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# Focus on Seed Programs

## The Seed Industry in Egypt

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### Introduction

Egypt is located between longitude 30°E and latitude 27°N. It is bordered by Libya in the west Sudan in the south and Red Sea in the East and the Mediterranean sea in the north. The country has a total area of 1,001,450 sq km and population of 70 million people with annual growth rate of 2%.

Egypt has made tremendous progress in its overall economic and agricultural development in recent years. The per capita income has increased over the years, but there is rapid population growth and high rural to urban migration which undermines the economic growth. In the 1980s, the GoE shifted from centralized state planning and control towards free-market economy adopting various reform programs. Since 1986/87, the Ministry of Agriculture and Land Reclamation (MALR) took active measures in reforming the agricultural sector of the economy by liberalizing production, marketing, pricing, foreign trade and investment in agriculture.

The agricultural development strategy towards the end of the next decade aimed at raising the potential of Egyptian economy to secure self sufficiency in food production, improve the capacity and competitiveness in regional and international markets, increased participation of private sector in production and export of better quality products.

The MALR is responsible in setting agricultural policies, developing appropriate legal framework and playing greater role in research and extension in a free market economy focusing on major agricultural commodities such as cereals, fiber and oil crops, sugar crops, fruits and vegetables and livestock.

Food production to meet the need of 70 million people, growing at the rate of 2.2% per year, should come from increased crop yields through intensive agriculture. High quality seed of improved varieties are considered a key input in overall strategy of the Government of Egypt (GoE) to increase agricultural production.

## The Role of Agriculture

The ancient Egyptian civilization was based on agriculture and structured farming existed as far back as 10,000 years ago around desert wells and along the Nile river. Almost all 7 million feddans (@ 1 feddan = 0.42 ha) of arable land is irrigated and crop production now comes from the 'old' land. The GoE has plans to expand arable land to 10 million feddans by the year 2020, reclaiming 150,000 feddans of 'new' land per year. However, each year about 50,000 feddans of arable land is lost to urbanization despite government efforts to maintain existing area and sustain the agricultural base of the country. In Egypt, about 95% of the average farm holdings are 5 feddans (2.1 ha) or less.

At present, agriculture employs 33% of labor force and contributes 20% of GNP. It provides livelihood for the rural population, which produces half of the

food consumed locally and most of the cotton used by the industry. Agriculture is the source of revenue and hard currency to the national economy through export of cotton, fruits, vegetables and seed. The area, production and productivity of some selected crops are shown in Table 1.

The Aswan Dam provides irrigation water, prevents flooding and controls water supply through out the year. The cropping intensity is very high (1.85 crops/year) due to availability of irrigation water throughout the year. Crop yields are relatively high and during the past 35 years steady increases have been sustained as a result of favorable climate, adequate irrigation, availability of credits and technical assistance. Although farmers have managed to produce relatively high average yields, the productivity of major crops remains below potential due to low yield of improved varieties, inadequate supply of inputs and poor crop management.

Table1: Area cultivated, productivity and production of selected crops in Egypt (1990-99)

Crop	Year	Cultivated area		Productivity		Production	
		feddan	%	Ardab	%	Ardab	%
Wheat	1990	1,954,696	100	14.6	100	28,453,663	100
	1994	2,110,943	108	14.0	96	29,578,210	104
	1999	2,379,450	122	17.8	122	42,310,944	149
Faba bean	1990	302,890	100	8.0	100	2,417,821	100
	1994	230,658	76	7.0	89	1,628,148	67
	1999	318,579	105	6.2	78	1,981,178	82
Maize	1990	1,975,815	100	18.7	100	34,275,959	100
	1994	1,739,512	88	20.1	107	34,879,590	102
	1999	1,647,870	83	21.8	117	35,886,345	105
Rice	1990	1,037,461	100	3.1	100	3,167,421	100
	1994	1,377,710	133	3.3	109	4,582,263	145
	1999	1,559,095	150	3.7	122	5,816,181	184
Cotton	1990	993,047	100	5.2	100	5,168,958	100
	1994	884,310	89	7.9	151	6,960,798	135
	1999	645,417	65	6.1	117	3,919,945	76

Note: 1 feddan = 0.42 ha

## Historical Background

The ancient Egyptians recognized seed as a key input for crop production and practiced seed selection and trade as a means to improve crop yield and quality. Manually shaken sieves were used to clean seed, baskets and silos were used to store seed mixed with fine ashes; and some seed was even supplied by specialized farmers as early as 3200 BC.

The modern seed industry began in 1922 when a Seed Production and Distribution Unit for cotton was established under the Ministry of Agriculture. The Unit was gradually evolved to a Branch (1942); Section (1957); Directorate (1960); and eventually to Under-Secretariat (1980) i.e. the Central Administration for Seeds.

Similarly, the seed laws were amended in line with the developments of the seed sector. The Seed Law No. 5 (of 1926), enacted to regulate cotton seed production and trade, was followed by Law No. 123 (of 1946) to promote seed production of major field crops. Moreover, Law No. 52 (of 1957) was enacted to regulate seed testing and handling. The Seed Law No. 53 of 1966 is an all-inclusive agricultural act and gave the Ministry of Agriculture the statutory responsibility for the seed sector in Egypt. The seed law is now amended defining the role of MALR and reflecting recent changes in the liberalized seed sector.

Seed has been recognized as an important input in raising agricultural productivity. The MALR is supporting and strengthening the infrastructure for the seed industry. During the last 15 years over LE 200 million was invested in the seed sector. Moreover, the MALR encouraged the participation of the private

sector by liberalizing the national seed sector.

At present more than 700 thousand tonnes of seed are used per year which include 450 thousand tonnes for field crops, 240 thousand tonnes for vegetatively propagated crops and 5,500 tonnes for vegetable crops.

## National Seed Industry Policy

The main objectives of the national seed industry policy is to encourage and facilitate the establishment of an efficient and effective seed sector with participation of the private investments to enhance agricultural development. The national policy is aimed at the following reforms:

- Establish an independent agency for testing and release of new varieties
- Reduce government investments and support in seed production of self-pollinated crops
- Terminate the involvement of the ARC in seed production, processing and marketing
- Evaluate pilot schemes to determine conditions for entry of private sector and bring better management and efficiency into the seed sector
- Encourage the seed producers union and seed trade association to provide a forum for exchanging views to support the national seed industry

## National Seed Council

The NSC was established by Ministerial Decree No. 820 (of 1988), but reconstituted by Decree No. 588 (of 1991) to represent all stakeholders of the seed industry and to advise the Ministry of Agriculture on policies and issues related to the seed sector. The Council is responsible to lead, guide and monitor the reform of the seed sector.

### **Permanent Committee for Variety Registration**

The technical and administrative procedures for variety registration were modified and its management transferred from ARC to CASC. Decree No. 937 of 1995 was issued to broaden its functions and membership, which include heads of research institutes (ARC), CASC and representatives of Egyptian Seed Association and four seed companies. Decree No. 867 of 1997 assigned responsibility of variety description tests (DUS) and variety performance tests (VCU) to CASC. Decree No. 82 of 1998 establishes the policy and provides guidelines on procedures for the release of crop varieties developed by ARC. The decree envisages the establishment of Variety Release Advisory Committee consisting of 9 members drawn from ARC (3), private seed companies and ESAS (3), CASP (1), CASC (1) and the Egyptian Association of Plant Breeders (1).

### **Agricultural Crop Seed Committee**

The Committee is working within the framework of Seed Law No. 53 (of 1966) and Ministerial Decree No. 726 (of 1993) regulating seed export (packaging, sealing, issuing international certificates) and Ministerial Decree No. 700 (of 1994) regulating seed import. Both decrees amend Decree No 90 and 91 of 1967 for seed export and import respectively.

### **Seed Laws and Regulations**

The Seed Law No. 53 of 1966 is an all-inclusive agricultural act and covers: (a) organization of crop production, (b) registration of crop varieties, and (c) seed production and marketing. The Law and related Ministerial Decrees issued pursuant to provisions in the law include allocation of seed production areas (zoning), establishment of seed processing facilities, quality control and certification and

control of seed trade. In 1967 several decrees were issued including Decree No. 25 (seed production of agricultural crops), Decree No. 87 (crop seed processing stations), Decree No. 88 (processing and treatment of cotton seed), Decree No. 89 (control of cotton seed for industrial purposes), Decree No. 90 (seed testing), Decree No 91 (import and export of seed). The Law gave the Ministry of Agriculture the statutory responsibility for the seed sector in Egypt.

CASC has reviewed all relevant seed laws, updated and prepared a comprehensive draft law for enactment by the legislature. Gaps in the seed law related to rules and standards for field inspection, certification of seed and planting material, seed trade and market control will be issued in respective decrees. A draft law for the intellectual property rights including a separate section on plant breeder's rights is prepared and will be ratified in the near future.

Some of the key Ministerial Decrees issued to improve the seed industry are listed below:

- a. Ministerial Decree No. 293 of 1990 dealing with field inspection of seed crops
- b. Ministerial Decree No. 726 of 1993 covering the control of seed export
- c. Ministerial Decree No. 1517 of 1993 defining certification of horticultural, medical, aromatic and vegetatively propagated crops
- d. Ministerial Decree No. 513 of 1994 setting rules and conditions for certified seed production of agricultural crops
- e. Ministerial Decree No. 1550 of 1994 setting field inspection standards for certification of field crops and vegetable crops
- f. Ministerial Decree No. 1064 of 1995 specifying crops to be registered for seed production

- g. Ministerial Decree No. 926 of 1995 reorganization of CAS and the establishment of CASP and CASC as separate organizations
- h. Ministerial Decree No. 706 granting legal authority for seed marketing control officers of CASC
- i. Ministerial Decree No. 38 of 1997 assigning CASC as the official seed certification authority stipulating various operations of the seed industry (handling, processing, storage, trade, import, export)
- j. Ministerial Decree No. 326 of 1997 setting standards for seed-borne diseases
- k. Ministerial Decree No. 867 of 1997 assigning CASC the responsibility for coordinating variety description tests (DUS) and variety performance tests (VCU). It limits the role of public research to produce parental material and breeder seed.
- l. Ministerial Decree No. 868 of 1997 authorizing CASC to set specifications for seed packages to control fraud. It prohibits seed trade except for those involved in seed production.
- m. Ministerial Decree No. 82 of 1998 defining crop variety registration protocols and procedures
- n. Ministerial Decree No. 368 of 1998 setting seed testing standards and procedures for certification
- o. Ministerial Decree No. 1648 of 2001 determining the testing period for new vegetable varieties imported from OECD countries

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

The Agricultural Research Center (ARC) represents the principal agency within the Ministry of Agriculture and Land Reclamation responsible for technology generation and transfer to Egyptian agriculture. It

represents one of the largest infrastructures dedicated to research and development in the agricultural sciences. The focus of future research programs has been defined by a number of strategic and challenging national goals set for Egyptian agriculture: (i) bridge the food gap and increase self-reliance; (ii) optimize crop returns per unit of land and water; (iii) expand foreign exchange earnings from agricultural exports; and (iv) enhance sustainability of agricultural resources.

### **Variety Development**

The ARC has a primary responsibility for agricultural research, crop improvement and variety testing throughout the country. The main field crop breeding programs are cereals, legumes, fiber crops, oilseed crops, fodder crops and sugar cane. The ARC has 16 research institutes and 6 central laboratories with 46 experimental research stations (10 regional and 36 specialized stations) throughout the country. They represent a huge testing network as well as outreach facilities for the implementation of ARC research programs under diversified environmental conditions. In addition, the ARC manages breeder and foundation seed production on its own farms totaling 27,000 acres under the supervision of the Horticultural Services Unit.

Further more, the Food and Agriculture Council, the National Research Center, and the Agricultural Faculties (16) also have limited crop improvement research. More recently, the private sector started introducing and testing foreign bred varieties. Eight seed production companies are licensed to acquire research stations.

### **Variety Release and Registration**

According to Seed Law No. 53 of 1966 and Ministerial Decree No. 935 of 1988, all agricultural and vegetable crop varieties

in Egypt should be tested through the MALR variety trial system before approval for seed production, marketing and certification. The Ministerial Decree No. 82 of 1998 specifies the protocol for variety testing and evaluation for different crops. A minimum of three years is required for DUS and VCU tests. Vegetable varieties imported from OECD member countries should be tested for

adaptability for not longer than one year. About 217 varieties of 27 field crops and 335 varieties of 28 vegetable crops have been registered under the supervision of ARC. ARC developed the majority of field crops and smaller number of vegetable crop varieties. The varieties under certification are shown in Table 2.

Table 2: List of varieties under certification in Egypt (2000)

Crop	Number of varieties	Crop	Number of varieties
<b>Field crops</b>			
Barely	6	Wheat	24
Rice	11	Maize	67
Sorghum	13	Millet	1
Chickpea	2	Lentil	4
Mung bean	1	Cowpea	4
Faba Bean	12	Sesame	6
Peanut	3	Flax	2
Canola	1	Soybean	6
Sunflower	7	Cotton	15
Teosinte	1	Sugar cane	7
Sugar beet	19	Gouar	1
Lablab	1	Alfalfa	6
Berseem clover	9	Sorghum x Sudan	8
Sudan grass	1	Fodder Cowpea	1
<b>Vegetables</b>			
Artichoke	2	Asparagus	2
Bean	19	Cucumber	52
Garlic	1	Cantaloupe	9
Cabbage	2	Cauliflower	1
Carrot	8	Eggplant	18
Hibiscus	1	Okra	1
Onion	4	Lettuce	8
Faba bean (veg.)	4	Radish	3
Sweet melon	22	Sweet potato	4
Strawberry	5	Pepper	34
Potato	74	Pea	7
Tomato	67	Squash	8
Water melon	16	Turnip	1
Table beet	2	Spinach	1

### **Variety Maintenance and Breeder Seed Production**

Variety maintenance and breeder seed production is carried out under the direct supervision of the breeder. For cereal crops such as wheat a head to row method is used for variety maintenance. The seed retained from rows is bulked for initial increase under rigorous rouging. Seed from the initial multiplication is planted on selected fields to produce breeder seed - a source for foundation seed and later generations.

### **Seed Production**

In Egypt, the Association of Official Seed Certifying Agencies (AOSCA) seed certification scheme is followed. There are four classes of seed production, namely; breeder, foundation, registered and certified seed.

#### **Foundation Seed Production**

ARC has a special unit, which manages foundation seed production of each crop or group of crops under breeder supervision. Foundation seed is produced on state farms; inspected by CASC; and processed, stored and distributed by ARC.

However, for cotton foundation and registered seed is produced on state farms under ARC supervision, processed at Sakha and distributed according to variety zoning. The ARC also produces almost all inbred lines of single crosses used by private companies to produce hybrid seed.

#### **Registered and Certified Seed Production**

Registered and certified seed is produced on contract with seed growers. The Central

Administration for Seed Production (CASP) and private seed companies organize contracts and supervise seed growers

The Central Administration for Seed Production (CASP) implements government seed production policies; advises ARC on foundation and registered seed requirements; plans, contracts and supervises certified seed production; and coordinates seed processing and storage to minimize transportation costs; seed marketing and distribution; and assist the transfer of public sector facilities to the private sector. CASP has four general directorates: (1) Processing, (2) Seed Marketing and Distribution, (3) Seed Production in the Governorates, and (4) Commercial Affairs. CASP has the seed market share of 100% for cotton, barley and lentil, 67% for rice and 65% for wheat seed.

There are 99 registered private seed companies specialized in maize, sorghum, sunflower, vegetables and forages (alfalfa, berseem clover, sorghum x sudan grass). Some seed companies have established seed processing facilities whereas others use government plants on contract.

EAO handles about 25% of the vegetable seed imported into the country.

While almost all agricultural crop seed is handled by the public sector in 1991, this figure has changed dramatically in 2000 (Table 3).

The Central Administration for Seed Certification and Testing (CASC) inspect the fields, test the quality and certify the seed. The relatively small average farm size, however, is a major impediment for seed production.

Table 3. Share of the public and private sector in seed production

Crop	Share of Public sector (%)		Quantity distributed in 2000
	1991	2000	
Wheat	100	67	344,000
Rice	100	65	160,000
Faba bean	100	82	6,358
Soybean	100	10	669
Barley	100	100	1000
Lentil	100	100	53
Cotton	100	100	180,000

### Seed Processing and Storage

Seed processing facilities are widely distributed throughout the country and owned by both public and private seed companies and agricultural research center. The processing capacity of public and private seed enterprises is shown in Table 4. In addition, there is also a cottonseed delinting plant with a capacity of 5 tonnes/h.

#### Seed Processing

The Egyptian Agricultural Authority (EAO) is responsible for seed processing facilities. CASP coordinates allocation of seed processing operations to different plants in ARC, CASP and EAO to minimize transportation costs. The Processing Department of CASP monitors seed cleaning in each plant to ensure timely operation and minimize contamination. Foundation and registered seed is processed in ARC plants including some certified seed for CASP and private companies on contract. Some private

companies process seed of maize, sorghum, sunflower and clover.

CASP supports the transfer of some seed plants established under GTZ/CAS Seed Project to seed centers that can operate as profit centers after a scheduled transitional period. They will start as a pilot project, serve as examples for business units, and will operate under independent management.

Table 4. Quantity of seed processing facilities available

Institution	Number	Capacity
CASP	18	115
EAO	8	68
ARC	9	42
Private Sector	20	90
<b>Total</b>	<b>55</b>	<b>322</b>



The changes in cotton sector have the greatest impact on the cottonseed supply system where farmers become free to plant as much area as they wish, and to market the production as seed or fiber to the gineries, export companies or the government based on competitive prices. The traditional seed rate for cotton is reduced from 60-70 to 25-30kg/feddan for mechanical delinted seed and 20kg/feddan for acid delinted seed. Cotton seed production, processing and marketing have become substantially liberalized, and could be one of the most profitable operations in the Egyptian seed sector.

### **Seed Storage**

The present storage capacity is 100,000 tonnes including an open storage with a capacity of 75,000 tonnes. It is estimated that about 5% of seed is damaged during storage before distribution to farmers. These facilities do not maintain the viability of undistributed seed and/or carry-over seed, which may be as much as 20% in some crops. The estimated seed storage requirement may reach 150,000 tonnes: 113,000 tonnes in the Delta and 37,000 tonnes in Upper Egypt. CASP is renovating existing seed storage facilities and is planning to build additional stores with a capacity of 96,000 tonnes. CASP has invested substantially to improve both the processing and storage facilities from 1992 to 1995.

### **Seed Marketing and Distribution**

**T**he current seed market in Egypt is worth LE 1.04 billion [domestic (980 million) and international (60

million)] equivalent to one third of the Indian seed market. Field crops account for LE 640 million domestic market whereas vegetables occupy LE 300 million. Clovers and vegetables each account LE 30 million in international seed market.

### **Credit Facilities**

In the past the Principal Bank for Development and Agricultural Credit (PBDAC) provides credit and was responsible for storage and distribution of certified seed. However, the role of PBDAC has been reduced to a financial agency for the seed industry.

### **Seed Marketing**

Seed marketing and distribution is transferred to the cooperatives and private sector. CASP has a commercial department which is responsible for setting prices and marketing its seed.

### **Seed Distribution**

Seed is packaged in small woven polypropylene bags for almost all crops and in all seed plants. Both public and private seed producers distribute their seed through cooperatives, licensed seed dealers and extension. The amount of certified seed of major crops processed and distributed is shown in Table 5.

Table 5. Quantity (ardab)<sup>†</sup> of seed processed and distributed from 1992/93 to 1999/00

Crop		Year		
		1992/93	1994/95	1999/2000
Wheat	Processed	460,769	380,473	297,064
	Distributed	403,039	375,870	230,454
Barley	Processed	8,421	6,620	3,003
	Distributed	8,238	6,620	2,067
Rice	Processed	257,028	195,449	177,099
	Distributed	234,863	178,149	175,744
Maize	Processed	125,350	89,678	18,333
	Distributed	34,850	51,178	17,766
Lentil	Processed	4,227	740	52
	Distributed	2,082	701	52
Faba bean	Processed	46,562	17,980	5,230
	Distributed	13,012	12,885	5,230
Sesame	Processed	268	36	54
	Distributed	101	36	54
Peanut	Processed	1,757	918	608
	Distributed	1,757	1,541	598
Soybean <sup>‡</sup>	Processed	1,113	1,308	95,480
	Distributed	964	796	37,660
Onion	Processed	479	81	175
	Distributed	104	81	78
Cotton	Processed	872,387	233,075	208,657
	Distributed	495,405	221,213	152,980

Note: <sup>†</sup>One ardab is equivalent to 160kg (lentil), 155kg (faba bean), 150kg (wheat), 140kg (maize), 120kg (barley, rice, sesame, cotton), 102kg (onion), 75kg (peanut); <sup>‡</sup>Quantity is in tonnes

Table 6. Comparison of grain and seed price in 2001 crop season

Crop	Unit	Grain price LE/Ardab	Seed price LE/Ardab
<b>Cereals</b>			
Wheat	Ardab (150 kg)	95	225
Barley	Ardab (150 kg)	75	120
Rice	Ardab (120 kg)	84	179
<b>Legumes</b>			
Faba bean	Ardab (155 kg)	200	374
Lentil	Ardab (160 kg)	350	425
<b>Oil crops</b>			
Soya bean <sup>a</sup>	tonne	1230	1386
Sesame	Ardab (120 kg)	380	520
Peanut	Aardab (75 kg)	100	165

Note: <sup>a</sup> Soya bean prices are quoted per tonne

## International Seed Trade

About 73 companies are registered for seed import and 76 for seed export. Both seed importing and exporting companies deal with wholesale marketing and distribution of seed. Some produce vegetable seed locally, but most of the seed is imported mainly from Denmark, France, Holland, Japan, UK and USA. Seed is exported to the Gulf countries, Pakistan and Europe.

## Seed Quality Control and Certification

The Central Administration for Seed Testing and Certification (CASC) implements seed quality control, certification and law enforcement. It has five general directorates: (1) Seed Measures and Development, (2) Field Inspection, Testing and Retesting, (3) Seed Testing Affairs in the Governorates, (4) Gins and Oil mills; and (5) Seed Certification. The main responsibilities are variety registration and plant breeders' rights; seed certification; seed market control and law enforcement; licensing of seed producers, processors, traders and dealers; and seed industry support, training and promotion. CASC also serves as technical secretariat for variety registration, crop seed and other specialized councils and their sub-committees (e.g. seed and cotton councils).

### Seed Certification

Seed certification is conducted according to standards established in various decrees: (1) conditions and procedures for licensing seed production (Decree No. 513 of 1994); (2) field standards for seed certification of major crops (Decree No. 1550 of 1994); (3) seed testing rules and standards (Decree No. 90 of 1967); legal tool for

organizing seed certification, trade, import, export, processing and storage (Decree No. 38 of 1997) and seed health testing standards for seed-borne diseases (Decree No. 236 of 1997).

### Seed Law Enforcement

All seed is subject to inspection during marketing and distribution whether certified or not, and whether produced by public or private sector institutions. All imported seed is not certified locally unless requested, but should meet the requirements of Law No. 53 of 1966 and Ministerial Decrees promulgated there under. Most vegetable seed for export is not certified, but firms are responsible to ensure quality and use their brand names to maintain market acceptance. Seed legislation is under continuous review to meet the developments of the seed industry.

CASC administers seed certification and law enforcement units in all governorates through 22 regional seed certification directorates and three main (Giza, Tanta and Minia) and nine regional (Alexandria, Assuit, Benisuef, Damanhor, Mansoura, Quesna, Quena, Sakha and Zagazig) seed testing stations. All seed testing stations are well equipped and computerized. ISTA procedures and methods are used to ensure reliability, uniformity and efficiency of seed testing. Control plot testing is carried out in Sakha and Sids to verify seed lots used for further seed multiplication and monitors the efficiency of seed certification (field inspection). CASC charges fees for field inspection, seed testing and for licensing seed producers and traders.

### Privatization of the Seed Sector

The private sector has been dominant in production, import and distribution of vegetable and forage seed. They also have already gained a major share in the supply of hybrid seed of maize, sunflower and sorghum. Moreover, the private sector began producing seed of self-pollinated crops such as wheat, rice and faba bean where the share now reached 30-40% of the commercial seed market.

of seed production and marketing in public and private sectors.

There is also a plan to privatize all public seed production within three years where evaluation of the assets and legal status are under discussion. At present there is ongoing discussion for privatization of state controlled seed production by merging the Horticultural Services Unit, the Egyptian Agricultural Organizations (EAO) and CASP into a share holding company with MALR (24%), employees (40%) and the private sector (36%).

The GTZ seed project has gathered essential data from two seed centers to study the costs and prices of wheat and rice, the major self-pollinated cereal crops in the pilot projects. The costs include depreciation and maintenance of facilities as well as variable costs associated with seed production including premium for seed growers, operational, labor, transportation, interest, management and other costs. The preliminary findings show that grain price for wheat and rice is 95 and 84 L.E/ardab whereas the corresponding certified seed prices are 225 and 179 L.E/ardab.

The GTZ Seed Project is also studying a transportation cost model for seed to identify the relative efficiency of alternative locations of seed production and processing centers. This will provide information for the decision required for further reform in the seed sector, and for improving the management and efficiency

## **Seed Research, Training and Extension**

The infrastructure for seed research, training and extension have been established and relatively functional.

### **Seed Technology Research**

The Seed Technology Center of ARC is responsible to conduct research on seed science and technology focusing on practical problems of seed production under Egyptian condition. Some institutions of higher education such as Ain Shams, Alexandria and Cairo universities conduct seed research and offer seed courses at undergraduate and graduate level for students specializing in agronomy or crop science.

The seed sector in Egypt has considerable support from GTZ and USAID to reform its program and human resource development. A substantial number of staff has been trained in both at post-graduate level and short courses in USA, Europe and at the Seed Unit of ICARDA.

### **Seed Extension and Promotion**

A Seed Extension Department has been established at CASC main office in Giza and Sections in the governorates. The subject matter specialists are being trained to provide the village extension officer with relevant information on the benefits and use of certified seed.

### **National Newsletter**

Since 1997, Egypt has launched a quarterly bulletin of seed industry to facilitate information exchange. The newsletter covers scientific articles related to seed science and technology as well as

up-to-date statistics on seed production, imports and exports.

## **National Seed Trade Associations and International Membership**

In Egypt, a number of professional associations have been established to promote the interest of its members. Moreover, Egypt is actively pursuing membership in international organizations to modernize and promote its seed sector.

### **National Seed Association**

The Egyptian Seed Association (ESAS) was established in March 1998 as a not-for-profit organization according to Law 32 of 1964. The founding members include plant breeders and seed producers, traders, importers, exporters, etc. ESAS was established to represent the interests of its members under the economic reform program being implemented in Egypt. The goal is to create a liberalized and integrated seed industry conducive to private sector investment for the benefit of farmers and agricultural development in Egypt. ESAS will cooperate with government to improve the regulatory framework and build a competitive environment for the seed industry. The association is expected to play a leading role in seed production and supply in Egypt. ESAS has a newsletter to facilitate exchange of information among its members and the public at large.

To promote the interest of plant breeders the Egyptian Plant Breeders Association was also established in Egypt.

### **International Membership**

Egypt is a member of the International Seed Testing Association since 1952. The Giza Seed Testing Station become an

accredited member of ISTA and issues international certificates.

Egypt is a member of OECD Seed Schemes for cereals, maize and sorghum and vegetables. Application for membership in herbage and oil seed is submitted to OECD and is under review.

The national seed trade association, ESAS, is a member of International Seed Federation (FIS), African Seed Trade Association (AFSTA) and Asia Pacific Seed Association (APSA).

Egypt is a founding member of the WANA Seed Network and plays a key role as it holds the chairmanship of its Council and Steering Committee.

## Conclusion

The Ministry of Agriculture and Agrarian Reform has started the liberalization or privatization of the seed sector in a gradual and coordinated manner. It restructured and reorganized the Central Administration for Seeds and the entire seed sector and took active measures to implement the economic reform program in the agricultural sector. The agricultural reform programs can be summarized as follows:

- Removing government control on farm output prices, crop areas and procurement quotas for all crops
- Increasing farm gate prices for cotton and sugarcane to international market level
- Removing agricultural input subsidies for farmers
- Lifting government restrictions on private sector import, export and market of farm inputs and agricultural crops
- Changing the role of PBDAC to the agricultural credit agency

- Limiting public ownership of land and selling reclaimed land to private sector and adjust land tenancy system
- Limiting the role of MALR to agricultural research, extension and economic policies

The economic reform program aims at releasing the agricultural sector from all restrictions and distortions, improving agricultural trade; stimulating private

sector participation; encouraging use of modern technology; increasing cultivated land, productivity, farm income and exports to raise the share of agriculture for economic and social development of the country. Moreover, the reform will make

high quality seed of improved varieties available in sufficient quantity, at reasonable price, at the right place and time to serve the seed industry in Egypt.



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