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Ministry of Agriculture and Land Reclamation

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Report No. 101

PRODUCTION AND MARKETING OF SELF POLLINATED SEEDS: STEPS TO INCREASE THE PRIVATE SECTOR'S SHARE



APRP

Reform Design and Implementation Unit

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RDI REPORTS

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SECTOR'S SHARE**

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ACRONYMNS

APRP	Agricultural Policy Reform Program
ARC	Agricultural Research Center
CAS	Central Administration for Seed
CASC	Central Agency for Seed Certification
CASP	Central Agency for Seed Production
CIMMYT	International Maize and Wheat Improvement Center
DAI	Development Alternatives, Inc.
EGA Seed	Egyptian Agricultural Company for Seed Production
EMCIP	Egypt Major Cereals Improvement Project
ESAS	Egyptian Seed Association
FCRI	Field Crops Research Institute
GTZ	German Technical Assistance Program (Deutsche Gesellschaft Fur Technische Zusammenarbeit)
HSU	Horticultural Services Unit
MALR	Ministry of Agriculture and Land Reform
MRP	Maize Research Program
PBDAC	Principal Bank for Development and Agricultural Credit
RDI	Reform, Design and Implementation Unit (of APRP)
SPV	Self-Pollinating Variety

EXECUTIVE SUMMARY

Egypt has made outstanding advances in the production of field crops during the past two decades, due especially to productivity increases from improved crop varieties. Improved varieties have been introduced via production and distribution of certified seed.

Initially, all certified seed was produced by a government agency. In 1981, the decision was taken to allow private seed companies to produce certified maize seed. Private production of seed for the self-pollinating crops wheat, rice and faba bean was encouraged starting in 1994.

This study reviews the current status of seed production and marketing for self-pollinating varieties (SPVs) and examines constraints to an expanded role for the private sector. The study also seeks to assess the capability and readiness of the private sector to replace government production of self-pollinating seeds.

Findings

While private sector production of self-pollinating varieties has expanded steadily since 1994, it amounts to only about 30% of total national production today.

Initially, most privately produced seed had to be processed in government plants, and private production was limited by available plant capacity. Since then, however, additional private capacity has been installed. Six companies already have processing facilities, and two more plants are due to be completed this year, bringing total private processing capacity to more than 35 tons per hour. With this capacity, private seed companies will be able to produce an amount equal to 100% of the rice seed and about 90% of the wheat seed that farmers have purchased from the market in recent years.

The private sector has rapidly established a system for marketing the seeds that it produces. About 74% of total private production is distributed either through direct sales to farmers or through private merchants. The balance is distributed through cooperatives, Agricultural Councils, and the Principal Bank for Development and Agricultural Credit (PBDAC). Experience to date with seed and other inputs such as fertilizer and chemicals indicates that the private sector is capable of marketing all of the national seed requirements. The fact that more than twenty private seed companies have begun to produce SPVs in just six years demonstrates the responsive and competitive nature of the private seed sector.

The private sector's share of the market has been limited by several factors:

- Uncertainty about how much seed the government's seed agency, the Central Authority for Seed Production (CASP), will produce has been a serious restraint to the private sector.
- Problems in the planning of production and in the distribution of *registered seed* have limited privatization in the production of certified seed. The availability of registered seed is determined largely by ARC, through the Cereals Council, in conjunction with CASP.

- CASP allocates the registered seed once it has been produced. Consequently, the private companies cannot always get the registered seed they need. CASP's control of the distribution of private seed represents a conflict of interest.
- Due to its large size, CASP's seed prices dominate the market. The procedures used to set these prices do not take all costs into account, which means that they limit the incentive for private companies to enter the market.

Recommendations

- I. A stronger system for planning the production and for the distribution of registered seed is needed. It is recommended that the duties and responsibilities of the *Cereals Council* be strengthened and expanded for these purposes.
 - i) It is recommended that the membership of the Cereals Council be expanded to include several representatives of private seed companies and a representative of the Egyptian Seed Association, ESAS.
 - ii) A stated goal of the Council would be to allocate decreasing quantities of foundation seed to CASP and increasing quantities of foundation and/or registered seed to the private sector each year over the next three years. By the third year the private companies would be expected to produce all of the certified seed for wheat, rice and faba beans.
 - iii) The quantities of foundation and registered seed available to CASP, and CASP's targets for the production of certified seed, would be announced well before the planting time for each crop, so that the private sector could develop their plans and requests for seed.
 - iv) The Council's plans for registered seed production should be based on written requests from private companies and CASP, as well as on the recommendations of plant breeders and extension specialists for each variety. Production of additional amounts of registered seed would be planned in some cases, to allow for market growth.
 - v) The actual production of the registered seed would be carried out as authorized by the Cereals Council. When possible, and as the demonstrated capabilities of the company merit, the Council would allow private seed companies to produce their own registered seed from foundation seed supplied by the Agricultural Research Center (ARC). The ARC would supervise such registered seed production.
 - vi) Until the private sector demonstrates its capability to produce all of the required registered seed, the Council will specify additional amounts of registered seed to be produced by CASP or by the Seed Unit of the ARC Field Crops Research Institute.
 - vii) Well before planting each year, the Council would authorize the distribution of the quantities of registered seed that had been requested in the previous year. It would announce the additional quantities available and take requests from the private sector and CASP for the amounts of seed they would like to purchase.

- viii) If more registered or foundation seed is requested than is available for any given variety, the Cereals Council would allocate the available amount among those requesting it, based both on principles of fairness and upon each company's demonstrated capabilities.
 - ix) If private sector requests for registered and/or foundation seed do not amount to enough to supply demonstrated market requirements, plus a reasonable margin for carry-over, additional CASP production would be authorized to fill the gap.
2. It is recommended that the system of exclusive releases be considered for self-pollinating crops in cases where it is merited in the opinion of researchers and the Variety Release Advisory Committee.
 3. Until CASP is privatized, it is recommended that the government require that CASP's seed prices reflect the full costs of seed production including depreciation, interest, and all personnel and overhead costs.
 4. When CASP is privatized, it is recommended that the agency be sold as a number of separate components rather than as a single entity. This would prevent the creation of a company so large that it would have the power to monopolize the market.
 5. After CASP is privatized, it is recommended that the resulting private companies be required to operate like all other private companies. They should not be permitted to retain any special advantages, such as control of registered seed, or have any authority to use government resources.

INTRODUCTION

Egypt has made steady progress in the production of field crops during the past two decades. Yields of wheat, rice and faba beans have all increased by about 50% during this period, as illustrated in the diagram on the following page. While there are many reasons for the production increases, much of the success is due to the introduction of improved crop varieties. The introduction of improved varieties has been greatly facilitated by the production and distribution of certified seed. Thus, the seed industry has played an important role in Egypt's continuing agricultural development.

During the period of production and productivity gains, agriculture has been the leading sector in the Government of Egypt's efforts to move the economy from public sector dominance toward private production. The goal of this process is to draw upon the advantages of greater private productivity and more efficient markets. Many economic activities that were once carried out by public sector organizations have gradually been shifted to the private sector. This has affected the production and distribution of agricultural inputs, including seeds. At one point, the public sector was responsible for almost all certified seed production, but the private sector has taken on an increasingly important role.

The shift to private seed production has proceeded at different rates for different categories of seed. For vegetable seed, the private sector has traditionally played the leading role. While many vegetable seeds are imported, private companies do almost all of the local production and distribution. For maize seed, the government monopolized production until 1980, when private involvement was first encouraged. More than 20 private companies have now entered into maize seed production, and over 85% of hybrid maize seed is now produced by the private sector.

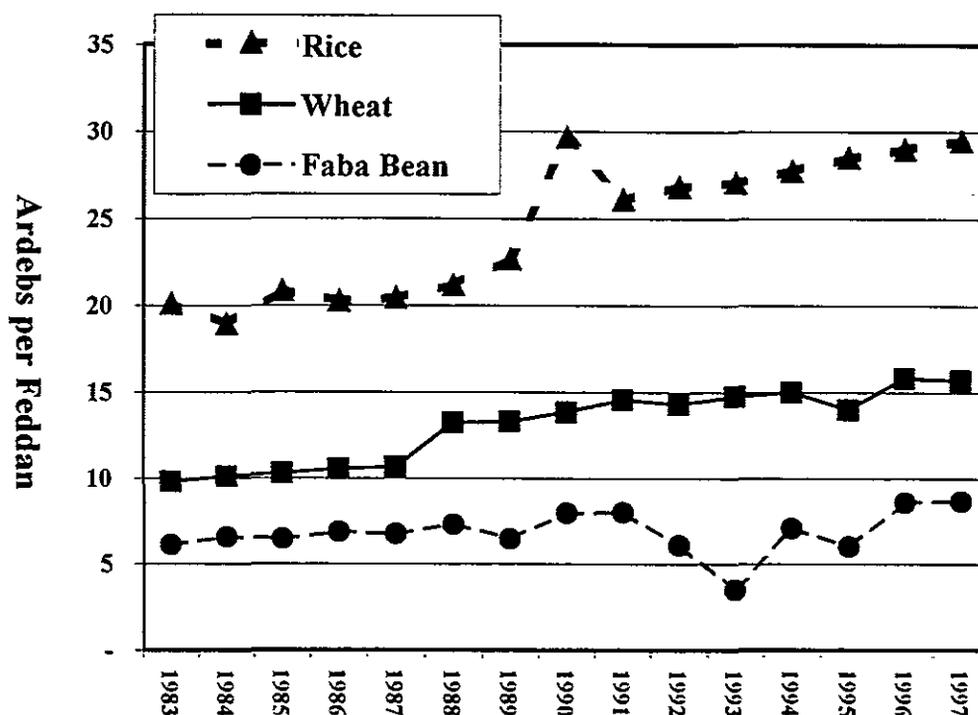
For wheat, rice and faba beans, the movement toward privatization has been slower. The public sector continued its monopoly of these seeds until 1994, when private companies were first encouraged to begin production. Private production has gradually increased; however, the public sector still produces some 70-75% of the wheat and rice seed. And although it is outside the scope of this study, the public sector still controls production of all cotton seed.

Some observers contend that the public sector's continued dominance of wheat and rice seed production is normal and justified because these crops are *self-pollinating*. Once a farmer obtains one batch of good seed for these self-pollinating varieties, he can easily produce his own seed in subsequent years, thereby reducing the size of the market and the potential profits to be gained by specialized seed companies. This contrasts with *hybrid* seed commonly used for *cross-pollinated* crops such as maize and many vegetables. Hybrid seed cannot be easily reproduced by farmers and must be purchased from the market each year. This provides one explanation why private seed companies tend to invest more in producing hybrids and less in SPVs.

Other observers contend that the self-pollinating nature of rice, wheat and faba bean seeds is not an adequate explanation for the slow pace of privatization in their production. They point out that in many countries the production of such seeds is carried out by private

companies. While farmers often do save a part of their production to be used as seed in future years, they also buy new certified seed every three years or so in order to obtain the latest varieties and renew their seeds' vigor.

Figure 1: National Average Yields for the Self-Pollinating Crops (1983-1997)



Over the past few years, several Egyptian companies are reported to have made profits selling SPV seeds, showing that private sector production is feasible. However, the public sector continues to produce and distribute self-pollinating seeds in large and unpredictable quantities, which makes it risky for private companies to enter the business or expand their production.

In 1998, the Egyptian Seed Association (ESAS) communicated to the government its hope that the government would withdraw from self-pollinating seed production in order to encourage and allow the private sector to take over this portion of the seed market. The National Seed Council responded by requesting that ESAS develop and propose a schedule that would allow the private sector to gradually replace public production in a way that would ensure the availability of a continuous supply of seed to farmers.

Purpose and Objectives of the Study

The purpose of this report is first to assess the current situation in the production and marketing of certified seed for wheat, rice and faba beans -- the market shares and marketing practices of the private and public sectors in the production of these seeds.

Specific objectives of the study are to:

1. Assess the capability and readiness of private seed companies to replace government production of self-pollinating seeds.
2. Identify constraints to an expanded private sector role in producing such seeds.
3. Recommend steps to overcome these constraints.
4. Develop, in cooperation with ESAS and the government, a practical schedule for the gradual transfer of responsibility for SPV seed production to the private sector.
5. Identify the likely advantages and disadvantages of implementing this transfer.

Study Procedures

To carry out its assignment, the study team visited with relevant officials of the Ministry of Agriculture and Land Reform (MALR), the Central Agency for Seed Production (CASP), the Central Agency for Seed Certification (CASC), the Agricultural Research Center (ARC), and eight of the private seed companies. Visits were also made to private traders and agricultural officials in three governorates to review the current situation of seed distribution and marketing. Discussions were also held with researchers, extension specialists and farmers at the ARC's Rice Research Center in Kafr El Sheikh. A complete list of organizations and persons visited is provided in Annex A. Relevant literature and statistics were also reviewed.

ISSUES AND CONCERNS

In the course of the study team's visits with the private companies, government agencies, and officials, various concerns were expressed, and problems were identified.

Government officials and others familiar with Egyptian agriculture voiced numerous concerns about private sector production:

1. Many feel that the private seed companies lack the infrastructure (seed plants, research capabilities) necessary to meet the demand for self-pollinating seeds.
2. It is often stated that the private companies have inadequate marketing capabilities and that they rely heavily on government extension agents and PBDAC (the government agricultural bank) to do their marketing.
3. Others fear that if they are allowed to expand and replace public sector production, the private companies will behave monopolistically.
4. There is concern that if the private sector is allowed to expand its production, seed quality will be compromised. A specific fear is that small seed companies with inadequate facilities and without internal quality control procedures are detrimental to seed quality.

The private seed companies expressed a somewhat different set of concerns. They maintain that:

1. The government's seed company, CASP, controls the distribution of registered seed, and the agency does not produce enough registered seed, or enough of the right varieties, to meet the private sector's need.
2. Uncertainty about what CASP will produce makes seed production and marketing very risky for private companies, especially considering their small size and limited resources in comparison to CASP.
3. Because CASP dominates the market, the prices it sets for seeds must be followed by private companies, but CASP prices do not reflect the full cost of production.
4. CASP does not always produce enough registered seed. As a consequence, CASP and the private companies have sometimes been forced to produce certified seed from certified seed, rather than from registered seed.
5. The government certifying agency, CASC, is inconsistent in carrying out its duties.
6. Access to marketing channels is unequal, and CASP has an unfair advantage in being able to enlist extension agents in the marketing of their seed.
7. Large seed companies complain that it is unfair that small companies with inadequate facilities (infrastructure) and low costs are allowed to produce seed and undercut them in the market by selling at low prices.
8. The government, and CASC in particular, does not do a good job of disseminating statistics about seed production or about the quantities of seed that are certified and distributed each year.
9. The companies are uncertain and afraid of what will happen with regard to the long-promised privatization of CASP.

The plant breeders who are responsible for the research and development of new varieties have still different concerns:

1. Above all, they want to see a safe, reliable system for seed production and certification, to ensure that the farmers can obtain high-quality, reasonably priced seed of appropriate, high-yielding varieties, when they need it.
2. They want to see a seed industry that is dynamic and that will not only respond to farmers' needs but is prepared to distribute new varieties as soon as they are developed and registered. The plant breeders and the Minister of Agriculture want to be assured that a high proportion of the area for self-pollinating crops is covered with new, certified seed each year, according to the planned varietal policy.
3. They want a system that makes it possible to change varieties quickly in response to whatever plant pest and disease problems may emerge.

CERTIFIED SEED PRODUCTION AND MARKETING IN EGYPT

Plant Breeding Research and Development

Plant breeding, an important aspect of modern agricultural science, is the basis for developing new crop varieties that are capable of high yields and are resistant to pests and diseases. In Egypt, the main responsibility for plant breeding research lies with the Agricultural Research Center (ARC) of the Ministry of Agriculture and Land Reform (MALR). However, breeding research is also conducted in some of the colleges of agriculture at Egyptian universities. Some of the private seed companies have established their own breeding development programs for certain crops, particularly maize and vegetables.

In breeding improved crops, it has been common to import basic germplasm from other countries and to then conduct research to select and develop varieties suitable to local conditions. Of particular concern is compatibility with the local climate and resistance to local pests.

In the case of wheat, progress in variety development came from collaboration between ARC and the International Maize and Wheat Improvement Center (CIMMYT), which began in 1966. This effort provided Egypt with a broad spectrum of germplasm, particularly dwarf varieties from Mexico, India and Pakistan. There has been similar cooperation with the International Rice Research Institute (IRRI). Wheat, rice and faba bean research all benefited greatly in the 1980s from the USAID-sponsored Egypt Major Cereals Improvement Project (EMCIP).

When the development and testing of a variety reaches the point at which the breeder believes it is ready for commercial introduction, application is made to the Variety Registration Committee of MALR to have the variety officially evaluated and registered. Imported varieties may also be registered, as has been done for many vegetables and numerous maize and sorghum varieties. Only registered varieties may be produced for sale as certified seed.

The Wheat Section of the Field Crops Research Institute (FCRI) of ARC currently has some 15 varieties of bread wheat registered for commercial production, in addition to 4 varieties of durum. Recently, emphasis has been placed on developing varieties that are resistant to "yellow" or stripe rust, after this became a problem with Sakha 69, a variety long popular with Delta farmers. Another concern of breeders has been the emergence of "loose smut," another fungal disease. Some of the available varieties have been bred specifically for conditions in Middle and Upper Egypt, where heat tolerance is of concern. Other varieties have been bred for tolerance to salinity. Several recent releases are long-spiked varieties.

There are 10 varieties of rice currently registered for commercial production, all of which were developed by breeders in the Rice Section of the FCRI. The main emphasis in breeding has been for resistance to blast, a fungus disease, and the development of short season varieties. Several recent releases mature in 120 days, as opposed to the 150 days which has been common in Egypt. The short season varieties are already playing a significant role in facilitating more intensive crop rotations.

Twelve varieties of faba bean developed by the Legume Section of FCRI are currently registered for production. The breeding program for faba beans has been challenged by the outbreak of a virus in Middle Egypt that first appeared in 1992. This devastated production in that area and caused many farmers there to discontinue faba bean production. In addition to breeding for disease tolerance and resistance to a common parasitic weed, faba bean research has produced a number of short season varieties, which increases the feasibility of harvesting the bean prior to the optimal planting time for cotton.

Currently, seven private seed companies have their own breeding programs, most of which are directed at the development of maize hybrids. Many of these private programs are headed by breeders who received training and experience from the ARC. Some of the private companies have international affiliations and have imported varieties from other countries. So far, none of the private companies has worked to breed its own wheat or rice varieties. It is believed some wheat and rice varieties in other countries might be useful in Egypt, but so far none has been imported for registration and commercial release.

In one case, a private company obtained the rights to a faba bean variety known as "Wally", which was bred by a researcher at Assiut University.

Egypt is in the process of developing national legislation that will establish plant variety protection rules for developers of new plant varieties. This means that developers will be entitled to collect royalties from anyone who uses one of their varieties. For the past two years, seed companies that use varieties developed by ARC have been required to pay for "breeder's right" when they produce seeds that were developed by ARC.

Certified Seed Production

Until recently, most maize farmers in Egypt depended on saving their own seed because improved seeds were not widely available. In the 1940s the Ministry of Agriculture established the General Directorate of Seed Multiplication, which received registered seed from the research units of the ARC as the raw material for producing certified seed. The volume of certified seed initially available to farmers was quite small.

By the 1970s, as breeding research expanded and numerous improved varieties for different crops emerged, the amount of seed produced by the Directorate of Seed Multiplication increased. Eventually, the Directorate was reorganized into the Central Administration for Seed (CAS), which had the responsibility for both multiplication and certification.

The Seed Multiplication Directorate and then CAS did not have land or production facilities for the actual growing of seed. Rather, these organizations contracted to have the seed grown on state farms and by private contract farmers, under agency supervision. The agency then processed the seed in its own seed cleaning plants.

During this era, the responsibility for distributing seeds was carried out by the government's Agricultural Credit Bank, which was later to become the Principal Bank for Development and Agricultural Credit (PBDAC). The credit bank worked through the agricultural cooperatives, which were heavily influenced by the government at that time. To encourage certified seed use, the government greatly subsidized seed production, and seed was a part of a package of inputs that farmers received as in-kind credit.

Private Sector Production Begins with Maize Seed in 1980. By the late 1970s it was found that the hybrid maize seed being produced by the Directorate of Seed Multiplication had no yield advantage over its parent lines. This suggested that production procedures were inadequate. To ensure that the potential of the new varieties about to be released by the Maize Research Program (MRP) of ARC would not be lost, the Ministry of Agriculture decided to allow private and quasi-private companies to undertake the business of maize seed production. Consequently, three new seed companies were formed: Misr Pioneer Seed Company was organized in 1980¹, while the Egyptian Agricultural Company for Seed Production (EGA Seed) and the National Seed Company were formed in 1981. All three were joint ventures between government entities and the various private sector interests, including majority international ownership in the case of Pioneer.²

While Misr Pioneer obtained breeding materials for hybrids from Pioneer International and embarked immediately on its own local breeding research, National Seed and EGA Seed started by producing composites and hybrid varieties that were developed by the ARC. The Maize Section provided the two companies with the necessary foundation seed.

In 1989, two additional companies were created, the Misr-Danton Company and the Nile Seed Company, both privately held by Egyptian owners. Then, in 1993, the Misr Hytech Seed International company was formed, with majority ownership by a group of international seed companies, including AgrEvo of Germany, and by private Egyptian investors. In the following years, a number of other private seed producers began operations, including several contract seed growers who formed new seed companies of their own. During this time the Nile Storage Seed Company obtained an exclusive marketing agreement with DeKalb International.

By the 1997 production year, seed was being produced by 21 different organizations. These were mainly private sector companies³, but a number of cooperatives (now

¹ Pioneer actually started importing and selling seed in 1978, two years before the Misr Pioneer joint venture company was organized. By 1983, the company was selling seed that it had produced in Egypt.

² Misr Pioneer was initially owned by Pioneer Hi-Bred International (51%), by the Agrarian Reform Organization (government), and local private investors. Pioneer International has since increased its capital contribution and now owns 80%, while the Agrarian Reform Organization's share has been greatly reduced and is currently in the process of being divested. National Seed's initial ownership consisted of various government banks, an insurance company, and private individuals, although many of the banks have since been privatized. EGA Seed continues to be owned by several organizations that, if not government, have close government affiliations, and by individual private investors.

³ By this time, the government had begun to divest its interests in the three original joint venture companies that were formed in 1980 and 1981.

considered to be non-governmental organizations) and the Agrarian Reform Organization (government) had also started producing certified seed.

The amount of certified maize seed produced and available to Egyptian farmers has increased dramatically since the government decided to allow and encourage the private sector to enter this business in 1980. By 1985, total production exceeded 10,000 tons, which was more than three times greater than the highest level reached by the Directorate of Seed Multiplication.

By 1997-98, about 80% of the 21,590 tons of certified maize seed produced in Egypt came from private companies. The private sector clearly has the capacity to produce all of the maize seed required by Egyptian farmers. Nevertheless, in 1987 the Agricultural Research Center's Maize Section opted to get into the business of producing maize seed, due reportedly to concerns about the quality of the seed that was being produced by private companies at the time.

The ARC continued to produce varying amounts of certified maize seed until 1997, thus continuing the government's presence in the maize seed business. Then, in February 1998, MALR's Central Administration for Seeds Production (CASP) took over the maize seed production that had been done by ARC. The private seed companies saw this as unfair competition by a government agency. MALR has since decided that CASP's production of certified maize seed will be phased out over the next two years. In the meantime, however, CASP continues to compete with the private sector in maize seed production.

Private Sector Production of Seed for Self-Pollinating Crops. Although the private sector has produced most of the hybrid maize seed since the mid-1980s, private production of SPV seeds was never encouraged. Indeed, since the government distributed seed for these crops at subsidized prices, there was no incentive for private companies to enter the business.

After the government embarked upon its program of liberalization in the late 1980s, however, the situation began to change. Further privatization of seed production was discussed at the First National Conference on Seed, held in May 1991. Liberalization of rules and regulations on seed inspection and seed importation was recommended. It was recognized that to have CAS be both the producer and the certifying agency for certified seed represented a conflict of interest. At this time it was announced that the PBDAC would gradually withdraw from the business of seed distribution.

After the First National Seed Conference, the National Seed Council was formed and began to work on the recommendations of the conference. It recommended that there be a gradual shift to private seed production and that the CAS and ARC should not produce certified seed.

The activities discussed above resulted in Ministerial Decree No. 477 of 1993, which directed the re-organization of CAS into two separate entities, CASP and the Central Administration for Seed Certification (CASC). Although the organization of CASP represented a clear statement that the public sector intended to remain in the seed business for some time to come, rules were changed at this time to be more supportive of private production. Companies with qualifying legal status were allowed to

become distributors of seeds produced by CASP in 1992-93. And beginning in 1993-94 they were permitted to start distributing and producing on their own account.

Private sector seed production began in 1994 for rice and in 1995 for wheat. At the same time that private companies began production, a number of cooperatives also started producing certified seed for the SPVs. In statistics on seed, the production of cooperatives is often lumped in with that of privately owned seed companies. While agricultural cooperatives in Egypt are now considered to be private organizations, they do still receive certain types of support from the government. This is particularly true of the cooperatives in the agrarian reform sector.

As the following graphs indicate, private sector production – including Agrarian Reform and other cooperatives – has gradually expanded since it began in the mid-1990s. It accounted for 27% percent of the wheat seed in 1999 and 31% of the rice seed in 1998, the last year for which data is available. In the case of faba beans, private production did not begin until 1996. Although the private sector appears to have accounted for more than half of the total market in 1997, it dropped down to just 35% in 1999.

Four private companies were involved in the production of wheat seed during 1995, the first year that crop was produced by the private sector, and nine produced it in the following year⁴. According to the latest information available, 24 companies were involved in wheat seed production in 1999, and 15 companies were involved in rice seed production in 1998. The organizations currently involved in these two crops, and their levels of production, are shown in Table 1 on the following page. It is apparent that most companies are involved in both crops.

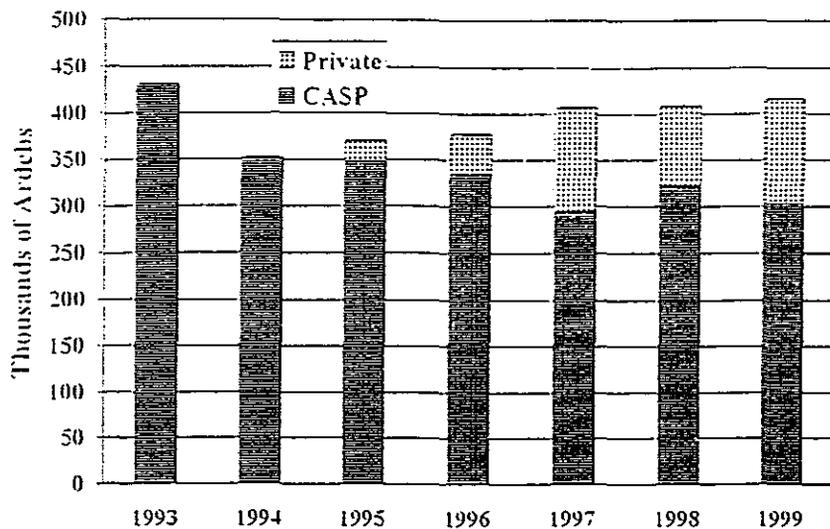
Discussions with private producers showed that many of the same companies involved in wheat and rice have also produced faba bean seed. However, many of these companies reported that they had cut back or discontinued faba seed production after trying it for one or two years. Particularly those who had tried to market in Middle Egypt reported that the virus problems there had made farmers reduce their production drastically, which made it difficult to market seed. Others reported that faba bean imports have discouraged Egyptian producers and made the market less attractive than for other crops such as wheat. Other companies report that CASC's requirements for certification of faba seed are too difficult to meet.

All of the private sector companies interviewed by the study team reported that they would like to expand their production further. Without exception, they stated that, given favorable conditions, the private sector is capable of producing all of the certified seeds demanded by Egyptian farmers.

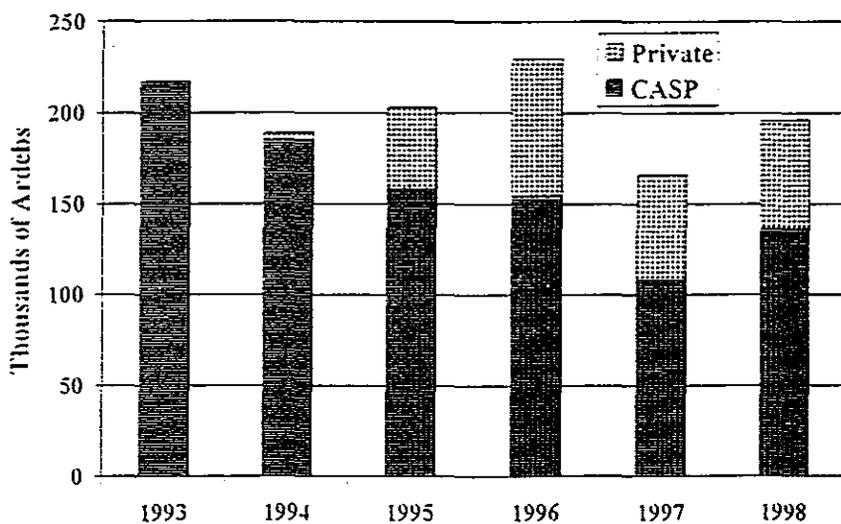
⁴ Abou-El-Maaty, Tamer Asran, "The Economic Effects of Liberalization Policy of Seed Production for Some Cereals Crops in Egypt," MSc Thesis, Ain Shams University, Faculty of Agriculture, Department of Agricultural Economics, 1998.

Figure 2

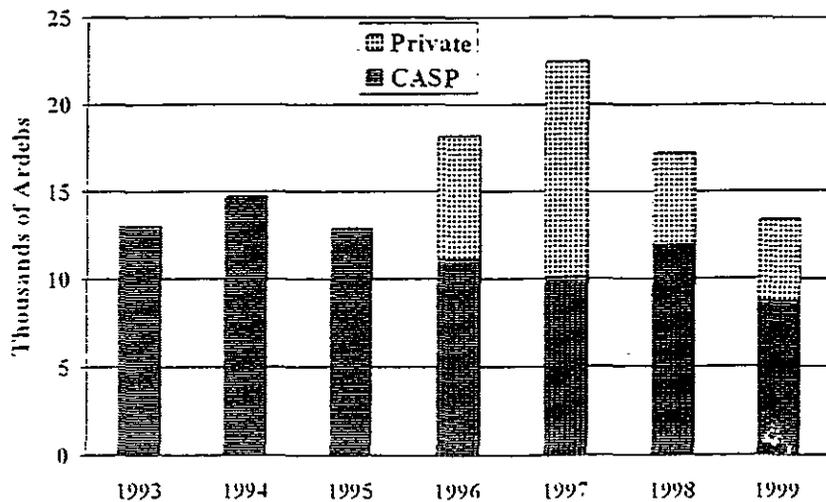
Wheat Seed Produced by CASP and Private Companies



Rice Seed Produced by CASP and Private Companies



Faba Bean Seed Produced by CASP and Private Companies



While the private companies expressed their desire to expand production, they all identified a number of factors that have hindered them from expanding. These were as follows:

- Uncertainty about how much seed CASP will produce. CASP is so large in comparison to any of the private companies that even a small percentage change in its production can have a big impact on the largest private company.
- Given CASP's large size, the price it sets has a heavy influence on how much private companies can charge for their seed. Being in the public sector, however, CASP does not have to reflect the full economic costs of production in the prices it sets. According to many private companies, CASP's prices are so low that there is little if any margin of profit to be made in selling SPV seeds.

Production of Breeder, Foundation and Registered Seeds

Several stages in seed multiplication precede the actual production of certified seed. These involve using the *breeder seed* to produce *foundation seed*. In the following year, the foundation seed is planted in order to grow *registered seed*. It is the registered seed that is multiplied in the final stage to obtain *certified seed*. The *raw seed* obtained at each stage is then cleaned in a processing plant and tested, prior to being stored and used for the next stage.

In many countries it is common for the certified seed producer to obtain foundation seed from the seed breeder, do one multiplication to obtain registered seed, and do the final multiplication to obtain the certified seed. Egypt has not normally followed this system.

Until 1997, the Seeds Unit of the FCRI carried out the first two stages of multiplication and produced the registered seed. The registered seed was then supplied to CASP or to private seed companies for certified seed production. In 1997, the responsibility for producing registered seed was assigned to CASP. This meant that CASP had to produce registered seed for itself as well as for the private seed companies.

Having CASP produce the registered seed has caused some problems. Almost without exception, the private companies claim that they have trouble obtaining sufficient quantities of the seed they request from CASP. They believe that CASP keeps a major share of the more desirable varieties for itself. Several companies reported that CASP supplied only half of what they requested. Others said that CASP told them that what they requested was not available, and CASC then authorized them to produce certified seed from the certified seed the company had produced in the preceding year. On some occasions CASP itself has produced certified seed from certified seed, when it did not have an adequate amount of the required registered seed.

Table 1. Certified Seed Production for Rice (1998) and Wheat (1998 & 1999), by Organization (Ardebs)

Crop	Rice	Wheat	
	1998	1998	1999
CASP	137,461	322,672	303,250
Agrarian Reform Sector Co-ops	4,202	11,047	21,980
Other Cooperatives	8,497	12,972	12,804
EGA Seed	26,412	20,235	30,965
Al Wataniya Co. (National Seed)	6,171	8,984	14,364
Agro-Seed Co.	2,235	4,423	4,511
Interseed Co.	-	-	4,356
Danton Co.	2,263	-	2,725
El Safa Co.	-	1,623	2,635
Hi-Seed	1,099	1,710	2,385
Nubaseed	-	1,784	2,160
Agro Tech Co.	227	-	1,914
Senduz Co.	3,093	-	1,757
El Arabia Co.	312	658	1,600
El Dawlia Co.	-	2,250	1,584
Fine Seeds Co.	1,045	1,144	1,478
Misr Hi-Tech	2,625	298	1,260
Pureseed Co.	-	2,597	1,139
Man Trade Co.	-	-	788
El-Zahraa Co.	840	744	611
El Watany for Cotton Co.	-	-	587
Abu El-Fadl	601	266	450
Delta Seed	569	400	339
Agri-Services Co.	-	106	238
Mervat Co.	-	-	200
El Motatwera Group	-	300	100
United Co.	476	-	-
TOTAL	198,128	394,213	416,180

SOURCE: Unpublished data provided by CASC.

Note: Ardeb weights are 150 kg for wheat and 120 kg for paddy rice.

When the problem of registered seed availability was raised with the director of CASP, he indicated that CASP only produces the registered seed that the Cereals Council, a planning body under the ARC, tells them to produce. He said that the varieties demanded by the market are not always produced in sufficient quantities. This observation seemed to be echoed by other informed observers, who pointed out that the Cereals Council tends to emphasize the newly released varieties, which the breeders would like to see farmers use. The Council also tries to ensure that several varieties are available for each region of the country, so that alternatives exist should some varieties experience problems with pests or disease.

The private seed companies and CASP both claim that quantities of some registered seed have not matched farmer demand. They also complain that some varieties have been “cancelled” or withdrawn from the market⁵ after the registered seed had already been sold to the seed companies. This occurred with both the Giza 171 rice variety and Giza 163 wheat. The seed producers were particularly perplexed by the decision to withdraw these varieties because they had not only paid for the registered seed but had also paid the additional “breeder’s right” fee, which was not refunded. In the case of Giza 171 rice, the seed companies also felt compromised with farmers who had been promised the certified seed, since Giza 171 was a variety that had been specifically sought out by exporters. Thus, their clients lost export sales.

Evidently, Giza 171 rice was withdrawn due both to ARC’s fears of growing susceptibility to blast disease, and because they wanted to encourage the introduction of new, short season varieties. In the case of the Giza 163 wheat, the decision was based on problems with susceptibility to yellow or stripe rust fungus.

Regardless of which agency is responsible for the problems described above, the study team believes that to have CASP in charge of certified seed distribution represents a conflict of interest. While CASP competes with the private companies in producing and marketing certified seed, this organization is also in charge of supplying them with their most basic input, the registered seed.

Seed Processing and Storage

After raw seed is produced in the field, it is cleaned and sometimes receives a treatment of chemical dressing in a seed processing plant. CASP has a large network of such plants located at 16 stations throughout Egypt. These include the four seed stations that formerly belonged to the Egyptian Agricultural Organization.

Some of the companies that entered the production of SPV seeds already had seed cleaning facilities which they had acquired for the processing of hybrid maize seed. Others contracted to use the processing plants of CASP. More than 70% of the wheat and rice seed produced by the private sector in 1996 was processed in CASP facilities; in the following year, however, only 32% of the private wheat seed was processed by CASP. Although more recent information has not been published by CASP, it

⁵ Evidently this has been the result of ministerial decrees, based on the recommendations of ARC plant breeders.

appears that only a very small proportion of the private sector's seeds has been cleaned at CASP facilities during the past year.⁶

Private seed processing capacity has expanded quickly during the past four years. Three companies have constructed new cleaning plants, one of which was to replace an older facility. A private company purchased the Nubaseed plant from the government in 1999. Two new plants are currently being constructed, which will mean a total of eight private plants available for processing SPVs by the end of the year. The combined capacity of the eight plants comes to a total of about 35 tons per hour.

While not insignificant, 35 tons per hour of private capacity is still considerably less than the current capacity of CASP. In 1998, the combined capacity of CASP's 16 seed processing stations was reported to be about 162 tons per hour, including the 68 tons per hour capacity of the four stations which previously came under the Egyptian Agricultural Organization.⁷ Details on the public and private plants are given in Appendix 2.

In addition to the CASP plants, the ARC has plants with a combined capacity of 38 tons/hour, located in four seed cleaning stations. These plants are used to clean and process the breeder and foundation seeds of all of the crops under ARC research programs and for which ARC produces breeder and foundation seeds. This capacity is also sufficient to process registered seed, which was what was done prior to the recent transfer of that responsibility to CASP.

Although the private sector has less installed capacity than CASP, the private capacity corresponds well with the demands of the market. If operated on two eight-hour shifts per day for 100 days during each season, this capacity would be sufficient to process more than 380,000 ardebs of wheat and well over 400,000 ardebs of rice per year. As shown in Figure 2 above, this is enough to process more than 90% of the wheat and 100% of the rice seed that farmers have purchased from the market in recent years, i.e., the effective demand.

The private companies' processing facilities are not as evenly distributed throughout the farming areas as those of CASP. The plant of the largest company, EGA-Seed, is located at Sids in Beni Suef Governorate, south of Cairo. Two plants are located in the western part of the Delta. However, there are none in the northern or eastern Delta, nor are there any in Upper Egypt. This suggests that the private companies may face greater transportation costs than the government's seed agency.

In at least one important area, the CASP processing facilities are less efficient and thus more costly to operate than the private plants. That is in the area of personnel. It

⁶ The GTZ marketing advisor reported that CASP's records show only a few instances where CASP facilities were used to process private sector seed in the past year, and that the tonnage was "very small".

⁷ Appendix Table 2 in Krenz, Ronald D., "Sub-Sector Map of Agricultural Seeds," APRP/RDI Report No. 41, June 1998.

is difficult to state just how many personnel are required to operate the government plants, but it is clear that the number is large in comparison to the private companies⁸.

The private companies that have constructed their own processing facilities have also built warehouses large enough to store the seed they produce. Some of the other private companies also have their own warehouses, while many others rent storage from the PBDAC. Even those companies with warehouses at the sites of their storage plants often rent storage from the PBDAC or from private merchants in regional capitals and towns where they need temporary storage during the marketing season. Conditions for seed storage in some of these warehouses is less than desirable, and there is some loss due to damage from moisture or rodents. However, most companies reported that their storage losses ranged between two to five percent, meaning that storage loss is not a major problem for the private companies.

Seed Certification

Seed certification, which is an important dimension of quality control, is conducted by CASC. The private companies pay CASC a fee for certification, which entails both inspection of field production and sampling and testing of the seeds after they are harvested.

The performance and reliability of CASC are believed to have improved in the past few years, since CASC and CASP were re-organized from the old CAS and required to operate independently of each other. The German aid agency, GTZ, has been helping CASC improve its procedures through training and technical support. The MALR, with the support of GTZ, aims to make CASC operate on a self-supporting basis, meaning that the fees it collects would cover its operating costs. CASC did significantly increase its fees during the past year, which brought complaints from the private sector.

Reportedly, it was CASC that authorized CASP and some of the private companies to reproduce seed from certified seed, when there was not enough registered seed available.

The private companies believe that CASC is often arbitrary and unpredictable in carrying out its duties, and that it will reject some fields without apparent justification. They also think that CASP gets easier treatment from CASC and that CASP uses its influence in the Ministry to obtain special treatment in the certification process. However, the head of CASC maintains that the agency is impartial in carrying out its duties. He points out that CASC rejected 1,800 feddans of CASP seed this year and that the Minister backed them up in doing so.

⁸ Krenz, *op. cit.*, p. 12 reports that CASP has a total of 7,029 employees, of which 3,748 were classified as casual employees. It is not known how many of these were assigned to operate the processing plants and how many worked in other departments such as field production and marketing. This number is several times the number with which the private sector companies operate. EGA-Seed, for example, which has about 4% of the processing capacity of CASP, operates with just 150 total personnel, or about 2% of CASP's personnel. The Nubaseed Company, which was recently purchased from the government by a private company, reported that it reduced the number of personnel from over 1,100 to just 77.

CASC requires that seeds carried over from one year to the next be re-tested and re-certified. Recently the agency has also adopted the practice of testing carry-over seeds for vigor, in addition to the normal test for germination. Companies report that inflexibility on the part of CASC makes it difficult and costly to deal with carry-over seed. They find it unfair that they are required to list the year of production on the seed bag after the seed has gone through the re-testing process. They point out that seed companies in some major producing countries such as the United States are not required to show the year of production on their labels. Thus, many of the seed companies report that they normally dispose of unsold seed, rather than go through the cost and administrative difficulties required to carry it over.

The private seed companies complain that CASC's administrative requirements are unnecessarily burdensome. They point out that CASC requires written notice of all shipments of certified seed, which means that a notification slip must be submitted for every shipment of seed to a dealer. The Head of CASC maintains that this is necessary in order to prevent the marketing of illegitimate seed. He explained that some traders put common grain in bags marked as if they were certified, or that they will mix common grain with certified seed that they obtain from a seed company.

Distribution and Marketing

The current system of marketing certified seed really began to develop only in 1992. Until that time, PBDAC was responsible for distributing most of the seed produced by CASP. Removal of the Bank from the input distribution business was part of the catalyst for private companies to get into the production of SPV seeds. As the bank was phased out of input distribution, subsidies on inputs were also removed. This caused the prices for inputs to increase, creating profit-making potential in the production and marketing of seed for SPVs, and attracting the private sector to the business. Other important changes in the way the government structured and regulated the industry were already discussed above⁹.

After 1992, when the government decided to drop most remaining subsidies on inputs and for PBDAC to withdraw from the input distribution business, PBDAC continued to distribute some seeds along with fertilizer and other inputs¹⁰. However, the quantities sold by PBDAC have been drastically reduced. Since the inputs it distributes are no longer subsidized, the Bank's marketing power has been greatly reduced.

⁹ Starting in the 1980s, hybrid maize seed pricing was organized somewhat differently from seeds for SPVs. This worked more like a regulated monopoly where the government, the private sector, and PBDAC bargained over the price each year, and where prices were allowed to be high enough to provide profit for the private sector. This is discussed in Fitch, James B. and Abdrabboh A. Ismail. "Challenges in the Liberalization of Seed Production and Marketing in Egypt: The Case of Hybrid Maize Seed," APRP/RDI Report No. 61, April 1999, pp. 15-20.

¹⁰ After fertilizer subsidies were removed and fertilizer production and marketing were privatized, the proportion of fertilizer moving through private channels at first increased dramatically, while the PBDAC share dropped quickly. Then, due to a temporary shortage brought about by an international fertilizer price increase, PBDAC was temporarily allowed to re-enter the fertilizer marketing business. For discussion of what happened in fertilizer, see Zalla, Tom and Abdel-Hamid Youssef Saad. "Fertilizer Production and Marketing in Egypt: Baseline Study," APRP/MVE Impact Assessment Report No. 2, December 1998.

Subsidies for seeds were not removed abruptly but rather were reduced over a period of years as the price charged by CASP was allowed to rise. The resulting increases are shown on the following page in Figure 3, which shows the farm price per ardeb of seed set by CASP, with approval of MALR. However, the effect of the increases is most easily noted in the seed-to-grain price ratios shown in Figure 4. These ratios are obtained from dividing CASP's end-user prices by the farm prices for the respective grains. An international rule of thumb for SPVs is that the price of certified seed is normally about double the price of grain. Figure 4 shows that during the 1980s, and until 1992, seed prices in Egypt fluctuated between 1.0 and 1.5 times the grain price. After this, the relative seed prices increased.

Figure 3. Seed Prices Charged by CASP, 1983 - 2000

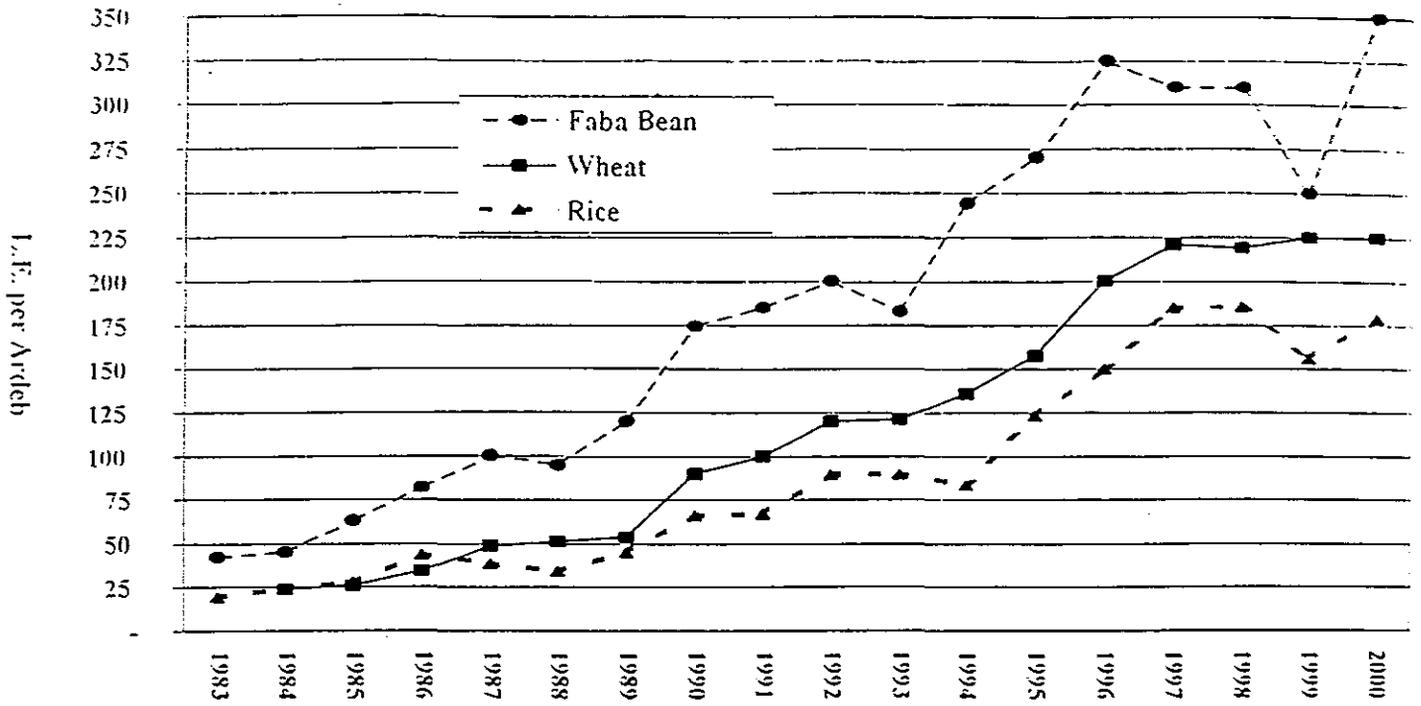
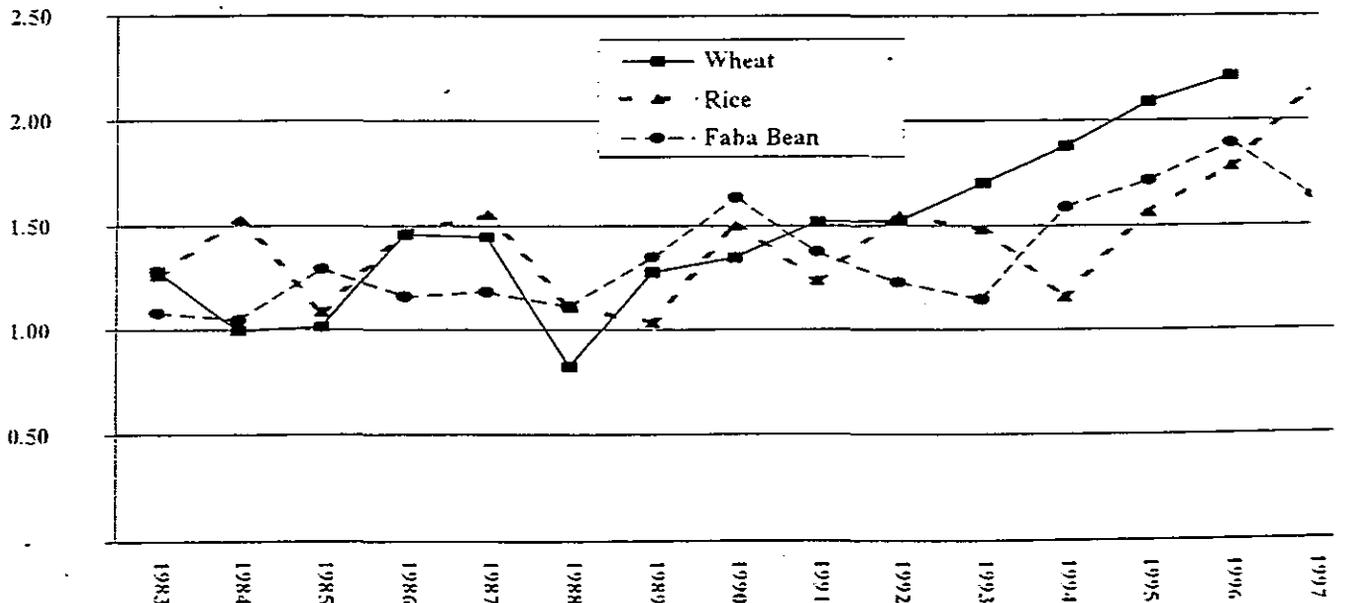


Figure 4. Ratios of Seed Prices to Grain Prices



Several observations about the seed price increases are worth noting. First of all, the graphs show that the prices did not all go up at the same time. The wheat and rice seed prices were raised somewhat in 1993, but faba bean prices were not increased until 1995. The price ratio, however, is more indicative of the incentive for seed producers. The ratio of wheat seed to grain price exceeded 2.0 slightly in 1995, but rice did not pass this mark until 1997. And the faba bean seed price did not surpass 2.0 even then. If anything, the seed prices and price ratios have been uneven in their progress. The faba bean seed price dropped sharply in 1999, and the rice seed price was lower for both 1999 and 2000 than it was in 1998. There will be further discussion of the CASP pricing system in the following section.

One impact of the withdrawal of PBDAC from the seed business and from the increases in seed prices appears to have been a reduction in the amount of seed distributed and in the proportion of crop area that is covered by certified seed. The latter statistic is often referred to as the *seed coverage ratio*. This is shown in Figures 5 and 6. It should be noted, however, that the big drop in seed production occurred after 1990, two years before it was announced that PBDAC would no longer distribute seed, and four years before the private seed producers began production. And the coverage ratio has continued to decline.

The coverage ratio is of particular importance to plant breeders and the Minister. They would like to see 30% or more of the area for each crop covered by new (certified) seed each year, which would indicate that seed is being replaced before it loses productivity. This level of coverage would also help to ensure – although it would not guarantee – that new varieties are reaching farmers, and that disease and pest problems are not being permitted to multiply. Promoting a high coverage ratio has been a part of Egypt's strategy for increasing productivity. Interestingly, despite the fact that coverage ratios have declined, crop yields for the SPVs have continued to increase, as was shown in Figure 1.

Marketing and Distribution Procedures of CASP. Under PBDAC's system of distribution, little marketing or promotional effort was required of CASP, which was then the only producer of seeds for the SPVs. If more seed was produced than farmers wanted to purchase, the bank would often encourage them to take the seed anyhow, or risk not being able to access credit or buy fertilizers and chemicals at the subsidized prices the bank offered. Since 1992, PBDAC has still been distributing some seed, but this has been declining every year.

Soon after the withdrawal of the Bank began, extension agents became involved in the sale of seed and other inputs. In some cases, the extension agents were apparently paid a direct commission for their sales efforts. In other cases, they worked on an after-hours basis in the villages where they lived, selling on their own account. In some instances the agents helped sell seed as part of their normal work in support of the village cooperatives, and through their work with the Agricultural Consultative Councils at the district level. They could also receive a commission for these latter efforts.

Although the Minister of Agriculture objected strongly to the practice of using extension agents when it emerged, it was a difficult practice to eliminate at first, because alternatives had not been developed. The private seed companies maintain

that CASP uses its influence as an agency of MALR to exert special influence over the extension service.

With the increasing withdrawal of the Bank, CASP was also forced to learn to deal more directly with the agricultural cooperatives. Since many cooperatives lacked financing, this meant leaving seed on consignment and collecting payment after it had been sold.

CASP also activated its own network of marketing personnel in offices or "agencies" in all of the governorate capitals and in many of the district headquarters. They were charged with direct marketing to farmers. CASP established a system of incentives designed to encourage its people to market SPV seed. CASP also developed procedures for distributing through private traders and village merchants.

Another tactic used by CASP has been to distribute seed through a private company known as EMEPAC, and also referred to as "Boursa." While EMEPAC is technically private, the Horticultural Services Unit (HSU) of MALR is one of the company's shareholders. Although the Head of CASP denied that this was the case, other sources of information made it clear that EMEPAC is a CASP distributor. The arrangements for this are not clear, nor could the proportion of CASP seed sold through EMEPAC be determined. What is most important, perhaps, is the appearance of impropriety. Whether or not it is true, many private sector companies believe that EMEPAC takes unfair advantage of its connection to the HSU and MALR. They believe that EMEPAC benefits from use of government facilities without having to fully pay.

CASP has received technical support and training in marketing procedures from GTZ. CASP also began to participate in the system of demonstration fields and field days organized by the ARC crop improvement programs for wheat, rice and maize.

The relative importance of CASP's various marketing channels is not known exactly. The head of CASP reported that about 60% of the agency's SPV seed is sold by direct sales through their own outlets, while the balance goes through cooperatives, extension and PBDAC. He was uncertain as to the proportions in the other channels. He stated that the role of PBDAC has declined greatly in recent years but that he would not be surprised to see it expand, now that a new president has been named for the Bank.

The study team obtained information on CASP's distribution of wheat in two governorates: Kafr El Sheikh in the northern Delta, and Menoufia, just north of Cairo. The results are summarized in Table 2 below. It is not surprising to see that the situation varies between the two governorates, as conditions in the two governorates vary, and one is quite close to Cairo. The extension system is known to be stronger in Menoufia than in Kafr El Sheikh. These two governorates taken together are probably not typical of Egypt as a whole, and no information was available on CASP's sales through merchants in Menoufia. Nevertheless, the statistics suggests that CASP's direct marketing may be of less importance than the agency believes. While CASP's direct sales are important, it appears that sales through cooperatives are also very important.

The exact meaning of the term “extension” shown in Table 2 is not clear. It seems that there continues to be some direct use of extension agents to sell seed, but extension agents also play a strong role in some cooperatives. Furthermore, the Agricultural Consultative Councils in each district operate under the guidance of the District Extension Agents, who serve as the Councils’ secretaries. It seems likely that “extension” sometimes refers to these organizations, rather than to the independent sales activities of extension agents.

Table 2. Relative Importance of CASP Marketing Channels for Wheat in Two Governorates	
Kafr El Sheikh Governorate:	
Marketing Channel	Percent of Total Seed Distributed through Channel
CASP Direct ^a	48%
Merchants	4%
Extension	4%
Cooperatives ^b	36%
PBDAC	4%
Other	4%
TOTAL	100%

Note: Unpublished CASP data.

a Includes sales from CASP offices and direct from CASP seed plant.

b Includes Agrarian Reform Cooperatives.

Menoufia Governorate:	
Marketing Channel	Percent of Total Seed Distributed through Channel
CASP Direct	31%
Cooperatives	40%
Extension	29%
TOTAL	100%

Note: Information obtained from local extension officials.

SOURCE: See Appendix 3.

Private Sector Marketing and Distribution Procedures. Although the private sector did not begin wheat and rice seed production until 1994 and marketing until 1995, many of the companies that entered this business already had experience with hybrid maize seed. It had been their practice to rely on PBDAC for the distribution of their maize seed. When the Bank began to withdraw from input distribution in the early 1990s, the private sector suffered a shock and had to react by becoming more active marketers of their seed in order to survive. The challenge was made greater by the significant number of new companies entering the business during this period.

After 1992, the private seed companies improved their marketing practices in several ways. They hired more people for their marketing staffs. They worked to establish new distribution arrangements with the cooperatives at the national and governorate levels. EGA-Seed established ten regional offices for direct sales to farmers and to handle arrangements with their dealers in each area. The companies also worked out new distribution arrangements with dealers and traders. More competition developed on the “discounts” or commissions they offered to the dealers and to the cooperatives that handled their seeds. Whereas the discount charged by the bank to handle maize seed had originally been only 2%, this reached 15% before the bank withdrew. Some companies now offered even larger commissions than this to the traders who became their distributors. The higher discounts applied particularly to maize, and particularly to those distributors who were capable of handling a larger volume.

To make their marketing more effective, the seed companies also paid more attention to setting up demonstration plots and holding field days. This was particularly true in the beginning for the companies that had already produced maize seed. Today, many of the larger companies have also started participating in extension demonstration fields and holding field days of their own for wheat and rice. The maize seed companies also began to package their seed in smaller bags to make it affordable to small farmers. A similar practice was followed for wheat and rice seed, although CASP has also begun to use more convenient sized packages.

The private sector also resorted to the use of extension agents as distributors. The prevalence of this practice varies from company to company, and it seems to be less important now than it was a few years ago.

Indications are that the private sector’s marketing efforts have worked. As noted previously, they managed to expand from zero in 1993 to about 30% of the market for SPV seeds in 1999. Based on information provided by six of the larger seed companies, the overview of distribution channels shown in Table 3 was developed. While the six companies may not be entirely typical of the industry as a whole, the fact that they accounted for 57% of the wheat and rice seed produced by the private sector in 1998 suggests that the table may not be far from the averages for the industry as a whole.

Table 3. Private Sector Distribution Channels for SPV Seed	
Marketing Channel	Percent of Total Seed Distributed through Channel
Private ^a	74%
Extension	6%
Cooperatives	6%
Agricultural Councils	8%
PBDAC	6%
TOTAL	100%

^a "Private" includes direct sales to farmers and sales through private agents, traders and merchants.

SOURCE: See Appendix 3.

Table 3 indicates that the private seed companies have come to rely heavily on private sector channels – that is, direct sales by their own personnel plus sales through dealers, traders and merchants – to get their SPV seed to farmers. It is particularly noteworthy that they depend less on cooperatives than seems to be the case for CASP.

Without exception, the private seed companies expressed confidence in their ability to develop the necessary additional marketing capability to handle all seed distribution if CASP withdraws and the private sector is given the chance to produce all of the SPV seeds. This additional marketing capability could be developed in three years or less.

The study team made visits to four governorates. During these visits, discussions were held not only with seed companies and local directors of MALR, but also with local farm input merchants in the capital cities of Menoufia and Kafr El Sheik Governorates. In both cases the merchants had retail shops of their own in the capital, and they distributed seed through village merchants in the other towns of the governorates. The merchant in Kafr El Sheikh also distributed in the nearby governorates of Damietta, Dakahliya and Gharbia.

The merchants reported that there are six to seven other large traders in the governorate capitals and several in each district center. They reported that there is a merchant who sells farm inputs in virtually every village of their governorates. These merchants concurred with the assessment of the seed companies that, if the industry were privatized, it would take a maximum of three years for private merchants to effectively distribute all of the seed. The merchants who were contacted also had experience in dealing with CASP seeds. They said that they preferred to deal with private companies because they were more flexible in the arrangements they could make. These dealers indicated that, on occasion, they had been provided seed on consignment from a private seed company, something CASP was not able to do.

While the picture painted by the merchants and the private seed companies is a favorable one, the study team is not entirely convinced that full privatization of the market will be as easy as they describe. First of all, the situation seems to be different in other parts of the country. There are reportedly villages without private traders in some governorates¹¹. This may explain why the private sector seed distribution is much stronger in some governorates than in others.

The data in Table 5 show the distribution of certified seed for the 1997 wheat crop by governorate. By that time, the private sector's share amounted to 21% of the total certified seed that farmers purchased. But the private share was already well over 30% in some governorates, especially those near Cairo, and it had even reached 44 % in Beheira Governorate in the central Delta. The private share was also quite high in several of the Middle Egypt governorates. In areas such as Fayoum, Ismailia and Aswan, however, the penetration of private seed was at or near zero.

Undoubtedly the private sector has gained share in many areas since 1997. Nevertheless, the table illustrates some of the challenges facing the private sector. It will need to work harder to distribute to areas where there are no private seed plants,

¹¹ Comment by Farouk Afifi, Chairman of EGA-Seed.

such as Upper Egypt and in other outlying governorates. As the data in Tables 3 and 4 indicate, the private sector will also have to work more closely with cooperatives to develop business where CASP has dominated.

Governorate	Proportion of Seed Distributed by:	
	CASP	Private Sector
Alexandria	89 %	11 %
Beheira	56 %	44 %
Nobariya	67 %	33 %
Gharbia	91 %	9 %
Kafr El Sheikh	89 %	11 %
Damietta	65 %	35 %
Dakahliya	79 %	11 %
Sharkia	87 %	13 %
Menoufia	80 %	20 %
Qalubiya	63 %	37 %
Giza	67 %	33 %
Ismailia	99 %	1 %
Fayoum	95 %	5 %
Beni Suef	84 %	16 %
Menia	64 %	36 %
Assiut	62 %	38 %
Sohag	64 %	36 %
Qena	85 %	15 %
Aswan	100 %	-
All Egypt	79 %	21 %

Source: CASC

Seed Prices

It was noted previously that SPV seed prices were allowed to rise starting about 1994. Recent nominal and relative prices were shown in Figures 3 and 4. Although the private sector has been allowed to participate in SPV seed production, in effect the government still sets the price. Since CASP's production still accounts for about two thirds of the market or more, the price charged by CASP dominates the market. CASP proposes the prices it wants to charge for its seed, and MALR, perhaps after some discussion and adjustments, approves a price for CASP. Some private sector companies charge a little bit less than CASP in order to win more market share, and other companies have charged 10-12% higher prices.

For example, the CASP price for wheat seed has recently been L.E. 225 per ardeb or L.E. 1.50 per kg. Many companies sell at the same price, whereas others have sold at least a part of their seed for as low as L.E. 1.40-1.45 per kg. Others have asked as much as L.E. 1.70 per kg for their seed, pointing out that their seed is better quality than CASP's. But the higher priced companies admit that they are not able to sell much at L.E. 1.70. These companies acknowledge that they have ended up selling much of their production at the CASP price or even lower.

In setting the dominant price, CASP is exercising price leadership. As long as its prices are sufficient for the private companies to cover their costs and hopefully make a small profit, the companies do not complain. If SPV seed production were not profitable, why would so many companies have entered the business? Several companies report that there has been a small profit margin in the SPV seeds, and most companies have not complained about CASP prices.

Nevertheless, the study team believes that there are some inherent dangers in the current system. One problem is that since CASP is not private, its cost accounting procedures are not devised to determine the true cost of production. Secondly, the private sector companies are not yet very adept at cost accounting, and the sector as a whole is not prepared to show the government that the CASP price is too low, if the need arises to do this. These same issues have caused problems with hybrid maize seed production¹².

Tables 5 and 6 below compare CASP's recent price derivations for wheat and rice seed to the study team's estimates of the private sector's costs for these seeds. They show that CASP leaves important elements out of its price derivations. In particular, CASP's statement of finance charges is extremely low. This is understandable since the agency is not required to borrow operating money from a bank in order to do business, as many private sector companies must do. Furthermore, CASP's facilities have either been obtained from the government's capital budget or from foreign donations, and the agency is not required to show the cost of depreciation in making its price derivation statements. Thus, its stated cost of operation for processing facilities is much lower than the private sector's.

Tables 5 and 6 were put together quickly by the study team. The private sector companies did not have information readily available to provide good estimates of many of the cost items. Thus, the private sector costs shown in the tables are only estimates. So far most private sector companies seem to think that they are making a profit in producing the SPV seeds. Thus, their costs of production may not be as high as what the tables seem to indicate. If the government decides to reduce the price for CASP seeds in the coming years, and if the prices are so low that most private companies cannot cover their costs, the private companies will not be able to defend themselves very easily given that they do not have accurate cost information to make a case to the government.

Of course, as CASP's size in the market continues to shrink, the issue of CASP's prices will become less important. With time, the agency will no longer be able to dominate the market and set the price to the extent that it currently does. If CASP is privatized, as the government indicates that it soon will be, then its new private owners are not likely to keep prices too low, or they will not be able to make any return on their investment. Thus, the potential problem discussed above may never materialize.

¹² See Fitch and Abdrabboh., *op. cit.*

Table 5. Comparison of CASP Derivation of WHEAT Price to Private Sector Costs

Elements	CASP Price		Private Sector
	Per Ardeb	Per Ton	Cost per Ton
Raw materials	129.90	866.00	947.00
Packaging (bags for clean seed + bags for raw seed)	12.60	84.00	90.00
Transport	9.40	62.67	11.00
Processing	3.80	25.33	50.00
Field Supervision			11.00
Fungicidal disinfectant	11.50	76.67	85.00
Finance Interest	0.30	2.00	145.00
Sub-total	167.50	1,116.67	1,339.00
Discount in return of selling sieving by-products	(8.20)	(54.67)	(37.50)
Total direct costs (raw seed)	159.30	1,062.00	1,301.50
Receiving, storing, weighing costs (storage & transport)	5.00	33.33	25.00
Services and goods supply	5.00	33.33	
Fumigating and dusting costs	1.00	6.67	
Strings & lead & stamp costs (certification tags)	1.00	6.67	33.33
Production incentive, seed central administration personnel	5.00	33.33	
Marketing and distribution incentive	10.00	66.67	150.00
Excellence raise incentive	1.00	6.67	
Labor	8.70	58.00	
Marketing & tech. support staff salaries, incentives			20.00
Equivalent price reduction for cooperatives & other agencies	3.00	20.00	
Agriculturists Syndicate Finance	3.00	20.00	7.50
Finance, social fund for seed production sector personnel	3.00	20.00	
Left-over loss reserve (carryover cost)	5.00	33.33	81.00
Reserve for rejected raw materials	5.00	33.33	
Reserve for packages loss (loss in storage)	1.00	6.67	40.00
Cereal council	0.50	3.33	
Seed council	1.00	6.67	
Breeders fees	5.00	33.33	42.00
Laboratory tests and field inspection	2.50	16.67	17.00
Overhead			69.00
TOTAL COST	L.E. 225.00	1,500.00	1,786.33

Source: CASP price justification as shown in MALR statement of 1-Aug-99; private sector cost Estimate as shown in Appendix 4.

Note: Ardeb of wheat weighs 150 kg.

Table 6. Comparison of CASP Derivation of RICE Price to Private Sector Costs

Elements	CASP Price		Private Sector
	Per Ardeb	Per Ton	Cost per Ton
Average purchase price for raw materials	75.29	627.42	905.00
Packaging (bags for clean seed + bags for raw seed)	10.88	90.67	90.00
Transport (raw seed)	7.55	62.92	11.00
Processing	4.02	33.50	50.00
Field supervision			9.00
Bank charges	1.25	10.42	133.00
Total costs of raw materials purchase	98.99	824.92	1,198.00
Discount in return of selling sieving by-products	(5.29)	(44.08)	(42.50)
Net costs of the purchase of raw materials	93.70	780.83	1,155.50
Receiving, storing, weighing costs (storage & transport)	5.00	41.67	25.00
Marketing and distribution incentive	10.00	83.33	130.00
Services and goods supply	5.00	41.67	
Strings and lead stamp costs	1.00	8.33	33.33
Reserve for refused Packaging (loss in storage)	1.00	8.33	37.00
Left over loss reserve (carry-over cost)	5.00	41.67	32.00
Rejected raw materials & seeds after sieving reserve	5.00	41.67	
Production incentives for admin. Personnel	5.00	41.67	
Seed council (board) activities	1.00	8.33	
Cereal council (board) activities	0.50	4.17	
Agriculturists Syndicate Finance	1.80	15.00	8.00
Laboratory tests and field inspection costs	4.00	33.33	15.00
Breeders fees (incl. assessment for Nat'l Rice Campaign)	5.00	41.67	67.00
Marketing & tech. support staff salaries, incentives			20.00
Temporary labor costs	8.00	66.67	
Finance, social fund for seed production sector personnel	5.00	41.67	
Overhead			64.00
TOTAL COST	L.E.	156.00	1,300.00
			1,586.83

Source: CASP price justification as shown in MALR statement of 25-Jan-99; private sector cost Estimate as shown in Appendix 5.

Note: Ardeb of rice weighs 120 kg.

SUMMARY OF FINDINGS AND RECOMMENDATIONS

Egypt has made outstanding advances in the production of field crops during the past two decades, due largely to productivity increases based on improved crop varieties. The adoption of improved varieties has been facilitated by the widespread availability and use of certified seed.

Initially, all certified seed was produced by a government agency. In 1981, however, the decision was taken to allow private seed companies to produce certified maize seed, and private production of wheat, rice and faba bean seeds was encouraged starting in 1994.

Since the Egyptian Government embarked on its program of structural reforms in 1987, there has been significant growth in the private sector. Although certified seed production has benefited from the establishment of private companies to produce hybrid maize and sorghums, privatization has gone much slower in the case of the self-pollinating crops such as wheat, rice and faba beans. By 1997, private seed companies produced 76% of all certified maize seed. In 1998-99, however, the private sector produced only about 30% of the certified wheat and rice seed.

Private Sector Seed Processing Capabilities

During the course of the study, government officials and others familiar with Egyptian agriculture voiced numerous concerns about private sector production. Many feel that the private seed companies lack sufficient infrastructure (seed plants, research capabilities) necessary to take full responsibility for supply of self-pollinating seeds.

However, the study shows that the private sector has rapidly expanded its production of seeds for self-pollinating crops. Private production increased from just a few hundred tons in 1994 to 5,756 tons of rice seed and 9,407 tons of wheat seed in 1998. Private seed production has not been limited to just a few producers. In 1999 more than 20 private companies were involved in the production of certified rice and wheat seed. Furthermore, the private companies have installed significant amounts of seed processing capacity in the past several years.

Before the end of 2000, two more seed cleaning plants will be completed, bringing the total number to eight. Private companies will have a combined installed processing capacity of more than 35 tons per hour, and they will be capable of producing virtually all of the wheat and rice seed that the country requires.

Research capabilities

Some government officials, as well as owners of the larger seed companies, feel that private seed companies should be required to maintain their own research programs, implying that they should have staff to do their own breeding research. Indeed, many of the larger seed companies have established research programs, aimed primarily at developing hybrid maize seeds. To date, no privately developed wheat or rice varieties have been developed or registered in Egypt. And there are currently no

known private sector programs to breed wheat or rice. In other countries it is common practice for seed companies to depend upon public sector research programs. Indeed, Egypt has a well-established program for breeding and other research in the Agricultural Research Center. This program currently has about 10 rice varieties and 15 wheat varieties that have been registered and are available for companies to produce.

Although there are undoubtedly benefits to the country and to the companies that do establish their own research and breeding programs, the study finds no reason to require that private seed companies establish such programs.

Marketing Capabilities

Some observers believe that the private companies have inadequate marketing capabilities, and that they rely too heavily on government extension agents or the PBDAC to do their marketing. Indeed, marketing and promotion of seed presents a challenge, but one that the private sector can handle.

Most of the large companies like EGA-Seed, the National Seed Company, and Misr Hi-Tech have been in business for a long time and have previously developed the capacity to market significant quantities of hybrid maize seed. Such companies have well-established networks of dealers and traders who act as their agents, as well as regular professional sales staff who work with dealers and who help establish demonstration fields, participate in extension demonstrations, and hold field days of their own. Smaller companies which have only recently entered the seed business have limited staff and have had to work hard to develop marketing networks. It appears that most of these companies do not as yet have demonstration fields or hold field days.

Although the marketing capabilities of the private seed companies vary, well over half of the private seed production is in the hands of larger companies with well-established marketing channels. The private sector has rapidly established a system for marketing the seeds that it produces. The study found that about 74% of total private production is distributed either through direct sales to farmers or through private merchants. The balance is distributed through cooperatives, Agricultural Councils and PBDAC. Experience to date with seed, and experience with other inputs such as fertilizer and chemicals, indicates that the private sector is capable of marketing all of the national seed requirements.

The private companies interviewed all believe that it would be possible for them to market much larger amounts of seed if public sector production is phased out and the private sector is allowed to fill the resulting gap. Based on what has already been accomplished over the past few years in seed, and considering the privatization that has occurred in marketing other inputs such as fertilizers and chemicals, the study concurs that the private sector is capable of developing the marketing capacity to distribute the country's full requirements for seeds of the self-pollinating crops.

Private Sector Concerns about CASP Production Plans and Control of Prices

The private seed companies have many concerns about the pace of privatization and the government's role in this process. Above all they are concerned that they are not informed as to how much seed CASP intends to produce. The study team believes that this is a justifiable concern, given CASP's large size and the impact that the agency's production decisions can have on the market.

The seed companies say that the government controls prices, and many believe that the prices it sets for seed do not reflect full costs of production. The study team agrees that the government controls the market price when it sets the prices CASP charges for its seeds. This is of particular concern since the procedures for setting CASP's seed prices do not take all of the real costs of seed production into account. For example, CASP does not include depreciation or interest in its cost calculations, although these are real costs that private companies incur.

1. Until CASP is privatized, it is recommended that the government require CASP's seed prices to reflect the full costs of seed production, including depreciation, interest, all personnel and overhead costs.

The private sector is not well prepared to discuss pricing with the government or to demonstrate that CASP does not take all costs into account.

2. It is recommended that the Egyptian Seed Association, ESAS, work with its member companies to develop better information on the costs of production so that the industry is better prepared to negotiate when government pricing decisions are being deliberated.

Planning and Allocation of Registered Seed

Another complaint of the seed companies is that CASP controls the distribution of registered seed. The study team agrees that this is a serious problem. CASP's control of registered seed is a conflict of interest since CASP competes with the private companies while controlling their most basic ingredient.

Furthermore, the planning of registered seed production has been inadequate. CASP does not always produce enough registered seed, and the private companies have not been able to get enough registered seed for some varieties. Furthermore, both the private companies and CASP have sometimes been authorized to produce certified seed from certified seed, because no registered seed was available. This presents a serious concern for seed quality.

Everyone concerned with Egypt's seed industry agrees that the statistics available on seed are limited and of poor quality. This causes great uncertainty for the private seed companies, and it leaves government authorities in the dark as to what is really happening.

The study team believes that a stronger system for planning the production and for the distribution of registered seed is needed. Therefore, it is recommended that a revised system be adopted for planning the production and allocation of registered seed.

3. It is recommended that the duties and responsibilities of the Cereals Council be expanded to include the planning and allocation of registered and foundation seed.
- i) It is recommended that the membership of the Cereals Council be expanded to include representation from the private sector. This would include several representatives of private seed companies and a representative of the Egyptian Seed Association, ESAS.
 - ii) A stated goal of the Council would be to allocate decreasing quantities of foundation seed to CASP and increasing quantities of foundation and/or registered seed to the private sector each year over the next three years. By the third year the private companies would be expected to produce all of the certified seed for wheat, rice and faba beans.
 - iii) It is recommended that CASP's targets for the production of certified seed be announced well before the planting time for each crop, so that the private sector can develop plans and requests for seed without the uncertainty that currently exists.
 - iv) The Council's plans for registered seed production should be based on written requests for future delivery that the private companies and CASP submit, as well as on the recommendations of plant breeders and extension specialists for each variety. Production of additional amounts of registered seed would be planned in some cases, to allow for market growth.
 - v) It is recommended that the actual production of registered seed be carried out as authorized by the Cereals Council. When possible, and as the demonstrated capabilities of the company merit, the Council would allow private seed companies to produce their own registered seed from foundation seed supplied by the ARC. The ARC would provide supervision for such registered seed production.
 - vi) Until the private sector demonstrates its capability to produce all of the registered seed that is required, the Council will specify additional amounts of registered seed to be produced by CASP or by the Seed Unit of the ARC Field Crops Research Institute.
 - vii) Well before planting each year, the Council would authorize the distribution of the quantities of registered seed that had been requested in the previous year. It would announce the additional quantities available and take requests from the private sector and CASP for the amounts of seed they would like to purchase.
 - viii) If more registered or foundation seed is requested than is available for any given variety, the Cereals Council would allocate the available amount among those requesting it, based both on principles of fairness and upon each company's demonstrated capabilities.
 - ix) If private sector requests for registered and/or foundation seed do not amount to enough to supply demonstrated market requirements, plus a reasonable margin for carry-over, additional CASP production would be authorized to fill the gap.

Public and Exclusive Release Varieties

MALR's *Policy and Procedures for Release of Plant Varieties*, approved in July 1999, specifies procedures that are likely to promote the seed industry and facilitate the expansion of the private sector. It provides for general release of some varieties to all producers, while other varieties may be on exclusive release to a specific company.

The availability of varieties for exclusive release is advertised by the Variety Release Advisory Committee (VRAC). Companies interested in producing them are asked to submit bids, including a demonstration of production and marketing capabilities. This system was designed to ensure that new varieties with undeveloped markets receive adequate attention in production and marketing, which might not occur if they were given general release. The company awarded the exclusive right has a special incentive to promote the variety and ensure its quality.

4. It is recommended that the system of exclusive releases be considered for self-pollinating crops in cases where it is merited in the opinion of researchers and the VRAC.

Future of CASP

The Government has repeatedly stated that it intends to privatize CASP, but plans for doing so have not been finalized. Given its size and the resources the agency controls, the ultimate disposition of CASP has potentially great consequences for the private sector. For example, if CASP should be sold as a single entity, it would be so large relative to other companies that it might have the power to monopolize the market. Therefore, it is important to proceed with caution.

5. When CASP is privatized, it is recommended that the agency be sold as a number of separate components rather than a single entity. This would prevent creation of a company large enough to monopolize the market.
6. After CASP is privatized, it is recommended that the resulting private companies be required to operate like all other private companies. That is, they should not be permitted to retain any special advantages, such as control of registered seed, or have any authority to use government resources.

Quality Control

Quality control is an essential part of the production of high quality, reliable seeds. There are several aspects to quality control. In Egypt's case, a government agency, CASC, is charged with supervising the certification process in the field, in the processing plant, and through testing of the cleaned seed for germination and purity. Recent efforts to improve the procedures and operations of CASC are to be commended and are believed to have raised quality standards. Nevertheless, the private seed companies claim that CASC is often arbitrary in decisions and that its

requirement for reports on all shipments of certified seed is unnecessary and burdensome.

Quality control is also the responsibility of the producing company and cannot be considered the sole responsibility of CASC. Some private companies have very limited internal quality control procedures.

7. It is recommended that CASC continue to strengthen its certification procedures to ensure quality, and that it improve the enforcement of established qualifications for company registration.
8. It is recommended that ESAS work to convey to CASC its members' concerns about the certification process.
9. It is further recommended that ESAS work with its members to improve their own internal quality control systems.

The shortages in supply of registered seed that have emerged in some cases, particularly with wheat, has meant that both CASP and private companies have been asked to produce certified seed from certified seed rather than using registered seed. This creates serious risks for seed quality and is another factor that supports the need for a new system of planning and production for registered seed, suggested above.

Availability of Statistics on Seed

For the efficient operation of a seed industry, it is important that reliable statistics be readily available to seed producers and marketers. This is needed both for government policy makers to understand the problems and needs of the sector and for seed companies to plan their production and marketing programs. Much of the information needed by producers is collected by CASC, but the agency is often reluctant to release the data it collects, and its statistical bulletins are slow to appear.

10. It is recommended that CASC improve its system for disseminating seed statistics in a timely manner and make the information available, impartially, to all of the various components of the seed industry.
11. It is recommended that ESAS support and cooperate with CASC in this effort.
12. It is also recommended that ESAS do everything possible to disseminate the information it obtains from CASC to its own members.

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ANNEX A. List of Persons Contacted / Places Visited by Study Team

<u>Date</u>	<u>Persons Visited</u>
11-Nov-99	Dr. Tag El-Din M. Shehab El-Din, National Wheat Program Leader, ARC/FCRI
21-Jan-00	Study team met with Sherif El-Kerdany, Egyptian Seed Association
22-Jan-00	Dr. Farouk Afifi, Chairman, Egyptian Agricultural Company for Seed Production
23-Jan-00	Eng. Mahamed Abdel Meguid, Director of Extension, and Eng. Hussein Diao, Director of Agriculture, Giza Governorate
23-Jan-00	Dr. Essam Gheith, Eng. Yehia Barsoum, Eng. Methat El Sherif, National Seed Co.
23-Jan-00	Eng. Zaki Hamza, Chairman, El Nil Seed Company
23-Jan-00	Dr. Abdel Azim Tantawi, Head, Field Crops Research Institute, Agricultural Research Ctr.
23-Jan-00	Dr. Sami Abada, Head, Central Administration for Extension, MALR
24-Jan-00	Eng. Magdy Abdeen, Head, Central Administration for Seed Production
24-Jan-00	Eng. Fawzi Shaheen, Head, Central Administration for Seed Certification
25-Jan-00	Eng. El Sayed Tantawi, Chairman, General Cooperative for Rice and Cereals
24-Jan-00	Dr. Ali Saada, First Undersecretary for Agricultural Services, MALR
27-Jan-00	Dr. Adel Rady, Owner, Aro-Seed Company
27-Jan-00	Dr. Shawki El Bagouri, Undersecretary for Agrarian Reform, MALR
27-Jan-00	Gen. Mounir Mehessin, Dr. Mohamed Nasr, Dr. Essam Gressi, Misr Hi-Tech Seed Co.
27-Jan-00	Dr. Adel Yasseen, Chairman, Fine Seeds Co.
29-Jan-00	Eng. Mohamed O. Raslan, Director of Ag., Eng. Mahmud M. Aboud, Director of Extension, and Eng. Abdul Moneim M. Khalil, Director of Ag. Coops, Menoufia Gov't.
29-Jan-00	Magdy and Mokhtar Attia Khamees Co., Shebin El Kom
30-Jan-00	Dr. Ibrahim Rizsk, ARC Rice Research Center, Kafr El Sheikh, with group of seven farmers and nine rice extension specialists
30-Jan-00	Eng. Mohamed Khalil, Director of Agriculture, Kafr El Sheikh Governorate
30-Jan-00	El Sheikh Co. (Wholesale and Retail Agricultural Input Merchants), Kafr El Sheikh
2-Feb-00	Dr. Ibrahim Sheta, Undersecretary of Agriculture and Director, Horticultural Service Unit
2-Feb-00	Eng. Rushdy M. Hassib, former head, Central Administration for Seed Production
6-Feb-00	Dr. Chris Weisbecker, Leader, GTZ Technical Assistance to CASP
7-Feb-00	Mr. Wilfried Schwiebert, GTZ Advisor for Marketing to CASP
7-Feb-00	Mr. Adel R. Iskander, Financial Analyst, GTZ / CASP
8-Feb-00	Debriefing for Dr. Ali Saada, First Undersecretary, MALR
8-Feb-00	Debriefing for Dr. Saad Nassar, General Director, Agricultural Research Center
9-Feb-00	Debriefing for APRP and Various Government Officials, RDI Office
9-Feb-00	Debriefing and discussions, approx. 30 seed industry officials, at Egypt Seed Association offices, Mohandeseen, Cairo

ANNEX B. Conceptual Background on the Private Sector's Role in Certified Seed Production

Strong seed industries are essential to modern crop improvement programs. Seed industries are comprised of several linked components, including research, production, processing, quality control, and marketing. In initial stages of development, these components are often quite weak or even non-existent. Farmers make their own variety improvement decisions by selecting seed from one year's crop to be used for the next. A few farms or private companies may specialize in seed production, but the advantages of such specialization are often limited due to the absence of significant improvements in varieties.

As agricultural development proceeds, research on production problems and in plant breeding are often assigned to a government organization. Based on the resulting improved varieties, the government may then undertake to produce and process seed and to ensure seed quality through seed certification programs. To encourage farmers to use new varieties, governments often begin by distributing their seed at low, subsidized prices. As the use of improved seeds expands, however, the costs of such systems become a serious drain on limited government resources.

As improved, high-yielding varieties are developed, opportunities for private seed production emerge. As explained in the report, the production and marketing of hybrid maize seed is normally one of the first segments of the industry to attract private entrepreneurs. Thus, private seed industries often start with the production of hybrid maize seed. However, these companies then often move on the production of seed for self-pollinating crops because it gives them a chance to get greater use out of their facilities and to capitalize on the market position they have developed in maize.

There are a number of advantages to private seed industries, as compared to the government seed sector they replace:

- ♦ Private companies are typically more efficient at seed production, processing and marketing, which means that they are able to produce at lower cost.
- ♦ Competition among private companies can serve as the incentive to develop and introduce more varieties than might result from a government program alone.
- ♦ Competition among private companies to preserve the reputation of their company name and brands often proves to be a more effective safeguard and assurance of quality control than is possible to obtain in a seed industry that is run by a single government agency.

Of course, the profit motive is the incentive for the private sector to pursue the seed business. There are often concerns that, in the pursuit of profit, private companies might charge prices that are too high and could reap monopolistic profits. Indeed, this could occur if there were only one or a few seed companies selling a limited number of improved varieties. However, certain conditions will limit the potential for monopolistic pricing:

- ♦ Government breeding programs can make the varieties they develop available to a number of companies, or they can make exclusive releases of similar varieties to various companies.
- ♦ Private companies can develop their own breeding programs, thus increasing the number of new varieties that are available.
- ♦ The entry of or affiliations with international seed companies can serve both to expand the number of companies and the number of varieties available, thus increasing competition.

As the private sector develops and expands, the public sector role in the actual production of certified seed decreases and eventually disappears. For public agencies to continue to produce, process and market seeds will be seen as unfair competition to private companies, particularly since such agencies are likely to be subsidized from the government budget. Thus, it is important that the government cease to be a producer and marketer.

Although the government will no longer produce certified seed, this is not to say that its presence in the seed sector is no longer needed. There may be value in the government continuing to do breeding research for many years, at least until the private sector is able to develop strong breeding programs of its own. Seed certification is another area that may require continued government involvement. Furthermore, there may be need for the production of basic seeds – that is the successive generations of breeder seed and foundation seed which precede registered seed – to continue under the government management, perhaps as a part of the plant breeding/research organization. At some point, however, it is normal for the production of the registered seed itself to be taken up by the private sector. This is the step in seed multiplication that proceeds the actual production of certified seed.

Appendix 1. Seed and Crop Production Data Base

Data on Wheat									
Year Seed Harvested	Year Crop Harvested	Wheat Seed Price LE/ardeb	Wheat Grain Price LE/ardeb	Wheat Seed Produced Ardebs	Wheat Seed Distrib'd Ardebs	Wheat Seed % Unsold	Wheat Area 000 feddan	Wheat Seed Coverage % area	Wheat Yield Ard/fed
1982	1983		16.49	341,546	306,634	10.2%	1,373.6	56%	9.79
1983	1984		18.65	313,376	290,423	7.3%	1,320.0	55%	10.08
1984	1985	23.70	25.76	209,796	206,070	1.8%	1,178.4	44%	10.27
1985	1986	25.60	33.74	335,326	312,558	6.8%	1,185.9	66%	10.53
1986	1987	34.10	33.53	352,399	342,226	2.9%	1,206.3	71%	10.66
1987	1988	48.80	35.61	485,041	356,017	26.6%	1,373.0	65%	13.22
1988	1989	51.30	65.48	427,776	425,466	0.5%	1,421.7	75%	13.31
1989	1990	53.70	71.00	558,303	507,504	9.1%	1,523.5	83%	13.85
1990	1991	90.00	74.72	881,955	701,977	20.4%	1,954.7	90%	14.56
1991	1992	100.00	79.02	583,706	431,949	26.0%	2,215.1	49%	14.30
1992	1993	120.00	79.34	460,769	403,039	12.5%	2,091.7	48%	14.72
1993	1994	121.00	79.97	446,419	420,440	5.8%	2,128.5	49%	14.99
1994	1995	135.75	84.00	380,473	375,870	1.2%	2,110.9	45%	14.01
1995	1996	157.50	96.02	455,416	391,709	14.0%	2,511.8	39%	15.79
1996	1997	200.35	100.06	338,948	313,155	7.6%	2,420.9	32%	15.69
1997	1998	220.75		288,556	254,576	11.8%			
1998	1999	218.75		409,405	338,917	17.2%			
1999	2000	225.00		416,705	328,722	21.1%			
2000	2001	225.00							

SOURCE: Data prior to 1997 is from Central Agency for Seed Production, "Agricultural Seed Sector Statistics." Data for 1997-99 is from Central Agency for Seed Certification.

Appendix 1. Seed and Crop Production Data Base

Data on Rice									
Year Seed Harvested	Year Crop Harvested	Rice Seed Price LE/ardeb	Rice Grain Price LE/ardeb	Rice Seed Produced Ardebs	Rice Seed Distrib'd Ardebs	Rice Seed % Unsold	Rice Area 000 feddan	Rice Seed Coverage % area	Rice Yield Ard/fed
1982	1983		15.13	388,084	369,866	4.7%	1,011.3	73%	20.08
1983	1984	19.00	15.71	371,092	324,185	12.6%	983.5	66%	18.92
1984	1985	24.00	25.38	321,961	292,175	9.3%	924.0	63%	20.83
1985	1986	27.50	29.68	274,631	211,558	23.0%	1,007.8	42%	20.25
1986	1987	43.50	24.72	488,600	358,868	26.6%	981.1	73%	20.42
1987	1988	38.40	30.78	437,134	336,675	23.0%	837.1	80%	21.17
1988	1989	34.00	43.54	392,455	323,732	17.5%	982.5	66%	22.67
1989	1990	45.00	44.04	376,565	349,930	7.1%	1,036.3	68%	29.67
1990	1991	66.00	54.46	517,707	396,821	23.4%	1,094.6	73%	26.08
1991	1992	67.00	57.94	477,052	290,355	39.1%	1,214.5	48%	26.83
1992	1993	89.65	60.50	289,014	231,616	19.9%	1,276.3	36%	27.08
1993	1994	89.65	72.65	257,028	234,865	8.6%	1,377.7	34%	27.75
1994	1995	83.67	78.73	236,717	229,422	3.1%	1,400.0	33%	28.50
1995	1996	123.13	84.31	182,022	178,163	2.1%	1,405.3	25%	29.00
1996	1997	149.97	86.15	164,528	145,192	11.8%	1,549.9	19%	29.47
1997	1998	185.00		209,382	174,615	16.6%			
1998	1999	185.40		198,128	150,655	24.0%			
1999	2000	156.00							
2000	2001	178.80							

SOURCE: Data prior to 1997 is from Central Agency for Seed Production, "Agricultural Seed Sector Statistics." Data for 1997-99 is from Central Agency for Seed Certification.

Appendix 1. Seed and Crop Production Data Base

Data on Faba Bean									
Year Seed Harvested	Year Crop Harvested	V.Faba Seed Price LE/ardeb	V.Faba Grain Price LE/ardeb	V.Faba Seed Produced Ardebs	V.Faba Seed Distrib'd Tons	V.Faba Seed % Unsold	V. Faba Area 000 feddan	V. Faba Seed Coverage % area	V. Faba Yield Ard/fed
1982	1983		38.91	50,108	45,435	9.3%	289.5	31%	6.11
1983	1984	42.00	43.00	50,845	48,390	4.8%	270.9	36%	6.57
1984	1985	45.00	49.00	49,206	48,528	1.4%	284.7	34%	6.46
1985	1986	63.00	71.01	54,822	52,597	4.1%	270.2	39%	6.84
1986	1987	82.00	85.00	73,817	73,237	0.8%	286.3	51%	6.74
1987	1988	100.00	85.79	101,740	61,191	39.9%	362.8	34%	7.30
1988	1989	95.00	89.50	56,293	56,007	0.5%	329.2	34%	6.45
1989	1990	120.00	107.00	56,649	53,371	5.8%	302.9	35%	7.97
1990	1991	174.50	135.59	52,647	50,123	4.8%	289.2	35%	7.98
1991	1992	185.00	164.01	36,955	22,308	39.6%	382.0	12%	6.08
1992	1993	200.00	160.01	46,561	13,012	72.1%	220.1	12%	3.56
1993	1994	182.50	153.78	24,771	14,714	40.6%	342.2	9%	7.06
1994	1995	244.06	158.01	17,980	12,885	28.3%	319.7	8%	5.99
1995	1996	270.20	172.34	14,830	10,936	26.3%	329.3	7%	8.58
1996	1997	325.00	189.61	11,103	10,124	8.8%	355.0	6%	8.67
1997	1998	310.00		12,034	10,326	14.2%			
1998	1999	310.00							
1999	2000	250.00							
2000	2001	350.00							

SOURCE: Data prior to 1997 is from Central Agency for Seed Production, "Agricultural Seed Sector Statistics." Data for 1997-99 is from Central Agency for Seed Certification.

Appendix 2. Seed Processing Capacity of the Private and Public Sectors		
Company / Organization	Plant Capacities	
	Tons per Hour ^c	Tons per Season ^d
EGA - Seed	6.25	10,000
Wataniya	5	8,000
Misr Hi-Tech	3.5	5,600
NobaSeed	4.5	7,200
Fine Seeds	4	6,400
El Nil	4	6,400
Agro Seed ^a	4.5	7,200
Ag Tech ^b	4	6,400
Sub-TOTAL, Private	35.75	57,200
CASP (16 stations)	132	211,200
ARC (4 stations)	38	60,800
TOTAL, Public & Private	205.75	329,200
^a Plant scheduled for completion in April 2000. ^b Plant scheduled for completion in June 2000. ^c Hourly capacity to process either wheat or rice. ^d Assumes 100 days running on double shifts (16 hours/day)		
Note: Capacities of the private companies are as the companies reported to the study team. Public sector capacities are as reported by Krenz (1998).		

Appendix 3. Marketing Channels Used by Private and Public Sectors

Marketing Channels Used by Private Sector

Company:	EGA-Seed	Misr HiTech	Wataniya	Nobseed	Agro Seed	Fine Seed	Weighted Average
Marketing Channel							
Private ^a	75%	90%	58%	90%	90%	70%	74%
Extension	10%	5%	0	2%	0	0	6%
Cooperatives	5%	5%	13%	3%	5%	0	6%
Ag Councils	5%	0	21%	3%	5%	0	8%
PBDAC	5%	0	8%	2%	0%	30%	6%
TOTAL	100%	100%	100%	100%	100%	100%	100%

a "Private" includes direct sales to farmers and sales through private agents, traders and merchants.

CASP Distribution Channels for Wheat in Two Governorates				
Kafr El Sheikh Governorate:				
Marketing Channel	1996-97	1997-98	1998-99	Average Percent
	Ardebs			
CASP Direct ^a	17,216	14,630	18,267	48%
Merchants	3,414		944	4%
Extension	344	3,555		4%
Cooperatives ^b	12,262	11,608	13,042	36%
PBDAC	4,306	-	-	4%
Other	2,462		1,461	4%
TOTAL	40,004	29,793	33,714	100%
Note: Unpublished Information obtained from CASP.				
a Includes sales from CASP offices and direct from CASP seed plant.				
b Includes Agrarian Reform Cooperatives.				
Menoufia Governorate				
Marketing Channel		1998-99	1999-00	Average Percent
	Ardebs			
CASP Direct		3,215	3,800	31%
Cooperatives		4,000	5,000	40%
Extension		4,000	2,500	29%
TOTAL		11,215	11,300	100%
Note: Information obtained from local extension officials.				

**Appendix 4. Cost of Producing Certified WHEAT SEED in Egypt,
"Typical" Private Producer.**

Basic production parameters and assumptions		
a	Registered seed requirements: kg seed per feddan	60
b	Production of raw seed, ardebs field weight	16
c	Production of grain, kg field weight (150 kg/ardeb)	2,400
d	Extraction of clean seed, percent of field weight	90%
e	Production of clean dry seed, kg/feddan	2,160
f	Seed production cost, contract grower, LE per ardeb	125
		Cost per FEDDAN
		Cost per TON Finished Seed
		(LE)
		(LE)
On-farm production costs:		
h	Registered seed cost per feddan (LE 225/ardeb)	90
i	Breeding royalties to ARC (equal cost of seed)	90
j	Seed production cost, contract grower, LE per feddan	2,000
k	Credit - 50% of seed cost charged to grower	(45)
l	Certification inspection costs - LE 20/feddan+share other fees	22
l	Cost of field bags (LE 3 per 50 kg sack)	144
m	Transport from field to processing (LE 10/ton)	24
n	Field staff, salaries, incentives, transport, per diem	24
o	Sub-total, production costs per feddan & per ton	2,349
		1,088
Processing and Marketing Costs:		
		(LE)
p	Processing and cleaning, including depreciation on plant & equipment	50
q	Chemical seed dressings, insecticides and fungicides	85
r	Certification, inspection & testing (LE 30 per 25 ton lot x 6 tests)	7
	Certification tags (LE 1 each - 30 kg bag)	33
s	Assessment, agricultural syndicate, (0.5% of selling price)	8
t	Bagging (plastic) @ LE 0.70 per 30 kg sack, including technical pamphlet	23
u	Storage (5 mo's @ LE 3 per ton/month)	15
v	Transport cost (1 haul to distributor)	10
w	Marketing & tech. support to farmers - staff salaries, incentives, materials	20
x	Storage loss, 3% of the above	40
y	Overhead - general management and admin. costs (5% of above)	69
z	Interest on operating capital - 15% on the above for 8 months	145
aa	Carry-over cost (5% of above, 10% carry-over, sale for rat poison)	80
bb	Sub-total, processing and marketing costs	585
cc	Sub-total, production, processing and marketing	1,672
dd	Credit sale of seed cleaning by-products	(38)
ee	Distribution cost / agent discount (10% of price)	150
ff	Total costs, production, processing, marketing, distribution	1,785

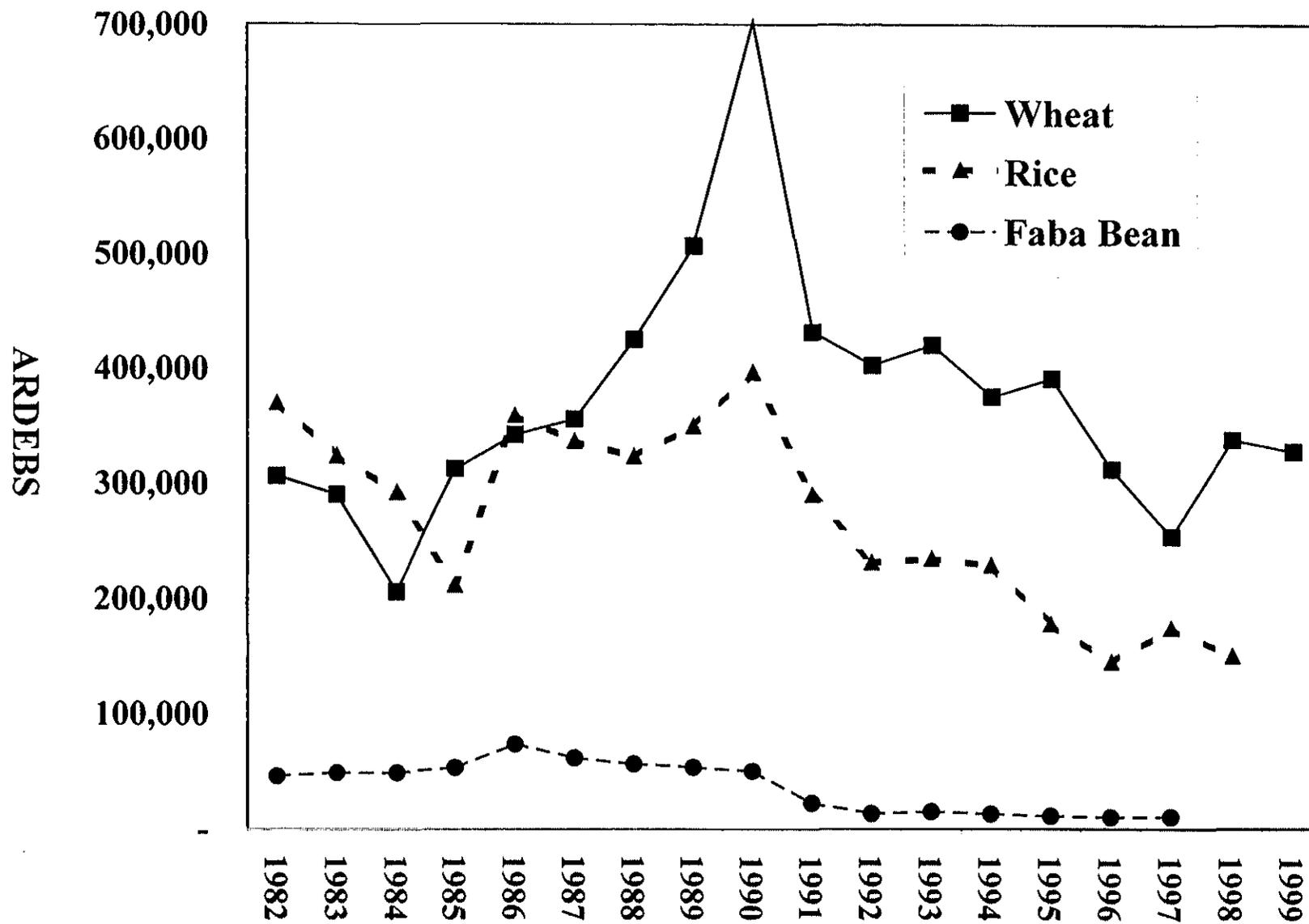
SOURCE: Estimates of study team, based on information provided by six companies.

Appendix 6. CERTIFIED SEED PRODUCTION by TYPE OF ORGANIZATION - 1997-99

	<u>Quantity - metric tons</u>			<u>% of Total Certified</u>	<u>% of Total Available</u>	<u>% of Total Distributed</u>	<u>Distributed - % of Certified</u>	<u>Distributed - % of Available</u>
	<u>Certified</u>	<u>Available</u>	<u>Distributed</u>					
CERTIFIED WHEAT SEED: 99 Seed Production - Distribution for '00 Crop (Distributed at end of Calendar Year 99)								
CASP	45,488	42,531	34,490	73%	73%	70%	75.8%	81.1%
Private Companies	11,801	10,597	9,838	19%	18%	20%	83.4%	92.8%
Agrarian Reform	3,297	3,297	3,216	5%	6%	7%	97.5%	97.5%
Co-operatives	1,921	1,901	1,765	3%	3%	4%	91.9%	92.9%
TOTAL	62,506	58,326	49,308	100%	100%	100%	78.9%	84.5%
98 Seed Production - Distribution for '99 Crop (Distributed at end of Calendar Year 98)								
CASP	48,401	48,275	39,466	79%	79%	78%	81.5%	81.8%
Private Companies	9,407	9,002	8,234	15%	15%	16%	87.5%	91.5%
Agrarian Reform	1,657	1,641	1,570	3%	3%	3%	94.7%	95.7%
Co-operatives	1,946	1,919	1,568	3%	3%	3%	80.6%	81.7%
TOTAL	61,411	60,836	50,838	100%	100%	100%	82.8%	83.6%
CERTIFIED RICE SEED: 98 Seed Production - Distribution for '99 Crop								
CASP	16,495	16,300	13,167	69%	75%	73%	79.8%	80.8%
Private Companies	5,756	4,091	3,685	24%	19%	20%	64.0%	90.1%
Agrarian Reform	504	440	440	2%	2%	2%	87.2%	100.0%
Co-operatives	1,020	812	787	4%	4%	4%	77.2%	97.0%
TOTAL	23,775	21,643	18,079	100%	100%	100%	76.0%	83.5%
97 Seed Production - Distribution for '98 Crop								
CASP	20,189	17,609	15,451	8	70%	74%	76.5%	87.7%
Private Co's & Others	9,440	7,517	5,502	34%	30%	26%	58.3%	73.2%
TOTAL	27,601	25,126	20,954	100%	100%	100%	75.9%	83.4%
CERTIFIED FABA BEAN SEED; 97 Seed Production - Distribution for '98 Crop								
CASP	1,863		1,600	39%		36%	85.9%	
Private Companies	2,779		2,779	59%		62%	100.0%	
Co-operatives	39		39	1%		1%	100.0%	
Research Centers	66		66	1%		1%	100.0%	
TOTAL	4,747		4,484	100%		100%	94.5%	
96 Seed Production - Distribution for '97 Crop								
CASP	1,811	1,704	1,234	72%	82%	82%	68.1%	72.4%
Private Companies	720	386	272	28%	18%	18%	37.7%	70.5%
TOTAL	2,531	2,089	1,506	100%	100%	100%	59.5%	72.1%

SOURCE: CASC.

Appendix 7. Production of Certified Seed, 1982 - 1999



Appendix 8. Crop Area Planted with Certified Seed

