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# Focus on Seed Programs

## The Cyprus Seed Industry

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### Introduction

The Island of Cyprus is located at latitude 35°N and longitude 33°E in the far eastern end of the Mediterranean Sea. It is mostly mountainous with two parallel mountain ranges and a central fertile plain in between. Cyprus has an area of 925, 100 ha and a population of approximately 750, 000.

Cyprus has a typical Mediterranean climate with cold winter rains and hot dry summers. The rainfall is generally low on the plains with an average of 350 mm and increases with altitude reaching an average of 750 mm on the mountains. Field crops usually suffer from regular droughts and sometimes from severe frosts (e.g. potato).

The agricultural land is about 200,000 ha of which arable crops (cereals, legumes, fodder crops) occupy about 89,000 ha (44.5% including 4,500 ha fallow land), pastures 1,100 ha (0.5%), permanent crops and vegetables 53,000 ha (27%). The remaining uncultivated, shrub and desert land is about 55,500 ha (28%). The main crop area, production and export from 1996 to 1998 are shown in Table 1.

Agricultural land is privately owned and the majority of farms are small family holdings with an average size of 3.5 ha, made up of several small plots each with a mean area of 0.78 ha. At present agriculture contributes less than 5% to GDP and about 10% to employment due to fast growth in other sectors of the economy particularly tourism and other services. Nevertheless agriculture continues to play a significant role for the national economy. It continues to earn large sum of foreign exchange which still accounts for over 20% of all exports; employs sizeable proportion of rural population; contributes to food security and supplies the local market, including the sizeable tourist industry; and maintains the environment.

### Background of the Seed Sector

Since 1945, the Department of Agriculture has been dealing with seed production and supply. Initially the emphasis was given to the production of vegetable seed for export to the United Kingdom. Later on, attention was focused on seed production for domestic market. In 1951, a Seed Production Section was created within the

Department of Agriculture and become responsible for seed production, processing, marketing and quality control. Further expansion took place in 1965 when the Seed Production Center (SPC)

was established in Nicosia with seed processing and storage facilities. A few years later, in 1970, a modern seed testing laboratory was set up at SPC.

Table 1: Area (ha), production (tonnes) and exports (tonnes) from 1996-1998

Crops	1996			1997			1998		
	Area (ha)	Production (tonnes)	Exports (tonnes)	Area (ha)	Production (tonnes)	Exports (tonnes)	Area (ha)	Production (tonnes)	Exports (tonnes)
Cereals	58940	141190	-	43020	47780	-	59090	65820	-
Fodder crops									
-Seeds	78	64	-	78	73	-	74	68	-
-hay	13230	71923	-	28100	78500	-	17410	108000	-
-Grazing	6060	-	-	7420	-	-	7020	-	-
Potatoes	9125	228000	178285	7000	81500	34613	7500	138092	92107
Vegetables	3300	93180	1219	2987	91500	1209	2891	101809	1061
Watermelons & melons	920	43500	1427	925	43500	1053	950	47500	203
Grapes	20100	114000	4633	19950	101000	2705	19870	124000	3986
Citrus	7150	151000	85013	6900	142500	79354	6210	115500	60591
Fresh fruits	3978	35875	-	3579	34480	-	3714	42545	-
Nuts	3820	1555	-	3820	1652	-	3920	1910	-
Olives	5770	12500	27	6100	9000	11	6600	10700	11

Source: Agricultural Statistics, Ministry of Finance

During the last decade the national cereal seed demand has increased significantly. However, due to the prevailing weather conditions only 50% of the total demand of barley seed, the main bulk of seed produced, is covered with certified seed. The remaining requirement is covered with commercial seed produced locally and supplied to SPC by the Cyprus Grain Commission (CGC). The commercial seed is processed and tested at the SPC for distribution to farmers. In order to meet the total national seed demand, a modern silo complex was erected at the SPC and put into commercial operation in May 1995.

The public seed sector has been developed significantly during the last 30 years. However, the private sector has only been involved in marketing of imported vegetable and some forage seed.

## National Seed Policy and Laws

At present Cyprus is a candidate for accession to the European Union (EU) and is in the process of harmonizing its agricultural and seed policies, legislations and institutions in line with the European Union.

### National Seed Policy

The Cyprus Government, through the Seed Production Center (SPC) of the Department of Agriculture, is the only entity producing the bulk of cereal and fodder seed in the country. In fact, the initiative has been undertaken by necessity, since the private sector was reluctant to undertake seed production and supply of these crops due to huge investments needed in processing and storage facilities and working capital

required for production and marketing of such large quantities of seed.

On accession to the European Union, an extended transitional period has been requested during which,

- Efforts will be exerted particularly to enlist the private sector to invest in the seed industry, thus increasing certified seed production
- Commercial seed (mainly barley) will be allowed to be provided to the farmers to meet their demand, when certified seed do not suffice
- Farmers will be encouraged to establish their own cleaning and storage facilities, mostly through cooperatives, to cover part of their seed requirements by producing farm saved seed
- Certain quality requirements of barley seed will be relaxed, especially those referring to analytical purity such as maximum content of *Avena* sp., other seeds etc.

Upon accession to EU, the Seed Production Center will be operating as a separate entity within the Department of Agriculture, maintaining independence from the certification authority.

### **Seed Laws and Regulations**

At present there are two main seed laws in effect in Cyprus:

- a) The Vegetable and Flower Seed Production Law of 1947 regulating seed production of vegetables and flowers. To enforce the law scheduled areas and approved crops are declared for seed production to prevent any undesirable cross-pollination.
- b) The Seed Law of 1954 regulating the sale of seed for planting purposes and provisions for seed testing. Each year the law is enforced by issuing a license to a seed dealer who complies

with the provisions and requirements of the law. According to the provisions of the law an official of the Department of Agriculture can take samples from the premises of the licensed seed dealers for market control.

A comprehensive Seed Law No 63 (I) of 1998 which is compatible with OECD and European Union rules and standards has been ratified by the House of Representatives. The new Seed Law makes provisions for evaluation and registration of varieties, establishment of list of varieties, quality control and certification (field inspection, seed sampling, seed testing and post control plot tests), seed marketing and licensing of seed dealers in accordance with the relevant EU Directives covering cereals, oil and fiber crops, forages, potatoes and vegetables grown in Cyprus.

The Law will come to force when the implementing regulations deriving from the law are completed and approved by the House of Representatives. Drafting of all implementing regulations is expected for completion in early 2001 and will be forwarded to the Attorney's House for legal vetting. Subsequently, they will be submitted to the House of Representatives for enactment by the mid 2001. The legislation will be fully harmonized with the EU legislation by late 2001.

A separate law for plant variety protection (PVP) is prepared in accordance with the 1991 UPOV Convention and has already been submitted for ratification. The unit that will be established within the Agricultural Research Institute (ARI) is responsible both for variety evaluation and PVP. North European varieties, included in the Common Catalogue of the EU will be freely marketed in Cyprus.

### **Agricultural Research and Crop Improvement**

The Agricultural Research Institute (ARI) is a Department of the Ministry of Agriculture, Natural Resources and Environment (MANRE) with headquarters at Athalassa, Nicosia (<http://www.ari.gov.cy>).

It was established in 1962 as a cooperative project between the government of Cyprus and the UNDP, with FAO acting as the executing agency, and was entrusted to the government of Cyprus in 1967.

It is the sole institution engaged in applied and adaptive agricultural research within the domain of plant and animal production.

The Agricultural Research Institute is responsible for agricultural research, crop improvement of cereals, food legumes, forages and vegetables. At present there is no private sector plant breeding in Cyprus.

The Institute has an experimental farm at its headquarters for livestock research (cattle, sheep, goats) and 3 outstations at Achelia and Zygi for field crops, vegetables and citrus and at Saittas for deciduous fruits. Moreover, extensive trials are also undertaken in farmers' fields.

The Institute is the national AGRIS Center collecting, cataloguing and indexing agricultural literature published in Cyprus, and is also the national CARIS Center collating information on on-going research. All this information is supplied to Food and Agriculture Organization for inclusion in the global databases of the AGRIS and CARIS systems

### **Variety Development**

ARI is responsible for variety development and evaluation as well as variety maintenance and breeder seed production. Materials from national crossing programs or introduced from abroad are screened for adaptation to conditions in Cyprus. Three types of yield trials are carried out, namely; Initial, Preliminary and Advanced trials. Initial trials are carried out in one or two locations either in rows or in small plots where introduced and advanced crosses are evaluated. The preliminary trials are carried out in two locations and two replications. Advanced yield trials are conducted in five locations and six replications. Promising lines are tested for two or three years in advanced yield trials. Superior lines are tested in farmers' fields and new cultivars are then released. It usually takes 12 years from crossing to the release of a new variety.

### **Variety Release and Registration**

The existing seed law does not include regulations for variety evaluation, release and registration. The Seed Committee within the Department of Agriculture advises the Director to release new varieties developed by ARI. The decisions of the Committee are mainly based upon trials conducted and submitted by the breeders. In recent years a number of varieties have been released to farmers (Table 2). The members of the Seed Committee are agricultural officers from the Department of Agriculture and the Agricultural Research Institute.

At present DUS tests are carried out at two locations for a period of two years. VCU tests for rainfed crops are carried out in three to four locations for a period of four years whereas for irrigated crops it requires one to two locations and two to three years. A Seed Committee within the Department of Agriculture is responsible for registration of varieties based on the

breeder's test where the new varieties are grown for two to three years on large-scale trial on government farms. The Committee is drawn from agriculture officers of the Department specialized in agronomy, horticulture, seed production and plant protection and a representative of ARI.

Table 2. List of crop varieties released in Cyprus

Crop	Varieties released
Barley	Lefkonico, Kythrea
Fodder barley	Lysi, Sanokrithi 94
Durum wheat	Karpasia, Macedonia
Oat	Mulga, Algeria
Chickpea	Kyrenia, Lambousa
Cowpea	Trikomo, Yerolakkos
Bean	Myrtou
Groundnut	Kouklia, Nikoklia
Common vetch	Achilleas

The 'Seed Law' of 1998 covers all aspects of variety registration. Under the new law both DUS and VCU tests are required for variety release and registration of field crops whereas in case of vegetables only DUS tests are necessary. ARI is responsible to conduct these tests at the national level, but a new unit will be established within ARI for variety evaluation and plant variety protection.

Moreover, a Seed and Propagating Material Technical Committee will also be established within the Department of Agriculture, replacing the existing Seed Committee. The Committee will be responsible to assess the DUS and VCU tests and to make decisions for registration of varieties in the National Catalogue. The committee may include representatives of the private sector and farmers' organizations. It is noted that once a variety is registered in the national catalogue and then included in the EU common catalogue, it can be freely traded

throughout Union member countries.

### Variety Maintenance

The Agricultural Research Institute is responsible for variety maintenance and the production of breeder seed, intended for further multiplication under the existing seed certification schemes.

### Seed Production

There are four classes of seed recognized in the country: breeder, pre-basic, basic and certified seed. However, in case certified seed is short of production, commercial seed would be produced to fill the gap in seed supply.

#### *Pre-basic and Basic Seed Production*

The Agronomy Section of the Department of Agriculture in consultation with the breeder is responsible for pre-basic and basic seed production on government farms. Multiplication is carried out under strict control with the aim of producing high quality seed. The premium paid for cereal seed is the similar to that of certified seed paid by SPC to contract growers.

#### *Certified Seed Production*

The Seed Production Center under the Department of Agriculture (MANRE) is a public sector entity responsible for certified seed production based on existing certification schemes. Seed crops are produced on contract with farmers. For barley, contract seed growers are paid a premium of C£4/tonne over the official price fixed for commercial grain. The premiums for forage barley and for wheat are C£20 and C£5/tonne, respectively. After harvest the seed crops are delivered to the SPC for processing and testing.

#### *Commercial Seed Production*

When certified seed is not sufficient, good quality barley grain is tested for purity and germination and supplied by SPC as

commercial seed to meet demand. Commercial seed is not certified for varietal purity. The proportion of commercial seed varies from year to year depending on weather conditions which affect production of certified seed (Table 3).

Each year SPC handles about 10,200 tonnes of cereal seed, 230 tonnes of forage seed and small amount of food legume and vegetable seed worth US\$3.5 million. The quantity of cereal seed sold by the Center represents about 80% of the total seed requirement compared to 60% prior to 1983.

Vegetable seed produced by the Seed Production Center are all certified. Vegetable seed imported are mostly standard seed.

### Seed Processing and Storage

Seed processing is carried out at the headquarter of Seed Production Center in Nicosia. The processing facilities include three large seed cleaning plants with a total capacity of 12 tonnes/hour, one small seed cleaning line for basic seed (2 tonnes/hour), one small seed cleaning machine for vegetable seeds (50 kg/hour), one huller-de-bearder machine (200 kg/hour), one magnetic separator and one needle indented cylinder machine.

The huller-debearder, the magnetic separator and the needle machine, are separate units used mainly for cleaning vegetable seeds, alfalfa seeds contaminated with *Cuscuta* spp. and pulses

affected by storage insects, respectively.

The average cost breakdown from harvesting to end of processing for wheat and barley seed is shown in Table 3. The quantity of seed processed for domestic sale by the SPC during the last six years is shown in Table 4.

Available seed storage facilities include a silo complex with a capacity of 11,000 m<sup>3</sup> tonnes for bulk storage of cereals; one store of 2000 tonnes; an open shed with 5000 tonnes of bagged seed; and two small stores for vegetable and forage seed. The silo commissioned in 1995 is a modern high-technology storage complex and comprises: (a) intake station (50 tonnes/hour capacity for barley); (b) seed conveying system; (c) seed pre-cleaning and spraying systems; (d) seed storage system (10 metal silos); (e) extraction, storage and out-loading systems for dust and rejects; (f) delivery station; and (g) electronic control and automatic data-recording systems. The increased storage facilities will assist SPC to satisfy national cereal seed demand, which is currently estimated at 12,000 tonnes/year. The silo solved acute storage problem at SPC, reduce storage losses, promote safer storage, and enable SPC to store seed security stocks for use in drought years. Each year the silo complex is hired to the CGC from November to April to optimize its use.

Some private seed firms exporting faba bean or marketing common vetch have their own processing and storage facilities.

Table 3. Cost breakdown for handling certified seed from 1997-1999

	Cereal seed price (C£/tonne)	
	Wheat	Barley
Labor (salaries and wages)	23.62	23.62
Transportation (in and out)	6.67	6.67
Bagging material	2.99	2.99
Chemicals	6.06	6.06
Cleaning losses	10.09	5.84
Commission for Cooperative Bank	3.86	3.86
Depreciation and maintenance of machinery and buildings	2.33	2.33
Depreciation and maintenance of silo complex	6.98	6.98
Others	1.62	1.62
Total cost for cleaning, treatment, bagging, storage and distribution	64.22	59.97

**Note:** Interest on capital investment is not included in the cost; The Seed Production Center does not pay taxes as a non-profit government organization

Table 4. Seed processed for domestic sale by the SPC from 1994-1999 (tonnes)

	1994	1995	1996	1997	1998	1999
<b>Cereals (Total)</b>	<b>11,710</b>	<b>10,936</b>	<b>10,403</b>	<b>10,803</b>	<b>9,029</b>	<b>8,197</b>
Durum wheat	698	1,010	1,145	1,232	1,144	1,097
Barley (Certified)	3,405	4,034	4,074	914	1,088	4,506
Barley (Commercial)	7,607	5,892	5,184	8,657	6,797	2,594
<b>Food legumes</b>	<b>3</b>	<b>16</b>	<b>24</b>	<b>17</b>	<b>22</b>	<b>26</b>
<b>Forages</b>	<b>185</b>	<b>219</b>	<b>274</b>	<b>228</b>	<b>237</b>	<b>238</b>
<b>Vegetables</b>	<b>2.9</b>	<b>1.5</b>	<b>1.1</b>	<b>1.1</b>	<b>0.8</b>	<b>0.5</b>
	11,901	11,172	10,702	11,049	9,289	8,462

## Seed Marketing and Distribution

Marketing of cereal and forage seed is carried out by the SPC through the Village Cooperative Credit Societies (VCCS) which provide farmers with credit to purchase seed. Seed marketing and distribution follow a specific procedure. Before each growing season, the SPC sends a catalog of available cereal and forage seed to all VCCS. The farmers place an order with

the secretary of the local VCCS specifying their seed requirements. The secretary submits the total seed requirement of the village to the SPC, which in turn allocates the available seed to the Cooperatives.

The final seed allocations are submitted to the Cooperative Central Bank (CCB) for approval before financing the purchase of seeds. The Department of Agriculture arranges the delivery of approved seed quantities to the VCCS using private

haulages. On receipt of the seed, the secretary of the Cooperative Society signs the relevant documents which are submitted by SPC to the Credit Cooperative Bank for payment. A commission of C£0.20 per 50kg bag of seed is paid to the VCCS and the CCB for marketing seed.

Any surplus cereal seed from the demand of the Societies is sold to individual farmers directly from the SPC headquarters with the same price of seed sold to the Cooperative Societies. Food legume, vegetable and some forage seed are sold directly from the SPC or through

the District Agricultural Offices to interested seed dealers or farmers.

At present basic, certified and commercial seed price is about 50% higher than the commercial grain price. This difference in price is intended to cover all the expenses incurred in seed production: premium for contract seed growers, processing and transport costs, cleaning losses, maintenance and depreciation of machinery and buildings, and commission for CCB and VCCS. The official grain and seed prices for basic, certified and commercial cereal seed from 1997 to 2000 are shown in Table 5.

Table 5. Grain price and basic, certified and commercial cereal seed price from 1997-2000

Year	Crop	Grain price C£/tonne	Seed price C£/tonne	Increase in seed price (%)
1997	Barley			
	- Basic & Certified	120.48	181	50
	- Commercial	120.48	179	49
	Durum wheat	141.50	207	46
1998	Forage barley	120.48	193	60
	Barley			
	- Basic & Certified	126.50	187	48
	- Commercial	126.50	185	46
1998	Durum wheat	141.50	207	46
	Forage barley	126.50	199	57
	Barley			
	- Basic & Certified	126.50	190	50
2000	- Commercial	126.50	188	49
	Durum wheat	145.00	212	46
	Forage barley	126.50	202	60
	Barley			
2000	- Basic & Certified	126.50	194	53
	- Commercial	126.50	192	52
	Durum wheat	145.00	216	49
	Forage barley	126.50	206	63

The private sector is very active in marketing imported vegetable and some

forage seed such as alfalfa, oats, lolium, vetches, etc. However, each year small



quantities of commercial seed of local faba bean variety are processed by two private firms and exported to neighboring countries. Similarly, smaller quantities of commercial seed of carrot and cowpea are also exported. It should be noted that few years ago large quantities of faba bean seed was exported. The quantities of seed imported and exported during the last two years are shown in Table 6.

### Seed Promotion

The government uses different methods to promote the adoption of new varieties and use of certified seed. The Department of Agriculture multiplies seed of the new varieties on government farms which can be used for promotion purposes. Demonstration fields are established and field days organized in areas where new varieties are to be grown commercially. A wide range of media (printed material, radio and TV) is used to popularize new varieties.

There are also policy measures for promotion of certified seed:

- a) Government provides the CCB with credit to finance the VCCS which gives credit to farmers for purchase of seed.
- b) A commission of C£0.20/50kg bag of seed is paid to the CCB and the VCCS for marketing certified seed.
- c) Seed is delivered to all villages at a flat rate throughout the country equivalent to seed price at SPC in Nicosia.

The private sector promotes imported seed through local seed dealers who are usually involved in marketing of agricultural inputs such as fertilizers, chemicals and irrigation equipment.

### Informal Seed Sector

In addition, to the SPC and the private

sector, farmers produce a considerable amount of seed for their own need. It is estimated that the informal sector provides about 20% (cereals), 20-25% (forages) and 80% (food legumes) of the total national seed requirements.

### International Seed Trade

The terms and conditions of seed imports are presently regulated by the Seed Law of 1954 which generally governs the sale of seeds. Based on this Law the Director of Agriculture has recently prohibited seed import of genetically modified varieties. In addition, the plant health regulations cover, *inter alia* seed imports. As part of GATT Agreement, there is no restriction for seed imports and, therefore, no import licenses are required. However, phytosanitary import permit is required, which is granted by the Plant Protection Service of the Department of Agriculture.

For seed exports a license is required which is granted by the Ministry of Commerce, Industry and Tourism. The Produce Inspection Service of the Ministry of Commerce, Industry and Tourism inspects all seed lots intended for export. The Service draws the samples, which are delivered to the seed testing laboratory to test purity and germination. All seed consignments intended for export are accompanied by phytosanitary certificate, issued by the Produce Inspection Service. However, if the importer requests the seed to be free from a specific pest, then the crop should be examined during the growing season by an authorized officer of the Plant Protection Service and a separate phytosanitary certificate will be issued. There is an active National Quarantine Service, under the Department of Agriculture, which is involved in the regulation of seed imports. There is a checklist of quarantine pests including bacteria, fungi, weeds etc., and all imports

should be checked to be free from these pests.

Table 6. Seed imports and exports in 1998 and 1999 (tonnes)

Purpose	Crop	1998	1999
Import	Lucerne	3,18	1,13
	Fescue	1,65	9,17
	Ryegrass	21,3	47,35
	Timothy grass	1,36	3,70
	Other forages	129,2	160,4
	Flowers	0,4	0,3
	Vegetables	31,1	36,6
	Others	12,9	-
Export	Faba bean	180,5	266,0
	Carrots	0,78	1,9
	Cowpeas	-	0,1

## Seed Quality Control

Seed quality control involves varietal certification (field inspection and control plots) and seed testing to ensure that quality seed reaches the farmers. At present, seed certification schemes cover cereals, food legumes, vegetable crops and forages. Cyprus is also a member of the Grasses and Legumes, Crucifers and Other Oil/Fiber Species and Vegetables Seed Certification Schemes of OECD.

The seed production branch of the Agronomy Section of the Department of Agriculture is responsible for seed certification. Under the new Seed Law the Department of Agriculture will be the responsible body for seed quality control and certification: field inspection, laboratory seed testing and control plots.

### Field Inspection

The Agronomy Section of Department of Agriculture is responsible for field inspection. All seed crops grown under a

seed certification scheme are inspected at the appropriate stage of the crop to check field standards. Seed crops are inspected for varietal identity and purity, isolation, the presence of other crops, weeds, seed-borne diseases, etc. Crops, which meet prescribed standards, are allowed to produce seed. Under existing legislation, field inspection is free, but under the new Seed Law inspection costs will be charged accordingly.

### Seed Sampling

The field approved seed crop is harvested and delivered to the SPC. An official sample is taken before and after processing, and submitted to the seed testing laboratory to check seed quality.

### Seed Testing

Laboratory seed testing was started in 1945 as a result of export-oriented vegetable seed industry. In 1970, a modern laboratory was established at the SPC for seed certification and for enforcing the seed law of 1954. In 1977, the seed testing laboratory became an accredited

member of the International Seed Testing Association (ISTA). All seed testing practices are conducted in accordance with the ISTA rules.

Seed lots are tested for quality attributes such as analytical purity, number of foreign seeds, moisture content, bushel weight (for cereals) and germination. There is a provision for testing service for seed dealers and farmers on payment of fees. The laboratory also participates in ISTA referee testing programs on a voluntary basis.

### **Control Plots**

Field control plots are also established to check the varietal purity of seed lots, which have been certified or to assess the varietal purity and approve the seed lots for the next generation of seed production.

### **Labelling**

When a seed lot meets the prescribed minimum quality standards, certification labels are attached to every seed package which is the final step of seed certification.

### **International Membership**

Cyprus is a member of the Seed Schemes of the Organization of Economic Cooperation and Development. The membership includes Grasses and Legumes, Crucifers and Other Oil/ Fiber Species and Vegetable Seed

certification schemes, since 1963 and 1972, respectively.

The seed testing laboratory is a member of the International Seed Testing Association (ISTA). However, it is not recredited to issue ISTA certificates.

Cyprus is a founding member of the WANA Seed Network and serves as a member of its Steering Committee. Cyprus actively contributed towards the activities of the Network and has produced two publications in collaboration with the Secretariat.

### **Research and Training**

ARI is conducting research mainly aimed at breeding programs to develop varieties with high and stable yields, tolerant to pests and adapted to the dry weather conditions. There is no specific seed related research.

The Department of Agriculture annually organizes a refresher course for cereal crop inspectors. The course deals with the botanical description of all cereal varieties currently included in seed production and certification. All the theoretical lectures related to crop inspection are covered and followed by practical training in the field. Written instructions on crop inspection and variety description are also given to all participants. The courses are usually held for one day and attended by 25 agricultural officers and agricultural superintendents.

### **Constraints in the Seed Sector**

The main constraints of the seed industry in Cyprus can be categorized into three main issues. These include variability of the climatic conditions, production technology and government policy.

*Unfavorable Climatic Conditions*

The yield of rainfed crops depend to a large extent on the weather conditions and is therefore unreliable and unpredictable. The rainfall is usually low, erratic or unevenly distributed. Even if cumulative rainfall reaches the potential water requirement of the crop, long dry spells during critical periods, (i.e. March), may predispose crops to water stress, thus limiting grain production and/or lower grain quality by reducing specific weight (e.g. cereals).

In Cyprus, available meteorological data show that every 10 years the cereal grower may expect three good, four average, two poor and one very bad season. Cereal seed production is vulnerable to such climatic variability. To overcome the drought problem, supplemental irrigation is used for some crops intended for basic seed production. The cereal seed crops are also allocated all over the country to avoid local droughts. Moreover, small quantities of basic and certified seed are kept as security stocks for one year. Since it is difficult to keep adequate amount of certified seed of cereals, large quantity of commercial seed from local grain production are used as security stocks. This commercial seed is selected, tested and kept separate in appropriate stores by the Cyprus Grain Commission in collaboration with the Seed Production Center until adequate harvest is ensured for the next season.

#### *Problem of Noxious Weeds*

During the last few years, the presence of *Bromus* spp. in barley seed has created a very serious problem. *Bromus* could not be controlled by any herbicide currently used in cereal crops and is very difficult to remove during seed processing. An increasing infestation of barley fields has resulted in rejection of seed crops during field inspection and harvested seed lots

during delivery to the Seed Production Center.

#### *Lack of Price Policy for Grain Legumes*

The production cost of grain legumes has increased considerably during recent years because of labor shortage, though full mechanization of harvesting has already been achieved. Moreover, due to lack of government price policy, the area of grain legumes has been significantly reduced in recent years, in favor of cereals which are fully mechanized and subsidized by the government. Consequently, seed prices of faba bean and common vetch are no longer competitive in the international market. As a result seed export of faba bean has significantly declined and that of common vetch is completely abandoned.

In addition, the monoculture of cereals, which has been practiced to a large extent in the rainfed areas during recent years, has led to increase of noxious weeds (e.g. *Bromus* spp.) infestation, pests, and deterioration of soil fertility.

### **Recommendations for the Seed Sector**

The following are recommended to improve the national seed production and supply of cereals, food legumes and forages in Cyprus.

- a) In order to overcome the drought problem and to ensure a regular seed supply to farmers, adequate seed security stocks should be kept. Moreover, adequate quantities of basic seed should be produced every year using supplemental irrigation, if necessary.
- b) Particular attention should be given to the control of *Bromus* spp. which become a serious problem in cereals

during recent years. The following control measures are suggested: (1) avoiding monoculture of cereals by using legumes in crop rotation where chemical control of *Bromus* is possible; (2) using *Bromus* infested cereal crops for hay production; (3) fallowing infested fields for one year; or (4) using certified seed free from *Bromus*.

- c. Price policy of grain legumes to be reconsidered by the Government and support their production.

Consequently, the government agricultural policy should encourage not only the production of cereals, but also the production of grain legumes, which are considered valuable for rotation with cereals as practiced in previous decades. For promotion of grain legumes an area compensatory payment may also be given to growers as applied in the European Union. In fact this is expected to start from next growing season.



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