMYT) and local wild genetic resources (wild barley). The main aim is to increase yield, stability of yield (low G x E interaction), quality (especially bread and pasta products). Emphasis is given to adaptation to low rainfall areas, heat tolerance, disease resistance, earliness, high harvest index and other important traits. In the initial stages of the cereal improvement programme in Cyprus (1967), imported varieties were also evaluated for adaptation in Cyprus, without making crosses, but recently this method proved inefficient and hence the efforts were concentrated on hybridization programmes.

Hybridization programmes aim at increasing forage production of hay crops (barley) and at developing pasture crops for the dry Mediterranean climate. This programme uses the brittle rachis gene of wild barley to develop self-regenerating



pasture barley. The significance of this original work (not known to have been done elsewhere) is the following: it uses adapted genetic resources of wild barley (*H. vulgare* ssp. *spontaneum* and *H. vulgare* ssp. *agriocrithon*) and is successful, in the sense that it provided a new pasture crop to improve the productivity and economic utilization of marginal Mediterranean lands.

For other field crops (chickpeas, cowpeas, field peas, phaseolus beans, ground-nuts) varieties developed in other countries or International Centres (ICRISAT, CIAT) are introduced and evaluated in Cyprus, because these crops are of small economic value to Cyprus.

The variety improvement programme on field crops aims at better utilization of the limited resources (land, water) by increasing yields and improving the quality of production as there is no possibility of satisfying local needs on field crops, even by the most optimistic expectations of breeding programmes. Thus there is no effort made towards increasing export opportunities.

The breeding programme of the ARI during the last 25 years, produced new varieties of durum wheat, barley, forage crops and food legumes which are grown by the farmers. However there is a need for improved facilities (field and laboratory equipment) and training of scientific and technical staff on modern methodology (genetic engineering etc.).

The results of the breeding programmes of the Agricultural Research Institute are discussed in joint meetings with the Extension Services (Department of Agriculture). The new varieties are demonstrated to the farmers by the Extension Services and certified seed is sold to all, small and relatively big farmers (Cyprus standards). There is no problem in seed production and distribution. Farmers are not directly involved in the breeding activities, but their opinion on released varieties is conveyed either directly or through the Extension Services, to the scientists involved in the breeding process.

4.3 USE OF FOREST GENETIC RESOURCES

Six seed-orchards have been established out of which four are found in the area occupied by the Turkish troops. The other two seed-orchards are used for seed collection in order to cover some of the needs of the Forestry Department for reforestation works.



CHAPTER 5

National Goals, Policies, Programmes and Legislation

5.1 NATIONAL PROGRAMMES

Plant genetic resources activities are not organized into a “National programme” and consequently it is not a single integrated government - funded programme. However, all the activities are carried out within the Ministry of Agriculture, Natural Resources and Environment i.e. the Agricultural Research Institute, the Forestry Department, the Department of Agriculture as well as the Environment Service. The activities are funded mainly by the Cyprus Government.

The aim of the Cyprus governmental projects is to protect, conserve, evaluate and utilize the genetic resources of the country. There is no National Genetic Resources Committee. Individual projects are proposed by Scientists working in different aspects related to crop and forest genetic resources.

The Genetic Resources programme at the ARI is under the Horticulture Section of the ARI and the head of the Genebank and of the National Herbarium (and National Coordinator) is accountable to the head of the Horticulture Section and to the Director of the ARI. The head of the CYPARI Genebank is a permanent Government employee.

The annual programme is decided by the head of the Genebank with the approval of the Director. The programme has its own budget which, along with the overall budget of the ARI is approved by the Ministry of Agriculture, Natural Resources and Environment and subsequently by the House of Representatives.

The genetic resources collections are not protected by legislation. There are however national and international commitments of the Cyprus Government.



5.2 TRAINING

The Genetic Resources programme (the CYPARI Genebank and the National Herbarium) is the responsibility of one scientist (A. Della).

A. Della has the following training:

- B.Sc. in Natural Sciences (Aristotelian University Salonica, Greece 1963-1968)
- M.Sc. in Conservation and Utilization of Plant Genetic Resources (University of Birmingham, 1978-1979).
- Plant Breeding Course. IAC Wageningen. The Netherlands. March - June, 1992.
- Training on Recent Techniques for Protein Improvement. IAEA Laboratory. Seibersdorf, Austria. October 1 - 31, 1975.
- Study tour to the Germplasm Laboratory. Bari, Italy, 19-25 February, 1978.
- Course on Practical Seed Technology for Gene Banks, 13-21 September 1979. Scotland, U.K.
- Course on "Documentation and Information Management" USDA, Beltsville (USA). 2-20 August, 1982.
- Group Training in Documentation of Genetic Resources "K Malkov" Sadovo, Bulgaria, 23-25 September, 1985.
- International Training Course on Collecting Characterization, Evaluation and Multiplication of Annual Legumes Genetic Resources for the Mediterranean Area. Badajoz, Spain, 19-24 May, 1986.

In 1992 she enrolled for an external Ph.D. degree with the University of Patras, Greece on the subject of endemism in Cyprus.

A. Della also participated in a number of related International workshops.

A. Della is assisted by four technicians, none of which have received any training related to genetic resources as yet, apart from the on job training. Locally no such courses are available. Training allocation and promotion depends on personal merit and as such both male and female staff are treated equally and at all levels.

In view of the fact that the temporal continuation of on-going programmes and projects on this issue should be safeguarded and at the same time capabilities need to be expanded, it is suggested that qualified personnel from all relevant Departments receive special training in the field of plant genetic resources.



5.3 NATIONAL LEGISLATION

In every case of imports of plant material, an import licence and a phytosanitary certificate are required and all consignments, must comply to strict regulations. All consignments are thoroughly examined by qualified plant protection officers. In the case of import of fruit trees or vine plants they are kept in quarantine until proved to be free from diseases.

Cyprus has ratified the Washington Convention on the International Trade in Endangered *Species* of Wild Fauna and Flora, the Bern Convention on the Conservation of the European Wildlife and Natural Habitats as well as the Convention Concerning the Protection of the World Cultural and Natural Heritage.

In addition Cyprus has signed and very soon will proceed with ratifying the Convention on Biodiversity.

The said Conventions can serve as tools towards the sound management, protection and sustainability of plant genetic resources.

Currently, an international consultant is drafting a Framework Law for the Protection of Nature which, inter alia, will incorporate regulations for the national implementation of commitments undertaken by the ratification of the above Conventions.



CHAPTER 6

International Collaboration

6.1 UNITED NATIONS INITIATIVES, FAO GLOBAL SYSTEM, THE CGIAR

In 1975 Cyprus agreed to cooperate with the International Board for Plant Genetic Resources (IBPGR) through the Agricultural Research Institute (ARI). Cyprus participated in the FAO/IBPGR Mediterranean programme, since 1981 participates in the UNDP/IBPGR European programme for Plant Genetic Resources (ECP/GR) and since 1992 in the IPGRI WANANET. Athena Della is the National Coordinator.

Cyprus also endorsed the International Undertaking on Plant Genetic Resources in 1983 and in 1985 became a member of the Commission on Plant Genetic Resources. Cyprus also signed the Convention of Biodiversity at the Earth Summit during 1992, held in Rio. Cyprus also signed the establishment of the International Plant Genetic Resources Institute (IPGRI) in 1993.

At the Agricultural Research Institute a project was initiated in 1979 for collecting, conserving and utilizing the genetic variability existing in local germplasm. The ARI was also involved in environmental assessment in the island.

In the framework of cooperation with the IBPGR the ARI organized a number of collecting missions (Tables 1 and 2). ARI's staff received training on genetic resources subjects, including the Birmingham M.Sc. course and participated in a number of workshops. In 1985 the CYPARI Genebank was established.

Structural Changes and Reform Policies with Regard to Cyprus International Relationships and their Impact on Development

Cyprus surpassed the stage of subsistence and entered the stage of market oriented economy long ago. The small size of the country, the limited resources, the dependency of the economy on imported inputs, the limited local demand, the fact that the economic viability of large commercial farms depends on the external marketing conditions and a series of international developments made it essential for the Government to seek expansion of Cyprus relationships with the outside world. To achieve this objective it under-took initiatives the most important of which concern:



- a) Promotion of international trade.
- b) Development of technical and economic co-operation with developed and developing countries.
- c) Customs Union agreement with the European Community
- d) Application for full membership of the European Community
- e) Joining the GATT.

An examination of these developments with a focus on their impact on agricultural and rural development follows.

6.2 INTERNATIONAL TRADE IN AGRICULTURE AND OTHER RURAL PRODUCTS

International trade developments are regarded as substantial determinants of agrarian reform and rural development. Traditionally, overseas markets have been supplying the economy of Cyprus with both consumption goods and inputs required for development. At the same time they have been providing outlets to the Cyprus agricultural production thus improving employment and income in rural areas.

As agriculture's contribution to the total domestic exports has always been significant, agricultural and trade policies have been restructured with the aim of expanding agricultural exports. To this end, measures have been taken towards encouraging export oriented commodities, improving the quality and raising competitiveness and increasing the effectiveness of marketing arrangements for further exploitation of export possibilities in existing, but also in new markets.

In its effort to expand agricultural exports, Cyprus concluded bilateral trade agreements with a number of European countries including the former European Socialist countries as well as Arab countries.



6.3 TECHNICAL AND ECONOMIC COOPERATION WITH OTHER COUNTRIES

As Cyprus is a small developing country the government placed among its priorities the promotion and support of technical and economic co-operation with other developed as well as developing countries. The role of this kind of co-operation has been of great importance as regards the field of agrarian reform and rural development. Various forms of co-operation are realized through FAO, the UNDP, the World Bank and other international organizations or are based on bilateral agreements. Through its co-operation programme Cyprus secured financial assistance (loans) for several major agricultural projects from the Kuwait Fund, the Near East Co-operative Programme, the World Bank etc.

In the field of training and management Cyprus receives assistance in the form of expert advice, equipment, education mainly from FAO and the UNDP. It has established co-operation with Reading University, U.K. and other Universities for exchanging educational facilities and secured a relatively great number of scholarships and fellow-ships from the British Council, the USA AID and other institutions for training and specialization of Government officials.

In the field of agricultural research it has close connections with international and regional relevant institutions and programmes such as ICARDA, IPGRI, ARINENA and other, with which it exchanges research findings, views and expert advice. During the last decade Cyprus has provided direct or through FAO technical assistance to a number of developing countries including training on specific aspects of animal husbandry, veterinary services, farm management, irrigation, water use, forestry, fishing and extension education.

Mention should also be made to the Research Programme on the “Ecophysiological Study of the Germination of Endemic, Rare and Endangered Flora *Species* of Cyprus”. The Programme is sponsored by the Research Committee of the University of Athens and executed by the Botanical Section of the Biological Department of the said University, in cooperation with the Department of Forests, the Agricultural Research Institute and the Environment Service of the Ministry of Agriculture, Natural Resources and Environment of Cyprus.

The Cyprus-E.U. Customs Union Agreement and the structural changes required to comply with the concessions obtained for agricultural products

The Cyprus Association Agreement with the E.U. was concluded on 19 December, 1972 and became effective on 1 June, 1973. This Agreement provided for two successive stages. The first stage was due to end in 1977 and the second stage to last, in principle, five years thereafter. The main purpose of the Association Agreement was to consolidate and expand the trade and economic relations be-



tween Cyprus and the E.U. on a new basis, i.e. the conclusion ultimately of a Customs Union between Cyprus and the European Union.

Under the Association Agreement of 1972 certain tariff concessions were made by the E.U., whilst Cyprus was allowed to continue to benefit from the preferential regime enjoyed in the United Kingdom and the Irish Republic markets. At the same time, Cyprus undertook to reduce its import duties in favour of E.U. products by up to 35%, within a five-year period. A number of products were partly or completely exempted from this tariff reduction mainly for protection or revenue purposes.

The first stage of the Association Agreement expired on 30 June, 1977. Consequently, an Additional Protocol to the 1972 Agreement (improving the export regime for industrial products) was agreed in 1977, extending the first stage until 31 December, 1979.

As regards the exports of agricultural products, two Protocols were signed with the E.U. in 1978. The first Protocol covered concessions to be given to Cyprus in the context of the Community's Mediterranean Agricultural Policy, whereas the second one, the Supplementary Protocol, granted Cyprus improved concessions (in most cases linked with quotas and calendars) for certain agricultural products, in view of the importance of these exports to the economy.

The first stage of the Cyprus - E.U. Association Agreement was eventually extended (with minor amendments), until the end of 1987.

On 19 October 1987, the Protocol concerning the contents of the second stage of the Cyprus - E.U. Association Agreement leading to Customs Union was finally signed in Luxembourg. This stage provided for two phases. The first, the transitional one, would be of a duration of ten years and the second, the final one, of a duration of five or four years. The main provisions of this Protocol in the field of agriculture, were the following.

1. First Phase

The relationship of the two parties was based on the principle of reciprocity. According to this principle, only those agricultural products which were covered by reciprocal concessions would be included in the Customs Union.¹ This involved 42 agricultural products, of export interest to Cyprus.

For these products, Cyprus and the Community would, as a general rule, eliminate residual customs duties at a rate of 9% per annum.² Cyprus would adopt the Common Customs Tariff of the Community at the same rate and undertook to abolish quantitative restrictions and measures of equivalent effect upon entry into force of the Protocol. However, for certain sensitive products like wines,



grapemust, fruit juices and canned fruits, Cyprus would, during the first phase, maintain the present regime, i.e. customs duties and the import licensing system.

Regarding the export regime of agricultural products, the Protocol provided for improved concessions towards Cyprus. Moreover, it provided for the inclusion of 17 new products into the Customs Union, including grapemust and table wines in bulk.

It should be mentioned in this context that during the first phase of the second stage, the mechanisms of the Common Agricultural policy of the Community would not be adopted by Cyprus. However, the Community would modulate or examine the possibility of modulating its reference price system to the benefit of Cyprus, within fixed annual quantities for a variety of products. Finally, although all the remaining agricultural products would be excluded from Customs Union, Cyprus and the Community agreed to grant each other various concessions, for a number of products.

2. Second Phase

By virtue of the 1987 Protocol, the transition from the first to the second phase will be decided upon by the Association Council at the end of the first phase. The main criterion for the passage to the second phase is the adoption by Cyprus of all those measures and mechanisms as well as the completion of the preliminary work that is necessary, in order to allow the free circulation of products covered by the Customs Union to take place. More specifically, for the passage to the second phase, the Association Council will take a decision on the abolition of rules of origin, the relevant policy measures emanating from the Treaty of Rome regarding competition, state aids, indirect taxation, the drawback system etc., not adopted during the first phase, as well as on measures concerning the free movement of agricultural products to be covered by the Customs Union, on the basis of the principle of reciprocity.

Such measures include the introduction by Cyprus of Community quality standards for these products, the application by Cyprus internally of domestic price constraints similar to those in force in the Community and Community measures at the Cyprus frontier. Preparatory work on all these and other issues will have to be done during the first phase and Cyprus shall submit relevant suggestions to the Community.

¹According to the Treaty of Rome, agricultural products are all those products falling under Annex II of the Treaty, which also includes industrial products of agricultural origin.

²As from 1.1. 1993, the Community granted duty free access to all of these products within the context of its new Mediterranean policy.



During the second phase, Cyprus will adopt mechanisms of the Common Agricultural Policy for the agricultural products which will be covered by the Customs Union. At the same time, the Community will abolish for the same products all restrictions of the Common Agricultural Policy (i.e. reference prices) for the products originating in Cyprus. The Customs Union shall be fully achieved within fifteen years from the entry into force of the Protocol.

It should be noted in this context, that in view of the various issues arising from the commitments of the Community and Cyprus, within the framework of the recently concluded Uruguay Round of Trade Negotiations under GATT, Cyprus has recently entered into consultations with the European Union in an attempt to identify ways and means to streamline the provisions of the Protocol of 19 October 1987 with the new GATT rules, while maintaining the concessionary nature and the spirit of the Agreement.

6.4 JOINING THE EUROPEAN UNION (FULL MEMBERSHIP)

A major policy issue arises from the opportunity of Cyprus to join the European Union (EU) as a full member. On July 4, 1990, the Government submitted its application for full membership of the European Union, and in 1994 started substantial talks with the European Commission. The possibility of attainment by Cyprus of member state status will entail the following:

- a.** Participation in the Union's policy making and administration institutions.
- b.** Unification of the market to that of the Union's with regard to free circulation of all goods and services as well as factors of production.
- c.** Adoption of the Union's policies, the most important of which is the Common Agricultural Policy (CAP).
- d.** Participation in the European Union's budget.
- e.** Harmonization of Cyprus laws, rules and regulations with those of the European Union.

Taking into consideration the intention of the Government to proceed with full membership, considerable action will be necessary in addition to the obligations undertaken during the transitional period of the Customs Union.

Regarding Agriculture and Rural Development the overall planning of the agricultural sector should be oriented towards the goal of full membership. This will require drastic restructuring, including institutional and legal changes, so that



the necessary transformations be implemented at the proper time as Cyprus has to adopt CAP from the first day of its entry to the EU. The focus of restructuring should be on preserving the position of agriculture in the national economy and maintaining rural people's income. Such a restructuring will require organizational, institutional, legal and production and marketing arrangements.

6.5 JOINING THE GATT

The Government of Cyprus, having in mind the prospects of joining the European Union and taking into consideration the importance of the negotiations of the Uruguay round for international trade, has signed on 17 April 1994 the Final Act in order to acquire eligibility to join the new international trade organization as a founding member. The commitments that were undertaken covered the sectors of industry, agriculture and services and accepted unconditionally the results of the Uruguay round, which were centred around an agreement for a package of measures for the beginning of a long-term procedure bringing about gradual liberalization of trade among member states. This package was providing that member countries should grant concessions on basic sectors affecting the trade of products, including agricultural products.

In the agricultural sector the concessions referred to:

- i. Market access
- ii. Domestic support
- iii. Export competition

More specifically, in the area of market access, Cyprus has chosen to submit ceiling bindings for agricultural products (reflecting the tariff equivalent of the licensing system applied at present) also taking account of the respective ad valorem and specific rates submitted to GATT by the European Community. These ceiling bindings will be subsequently reduced by 24% on average over a 10-year period, as in all developing countries.

In the area of domestic support, the aggregate measure of support (AMS) committed by Cyprus will be reduced by 13.3 % within a period of 10 years. Finally, in the case of export subsidies, the budgetary outlay and quantity reduction commitments of Cyprus are of the level of 24% and 14% respectively, within a period of 10 years.

The New GATT Agreement will come into effect on 1.7.95.



CHAPTER 7

National Needs and Opportunities

Most of the crop germplasm (cereals, food and forage legumes) that has been collected and conserved in the CYPARI Genebank has disappeared from farmers fields. There still exist variation in fruit trees and some vegetable *species* for most of which there are no organized collections. Most of the germplasm in the CYPARI Genebank has not been characterized and has not been evaluated. Consequently there is still a lot to be done in Cyprus. However, priorities must be decided. As already reported the Genetic Resources Programme of the ARI depends on a limited number of staff working in all the activities of both the Genebank and the National Herbarium, as well as the Improvement of faba beans. Funds are limited also.

In spite of the above, activities which must be carried out are as follows:

- To ensure conservation of the collected germplasm according to International standards by monitoring seed viability, regeneration/multiplication when needed.
- Computerization of the Genebank; after deciding on the most suitable software and handling of the data. Training is required.
- Publish a germplasm catalogue in which all the available information will be gathered.
- Identify the local germplasm which should be collected. Collect according to priorities and funds available.
- Introduction and execution of programmes aiming at the conservation of endemic and rare plants.
- Characterization and evaluation of available germplasm. Characterization and evaluation will be carried out according to priorities and funds available.
- Utilization of desirable genes in crossing programmes.
- Enrichment of the National Herbarium by collecting, preparing Herbarium specimens and identifying them.
- Computerization of the National Herbarium.
- Publish a catalogue in which all the available information will be gathered.
- Bring all the historical collections together.



- Ratify the Convention on Biodiversity
- Introduction of a contingency planning in case of accidental release into the environment of unwanted Plant Genetic material.

The national programme (the CYPARI Genebank and the National Herbarium) is the responsibility of one scientist. Her duties include the collection, evaluation and in the case of the faba beans the utilization and variety improvement. She has been appointed as the National Coordinator. She is responsible for enriching and maintaining the National Herbarium as well as for identifying plants for other projects. Her responsibility extends into studying the flora of certain areas in the framework of environmental assessments. She represents the ARI in related meetings and workshops within the country as well as abroad. She also provides her opinion to policy makers on related aspects.

A. Della is assisted by four technicians, three of which are almost of the same age as she is (around 50 years old). This fact and with approximately 10 years of useful service remaining, presents a serious problem, which could prove detrimental to the continuation of the Genetic Resources Programme. Indeed, young, qualified scientists and technicians must be employed in good time in order to be adequately trained and be given the opportunity of generating the necessary experience required for the unobstructed continuation of the genetic resources conservation tasks and activities.

The present facilities of the Genebank are only just the very basic ones. Space in all areas presents a serious problem which must be addressed the soonest. Cold room space will soon prove inadequate. Furthermore there exist no cleaning room, drying room, seed physiology laboratory or a staff working area. In view of the above and in the absence of dedicated and suitably furnished and equipped areas, the pre-room (15 m²) adjacent to the cold room is used by the three technicians for the activities of packing, documentation, herbarium specimen drying, specimen mounting etc.

The requirement for a dedicated Genetic Resources Unit to include the CYPARI Genebank and the National Herbarium, suitably and adequately staffed and equipped, is becoming increasingly obvious and as such is already under consideration by the ARI. Funding of such a project is required if it is to materialise.



CHAPTER 8

Proposals for a Global Plan of Action

- To evaluate the National programmes and identify their individual needs.
- To assist the National programmes to update their facilities and ensure the supply of new equipment and training in all aspects involved.
- To stimulate and ensure funding of projects on National, International or Regional level, considering always the priorities of the country.
- To identify the remaining genetic variability in local germplasm and to stimulate collecting and conserving as a priority aspect since rapid developmental changes expose local germplasm to the danger of extinction.
- To ensure repatriation, when need arises, of local germplasm, conserved in Genebanks outside the country, collected during the time that there were not National Genebanks and/or local germplasm was sent to be conserved for long term conservation.
- To ensure Country's Rights on their own Genetic Resources.



Acknowledgements

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RE950915.C02(H)