



Food and Agriculture  
Organization of the  
United Nations



The Commission for Controlling  
the Desert Locust in the  
Central Region



## CRC regional workshop on environmental & health standards (EHS)

25 – 29 September 2016, Hurghada, Egypt

## 1. Introduction

The environmental and health standards (EHS) of the Commission for controlling the Desert Locust in the Central Region (CRC) define the requirements that a Desert Locust control campaign should meet with the aim to minimize environmental and human health effects of insecticide use. The EHS provides explicit benchmarks, which Desert Locust control operations should comply with, to ensure that environmental and human health effects are avoided or kept to an acceptable minimum.

The CRC-EHS were developed by experts from 7 CRC frontline countries (Egypt, Eritrea, Ethiopia, Oman, Saudi Arabia, Sudan and Yemen) in a workshop in May 2012. The EHS were subsequently adopted by the 28th session of the CRC in November 2012.

In September 2014, countries met again to discuss implementation of the EHS and review methods for monitoring the potential environmental and human health effects of insecticide use in locust control.

Since 2014, the National Locust Control Units (UNLAs) of the CRC frontline countries have appointed an EHS officer, responsible for implementation and monitoring of the EHS. All countries also conducted national training workshops on the EHS and on environmental and health monitoring, with the Commission's financial and technical support.

The present workshop was organized with the objective to review the current status of protecting environmental and human health during locust control in the CRC frontline countries and to evaluate the implementation of provisions of the EHS. The workshop was also expected to provide concrete advice on continued national implementation of the EHS.

The workshop was organized in Hurgada, Egypt, from 25 – 29 September 2016. Fourteen experts from six CRC member countries (Egypt, Eritrea, Ethiopia, Oman, Saudi Arabia and Sudan) participated in the workshop, as well as an expert of the Desert Locust Control Organization for East Africa (DLCO-EA). The workshop was facilitated by staff from the CRC Secretariat as well as by an FAO consultant (see Annex 1 for a complete list of participants).

The workshop consisted of a series of technical presentations, discussions and practical exercises, as well as a field day in which a simulation exercise was conducted. The programme of the workshop is shown in Annex 2, which includes a list of presentations given.

## 2. Progress on implementation of the EHS

All participants were requested, prior to the workshop, to prepare a report on the status of implementation of the EHS in their country. They were provided with a template as well as a detailed spreadsheet in which the level of implementation could be filled in for each of the requirements of the EHS.

The status of national implementation of the EHS was presented during the workshop. Formal implementation of the EHS had only started recently in most countries, and it was therefore not expected that all its provisions would have been met. It was noted, though, that a considerable number of aspects of the EHS were already in practice in the CRC member countries, even before adoption of the EHS. Others would require more time and resources, as well as political support, for their application.

### **Relatively well implemented provisions of the EHS**

Most countries indicated that the following provisions in the EHS were common practice, or well-advanced in their implementation:

1. A preventive control strategy is applied; control targets are properly demarcated; and treatment of solitary or scattered locust populations is avoided. [EHS provisions 1.1 & 1.2]
2. All insecticides are registered for locust control and conform to human health and environmental criteria listed by FAO. [2.1, 2.3 & 2.4]
3. ULV application equipment is being favoured and EC sprayers only used during invasions; all control teams have calibration equipment. [3.3, 3.4 & 3.5]
4. Insecticides meet FAO/WHO specifications and conform to quality standards for at least 2 years after importation/formulation; insecticide packaging and labelling conforms to international standards. [4.2, 4.2, 4.3, 4.4, 4.5]



5. Pesticide stock records are kept up-to-date. [7.5]
6. Habitants close to areas treated are informed prior to the control operations about precautions. [9.3]
7. Insecticide applications are being carried out according to the principles described in the relevant FAO guidelines, and real volume application rates are measured [11.1 & 12.2]
8. All persons that handle insecticides use personal protective equipment appropriate for their tasks. [14.1]
9. Pre-harvest interval are defined for the insecticides used in locust control; shepherds are informed about withholding periods for their livestock; and waiting periods for control staff are observed. [16.1, 16.4 & 16.5]
10. All national locust control units have appointed an environmental and health and officer who is responsible for the overall implementation of the EHS. [24.1]

Thus, several of the key aspects of the EHS appear to be implemented in the majority of CRC member countries. Countries noted that increasing attention is being paid by national locust control units to environmental and health aspects of locust control.

### **Least implemented provisions of the EHS**

The following provisions of the EHS were not implemented in most CRC member countries:

1. Treatments with entomopathogens are not carried out much. [1.4]  
The use of *Metarhizium* is further discussed in section 4.1
2. The FAO Pesticide Stock Management System (PSMS) is not used to monitor insecticide stocks throughout the country, not are bar codes used on insecticide drums/containers. [7.6 & 4.6]  
Staff of NLCUs has recently been trained on using the PSMS, but the system is considered complex and not very user-friendly, and its use is unlikely to be taken up any time soon in the region.
3. Health centres in areas that will likely see control operations have not received relevant toxicological information on the insecticides to be used; and health staff in the strategic health centres are not trained in diagnosis and treatment of insecticide poisoning. [6.1 & 6.4]
4. Antidotes are not available to control teams operating far from health centres. [6.3]  
It was noted, however, that it has become virtually impossible to obtain automatic injectors with antidotes for organophosphate insecticides (i.e., atropine and pralidoxime).
5. Drivers of vehicles transporting insecticides have not received training on product handling and on emergency procedures in case of accidents involving the products; and insecticide transport is not accompanied by the appropriate documentation. [8.3 & 8.4]
6. Personal insecticide use records are not kept for all persons handling or applying insecticides; regular occupational health monitoring of all personnel handling or applying insecticides is not conducted, not is a medical check-up at the end of the campaign; and persons showing high cholinesterase inhibition can therefore not be withdrawn from work with insecticides. [19.2, 19.3, 19.5 & 19.6]  
It was noted that collaboration with the ministry responsible for public health is not always well established (see section 4.2). Also, the limited availability of cholinesterase kits complicates health monitoring in countries with many control locations.
7. Pressed/compacted empty containers are not recycled or disposed in accordance with national regulations or relevant international standards. [21.3]

Several participants indicated that no drum cleaners/crushers were available or that recycling of metal or plastic containers was not possible in the country (see section 4.3).

Overall, it was noted that there is still a lack of awareness with decision makers about the importance of meeting environmental and health standards for locust control. As a result, only limited priority – and funding – is given to insecticide risk reduction during locust control campaigns. This is even more a problem in member countries having decentralized agricultural authorities.

Lack of specialized staff and high staff turnover at the national locust control units were also seen as a constraint to build capacity for the health and environmental aspects of locust control. Furthermore, the high costs of pesticide residue analysis, the low quality of PPE, the lack of monitoring equipment and of DGPS on aircraft, were all mentioned as holding back implementation of the EHS in the region.

Finally, it was noted that some provisions of the EHS had not yet been implemented because important Desert Locust control operations has not been conducted over the last few years.

## Field simulation

A field simulation was carried out on the second day of the workshop. The simulation was designed to practice the collection of monitoring data and of other information relevant for the verification of implementation of the EHS. After collection of the data, participants evaluated and interpreted the results.

The field site was located at a desert area about 40 km west of Hurghada (figure 1). Since there was very little vegetation at the site, an “area treated against locusts” was mapped out in the field using markers and flags, indicating various types of environment: cultivated, a river and grassland, of which part was treated against locusts. The map of the simulation area (without the treatment indicated) was also made available to participants in e-Locust.

Participants were divided in teams of three and each assigned a car with driver. Furthermore, each team received a tablet with e-Locust, a GPS and a spray application form with the details of the simulated treatment.



**Figure 1.** Simulated environment treated against Desert Locust during the field day. In green are cultivated areas, in blue rivers and in white grassland, of which the red area was indicated as treated.

In four locations at the site (RP 1 – 4), tents were placed where resource persons responsible for different parts of the locust control campaign were housed: a head of control operations, a pesticide store keeper, a person responsible for insecticide transport and a head of a control team. These persons all held documentation relevant to verify implementation of particular provisions of the EHS, that participants were expected to compile and evaluate (see Annex 3 for a detailed list - so-called “non-monitoring” information). The control campaign staff in the tents could also be interviewed to obtain clarifications about the information.

In addition, on one site (PPS) a field pesticide storage site was set up, and one other site (IF) a farmer and a shepherd could be interviewed about the control operation.

Two teams of 3 participants conducted these non-monitoring tasks.

Two other teams of participants were assigned to environmental and health monitoring tasks (the “monitoring tasks”). This included conducting a situation analysis of the treatment site using the environmental and health monitoring form, sampling of water and vegetation, monitoring effects on non-target arthropods and monitoring of terrestrial vertebrates. These monitoring teams also visited the pesticide storage site and the farmer/shepherd. The teams were provided with monitoring materials, to be able to conduct their tasks.



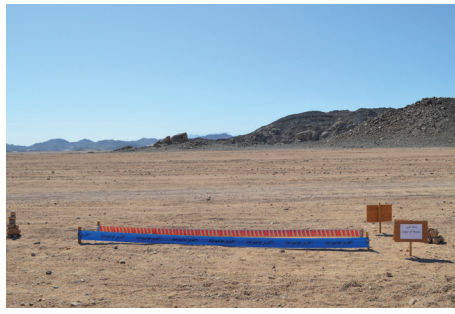


Figure 2. Marking of landscape elements and resource locations in the field simulation area.

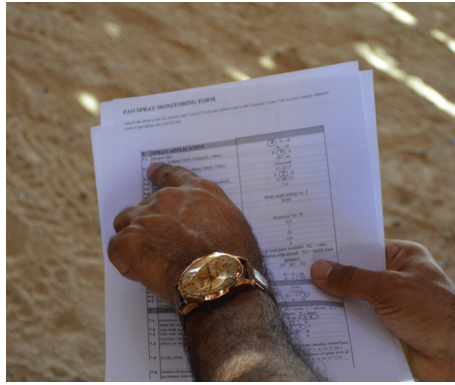


Figure 3. Impressions of the field simulation

The field day started with a briefing at the “CRC HQ” on the field site, after which teams spent about 3 hours in the field collecting information. Subsequently, all teams returned to the field HQ and continued analysing the data.

The day after the field day, the teams were asked to present their findings. All information collected was discussed, in particular to what extent the data confirmed or contradicted the provisions of the EHS.

Overall, the simulation was considered very useful by the participants. The practical aspects of monitoring the (virtual) control operation, the collection information on the control campaign under field conditions, the comparison of different pieces of evidence in favour of or contradicting certain provisions of the EHS, and the plenary analysis and discussion of the results, were in particular appreciated.

## 4. Selected EHS requirements

### 4.1 *Metarhizium*

There is a clear interest in using *Metarhizium acridum* as a biocontrol agent against locusts. However, its use so far in the region is minimal and various constraints were mentioned to apply the biopesticide.

In some CRC member countries (e.g. Egypt, Saudi Arabia, Oman), insecticides on the basis of *Metarhizium* are not yet registered. This is partly because a company having to submit relevant documents to the authorised Ministry to register a pesticide has to conduct several seasons’ of field efficacy trials, which is difficult given the erratic nature of Desert Locust populations.

Another constraint mentioned for the use of *Metarhizium* is the relatively short shelf-life which means that the product can only be ordered when locust populations have a high probability of occurring over the next few months.

In the discussions that ensued, it was indicated that many efficacy data for *Metarhizium* are available at FAO, for various species of locusts and under climatic and ecological conditions that are identical or very similar to the Central Region. Most of these field trial reports can be freely requested from FAO by national pesticide registration authorities and used as a basis for the authorization of this biopesticide . Furthermore, given the localised and irregular nature of Desert Locust populations, it was suggested that countries in the region could mutually accept efficacy trial data for *Metarhizium*, as has been the case in other parts of the world. Where needed, FAO could provide technical assistance to pesticide registration authorities to this end.

The application of *Metarhizium* requires additional technical training of locust control staff, when compared to the use of conventional insecticides. Therefore, specialized control teams were trained in both West Africa and Madagascar. Participants suggested that CRC conducts training in the application of *Metarhizium* for those countries where the biopesticide is (expected to be) registered.

### 4.2 Health monitoring

It was noted that the monitoring of possible health effects as a result of the handling and use of insecticides by locust control staff is not yet effectively organized in many CRC member countries. This includes medical check-ups before, during and after control operations, monitoring of cholinesterase inhibition in case organophosphate insecticides are used, and organization of treatment of pesticide poisoning.

It was therefore suggested that the NLCUs establish an active collaboration with the ministry responsible for public health, with the aim to ensure that the health of locust control staff is properly monitored and that medical support in case of incidents can be provided effectively.

To provide support to medical staff, it was also suggested that FAO/CRC commissions the elaboration of standard operating procedures for medical check-ups of pesticide handlers as well as for the diagnosis and treatment of poisoning by insecticides used in locust control.

### 4.3 Pesticide use passport

The model for a pesticide use passport was presented and discussed, as a means to document individual handling and use of insecticides by locust control staff. In case of poisoning or other health problems that might be attributed to locust control insecticides, the pesticide use passport should help identify possible relationships between insecticide use and any adverse effects.



Participants expressed some hesitation towards “more forms to be filled” during a control operation. However, the importance of documenting individual use of pesticides was recognized. It was noted that similar pesticide use records have now to be kept (by law) for professional pest control operators in many parts of the world.

It was suggested that CRC member countries try out the passport in selected regions or for selected control teams, and report back to CRC secretariat about its use and possible constraints.

#### **4.4 Empty containers**

The collection and disposal or recycling of empty insecticide containers remains a problem in almost all CRC member countries. Approaches applied elsewhere for recycling metal and plastic insecticide containers were discussed. It was noted that recycling or, if that is not possible, environmentally sound disposal, likely needs to be implemented at a larger scale than just for locust control insecticides; the quantities used in locust control are probably too small to allow economically viable recycling.

However, NLCUs need to ensure at least that all empty containers are triple-rinsed (for water-based insecticide formulations) or solvent-rinsed (for ULV formulations), crushed and safely stored until a recycling/disposal solution is found. FAO may be able to provide technical assistance to countries wishing to establish a national empty pesticide container management system.

#### **4.5 Environmental monitoring**

A refresher was presented of human health and environmental monitoring methods in locust control. Monitoring of locust control operations at three levels was discussed: i). rapid assessments by control teams, ii). dedicated monitoring by specialised teams, and iii). In-depth monitoring by research institutions.

None of the CRC member countries had so far established a dedicated team for monitoring insecticide application quality, human health and the environment. This in spite of the national training that had been provided by CRC on monitoring techniques in all frontline countries.

At the request of participants, particular attention was given to further explain sampling techniques for pesticide residue analysis and monitoring of effects on honeybees.

#### **4.5 Incident monitoring**

Incidents may occur during or after locust control operations, such as insecticide spills, mortality of fish or honeybees, or presumed effects of the insecticides on livestock. Such incidents are often characterized by a relatively long delay between the notification of the incident and the investigation, the absence of information before the incident occurred, and incident descriptions done by non-specialist persons.

Methods for investigating such incidents were presented and discussed. A check-list is available from FAO that can be used to assist in incident investigation.

## **5. Measuring implementation of the EHS**

Measuring objectively to what extent a given country has implemented the provisions of the EHS is a complex matter. Some indicators have been presented earlier in the EHS Implementation Handbook, but these are not always quantitative and/or precise. However, being able to measure implementation of the EHS will help NLCUs to identify gaps and will allow external parties (e.g. national auditors under environmental impact assessment legislation, international development partners) to review the level of compliance of locust control with environmental and health standards.

The CRC Secretariat has developed an EHS Evaluation Card, a tool to measure performance in implementing the EHS. The tool is programmed in Virtual Basic and MS Excel. It assesses implementation of each provision of the EHS as: “not implemented”, “partially implemented” (~50%), “fully implemented” (~100%), or “not applicable under national conditions”. The tool was explained to participants and briefly tried out.

The advantage of the tool is its user-friendliness; it can be filled out fairly rapidly. The disadvantage is that the implementation criteria are not quantified for each of the provisions. While the latter would make the evaluation tool much more complicated (ref. the “score card” developed to this end by the CLCPRO), it also allows for more objective and comparable outcomes.

Participants were requested to conduct an evaluation on the implementation of the EHS in their country using the tool, and provide feedback to the Commission secretariat.

## 6. National EHS implementation plans

Implementation of the EHS still requires considerable efforts in all CRC member countries. It was therefore suggested that countries elaborate work plans to structure the national implementation of the EHS.

Participants recognized, however, that full implementation will require time and resources and is unlikely to be achieved in the very short term. It was recommended instead that NLCUs focus on a limited number of EHS requirements and identify concrete actions that will lead to their implementation. Such priority requirements may differ from country to country.

On the basis of the national works plans, the CRC could then assess to what extent it could assist countries technically in carrying out the activities.

The following steps were proposed for the elaboration of a national works plan for implementation of the EHS:

1. The NLCU again analyses the actual national implementation of the EHS, using the CRC-EHS Evaluation Tool;
2. The NLCU reports to the CRC Secretariat on implementation and identify gaps;
3. The NLCU, at the same time, provides feedback on the practical use of the Tool and suggest improvements;
4. The NLCU, where needed in concertation with other stakeholders, identifies a limited number (proposed are three) of main requirements that have not yet been implemented, entirely or partially. These requirements will be selected on the basis of:
  1. National priorities (e.g., policy, legal, agronomic, environmental, human health);
  2. Ease of implementation (financially and organizationally);
5. The NLCU, where needed in concertation with other stakeholders, prepares a succinct national implementation plan for these priority requirements, covering at least the following elements:
  1. Initial situation (“baseline” for the requirement);
  2. Activities to be conducted;
  3. Actors involved;
  4. Target dates;
  5. Resources required (staff, equipment, capacity building, budget {internal, external});
6. The NLCU sends the plan to the CRC Secretariat, who reviews it and provides technical advice on implementation, if required;
7. The CRC Secretariat identifies commonalities among the implementation plans, as a basis to provide (partial) technical support to countries;
8. The CRC Secretariat sensitizes national decision makers about the work plan and requests them to support its implementation;
9. The NLCU includes activities needed for implementation and monitoring of the EHS in the yearly work plan;
10. CRC frontline member countries will start implementation.

The degree to which the implementation plans have been successfully achieved will be discussed again at the next meeting of the CRC-EHS officers.



## 7. Recommendations

Based on the deliberations during the workshop, the participants suggested the following recommendations:

### **Workshop participants**

1. Inform higher management at the relevant ministries responsible for locust control about the outcomes of the workshop.

### **CRC Member Countries**

2. Step up the implementation of the Environmental and Health Standards (EHS) for Desert Locust control operations in the Central Region, as was recommended by the 28th Session of the CRC in 2012, and therefore include activities needed for implementation and monitoring of the EHS in the yearly work plans of the NLCU;
3. Establish an EHS monitoring team that can operate independently with regard to personnel, logistics and equipment;
4. Establish a documentation system for verification of the implementation of the EHS, which includes the collection and analysis of relevant data;
5. Prepare a national work plan for implementation of the EHS, along the lines described in this report;
6. Conduct annual national training courses on implementation of the EHS, involving drivers, store keepers, laborers and other relevant staff, and resulting in certification of this staff;
7. Envision the registration of *Metarhizium acridum* for locust control, if this biopesticide has not yet been registered, taking into account efficacy data that have been compiled throughout the Desert Locust area;
8. Give emphasis to using more environmentally friendly locust control methods and products, such as biopesticides and barrier treatments with insect growth regulators;
9. Establish active collaboration between the NLCU and the ministry responsible for public health with the aim to ensure that the health of locust control staff is properly monitored and that medical support in case of incidents can be provided effectively;
10. Encourage further collaboration between the NLCU and other key stakeholders for the implementation of the EHS, such as (but not limited to) ministries responsible for public health, labour and the environment;
11. Strive to fulfil the EHS requirement that spray aircraft are equipped with DGPS;
12. Start using the EHS Evaluation Tool for assessing the degree of national implementation of the EHS as well as gaps and constraints for implementation, and provide feedback to the CRC Secretariat.

### **The CRC**

1. Conducts a regional training course on the use of *Metarhizium acridum* leading to the establishment of specialized national control teams that can apply this biopesticide effectively;
2. Provides member countries with the necessary equipment to conduct monitoring of the EHS, such as for residue sampling, biological monitoring, cholinesterase assessments and pesticide application quality assurance;
3. Supports – technically and financially – the organization of further national training courses on implementation of the EHS;
4. Engages with DLCO-EA to continue to ensure the proper longer-term storage of *Metarhizium acridum*, when this biopesticide is used on a larger scale in the region;
5. Develops materials that can be used to raise awareness of national policy and decision makers on the importance of environmental and health protection in locust control.
6. Commissions the elaboration of a guidance document on recognition and treatment of insecticide poisoning intended for medical personnel in locust-affected areas.
7. Organizes a regional workshop to evaluate progress of implementation of the EHS in two years' time.

## Annex 1 – Participants

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## Annex 2 – Programme of the workshop

Day/Date	Time	Topic	Presenter	Activity/Location/ presentations
Sunday, 25 September	08:30 – 09:00	Registration		
	09:30 – 09:00	Opening ceremony, objectives and programme of workshop, housekeeping matters, drafting committee	Mamoon	Plenary/Meeting room
	09:30 – 10:00	Introduction – EHS: history of development and reminder of previous recommendations	Essam	Presentation/Meeting room [EHS 2019 Introduction.pptx]
	10:00 – 10:30	<b>Break</b>		
	10:30 – 12:30	National progress on implementation of the EHS	Country representatives	Presentation/ meeting room
	12:30 – 13:30	<b>Break (lunch/prayer)</b>		
	13:30 – 15:00	Highlights on Advantages/ Disadvantages of the EHS national plans (Derived from countries' reports and presentations),	Harold	Presentation/ meeting room [EHS - National implementation.pptx]
	15:00 – 15:30	<b>Break</b>		
Monday, 26 September	15:30 – 17:00	Field exercise, explanation of the field simulation (groups, roles, (objectives, report etc	Essam	Presentation/ meeting room Instructions of Field] [Simulation.pptx]
	07:00 – 08:30	Moving from Hotel to field camp Highlight and explanation of groups roles	Harold /Essam	CRC Camp
	08:30 – 12:00	Field exercise	Groups A(1&2) and B (1&2)	Field exercise
	12:00 - 15:00	<b>Break /wrap up/back to Hurghada (end of the day)</b>		
	08:30 – 10:00	Comments by participants on the field simulation (Monitoring Procedures).	Participants	Discussion/ meeting room
	10:00 – 10:30	<b>Break</b>		
	10:30 – 12:30	Analysis of the simulation, Evaluation and lessons learnt	Harold/ Essam/ Mamoon	Discussion/ meeting room
	12:30 – 13:30	<b>Break (lunch/prayer)</b>		
	13:30 – 15:00	Quick revision on EHS-CR Requirements, Implementation Manual, (Practical & Non Practical), Resource Persons (Roles), EHS Team (qualifications, structure, duties, organizational skeleton), planning for Implementation	Harold/ Essam	Presentation/ discussion/ meeting room [EHS – principles.pptx]
	15:00 – 15:30	<b>Break</b>		
	15:30 – 17:00	Quick revision on Monitoring Process (dedicated monitoring) SOPs and Monitoring Forms	Harold/ Essam	Presentation/ discussion/ meeting room

Day/Date	Time	Topic	Presenter	Activity/Location/ presentations
Wednesday, 28 September	08:30 – 10:00	Quick revision on technical topics: pesticide use passport, bees	Harold	Presentation/ discussion/ meeting room [EHS - Pesticide use passport.pptx]
	10:00 – 10:30	<b>Break</b>		
	10:30 – 12:30	Quick revision on technical topics: pesticide residue sampling; empty containers	Harold	Presentation/ discussion/ meeting room [EHS - Environmental monitoring - Residue sampling.pptx] [EHS - Empty containers. pptx]
	12:30 – 13:30	<b>Break (lunch/prayer)</b>		
	13:30 – 15:00	Measuring implementation of the EHS: development of a score card	Osama Rabie	Presentation/ discussion/ meeting room [EHS Score card.pptx]
	15:00 – 15:30	<b>Break</b>		
	15:30 – 17:00	Exercise on the score card	Osama Rabie/ Essam	Meeting room
Thursday, 29 September	08:30 – 10:00	Quick revision on technical topics: incident monitoring		Presentation/ discussion/ meeting room [EHS - Incident monitoring.pptx]
	10:00 – 10:30	<b>Break</b>		
	10:30 – 12:30	Identifying of National Obstacles on implementation of EHS on the CR countries Future plan of implementation of EHS on the CR countries	Mamoon	Discussion/ meeting room
	12:30 – 13:30	<b>Break (lunch/prayer)</b>		
	13:30 – 15:00	Workshop recommendations, closer	Mamoon/ Harold	Discussion/ meeting room

## Annex 3 – Documentation and materials prepared for the field simulation

Location/type	Information/materials	Remarks
<b>Hand-outs to all groups at start of simulation</b>	0.1 Spray monitoring form	Malathion
	0.2 Survey and control form	
	0.3 Map & e-Locust	
<b>Location 1 Head of control operations (RP1)</b>	1.1 List of insecticides registered in country X against locusts, and their recommended rates [EHC provisions: 2.1, 2.2, 11.1]	List with recommended application rates and registration validity. Can be checked against insecticides used during the campaign, in stock, tested for quality control.
	1.2 Distribution records of sprayers and maintenance records [3.2, 3.3, 3.4, 3.6]	List of available sprayers, numbers, maintenance dates and outcomes, sprayer locations. Can be checked against sprayers used during the campaign.
	1.3 List of persons trained in pesticide application [5.1]	Staff posts, dates of last training. Can be checked against the summary list of control records and the outcomes of cholinesterase monitoring.
	1.4 Contract with an independent laboratory for pesticides residues [16.1, 16.3, 20.1]	
	1.6a Monitoring check-list [20.1]	Filled out – fenitrothion. Completeness check; measures taken
	1.5b Poisoning incident form [19.6, 20.1]	Filled out – fenitrothion. Completeness check; measures taken
	1.5c Monitoring check-list [20.1]	Filled out – fenitrothion. Completeness check; measures taken
	1.6 Results of awareness building exercises of nomads and shepherds. [9.1, 9.3, 9.4, 16.2, 16.4]	Identify messages and precautions that require further attention
<b>Location 2 Person responsible for pesticide storage &amp; transport (RP2)</b>	2.1 List of pesticide stores [7.1]	Check store status; cross-check with quantities insecticides stored
	2.2 Availability & distribution records of the insecticides [7.5]	List of outgoing drums, locations of stocks, numbers of empty containers returned. Check against transport records, used insecticides, returned containers, release dates and quality control needs.
	2.3 Pesticide quality analysis [4.1, 4.4]	Check against release dates of insecticides in stock; verify against FAO/WHO specifications.
	2.4 List of purchased equipment for pesticide transport [8.2]	Check against quantities of pesticides in stock in various store locations.
	2.5a Transport documents [8.4]	Filled out – Malathion. Check against insecticide storage data and distribution records.
	2.5b Transport documents [8.4]	Filled out – Metarhizium. Check against insecticide storage data and distribution records.



Location/type	Information/materials	Remarks
	2.6 FAO Specification Malathion ULV [4.4]	Malathion. To confirm document 2.3
	2.7 Persons trained in the use of PSMS [7.6]	Check against stores with most insecticides
	2.8 List of PPE stocks	Check if sufficient to cover staff numbers for 3 month campaign
<b>Location 3 Medical post (RP3)</b>	3.1 Safety data sheets for (some of the) insecticides used in the spray forms [6.1]	3.1a Malathion UL; 3.1b Fenitrothion EC; Green Guard SC (Metarhizium). Check against stock records which are missing (i.e. teflubenzuron). Check whether right formulations.
	3.2 Location of (potential) control sites and medical facilities [6.2, 6.3]	Types of medical posts (poison control centre, hospitals, medical centres). Information on transport times between control sites and the nearest medical posts. Check which sites are properly serviced by medical assistance; identify control areas where antidotes should be available with teams. Cross-check against trained medical staff (doc 3.3).
	3.3 Information on training of medical staff [6.4]	Verify which medical centres have trained staff; cross check against location of control, sites (doc. 3.2)
<b>Location 4 Head of control teams (RP4)</b>	4.1 List of names control staff in the team	Cross check against training records; cross-check against control records and pesticide use passports
	4.2 Summary list of control records, [12.1, 12.2, 12.4, 18.1]	List showing locations of treatments (coordinates), quantities of pesticides used, surface areas treated; equipment used; efficacy levels. Cross check against registered insecticides; control staff and their training; poisoning records. Calculate real application rates. Check whether types of targets justify treatment.
	4.3 Pesticide use passports for (most) control staff in the team [5.1, 19.1, 19.2, 19.3, 19.6]	Filled out for Mr 8 and for Mr 12. Cross-check against insecticides used by these control staff; check against training records.
<b>Location 5 Pesticide field storage (PPS)</b>	Several insecticide drums and containers placed in the field. Several sprayers placed in tent. Staff member indicating he is not feeling well.	Check insecticide labels; drum quality; distance to habitations, Check maintenance of sprayers. First aid; interview and fill out poisoning form; check if first aid kit is present.
<b>Location 6 Farmer and shepherd (IF)</b>	Both to indicate that they have not been informed about treatments; phytotoxicity on crop; poisoning of goats.	Provide information. Take vegetation sample for residue analysis. Call up dedicated monitoring team.



The Commission for Controlling  
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