



**Natural
Resources
Institute**

Report on NRI/IPARC/FAO EMPRES

International Train the Trainers

Locust Survey and Control Course

22 January – 2 February 2000

Sultanate of Oman

Sponsored by DFID*, FAO and APLC*****

* Department for International Development, British Government

**Food and Agriculture Organization of the United Nations

*** Australian Plague Locust Commission

Introduction

This international training course was set up in 1997 in response to the need for safer and more efficient locust survey and control in many countries. A sustainable and cost-effective way to approach this is to train trainers who can then implement regional, national and local locust survey and control courses in their respective countries as well as informal on-the-job training of colleagues. The two previous courses were held at the International Pesticide Application Research Centre, Imperial College, UK, but the decision was taken this year to move the course to locust-affected countries. The move increases the likelihood of having live locusts for the field exercises and failing that, at least the chance to work in habitat typical for locusts of the host country. Course costs are also significantly reduced.

The course supports and dovetails with the current FAO EMPRES initiative to develop a coherent Desert Locust training programme and training resources. While EMPRES is constrained by its mandate to focus on the Desert Locust, the International Course provides the opportunity to broaden the participant base to include any country affected by any species of locust. This interaction with non-Desert Locust countries brings new ideas into the Desert Locust sphere (and vice versa) and aids the development and refinement of safe and efficient methods.

There is considerable beneficial synergy between the NRI-managed International Course and the much larger FAO locust training programmes (including the EMPRES training programme and other FAO regional and national courses). Support from FAO (amongst other sponsors) and participation by FAO staff as trainers have been critical to the success of the International Course. In turn, the International Course has provided the opportunity for FAO staff, in collaboration with NRI and other personnel, to develop better training materials, techniques and capabilities. It has also helped to highlight the importance of developing training skills so that value can be added to training investments in the form of training courses being organised and run subsequently by former trainees.

This beneficial synergy continues through the collaboration between EMPRES and NRI on the compilation of a core EMPRES training manual and other ancillary materials, from which other manuals at different levels can be derived. The British Government's Department for International Development (DFID) has approved funds for NRI staff involved with the International Course to assist with the drafting and editing of parts of this manual.

The training course

The course was held at the Ministry of Agriculture Rumus Training Centre some 60 km outside Muscat in the Sultanate of Oman. This provided comfortable accommodation and excellent modern training facilities with audio-visual equipment, while also allowing rapid access to open field sites in typical locust habitat for the survey and control practical exercises. The course was divided into three sections: survey, control and training skills (see Appendix 1 for course programme).

All participants were provided with course notes for all of the modules covered, including the training skills sections. These, and the other documents distributed provide source material for developing customised training materials for subsequent regional, national and local courses.

The course staff

- Hans Dobson, Natural Resources Institute (locust control specialist and course organiser)
- Munir Butrous, FAO EMPRES Programme, (locust control and safety specialist)
- Keith Cressman, FAO Rome (locust survey and forecasting specialist)
- Fuad Bahakim, FAO EMPRES Programme, (locust survey specialist)
- John Lowe, Centre for Rural Development and Training (training skills specialist)
- Peter Spurgin, Australian Plague Locust Commission, gave a presentation on control methods and in particular, the use of Metarhizium as a locust biopesticide in Australia
- Mamoon Al-Alawi, Head of the Desert Locust Unit, Muscat, was a participant and also in-country course manager.

The participants

These were staff involved with locust management from a total of 13 countries - see Appendix 2 for participant list and contact details.

The approach

The philosophy of the course recognized the depth and breadth of experience present within the group of participants and trainers and, through a participatory approach, aimed to promote the sharing of skills and experience to everyone's benefit.

To this end, the number of lectures were kept to a minimum while maximising the use of indoor and outdoor practical exercises and discussions sessions. All participants gave a half hour evening talk on locust issues in their country of origin and as part of the training skills sessions, also prepared and delivered a training session on a technical topic from the course programme.

Evaluation

Multiple choice tests were set at the beginning and the end of the course. The questions were identical in order to be able to judge whether technical understanding had improved during the course. The results before and after are shown in Appendix 3 and show an average improvement of 26% and 39% for control and survey sections respectively (or absolute improvements of 15 and 20 percentage points respectively). For the training skills sessions, the final afternoon was devoted to the participants training each other and their performance was judged to be satisfactory and some cases excellent by the training skills consultant John Lowe. The participants demonstrated their ability to set aims and objectives, to use audio-visual equipment effectively and to incorporate recently-learned techniques to encourage dialogue and understanding.

Assessment of the course

The response from the participants was very good with enthusiastic participation in classroom and field exercises. There was also a lot of sharing of ideas on different approaches to the problems of control of different species of locusts in different countries. A formal assessment of participants' views was made using an anonymous multiple choice form and the results and pooled comments are shown in Appendix 4.

Follow-up

The value of this course is multiplied many times if participants go on to organise training courses of their own. Plans are already in preparation for national courses in Sudan and Oman and in an attempt to track other training events which spring from this course (and in a small way, to encourage the process) a follow-up form was drawn up and distributed to all participants (see Appendix 5). At the end of the year 2000, they will be asked to return the forms with details of any training activities during the year.

Conclusions

The course provided technical training and updating on the procedures and techniques of survey and control, as well as building skills in effective training of others. The technical material was an essential grounding for more junior staff and senior staff who have been transferred recently into locust control, and a useful refresher for experienced staff. The training skills sessions were warmly received and will help participants to deliver effective training courses in their countries.

The sharing of skills and experiences from different countries, continents and locust species was one of the most valuable and rewarding aspects of the course. Some of the contacts made between participants are likely to continue and lead to productive linkages between individuals and institutions in the locust-affected world.

As in previous years, the course provided trainers with the opportunity to refine materials and try out new approaches for the effective communication of fundamental concepts and principles of survey and control. The training notes and visual aids have been further improved during the course (thanks to good office facilities with fast photocopier, computer and colour printer) and the process of developing 'Trainers Notes' has begun i.e. step by step instructions on how to convey the technical material together with advice on which visual aids and exercises to use at which time. These will be developed further and will, it is hoped, eventually form part of the FAO Desert Locust training manual. The ability of trainers at the International Course continues to improve each year as they become more and more familiar with the material and refine their training skills and field exercise techniques.

The feedback on the course has been encouraging and it is clear that it serves useful roles in improving participants' technical capability and training skills, as a forum for

exchange of ideas and experiences and as a test bed for new training materials and approaches. Some of the feedback is constructive criticism which will be an invaluable aid to the process of modifying and improving the course in the future. It is hoped that the next International Course will take place in late 2001 in another locust-affected country and that parts of the FAO training manual and ancillary equipment can be tested in final draft form there.

Acknowledgements

I am grateful to those organisations that sponsored participants - DFID, FAO and APLC – individuals within these organisations put great effort into organising the necessary support and into ensuring the successful attendance of their respective participants. Thanks are also due to FAO for incorporating the attendance of the three FAO trainers within their work programmes and budgets – I am grateful to these and the other trainers for all their hard work in preparing and conducting the sessions. Special thanks go to the Ministry of Agriculture for hosting the course so magnificently and to Mamoon Al-Alawi and his staff for their tireless efforts behind the scenes which made the course a pleasure and a great success.

Hans Dobson
10 February 2000

APPENDIX 1. Programme for International Train the Trainers Locust Survey and Control Course, Oman 22 January - 2 February 2000

Day/Date	Time	Module	Who	Activities
Sat 22/01	0930-1000	Opening ceremony and refreshments	MoAF	Formal opening
	1030-1300	Registration. Admin announcements. Introduction to course.	All	Registration, distribution of materials
	1400-1530	Participants experience of locust operations and the constraints to safe and effective locust management.	MB/All	Discussions.
	1600-1730	Continuation and Pre-course assessment.	MB/All	Discussions. Multiple choice paper
SURVEY SESSIONS				
Sun 23/01	0830-1030	Why make surveys and how to plan and make them, who, where, when	KC	Classroom presentation + discussions
	1100-1300	Continuation and Desert Locust assessment (survey) and search	KC	Classroom presentation + discussions
	1400-1530	Continuation and different survey methods: foot, vehicle, aerial; measuring foot pace	KC/FB	Classroom presentation + exercise
	1600-1730	Continuation	FB/KC	Classroom presentation + field demo Field exercise
Mon 24/01	0830-0900	What equipment to take on survey	FB/KC	Classroom presentation + discussions
	0900-1030	How to use a map	KC/FB	Classroom presentation + exercise
	1100-1300	How to record survey results and relation to forecasting	KC/FB	Classroom presentation + discussions
	1400-1530	How to use a compass and GPS	KC/All	Classroom presentation + field exercise
	1600-1730	Continuation		
Tues 25/01	0730-1300	Survey techniques in practice	FB/All	Field practical
	1400-1530	Presentation of information collected during the survey	KC/FB	Group presentations + discussion
	1600-1730	What to do with information from the surveys - transmission and data management	KC/FB	Discussions

CONTROL SESSIONS				
Wed 26/01	0830-1030	The control process - a logical procedure. Is control necessary? Decisions on when and how.	HD	Discussions
	1100-1300	Different targets and control technology options - pros, cons	HD	Swarm video and discussions
	1400-1530	Different conventional pesticides and formulations. Toxicities, pictograms etc	HD	Discussions and toxicity calculations
	1600-1730	Alternatives to conventional insecticides - IGRs, biopesticides in Australia	HD/PS	Discussions
Thurs 27/01	0830-1030	Swath width exercise (vehicle and hand-held) sampling spray.	MB	Field practical
	1100-1300	Counting drops, graphing deposition profiles, track spacing to use and work rate	MB/HD	Indoor exercises and discussions
	1400-1530	Droplet size and behaviour. VMD/NMD. Types of atomiser and the spectrum they produce	HD/MB	Discussions and indoor practical
	1600-1730	Continuation, and good and bad spraying conditions	HD	Discussions
Fri 28/01		Day off		
Sat 29/01	0830-1030	Sprayer calibration - what is it. Calibration calculations	MB/HD	Indoor exercises
	1100-1300	How to calibrate a sprayer and make settings	MB/HD	Field practical
	1400-1530	Principles and techniques of ULV spraying, demarcating and track guidance GPS technology for aerial and ground spraying	HD/MB	Discussions
	1600-1730	Monitoring operations and efficacy	MB	Indoor exercise + discussion
Sun 30/01	0830-1300	Mock spraying exercise - demarcating, spraying, monitoring	HD/MB	Field practical
	1400-1500	Analysis of the mock spraying exercise and data collected	MB	Discussions
	1600-1730	See next page		

TRAINING SKILLS SESSIONS				
	1600-1730	Learning cycle and adult learning process Participatory training methods	JL	Group exercise and discussion Demonstration and discussions
Mon 31/01	0830-1030	Target group profiles	JL	Exercise and discussion
	1100-1300	Training needs analysis	JL	Exercise and development task
	1400-1530	Training objectives and training session planning	JL	Exercise and development task
	1600-1730	Communications and learning aids	JL	Demonstration and discussion
Tues 01/02	0830-1030	Training module planning workshop	JL	Group work
	1100-1300	Training session planning workshop	JL	Group work
	1400-1530	Presentation of prepared modules (video-taped) and analysis	JL	Participant presentations and discussion
	1600-1730	Presentation of prepared modules (video-taped) and analysis	JL	Participant presentations and discussion
Wed 02/02	0830-1030	Pesticide safety and First Aid	MB	Discussions and demonstrations
	1100-1300	Course evaluation and Post course assessment	HD	Multiple choice papers
	1400-1530	Certificates and close		Formal closing

HD - Hans Dobson, Natural Resources Institute (NRI)

MB - Munir Butrous, Food and Agriculture Organization (FAO), EMPRES Programme

KC - Keith Cressman, Food and Agriculture Organization (FAO), Rome HQ

FB - Fuad Bahakim, Food and Agriculture Organization (FAO), EMPRES Programme

JL - John Lowe, Centre for Rural Development and Training (CRDT), Woverhampton University

PS - Peter Spurgin, Austalian Plague Locust Commission (APLC)

APPENDIX 2. Contact details for participants and Trainers at the NRI/IPARC/EMPRES International Train the Trainers Locust Control Course held in Muscat, Oman 22 January - 2 February 2000.

	Name	Address	Telephone/fax	Email
Participants				
1	Felege Elias	Senior Officer, Locusts and other Migratory Pests Plant Protection Department P.O.Box 62347, Addis Ababa ETHIOPIA	tel 00251 1 185675 fax 00251 1 614996	empreseth.fao@telecom.net.et
2	Zimam Sibhatu Welde Michael	Zonal Crop Protectoin Expert Ministry of Agriculture, Gash Barko Zone P.O.Box 19, Barentu ERITREA	tel 00291 1 181077 fax 00291 1 181415 or FAO fax 181690 or via 00291 1 185179	Via Elsa Tekle empres@gemel.com.er
3	Rabie Abdel Hameed Khalil	Head of Locust Section Plant Protection Directorate (HQ) P.O.Box 14, Khartoum North SUDAN	tel 0024911 339423 fax 0024911 339423 tel 337495 (direct)	empres@sudanmail.net
4	Abdu Farea Al-Romaih	Assistant Manager Desert Locust Centre Plant Protection Department HQ P.O.Box 26, Sana'a YEMEN	tel 009671 250980 fax 009671 228064	EMPR-FAO-YE@y.net.ye
5	Sidi Sanyang	Principal Research Officer National Agricultural Research Institute PMB 526, Serekunda THE GAMBIA	Tel: 00220 483162 or: 00220 484925 fax: 00220 484921	sidi.nari@qanet.gm
6	Léon Claude Raveloarison	Chief EMTLA Route Digue B.P. 676 Antananarivo, 101 MADAGASCAR	tel 00261 20 22 214 14 (365) 002612022 27730 fax 00261 2022 61877 00261 331104831 (mobile)	lcravelo@dts.mg or cafcnla@compro.mg
7	John Ngondi Katheru	Scientific Officer International Red Locust Control Organisation for Central and Southern Africa P.O.Box 240252, Ndola ZAMBIA	Tel 00260-1-614284 fax 00260 2 614285	locust@zamnet.zm
8	Peter Munyao Kimwelle	Provincial Crop Protection Officer	Fax 0025424468/442797 and	vek@net2000ke.com

	Name	Address	Telephone/fax	Email
		Rift Valley Province Ministry of Agriculture P.O.Box 530, Nakuru KENYA	00254037213118	
9	Abbas Ali Hirbod	Manager of General Pest Division Plant Protection Organisation Tehran IRAN	Tehran 009821 2403198 or 2402712 or 8080983	c/o FAO-IRN@Field.fao.org
10	Ram Mohan Shukla	Deputy Director (Locust Control) Directorate of Plant Protection, Quarantine and Storage, Ministry of Agriculture N.H.- 4, Faridabad (Haryana) INDIA	Tel 0091 129 412149 fax 0091 11 3384182 fax 0091 129 4122125	FAO-IND@field.fao.org
11	Trevor Humphery	Assistant Operations Manager APLC, Department of Agriculture, Fisheries and Forestry, GPO 858 Canberra ACT 2601 AUSTRALIA	Tel: 006126 272 5070 or 272 5076 fax 272 5074	trevor.humphery@affa.gov.au
12	Peter Spurgin	Application/Control Officer APLC, Department of Agriculture, Fisheries and Forestry , GPO 858 Canberra ACT 2601 AUSTRALIA	00612 6 272 5076 fax 272 5074	peter.spurgin@affa.gov.au
13	Ahmed Ould El Hadj	National Expert, Locust Control GCP/INT/651/NOR BP 665, Nouakchott MAURITANIA	tel 00 222 258342 fax at FAO 00 222 253467	faonorim@toptechnology.mr
14	Mamoon Khamis Al-Alawi	Ministry of Agriculture and Fisheries (LCU) P.O. Box 467 Post Code 113, Muscat SULTANATE OF OMAN	Tel 00968 540 648; 00698 696 300 fax: 00968 540 720; 00968 695 909	dlumaf@omantel.net.om
15	Abdul Aziz Mansoor Al-Shanfari	Ministry of Agriculture and Fisheries P.O. Box 1501/211 Salahah SULTANATE OF OMAN	Tel: 00968 9492264 Fax: 294141	
16	Hamed Ahmed Al-Shehi	Ministry of Agriculture and Fisheries (LCU) P.O. Box 467 Post Code 113, Muscat	Tel 00968 540 648 Fax 00968 540720	

	Name	Address	Telephone/fax	Email
		SULTANATE OF OMAN		
17	Khalfan Salim Al-Maqbali	Ministry of Agriculture and Fisheries (LCU) P.O. Box 467 Post Code 113, Muscat SULTANATE OF OMAN	Tel 00968 840348 Fax 00968 540720 or 00968 695909	
18	Abdullah Salim Al-Darmaki	Ministry of Agriculture and Fisheries (LCU) P.O. Box 467 Post Code 113, Muscat SULTANATE OF OMAN	Tel 00968 540 648 Fax 00968 540720	dlumaf@omantel.net.om
19	Nasser Saif Aziz Al-Marthy	Ministry of Agriculture and Fisheries (LCU) P.O. Box 467 Post Code 113, Muscat SULTANATE OF OMAN	Tel 00968 540 648 Fax 00968 540720	dlumaf@omantel.net.om

	Name	Address	Telephone/fax	Email
Trainers				
1	Hans Dobson	Migratory Pest and Crop Protection Specialist Natural Resources Institute IPARC, Imperial College at Silwood Park Ascot, Berkshire, SL5 7PY UNITED KINGDOM	Tel 0044 (0) 1344 294383 Fax 0044 (0) 1344 294450	Hans@Dobsons.demon.co.uk or H.M.Dobson@gre.ac.uk
2	Munir Gabra Butrous	National Professional Officer (NPO-C) C/o FAO Office EMPRES Programme PO Box 1117 Khartoum or Plant Protection Directorate - P.O.Box 14 Khartoum SUDAN	Tel/fax 0024911 335380 mobile 00249 (0)12309969	empres@sudanmail.net
3	Keith Cressman	Forecasting Officer Locust Group, AGP FAO, Via delle Terme di Caracalla 00100 Rome ITALY	Tel 003906 57052420 Fax 003906 57055271	Keith.Cressman@FAO.ORG
4	Fuad Bahakim	National Professional Officer (NPO-S) EMPRES Programme FAO-Office, P.O.Box 1867 Sana'a, YEMEN	Tel/fax 009671 250980 or 250956 (PPD) or 228036 (PPD)	EMPR-FAO-YE@y.net.ye
5	John Lowe	Centre for Rural Development and Training (CRDT) University of Woverhampton Gorway Rd Walsall West Midlands, WS1 3BD UNITED KINGDOM	Tel 0044 (0)1902 323219 fax 0044 (0) 1902 323212	in4318@wlv.ac.uk and crdt@wlv.ac.uk

APPENDIX 3. Multiple choice test results at beginning and end of course

Participant number	Control			Survey		
	Before	After	% Improve	Before	After	% Improve
1	17	18	6	13	18	38
2	12	17	42	12	12	0
3	18	20	11	14	15	7
4	9	15	67	15	18	20
5	16	19.5	22	16	15.5	-3
6	12	15	25	10	14.5	45
7	17	18.5	9	16	18	13
8	14	20	43	11	18.5	68
9	7	12	71	4	9	125
10	16	19	19	10	17.5	75
11	19	20	5	14	18	29
12	20	19	-5	17	19	12
13	14	17	21	8	14.5	81
14	14	16	14	15	18.5	23
15	16	15	-6	15	18	20
16	10	15	50	14	18.5	32
17	10	15	50	10	15	50
18	16	17	6	14	19.5	39
19	12	18	50	12	19.5	63
Average scores	14.2	17.2		12.6	16.7	
% improvement*			26			39
Average percentage	71	86		63	83	
% improvement**			15			20

*Expressed as % of pre-course result

** Expressed as absolute increase in percentage points

APPENDIX 4. Results of anonymous participant assessment of course

Please indicate your satisfaction with the following by marking the appropriate box: (frequency of responses are marked in the boxes)

PRACTICALITIES	Poor		Acceptable		Good
Accommodation			4	1	13
Food and drink				2	17
Training facilities				1	17
Course organisation			2		16
Social/leisure activities	1	1	2		12
DURATION	Too Short		Acceptable		Too Long
Length of the course	1		12	5	1
Daily schedule			6	7	6
INSTRUCTORS	Poor		Acceptable		Good
Knowledgeable				2	17
Ability to present material			2	2	15
Helpfulness			1	2	16
TECHNICAL CONTENT	Too Easy		Acceptable		Too Difficult
Locust control modules	6		11	2	
Survey modules	8	1	9	1	1
Training skills modules	5	1	11	2	
Classroom presentations	3	3	8	2	2
Field exercises	5	2	8	4	
Course notes	4	1	11	2	
Test at the beginning/end	3	4	9	2	1
USEFULNESS	Not at all		Partly		Extremely
How confident are you that you can apply the skills that you learned and the knowledge that you obtained when you return to your work?			1	7	9

Please write any suggestions for future improvements below: (See next page for comments)

APPENDIX 4 continued. Pooled comments from the participant evaluation forms:

- Training skills sessions should be longer (4 participants made this point)
- This type of course needs to be run regularly in the different locust regions
- Excellent, but participants would have like to see some of the agricultural activity in Oman which they have to protect against locusts
- All lectures and practical exercises are very good - continue
- Trainers notes are required to help participants carry out their own training
- Calibration of pace length should be done 3 days after arrival when participants have recovered from travel stress
- Medical costs should be covered by training course funds
- Excellent course, well organized and professionally run
- Informal atmosphere of the course is an ideal environment for learning and interaction between participants
- Too much focus on numerical details rather than process and principles
- Energy levels got low at times – need warm-up activities
- Group dynamics could have been established earlier by use of some specific facilitation techniques
- Aims of the assessments (tests) should be clearly explained and should include training skills issues as well as technical issues of survey and control
- Participant presentations were useful but holding them in the evenings made the days too long (3 participants made this point)
- Some confusion between ULV and EC spraying techniques
- Each participant should have been asked at the start of the course exactly what they expected to achieve
- Pre-requisites for attendance should be a good existing knowledge of the technical material and a specific training role in participants' respective organizations
- Classroom sessions needed to be broken up a little more with more activities to prevent loss of concentration
- Discussions are very important at this sort of event and sometimes had to be cut short due to lack of time

APPENDIX 5. Training follow-up form

Dear Participant

Following your attendance at the International Train the Trainers Locust Survey and Control Course in Muscat, Oman (Jan 22 - 2 Feb 2000) we are interested in whether the knowledge and skills you have gained from trainers and other participants will be passed in some way to other staff involved in locust management. It would be very helpful if you would agree to take this form with you and fill in details of any training which you carry out during the year ahead. If you are in agreement with this, I will contact you in 10 months time (December 2000) to seek the following feedback:

Have you carried out any sort of locust survey and control training during the period February - December 2000? If the answer is yes, please answer the following questions	
What sort of training (formal courses, hands-on instruction or informal passing of information to colleagues)	
If you have held formal courses, how many courses, when and where?	
Who was trained (e.g, locust officer, technicians, other plant protection staff, drivers, scouts, nomads, labourers, farmers) and how many?	
Did you use any of the information or printed materials provided at the Muscat course? If so, which parts?	
Are you planning any locust training courses in the next 12 months and if so please give details?	

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