Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases

- Desert Locust Component -

Central Region Programme

EMPRES/CR

Progress Report

December 2001 – December 2002

Food and Agriculture Organization of the United Nations

A Introduction

The Desert Locust component of EMPRES (Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases) was initiated in mid 1994. Its purpose was to strengthen the locust management capacity of locust-affected countries with the aim of minimising the risk that Desert Locust plagues will develop. It was designed as a collaborative programme in which affected countries, regional organizations, donors, and FAO, participate in the development of improved preventive control strategies. Preparatory activities started in 1995 in the Central Region, comprising nine countries around the Red Sea (Djibouti, Egypt, Eritrea, Ethiopia, Oman, Saudi Arabia, Somalia, Sudan and Yemen). This area is considered to be the origin of most Desert Locust outbreaks.

The **primary development objective** of the EMPRES Central Region Programme (EMPRES/CR) is stated as:

"To minimise the risk of Desert Locust plagues emanating from the Central Region of the Desert Locust distribution area through well-directed surveys and timely, environmentally sound interventions in order to mitigate food security concerns in the Central Region and beyond."

The overall **Programme goal** was re-defined in February 2000 as:

"To strengthen the capabilities and capacities of the national, regional, and international components of the Desert Locust management system to implement effective and efficient preventive control strategies based on early warning and timely, environmentally sound, early control interventions.

A full donor-assisted programme began in 1997 with the recruitment of the EMPRES/CR team in duty stations at Asmara, Sana'a, Khartoum and Addis Ababa.

Since then the EMPRES/CR activities have focussed on five main areas:

Early Detection

Desert Locust survey and forecasting methodologies and systems are being strengthened and improved. Timely action relies on efficient information networking.

Early Reaction

Technical assistance and advice is being provided to affected countries in order to increase their early intervention capacity, and to assure more effective and environmentally safer control operations

Research

EMPRES provides the platform for joint national and international research programmes on improved Desert Locust control tactics and strategies. Initial topics being covered include bio-control, population dynamics, survey methodology, barrier treatment, economic impact, and environmental impact. These involve, for example,

field trials on insect growth regulators (IGR), botanical insecticides, and mycopesticides.

Campaign Planning and Contingency Arrangements

Campaign planning procedures and contingency arrangements are being developed in close cooperation with Central Region countries. The aim is to improve preparedness for Desert Locust interventions so that the necessary resources can be mobilised early enough when critical situations arise.

Capacity Building

Apart from improvements in technical and organizational areas, EMPRES concentrates on the development of human capacity through intensive international, regional, and national training programmes for different target groups and on relevant subject matters. Database and information management, training of national trainers and field staff, and training of scouts, farmers and nomads, are being addressed.

Following the approval of the EMPRES Programme by the FAO Council in mid-1994, a number of donors provided support to FAO for EMPRES/CR, namely the Netherlands, the USA (through USAID), Germany and Switzerland (through GTZ). Other development agencies such as those from the U.K., Belgium, Japan and Norway provided assistance bilaterally or to specific areas of the Programme. All in all, including FAO funds from the Regular Programme, an amount of about US$ 5 million was allocated to the 4-year Phase I of the Programme (1997 – 2000). Following a Evaluation Mission in 1999 which recommended that there should be a Phase II of EMPRES/CR, a Programme Planning Workshop for Phase II was held in El-Tur (Egypt) in March 2000. The Workshop estimated that about US$ 5.52 million were required during Phase II to cover staff salaries, operational expenses, equipment and contracts, research programmes, training and support costs.

A 3-year Phase II of the EMPRES/CR Programme (2001 – 2003) started in January 2001, taking into account the recommendations of the Evaluation Mission and based on the Implementation Document developed by participants at the EL-Tur Workshop.

The Purpose of Phase II was formulated as:

"Components of preventive Desert Locust control management developed and adopted."

The following eight results were anticipated to contribute to the above purpose:

R-1: Operational mandate of different regional organizations in Desert Locust management harmonized.

R-2: National and regional communication networking enhanced.

R-3: Desert Locust early warning and information systems improved.

R-4: Desert Locust survey procedures of the member countries improved.

R-5: Desert Locust technicians and officers qualified.

R-6: Contingency plans available and implemented.

R-7: Efficient and environmentally safer control methods introduced.

R-8: Systematic methods of campaign evaluation developed.

By the end of 2002, four FAO-EMPRES/CR staff remained, based in Khartoum (2), Sana'a (1), and Cairo (1). In addition, one GTZ staff seconded to the EMPRES/CR Programme as Visiting Scientist was based in Cairo until December 2003. The current Associate Professional Officer (APO) position in Khartoum will expire in January 2003. The post of the Research & Development Expert in Sana'a was terminated in July 2002 and replaced by a new international staff member based in Khartoum as from December 2002. The position of the former EMPRES National Professional Officer (NPO) in Khartoum has been vacant since August 2001 due to administrative difficulties in transferring the NPO post under changed Terms of Reference to Addis Ababa. As before, EMPRES/CR is supported by national Liaison Officers in eight of the nine the member countries and by a representative of the Desert Locust Control Organization for Eastern Africa (DLCO-EA). Somalia is represented by an "EMPRES Link Person".

B. Status Report

B.1 Achievements of Outputs

Result 1: Operational mandate of different regional organizations in Desert Locust management harmonized.

Indicator 1.1: At least 1 EMPRES country joins CRC as a new member by 2002

Indicator 1.2: A draft MoU between CRC/DLCO (supported by EMPRES) on implementation of sustainable DL management concepts in the CR formulated by 2003

Under Result 1 it is expected that coordination and collaboration between the two regional organizations, the FAO Commission for Controlling the Desert Locust in the Central Region (CRC) and the DLCO-EA has increased by the end of Phase II. This will support the development of effective preventive control at the regional level. EMPRES is facilitating the harmonization of the technical mandates of these organizations and the integration of the activities of EMPRES/CR.
In addition it is expected that at the end of the Phase II, the discussion between CRC and DLCO-EA will have resulted in a Memorandum of Understanding between these two organizations. This memorandum will outline collaboration between CRC and DLCO-EA as part of a concept of sustainable preventive Desert Locust management in the Central Region.

It is also targeted that by the year 2002 at least one of the Central Region countries, which is not yet a member of the CRC, will join the Commission and submit a formal application to FAO. The countries eligible for membership, in accordance with an earlier decision of Commission members, are Djibouti, Eritrea, Ethiopia and Somalia.

Planned Activities	Status / Reasons for Deviation
1.1 Coordinate EMPRES/CR activities with various partners	• The 4th Consultative Committee Meeting was conducted in Cairo, Egypt from 15-17 January 2002. EMPRES/CR progress and achievements were presented to donors supporting the EMPRS/CR Programme and to senior representatives from the member countries. • The annual FAO EMPRES/CR staff meeting was conducted in Cairo from 21-22 January 2002. The details for the individual work plans for 2002 of the staff members were discussed and specific tasks assigned. In a special session the unsatisfactory results under the research component were addressed and proposals for improvements made. • EMPRES/CR Coordinator participated in 23rd Session of the CRC in Damascus from 9 -14 March 2002 and informed the participants of the objectives of the EMPRES/CR programme and its achievements. In this meeting delegates from the non-CRC EMPRES countries Eritrea and Ethiopia participated and Djibouti was welcomed as the 14th member of the Commission. • The 10th EMPRES/CR Liaison Officers (ELO) Meeting was hosted for the first time by Saudi Arabia, in Jeddah from 27 – 31 October 2002. Also for the first time since the beginning of the EMPRES/CR programme in 1997 a representative from Somalia attended the ELO Meeting. The standard procedure was followed of evaluating EMPRES/CR progress in a participatory manner and of jointly developing the activities for the

Planned Activities	Status / Reasons for Deviation
	workplan for 2003. Representatives from the EMPRES/WR programme also participated in the meeting (for the third time) to improve collaboration between the two EMPRES Regions. In general the meetings at different levels with the various EMPRES/CR stakeholders contributed greatly to enhanced support for the programme from the member countries. The understanding that there is a joint responsibility for the achievements of the EMPRES/CR programme as a whole is gaining further momentum.
1.2 Develop mechanisms towards sustainability of improved DL management	A first meeting of the "***Joint CRC / EMPRES / DLCO-EA / FAO Technical Forum for the Central Region***" (TFCR) was conducted in Addis Ababa, Ethiopia, at the DLCO HQ from 12 – 13 December 2001. The main items discussed were: • Development of standard training curricula and methodologies, emphasizing practical field exercises, to strengthen the capacities of the national locust units for regular training of new staff and retraining mechanisms. • Promotion of environmentally safer and effective technologies for controlling the Desert Locust, with emphasis on bio-pesticides and barrier treatments. • Strengthening the Desert Locust information management capacities of the member countries and their international networking systems. • Implementation of standard Desert Locust reporting schemes. • Development of a common approach towards improved preventive control strategies. As major achievement of the first meeting, EMPRES/CR equipped one DLCO-EA aircraft with a Differential Global Positioning System (DGPS) in July 2002 for better navigation during aerial control operations, more targeted pesticide applications and improved management of control operations. The installation of the "Trimble Trimflight 3" and the training of a DLCO-EA pilot were successfully conducted. As a result it has been agreed with DLCO-EA to conduct a demonstration on DGPS for interested parties during 2003. In addition, Standard Operating Procedures (SOP) for control operations have been developed in agreement with DLCO-EA and recommended for distribution within the DLCO-EA and CRC member countries as quick reference. A proposed joint survey between Eritrea and Sudan under the umbrella of DLCO-EA did not materialize due to increasing security concerns. A second meeting was conducted in Cairo, Egypt, from 27 - 28 November 2002. The major objectives were: • To harmonize technical approaches between CRC, EMPRES, DLCO-EA and FAO; • To avoid duplication of effort; • To strengthen regional cooperation As an important result of this meeting, DLCO-EA agreed to harmonize its locust information system with the Desert Locust Information System (DLIS) at FAO HQ and with CRC, by using the locust situations and forecasts in FAO's Desert Locust Bulletin for its own bulletin (See also 3.3). DLCO-EA also agreed to shift its emphasis to the use of bio-pesticides already available on the market. Although the Organization continues to play

Planned Activities	Status / Reasons for Deviation
	a vital role in the registration process of bio-pesticides within a regional framework, greater efforts are required in documenting the work that has been done so far in the region and in keeping in close contact with EMPRES and the CRC. Meanwhile, CRC is supporting the introduction of metarhizium as an alternative control product, and DLCO-EA will participate in a demonstration on bio-pesticides (Port Sudan, January 2003) and will be involved in upcoming trials in Tanzania against Red Locust (spring 2003). Also DLCO-EA has been encouraged to submit research proposals to EMPRES for consideration. In its efforts to strengthen the capacity of affected countries to organize and conduct their own training courses, EMPRES/CR is finalizing a Desert Locust Master Trainer Manual. DLCO-EA welcomed this initiative and will incorporate the manual into their training programmes. At the same time, DLCO-EA has started to finalize a training manual on aerial control. Despite some good results the harmonization process between the two regional Organizations is slow because of usually delayed feedback from DLCO-EA when it comes to initiating joint activities. This is partly due to outdated communication facilities and equipment at the DLCO-EA HQ. For that reason EMPRES/CR agreed to support DLCO-EA HQ with new computer and radio equipment. Cooperation between EMPRES/CR and the CRC has improved significantly since the transfer of the EMPRES/CR coordination office to Cairo in September 2001. The CRC Secretary and the EMPRES/CR Coordinator are consulting each other on all technical and organizational aspects on a routine basis and are jointly supporting a number of key activities such as training and research. Joint work planning and monitoring of the developments in the member countries has become an integral procedure. At present EMPRES/CR is running four ***Country Focus Programmes*** (CFP) with the aim to give special support in raising operational capacities in ***Eritrea, Ethiopia, Sudan*** and ***Somalia***. Emphasis is basically on improved survey and locust information management systems and contingency arrangements. While the CFPs in Sudan, Ethiopia and Somalia showed satisfactory results, the process in Yemen and Eritrea was much influenced by internal and external obstacles during the past years. For that reason the CFPs in Eritrea and Yemen were reviewed from 12 – 26 April 2002 and new programme outlines designed. As a result of the discussions held in Yemen a new Liaison Officer was appointed and the Locust Control Centre (LCC) was granted more autonomy by the National Campaigns Division of the GDPPD. Furthermore, the Ministry agreed to allocate sufficient funds form the national budget to enable the LCC to conduct regular surveys during recession periods. In order to further encourage the use of the DL database, RAMSES, in Eritrea and Yemen, local RAMSES experts provided special on-the-job trainings to the Locust Information Officers in Eritrea and Yemen from July to August 2002. Furthermore, the NPO-Survey visited Eritrea in September 2002 to support the development of adapted survey and locust info systems. Additional survey equipment (20 Garmin GPS hand sets) and five vehicle mounted sprayers have been provided for Eritrea in August 2002 to replace some of the losses that occurred during the conflict with Ethiopia. Yemen benefited from additional computers and one *eLocust* equipment for testing electronic field data transmission using HF radio transceivers. The major handicap in Eritrea is lack of staff at the Ministry of Agriculture specifically to take care of the locust operations and the decentralization of responsibilities to the agricultural offices in the Zones. However, the Minister has been requested to nominate at least three staff at the HQ in Asmara to handle and coordinate primarily locust activities together with the agricultural offices and has been urged to nominate a new Liaison Officer to stimu-

Planned Activities	Status / Reasons for Deviation
	late again the cooperation with EMPRES/CR. Unfortunately; a decision is still pending as at December 2002. Besides insufficient staffing level at the Locust Control Unit (LCU), unsatisfactory communications are another major obstacle to smooth liaison with Eritrean counterparts. It is only recently that the email connection has improved to a certain degree. In Ethiopia 18 radio operators have been trained on receiving and passing locust information to the national HQ and guidelines on handling locust information prepared in Amharic. The Agriculture Bureaux have been instructed on survey operations and the locust report format translated into Amharic. Plant Protection staff from Harar and Jijiga is now conducting regular surveys. In November 2002, a national Survey and Control (S&C) training course has been conducted for 13 trainees from the locust affected areas in Ethiopia. In addition, in December 2002 a local survey course has been organized for 27 scouts in Dire Dawa. All locust information and reports are regularly registered in the RAMSES data base. At the PPD in Sudan significant steps have been undertaken over the past years in improving the locust survey and information system. The good progress has led to a recommendation to evaluate the CFP in Sudan in 2003.The Information Office is now functional, the national locust network operational, and RAMSES is being used appropriately. During 2002 EMPRES/CR supported the LCU amongst others with one *eLocust* system and a stand-by generator. However, the question of decentralizing the locust activities under the PPD to the agricultural offices of the States has not yet been resolved. Since the nomination of the EMPRES Link Person (ELP) in Somalia (Hargeisa) in December 2001 the survey operations have gained momentum again. Surveys are now carried out in northern Somalia on a regular basis and the reports are usually passed to DLIS in a timely manner. To put the information system on a broader basis links have been established to the local agricultural offices which provide ecological information to the Ministry in Hargeisa via private radio operators. The survey operations are supported by EMPRES/CR through the FAOR in Kenya with USD 20,000 per year. As the programmes in Yemen and Eritrea required much attention it was not possible to initiate CFPs in Oman and Saudi Arabia as planned. This activity has been postponed to 2003. The CFPs in both countries need close collaboration and consultation with the CRC to respond to possible needs in terms of equipment or consultancy. However, it is expected that the activities under the CFPs in both countries will be mainly covered by from national resources. A ***standard progress reporting format*** for EMPRES Liaison Officers has been developed and distributed to the member countries in order to obtain better information on the progress made in adopting and implementing improved DL management components into the national systems. The format has been well received and was used to produce more meaningful reports presented in the 10th ELO Meeting. It has been agreed to use the new format as the standard for future meetings.
1.3 Strengthen the collaboration between EMPRES/CR and WR	It became an accepted practice that delegates from both Programmes participate in each others major meetings such as ELO meetings. Since EMPRES/Western Region (WR) has only recently started operating, the areas for joint activities are not yet well defined. However, the exchange of technical expertise has gained momentum during the past months as far as the introduction of improved survey and information systems in general, for the data transmission system, *"eLocust"*, and the use of DGPS in particular are concerned. For assisting the Information Officers in setting up the eLocust system in Yemen and Sudan, an international expert from EMPRES/WR

Planned Activities	Status / Reasons for Deviation
	visited both countries in November 2002. One EMPRES/WR staff contributed with his expertise to the Sprayer Testing workshop organized by CRC and EMPRES/CR during September 2002. In order to harmonize the training approaches in the two Regions one national staff from Libya attended the international ToT Training course organized by EMPRES/CR in October 2002. It also has been agreed to introduce the Training Manual for Training of Master Trainers developed by EMPRES/CR in the WR once it is published. The same applies to the adoption of the research approach. Since EMPRES/CR, with the help of international locust experts, has already developed an outline for operational research projects, it has been agreed to adopt the same approach in the WR. In addition opportunity will be given to national staff from one or the other Region to participate in field trials or demonstrations on the application of novel pesticides once the chance occurs. The next possible opportunity will be the participation of one national locust officer from the WR in the Metarhizium/PAN demonstration scheduled for January 2003.
1.4 Promote the CRC membership of non-member countries of the Central Region	After Djibouti became 14th member of Central Region Commission (CRC) in March 2002, EMPRES/CR and the CRC continued sensitizing the remaining non-CRC EMPRES/CR member countries, Ethiopia and Eritrea, to join the Commission. High-level delegates from both were invited to attended CRC 23rd session. In the meeting the delegates expressed their interest and willingness to join CRC. However, concrete initiatives at ministry level have only been observed in the case of Ethiopia. It can be expected that Ethiopia will submit an official request to FAO by early 2003.

Result 2: National and regional communication networking enhanced.

Indicator 2.1: Timeliness of sending DL reports to DLIS improved by 20% by 2001, 50% by 2002, 80% by 2003

Indicator 2.2: Fixed radio schedules defined and made standard communication procedures at 5 DL units by 2003

Considerable progress has already been made during Phase I in designing and establishing an efficient communication network in the Central Region. However, as technology advances and some equipment requires replacement, the network needs to be upgraded, maintained and advanced technology introduced. In addition, further efforts need to be made to ensure that the network is used regularly by the stakeholders in the region for exchanging Desert Locust reports, and for communication with DLIS at the FAO HQ.

The timeliness and quality of locust survey reports submitted to the DLIS at FAO HQ is considered to be a useful benchmark for improved information exchange. These reports should be submitted within 5 days after completion of a survey carried out by national Locust Control Units (LCUs). Even if no surveys have been done, DLIS needs to receive a national report once a month and this report should be received not later than on the 25th of that month, so that the information can be incorporated into the monthly bulletins.

The establishment of schedules for radio contacts between the different units of the national locust services is considered another important factor for improved communication on locust aspects within the affected countries. Furthermore, EMPRES/CR will consider up-dated and / or new computer software and support if repair of equipment is needed.

Planned Activities	Status / Reasons for Deviation
2.1 Stimulate pro-active attitude in information exchange among stakeholders	With regard to national locust communication systems, detailed information on the radio network is available from Yemen, Sudan and Ethiopia. The LCUs in Saudi Arabia and Oman are in the process of replacing their conventional HF radio transceivers by using cellular mobile phones to transmit field information to the HQs. About 240 base- and 210 mobile-HF radio transceivers are currently being used for transmission of locust information in seven of the nine member countries. In Djibouti no national locust information network is established so far. The same applies to Somalia where private radio operators are used for transmitting information relevant to locusts. Since early 2002 a *unified* communications network has been established in Eritrea by the MoA connecting the agricultural offices with the Ministry by using data-fax technology. The modalities and mechanisms on how to make use of the unified information network for the transfer of locust data still needs to be clarified. Fixed radio schedules have been established at the LCUs in Sudan and Ethiopia and are in the process of being introduced in Yemen. Standard Operating Procedures (SOP) for regular radio communication on locust matters are in the process of being drafted and will be finished by early 2003. To date no precise information on the set-up and functioning of the locust communication network has been received from Egypt but this gap is expected to be filled soon. Regular contacts have been established with the LCUs to directly or indirectly monitor the performance of the national information exchange and to provide feedback. In general locust reporting has improved significantly over the past years. The overall performance in terms of quality and timeliness during 2002 was the highest in Sudan (98%) of all EMPRES/CR countries. The lowest performance was observed in Eritrea (58%). In terms of quantity, the total number of reports received by DLIS from the member countries increased from 67 in 1997, 77 in 2000, and 106 in 2002. Since March 2002 the CRC is regularly preparing Arabic translations of the monthly DLIS bulletins in a PDF format. They are circulated to the Arab speaking countries of the Central and Western Regions. The Arabic versions of the DL Bulletins are also available on the FAO HQ Locust Group webpage. In order to avoid conflicting information it has been agreed also with DLCO-EA not to exchange locust observations bilaterally but to pass them to DLIS.
2.2 Maintain and update communication and radio equipment	It was planned to provide Eritrea and Djibouti with up to five HF radio sets. The original request from Eritrea became redundant after the Ministry of Agriculture installed the above mentioned unified radio-data transmission network at all its agricultural offices. Five HF Codan radio transceivers have been ordered for Djibouti (3), northern Somalia (1) and DLCO-EA (1). The equipment arrived in December 2002 in Addis Ababa, as it was agreed that DLCO-EA would assist in the installation of the radios. It is expected that the radio equipment is set up and operational by mid 2003.

Result 3: Desert Locust early warning and information systems improved.

Indicator 3.1: RAMSES installed and being used in at least 5 countries by 2003

Indicator 3.2: Remote sensing images incorporated into surveying decisions in at least two countries by 2003

EMPRES/CR considers the improvement of early warning and information systems at the DLCUs as a key prerequisite for efficient preventive control and has given high priority to this aspect since its inception. Phase II will further contribute to this area and will pay special attention to defining and meeting information needs. This includes further efforts to introduce access to satellite images in the region as well as to continue the development of appropriate data management systems such as RAMSES (Reconnaissance and Monitoring System for the Environment of Schistocerca) for forecasting as well as for other data management purposes.

New technologies, in particular remote sensing, have gradually improved the assessment of Desert Locust breeding areas and forecasting at the FAO HQ. It is expected that further efforts will be made to make advanced technologies available to the locust-affected countries so that surveys can be planned and directed more efficiently and the locust population level can be assessed more reliably. Further efforts will be made to harmonize and streamline the flow of Desert Locust information within the region.

Planned Activities	Status / Reasons for Deviation
3.1 Build up national and regional DL information systems	National locust information systems are operational in Sudan, Ethiopia, Saudi Arabia and Oman. The information channels in northern Somalia are also operating surprisingly well given the comparatively weak infrastructure. As mentioned under 2.2 the information network in Djibouti is in the process of being built up. In Egypt and Yemen the systems are still not functioning well despite their potential and the available resources. This point has been raised on several occasions with the ELOs and resulted in Egypt in establishing an Information Office at the Locust Centre in November 2002. Also in Yemen the Information Office at the Locust Centre has finally become operational. As feed-back from most member countries on their specific needs in this area has been very slow and not always to the point, it was decided to investigate the current status of the national locust information systems in some of the countries more in detail. As a result, recommendations have been prepared and submitted to Eritrea, Sudan and Yemen. The implementation of the recommendations is being monitored.
3.2 National locust information routinely dispatched to DLIS	At the 9th ELO Meeting, a routine procedure jointly to assess performance with regard to the standard locust reporting procedures was established. During the 10th ELO Meeting, the progress achieved in implementing improved survey and information systems was discussed. As mentioned under 2.1, most of the EMPRES/CR countries (8 out of 9) sent their locust reports in a timely manner. The report quality was best in Sudan and Ethiopia. Reports received from six countries were above average. A country-by-country analysis revealed that specifically the reports received from Eritrea still need to be improved in most aspects. But also those received from Oman, Yemen, Saudi Arabia, Somalia and Djibouti could be improved with respect to quality, timeliness and frequency. It has been agreed by all member countries to produce high quality reports by mid 2003 at the latest.

Planned Activities	Status / Reasons for Deviation
3.3 Harmonize DL information systems between CRC, DLCO-EA and DLIS	As a result of the first meeting of the "Joint CRC / EMPRES / DLCO-EA / FAO Technical Forum for the Central Region" (TFCR) the CRC regularly informed the DLCO-EA of the Desert Locust and rainfall situation in the key countries of the Central Region. Unfortunately no reciprocal reports have been received from DLCO-EA. This observation was tabled during the 2nd meeting in November 2002 and it was agreed with DLCO-EA that starting from 1 December 2002, DLCO-EA will modify its monthly bulletin by incorporating the locust situations and forecasts for the DLCO-EA member countries from the monthly FAO Desert Locust Bulletin. It is expected that this will avoid duplication between the two organizations in this matter while allowing increased dissemination of locust information.
3.4 Incorporate DL data management systems at the LCUs	The Desert Locust Data Management System, RAMSES, has now been installed in four member countries, Eritrea, Ethiopia, Sudan and Yemen. It is fully functional in Sudan and Ethiopia and regularly being used for registering historical and new locust and ecological data. Since RAMSES has not been operational in Eritrea for some time due to various reasons (see progress report 2001), on-the-job training has been provided to the Eritrean Information Officer in July-August 2002. A follow-up visit during 2003 on the use of the database by a FAO staff member in connection with the overall information system was seen necessary. Also in Yemen special training and advice has been delivered to the Information Officer of the LCU in August 2002 and a new RAMSES computer provided by the GTZ Locust Project. Progress has been made with the LCU in Saudi Arabia, whereby the government purchased all the necessary hard- and software, allowing the GIS software and a country-specific RAMSES version to be installed in October 2002. A training course on the application of RAMSES is scheduled for January 2003. To develop the RAMSES system further it is now being planned to update the existing version and to improve the connectivity between RAMSES and the SWARMS databank at the FAO HQ during 2003 in order to reduce the workload for manual data registration at the DLIS office. The remaining potential EMPRES/CR countries are Oman and Egypt. Oman has been requested to seek for an agreement with the CRC to provide the computer hard- and software. It is being planned to hire a consultant for developing a country-specific RAMSES version and to provide training to the Information Officer during 2003. As a prerequisite for the introduction of RAMSES in Egypt the national information system must be reviewed and made operational first in order to make meaningful use of the database. As mentioned under 3.1 promising initiatives have been made to establish an Information Office at LCU, but it cannot be expected that a decision to introduce the database will be made before the end of 2003. The Information Officers form the PPD Sudan and the LCU in Ethiopia benefited from additional in-depth training on RAMSES applications and trouble shooting at the Natural Resources Institute/UK (NRI) in January 2002 with the objective to raise the regional capacity in this matter. The Information Officers who were trained could make use of their special know-how during the above mentioned on-the-job training provided to the Information Officers in Eritrea and Yemen. Unfortunately the recommendation to produce monthly reports on the DL situation for internal use based on RAMSES has not been followed by any of the Information Officers using the database. This would have been specifically important also in the context of Contingency Planning to keep the higher government officials regularly updated on the national locust situa-

Planned Activities	Status / Reasons for Deviation
	tion. During the 10th ELO Meeting the ELOs have been encouraged to make sure that DL reports are being produced and submitted to the Department Heads on a monthly basis and to transmit RAMSES data export files regularly to DLIS from March 2003 onwards. It was planned to produce RAMSES-based case studies for Ethiopia and Yemen. So far only the LCU in Ethiopia has created a complete set of historical data. The Information Officers in Yemen and Sudan are still in the process of screening old files and entering data. Taking into account the time consuming process for data entry and the fact that the Information Officers still have to develop full confidence in using RAMSES for ordinary purposes, this target should be considered as too ambitious for the time being. Even after historical data sets are available they need to be validated in order to produce meaningful case studies. It is more realistic to expect only slow progress in this aspect in the foreseeable future.
3.5 Introduce new technology including remote-sensing into early warning information system	For introducing modern early warning technologies such as satellite imagery and eLocust etc. in the expected effective manner, it is a prerequisite that an active survey and locust information management system is in place at the national LCUs. DLIS undertook efforts over the past years to make satellite imageries available to the locust affect countries as one of the decision making tools for more targeted surveys. The process of adapting the remote sensing technology has much been affected by the uncertainty of the staffing situation at DLIS. In early 2002 AGPP managed to recruit a remote sensing expert on a temporary basis to continue work on this matter. In order to test the application and handling of satellite images by the Information Offices, Yemen and Sudan were provided by DLIS with the necessary computer software and received SPOT-satellite images electronically. These will be analyzed within RAMSES in future. Compared to the former NOAA imagery, SPOT satellite images have better resolution. In addition, the electronic transfer avoids the previously encountered difficulties with the meteorological agencies in obtaining the imageries without pay or in time. The LCUs in Sudan and Yemen received two complete electronic data transmission sets, comprising CODAN radio transceivers, modems, palmtop computers including eLocust software and GPS for testing purposes. The installation of the equipment was delayed due to difficulties at custom offices in particular in Yemen. In June 2002 the Information Officers in Sudan and Yemen received basic training on the application of eLocust and with the help of one EMPRES/WR staff the data transmission system was finally set up in November 2002. However, during the following practical testing both teams failed to transmit field data via modem to the information offices at the HQs due to configuration problems between the palm top computer and the modem. This matter is being pursued with the colleague from the WR before disseminating the technology to other countries.
3.6 Carry out ground truthing operations	During the reporting period no ground truthing surveys were conducted. Due to observations made during previous exercises the need was felt to provide the national survey teams first with clear instructions on which parameters the assessment should be carried out and in which areas in order to make the operations more useful for verifying and calibrating SPOT satellite images.

Result 4: Desert Locust survey procedures of the member countries improved.

Indicator 4.1: Survey plans developed and made integral procedure of the PPD in at least 4 member countries by 2003

Indicator 4.2: Key breeding areas of at least 2 member countries identified and described by 2003

Indicator 4.3: Up to 2 joint border surveys conducted on two borders in the CR by 2003. (Other than the Egyptian – Sudanese borders)

Exploring the possibilities for improving survey procedures is a long-term process, that already started during Phase I. It will be achieved through a combination of applied research (e.g. in respect of survey methodology and the assessment of survey results), data collection on important breeding areas, surveys, which are jointly conducted by EMPRES countries along their border areas, and training of technical survey staff.

It is expected that by the end of Phase II, comprehensive survey plans, including mechanisms to activate and modify the plans depending on environmental conditions, will have been developed in at least four EMPRES/CR countries. More accurate description and mapping of the key breeding areas will be in place in at least two countries by 2003.

The distribution and density of locust populations that may occur will be recorded. These data will be analysed together with data available from past assessments. The analysis will contribute to improved and more targeted surveys as well as to better forecasting. This activity is a joint collaboration between the national Locust Units, EMPRES/CR and the University of Wageningen. Information will be collected on the delimitation and ecology of important locust breeding areas. These data will be analysed against historical records and meteorological/remote sensing data, and will be incorporated into survey plans.

Planned Activities	Status / Reasons for Deviation
4.1 Develop sustainable and targeted survey procedures	Due to the heterogeneous geographical and ecological conditions in each of the member countries the development of adapted survey procedures which are easy to handle and realistically applicable by the national LCUs proved to be challenging. Nevertheless, provisional survey programmes have been prepared for the different seasons in Sudan, Somalia, Eritrea and Yemen. The relevance of the survey programmes in Eritrea and Yemen still needs to be assessed during 2003 in the light of the institutional difficulties observed in these countries during the past years. The implementation of the survey plans in Sudan and Somalia went comparatively smoothly. No survey programme has been prepared by the LCU in Egypt, contrary to original targets, but the matter is under discussion with the responsible officers. It is proposed that regular surveys should be organized by the Egyptian LCU during the winter season on the south-western coastal plains and adjacent areas and in the summer season at Shark Oweinat and Tushka. A draft reference survey plan has been distributed to all member countries for comment by April 2002 but the response form the LCUs was quite limited. Given the positive feedback on the Standard Operating Procedure (SOP) for ground control operations, the participants of the 10th ELO Meeting suggested to come up with a similar SOP for surveys.

Planned Activities	Status / Reasons for Deviation
	The originally planned workshop on improved survey procedures was not conducted mainly because the key partner in this exercise (Wageningen University) was not yet ready to present its research findings to a broader audience.
4.2 Define and describe potential breeding areas in the CR	Initial studies have been undertaken based on historical data during 2000 and 2001. A draft inventory of DL breeding areas, its occurrence and geographical distribution in the Central Region prepared by July 2002 covering the period form 1994 – 2001 did not produce the expected relative advantage as compared to previous references such as the DL Atlas prepared by Popov, 1997. In addition, because some unverified and incomplete data sets were used, the details provided in the report cannot be recommended as a suitable orientation for the Information Offices. It has therefore been recommended to redefine this activity in the light of the increasing use of the RAMSES system and in the connection with SWARMS GIS at FAO HQ. Studies carried out along the Red Sea coastal plans by the Universities of Wageningen and Khartoum as well as by ICIPE revealed that the spatial distribution of solitary populations of Desert Locust is positively correlated to certain plant communities. Since 1998 Wageningen is supporting a PhD student to investigate the dynamics of Desert Locust populations during the winter breeding season. It is expected from this study to identify locust habitats on which surveys should be focused by describing the habitat based on plant composition, soil and land use. With the aim of enhancing the ability of the national survey teams to find locusts and in particular hopper bands in the field, it has been agreed to produce plant field cards as reference to better identify potential locust breeding areas.
4.3 Carry out joint surveys	One cross-border survey was conducted by joint Saudi and Yemeni survey teams in December 2002 after a bilateral agreement was signed between the two governments in July 2002 to enhance the collaboration between the locust control authorities. The survey was conducted along the eastern coastal plans between northern Midi, Wadi Haradh and Al-Jarr area. Only a few solitary locusts were found. The planned joint surveys between Djibouti/Somalia and Sudan/Eritrea did not materialize because of not entirely unexpected security concerns in the case of the latter. A survey between Djibouti/Somalia will be reconsidered once the survey capacity in both countries in terms of personnel has increased.
4.4 Strengthen self-reliant survey capacity in Somalia	During 2001 regular monitoring of the locust situation in the key breeding areas of northern Somalia almost came to a halt after the end of assignment of the EMPRES/CR United Nations Volunteer (UNV) and the sudden death of the DLCO-EA Caretaker in Hargeisa at almost the same time. These events and the observation that the newly appointed DLCO-EA Caretaker did not perform as expected made it necessary to search for other solutions for maintaining survey capacity in northern Somalia grounds, using national manpower. Efforts were undertaken to encourage the Minister of Agriculture to nominate an officer responsible for locust surveys and as EMPRES/CR Link Person (ELP) at the same time. In the meantime a locust office at the local MoA has been established and equipped with communication facilities, Internet access and furniture. EMPRES/CR undertook efforts in December 2001 to train the MoA staff on locust monitoring and all aspects of locust survey and reporting. With the nomination of an ELP in December 2001 and after he benefited from on-the-job-training during a back-stopping-visit by the NPO-S in March 2002, locust survey operations started to gain momentum again. The DLIS received in total 15 survey reports of relatively good quality from northern Somalia during 2002. The costs for conducting the surveys were covered by USAID trust funds, and were much reduced compared to the support of

Planned Activities	Status / Reasons for Deviation
	the UNV.
4.5 Support national survey teams	One additional desk top computer has been provided to the LCU in Yemen in September 2002. The GTZ Locust Project made USD 20,000 available to Sudan for repair and maintenance of survey vehicles. The GTZ Locust Project supported the locust survey and information capacity in Sudan with 16 field beds incl. mosquito nets, 5 GPS hand sets, 1 desktop computer plus accessories, 1 copy machine, and 1 camera in October 2002.

Result 5: Desert Locust technicians and officers qualified.

Indicator 5.1: At least 50% of DL technicians trained in each CR country by 2003

Indicator 5.2: At least 2 trainers trained according to agreed standards for each country by 2002

Training of the different personnel involved in locust control aspects is an important component of strengthening the preventive control capacities of the EMPRES/CR countries. EMPRES/CR has already given considerable attention to this subject during Phase I. However it is not only necessary to organize additional training courses which meet the given training standards but also to develop these standards and the training materials required such as manuals, guidelines and curricula. New training approaches have to be explored and appropriate procedures for identifying training needs developed and introduced. In addition, monitoring procedures need to be introduced, which provide feed-back on how effective the training events have been and also on how they translate into an improved performance of trainees when they work in their Locust Control Unit. Attention also needs to be given to collaboration with universities and with other organizations conducting training events in the field of locust management (e.g. donor agencies sponsoring bilateral training).

It is expected that at least 50 % of the combined total of Desert Locust control officers and technicians in the Central Region will be trained during the Phase II. Furthermore by 2002 each of the member countries will have designated at least two trainers in Desert Locust management and they will have received special training from EMPRES/CR.

It is anticipated that the LCUs of the member countries will increasingly incorporate specialized training courses for the different groups involved in Desert Locust in their own national training programmes and will be able to maintain such a system. Success will become apparent when national training courses are organized on a routine basis.

The University of Khartoum, with support from the CRC/EMPRES, has developed a special Diploma course on Desert Locust management. The use of the Diploma course in locust management at the University of Khartoum is promoted through DLCC, EMPRES and CRC fellowships.

Planned Activities	Status / Reasons for Deviation
5.1 Define training standards	With major inputs from NRI and the DLIS, the EMPRES/CR training standards have been set out in a draft Training Manual (TM) for national trainers and have been jointly assessed with the participants of the International Training-of-Trainers (ToT) training course conducted in Oman by October 2002. The participants of the ToT course acknowledged the value of outlined training procedures and the methodology to address technical subjects on survey, reporting, control and safe handling of pesticides in national training courses. The member countries have now been encouraged to actively make use of their training capacity built up over the past 5 years and the references provided by EMPRES/CR.
5.2 Define training needs on technical DL subjects at different levels	The process of identifying the training needs in the member countries turned out to be more difficult than expected. Some tentative information has been received from Ethiopia and Sudan but most of the other LCUs were slow in assessing the performance of their staff involved in locust operations or in passing relevant information to EMPRES/CR. This observation could have several institutional and organizational reasons, i.e.: • No clear job descriptions of locust staff at most of the LCUs; • Due to decentralized locust operations in some countries it is not transparent what staff from other local departments might potentially be involved in survey and control operations; • Frequent changes of positions and staff; • No clear guidance available on the procedures/references to assess the performance of the staff and training needs. In order to develop a better picture of the capacity of the technical staff it has been recommended to the ELOs to conduct at least one mock survey and control exercise per year and to assess the performance jointly with the staff in order to detect crucial knowledge gaps and mistakes. The mock exercises could comprise aspects such as finding of artificial hopper bands, demarcation and control. The EMPRES/CR Programme will work out guidelines for mock operations by 2003.
5.3 Develop training curricula / manuals for ToT-courses	A consultant from NRI was engaged by EMPRES/CR in April 2002 with the preparation of a Training Manual (TM) for national trainers. The first draft has been developed in collaboration with the Locust Forecasting Officer by September 2002 and tested during the international ToT training course in October 2002. Several constructive comments were made by the participants which have been incorporated into the final version. The Manual comprises amongst others session plans based on the revised FAO Desert Locust Guidelines, guidance on training methods, participatory training techniques, and the use of visual aids. It contains also reference course programmes, pre- and post-course assessments, useful forms and lists of necessary course material. In a separate file, a series overhead transparencies have been compiled which could be used during training courses. It is now being planned to assemble Training Kits which will contain besides the TM also other useful material such as maps, compasses, field cards, a CD ROM etc. All LCUs of the member countries as well other national training institutions will be provided with such kits to perform and sustain training courses on technical locust management aspects under their own responsibility. A French and Arabic version of the TM will be produced in due course.

5.4 Assist universities in DL curricular development and involve students in EMPRES activities

Since 2000, CRC, EMPRES/CR and FAO have supported a special Course at the University of Khartoum on Desert Locust management for Diploma students. The first term started in 2001 with six students from Sudan, Eritrea and Ethiopia who graduated by end of August 2002. Eight students have been enrolled at the University for the academic year 2002/2003, two of them from outside the CR, (India, Libya), funded by various fellowship resources.

The overall success of the course and its results were difficult to assess from the first intake. By December 2002 the University had neither reported on the course performance to the sponsors nor made available copies of the students' dissertations. Also, the benefiting countries did not respond to the request to inform EMPRES/CR or the CRC of the positions taken up by the former students. On several occasions the University addressed their needs with regard to teaching and training material to FAO and EMPRES/CR which have partly been met from available funds. In addition to various computers and other teaching material already provided during the previous years, eight sets of survey equipment including GPS hand-sets have been ordered in support of the course in 2002. In general it might be advisable to evaluate the Diploma course and its long-term sustainability after the second term.

One MSc student from Oman benefited from CRC sponsorship and finished his study on Protocol Development of Desert Locust Sprayer Testing Procedures at Greenwich University, U.K., by December 2002.

5.5 Organize different training courses at different levels

As mentioned under 5.1, one international ToT training course has been organized by EMPRES/CR in Muscat, Oman, in collaboration with NRI from 7-17 October 2002. Based on the draft TM trainers from CRC, EMPRES/CR, AGPP, and the University of Wolverhampton presented the various topics and sessions on survey, reporting, locust information management, early warning, control, safety, but also training course organization and participatory adult education. In addition, one co-trainer from the LCU of Ethiopia was given the chance to further improve and develop his capacity as Master Trainer. In total 15 trainees, nine from the Central Region, one from EMPRES/WR and five from the South-West Asia Commission attended the course.

To date four international ToT training courses have been organized under the EMPRES Desert Locust Programme. It can be assumed that a sufficient number of master trainers now exists in the Central Region who are capable to organize and to perform Survey and Control (S&C) training courses in accordance to standards set in the TM. For that reason the trained master trainers were asked to practise their knowledge as soon as they returned to their duty stations and to give feed back to the organizers on their experiences made. The member countries have been encouraged to undertake efforts to organize self-reliant S&C training courses at national level on regular basis and to integrate locust S&C subjects into the national training schemes such as agricultural schools and extension services.

Supported by EMPRES/CR and the CRC, several national and local training course have been conducted during the reporting period:

- One national training course in Egypt on Desert Locust S&C in Arabic for 16 trainees by August 2002;
- One national survey and locust reporting course in Djibouti in French for 16 trainees by November 2002;
- One national S&C training course in Ethiopia in Amharic for 13 trainees by November 2002;
- 27 scouts and farmers were trained in a local training course in Ethiopia by December 2002.

Eritrea planned to organize training courses for farmers as a CFP activity by the end of 2002. No confirmation has been received from the Eritrean counterpart whether the training was conducted or not.

The Locust Forecasting Officer from DLIS, FAO HQ, paid back-stopping-visits to Djibouti in January, and to the LCUs in Sudan and Yemen during June 2002 providing on-the-job training and advice on standard survey and locust information procedures, RAMSES data bank applications and the use of eLocust and of satellite images. Such visits have been considered as very useful and recommended to be repeated during 2003.

EMPRES/WR organized a workshop on new technologies for locust S&C in Mauritania in December 2002. Two locust staff from the CR (Sudan and Saudi Arabia) attended the workshop.

The implementation of the planned regional campaign management and evaluation seminar is pending since 2001. Again it proved to be very difficult to find competent consultants in general management aspects with the necessary locust background. However, this aspect is very important in organizing locust survey and control operations more efficiently and should still be handled in the broader context of institutional development of the LCUs and contingency planning.

5.6 Develop and introduce regular training impact mechanisms

Significant efforts have been undertaken by the LCUs in Sudan and Yemen to assess the training needs of their staff. The initial results of this activity have been received from Sudan but not yet from Yemen. The PPD Sudan is now trying to organize national training courses according to the observed needs.

From the experiences gained in Sudan and Yemen and the reasons outlined under 5.1, the need for guidelines not only on how to conduct such assessments but also on analyzing the results and drawing meaningful conclusions became evident. It has now been concluded to try to find a suitable consultant to assist EMPRES/CR in developing training impact assessment guidelines ready for distribution by end of 2003.

Result 6: Contingency plans available and implemented.

Indicator 6.1: National contingency plans for recession monitoring and control for outbreaks, upsurges and plagues adopted in up to 6 countries by 2002

Contingency planning is a vital component during the prevention of Desert Locust plagues. The national LCUs in the individual member countries not only need to prepare plans covering scenarios from recession to plague situations, but also need to ensure that arrangements for implementation of these plans are in place and regularly reviewed. Such arrangements should cover the provision of manpower, equipment, supplies and financial resources. For upsurges or plague situations it is likely that additional resources will be needed from the Ministries of Agriculture and from other departments of the Governments. Arrangements for the supply of these additional resources will be made and will be reviewed periodically to ensure that the other government units can supply such resources at short notice. In some cases external assistance will be needed to fill gaps in resources. These gaps will be specified and discussed at the regional and the international levels. Possibilities for meeting these requirements will be identified and mechanisms for mobilization reviewed. A modelling tool developed by the University of Wageningen and GTZ is considered to be an important element for the development of contingency plans.

Planned Activities	Status / Reasons for Deviation
6.1 Introduce national contingency and rapid deployment plans into the locust management system	With the help of a consultant and in collaboration with AGPP and the CRC a regional Contingency Planning workshop was organized in Borg El Arab, Egypt, by February 2002. In total 14 participants from eight member countries, AGPP, the CRC and EMPRES/CR attended the workshop. The workshop clearly demonstrated the difficulties in detecting outbreak populations and to control them effectively, and that it might be necessary to call in aircraft support and to mobilize additional resources at a relatively early stage of an upsurge situation. The workshop revealed the importance of assessing the critically logistic capacities of the LCUs necessary to cope with upsurge and plague situations. The need to develop and put in place suitable contingency mechanisms at the national level became obvious to all participants. Nevertheless interrelating national contingency arrangements and synchronising individual efforts in the regional context by taking into account the migratory nature of the pest, requires the whole issue to be addressed in the broader context. Perhaps due to the complexity of the problem, follow-up efforts on contingency planning have only been made in Sudan (June 2002) and Oman (March 2002) with mixed results. The contingency plans developed were on the one hand both too detailed and ambitious as far as likely impact of the available resources is concerned and on the other hand too general or lacking important information on how to trigger mechanisms at national or international level in a realistic timeframe. It was targeted that up to 3 of the member countries would created national Contingency Planning Steering Committees at national level in order to keep the higher authorities informed and to prepare pre-emptive mechanisms in consultation with related government departments. Only in Sudan was the initiative taken to create a national Contingency Planning Committee, but the constitution of this committee is not yet known. No significant efforts have been observed in the other member countries and appeals have been made to the ELOs to actively address and pursue this matter. A draft guideline has been prepared by the above consultant to conduct similar contingency planning workshops at national levels. The intention and the ultimate relevance of repeating similar workshops in the countries were unclear and the matter was not pursued. However, it was seen interesting to use certain workshop components as mock exercises by the LCUs to assess the performance of survey and control teams and to detect operational deficiencies in locust control (see also 5.2 and 5.6). As a consequence of the workshop the EMPRES/CR Coordinator presented his personal views during the 10th ELO Meeting on improving the Desert Locust emergency prevention strategy in the light of necessary contingency arrangements and mechanisms at national, regional and international level. He posed basic questions and outlined the necessary prerequisites for preventive control. He reviewed the current status of preparedness in the Central Region by putting forward questions on the locust information capacities of participating countries, their capacities for early control and the degree to which these capacities could be expanded nationally to meet a serious upsurge in locust populations. Questions were also posed as to the capacities of regional structures (DLCO-EA and CRC) to meet a locust threat, and the extent to which FAO itself was well prepared to mobilize the necessary human and financial resources to back up national and regional capacities. As a result it was agreed to form a small committee to continue brainstorming on contingency planning issues. DLCO-EA agreed to contribute to contingency planning subject with an aerial deployment plan by end of 2002. The subject was tabled again during the 2nd Technical Forum for the Central Region (TFCR). DLCO-EA pointed out that during recession periods, DLCO-EA routinely positions one aircraft in Addis Ababa and Asmara. Given aircraft operationality, pilot availability and fuel stocks having been positioned, a DLCO-EA aircraft equipped with

Planned Activities	Status / Reasons for Deviation
	DGPS can be deployed to any member country within 7-10 days upon request and clearance from the host country. As one of the results of the discussions during the meeting it has been recommended to incorporate also the following procedure into national contingency plans as one of the important components: • PPD makes request to DLCO-EA indicating location of operations, airstrip positions, duration and need of airworthiness certificate; • DLCO-EA responds to PPD within 24-36 hours with aircraft type and registration code, name, nationality and passport details of the crew, departure base, suggested route, arrival date and time of aircraft, and copy of airworthiness certificate (if required); • PPD liaises with ministries (Agriculture, Civil Aviation, Foreign Affairs, Defence / Security, etc.) to determine deployment routing and obtain internal clearances for locust operations; • PPD informs DLCO-EA of approved deployment routing and that internal operational clearance is obtained; • DLCO-EA pilot informs PPD via the DLCO-EA Base Manager where to preposition fuel and oil within the country. Internal clearance for operations is the responsibility of the host country and may take time. DLCO-EA aircraft are insured to cover all Middle Eastern and African countries subject to security conditions. DLCO-EA funds do not cover DSA and operational costs in non-member countries. The latter must have signed a Letter of Adherence that is approved by DLCO-EA's Council and registered with the Government of Ethiopia. DLCO-EA agreed to provide a sample to EMPRES so that steps can be taken to organize these letters within the context of national contingency planning in Oman, Saudi Arabia and Yemen for consideration at the next DLCO-EA Council meeting (September 2003).
6.2 Allocate funds for emergency pesticide stocks	The CRC allocated USD 100,000 for emergency pesticide stocks in March 2002. These funds are available to all CRC member countries upon request. It has recommended that the CRC should investigate the possibility of advance procurement, storage free of charge, and delivery at short notice to the CRC member countries.

Result 7: Efficient and environmentally safer control methods introduced.

Indicator 7.1: At least 1 new additional control technology introduced in at least 3 countries by 2003

Research on new pesticides and application technology has opened up the prospect of introducing new methods for Desert Locust control, which are both more economical as well as safer for humans and the environment. In particular the application of environmentally safer chemical pesticides in barriers and the use of mycopesticides has become attractive. However, more testing under operational conditions on a large scale and registration is required in the EMPRES/CR countries before these new technologies can be made part of the national control strategy.

During Phase II at least one new and environmentally sound control technology should be introduced and used on an operational scale. Relevant registration proce-

dures for pesticides are expected to be completed during the 3-year period. It should be noted that the ability to conduct field trials in the Central Region will depend on the presence of sufficient locust infestations.

To facilitate the testing of new technologies, EMPRES/CR and the CRC in collaboration with national institutions and with assistance from GTZ, field trials of mycopesticides and environmentally friendly chemical pesticides will be organized.

The impact on the environment of new and traditional control technologies will be studied with assistance from SIDA, through the Universities of Uppsala and Gothenburg. These studies will produce recommendations on the types of pesticides which should be used in various habitats (e.g. rangeland, nature reserves or wetlands).

Planned Activities	Status / Reasons for Deviation
7.1 Facilitate development and testing of new technologies taking into account human health and the environment	During the past years, the International Centre of Insect Physiology and Ecology (ICIPE) undertook research on Desert Locust pheromones that influence the ability to change from solitary into the gregarious phase. The adult pheromone, ***Phenyl-Aceto-Nitrile (PAN)***, was found to inhibit pheromonal communication of gregarious nymphs resulting in the loss of their cohesive behaviour. Studies indicated that PAN disrupts the nymphs' ability to perceive their own pheromone, with effects on their immune system. Laboratory and limited field trials demonstrated that PAN causes dramatic changes in the physiology and behaviour of treated gregarious hoppers, manifested in reduced marching, hyperactivity, reduced food intake, and gradual dispersal. The affected hoppers become prone to enhanced mortality due to general stress, increased cannibalism, and predation. These effects could be achieved with low application rates of 200 mg/hectare. Based on these promising findings, EMPRES/CR started collaboration with ICIPE in this field in October 2001 in order to make PAN available to the affected countries as a low-cost, environmentally safer and effective alternative to conventional locust control. Under this collaboration mass-rearing facilities have been built up at the ICIPE station in Port Sudan in order to overcome the obstacles posed by the prevailing recession period and to perform at least semi-field trials with PAN. Considerable difficulties at the beginning delayed the process in building up sizeable colonies because of high mortality, low fecundity and cannibalism. These problems were largely resolved by mid of 2002. About 20,000 healthy first instars are now being produced per day from 25 indoor oviposition cages. Optimization/validation trials have been conducted during November and December 2002 in small plastic enclosures containing 500-600 hoppers. The purpose was to identify the appropriate concentration of PAN and undertake dose/mortality tests with Metarhizium and Chlorpyriphos at recommended and lower doses. A concentration 0.05% PAN was used in the combination tests. On the basis of two replicates up to ¼ of the recommended doses of the bio-pesticide and the chemo-pesticide mixed with PAN gave the same hopper mortality as compared to the parent pesticides and thus confirmed the results on the effect of PAN to increase the sensitivity to pesticides. Final confirmation of the effects of PAN under real field conditions will be required, as soon as the opportunity arises. The EMPRES/CR sponsored Diploma students from University of Khartoum spent three months at the ICIPE field station at Port Sudan. They participated in the rearing activities, which included observation of the hopper performance on different plants, and in studies on the effects of PAN on egg hatchability and of nymphal pheromone blend (NPB) on adults. In addition to the Diploma students three MSc students undertook research for their thesis at ICIPE Port Sudan Field Station on aspects of PAN, nymphal

Planned Activities	Status / Reasons for Deviation
	pheromone blend, and solitary locust-host plants relationship, respectively. Two PhD students from Mauritania sponsored by ICIPE's African Regional Postgraduate Programme in Insect Science (ARPPIS) also benefited from the project during the year. One studied the solitarious locust reproductive behaviour and the second investigated the behavioural and physiological effects resulting from exposure of hoppers to PAN and gravid females to nymphal pheromone blend. Because of delays encountered at the beginning of the project with regard to locust rearing, the workshop originally planned for December 2002 on the effects of PAN and the metarhizium product, *"Green Muscle"* (GM), was postponed to January 2003. In preparation of the field seminar comprehensive information on commercial mycopesticide products such as "Green Muscle" and "Green Guard" were compiled and made available to the member countries by October 2002. In collaboration with the PPD in Sudan and ICIPE all necessary arrangements for the implementation of the demonstration have been completed by December 2002. Invitations to interested institutions and individuals also from EMPRES/WR have been sent out. An FAO ***sprayer testing workshop*** was first organised in August 1994 to demonstrate and evaluate hand-held, knapsack and vehicle-mounted sprayers commonly used in Desert Locust control. Based on the recommendations of that workshop, a similar workshop was organized by EMPRES/CR and the CRC in Egypt from 23 – 25 September 2002. The aims were to evaluate the strengths and weaknesses of current spray machinery, to agree on key design and performance criteria for good ULV locust sprayers and to develop field testing methods to check compliance with the ideal. Experts from FAO (Rome, Mauritania), NRI, CIRAD, GTZ, Morocco and one MSc. student participated in the workshop. From the EMPRES member countries representatives from Saudi Arabia, Oman, Sudan and Yemen were invited. Equipment from *Micron Sprayers* (UK), *Curtis Dynamo* (USA), *Chemo Industries* (EGY) and *Berthoud Sprayers* (F) were tested. The workshop consisted of establishing jointly the testing criteria and presentations by the manufacturers on developments in their products. This was followed by field-testing of the sprayers and concluded with data analysis, discussion and drafting of ratings, conclusions and recommendations. All sprayers tested had advantages and disadvantages. The selection of most suitable type of sprayer will depend on the size and type of the target, for example portable passive drift sprayers will be more suitable for small hopper bands and vehicle-mounted drift sprayers for larger bands and in some instances small swarms. The workshop also provided the opportunity for invited specialists to work in a participatory way to formulate firmer ideas on what design and performance features locust sprayers should have, and simple, practical methods to test those features. These ideas will form the basis for development of FAO Guidelines on minimum requirements and standards for ULV locust and grasshopper sprayers, and related procedures to test them. With financial support form USAID, EMPRES/CR assisted in setting up ***DGPS equipment (Trimflight 3)*** on a DLCO-EA "Beaver" aircraft during July 2002. The purpose of the DGPS system is to help the pilot to improve spray swath placement during aerial control operations and to allow better recording/management of spraying operations. A consultant helped the DLCO-EA technicians in the installation process and testing of the functions. After some necessary modifications on the dashboard of the aircraft

Planned Activities	Status / Reasons for Deviation
	to fit the various components, the system was functioning successfully. For the purpose of training the pilots on the various functions and methods, the system was installed on a Land Rover. The pilots understood quickly the guidance functions and were confident to use the system. Also a demonstration was organized for other plant protection staff. The participants were very impressed by the ease of the use and the fact that the system could make accurate guidance of the aircraft much easier. Practical field trials conducted by DLCO-EA pilots against quelea bird roosting places revealed that the DGPS system can be used most effectively on flat and wide areas typical of locust spraying situations. After successful installation of the DGPS equipment, it has been agreed with DLCO-EA to organize a demonstration in Ethiopia during 2003 for other interested authorities and air operations in the Region. The aircraft is also to be contracted by FAO for a Red Locust control operation in early 2003, and this will provide experience of using the DGPS under operational conditions.
7.2 Assess environmental impact of locust control operations	It has been reported that since the US export restrictions, it was not possible to provide the PPD Sudan with the necessary equipment to conduct a baseline ***blood testing survey***. Alternatively EMPRES/CR handed the blood testing kit over to DLCO-EA. It was agreed that DLCO-EA would assist in its capacity as Regional Organization to conduct this survey in Eritrea by 2002. For various reasons the blood testing survey was not yet carried out. The participants of the 10th ELO Meeting appealed to DLCO-EA to implement this activity as soon as possible in 2003 in close collaboration with the LCU in Eritrea. The EMPRES/CR APO has studied the ***ecological sensitive zones*** located in winter and summer breeding areas of Sudan over the past two year. Preliminary findings on the biodiversity in areas of high ecological sensitivity such as key natural processes, unique features, rare flora and fauna, high biodiversity, critical habitats for breeding and feeding etc. are available but not yet comprehensively compiled and documented. The selection of sensitive areas in Sudan fell on an area at Khor Gowb, south of Suakin at the Red Sea coast based on the probability of spraying against DL and a high environmental vulnerability. The site, located in the traditional winter breeding area of DL, contained mangrove swamps, a temporary river and ponds and has been sprayed with pesticide several times in the past. Additional information on temporary water bodies has been collected from the North Kordofan summer breeding areas. A comprehensive literature review on side effects of pesticides on non-target organisms has been complied and a wind drift trial carried out during spring 2002 to investigate the effects of aerial pesticide application on mangrove biotopes. The study had involved base-line data collection of the fauna and the identification of indicator species. During the aerial pesticide application, the distribution of the spray was measured. This was followed by the detailed monitoring of the effects of the spray on the fauna within the sprayed and adjacent areas. Effects were noted on non-target insects for example *Pimelia sp*., *Gryllus sp*. and antlions. *Crustacea* were affected in the mangroves area, in particular shrimps. The populations of an indicator bird, the Hoopoe Lark, dropped after the spray, but it was not known if this was due to mortality or simply movement out of the area because of lack of insect food. The data still need to be analysed, but the probable conclusion is that suitable buffer zones should be established between sensitive areas such as mangroves and the sites of locust spraying operations.

7.3 Support operational research projects

Two collaborative research projects with the Universities of Khartoum and Aden are expected to finish by early 2003.

The University of Khartoum has been investigating the ecological effects on Desert Locust population dynamics since July 2000 with the aim of understanding the key factors influencing the population dynamics of the Desert Locust, in particular factors leading to gregarization. The specific objective included a study of the population densities in the summer and winter breeding zones, the correlation between population and habitat, the nature and extent of the population movement within and between different ecological zones and plant communities, and the role of the weather conditions, and the various mortality factors regulating population density.

Also since July 2000 the University of Aden has carried out studies on the impact of alternative pesticides used in Desert Locust control operations on honeybees and other non-target organisms. The preliminary results show no effect of metarhizium on honey bees. Field trials carried out on natural locust populations at the Red Sea coast during fall 2002 also showed no effect on bees.

One research project on the relationship between Desert Locust infestations, environmental factors and the impact of control measures in Saudi Arabia started in November 2002 in collaboration with the King Faisal University in Saudi Arabia.

Two additional research projects have been recommended for support and submitted to AGPP for approval and are expected to commence in early 2003:

- University of Khartoum: Distribution of the Desert Locust, in relation to herbage quality.
- University of Addis Ababa: Effects of metarhizium on grasshoppers.

The latter study is expected to encourage the registration process of biopesticides in Ethiopia.

Following the discussions in the contingency planning seminar in February 2002 it became clear that little has been done on improving survey methods for finding locusts, in respect of efficiency, time spent and at a competitive cost. As a result, the DLCC supported an MSc study at Imperial College, UK for an Iranian student to investigate survey methods for gregarious or gregarizing Desert Locust hopper patches. The aim was to assess a range of different survey patterns to identify a method that gives the best chance of detection. The experiments involved field exercises to determine the maximum transect width for survey activities and a computer simulation to evaluate different survey patterns. The results of the study are expected by early 2003.

Unfortunately most of the research proposals submitted to EMPRES/CR and the CRC in the past were often of poor quality or not related to the aims of the collaborative research initiative. Experiences showed that the guidelines provided were not followed properly with the consequence that many researchers and scientists faced difficulties in formulating their research proposals. Accordingly the research project guidelines were reviewed again and distributed to the ELOs with the request to approach potential institutions or students. In the past the role of ELOs in the process had not adequately been addressed. The ELOs have therefore been encouraged to be more active in interacting with the national research institutions in screening for promising research topics and in following up on progress. In many cases the researchers perceived the financial support by EMPRES and CRC as too small or the timeframe as too short and often had difficulties to adapt their programmes to fit the limits. It was recommended to provide the support mainly to university students rather than established scientists who are often more interested in basic research.

7.4 Promote the use of proven technologies

Bio-pesticides such as "Green Muscle" or "Green Guard" have proven their potential in many field trials as well as under operational conditions and have been recommended for Desert Locust control. FAO undertook many attempts during the past months and years in collaboration with other institutions to encourage the registration of metarhizium products in the Central Region. The handicap in most of the affected countries is that specific bio-pesticide registration guidelines are not available with the consequence that registration applications are treated on a case-by-case basis under chemical pesticide regulations.

The GTZ Locust Project during 2002 supported the registration of bio-pesticides in particular in Sudan and Yemen. A temporary import permit has been obtained in October 2002 from the Sudanese authority (National Pesticide Council) for locust and grasshopper control with metarhizium. A provisional registration of "Green Muscle" in Sudan can be expected by early next year based on the results of the scheduled field seminar in January 2003. For Ethiopia an import permit has been obtained in December 2002 for trial purposes. The discussions with the Yemeni authorities are still ongoing. To further stimulate the registration process of bio-pesticides, field demonstrations in collaboration with national authorities on other locusts and grasshoppers have been recommended for 2003.

A consultant has been contracted by the GTZ Locust Project to compile the experiences made on ***barrier treatments*** and to develop guidelines in collaboration with PRIFAS. A first draft is expected by early 2003.

Following the recommendations by EMPRES/CR, ***Exhaust Nozzle Sprayers*** (ENS) are generally no longer used for locust control by the member countries. The only exception was Oman but it is expected that the Omani LCU is putting ENS also out of use soon. All other member countries have replaced their ENS by vehicle-mounted ULV sprayers.

Based on the FAO Desert Locust Guidelines, ***Standard Operating Procedures*** (SOP) for ground pesticide applications have been developed as a quick reference for the national control teams. The pocket-size SOP for ground control are being prepared in English and Arabic. Similar SOP are being developed in collaboration with DLCO-EA for aerial pesticide application.

It has been planned to incorporate the recommended ***spray monitoring form*** also into the eLocust system for electronic data transfer. This activity is still pending but will be pursued during 2003.

7.5 Support national control teams

The CRC provided all member countries with 5 hand-held ULV each by August 2002. In addition, Egypt, Djibouti and Sudan benefited from 2 vehicle-mounted ULV sprayers each.

Through USAID funds EMPRES/CR equipped the LCU in Eritrea with additional 5 vehicle-mounted ULV sprayers by June 2002.

The GTZ Locust Project supported PPD Sudan with 25 hand-held ULV sprayers and 10 backpack sprayers (incl. tool kits and spare parts) by September 2002.

7.6 Provide LCUs with DL references

An Arabic translation of the revised FAO Desert Locust Guidelines is in progress and will be publish by 2003.

Translation of the two Desert Locust reference booklets from French into Arabic has been completed and distributed to all LCUs of CRC and EMPRES/CR countries and other concerned institutes.

The Arabic translation of the Desert Locust Bulletin is being prepared and distributed regularly to all CRC and EMPRES/CR member countries.

The CRC prepared and distributed two copies of a Desert Locust video tape for each of the CRC and EMPRES/CR member countries.

A first version of a Desert Locust literature database has been prepared in

collaboration with the International Society for Pest Information (ISPI) and distributed to the member countries by January 2002. A second edition is in process in collaboration with PRIFAS, ISPI, and the GTZ Locust Project. The final version, containing approximately 15,000 reports and articles, is expected by mid 2003.

Result 8: Systematic methods of campaign evaluation developed.

Indicator 8.1: Two case studies conducted by 2002

Indicator 8.2: Models to identify efficient control strategies via scenarios completed by 2003

The process of developing an improved preventive control strategy requires long-term attention and support. Up to the end of Phase I, EMPRES/CR has been active in the collection of data and has been looking into various components of preventive control. However it was seen necessary to assemble and to collate more data and then to develop analytical tools and methods such as socio-economic case studies and theoretical models.
With regard to the achievement of result 8, it is expected that at least two case studies on the efficiency and socio-economic impact of national control campaigns will be conducted by 2002. Furthermore, it is expected to complete the work using a computer-based model, which comprises elements of population dynamics and campaign organization as a tool for better contingency planning.

Planned Activities	Status / Reasons for Deviation
8.1 Develop suitable campaign evaluation mechanisms	(See also 1.2.) In order to better follow the activities carried out by the LCUs and also with the aim of monitoring the implementation of the EMPRES/CR recommendations, a ***standard progress reporting format*** has been prepared and distributed to the ELOs (except Somalia) in August 2002. Based on the proposed format, all ELOs produced more informative reports during the 10th ELO Meeting. The country presentations were more complete and useful than in previous ELO Meetings. The participants expressed their general satisfaction with the new format and suggested that this approach should be used in future ELO Meetings as a routine means of evaluating country performance. Various ***baseline information*** and data on the current status of locust management in the CR countries has been compiled over the past years and documented, but the information is still incomplete. the draft document was reviewed and suggestions made for necessary improvements in particular on rapid deployment arrangements in the member countries and contingency planning. Proposals have been made to fill these gaps and to assess the current capacity and status of preparedness of the EMPRES/CR member countries compared to the situation that existed before the last great plague in the 1980s. Reference will be made to the FAO Consultation of 1985, based on C. Ashall and J. Roy 1983. The adopted ***spray monitoring form*** has been distributed to all LCUs and should be used when control operations next occur. It has further been recommended to incorporate the form as data input format into the up-dated RAMSES and the eLocust systems.
8.2 Analyse socio-economic impact of campaigns	The evaluation of the economic impact of Desert Locust control has further been pursued during 2002. Several studies initiated in collaboration with various institutions during the previous years showed first results. As a bilateral contribution to the EMPRES/CR Programme supported by

Planned Activities	Status / Reasons for Deviation

SIDA the University of Gothenburg carried out field studies on environmental economics in Morocco, Sudan and Eritrea, the most recent of which had been conducted in Eritrea from 1993 to 1999. The findings were presented during the 10th ELO Meeting.

Also as contribution to EMPRES, the British Department for International Development (DFID) sponsored one study carried out in Mauritania and Eritrea during spring 2002. One study on the socio-economic impact of Desert Locust on smallholder farmers has been conducted in Sudan in 2001 and finalized in September 2002. A similar study was carried out in Egypt from July to August 2002. The final report was not yet finished by the end of the reporting period.

The findings of the various studies can be summarized as follows:

- All studies came to the same conclusion that, in the countries surveyed, the economic returns of DL control at national level were marginal if not negative both in respect of crop production and of crop prices;
- Farmers assessed drought as their primary problem for food security and locust attacks as the next most important;
- Poor farmers, with limited or no capacity to compensate crop losses by the other means, are the most vulnerable to DL attack;
- The efficiency of preventive control is highly appreciated by farmers in locust-affected areas as they suffer less crop damage;
- The recent recession years made it difficult to find farmers who had had direct experience of DL invasions;
- It is almost certain that rural communities affected by locust attacks will call for food aid, but it is difficult to compare the costs of food aid with DL control;
- It is unacceptable for the governments and rural populations to substitute DL control by food aid programmes;
- Crop insurance systems might be possible for commercial farmers but not for small scale farmers, given the state of the insurance market in most of the affected countries.

On insurance schemes, the Gothenburg study concluded that many farmers would be prepared to pay insurance contributions against damage caused by Desert Locust. The 10th ELO Meeting questioned this conclusion on the grounds that there is a likely wide difference between how farmers might respond to a theoretical question and what they might be actually prepared to pay. Furthermore, it should be noted that the drought insurance scheme in Morocco had so far not been a success, despite government coercion in linking drought insurance to the availability of agricultural loans.

EMPRES/CR was not in the position to update the ***ELS computer model*** as planned to assess the economic impact of Desert Locust control. The consultant who prepared the previous version in the context of the economic study of Steen Joffe was no longer available. It has been agreed not to follow this activity further.

8.3 Investigate scenarios on survey and control operations to improve strategies

The computer based model, ***symLocust,*** has been developed in collaboration with the Wageningen University and GTZ 1996 and updated in 2001. The model was introduced during the contingency planning seminar in February 2002 and much appreciated by the participants as a useful tool to assess to national survey and control capacities and their likely impact. Unfortunately, some of the applications failed to operate from CD ROM. In order to make the computer model available to the member countries a software specialist will be contacted to resolve the problem.

C. Staff status and Inputs

C.1 Staff situation

a. Professional staff

1 Programme Coordinator (Cairo, Egypt)	From August 2001, under FAO Regular Programme funds.
1 International Migratory Pest Expert (Khartoum, Sudan)	Appointed in December 2002
1 International Research & Development Expert (Sana'a, Yemen)	Contract ended in July 2002
1 National Professional Officer	Position vacant since August 2001.
1 National Professional Officer for Survey (Sana'a, Yemen)	Project-funded post. Current contract until December 2003.
1 Associate Professional Officer (Khartoum, Sudan)	Contracted until January 2003.

b. Support staff

1 Administrative Secretary in Cairo, Egypt, project-funded fixed-term contract from September 2002, currently until December 2003
1 Secretary in Sana'a, project-funded fixed-term contract until January 2003
1 Driver in Sana'a, project-funded fixed-term contract until August 2003
1 Driver in Cairo, GTZ-Project-funded until April 2003

C.2 Equipment ordered since January 2002 (Phase II)

Djibouti:	• 2 ULVA mast Micron sprayers
	• 5 Hand-held Micro- ULVA sprayers
	• 3 Codan Radio Transceivers
DLCO-EA	• 1 Codan Radio Transceiver (Djibouti base)
Egypt:	• 2 ULVA mast Micron sprayers
	• 5 hand-held Micro- ULVA
	• 25 Vibra-tak Tachometer
Eritrea:	• 5 Micron ULVA mast sprayers
	• various survey equipment incl. 20 Garmin GPS
Ethiopia:	
Oman	• 5 Hand-held Micro- ULVA
	• 5 Vibra-tak Tachometer
Somalia:	• 1 Codan Radio Transceiver
Saudi Arabia:	• 5 Hand-held Micro- ULVA
	• 5 Vibra-tak Tachometer
Sudan:	• 1 Generator
	• 8 Garmin GPS and other survey material (University of Khartoum)
	• 2 ULVA mast Micron sprayers
	• 15 Hand-held Micro-ULVA sprayers
	• 5 Vibra-tak Tachometer
	• 5 Garmin GPS
	• 1 Desk-top computer, incl. accessories
	• 1 Photocopy machine
	• 16 field beds incl. mosquito nets
	• 1 Toyota 4WD Land Cruiser Pick up
Yemen:	• 1 Desk-top computer, incl. accessories
	• 1 Laptop computer, incl. accessories
	• 1 Digital camera
	• 5 Hand-held Micro-ULVA sprayers
	• 5 Vibra-tak Tachometer

C.3 Training activities during the reporting period

- 1 International ToT training course (Oman, October 2002, total 15 trainees, 9 from the Central Region, 1 from EMPRES/WR and 5 from Southwest Asian Commission);
- 3 National S&C training courses (Egypt, August 2002; Djibouti, November 2002; Ethiopia, November 2002) total 45 trainees.
- 1 Local scouts training course (Ethiopia, December 2002) 27 trainees
- 1 special training course on RAMSES operation at NRI, January 2002, 2 trainees
- 1 Radio operation and maintenance training course (Ethiopia, April 2002) 18 trainees
- 1 DL Diploma course, University of Khartoum, 8 students (academic year 2002/2003)
- Various on-the-job training opportunities on RAMSES application, use of eLocust system, survey operation, locust information systems in Sudan, Yemen, Saudi Arabia, Egypt and Eritrea

C.4 Meetings, workshops, seminars attended by EMPRES/CR staff during the reporting period

- 4th Consultative Committee Meeting, Cairo, Egypt, 15 - 17/01/2002
- EMPRES/CR Staff Meeting, Cairo, Egypt, 21 - 22/01/2002
- Contingency Planning Seminar, Borg El Arab, Egypt, 13 – 21/02/2002
- CRC Meeting, Damascus, Syria, 09 – 14/03/2002
- Sprayer Testing Workshop, Cairo, Egypt, 09 – 16/09/2002
- 4th International ToT Training Course, Muscat, Oman, 07 -17/10/2002
- 10th EMPRES/CR Liaison Officers Meeting, Jeddah, Saudi Arabia, 27 – 31/10/2002
- 2nd Joint Technical Forum Meeting, Cairo, Egypt, 27 – 28/10/2002
- EMPRES/WR DGPS workshop, Nouakchott, Mauritania, 15-19/12.2002, two participants from EMPRES/CR

C.5 Relevant publications during the reporting period

- Report of 4th EMPRES Consultative Committee Meeting, Cairo 15-17 January 2002 (FAO) February 2002
- Farmers' DL Training Guideline in Tigrinya (PPQU Eritrea) January 2002
- Report on Radio Operation and Maintenance Training in Ethiopia (CPPTRD) June 2002
- Report on Progress - Country Focus Programme Ethiopia (CPPTRD) March 2002
- Report on Progress - Country Focus Programme Ethiopia (CPPTRD) June 2002
- Report on Progress - Country Focus Programme Sudan (PPD) June 2002

- Report on Progress - Country Focus Programme Sudan (CPPTRD) October 2002
- 2nd Report on Progress "Ecological Field Studies on Desert Locust Population Dynamics" (University Khartoum) February 2002
- 2nd Report on Progress "Impact of Alternative Pesticides used in Desert Locust Operation on Honey Bees and other Non-Target Organisms" (University Aden) March 2002
- Report on 23rd Session of the FAO Commission for Controlling the Desert Locust in the Central Region, Damascus, 2-14 March 2002 (FAO) April 2002
- Report on Radio Operators Training in Ethiopia (CPPTRD), April 2002
- Assessment of the Socio-Economic Impact of Desert Locust and their Control (DFID) April 2002
- Review of CF Programmes in Eritrea and Yemen (EMPRES/CR) May 2002
- EMPRES/CR Report on Progress - Period January - June 2002 (EMPRES/CR) July 2002
- Risk Assessment on the Importation and Large Scale Use of Mycopesticides against Locusts (FAO) August 2002
- Report on RAMSES training in Yemen (EMPRES/CR) August 2002
- Report on RAMSES training in Eritrea (EMPRES/CR) August 2002
- Scenario studies for improved DL survey and control strategies, 8th progress report (Wageningen University) August 2002
- Report on National Training Course in Egypt (CRC) September 2002
- Minutes of Meeting, 10th ELO Meeting (EMPRES/CR) November 2002
- Socio-economics of Desert Locust Control in Sudan - A Micro Level Case Study (EMPRES/CR) November 2002
- Report on Installation of Trimble Trimflight3 on DLCO-EA aircraft (DLCO-EA) October 2002
- 2nd meeting of the Joint Technical Forum for the Central Region (EMPRES/CR – CRC) November 2002
- Report on National Training Course in Djibouti (MoA Djibouti) November 2002
- Consolidated Report on progress "Optimization, validation and transfer of pheromone technology to national Locust Control Organizations" (ICIPE) November 2002
- Draft Workshop Report on Sprayer Testing Used in Desert Locust Control (EMPRES/CR – CRC) December 2002
- Manual to Visualize and Analyze SPOT4-Vegetation Images (AGPP) December 2002
- Report on National Training Course in Ethiopia (CPPTRD) December 2002
- 3rd Report on Progress "Ecological Field Studies on Desert Locust Population Dynamics" (University Khartoum) December 2002

D. General Assessment

Conclusion whether the programme purpose can be achieved
Recommendations on necessary steps to be taken
Future action required

Most activities planned during the 9th EMPRES/CR Liaison Officers Meeting have been successfully implemented. The involvement of the ELOs in the planning process encouraged the LCUs in most cases to take more responsibility for the implementation of the recommendations and techniques offered by the EMPRES/CR Programme. Best progress in actively introducing aspects of improved Desert Locust management has again been observed in Sudan. Notwithstanding the encouraging developments at the PPD in Sudan, much depends on the policies of the MoA to maintain and to further develop its human capacity at the LCU. Equally important for the sustainability of effective preventive locust control is a clear decision from the Government to maintain a centralized locust control service under the umbrella of the PPD, thereby receiving the utmost operational autonomy and support. The GDPP in Yemen eventually started to review and restructure its Locust Control Centre to play again a more active role in recognition of its importance in the regional context. Comparatively little progress has been made in Eritrea mainly because of the still pending nomination of a Liaison Officer and the ongoing restructuring process of the agricultural sector. In order to strengthen the interaction with the EMPRES/CR Programme it is strongly recommended to nominate a competent Liaison Officer in Asmara as soon as possible.

The integration of technical components is gradually going ahead. Most countries are incorporating the recommended survey and locust information systems in their national structures. As a result, locust reporting to the DLIS has significantly improved during the past months. Also new technologies such as RAMSES, eLocust system, use of satellite images etc. are in the process of being introduced into the national services and are beginning to take root. It is therefore likely that the targets set with regard to the early warning component can be achieved during Phase II. Important for this achievement was the active involvement of the AGPP Forecasting Officer in all these matters. The EMPRES/CR Programme gained much from his feedback, ideas and his direct interaction with the LCUs and the FAO staff. Particularly promising is the use of satellite images for remote detection of potential breeding areas. But in order to calibrate the satellite imageries in a way that they become a more reliable decision-making tool for directing surveys teams, it is essential to maintain the post of remote sensing expert at AGPP.

The same applies to the introduction of alternatives to chemical Desert Locust control. Metarhizium products are now becoming widely recognized as a promising alternative especially for containing outbreak populations and controlling locust infestation within ecological sensitive areas. The objections from some of the member countries to allowing “exotic” living organisms to be used within their boundaries started to moderate, with the understanding that metarhizium occurs naturally in all the locust-affected countries. Also the reservations with regard to the slow speed of action of bio-pesticides may possibly be resolved if PAN proves its potential to enhance the mode of action of metarhizium. First semi-field trials with PAN conducted jointly with ICIPE in Port Sudan could confirm these effects and also opened up new possibilities for reducing the application rate of conventional pesticides if mixed with small quantities of PAN. But before recommending the use of PAN for locust control,

its ecotoxicological status needs to be assessed. In any case, demonstrating the effects of alternative control means to the member countries and involving national scientists and plant protection staff actively in these demonstrations will be one of the priorities during the remaining months of Phase II.

The national LCUs should increasingly be in the position to handle national training courses more autonomously after the efforts EMPRES/CR has made to emphasise human capacity building during the past years and to provide the necessary tools such as the Training Manual for national trainers and training kits to all of the member countries. The LCUs should now gradually pursue regular training on technical locust matters in a self-sustained way. Limited financial support to national training courses can still be provided during 2003.

To stimulate cooperative research on Desert Locust matters in the Central Region was one of the major preoccupations of the EMPRES/CR Programme during the past years. Some of the reasons have been outlined above and in previous progress reports. It is now hoped that with stronger interaction between the ELOs and the national researchers some of the obstacles have been resolved and that the overall quality of the research proposals submitted to EMPRES/CR and the CRC is improving.

The enhanced collaboration with the various partners of the EMPRES/CR Programme at the regional and interregional level contributed significantly to the good performance during 2002. Notably the close interaction and routine consultation with the CRC in all aspects not only resulted in increased cost-sharing of certain activities, but also in taking on more responsibility regarding the dissemination of important components developed by the EMPRES/CR Programme also to the non-EMPRES Central Region countries. Despite the fact that EMPRES/WR has only just started operation, the exchange of experiences between two Regions at the level of the national officers has gained momentum and will further be expanded. The collaboration with DLCO-EA was not always as fruitful as expected which could, amongst others, be attributed to technical problems with regard to the out-dated communication system at the DLCO-EA HQ. Cooperation with the bi-lateral contributions to the EMPRES/CR Programme still remained below expectations. The previous observation still holds that bi-laterally supported activities are often conducted on an ad-hoc basis without the necessary consultation with the EMPRES/CR Coordination Office. Bilateral contributions are often driven by the own institutional interests which makes the coordination and integration of these inputs in a more meaningful way in some cases very difficult.

The technologies for improving preventive Desert Locust control have been addressed to a high degree during the past years. It is now necessary in collaboration with the ELOs to integrate these technologies into the national systems. In order to achieve this, structural and organizational considerations at the LCUs are becoming an increasingly key issue for making effective use of the recommendations and techniques. This aspect has become particularly important for contingency planning and the question of preparedness. Experience has clearly shown that for most of the LCUs it is difficult to come up with realistic contingency arrangements which could allow rapid deployment and the obtaining of additional resources at a short notice. This is not surprising given that tangible instruments and mechanisms are also lacking at higher levels, but it is necessary that operational contingency arrangements

are also in place at regional as well as international levels. This of course goes beyond the capacity of the individual countries and needs to be addressed by EMPRES/CR in the broader context and should also involve EMPRES/WR. It is therefore likely that this rather complex question cannot be resolved the comprehensive way as required within the remaining time of Phase II.

List of Acronyms

AGPP	Plant Protection Service (FAO)
APO	Associate Professional Officer (FAO)
CFP	Country Focus Programme
CPPTRD	Crop Production and Protection, Technology and Regulatory Department
CR	Central Region
CRC	FAO Commission for Controlling the Desert Locust in the Central Region
DGPS	Differential Global Positioning System
DL	Desert Locust
DLC	Desert Locust Control
DLCC	Desert Locust Control Committee
DLCO-EA	Desert Locust Control Organization for Eastern Africa
DLIS	Desert Locust Information Service (FAO HQ)
ELO	EMPRES Liaison Officer
EMPRES	Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases (FAO)
EMPRES/CR	EMPRES Central Region Programme
EMPRES/WR	EMPRES Western Region Programme
FAO	Food and Agriculture Organization of the United Nations
GDPP	General Directorate for Plant Protection
GIS	Geographical Information System
GPS	Global Positioning System
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit (German Technical Cooperation)
HQ	Headquarters
ICIPE	International Centre of Insect Physiology and Ecology, Nairobi
IGR	Insect Growth Regulator
LCC	Locust Control Centre
LCU	Locust Control Unit (National)
MoA	Ministry of Agriculture
NPO	National Professional Officer (FAO)
NRI	Natural Resources Institute (UK)
PAN	Phenyl-Aceto-Nitrile
PPD	Plant Protection Department (National)

RAMSES	Reconnaissance and Management System of the Environment of Schisto-cerca (GIS data management and aid to decision-making)
S&C	Survey and Control
TFCR	Joint Technical Forum for the Central Region
ToT	Training of Trainers
ULV	Ultra Low Volume
USAID	United States Agency for International Development
WR	Western Region
WU	Wageningen University