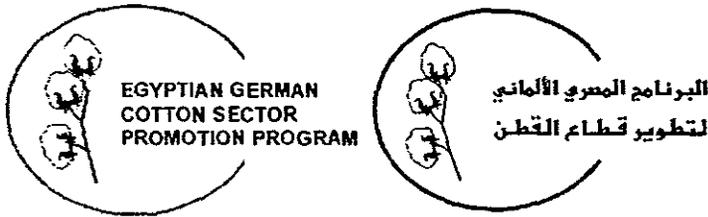


PN-ACS-478



APRP - RDI Unit
USAID CONTRACT No. 263-C-00-97-00005-00
&
Egyptian-German Cotton Sector Promotion Program

Report No. 48

STRATEGY FOR THE LIBERALIZATION OF PEST MANAGEMENT SERVICES

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November 1998

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ACRONYMS LIST

<i>ACRONYM</i>	<i>DESCRIPTION</i>
AC	Agricultural Census
AERI	Agriculture Engineering Research Institute
AHD	Aswan High Dam
AIC	Agricultural and Irrigation Committee of the People's Assembly
ALCOTEXA	Alexandria Cotton Exporters Association
APRP	Agricultural Policy Reform Program
ARC	Agriculture Research Center
ATUT	Agricultural Technology Utilization and Transfer Project
AY	Agricultural Year Locator (October 1 st to September 30 th of the following year)
BOD	Board of Directors
CAGA	Central Administration for Governorates Affairs
CAPMAS	Central Agency for Public Mobilization and Statistics
CAPQ	Central Administration for Plant Quarantine, MALR
CAWD	Central Administration for Water Distribution
CBE	Central Bank of Egypt
CIDA	Canadian International Development Agency
CIF	Cost, Freight and Insurance
CMA	Capital Market Authority
Co.	Company
COP	Chief of Party
CSPP	Egyptian-German Cotton Sector Promotion Program
CTS	Cargill Technical Services
DA	Development Associates, Inc.
DAI/B	Development Alternatives, Inc./Bethesda
ELS	Extra Long Staple Cotton
EMEPAC	Egyptian Company for Production Marketing and Exporting Ag. crops
ERSAP	Economic Reform and Structural Adjustment Program
ESAs	Employee Shareholder's Association
ESOPs	Employees Stock Ownership Program
EU	European Union
FAO	Food and Agricultural Organization of the United Nations
FDIs	Foreign Direct Investments

<i>ACRONYM</i>	<i>DESCRIPTION</i>
Fed.	Feddan = 4200 square meter
FIHC	Food Industries Holding company
FOB	Free on Board
FSR	Food Security Research Unit
GA	General Assembly
GASC	General Administration for Supply Commodities
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GOE	Government of Egypt
HC	Holding Company
IBTCI	International Business and Technical Consultants, Inc.
IDA	International Development Association
IFC	International Financial Cooperation
IFPRI	International Food Policy Research Institute
IPPC	International Plant Protection Convention
IPO	Initial Public Offering
IIMI	International Irrigation Management Institute
IR	Intermediate Results
Kg.	Kilogram
Kt.	Kentar
Libra	Pound of 0.45359 kilogram, also abbreviated as lb.
LE	Egyptian Pound
LK	Lint Kentar of cotton, 50 kgs.
LS	Long Staple cotton
MALR	Ministry of Agriculture & Land Reclamation
MENA	Middle East North Africa
MEIC	Ministry of Economy & International Cooperation
MIMW	Ministry of Industry & Mineral Wealth
MMT	Million Metric Ton
MoTS	Ministry of Trade & Supply
MPE	Ministry of Public Enterprises
MPWWR	Ministry of Public Works & Water Resources
MLS	Medium-Long Staple cotton
MVE	Monitoring, Verification & Evaluation Unit
NARP	National Agricultural Research Project (a former USAID Project)

<i>ACRONYM</i>	<i>DESCRIPTION</i>
NBE	National Bank of Egypt
NCF	National Consulting Firm
NGO	Non-Governmental Organization
O & M	Operation & Maintenance
OSAF	Office for Studies And Finance
PA	People's Assembly
PBDAC	Principal Bank for Development and Agricultural Credit
PEO	Public Enterprise Office
P&L	Privatization & Liberalization
PIDP	Partnership In Development Project
PMU	Project Management Unit
PPC	Program Planning Committee
PRA	Participatory Rapid Appraisal
PU	Purdue University
RDI	Reform, Design & Implementation Unit
ROW	Rest of the World
SCC	Sugar Crops Council
SCRI	Sugar Crops Research Institute
SIIC	Sugar and Integrated Industries Company
SK	Seed Kentar of cotton (157.5 kgs.)
SS	Short Staple cotton
STTA	Short Term Technical Assistance
SWG	Sugarcane Working Group
TA	Technical Assistance
TAMIS	Technical & Administrative Management Information System
TAT	Technical Assistance Team
TF	Task Forces
TO	Training Officer
TOR	Terms of Reference
TNA	Training Needs Assessment
TRG	Training Resources Group
TSG	The Services Group
UMD	University of Maryland
USAID	United States Agency for International Development
US\$	United States Dollar

<i>ACRONYM</i>	<i>DESCRIPTION</i>
WB	World Bank
WTO	World Trade Organization
WUA	Water User Association

STRATEGY FOR THE LIBERALIZATION OF PEST MANAGEMENT SERVICES

Executive Summary

The Ministry of Agriculture and Land Reclamation is committed to a reform program of privatisation and liberalization. This commitment includes plans to redefine the roles of MALR agencies and authorities to respond to the needs of a private sector led agricultural economy. In general, this implies that MALR institutions focus efforts on defining, implementing or enforcing the regulatory framework in which the agricultural sector operates. It also implies increasing responsibility of the private sector in the provision of goods and services to farmers and agricultural processors and traders.

Pest management services is an important reform area for the MALR. Over the past several years, there has been deliberate changes in the pest management industry. The private sector has grown, and the Central Authority for Pest Control has increased its role as a regulatory agency. Currently, the private sector provides pest management goods to over 90 percent of the cultivated area in Egypt. Yet, considerable reform remains. For example, the MALR needs to improve its training programmes in pesticide application for both farmers and professional applicators. It needs to define clear roles between the government and the private sector, and it must prepare procedures for licensing companies and registering pesticides.

This document is a good first step in carrying out pest management services reforms. It is an overall strategy which defines the role of government and the private sector in the industry. This document is intended to guide the MALR and the private sector to establish a market driven industry, led by the private sector, and regulated by the MALR to ensure safe and effective pest control. This document fulfils the requirements of Tranche II benchmark C9.

1. The Ministry of Agriculture and Land Reclamation (MALR) is committed to the liberalization of pest management services at the farmer level

The policy of the Ministry of Agriculture and Land Reclamation (MALR) is to liberalise the provision of all pest management services to farmers, while ensuring that the IPM principles established in cotton and certain other crops are maintained and also expanded to all crops.

The private sector already plays a role in the provision of pest management services in crops other than cotton, largely in the form of pesticide and sprayer distribution. This role is to be expanded in the future.

However, cotton still has a high level of direct government intervention. Cotton thus

needs to be treated separately, and will require a phased period of transition for government to withdraw from direct involvement and control. Private sector involvement in cotton will expand in parallel with government withdrawal.

The long term objective is for farmers to be free agents in the implementation of pest management in all crops, including cotton, having acquired the training, education and knowledge required. Farmers will be free to purchase pest management inputs and services in a competitive market of providers.

Achieving this long term objective will require the cooperation and partnership of government, farmers and the private sector.

2. The MALR is committed to an overall strategy for the implementation of integrated pest management (IPM) in all crops

Together with liberalization, an overall objective of the MALR is to establish and support sustainable, effective, efficient and economic pest management in all crops. In this respect the roles of government and the private sector, and the necessary supporting infrastructure, legislation and regulation, will be established.

In addition, this objective requires a thorough knowledge of the agro-ecology of the farming systems, and that pest management systems are integrated with crop production practices. Potential strategies, including indigenous IPM knowledge, will be evaluated with farmer participation. Farm economics, and other constraints faced by farmers, such as irrigation, drainage and fertilisation, will also need to be considered in order to develop appropriate crop management solutions.

Again, achieving this objective will require the cooperation and partnership of government, farmers and the private sector.

3. The private sector

The stakeholders in the private sector are considered as:

- Individual farmers.
- Farmers associations, groups and cooperatives.
- Large and small service companies (providers of inputs, pest monitoring and spraying services, information etc).
- Crop commodity companies.
- Any other private individual or organisation involved either directly or indirectly in pest management activities, either as suppliers or users of inputs or services.

It

4. Future roles of the MALR

The future roles of the MALR will consist of:

- Providing the legislative and regulatory infrastructure.
- Licensing, certification and monitoring of private service and input companies and of commercial pesticide applicators.
- Registration of pesticides and monitoring pesticide quality.
- Registration of spray application equipment.
- Research and recommendations for all pest management strategies.
- Monitoring the implementation of the recommendations.
- Monitoring the safe transport, storage, handling and application of pesticides.
- Collection of data on pest levels, pesticide use, areas treated, and costs.
- Pest monitoring, forecasting and early warning.
- Training, advice and support to all stakeholders in pest management matters.
- Implementation or supervision/coordination of pheromone mating disruption for pink bollworm in cotton.
- During the cotton transition phase, continuation of current activities but with declining involvement.

5. Future roles of farmers and private sector

The future roles of the farmer and private sector will consist of:

- Decisions with regard to what pest management operations are necessary and who undertakes them. These decisions must be within the framework of pest management recommendations, legislation and regulation established by government.
- Responsibility for the full costs of pest management operations.
- Following government recommendations for pest management and pesticide use.
- Undertaking pest management operations within the legislative and regulatory framework established by government.
- Import and supply of pest management inputs.
- Provision of training, education and information to farmers.
- Responsibility for any adverse external effects resulting from the implementation of pest management operations. Such effects will include, but not be limited to, the misuse of pesticides, contamination of the environment, and the effects of uncontrolled pest attacks on the crops of adjacent farmers.

6. Research and Technical Recommendations

The MALR will be the major organisation responsible for research, and the only organisation responsible for technical recommendations regarding pest management

techniques and practices. Suitable research methods will be evaluated and developed so as to involve farmers in the research process and produce practical solutions to problems at the farmer level.

Private companies may undertake their own research in pest management techniques and pesticide efficacy. However, the results must be approved by the MALR through a standardised procedure before being incorporated into the official recommendations.

Pesticide recommendations will be considered on an individual basis, and approval or withdrawal will be considered only on the basis of scientific evidence.

7. Training and Education programs

Training and education programmes will be the responsibility of both government and the private sector. All training and education contents will be derived from the official recommendations issued by the MALR.

The MALR will be responsible for basic extension, training and education programmes for farmers. Extension methods appropriate to Egypt will be developed and evaluated, including the farmer field school approach. Service and crop commodity companies will be encouraged to undertake their own training and education programmes, providing these follow the pest management recommendations issued by the MALR.

The objective of the programmes will be to provide the farmer with the training, knowledge and information required to make rational decisions for the implementation of pest management in all crops.

For the cotton transition phase, training will also prepare the farmer to adopt full responsibility for the field implementation of pest management techniques.

Training of commercial pesticide applicators will largely be undertaken by the private sector, supported by government. Certification, licensing and monitoring of such operators will be the responsibility of the MALR.

8. Input Supply

Input supply to farmers will be the responsibility of the private sector, and there will be no government involvement in this aspect. The types and amounts of pesticide imports will be at the discretion of the importing companies, providing that the pesticide is registered for use in Egypt.

The MALR will establish the necessary registration procedures for pesticides, sprayers and other inputs to ensure that only inputs of a satisfactory quality are available. The registration procedures will be as simple and transparent as possible.

Input suppliers will need to assume certain responsibilities for training and education of farmers with regard to their products and pest management techniques.

With regard to cotton, the MALR will continue to supply inputs to farmers during the transition phase, but with declining involvement.

9. Private company licensing procedures

To provide inputs or pest management services, all private companies and operators will be licensed. The necessary licensing procedures will be established, as will arbitration procedures in case of dispute. The licensing procedures will require that the company or operator proves adequate knowledge of the official pest management recommendations and of field implementation procedures. Companies will be monitored to ensure compliance with recommendations, legislation and regulations.

Failing to adhere to recommendations, legislation and regulations will incur severe penalties, including withdrawal of the license to operate.

10. Strategy and time scale for change

The above provides an outline of the basic government policy with regard to pest management under a liberalised system.

The overall strategy for the implementation of the changes, including those for cotton, and the relevant responsibilities of the concerned parties will be established and issued by the end of 1998. In this regard, all stakeholders will be consulted so that a fair, realistic and practical strategy can be developed which meets government objectives for the implementation of sustainable, effective, efficient and economic pest management on a national basis.

**STRATEGY FOR THE
LIBERALIZATION OF PEST MANAGEMENT
SERVICES**

1. Introduction

As part of our national liberalization strategy, plant protection inputs and services should be liberalized. The approach identified as integrated crop/pest/pesticide management (ICM/IPM) should be the fundamental strategy. Accordingly, our committee's task is to clarify the basis, approaches, obstacles and means of pest control, not only for cotton but also for Egypt's entire agricultural ecosystem. The current system should be carefully reviewed to determine the advantages and disadvantages. Where necessary, we must adopt new roles to liberalize pest management and establish a services system.

During our meeting of 25th May 1998, we concluded that the key issue is liberalizing pest management services in collaboration with the Ministry of Agriculture (MALR) and the private sector.

We must examine present pest control methods for cotton. We also need to examine the Ministry of Agriculture's national strategy towards ICM/IPM, farmers' responses, public acceptance and past achievements. We must determine whether MALR achieved success in pest management services in the cotton subsector. Additionally, pest control strategy and operations in the other field crops, horticultural and ornamental crops should be clarified. We must differentiate between cotton pest management services and other field and protected crops.

The private sector has previously established pest control services. These services must be expanded to all crops, rather than to cotton alone. As a result of this expansion, many private providers of pest control services will charge higher costs than those charged by MALR during the last 20 years. Farmers' awareness of this higher cost under the private sector is necessary. With financial support of the APRP project, we hope to gain acceptance of this private sector approach.

Our aim is to identify the present as well as exploring future approaches, constraints and solutions to problems in liberalizing pest management services nationally. The strategy and timeframe in which the private sector implements these services must be decided. Before making this decision, the following points should be addressed:

- Will the Ministry of Agriculture (MALR) accept liberalization of pest management services?
- Does MALR have established strategies for IPM for all field crops?
- Does the private sector comprise non-government organizations only?
- What are the present and suggested roles of MALR/CAPC in liberalizing pest management services?
- What are farmers' attitudes towards liberalizing pest management services?

- Will the government and/or private sector be responsible for training and education programs in pest management services?
- How do we adapt government roles to meet farmers' new needs?
- Who will be responsible for pest management services or pest control agents (pesticides) registration? MALR alone and/or other organizations, the private sector?
- Who will provide farmers with IPM inputs (pesticides, growth regulators, spray equipment, etc.) and maintenance of application equipment?
- Do we convert the CAPC into private service units on governorate and/or village scale to provide choice to farmers?
- Will licensing and monitoring of the private sector include CAPC as a new private unit dealing with pest management services?
- Do we differentiate between pest management services in cotton crops and other crops during the two-year transition period?
- Can we amend the existing government policy and decrees that limit pest management services liberalization?
- Can the private sector shoulder responsibility for pest management services through specified laws and decrees?

The answers to these questions must be formulated and declared in a policy identifying the strategy and timeframe for the changes.

2. Liberalization of Pest Management Services

• 2.1. Partners in Pest Management Services

Three partners are involved in liberalizing pest management services. Their activities must be coordinated to achieve the policy goals of successful sustainable agriculture in Egypt. These partners are as follows:

- ◆ **Farmers:** The clients/receivers of the service
- ◆ **MALR/CAPC:** The government sector, which will determine roles and actions through laws and decrees for pest management services
- ◆ **Private Sector:** Companies, organizations and other non-government entities working under national regulations. They will compete with MALR/CAPC to provide services to farmers, who will then choose to deal with the group offering better services.

• 2.2. Weaknesses among Partners

To understand the problems faced by farmers and the private sector, we outline the following areas of concern for each partner:

- ◆ **Farmers:** Suffer lack of knowledge and experience in pest management concepts. From 1950 to the present, farmers were fully dependent on MALR/CAPC for pest control operations, especially in cotton. Agricultural universities have played a role but unfortunately, they contributed to the failure of the agricultural cooperative system and have not increased farmer knowledge of pest management services.
- ◆ **MALR/CAPC:** As a government sector they have controlled every element of pest control: pesticide registration, supplying all pest control inputs through government tenders, and applying pesticides via ground and aerial application. Additionally, the extension services departments of MALR are responsible for the training and education of farmers and pest control supervision. Unfortunately, present approaches are insufficient to achieve the goals of MALR. MALR, for the most part, did not allow the private sector's involvement in plant protection in general and pest control in particular. When a farmer became the head of CAPC about 10 years ago, MALR initiated ICM/IPM. This effect can be seen in the comparison of market size and consumption of pesticides within the last 10 years. With this success, MALR/CAPC now needs time to liberalize pest management services. They must adopt new strategies to handle the needs of the farmers and the private sector.
- ◆ **Private Sector:** MALR/CAPC has controlled the importation of pesticides. As a result, the private sector faces great constraints with pesticide trading and pest control operations. Unfortunately, much of the private sector has little knowledge of pest management services or pesticide handling. Producers of pesticides prefer dealing with MALR directly through government tenders, resulting in sales of

products without providing services. Companies have not established staff to train and educate supervisors and farmers on the safe use of pesticides and ICM/IPM concepts. Part of the problem is that the private sector has difficulty in obtaining payment from farmers for pest management services. The absence of arbitration in resolving problems among the private sector and farmers and/or MALR contributes to the problem.

Is the private sector able to assume the roles of MALR/CAPC? To answer this question, we must consider the following:

- Implementation of MALR recommendations. The private sector wants their own products, system and approaches. They do not value MALR's current system because it lacks scientific basis.
- Provide pest forecasting and early warning system. This is expensive and requires special expertise. The private sector should educate farmers, supervisors and pest management specialists on the importance of forecasting.
- Monitor pesticide supply, use and quality. Ultimately, the farmers will pay the costs of monitoring. Checking the quality of pesticides is difficult and should be done at specified laboratories.
- MALR must accept private sector involvement in pest management services if successful liberalization is to occur. Farmers' acceptance will develop gradually once they are able to select the appropriate channel available in the private sector.
- Although free selection by farmers should be permitted, regulations are needed to control the misuse of pesticides. Penalties on the misuse or improper introduction of inputs or services should be severe.

3. Does MALR Have an Established/Announced Strategy for Pest Management Services?

MALR's strategy is to minimize the use of pesticides. Unfortunately, no accurate calculation on cost/benefit has been done. Unquestionably, MALR has succeeded in cotton pest control where is where all their efforts were directed. Other crops (vegetables, fruits, etc.) were left to the private sector but were not monitored by MALR. With few exceptions, MALR failed to supply a scientific basis to their "alternatives to pesticides" program. This resulted in unknown formulations and products finding their way to market. Many of MALR/CAPC'S efforts are to control pesticide trading, safe use, and quality, but such efforts are inadequate given the large size of the market. As a result the private sector, especially illegally established companies, has made large profits while offering poor service. This situation gives doubts about the future role of the private sector under liberalization.

To adapt to the liberalization of pest management services, MALR/CAPC should gradually divest from certain old roles, especially:

- Purchasing pesticides and pest control application equipment
- Nominating pesticides and amounts through import licensing control
- New roles are needed in the following areas:
 - * Implementation or supervision/coordination of pheromone mating disruption for all crops in addition to cotton
 - * During the transition phase, continuation of current field activities with declining involvement in cotton pest management
 - * Legislation and registration
 - * Monitoring pesticide quality
 - * Pest management recommendations for all crops based on applied research
 - * Recommendations for pesticides, spray thresholds, dosages, and rotations
 - * Collection of data on pest levels, pesticide use, areas treated, and costs
 - * Monitoring the safe transport, storage, handling and application of pesticides.

The involvement of MALR/CAPC in pest management services and/or strategy requires adopting new roles supporting liberalization. The private sector as well as farmers (as individuals and/or organizations) could maintain such roles. We suggest the following:

- * Monitoring implementation of pest management strategy and recommendations
- * Pest management services training, advice and support to the extension service
- * Licensing and monitoring private companies
- * Training, advice and support to the private sector
- * Pest forecasting and early warning

4. What is the Private Sector?

We need to clearly define the roles of MALR/CAPC in pest management services. Do we consider them among the private sector or not? The idea behind shifting CAPC to a special unit with pest management services is to simplify the relationship among pest management partners. This does not mean that CAPC will become a private service unit contracting to treat areas, because this situation would not give the farmer a choice. The definition of CAPC should be specified by law and/or decree.

The private sector consists of individual farmers, farmers' organizations, service companies, agricultural universities and groups, commodity companies or any other

organization involved directly or indirectly in pest management services (i.e., CAPC). We have to define the roles of each, considering that all will work simultaneously, either independently or cooperatively on a contracting basis. Competition must be encouraged. The final goal of the new system is a private sector comprised of individual farmers. This will not be easy. Due to the farmers' lack of pest control knowledge, they must operate within the framework of national regulations and legislation. Farmers do not value MALR's present pest control approaches for many reasons:

- Farmers believe that CAPC are government employees working under restrictive conditions with low pay.
- Frequently, MALR pest control advisors and/or supervisors are overworked and supervise large areas. This results in insufficient time to examine the fields or educate farmers on pest management services.
- MALR supervisors concentrate on technical control of key pests with high doses and high spray frequency.
- MALR advisors sometimes independently purchase pesticides. Farmers are unhappy, as it adds more cost to pest control operations.
- MALR supervisors do not have adequate knowledge of pest control. Sometimes they use pesticides which are not recommended, and sometimes they suggest exceeding the MALR recommended spray schedule.

Farmers must be trained in pest management to examine fields, identify key pests, select proper compounds and assure their timely use. This will be difficult and time consuming, but it is necessary. A transition period is needed to educate farmers on the safe use of pesticides, their hazards and environmental impact.

An important vehicle for farmer participation in pest management services is farmers' organizations. Training will be necessary for direct involvement (arranging for equipment, pesticides, supervisors, etc.), assuming farmers' organizations accept the role. Operating costs and maintenance must be examined to ensure efficient services. Some problems and complaints are expected at the outset, but good management will resolve these.

5. Suggested Roles of MALR/CAPC

• 5.1. Reorganization of MALR/CAPC

MALR/CAPC must examine its existing staff structures and facilities (stores, equipment, pesticides, etc.) nationwide. The existing roles governing pest management services must be identified in relation to agricultural laws. To liberalize policy MALR should review the current roles and determine if they will be continued,

canceled or changed, and whether such roles will be assigned to the private sector. A timeframe for the changes should be declared.

MALR should continue its current activities but with declining involvement (i.e., in cotton crops) during the transition. They must establish the policy and strategy and also the legislation addressing registration, recommendations, licensing, and monitoring pesticide quality. MALR should adopt the following new roles:

- Monitoring of pest management services to ensure appropriate use.
- Control of licensing for private companies, along with training similar to that done for the extension service.
- Pest forecasting and early warning in coordination with the private sector.
- Monitoring and supervision of safe transport, storage, handling and application of pesticides.
- Establishing a database system covering all agricultural areas in coordination with the private sector.
- Complementing the database collection with expert systems, thus providing farmers with quality pest management services.
- Consulting with private sector experts to formulate policy, strategy and laws for pest management services. A committee should be established to include universities, Agriculture Research Center, National Research Center, MALR/CAPC, private sector, Egyptian GIFAB organization and representatives of pesticide recommendation committees.

• **5.2. CAPC and Private Sector Roles for Cotton and Other Crops**

The roles of CAPC and the private sector, including farmers, should be the same for cotton as for other crops. Private sector companies, especially producers of plant protection inputs, should train CAPC staff and farmers. Competition should be encouraged among proposed new private units of CAPC and the private sector. The private sector is now performing pest management services on 13 million feddans successfully, while CAPC is performing IPM services exclusively for cotton in less than one million feddans. Cost-benefit analysis should show the advantages of the private sector acquiring pest management services from CAPC.

• **5.3. Can CAPC become the Responsible Agency for Pest Management Strategy and Services?**

CAPC will continue to register pesticides, establish regulations, announce pest management programs and define roles for those working in pest management services. The key issue in privatizing CAPC is how to handle their large employee base. This should not be a problem because experienced staff will find ways to work

in pest management services independently or through private companies. A one-year transition period is necessary for those employees to adapt to the new system. Undoubtedly, private companies will contact active persons in each location even on a village scale. Such changes in CAPC roles should be specified in the laws.

- **5.4. How Will the CAPC Enforce Quality Control, Conduct Inspection of Imported Pesticides, Train Farmers, and Ensure Proper Labeling?**

Differentiation is necessary between CAPC units competing with the private sector and MALR's responsibility for other tasks. These MALR roles include strategy management, regulations, recommendations, quality control, license issues, inspections of CAPC units and private companies, regulating importation of IPM inputs, training, and extension. Regulations should be reviewed every five years to address difficulties experienced within the previous period.

- **5.5. How Will MALR Enforce Pesticide Management Rules Under Liberalization?**

MALR is presently controlling all elements of pest management services including the private sector. Effective rules include licensing to import pesticides and other IPM inputs, inspections of quality control, safe use and labeling of pesticides, and inspection of the private sector. MALR can withdraw licensing of pest management services from CAPC units and/or private companies. If a problem develops between a private sector company and MALR, between two companies, between a private company and a CAPC unit, or between a service company and farmers, who will arbitrate? An impartial committee should be formed consisting of experts from universities, MALR, the private sector and lawyers.

- **5.6. Does MALR Continue Controlling Importation of Pesticide Types and Amounts?**

Surveys of the private sector indicate that they prefer open importation of recommended pesticides with no restrictions on the quantity. The same freedom in importation should be given to domestic formulators such as Kafr El-Zayat, Framchem, etc., in accordance with national regulations and law. The import ban on canceled or prohibited group A, B pesticides should be lifted or clarified. This should be followed on duty drawback pesticides in the free zone area. However, we must prevent the entrance of hazardous products, both for domestic use and for export. Coordinating with the Ministry of Health and the Organization of Chemistry of the Academy of Science is necessary to avoid the entry of prohibited pesticides.

MALR should continue checking the quality of the imported and locally formulated pesticides. Inspections should be regulated and judgment for any problem should be clearly specified.

6. Who Will Train and Educate Farmers?

MALR, CAPC private units and the private sector should cooperate in the training, education and demonstration to farmers in the following areas:

- The concept of pest control, IPM, and pest management services
- the importance, benefits and necessity of pest management services
- the implementation of pest management services
- the importance of farmers' daily visits to their fields
- differentiating symptoms of infestation and damage by key pests
- safe use, handling, storage, and disposal of pesticides
- selecting the appropriate pesticide and application equipment
- importance of the pre-harvest period.

Both the private sector and the government should carry out demonstration trials to convince farmers of the usefulness of pest management services. The final goal of this training program is to educate farmers so they may perform pest management services themselves. To avoid farmers' rejection, such a training program should not increase farmers' costs. Financial support is available through the government of Egypt or donor-supported projects for training and education. Training should start with protected cultivation (plastic houses) and gradually expand to all crops (i.e., cotton first, followed by wheat, maize, soybean, etc.) It is preferable to separate cotton pest management services from the other crops. The system in the USA for Florida citrus is a good example. The system in Gent, Belgium for plastic houses is another example.

7. Who Will Supply Pest Management Services to Farmers and the Private Sector?

MALR should not be involved in supplying pest management service inputs including pesticides. MALR must control the quality of the inputs without any direct interference in importation, distribution, selling, or prices. Private companies should assume these roles.

Pesticides can be imported by K&Z (Kafr El-Zayat Factory) or any other factory and formulated locally under agreement with the producers. This allows MALR to keep some stock of technical grades for emergency occurrence by key pests. Free zone areas belonging to formulation factories make quality control easier and less costly.

As equipment is one of the limiting factors affecting pest control, MALR must evaluate the performance and specifications of equipment for pesticide application. MALR through the Institute of Mechanization or the Department of Spray Technology should calibrate and register pest control equipment. MALR should set

reasonable specifications for sprayers and ground equipment to ensure that only appropriate equipment is imported.

- **7.1. Is it Necessary to Supply Farmers with Pest Management Services or ICM Packages?**

From the outset, the private sector, CAPC units and other organizations dealing with pest management services should be responsible for offering pest management services as a package. We suggest the private sector register pest management service programs for each crop or group of crops. Such programs should include agricultural practices (i.e., selection of the proper crop cultivator, date of plantation, irrigation and fertilization system, pest control, monitoring, safety period, harvest, etc.).

Following this system of pest management services, we will need to hire experienced staff from private companies. Such staff must suggest successful pest management services program strategy, educate farmers, and carry out experiments. MALR, CAPC units and private companies as well as commodity companies will also follow this strategy. In addition to field demonstrations, one-day training seminars for farmers and supervisors are necessary.

- **7.2. Who Will Introduce the Pest Management Services Package?**

Governmental and non-government units will offer pest management services to farmers. Accordingly, we must encourage the establishment of new companies for pest management services implementation. Big companies who have dealers at governorates such as Shora, Novartis, Camtrade, etc., should advise their dealers at these governorates to obtain licenses for pest management services. This tactic will put pressure on MALR to accept the liberalization of pest management services, as MALR would have more than 1,000 companies to license. This should convince MALR to completely privatize pest management services. Otherwise, MALR would have to design regulations to issue these licenses for trained and qualified traders, farmers and the private sector.

These services should be started on a small scale and gradually expanded until the farmers trust their own capabilities and are convinced the approach is viable. We expect a two-year transition period to create farmers' acceptance. Afterwards, farmers will be able to choose the most efficient and appropriate channel of pest management services, or they can independently perform pest management.

8. Formulation and Declaration of a Policy, Strategy and Timeframe for Changes

MALR should accept liberalization of pest management services through the specifications of agricultural law. Accordingly, MALR should formulate and declare the policy, strategy and timeframe for the liberalization of pest management services. MALR should clearly define pest control management and services roles and rules to

avoid misunderstandings. Concurrently, MALR must declare a pest control strategy on a national scale aimed at minimizing pesticide use and maximizing the role of agriculture practices, biological control agents, and sanitation. This should be accomplished through a monitoring system.

MALR should coordinate with the private sector through seminars, meetings and workshops. Based on the results of these meetings, MALR would announce a plan for pest management on a crop-by-crop scale. The plan should describe the elements of pest management implementation and evaluation.

The timeframe for completing the implementation of pest management strategy should be within the next two to three years. Initially, cotton pest control strategy can be declared and established by the end of 1998. Other crops could be completed between 1999 and 2000. Pest management services strategy should consider Egypt's agriculture system (i.e., dense cultivation, intercropping, soil conditions, and irrigation system, land possession by farmers, economy, and supply of pest management services inputs).

• 8.1. Present Pest Control Methods

The Agricultural Organization of Egypt (AOE) performed pest control operations successfully from 1950 until 1980. Pesticides and pest control machines were instituted by AOE at the village level. They established an efficient system which included the following inputs:

- pesticide supply
- sprayer and motor supply
- transportation facilities
- storage buildings
- application facilities
- trained spray personnel

It is surprising to discover the AOE refunded the costs of pest control packages without difficulties. Cost refunding is the critical constraint confronting the private sector in pest management services. During the transition period, agricultural banks could arrange a system for financing and refunding the costs of pest management services on a contracting basis with the private sector.

Traditional pesticide alternatives such as sulfur, plant extracts, mineral and plant oils, biocides and biofertilizers should be nominated for each target pest based on scientific data. Again, a pest control program should be declared and distributed for each sector and/or farmer scale. The private sector should contribute to the preparation, printing, publication and distribution costs of "Pest Control Recommendation Book" issued by MALR. They can also issue their own guidelines for the implementation and follow-up pest management services.

- **8.2. Amending Government Policy and Decrees Limiting Pest Management Services**

Every decree regarding pesticides and pest control should be carefully reviewed. Those hampering the liberalization of pest management services should be amended or deleted. Relationships among MALR, CAPC and the private sector should be specified by the decree of pesticide handling and use, or preferably by issuing a decree for pest management services. The new decree should be reviewed and discussed with experts from MALR, universities, and private sector groups including farmers' representatives. Arbitrators of judgment must be clearly specified.

9. Pest Control and Management by the Private Sector

The private sector now provides services on 13 million of the total 14 m. feddans of cultivated lands. This represents about 93% of the cultivated area. The private sector is capable of performing pest control services in an efficient manner.

- **9.1. Law Principles**

Through an agricultural decree, we must legalize the provision of pest management services by the private sector. The future role of private sector liberalization of pest control in different crops should be specified. The present decree addresses only pesticides without consideration of application and/or services. We offer the following recommendations:

- Decree should allow for full liberalization of the importation of pesticides and other pest management service inputs.
- Decree should allow for establishment of service companies with special licensing under specified conditions.
- A committee should be formed to prepare the additions to the pesticides decree (handling and use) in a specified timeframe. This must be done as quickly as possible.

These items should be legalized by the Minister's approval to the new law/deGREE previously issued and before the finalization of the new agriculture law.

- **9.2. Guidelines and Specifications for Planning the New Law for the Private Sector**

A clear law/deGREE covering liberalization of pest management services is needed. While MALR should coordinate with other Government of Egypt agencies and the private sector, it should lead the effort.

We must review the roles of all organizations working in pest control. The existing roles should be amended to adapt to the liberalization system. We recommend giving

total rights on pest control operations and pest management services to the private sector, but these should be transferred gradually during a transition period.

We need to establish an inspection team to track the safe use of pesticides, supply of pest management inputs, handling, storage, transportation and disposal of pesticides. Team members and supervisors should be selected and tasks, roles, and rules should be specified. They must inspect the private sector to ensure the proper use of pest management inputs and elements. The inspection team could consist of experienced members in sustainable agriculture, farmers, industries and environmentally concerned members.

MALR should continue role supervision, preparation of plans and strategy for pest management in addition to extension service and private sector inspection. This will require changing the approaches and functions of CAPC/MALR. Problems can be avoided by clear specification of all items involved in pest management services.

Farmers will ultimately bear all costs of pest management services. Through training and education, a choice will be created for farmers, allowing them to select appropriate services or to independently perform those services. During the 2-3 year transition period, MALR and the private sector can bear some of these costs to encourage farmers' acceptance.

Contracts must be made between farmers and pest management service companies indicating the methods of carrying out services, including components, timing and refund of pest control cost. The decree or the contract to resolve any problems arising between parties shall name an arbitrator.

The knowledge and experience of traders and dealers of pesticides should be enhanced by training and education through seminars on the safe use and handling of pesticides.

Government and non-government sectors should initiate training courses to educate farmers, inspectors, etc., on the concept and importance of liberalizing pest management services.