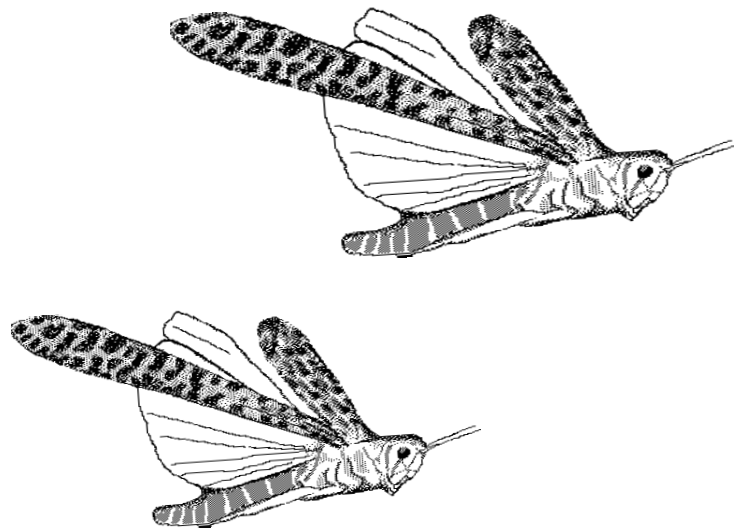


Desert Locust Joint Survey in the Spring Breeding Areas of the I.R. Iran and Pakistan

April 2003



FOOD AND AGRICULTURE ORGANIZATION
OF THE UNITED NATIONS

Rome, 2003



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**Desert Locust Joint Survey
in the Spring Breeding Areas
of Pakistan and the I.R. Iran**

April 2003

By

M. Azam Khan
M. Chalakizebardast
G.R. Kazemi Siahooei
S.M.H. Naqvi

**FOOD AND AGRICULTURE ORGANIZATION
OF THE UNITED NATIONS**

May 2003

Contents

Acknowledgements.....	2
Summary and Recommendations.....	3
Introduction	4
Methodology.....	4
Results and Discussions.....	5
(a) Northern Baluchistan	5
(b) Central Baluchistan.....	5
(c) Southern Baluchistan.....	5
Recommendations	6
Appendix 1. List of participants.....	8
Appendix 2. Itinerary.....	9
Appendix 3. Rainfall data.....	10
Appendix 4. Map of areas surveyed.....	12
Appendix 5. Completed <i>FAO Desert Locust Survey & Control Forms</i>	13
Appendix 6. Pictures.....	36
Appendix 7. Joint Survey itinerary for next year	45

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Summary and Recommendations

The 2003 Desert Locust Joint Survey was the ninth survey of the spring breeding areas of Pakistan and I.R. Iran. The survey was carried out for a period of 30 days from 1-30 April 2003. The joint survey team was comprised of two locust experts from each country. An additional locust expert from Pakistan and FAO joined part of the survey.

Keeping in mind that hot weather first arrives in Baluchistan, Pakistan, the first half of the survey was carried out there while the second half was in I.R. Iran. No solitary or gregarious locusts were seen on either side of the border in the surveyed areas. In general, rainfall on both sides was low this year, especially in I.R. Iran. The vegetation in the area was dry or drying and the conditions were not favourable for locust breeding except in the northern part of Baluchistan, Pakistan where good rains fell during the last week of March 2003 from Nushki to Nokkundi. Here, conditions were becoming favourable for locust breeding. Nevertheless, no significant developments are expected in the coming months.

The team has several recommendations to improve the organisation, implementation and usefulness of future joint surveys.

1. The practice to start the survey in Pakistan is good and should be continued in the future.
2. Although locating SPOT-VGT coordinates is a good exercise, these should be minimised because a lot of time was spent trying to reach the locations, leaving insufficient time for checking the main locust habitats and breeding areas.
3. For the first time, the team used eLocust and RealMaps programs on the Psion handheld computer for recording data and a digital camera for taking photographs of any interesting locust habitats. This proved to be useful and helped to report on time. The eLocust file containing the survey results was sent by email to FAO DLIS, DPP Karachi and PPO Tehran. It is recommended that proper training in the above subjects should be arranged by FAO for the joint survey participants. In this way, these new technologies will be promoted further and utilised in the best possible manner.
4. Good communication is extremely important during the joint survey because very remote places are visited. In case of emergency, there are no means to communication with the nearest locust or agricultural office nor with the Locust Unit Headquarters. Given the difficulties in establishing a HF radio system in I.R. Iran and the limitations of the radio schedule in Pakistan, It is recommended that one satellite phone be provided to each country. Moreover, for the internal communications of the team travelling in different vehicles, two walkie-talkie sets should be provided to each country to be used in case of route problems or any deviation. Funds from the FAO Southwest Asia Commission could be used for purchasing this equipment.
5. In each country, a one day meeting of the participants including the drivers, maintenance assistants and also the district locust officers along the itinerary should be arranged by the governments at least two weeks before the start of the survey so that necessary coordination, briefing and advanced preparation can be made.
6. The joint survey is undertaken in the remote, off-road and rugged areas in both countries. It also has a very long and exhausting schedule. Therefore, it is recommended that one day of rest in each country should be included in the itinerary.
7. One day in Zahedan was found to be insufficient for preparing a good final survey report. In future surveys, up to two days should be fixed for this activity.
8. Only 30 days are fixed for the joint survey and no time is allotted for travelling to the meeting points on the Iran/Pakistan border at Mirjavah and Taftan. It is recommended that two additional days should be included for travelling to and from the meeting point.
9. DSA for the current survey has sharply decreased to a minimum range for the team leader (from USD 80 to 50), locust officer (from USD 70 to 45), maintenance assistant and drivers (from USD 50 to 35). This is not fair. The dollar exchange rate has come down and the prices are going up, but instead of increasing the DSA it has decreased. It is requested that the DSA be paid to all participants at the previous rates.
10. Complete sets of maps covering the joint survey area in Pakistan and I.R. Iran should be provided to the teams of each country by FAO.

Desert Locust Joint Survey in the Spring Breeding Areas of Pakistan and the I.R. Iran

April 2003

Introduction

Joint surveys in the Desert Locust spring breeding areas in Baluchistan, I.R. Iran and Pakistan were regularly undertaken in 1960s and 1970s, but afterwards they stopped. After a gap of 20 years and because of the recommendations of the 19th session of the Commission for the Controlling the Desert Locust in the Southwest Asia in 1994, the FAO organised a joint survey in the spring breeding areas of Pakistan and I.R. Iran in 1995 and thereafter on an annual basis. The main objective of the joint survey is to check the potential Desert Locust spring breeding areas in Pakistan and I.R. Iran. The results are used for planning locust survey and control operations in the breeding areas along the Indo-Pakistan border during the following summer. The present survey in 2003 was the ninth in the series of annual joint surveys.

The joint survey team comprised of two locust experts from each country (Appendix 1). Bashir Muhammed, Assistant Entomologist from Karachi, participated during the first fortnight in Pakistan, provided additional coordination, and helped the team. Keith Cressman, FAO Locust Forecasting Officer, DLIS Rome, joined the team on 26 April at Kahnoj, I.R. Iran. The total period to cover all the areas in both the countries was 30 days, equally divided between the two countries. The survey commenced on 1 April in Pakistan and concluded on 30 April 2003 in I.R. Iran (Appendix 2). This year the scheduled was organised so that the survey started in Pakistan rather than I.R. Iran. As mentioned in the recommendations of the final reports of previous joint surveys, this is because the weather becomes hotter in Pakistan earlier than in I.R. Iran. A distance of about 10,000 km was travelled in Pakistan and I.R. Iran during this year's survey.

Methodology

The team followed the techniques recommended in the *FAO Desert Locust Guidelines* for surveying. The basis of habitat and locust assessment was observations made at each survey stop. A total of 134 stops were made in traditional breeding areas known to local locust officers and in places where recent SPOT-VGT satellite imagery suggested that might be green. Foot transects of 400-500 meters were done at most stops to look for locusts and estimate their density, behaviour and maturity.

The team took advantage of available and appropriate technology to assist them during the survey. FAO DLIS made available recent SPOT-VGT satellite imagery on its server in Rome. This was downloaded by the Locust Information Officers in Tehran and Karachi who determined the coordinates of places that may be green in the joint survey area. These coordinates were given to the survey team to check. The team located most of these places through the GOTO system on the GPS. This was a new practice for the participants and a very interesting exercise.

For the first time, eLocust was used for recording survey observations. Each team leader had a handheld computer (Psion 5mx) provided by the Commission. The Psion was connected to a GPS and both were connected to the vehicle's cigarette lighter for power using a special cable provided by FAO. At times, alkaline batteries were used instead. The GPS determined the coordinates of each stop and these were automatically transferred and entered into eLocust on the Psion. Other habitat and locust observations were entered directly in the Psion using the touch screen. The current position as well as previous positions could be displayed on maps in the RealMaps program on the Psion. The same information was also entered on the *FAO Locust Survey & Control Form*. The Locust Unit Head in Tehran gave intensive eLocust training to the Iranian team leader who in turn instructed his Pakistani counterpart. The team felt that eLocust was very useful and easy once they got used to it.

Temperature and relative humidity were recorded at each stop until Mr. Cressman arrived. He indicated that this data was not particularly useful or important and the team did not need to spend extra time collecting it. Photographs of any interesting locust habitats were also taken using a digital camera provided by the Commission as well as a conventional one. Information

was also gathered from shepherds and other local people. Almost every evening, the team sat down together, discussed the survey activities, observations and achievements of the day, and reviewed the route and area of the next day's survey as per the established itinerary.

After the team crossed from Pakistan to I.R. Iran on 16 April, the results of the survey in Pakistan, the eLocust file, was downloaded from the Psion to a computer at the Agriculture Office in Zahedan and emailed to DLIS Rome, DPP Karachi and PPO Tehran on the same day. Similarly, the data for the second half of the survey, that is, the results of the survey in I.R. Iran, were emailed on 30 April. The Iranian Team Leader took the responsibility to do this both times.

The last day of the survey was spent in Zahedan where the team leaders drafted the final survey report and tabulated the rainfall data on the Psion with the assistance of Mr. Cressman. Photos taken with a digital camera were downloaded to the computer at the Agriculture Office in Zahedan and burned onto a CD for the Pakistani participants, the Iranian team leader and FAO DLIS. The better pictures are found in Appendix 6.

Results and Discussions

For the sake of this report, Baluchistan in both Pakistan and I.R. Iran can be divided geographically into three parts: northern, central, and southern. Rainfall data, survey map and survey results (completed *FAO Desert Locust Survey & Control Forms* converted from eLocust) are presented in Appendices 3, 4 and 5 respectively. Photos are presented in Appendix 6.

(a) Northern Baluchistan

The northern part of Baluchistan is the area north of the Taftan Mountains in Iran and the Ras Koh Mountains in Pakistan. High elevation sandy and rocky plains from Zahedan, I.R. Iran to Nushki, Pakistan are found on the northern side of these mountains. The vegetation between Taftan and Nushki was greening and in some places green while in others, it was dry. Good rainfall was received in the area in February and March. Rain-fed and tube well irrigated fields of wheat, cumin and onion were seen in few places between Dalbandin and Nushki. On I.R. Iran side, several fields of wheat were present near Mirjavah.

No significant locust infestation had been reported from the area this year nor were there any signs of locusts seen during the survey. Due to the good rainfall received in northeastern Baluchistan, there is a slight risk that mature adults, if there are any present, could concentrate and breed in the irrigated cropping areas between Dalbandin and Nushki.

(b) Central Baluchistan

The central part of Baluchistan extends from south of the Taftan and Ras Koh Mountains to the Kech Band Mountains north of Turbat. In Pakistan, this region consists of the Great Sandy Desert west of Kharan, the Kharan Valley and the Rakhshan Valley of Panjgur that extends west to the Saravan, Suran and Zaboli valleys in I.R. Iran ending west of Jaz Murian at Kahnoj. Due to irregular low rainfall in the region during February and March, the vegetation in the different areas varied, i.e. greening, green, drying and dry. The soil was wet in many places in Pakistan due to low rainfall as recently as 28 March. In I.R. Iran, it was dry because of poor rainfall.

No locusts were seen in central Baluchistan in both countries during the survey. Due to the low rainfall that has fallen this year in the area, the current dry hot weather and the likelihood that additional rain will not fall, vegetation will dry out further and conditions will continue to be unfavourable for locust breeding in the coming months.

(c) Southern Baluchistan

The southern part of Baluchistan consists of the coastal plains that extend from Jask, I.R. Iran to the Kulanch Valley and Pasni, Pakistan. It includes the subcoastal areas of Dasht and Kech Valleys in Turbat, Pakistan. This region is famous for Desert Locust breeding and contains some of the best habitats between Pasni, Turbat and Chabahar, I.R. Iran.

Heavy rainfall occurred in January 2003 in Pakistan and in I.R. Iran near Chabahar and light rains fell further west along the coast near Jask. Consequently, vegetation in the region was green in many places but soil moisture was dry except in a few limited places.

No locusts were seen in the region. As additional rainfall is unlikely to occur, the present vegetation will dry up and the possibility of locust activity will decline further in both countries.

In all three parts of Baluchistan, the team spent a considerable amount of time trying to reach SPOT-VGT coordinate locations of possible green vegetation. In nearly all cases, these places were found to be farms of irrigated crops or palm groves and are not suitable Desert Locust habitats. Some of these were even villages. The rare locations where natural vegetation was green did not appear on the SPOT-VGT satellite imagery.

Recommendations

The team has several recommendations to improve the organisation, implementation and usefulness of future joint surveys.

1. The practice to start the survey in Pakistan is good and should be continued in the future.
2. Although locating SPOT-VGT coordinates is a good exercise, these should be minimised because a lot of time was spent trying to reach the locations, leaving insufficient time for checking the main locust habitats and breeding areas.
3. For the first time, the team used eLocust and RealMaps programs on the Psion handheld computer for recording data and a digital camera for taking photographs of any interesting locust habitats. This proved to be useful and helped to report on time. The eLocust file containing the survey results was sent by email to FAO DLIS, DPP Karachi and PPO Tehran. It is recommended that proper training in the above subjects should be arranged by FAO for the joint survey participants. In this way, these new technologies will be promoted further and utilised in the best possible manner.
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6. The joint survey is undertaken in the remote, off-road and rugged areas in both countries. It also has a very long and exhausting schedule. Therefore, it is recommended that one day of rest in each country should be included in the itinerary (Appendix 7).
7. One day in Zahedan was found to be insufficient for preparing a good final survey report. In future surveys, up to two days should be fixed for this activity.
8. Only 30 days are fixed for the joint survey and no time is allotted for travelling to the meeting points on the Iran/Pakistan border at Mirjavah and Taftan. It is recommended that two additional days should be included for travelling to and from the meeting point.
9. Based on a proposal to FAO from Pakistan, DSA for this year's survey sharply decreased to a minimum range for the team leader (from USD 80 to 50), locust officer (from USD 70 to 45), maintenance assistant and drivers (from USD 50 to 35). The participants felt that this is not fair. The dollar exchange rate has come down and the prices are going up, but instead of increasing the DSA it has decreased. It is requested that the DSA be paid to all participants at the previous rates.
10. Complete sets of maps covering the joint survey area in Pakistan and I.R. Iran should be provided to the teams of each country by FAO.

Appendices

Appendix 1. List of participants

Pakistan

Azam Khan	Entomologist/Dep. Director	Quetta	Team Leader
Mr. S.M.H. Naqvi	Assistant Entomologist	Nushki	Locust Officer
Mr. Sharaf Din	N.Q.	Sukkur	Maintenance Asst.
Bashir Muhammad	Assistant Entomologist	Karachi	Coordinator (1)
Moula Bux	Driver	Lahore	
Ghulam Mustafa	Driver	Quetta	
Mohammad Yousuf	Driver	Sukkur	
Umer Khatab	Driver	Islamabad	

I.R. Iran

Mahmoud Chalakizebardast	Head of Rodent Group	Tehran	Team Leader (2)
G.R. Kazemi Siahooei	Plant Protection Expert	Bandar Abbas	Locust Officer
Seyed Ahmad Eravani	Maintenance Assistant	Tehran	Maintenance Asst.
Seyed Reza Rezai	Driver	Sistan-Baluch.	
Mohammad Ali Jar	Driver	Sistan-Baluch.	
Sherafat Amiri	Driver	Jiroft	
Farshid Zeinali Ghal'eh	Driver	Tehran	

FAO

Keith Cressman	Locust Forecasting Officer	Rome	Advisor (3)
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(1) in Pakistan only

(2) m_chalaki@hotmail.com

(3) from 26 April onwards

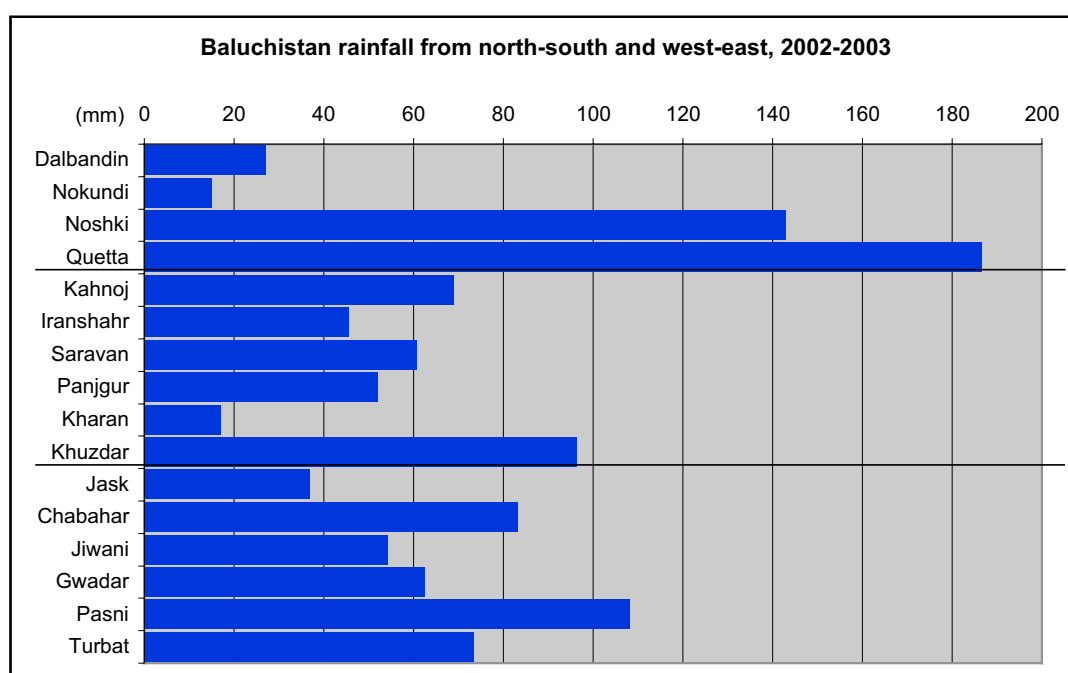
Appendix 2. Itinerary

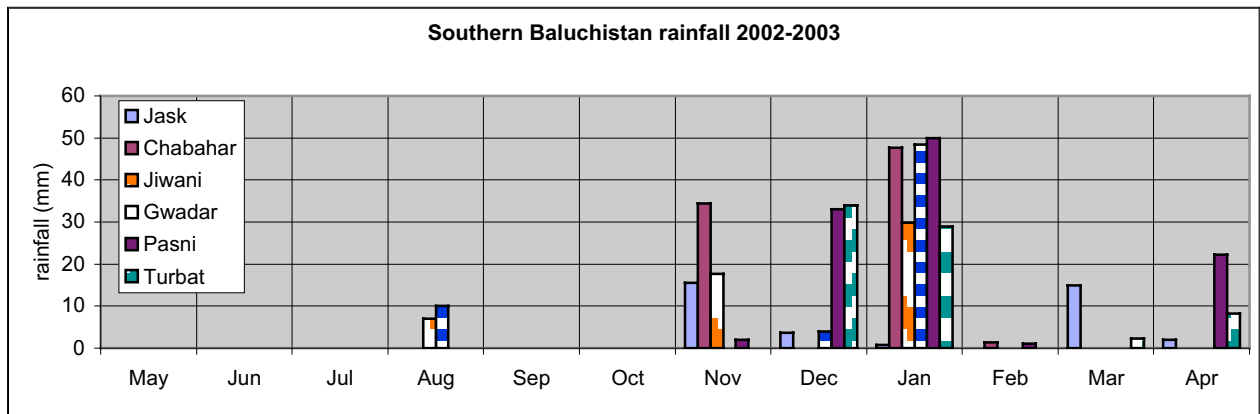
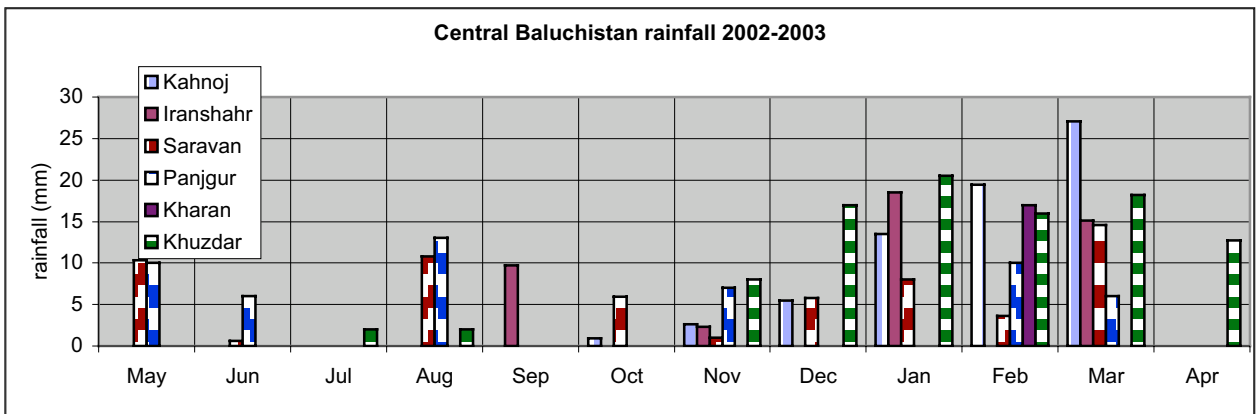
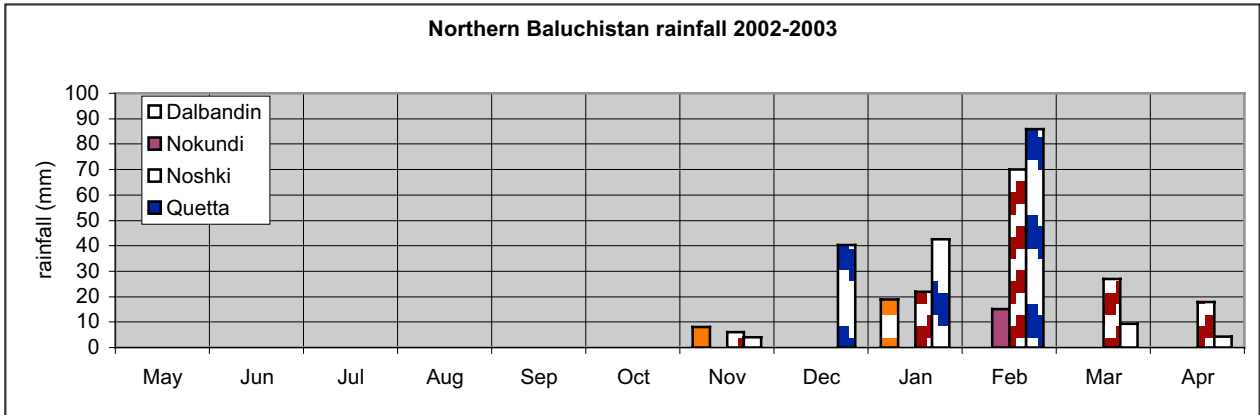
Date	Route & Area to survey	Overnight
1 Apr	I.R.Iran team cross border at Mirjaveh/Taftan*; Taftan - Nokkundi - Dalbandin	Dalbandin
2 Apr	Dalbandin - Chagai Hills - Padag - Nushki	Nushki
3 Apr	Nushki - Kharan; Kharan area	Kharan
4 Apr	Kharan area	Kharan
5 Apr	Kharan - Washuk - Nag - Panjgur	Panjgur
6 Apr	Panjgur and Prom areas	Panjgur
7 Apr	Panjgur - Hoshab - Turbat	Turbat
8 Apr	Turbat - Mand - Turbat	Turbat
9 Apr	Turbat - Pidararak - Pasni	Pasni
10 Apr	Pasni - Kulanch - Gwadar	Gwadar
11 Apr	Gwadar - Jiwani - Gwadar	Gwadar
12 Apr	Gwadar - Sunsar- Shooli - Turbat	Turbat
13 Apr	Turbat - Khuzdar	Khuzdar
14 Apr	Khuzdar - Quetta	Quetta
15 Apr	Quetta - Taftan	Taftan
16 Apr	Teams cross border at Taftan/Mirjaveh* Mirjaveh - Zahedan Send results of 1st Half of survey to DLIS	Zahedan
17 Apr	Zahedan - Khash - Gasht - Saravan	Saravan
18 Apr	Saravan - Suran - Saravan; Saravan - Esfandak - Saravan	Saravan
19 Apr	Saravan - Zaboli - Iranshahr - Bampur	Bampur
20 Apr	Bampur - Espakeh - Nikshahr - Chabahar	Chabahar
21 Apr	Chabahar - Beris - Sham - Gwater - Chabahar	Chabahar
22 Apr	Chabahar - Vashnum - Dashtiari - Negur - Chabahar	Chabahar
23 Apr	Chabahar - Zarabad - Jask	Jask
24 Apr	Jask area; Jask - Minab - Khanoj	Kahnoj
25 Apr	Kahnoj - Sowlon - Jaz Murrian - Zei Khalat - Kahnoj	Kahnoj
26 Apr	Kahnoj - Bahadorabad - Sahabad - Kahnoj	Kahnoj
27 Apr	Kahnoj - Dalgan - Iranshahr	Iranshahr
28 Apr	Iranshahr - Sardegal - Iranshahr	Iranshahr
29 Apr	South of Iranshahr; Iranshahr - Zahedan	Zahedan
30 Apr	Rest day	Zahedan
1 May	Finish and send final report to DLIS	Zahedan
2 May	Pakistan team cross border at Mirjaveh/Taftan*	

* 10 AM (Pakistan time) = 9:30 AM (Iran time)

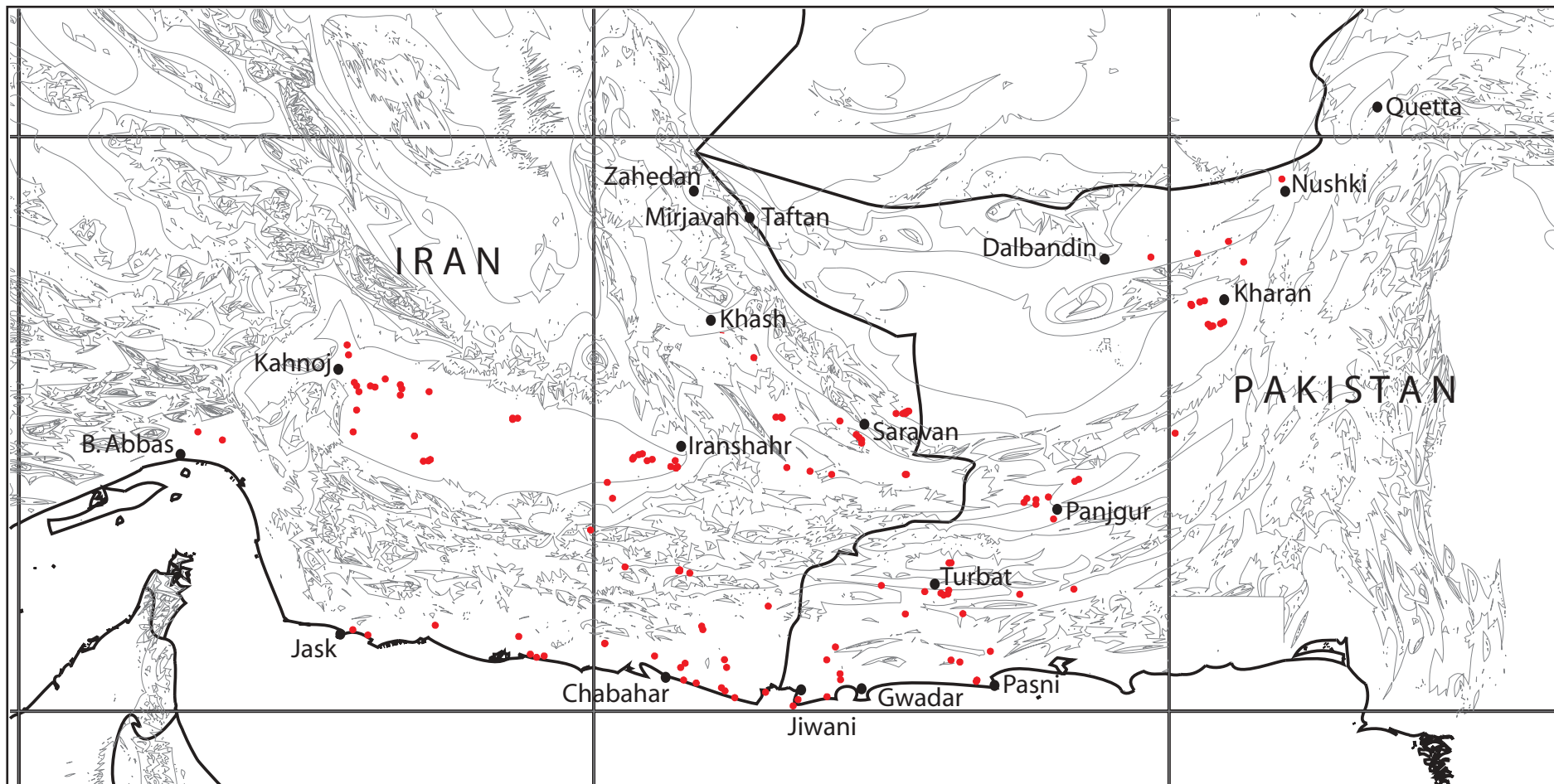
Appendix 3. Rainfall data

Station	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total
Northern Baluchistan													
Dalbandin	0	0	0	0	0	0	8	0	19	0	0	0	27
Nokundi	0	0	0	0	0	0	0	0	0	15	0	0	15
Noshki	0	0	0	0	0	0	6	0	22	70	27	18	143
Quetta	0	0	0	0	0	0	4	40.3	42.5	86	9.4	4.3	186.5
Central Baluchistan													
Kahnoj	0	0	0	0	0	0.9	2.6	5.5	13.5	19.4	27.1	0	69
Iranshahr	0	0	0	0	9.7	0	2.3	0	18.5	0	15.1	0	45.6
Saravan	10.3	0.6	0	10.8	0	5.9	1	5.8	8	3.6	14.6	0	60.6
Panjgur	10	6	0	13	0	0	7	0	0	10	6	0	52
Kharan	0	0	0	0	0	0	0	0	0	17	0	0	17
Khuzdar	0	0	2	2	0	0	8	17	20.5	16	18.2	12.7	96.4
Southern Baluchistan													
Jask	0	0	0	0	0	0	15.6	3.7	0.7	0	14.9	2	36.9
Chabahar	0	0	0	0	0	0	34.4	0	47.6	1.3	0	0	83.3
Jiwani	0	0	0	7	0	0	17.6	0	29.8	0	0	0	54.4
Gwadar	0	0	0	10	0	0	0	4	48.5	0	0	0	62.5
Pasni	0	0	0	0	0	0	2	33	50	1	0	22.2	108.2
Turbat	0	0	0	0	0	0	0	34	29	0	2.3	8.2	73.5





Appendix 4. Map of surveyed areas



● survey stops

Appendix 5. Completed *FAO Desert Locust Survey & Control Forms*

During this year's joint survey, field data and observations were entered directly into eLocust by the Team Leaders while, at the same time, the Locust Officers of each team completed the *FAO Desert Locust Survey & Control Forms*.

The completed forms on the following pages were derived by converting the eLocust export file to the MS Excel version of the *FAO Desert Locust Survey & Control Forms*. This was done by K. Cressman in Rome after returning from the joint survey.

1 SURVEY STOP							
1-1	date	11/04/03 16:37	12/04/03 10:37	12/04/03 11:46	12/04/03 13:40	12/04/03 18:11	13/04/03 09:38
1-2	name	Jiwani	Garok	Saijii	Shooli	Sulika	Lajaban
1-3	latitude (N)	25°2'46"N	25°19'31"N	25°26'48"N	25°33'31"N	25°50'45"N	26°1'1"N
1-4	longitude (E or W)	61°44'5"E	62°8'33"E	62°1'37"E	62°6'9"E	62°42'36"E	63°42'18"E
2 ECOLOGY							
2-1	area (ha) of survey	250	400	200	400	500	100
2-2	habitat (wadi, plains, dunes, crops)	Dunes	Dunes	Plains	Dunes	Plains	Crops
2-3	date of last rain	18/01/03	18/01/03	18/01/03	28/03/03	28/03/03	28/02/03
2-4	rain amount (mm, Low Moderate High. ?)	Low	Low	Low	Low	Low	Low
2-5	vegetation (dry, greening, green, drying)	Green	Dry	Green	Dry	Green	Green
2-6	vegetation density (Low Medium Dense)	Low	Low	Low	Low	Low	Dense
2-7	soil moisture (wet/dry)	Dry	Dry	Dry	Dry	Dry	Wet
3 LOCUSTS							
3-1	present or absent	Absent	Absent	Absent	Absent	Absent	Absent
3-2	area infested (ha)						
4 HOPPERS							
4-1	hopper stages (H123456F)						
4-2	appearance (solitary, transiens, gregarious)						
4-3	behaviour (isolated, scattered, groups)						
4-4	hopper density (/site, /m2, Low Med High)						
5 BANDS							
5-1	band stage (H12345F)						
5-2	band density (/m2 or Low Medium High)						
5-3	band sizes (m2 or ha)						
5-4	number of bands						
6 ADULTS							
6-1	maturity (immature, mature)						
6-2	appearance (solitary, transiens, gregarious)						
6-3	behaviour (isolated, scattered, groups)						
6-4	adult density (/transect, /ha, L M H)						
6-5	breeding (copulating, laying)						
7 SWARMS							
7-1	maturity (immature, mature)						
7-2	swarm density (/m2 or Low Medium High)						
7-3	swarm size (km2 or ha)						
7-4	number of swarms						
7-5	breeding (copulating, laying)						
7-6	flying (direction, time passing)						
7-7	flying height (Low Medium High)						
8 CONTROL							
8-1	pesticide name & formulation						
8-2	application rate (l/ha or kg/ha)						
8-3	quantity (l)						
8-4	area treated (ha)						
8-5	ground or air						
8-6	estimated % kill						
9 COMMENTS							
		T=31c-R.H: 47%	T=32c-R.H: 53%	T=33c-R.H: 43%	T=33c-R.H:40%	T=34c-R.H: 32%	T=29c-R.H: 51%

loc 99/03

Was a GPS used to determine locations? yes

Is a brief interpretation or analysis of the results included? no

Country: Pakistan

Locust Officer: Joint Survey Team

date: 17-Apr-03

cleared by: Cressman

date: 17-Apr-03

1 SURVEY STOP							
1-1	date	04/04/03 11:26	04/04/03 12:20	04/04/03 13:04	05/04/03 15:27	05/04/03 18:28	05/04/03 19:16
1-2	name	Keton 1st	Keton 2st	Rahchil	Loope	Zendedad	Srikoran
1-3	latitude (N)	28°21'6"N	28°20'42"N	28°21'56"N	27°25'7"N	27°1'0"N	27°0'0"N
1-4	longitude (E or W)	65°23'59"E	65°21'49"E	65°20'35"E	65°3'23"E	64°13'59"E	64°11'0"E
2 ECOLOGY							
2-1	area (ha) of survey	900	700	250	100	100	150
2-2	habitat (wadi, plains, dunes, crops)	Dunes	Dunes	Plains	Plains	Wadi	Hills
2-3	date of last rain	28/03/03	28/03/03	28/03/03	17/02/03	28/03/03	28/03/03
2-4	rain amount (mm, Low Moderate High. ?)	Low	Low	Low	Low	Low	Low
2-5	vegetation (dry, greening, green, drying)	Greening	Greening	Dry	Green	Green	Dry
2-6	vegetation density (Low Medium Dense)	Low	Low	Low	Dense	Medium	Low
2-7	soil moisture (wet/dry)	Wet	Wet	Dry	Dry	Dry	Dry
3 LOCUSTS							
3-1	present or absent	Absent	Absent	Absent	Absent	Absent	Absent
3-2	area infested (ha)						
4 HOPPERS							
4-1	hopper stages (H123456F)						
4-2	appearance (solitary, transiens, gregarious)						
4-3	behaviour (isolated, scattered, groups)						
4-4	hopper density (/site, /m2, Low Med High)						
5 BANDS							
5-1	band stage (H12345F)						
5-2	band density (/m2 or Low Medium High)						
5-3	band sizes (m2 or ha)						
5-4	number of bands						
6 ADULTS							
6-1	maturity (immature, mature)						
6-2	appearance (solitary, transiens, gregarious)						
6-3	behaviour (isolated, scattered, groups)						
6-4	adult density (/transect, /ha, L M H)						
6-5	breeding (copulating, laying)						
7 SWARMS							
7-1	maturity (immature, mature)						
7-2	swarm density (/m2 or Low Medium High)						
7-3	swarm size (km2 or ha)						
7-4	number of swarms						
7-5	breeding (copulating, laying)						
7-6	flying (direction, time passing)						
7-7	flying height (Low Medium High)						
8 CONTROL							
8-1	pesticide name & formulation						
8-2	application rate (l/ha or kg/ha)						
8-3	quantity (l)						
8-4	area treated (ha)						
8-5	ground or air						
8-6	estimated % kill						
9 COMMENTS							
		T=28-R.H12%	T=28-R.H. 10%	T=28c-R.H. 10%	Temp 32-R.H. 8%	T=27c-R.H. 11% SPOT coordinates	T=26c-R.H. 10% SPOT coordinates

ku-991.03

Was a GPS used to determine locations? yes

Is a brief interpretation or analysis of the results included? no

Country: Pakistan

Locust Officer: Joint Survey Team

date: 17-Apr-03

cleared by: Cressman

date: 17-Apr-03

1 SURVEY STOP							
1-1	date	06/04/03 10:52	06/04/03 11:26	06/04/03 12:22	06/04/03 12:58	06/04/03 13:40	07/04/03 08:38
1-2	name	Chackul	Drugdep	Sorwan	Sorcheel	Rohtak	Ranigor
1-3	latitude (N)	26°51'49"N	26°48'0"N	26°50'27"N	26°51'1"N	26°48'56"N	26°40'18"N
1-4	longitude (E or W)	63°57'14"E	63°50'43"E	63°50'46"E	63°46'1"E	63°44'30"E	63°59'55"E
2 ECOLOGY							
2-1	area (ha) of survey	300	150	200	600	400	100
2-2	habitat (wadi, plains, dunes, crops)	Plains	Dunes	Plains	Plains	Plains	Plains
2-3	date of last rain	17/02/03	17/02/03	17/02/03	17/02/03	17/02/03	28/03/03
2-4	rain amount (mm, Low Moderate High. ?)	Low	Low	Low	Low	Low	Low
2-5	vegetation (dry, greening, green, drying)	Greening	Green	Green	Drying	Drying	Dry
2-6	vegetation density (Low Medium Dense)	Medium	Medium	Medium	Low	Low	Low
2-7	soil moisture (wet/dry)	Dry	Dry	Dry	Dry	Dry	Dry
3 LOCUSTS							
3-1	present or absent	Absent	Absent	Absent	Absent	Absent	Absent
3-2	area infested (ha)						
4 HOPPERS							
4-1	hopper stages (H123456F)						
4-2	appearance (solitary, transiens, gregarious)						
4-3	behaviour (isolated, scattered, groups)						
4-4	hopper density (/site, /m2, Low Med High)						
5 BANDS							
5-1	band stage (H12345F)						
5-2	band density (/m2 or Low Medium High)						
5-3	band sizes (m2 or ha)						
5-4	number of bands						
6 ADULTS							
6-1	maturity (immature, mature)						
6-2	appearance (solitary, transiens, gregarious)						
6-3	behaviour (isolated, scattered, groups)						
6-4	adult density (/transect, /ha, L M H)						
6-5	breeding (copulating, laying)						
7 SWARMS							
7-1	maturity (immature, mature)						
7-2	swarm density (/m2 or Low Medium High)						
7-3	swarm size (km2 or ha)						
7-4	number of swarms						
7-5	breeding (copulating, laying)						
7-6	flying (direction, time passing)						
7-7	flying height (Low Medium High)						
8 CONTROL							
8-1	pesticide name & formulation						
8-2	application rate (l/ha or kg/ha)						
8-3	quantity (l)						
8-4	area treated (ha)						
8-5	ground or air						
8-6	estimated % kill						
9 COMMENTS							
		T=29c·R.H. 9.5%	T=31c ·R.H. 9%	T=34c·R.H. 9%	T=32.5c·R.H. 8.9%	T=33.3c·R.H. 8.9%	T=28c·R.H. 17%

loc 99/03

Was a GPS used to determine locations? yes

Is a brief interpretation or analysis of the results included? no

Country: Pakistan

Locust Officer : Joint Survey Team

date : 17-Apr-03

cleared by : Cressman

date : 17-Apr-03

1 SURVEY STOP							
1-1	date	07/04/03 17:22	07/04/03 17:57	08/04/03 11:12	08/04/03 11:45	08/04/03 12:42	08/04/03 13:45
1-2	name	Korpusht	menaz	Koshk	Koshklat	Absar	Jusak
1-3	latitude (N)	26°17'28"N	26°17'24"N	26°0'37"N	26°0'35"N	26°1'11"N	26°3'10"N
1-4	longitude (E or W)	63°6'27"E	63°5'24"E	63°2'40"E	63°1'11"E	63°4'47"E	63°5'15"E
2 ECOLOGY							
2-1	area (ha) of survey	200	100	200	100	400	200
2-2	habitat (wadi, plains, dunes, crops)	Crops	Crops	Crops	Crops	Plains	Crops
2-3	date of last rain	28/03/03	28/03/03	28/03/03	28/03/03	28/03/03	28/03/03
2-4	rain amount (mm, Low Moderate High. ?)	Low	Low	Low	Low	Low	Low
2-5	vegetation (dry, greening, green, drying)	Green	Green	Green	Green	Green	Green
2-6	vegetation density (Low Medium Dense)	Dense	Dense	Dense	Dense	Dense	Dense
2-7	soil moisture (wet/dry)	Wet	Wet	Wet	Wet	Dry	Wet
3 LOCUSTS							
3-1	present or absent	Absent	Absent	Absent	Absent	Absent	Absent
3-2	area infested (ha)						
4 HOPPERS							
4-1	hopper stages (H123456F)						
4-2	appearance (solitary, transiens, gregarious)						
4-3	behaviour (isolated, scattered, groups)						
4-4	hopper density (/site, /m2, Low Med High)						
5 BANDS							
5-1	band stage (H12345F)						
5-2	band density (/m2 or Low Medium High)						
5-3	band sizes (m2 or ha)						
5-4	number of bands						
6 ADULTS							
6-1	maturity (immature, mature)						
6-2	appearance (solitary, transiens, gregarious)						
6-3	behaviour (isolated, scattered, groups)						
6-4	adult density (/transect, /ha, L M H)						
6-5	breeding (copulating, laying)						
7 SWARMS							
7-1	maturity (immature, mature)						
7-2	swarm density (/m2 or Low Medium High)						
7-3	swarm size (km2 or ha)						
7-4	number of swarms						
7-5	breeding (copulating, laying)						
7-6	flying (direction, time passing)						
7-7	flying height (Low Medium High)						
8 CONTROL							
8-1	pesticide name & formulation						
8-2	application rate (l/ha or kg/ha)						
8-3	quantity (l)						
8-4	area treated (ha)						
8-5	ground or air						
8-6	estimated % kill						
9 COMMENTS							
		T=36c-R.H. 10% SPOT coordinates are houses, not locust habitat	T=35.5c-R.H.10.9% SPOT coordinates but not reached exactly due to garden wall of date palms	T=38c-R.H. 12% 0.46 km from SPOT coordinates	T=39.5-R.H. 11%	T=40c-R.H. 7.5%	T=40c-R.H.10.5%

lc 99/03

Was a GPS used to determine locations? yes

Is a brief interpretation or analysis of the results included? no

Country: Pakistan

Locust Officer : Joint Survey Team

date : 17-Apr-03

cleared by : Cressman

date : 17-Apr-03

1 SURVEY STOP							
1-1	date	08/04/03 18:29	08/04/03 19:17	09/04/03 10:49	09/04/03 13:02	09/04/03 17:41	09/04/03 17:58
1-2	name	Rodbun	Chagardan	Pidark	Shadikor	Gorani Chah 1st	Gorani Char 2st
1-3	latitude (N)	26°5'36"N	26°2'25"N	25°50'54"N	25°31'14"N	25°16'15"N	25°15'32"N
1-4	longitude (E or W)	62°30'6"E	62°52'46"E	63°12'39"E	63°26'58"E	63°20'59"E	63°19'36"E
2 ECOLOGY							
2-1	area (ha) of survey	700	500	10	100	200	50
2-2	habitat (wadi, plains, dunes, crops)	Plains	Plains	Wadi	Plains	Dunes	Dunes
2-3	date of last rain	28/03/03	28/03/03	28/03/03	28/03/03	31/01/03	31/01/03
2-4	rain amount (mm, Low Moderate High. ?)	Low	Low	Low	Low	Moderate	Moderate
2-5	vegetation (dry, greening, green, drying)	Green	Green	Green	Green	Green	Green
2-6	vegetation density (Low Medium Dense)	Dense	Medium	Low	Low	Dense	Medium
2-7	soil moisture (wet/dry)	Dry	Dry	Wet	Dry	Dry	Dry
3 LOCUSTS							
3-1	present or absent	Absent	Absent	Absent	Absent	Absent	Absent
3-2	area infested (ha)						
4 HOPPERS							
4-1	hopper stages (H123456F)						
4-2	appearance (solitary, transiens, gregarious)						
4-3	behaviour (isolated, scattered, groups)						
4-4	hopper density (/site, /m2, Low Med High)						
5 BANDS							
5-1	band stage (H12345F)						
5-2	band density (/m2 or Low Medium High)						
5-3	band sizes (m2 or ha)						
5-4	number of bands						
6 ADULTS							
6-1	maturity (immature, mature)						
6-2	appearance (solitary, transiens, gregarious)						
6-3	behaviour (isolated, scattered, groups)						
6-4	adult density (/transect, /ha, L M H)						
6-5	breeding (copulating, laying)						
7 SWARMS							
7-1	maturity (immature, mature)						
7-2	swarm density (/m2 or Low Medium High)						
7-3	swarm size (km2 or ha)						
7-4	number of swarms						
7-5	breeding (copulating, laying)						
7-6	flying (direction, time passing)						
7-7	flying height (Low Medium High)						
8 CONTROL							
8-1	pesticide name & formulation						
8-2	application rate (l/ha or kg/ha)						
8-3	quantity (l)						
8-4	area treated (ha)						
8-5	ground or air						
8-6	estimated % kill						
9 COMMENTS							
		T=39c-R.H. 7%	T=34c-R.H. 10.5%	T=35c-R.H. 21%	T=37c-R.H. 30%	T=30.5c-R.H. 65.5%	T=30c-R.H. 70%

loc 99/03

Was a GPS used to determine locations? yes

Is a brief interpretation or analysis of the results included? no

Country: Pakistan

Locust Officer: Joint Survey Team

date: 17-Apr-03

cleared by: Cressman

date: 17-Apr-03

1 SURVEY STOP							
1-1	date	10/04/03 10:29	10/04/03 10:57	11/04/03 11:10	11/04/03 12:25	11/04/03 15:14	11/04/03 16:06
1-2	name	Gano 1st	Gano 2st	Nigor	Chatl	Pishkan	Hore
1-3	latitude (N)	25°25'39"N	25°26'41"N	25°16'45"N	25°16'27"N	25°07'33"N	25°06'6"N
1-4	longitude (E or W)	63°11'5"E	63°06'27"E	62°15'57"E	62°08'50"E	62°01'44"E	61°46'40"E
2 ECOLOGY							
2-1	area (ha) of survey	400	500	200	150	200	100
2-2	habitat (wadi, plains, dunes, crops)	Dunes	Dunes	Dunes	Plains	Dunes	Plains
2-3	date of last rain	31/01/03	31/01/03	18/01/03	18/01/03	18/01/03	18/01/03
2-4	rain amount (mm, Low Moderate High. ?)	Low	Low	Low	High	Moderate	Low
2-5	vegetation (dry, greening, green, drying)	Green	Green		Green	Green	Green
2-6	vegetation density (Low Medium Dense)	Medium	Medium		Medium	Medium	Low
2-7	soil moisture (wet/dry)	Dry	Dry		Dry	Dry	Wet
3 LOCUSTS							
3-1	present or absent	Absent	Absent	Absent	Absent	Absent	Absent
3-2	area infested (ha)						
4 HOPPERS							
4-1	hopper stages (H123456F)						
4-2	appearance (solitary, transiens, gregarious)						
4-3	behaviour (isolated, scattered, groups)						
4-4	hopper density (/site, /m2, Low Med High)						
5 BANDS							
5-1	band stage (H12345F)						
5-2	band density (/m2 or Low Medium High)						
5-3	band sizes (m2 or ha)						
5-4	number of bands						
6 ADULTS							
6-1	maturity (immature, mature)						
6-2	appearance (solitary, transiens, gregarious)						
6-3	behaviour (isolated, scattered, groups)						
6-4	adult density (/transect, /ha, L M H)						
6-5	breeding (copulating, laying)						
7 SWARMS							
7-1	maturity (immature, mature)						
7-2	swarm density (/m2 or Low Medium High)						
7-3	swarm size (km2 or ha)						
7-4	number of swarms						
7-5	breeding (copulating, laying)						
7-6	flying (direction, time passing)						
7-7	flying height (Low Medium High)						
8 CONTROL							
8-1	pesticide name & formulation						
8-2	application rate (l/ha or kg/ha)						
8-3	quantity (l)						
8-4	area treated (ha)						
8-5	ground or air						
8-6	estimated % kill						
9 COMMENTS							
		T=32c-R.H. 54%	T=32c-R.H. 48%	T=32c-R.H. 63%	T=32c-R.H. 56%	T=32c-R.H. 59%	T=32c-R.H. 54%

loc 99/03

Was a GPS used to determine locations? yes

Is a brief interpretation or analysis of the results included? no

Country: Pakistan

Locust Officer: Joint Survey Team

date: 17-Apr-03

cleared by: Cressman

date: 17-Apr-03

1 SURVEY STOP							
1-1	date	11/04/03 16:37	12/04/03 10:37	12/04/03 11:46	12/04/03 13:40	12/04/03 18:11	13/04/03 09:38
1-2	name	Jiwani	Garok	Saijii	Shooli	Sulika	Lajaban
1-3	latitude (N)	25°2'46"N	25°19'31"N	25°26'48"N	25°33'31"N	25°50'45"N	26°1'1"N
1-4	longitude (E or W)	61°44'5"E	62°8'33"E	62°1'37"E	62°6'9"E	62°42'36"E	63°42'18"E
2 ECOLOGY							
2-1	area (ha) of survey	250	400	200	400	500	100
2-2	habitat (wadi, plains, dunes, crops)	Dunes	Dunes	Plains	Dunes	Plains	Crops
2-3	date of last rain	18/01/03	18/01/03	18/01/03	28/03/03	28/03/03	28/02/03
2-4	rain amount (mm, Low Moderate High. ?)	Low	Low	Low	Low	Low	Low
2-5	vegetation (dry, greening, green, drying)	Green	Dry	Green	Dry	Green	Green
2-6	vegetation density (Low Medium Dense)	Low	Low	Low	Low	Low	Dense
2-7	soil moisture (wet/dry)	Dry	Dry	Dry	Dry	Dry	Wet
3 LOCUSTS							
3-1	present or absent	Absent	Absent	Absent	Absent	Absent	Absent
3-2	area infested (ha)						
4 HOPPERS							
4-1	hopper stages (H123456F)						
4-2	appearance (solitary, transiens, gregarious)						
4-3	behaviour (isolated, scattered, groups)						
4-4	hopper density (/site, /m2, Low Med High)						
5 BANDS							
5-1	band stage (H12345F)						
5-2	band density (/m2 or Low Medium High)						
5-3	band sizes (m2 or ha)						
5-4	number of bands						
6 ADULTS							
6-1	maturity (immature, mature)						
6-2	appearance (solitary, transiens, gregarious)						
6-3	behaviour (isolated, scattered, groups)						
6-4	adult density (/transect, /ha, L M H)						
6-5	breeding (copulating, laying)						
7 SWARMS							
7-1	maturity (immature, mature)						
7-2	swarm density (/m2 or Low Medium High)						
7-3	swarm size (km2 or ha)						
7-4	number of swarms						
7-5	breeding (copulating, laying)						
7-6	flying (direction, time passing)						
7-7	flying height (Low Medium High)						
8 CONTROL							
8-1	pesticide name & formulation						
8-2	application rate (l/ha or kg/ha)						
8-3	quantity (l)						
8-4	area treated (ha)						
8-5	ground or air						
8-6	estimated % kill						
9 COMMENTS							
		T=31c-R.H: 47%	T=32c-R.H: 53%	T=33c-R.H: 43%	T=33c-R.H:40%	T=34c-R.H: 32%	T=29c-R.H: 51%

loc 99/03

Was a GPS used to determine locations? yes

Is a brief interpretation or analysis of the results included? no

Country: Pakistan

Locust Officer: Joint Survey Team

date: 17-Apr-03

cleared by: Cressman

date: 17-Apr-03

1 SURVEY STOP						
1-1 date	13/04/03 10:57	17/04/03 14:36	17/04/03 15:13	17/04/03 17:28	17/04/03 17:58	18/04/03 10:27
1-2 name	Bidrang	Khash	Beit Abad	Shams Abad Bala	Hoshak	Gogen
1-3 latitude (N)	26°3'43"N	28°17'31"N	28°4'34"N	27°31'29"N	27°24'23"N	27°35'24"N
1-4 longitude (E or W)	64°10'32"E	61°7'32"E	61°23'38"E	62°8'30"E	62°17'1"E	62°37'48"E
2 ECOLOGY						
2-1 area (ha) of survey	300	200	150	250	100	100
2-2 habitat (wadi, plains, dunes, crops)	Wadi	Plains	Plains	Dunes	Plains	Wadi
2-3 date of last rain	28/02/03	15/04/03	15/04/03	17/04/03	17/04/03	17/04/03
2-4 rain amount (mm, Low Moderate High. ?)	Low	Low	Low	Low	Low	Low
2-5 vegetation (dry, greening, green, drying)	Green	Greening	Green	Green	Dry	Dry
2-6 vegetation density (Low Medium Dense)	Low	Medium	Medium	Medium	Low	Low
2-7 soil moisture (wet/dry)	Dry	Wet	Dry	Wet	Wet	Dry
3 LOCUSTS						
3-1 present or absent	Absent	Absent	Absent	Absent	Absent	Absent
3-2 area infested (ha)						
4 HOPPERS						
4-1 hopper stages (H123456F)						
4-2 appearance (solitary, transiens, gregarious)						
4-3 behaviour (isolated, scattered, groups)						
4-4 hopper density (/site, /m2, Low Med High)						
5 BANDS						
5-1 band stage (H12345F)						
5-2 band density (/m2 or Low Medium High)						
5-3 band sizes (m2 or ha)						
5-4 number of bands						
6 ADULTS						
6-1 maturity (immature, mature)						
6-2 appearance (solitary, transiens, gregarious)						
6-3 behaviour (isolated, scattered, groups)						
6-4 adult density (/transect, /ha, L M H)						
6-5 breeding (copulating, laying)						
7 SWARMS						
7-1 maturity (immature, mature)						
7-2 swarm density (/m2 or Low Medium High)						
7-3 swarm size (km2 or ha)						
7-4 number of swarms						
7-5 breeding (copulating, laying)						
7-6 flying (direction, time passing)						
7-7 flying height (Low Medium High)						
8 CONTROL						
8-1 pesticide name & formulation						
8-2 application rate (l/ha or kg/ha)						
8-3 quantity (l)						
8-4 area treated (ha)						
8-5 ground or air						
8-6 estimated % kill						
9 COMMENTS						
	T=32c R.H: 29%	T=27c R.H.29%	T=28c R.H.24%	T=23c R.H.29%	T=25c R.H.42%	T=28c R.H.25% Spot coordinates

kc 99.03

Was a GPS used to determine locations? yes

Is a brief interpretation or analysis of the results included? no

Country: Pakistan / I.R. Iran

Locust Officer : Joint Survey Team

date : 17-Apr-03

cleared by : Cressman

date : 17-Apr-03

1 SURVEY STOP							
1-1 date	18/04/03 10:51	18/04/03 11:39	18/04/03 11:58	18/04/03 12:21	18/04/03 12:51	18/04/03 18:09	
1-2 name	Sarkoh	Shahrak Jalq	Qaley Omara	Tapook 1st	Tapook 2st	Mashkl	
1-3 latitude (N)	27°35'24"N	27°36'0"N	27°35'23"N	27°36'36"N	27°36'36"N	27°3'36"N	
1-4 longitude (E or W)	62°41'23"E	62°42'36"E	62°42'47"E	62°43'48"E	62°44'24"E	62°42'36"E	
2 ECOLOGY							
2-1 area (ha) of survey	100	10	100	200	200	1000	
2-2 habitat (wadi, plains, dunes, crops)	Crops	Crops	Wadi	Crops	Wadi	Wadi	
2-3 date of last rain	17/04/03	17/04/03	17/04/03	17/04/03	17/04/03	17/04/03	
2-4 rain amount (mm, Low Moderate High. ?)	Low	Low	Low	Low	Low	Low	
2-5 vegetation (dry, greening, green, drying)	Green	Green	Dry	Green	Dry	Green	
2-6 vegetation density (Low Medium Dense)	Dense	Dense	Low	Dense	Medium	Medium	
2-7 soil moisture (wet/dry)	Wet	Wet	Dry	Wet	Wet	Dry	
3 LOCUSTS							
3-1 present or absent	Absent	Absent	Absent	Absent	Absent	Absent	
3-2 area infested (ha)							
4 HOPPERS							
4-1 hopper stages (H123456F)							
4-2 appearance (solitary, transiens, gregarious)							
4-3 behaviour (isolated, scattered, groups)							
4-4 hopper density (/site, /m2, Low Med High)							
5 BANDS							
5-1 band stage (H12345F)							
5-2 band density (/m2 or Low Medium High)							
5-3 band sizes (m2 or ha)							
5-4 number of bands							
6 ADULTS							
6-1 maturity (immature, mature)							
6-2 appearance (solitary, transiens, gregarious)							
6-3 behaviour (isolated, scattered, groups)							
6-4 adult density (/transect, /ha, L M H)							
6-5 breeding (copulating, laying)							
7 SWARMS							
7-1 maturity (immature, mature)							
7-2 swarm density (/m2 or Low Medium High)							
7-3 swarm size (km2 or ha)							
7-4 number of swarms							
7-5 breeding (copulating, laying)							
7-6 flying (direction, time passing)							
7-7 flying height (Low Medium High)							
8 CONTROL							
8-1 pesticide name & formulation							
8-2 application rate (l/ha or kg/ha)							
8-3 quantity (l)							
8-4 area treated (ha)							
8-5 ground or air							
8-6 estimated % kill							
9 COMMENTS							
	T=30c R.H.28% Spot coordinates	T=31c R.H.27% Spot coordinates are a house inside Palm trees present in village	T=30c R.H.23%	T=30c R.H.33% Spot coordinates	T=34c R.H. 22% Spot coordinates	T=18c R.H.17% Spot coordinates	

kc 99.03

Was a GPS used to determine locations? yes

Is a brief interpretation or analysis of the results included? no

Country: **IR. Iran**

Locust Officer : **Joint Survey Team**

date : **30-Apr-03**

cleared by : **Cressman**

date : **30-Apr-03**

1 SURVEY STOP						
1-1 date	18/04/03 18:21	19/04/03 08:36	19/04/03 09:43	19/04/03 10:35	19/04/03 11:38	19/04/03 12:15
1-2 name	Mashki 2st	Kushok	Dehne Kahor Paien	Kahne shahr	Mehrabad	Dehe Bala
1-3 latitude (N)	27°3'36"N	27°3'36"N	27°5'17"N	27°7'11"N	27°33'0"N	27°33'35"N
1-4 longitude (E or W)	62°43'12"E	62°4'12"E	61°52'56"E	61°40'47"E	61°38'24"E	61°37'48"E
2 ECOLOGY						
2-1 area (ha) of survey	700	300	500	500	700	300
2-2 habitat (wadi, plains, dunes, crops)	Wadi	Wadi	Plains	Crops	Crops	Crops
2-3 date of last rain	17/04/03	22/03/03	22/03/03	22/03/03	22/03/03	22/03/03
2-4 rain amount (mm, Low Moderate High. ?)	Low	Low	Low	Low	Low	Low
2-5 vegetation (dry, greening, green, drying)	Green	Green	Green	Green	Green	Green
2-6 vegetation density (Low Medium Dense)	Low	Low	Medium	Dense	Dense	Dense
2-7 soil moisture (wet/dry)	Dry	Dry	Dry	Wet	Wet	Wet
3 LOCUSTS						
3-1 present or absent	Absent	Absent	Absent	Absent	Absent	Absent
3-2 area infested (ha)						
4 HOPPERS						
4-1 hopper stages (H123456F)						
4-2 appearance (solitary, transiens, gregarious)						
4-3 behaviour (isolated, scattered, groups)						
4-4 hopper density (/site, /m2, Low Med High)						
5 BANDS						
5-1 band stage (H12345F)						
5-2 band density (/m2 or Low Medium High)						
5-3 band sizes (m2 or ha)						
5-4 number of bands						
6 ADULTS						
6-1 maturity (immature, mature)						
6-2 appearance (solitary, transiens, gregarious)						
6-3 behaviour (isolated, scattered, groups)						
6-4 adult density (/transect, /ha, L M H)						
6-5 breeding (copulating, laying)						
7 SWARMS						
7-1 maturity (immature, mature)						
7-2 swarm density (/m2 or Low Medium High)						
7-3 swarm size (km2 or ha)						
7-4 number of swarms						
7-5 breeding (copulating, laying)						
7-6 flying (direction, time passing)						
7-7 flying height (Low Medium High)						
8 CONTROL						
8-1 pesticide name & formulation						
8-2 application rate (l/ha or kg/ha)						
8-3 quantity (l)						
8-4 area treated (ha)						
8-5 ground or air						
8-6 estimated % kill						
9 COMMENTS						
	T=28c R.H.18% Spot coordinates	T=22c R.H.26% Spot coordinates	T=27c R.H.23%	T=27c R.H.21%	T=26c R.H.32% Spot coordinates	T=32c R.H.20% Spot coordinates

kc 99.03

Was a GPS used to determine locations? yes

Is a brief interpretation or analysis of the results included? no

Country: **IR. Iran**

Locust Officer : **Joint Survey Team**

date : **30-Apr-03**

cleared by : **Cressman**

date : **30-Apr-03**

1 SURVEY STOP						
1-1 date	19/04/03 12:41	19/04/03 13:45	19/04/03 14:14	19/04/03 14:40	20/04/03 09:43	20/04/03 10:15
1-2 name	Chahe Pali	Bakhshan	Sarjoo	Qalea Shahbaz	Balochan Chahe	Spake
1-3 latitude (N)	27°33'28"N	27°22'48"N	27°21'36"N	27°19'58"N	26°59'25"N	26°51'7"N
1-4 longitude (E or W)	61°35'7"E	62°18'36"E	62°19'48"E	62°19'50"E	60°7'9"E	60°9'53"E
2 ECOLOGY						
2-1 area (ha) of survey	500	250	400	100	1000	1000
2-2 habitat (wadi, plains, dunes, crops)	Plains	Crops	Crops	Wadi	Dunes	Dunes
2-3 date of last rain	17/04/03	17/04/03	17/04/03	17/04/03	10/04/03	10/04/03
2-4 rain amount (mm, Low Moderate High. ?)	Low	Low	Low	Low	Moderate	Moderate
2-5 vegetation (dry, greening, green, drying)	Green	Green	Green	Green	Dry	Greening
2-6 vegetation density (Low Medium Dense)	Low	Dense	Dense	Medium	Low	Medium
2-7 soil moisture (wet/dry)	Wet	Wet	Wet	Dry	Dry	Dry
3 LOCUSTS						
3-1 present or absent	Absent	Absent	Absent	Absent	Absent	Absent
3-2 area infested (ha)						
4 HOPPERS						
4-1 hopper stages (H123456F)						
4-2 appearance (solitary, transiens, gregarious)						
4-3 behaviour (isolated, scattered, groups)						
4-4 hopper density (/site, /m2, Low Med High)						
5 BANDS						
5-1 band stage (H12345F)						
5-2 band density (/m2 or Low Medium High)						
5-3 band sizes (m2 or ha)						
5-4 number of bands						
6 ADULTS						
6-1 maturity (immature, mature)						
6-2 appearance (solitary, transiens, gregarious)						
6-3 behaviour (isolated, scattered, groups)						
6-4 adult density (/transect, /ha, L M H)						
6-5 breeding (copulating, laying)						
7 SWARMS						
7-1 maturity (immature, mature)						
7-2 swarm density (/m2 or Low Medium High)						
7-3 swarm size (km2 or ha)						
7-4 number of swarms						
7-5 breeding (copulating, laying)						
7-6 flying (direction, time passing)						
7-7 flying height (Low Medium High)						
8 CONTROL						
8-1 pesticide name & formulation						
8-2 application rate (l/ha or kg/ha)						
8-3 quantity (l)						
8-4 area treated (ha)						
8-5 ground or air						
8-6 estimated % kill						
9 COMMENTS						
	T=27c R.H.21%	T=29c R.H.20%	T=30c R.H.19% Spot coordinates	T=32c R.H.17% Spot coordinates were not reached because on top of mountain 710m from here	T=29c R.H.20%	T=29c R.H.18%

kc 99.03

Was a GPS used to determine locations? yes

Is a brief interpretation or analysis of the results included? no

Country: **IR. Iran**

Locust Officer : **Joint Survey Team**

date : **30-Apr-03**

cleared by : **Cressman**

date : **30-Apr-03**

1 SURVEY STOP						
1-1 date	20/04/03 11:20	20/04/03 13:15	20/04/03 16:22	20/04/03 17:00	20/04/03 17:28	20/04/03 17:48
1-2 name	Ogin	Nick Shahr	Korsar	Dalsar 1st	Dalsar 2st	Karchan
1-3 latitude (N)	26°34'35"N	26°15'19"N	26°13'11"N	26°13'47"N	26°13'11"N	26°12'7"N
1-4 longitude (E or W)	59°58'26"E	60°16'26"E	60°44'24"E	60°45'0"E	60°45'0"E	60°50'11"E
2 ECOLOGY						
2-1 area (ha) of survey	50	200	400	500	250	600
2-2 habitat (wadi, plains, dunes, crops)	Plains	Wadi	Crops	Crops	Crops	Wadi
2-3 date of last rain	10/04/03	16/04/03	16/04/03	16/04/03	16/04/03	16/04/03
2-4 rain amount (mm, Low Moderate High. ?)	Moderate	Low	Low	Low	Low	Low
2-5 vegetation (dry, greening, green, drying)	Greening	Green	Green	Green	Green	Green
2-6 vegetation density (Low Medium Dense)	Dense	Medium	Medium	Dense	Dense	Medium
2-7 soil moisture (wet/dry)	Dry	Dry	Wet	Wet	Wet	Dry
3 LOCUSTS						
3-1 present or absent	Absent	Absent	Absent	Absent	Absent	Absent
3-2 area infested (ha)						
4 HOPPERS						
4-1 hopper stages (H123456F)						
4-2 appearance (solitary, transiens, gregarious)						
4-3 behaviour (isolated, scattered, groups)						
4-4 hopper density (/site, /m2, Low Med High)						
5 BANDS						
5-1 band stage (H12345F)						
5-2 band density (/m2 or Low Medium High)						
5-3 band sizes (m2 or ha)						
5-4 number of bands						
6 ADULTS						
6-1 maturity (immature, mature)						
6-2 appearance (solitary, transiens, gregarious)						
6-3 behaviour (isolated, scattered, groups)						
6-4 adult density (/transect, /ha, L M H)						
6-5 breeding (copulating, laying)						
7 SWARMS						
7-1 maturity (immature, mature)						
7-2 swarm density (/m2 or Low Medium High)						
7-3 swarm size (km2 or ha)						
7-4 number of swarms						
7-5 breeding (copulating, laying)						
7-6 flying (direction, time passing)						
7-7 flying height (Low Medium High)						
8 CONTROL						
8-1 pesticide name & formulation						
8-2 application rate (l/ha or kg/ha)						
8-3 quantity (l)						
8-4 area treated (ha)						
8-5 ground or air						
8-6 estimated % kill						
9 COMMENTS						
	T=26c R.H.18%	T=35c R.H.16%	T=35c R.H.16% Spot coordinates	T=36c R.H.20% Spot coordinates	T=34c R.H.18% Spot coordinates	T=35c R.H.15%

lc 99.03

Was a GPS used to determine locations? yes

Is a brief interpretation or analysis of the results included? no

Country: I.R. Iran

Locust Officer : Joint Survey Team

date : 30-Apr-03

cleared by : Cressman

date : 30-Apr-03

1 SURVEY STOP						
1-1 date	20/04/03 19:00	21/04/03 09:00	21/04/03 09:56	21/04/03 10:26	21/04/03 11:40	21/04/03 12:40
1-2 name	Kiborz	Ramin	Kachoo	Beris Area	Gowater	Beris Area 2st
1-3 latitude (N)	25°54'50"N	25°16'16"N	25°14'43"N	25°10'35"N	25°9'52"N	25°7'3"N
1-4 longitude (E or W)	61°31'7"E	60°47'0"E	60°53'31"E	61°8'33"E	61°29'43"E	61°13'40"E
2 ECOLOGY						
2-1 area (ha) of survey	50	500	600	50	100	250
2-2 habitat (wadi, plains, dunes, crops)	Plains	Dunes	Plains	Dunes	Plains	Plains
2-3 date of last rain	16/04/03	28/02/03	28/02/03	28/02/03	28/02/03	28/02/03
2-4 rain amount (mm, Low Moderate High. ?)	Low	Low	Low	Low	Low	Low
2-5 vegetation (dry, greening, green, drying)	Green	Greening	Dry	Green	Green	Dry
2-6 vegetation density (Low Medium Dense)	Low	Low	Low	Low	Medium	Low
2-7 soil moisture (wet/dry)	Dry	Dry	Dry	Dry	Wet	Dry
3 LOCUSTS						
3-1 present or absent	Absent	Absent	Absent	Absent	Absent	Absent
3-2 area infested (ha)						
4 HOPPERS						
4-1 hopper stages (H123456F)						
4-2 appearance (solitary, transiens, gregarious)						
4-3 behaviour (isolated, scattered, groups)						
4-4 hopper density (/site, /m2, Low Med High)						
5 BANDS						
5-1 band stage (H12345F)						
5-2 band density (/m2 or Low Medium High)						
5-3 band sizes (m2 or ha)						
5-4 number of bands						
6 ADULTS						
6-1 maturity (immature, mature)						
6-2 appearance (solitary, transiens, gregarious)						
6-3 behaviour (isolated, scattered, groups)						
6-4 adult density (/transect, /ha, L M H)						
6-5 breeding (copulating, laying)						
7 SWARMS						
7-1 maturity (immature, mature)						
7-2 swarm density (/m2 or Low Medium High)						
7-3 swarm size (km2 or ha)						
7-4 number of swarms						
7-5 breeding (copulating, laying)						
7-6 flying (direction, time passing)						
7-7 flying height (Low Medium High)						
8 CONTROL						
8-1 pesticide name & formulation						
8-2 application rate (l/ha or kg/ha)						
8-3 quantity (l)						
8-4 area treated (ha)						
8-5 ground or air						
8-6 estimated % kill						
9 COMMENTS						
	T=30c R.H.42%	T=32c R.H.30%	T=32c R.H.24%	T=30c R.H.56%	T=33c R.H.40%	T=32c R.H.54%

kc 99.03

Was a GPS used to determine locations? yes

Is a brief interpretation or analysis of the results included? no

Country: **IR. Iran**

Locust Officer : **Joint Survey Team**

date : **30-Apr-03**

cleared by : **Cressman**

date : **30-Apr-03**

1 SURVEY STOP						
1-1 date	21/04/03 13:02	22/04/03 09:35	22/04/03 09:59	22/04/03 12:09	22/04/03 12:35	22/04/03 13:24
1-2 name	Sham	Vashnam 1st	Vashnam 2st	Oraki 1st	Oraki 2st	Balochi
1-3 latitude (N)	25°12'14"N	25°22'48"N	25°25'1"N	25°44'24"N	25°42'35"N	25°26'54"N
1-4 longitude (E or W)	61°06'43"E	60°45'26"E	60°47'46"E	60°56'24"E	60°57'0"E	61°08'17"E
2 ECOLOGY						
2-1 area (ha) of survey	20	250	500	300	250	150
2-2 habitat (wadi, plains, dunes, crops)	Crops	Plains	Plains	Crops	Crops	Plains
2-3 date of last rain	28/02/03	28/02/03	28/02/03	28/02/03	28/02/03	28/02/03
2-4 rain amount (mm, Low Moderate High. ?)	Low	Low	Low	Low	Low	Low
2-5 vegetation (dry, greening, green, drying)	Green	Drying	Greening	Green	Green	Green
2-6 vegetation density (Low Medium Dense)	Dense	Low	Medium	Dense	Dense	Low
2-7 soil moisture (wet/dry)	Wet	Dry	Dry	Wet	Wet	Dry
3 LOCUSTS						
3-1 present or absent	Absent	Absent	Absent	Absent	Absent	Absent
3-2 area infested (ha)						
4 HOPPERS						
4-1 hopper stages (H123456F)						
4-2 appearance (solitary, transiens, gregarious)						
4-3 behaviour (isolated, scattered, groups)						
4-4 hopper density (/site, /m2, Low Med High)						
5 BANDS						
5-1 band stage (H12345F)						
5-2 band density (/m2 or Low Medium High)						
5-3 band sizes (m2 or ha)						
5-4 number of bands						
6 ADULTS						
6-1 maturity (immature, mature)						
6-2 appearance (solitary, transiens, gregarious)						
6-3 behaviour (isolated, scattered, groups)						
6-4 adult density (/transect, /ha, L M H)						
6-5 breeding (copulating, laying)						
7 SWARMS						
7-1 maturity (immature, mature)						
7-2 swarm density (/m2 or Low Medium High)						
7-3 swarm size (km2 or ha)						
7-4 number of swarms						
7-5 breeding (copulating, laying)						
7-6 flying (direction, time passing)						
7-7 flying height (Low Medium High)						
8 CONTROL						
8-1 pesticide name & formulation						
8-2 application rate (l/ha or kg/ha)						
8-3 quantity (l)						
8-4 area treated (ha)						
8-5 ground or air						
8-6 estimated % kill						
9 COMMENTS						
	T=31c R.H.40%	T=33c R.H.52%	T=31c R.H.56%	T=35c R.H.35% Spot coordinates	T=36c R.H.35% Spot coordinates	T=35c R.H.29%

kc 99.03

Was a GPS used to determine locations? yes

Is a brief interpretation or analysis of the results included? no

Country: **IR. Iran**

Locust Officer : **Joint Survey Team**

date : **30-Apr-03**

cleared by : **Cressman**

date : **30-Apr-03**

1	SURVEY STOP						
1-1	date	22/04/03 13:44	23/04/03 09:20	23/04/03 10:09	23/04/03 10:34	23/04/03 11:04	23/04/03 11:22
1-2	name	Negor	Barak	Kahir	Bir Bala	Bandini	Darak
1-3	latitude (N)	25°22'52"N	25°28'49"N	25°35'21"N	25°27'22"N	25°28'50"N	25°28'7"N
1-4	longitude (E or W)	61°9'25"E	60°31'49"E	60°5'51"E	59°48'50"E	59°34'12"E	59°30'19"E
2	ECOLOGY						
2-1	area (ha) of survey	200	700	200	250	400	150
2-2	habitat (wadi, plains, dunes, crops)	Plains	Dunes	Dunes	Dunes	Plains	Plains
2-3	date of last rain	28/02/03	28/02/03	28/02/03	28/02/03	28/02/03	28/02/03
2-4	rain amount (mm, Low Moderate High. ?)	Low	Low	Low	Low	Low	Low
2-5	vegetation (dry, greening, green, drying)	Green	Green	Green	Green	Green	Green
2-6	vegetation density (Low Medium Dense)	Low	Medium	Medium	Medium	Medium	Medium
2-7	soil moisture (wet/dry)	Dry	Dry	Dry	Dry	Dry	Dry
3	LOCUSTS						
3-1	present or absent	Absent	Absent	Absent	Absent	Absent	Absent
3-2	area infested (ha)						
4	HOPPERS						
4-1	hopper stages (H123456F)						
4-2	appearance (solitary, transiens, gregarious)						
4-3	behaviour (isolated, scattered, groups)						
4-4	hopper density (/site, /m2, Low Med High)						
5	BANDS						
5-1	band stage (H12345F)						
5-2	band density (/m2 or Low Medium High)						
5-3	band sizes (m2 or ha)						
5-4	number of bands						
6	ADULTS						
6-1	maturity (immature, mature)						
6-2	appearance (solitary, transiens, gregarious)						
6-3	behaviour (isolated, scattered, groups)						
6-4	adult density (/transect, /ha, L M H)						
6-5	breeding (copulating, laying)						
7	SWARMS						
7-1	maturity (immature, mature)						
7-2	swarm density (/m2 or Low Medium High)						
7-3	swarm size (km2 or ha)						
7-4	number of swarms						
7-5	breeding (copulating, laying)						
7-6	flying (direction, time passing)						
7-7	flying height (Low Medium High)						
8	CONTROL						
8-1	pesticide name & formulation						
8-2	application rate (l/ha or kg/ha)						
8-3	quantity (l)						
8-4	area treated (ha)						
8-5	ground or air						
8-6	estimated % kill						
9	COMMENTS						
		T=35c R.H.28%	T=27c R.H.74%	T=28c R.H.65%	T=30c R.H.60%	T=30c R.H.62%	T=30c R.H.64%

kc 99.03

Was a GPS used to determine locations? yes

Is a brief interpretation or analysis of the results included? no

Country: **IR. Iran**

Locust Officer : **Joint Survey Team**

date : **30-Apr-03**

cleared by : **Cressman**

date : **30-Apr-03**

1 SURVEY STOP						
1-1 date	23/04/03 11:34	23/04/03 12:04	23/04/03 13:34	23/04/03 14:34	23/04/03 18:42	24/04/03 16:25
1-2 name	Poshti	Moradi Kashagh	Eme	Hojdan 1st	hojdan 2st	Qalae Qazi
1-3 latitude (N)	25°29'46"N	25°39'0"N	25°44'51"N	25°42'31"N	25°39'45"N	27°25'48"N
1-4 longitude (E or W)	59°26'59"E	59°21'0"E	58°37'25"E	57°54'24"E	58°2'16"E	56°33'36"E
2 ECOLOGY						
2-1 area (ha) of survey	5	300	1000	500	400	400
2-2 habitat (wadi, plains, dunes, crops)	Crops	Crops	Dunes	Dunes	Dunes	Crops
2-3 date of last rain	28/02/03	28/02/03	28/02/03	28/02/03	28/02/03	15/04/03
2-4 rain amount (mm, Low Moderate High. ?)	Low	Low	Low	Low	Low	Low
2-5 vegetation (dry, greening, green, drying)	Green	Green	Green	Green	Green	Green
2-6 vegetation density (Low Medium Dense)	Dense	Dense	Medium	Medium	Medium	Dense
2-7 soil moisture (wet/dry)	Wet	Wet	Dry	Dry	Dry	Wet
3 LOCUSTS						
3-1 present or absent	Absent	Absent	Absent	Absent	Absent	Absent
3-2 area infested (ha)						
4 HOPPERS						
4-1 hopper stages (H123456F)						
4-2 appearance (solitary, transiens, gregarious)						
4-3 behaviour (isolated, scattered, groups)						
4-4 hopper density (/site, /m2, Low Med High)						
5 BANDS						
5-1 band stage (H12345F)						
5-2 band density (/m2 or Low Medium High)						
5-3 band sizes (m2 or ha)						
5-4 number of bands						
6 ADULTS						
6-1 maturity (immature, mature)						
6-2 appearance (solitary, transiens, gregarious)						
6-3 behaviour (isolated, scattered, groups)						
6-4 adult density (/transect, /ha, L M H)						
6-5 breeding (copulating, laying)						
7 SWARMS						
7-1 maturity (immature, mature)						
7-2 swarm density (/m2 or Low Medium High)						
7-3 swarm size (km2 or ha)						
7-4 number of swarms						
7-5 breeding (copulating, laying)						
7-6 flying (direction, time passing)						
7-7 flying height (Low Medium High)						
8 CONTROL						
8-1 pesticide name & formulation						
8-2 application rate (l/ha or kg/ha)						
8-3 quantity (l)						
8-4 area treated (ha)						
8-5 ground or air						
8-6 estimated % kill						
9 COMMENTS						
	T=30c R.H.70%	T=34c R.H.47% Spot coordinates	T=33c R.H.69%	T=33c R.H.53%	T=33c R.H.60%	T=31c R.H.49%

kc 99.03

Was a GPS used to determine locations? yes

Is a brief interpretation or analysis of the results included? no

Country: **IR. Iran**

Locust Officer : **Joint Survey Team**

date : **30-Apr-03**

cleared by : **Cressman**

date : **30-Apr-03**

1 SURVEY STOP						
1-1 date	24/04/03 20:07	25/04/03 09:35	25/04/03 09:51	25/04/03 10:17	25/04/03 10:55	25/04/03 11:37
1-2 name	Jalabi	Ganj Abad 1st	Ganj Abad 2st	Sorkh Qala	Shamzan	Chah Shahi
1-3 latitude (N)	27°21'33"N	27°51'35"N	27°49'48"N	27°46'47"N	27°37'11"N	27°25'47"N
1-4 longitude (E or W)	56°46'23"E	57°55'11"E	57°56'23"E	57°57'36"E	57°56'24"E	57°54'36"E
2 ECOLOGY						
2-1 area (ha) of survey	250	300	400	500	400	500
2-2 habitat (wadi, plains, dunes, crops)	Plains	Crops	Crops	Crops	Crops	Crops
2-3 date of last rain	15/04/03	25/03/03	25/03/03	25/03/03	25/03/03	25/03/03
2-4 rain amount (mm, Low Moderate High. ?)	Low	Low	Low	Low	Low	Low
2-5 vegetation (dry, greening, green, drying)	Green	Green	Green	Green	Green	Green
2-6 vegetation density (Low Medium Dense)	Medium	Medium	Dense	Medium	Medium	Dense
2-7 soil moisture (wet/dry)	Dry	Wet	Wet	Dry	Dry	Wet
3 LOCUSTS						
3-1 present or absent	Absent	Absent	Absent	Absent	Absent	Absent
3-2 area infested (ha)						
4 HOPPERS						
4-1 hopper stages (H123456F)						
4-2 appearance (solitary, transiens, gregarious)						
4-3 behaviour (isolated, scattered, groups)						
4-4 hopper density (/site, /m2, Low Med High)						
5 BANDS						
5-1 band stage (H12345F)						
5-2 band density (/m2 or Low Medium High)						
5-3 band sizes (m2 or ha)						
5-4 number of bands						
6 ADULTS						
6-1 maturity (immature, mature)						
6-2 appearance (solitary, transiens, gregarious)						
6-3 behaviour (isolated, scattered, groups)						
6-4 adult density (/transect, /ha, L M H)						
6-5 breeding (copulating, laying)						
7 SWARMS						
7-1 maturity (immature, mature)						
7-2 swarm density (/m2 or Low Medium High)						
7-3 swarm size (km2 or ha)						
7-4 number of swarms						
7-5 breeding (copulating, laying)						
7-6 flying (direction, time passing)						
7-7 flying height (Low Medium High)						
8 CONTROL						
8-1 pesticide name & formulation						
8-2 application rate (l/ha or kg/ha)						
8-3 quantity (l)						
8-4 area treated (ha)						
8-5 ground or air						
8-6 estimated % kill						
9 COMMENTS						
	T=29c R.H.43%	T=30c R.H.32% Spot coordinates	T=30c R.H.31% Spot coordinates	T=34c R.H.27% Spot coordinates	T=34c R.H.24% Spot coordinates	T=34c R.H.33% Spot coordinates

kc 99.03

Was a GPS used to determine locations? yes

Is a brief interpretation or analysis of the results included? no

Country: **IR. Iran**

Locust Officer : **Joint Survey Team**

date : **30-Apr-03**

cleared by : **Cressman**

date : **30-Apr-03**

1	SURVEY STOP						
1-1	date	25/04/03 12:37	25/04/03 12:52	25/04/03 13:01	25/04/03 14:43	26/04/03 09:17	26/04/03 09:44
1-2	name	Chah Zardal	Sulan 1st	Toorig	Jaz Murian	Bahador Abad	Sohran
1-3	latitude (N)	27°10'30"N	27°10'41"N	27°11'20"N	27°23'41"N	28°11'10"N	28°05'59"N
1-4	longitude (E or W)	58°31'12"E	58°33'48"E	58°34'52"E	58°26'33"E	57°51'26"E	57°52'12"E
2	ECOLOGY						
2-1	area (ha) of survey	600	500	500	1000	200	500
2-2	habitat (wadi, plains, dunes, crops)	Dunes	Dunes	Dunes	Plains	Plains	Plains
2-3	date of last rain	25/03/03	25/03/03	25/03/03	25/03/03	25/03/03	25/03/03
2-4	rain amount (mm, Low Moderate High. ?)	Low	Low	Low	Low	Low	Low
2-5	vegetation (dry, greening, green, drying)	Green	Green	Green	Dry	Green	Green
2-6	vegetation density (Low Medium Dense)	Low	Medium	Low	Low	Medium	Low
2-7	soil moisture (wet/dry)	Dry	Dry	Dry	Dry	Dry	Dry
3	LOCUSTS						
3-1	present or absent	Absent	Absent	Absent	Absent	Absent	Absent
3-2	area infested (ha)						
4	HOPPERS						
4-1	hopper stages (H123456F)						
4-2	appearance (solitary, transiens, gregarious)						
4-3	behaviour (isolated, scattered, groups)						
4-4	hopper density (/site, /m2, Low Med High)						
5	BANDS						
5-1	band stage (H12345F)						
5-2	band density (/m2 or Low Medium High)						
5-3	band sizes (m2 or ha)						
5-4	number of bands						
6	ADULTS						
6-1	maturity (immature, mature)						
6-2	appearance (solitary, transiens, gregarious)						
6-3	behaviour (isolated, scattered, groups)						
6-4	adult density (/transect, /ha, L M H)						
6-5	breeding (copulating, laying)						
7	SWARMS						
7-1	maturity (immature, mature)						
7-2	swarm density (/m2 or Low Medium High)						
7-3	swarm size (km2 or ha)						
7-4	number of swarms						
7-5	breeding (copulating, laying)						
7-6	flying (direction, time passing)						
7-7	flying height (Low Medium High)						
8	CONTROL						
8-1	pesticide name & formulation						
8-2	application rate (l/ha or kg/ha)						
8-3	quantity (l)						
8-4	area treated (ha)						
8-5	ground or air						
8-6	estimated % kill						
9	COMMENTS						
		T=35c R.H.18%	T=39c R.H.13%	T=36c R.H.14%	T=38c R.H.14%	T=30c R.H.25%	T=32c R.H.20% Spot coordinates

kc 99/03

Was a GPS used to determine locations? yes

Is a brief interpretation or analysis of the results included? no

Country: **IR. Iran**

Locust Officer : **Joint Survey Team**

date : **30-Apr-03**

cleared by : **Cressman**

date : **30-Apr-03**

1	SURVEY STOP						
1-1	date	26/04/03 10:56	26/04/03 11:31	26/04/03 12:39	26/04/03 13:09	26/04/03 14:23	26/04/03 14:52
1-2	name	Shah Abad	Chah Hassan	Kahoor Abad	Mirmeqdad	Abas Abad	Chil Mashal
1-3	latitude (N)	27°53'24"N	27°50'24"N	27°44'59"N	27°48'20"N	27°49'47"N	27°49'11"N
1-4	longitude (E or W)	58°11'21"E	58°19'12"E	58°19'12"E	58°19'59"E	58°3'35"E	58°6'0"E
2	ECOLOGY						
2-1	area (ha) of survey	600	250	400	500	500	200
2-2	habitat (wadi, plains, dunes, crops)	Dunes	Crops	Plains	Dunes	Crops	Crops
2-3	date of last rain	25/03/03	25/03/03	18/04/03	18/04/03	25/03/03	25/03/03
2-4	rain amount (mm, Low Moderate High. ?)	Low	Low	Low	Low	Low	Low
2-5	vegetation (dry, greening, green, drying)	Green	Green	Green	Green	Drying	Drying
2-6	vegetation density (Low Medium Dense)	Medium	Dense	Low	Medium	Dense	Dense
2-7	soil moisture (wet/dry)	Dry	Wet	Dry	Dry	Dry	Dry
3	LOCUSTS						
3-1	present or absent	Absent	Absent	Absent	Absent	Absent	Absent
3-2	area infested (ha)						
4	HOPPERS						
4-1	hopper stages (H123456F)						
4-2	appearance (solitary, transiens, gregarious)						
4-3	behaviour (isolated, scattered, groups)						
4-4	hopper density (/site, /m2, Low Med High)						
5	BANDS						
5-1	band stage (H12345F)						
5-2	band density (/m2 or Low Medium High)						
5-3	band sizes (m2 or ha)						
5-4	number of bands						
6	ADULTS						
6-1	maturity (immature, mature)						
6-2	appearance (solitary, transiens, gregarious)						
6-3	behaviour (isolated, scattered, groups)						
6-4	adult density (/transect, /ha, L M H)						
6-5	breeding (copulating, laying)						
7	SWARMS						
7-1	maturity (immature, mature)						
7-2	swarm density (/m2 or Low Medium High)						
7-3	swarm size (km2 or ha)						
7-4	number of swarms						
7-5	breeding (copulating, laying)						
7-6	flying (direction, time passing)						
7-7	flying height (Low Medium High)						
8	CONTROL						
8-1	pesticide name & formulation						
8-2	application rate (l/ha or kg/ha)						
8-3	quantity (l)						
8-4	area treated (ha)						
8-5	ground or air						
8-6	estimated % kill						
9	COMMENTS						
		T=33c R.H.17%	T=34c R.H.21% Spot coordinates	T=35c R.H.13% Spot coordinates	T=38c R.H.13%	T=40c R.H.13% Spot coordinates	T=40c R.H.10% Spot coordinates

kc 99.03

Was a GPS used to determine locations? yes

Is a brief interpretation or analysis of the results included? no

Country: **IR. Iran**

Locust Officer : **Joint Survey Team**

date : **30-Apr-03**

cleared by : **Cressman**

date : **30-Apr-03**

1	SURVEY STOP						
1-1	date	27/04/03 09:31	27/04/03 12:55	27/04/03 13:27	27/04/03 13:48	28/04/03 08:44	28/04/03 09:11
1-2	name	Bagher Abad	Chah Mohammad	Chah Alvand	Nemat Abad	Sardegal 1st	Sardegal 2st
1-3	latitude (N)	27°46'48"N	27°32'55"N	27°32'20"N	27°32'59"N	27°14'22"N	27°13'56"N
1-4	longitude (E or W)	58°34'12"E	59°20'24"E	59°17'47"E	59°17'47"E	60°25'27"E	60°23'35"E
2	ECOLOGY						
2-1	area (ha) of survey	250	500	200	150	500	500
2-2	habitat (wadi, plains, dunes, crops)	Crops	Plains	Crops	Plains	Dunes	Dunes
2-3	date of last rain	25/03/03	25/03/03	25/03/03	25/03/03	25/03/03	25/03/03
2-4	rain amount (mm, Low Moderate High. ?)	Low	Low	Low	Low	Low	Low
2-5	vegetation (dry, greening, green, drying)	Green	Drying	Green	Drying	Dry	Dry
2-6	vegetation density (Low Medium Dense)	Dense	Low	Dense	Low	Low	Low
2-7	soil moisture (wet/dry)	Wet	Dry	Wet	Dry	Dry	Dry
3	LOCUSTS						
3-1	present or absent	Absent	Absent	Absent	Absent	Absent	Absent
3-2	area infested (ha)						
4	HOPPERS						
4-1	hopper stages (H123456F)						
4-2	appearance (solitary, transiens, gregarious)						
4-3	behaviour (isolated, scattered, groups)						
4-4	hopper density (/site, /m2, Low Med High)						
5	BANDS						
5-1	band stage (H12345F)						
5-2	band density (/m2 or Low Medium High)						
5-3	band sizes (m2 or ha)						
5-4	number of bands						
6	ADULTS						
6-1	maturity (immature, mature)						
6-2	appearance (solitary, transiens, gregarious)						
6-3	behaviour (isolated, scattered, groups)						
6-4	adult density (/transect, /ha, L M H)						
6-5	breeding (copulating, laying)						
7	SWARMS						
7-1	maturity (immature, mature)						
7-2	swarm density (/m2 or Low Medium High)						
7-3	swarm size (km2 or ha)						
7-4	number of swarms						
7-5	breeding (copulating, laying)						
7-6	flying (direction, time passing)						
7-7	flying height (Low Medium High)						
8	CONTROL						
8-1	pesticide name & formulation						
8-2	application rate (l/ha or kg/ha)						
8-3	quantity (l)						
8-4	area treated (ha)						
8-5	ground or air						
8-6	estimated % kill						
9	COMMENTS						
		Spot coordinates		Spot coordinates		DL 8 yrs ago	

kc 99.03

Was a GPS used to determine locations? yes

Is a brief interpretation or analysis of the results included? no

Country: **IR. Iran**

Locust Officer : **Joint Survey Team**

date : **30-Apr-03**

cleared by : **Cressman**

date : **30-Apr-03**

1 SURVEY STOP						
1-1 date	28/04/03 09:46	28/04/03 10:13	28/04/03 11:24	28/04/03 12:02	29/04/03 07:50	29/04/03 08:16
1-2 name	Shams Abad 1st	Shams Abad 2st	Hossein Abad	Nokjub	Baghdania	Dawari Motor
1-3 latitude (N)	27°12'29"N	27°11'36"N	27°10'45"N	27°11'26"N	27°10'48"N	27°07'33"N
1-4 longitude (E or W)	60°20'56"E	60°20'20"E	60°27'56"E	60°30'35"E	60°42'35"E	60°43'48"E
2 ECOLOGY						
2-1 area (ha) of survey	250	150		100	50	500
2-2 habitat (wadi, plains, dunes, crops)	Plains	Dunes	Crops	Town	Town	Dunes
2-3 date of last rain	25/03/03	25/03/03	25/03/03	25/03/03	25/03/03	25/03/03
2-4 rain amount (mm, Low Moderate High. ?)	Low	Low	Low	Low	Low	Low
2-5 vegetation (dry, greening, green, drying)	Drying	Green	Green	Green	Green	Greening
2-6 vegetation density (Low Medium Dense)	Low	Medium	Dense	Medium	Medium	Low
2-7 soil moisture (wet/dry)	Dry	Dry	Dry	Wet	Dry	Dry
3 LOCUSTS						
3-1 present or absent	Absent	Absent	Absent	Absent	Absent	Absent
3-2 area infested (ha)						
4 HOPPERS						
4-1 hopper stages (H123456F)						
4-2 appearance (solitary, transiens, gregarious)						
4-3 behaviour (isolated, scattered, groups)						
4-4 hopper density (/site, /m2, Low Med High)						
5 BANDS						
5-1 band stage (H12345F)						
5-2 band density (/m2 or Low Medium High)						
5-3 band sizes (m2 or ha)						
5-4 number of bands						
6 ADULTS						
6-1 maturity (immature, mature)						
6-2 appearance (solitary, transiens, gregarious)						
6-3 behaviour (isolated, scattered, groups)						
6-4 adult density (/transect, /ha, L M H)						
6-5 breeding (copulating, laying)						
7 SWARMS						
7-1 maturity (immature, mature)						
7-2 swarm density (/m2 or Low Medium High)						
7-3 swarm size (km2 or ha)						
7-4 number of swarms						
7-5 breeding (copulating, laying)						
7-6 flying (direction, time passing)						
7-7 flying height (Low Medium High)						
8 CONTROL						
8-1 pesticide name & formulation						
8-2 application rate (l/ha or kg/ha)						
8-3 quantity (l)						
8-4 area treated (ha)						
8-5 ground or air						
8-6 estimated % kill						
9 COMMENTS						
	Spot coordinates not DL habitat	Spot coordinates in palm trees	Spot coordinates. palms + wheat crop in a town			

kc 99.03

Was a GPS used to determine locations? yes

Is a brief interpretation or analysis of the results included? no

Country: I.R. Iran

Locust Officer : Joint Survey Team

date : 30-Apr-03

cleared by : Cressman

date : 30-Apr-03

1	SURVEY STOP					
1-1	date	29/04/03 08:41	29/04/03 09:37			
1-2	name	Dasht naigon	Mehmari			
1-3	latitude (N)	27°6'52"N	27°7'40"N			
1-4	longitude (E or W)	60°42'59"E	60°40'17"E			
2	ECOLOGY					
2-1	area (ha) of survey	500	250			
2-2	habitat (wadi, plains, dunes, crops)	Dunes	Dunes			
2-3	date of last rain	25/03/03	25/03/03			
2-4	rain amount (mm, Low Moderate High. ?)	Low	Low			
2-5	vegetation (dry, greening, green, drying)	Drying	Green			
2-6	vegetation density (Low Medium Dense)	Low	Low			
2-7	soil moisture (wet/dry)	Dry	Dry			
3	LOCUSTS					
3-1	present or absent	Absent	Absent			
3-2	area infested (ha)					
4	HOPPERS					
4-1	hopper stages (H123456F)					
4-2	appearance (solitary, transiens, gregarious)					
4-3	behaviour (isolated, scattered, groups)					
4-4	hopper density (/site, /m2, Low Med High)					
5	BANDS					
5-1	band stage (H12345F)					
5-2	band density (/m2 or Low Medium High)					
5-3	band sizes (m2 or ha)					
5-4	number of bands					
6	ADULTS					
6-1	maturity (immature, mature)					
6-2	appearance (solitary, transiens, gregarious)					
6-3	behaviour (isolated, scattered, groups)					
6-4	adult density (/transect, /ha, L M H)					
6-5	breeding (copulating, laying)					
7	SWARMS					
7-1	maturity (immature, mature)					
7-2	swarm density (/m2 or Low Medium High)					
7-3	swarm size (km2 or ha)					
7-4	number of swarms					
7-5	breeding (copulating, laying)					
7-6	flying (direction, time passing)					
7-7	flying height (Low Medium High)					
8	CONTROL					
8-1	pesticide name & formulation					
8-2	application rate (l/ha or kg/ha)					
8-3	quantity (l)					
8-4	area treated (ha)					
8-5	ground or air					
8-6	estimated % kill					
9	COMMENTS					
		If green, good DL breeding area. Very high sand dunes	Wheat crop irrigated by tubewell			

kc 99.03

Was a GPS used to determine locations? yes

Is a brief interpretation or analysis of the results included? no

Country: **IR. Iran**

Locust Officer : **Joint Survey Team**

date : **30-Apr-03**

cleared by : **Cressman**

date : **30-Apr-03**

Appendix 6. Pictures



1. Drying conditions in Kharan valley, northern Baluchistan, Pakistan (3 April 2003)



2. Dry and barren areas in the Kharan Valley, Pakistan (4 April 2003)



3. The western portion of the Kharan Valley, Pakistan (4 April 2003)



4. Checking the route and the location of possible Desert Locust habitats between Kharan and Panjgur, Pakistan (5 April 2003)



5. Standing water in the central Makran of Pakistan between Panjgur and Turbat (7 April 2003)



6. Zaboli Valley, west of Saravan, in northern Baluchistan, Iran (19 April 2003)



7. The Beris coastal plains east of Chabahar, Iran (21 April 2003)



8. Checking a potentially green area as indicated by SPOT-VGT satellite imagery near Chabahar. In this case, it turned out to be a banana plantation. (22 April 2003)



9. Stuck in soft mud on the coastal plains east of Jask, Iran (23 April 2003)



10. Drying vegetation in the western Jaz Murian Basin near Kahnoj, Iran (24 April 2003)



11. Another potential habitat indicated by SPOT-VGT satellite imagery turned out to be a farm in an oasis in the Jaz Murian Basin near Dalgan, Iran (27 April 2003)



12. Team Leaders used eLocust (a custom database and mapping program on a handheld computer) to record field data. This dramatically improved reporting quality and timeliness.



13. Another potentially green location indicated by SPOT-VGT satellite imagery turned out to be an oasis near Iranshahr, Iran (28 April 2003)



14. Very dry conditions in the traditional Desert Locust breeding area of Sardegal in the eastern Jaz Murian Basin near Bampur, Iran (28 April 2003)



15. Unfavourable breeding conditions prevailed west of Sardegal in the eastern Jaz Murian Basin, Iran (28 April 2003)



16. Conditions were also dry in traditional Desert Locust breeding areas south of Iranshahr, Iran (28 April 2003)



17. The 2003 Joint Survey Team. *Rear (left-right) Pakistani Team:* S. Din (Maint. Asst.), S.M.H. Naqvi (Locust Officer), A. Khan (Team Leader); **FAO:** K. Cressman (Advisor); **Iranian Team:** M. Chalakizebardast (Team Leader), G.R. Kazemi Siahooei (Locust Officer), S.A. Eravanian (Maint. Asst.). The Iranian drivers are in the front row.

Appendix 7. Joint Survey itinerary for next year

Taking into account the experiences of previous joint surveys including this year's survey, the following itinerary is proposed for the next Joint Survey. A rest day has been included in each country because of the long and exhausting schedule and an extra day provided for preparing the final report in Zahedan at the end.

Date	Route & Area to survey	Overnight
1 Apr	I.R.Iran team cross border at Mirjaveh/Taftan*; Taftan - Nokkundi - Dalbandin	Dalbandin
2 Apr	Dalbandin - Chagai Hills - Padag - Nushki	Nushki
3 Apr	Nushki - Kharan; Kharan area	Kharan
4 Apr	Kharan area	Kharan
5 Apr	Kharan - Washuk - Nag - Panjgur	Panjgur
6 Apr	Panjgur and Prom areas	Panjgur
7 Apr	Panjgur - Hoshab - Turbat	Turbat
8 Apr	Turbat - Mand - Turbat	Turbat
9 Apr	Turbat - Pidarak - Pasni	Pasni
10 Apr	Pasni - Kulanch - Gwadar	Gwadar
11 Apr	Gwadar - Jiwani - Gwadar	Gwadar
12 Apr	Gwadar - Sunsar- Shooli - Turbat	Turbat
13 Apr	Turbat - Uthal	Khuzdar
14 Apr	Uthal - Quetta	Quetta
15 Apr	<i>Rest day</i>	Quetta
16 Apr	Quetta - Taftan	Taftan
17 Apr	Teams cross border at Taftan/Mirjaveh* Mirjaveh - Zahedan <i>Send results of 1st half of survey to DLIS</i>	Zahedan
18 Apr	Zahedan - Khash - Gasht - Saravan	Saravan
19 Apr	Saravan - Suran - Saravan - Esfandak - Saravan	Saravan
20 Apr	Saravan - Zaboli - Saravan; Saravan - Khash - Iranshahr	Bampur
21 Apr	Iranshahr - Espakeh - Nikshahr - Chabahar	Chabahar
22 Apr	Chabahar - Beris - Sham - Gwater - Chabahar	Chabahar
23 Apr	Chabahar - Vashnum - Dashtiari - Negur - Chabahar	Chabahar
24 Apr	Chabahar - Zarabad - Jask	Jask
25 Apr	Jask area; Jask - Minab - Bandar Abbas	Bandar Abbas
26 Apr	<i>Rest day</i> ; Bandar Abbas - Kahnoj	Kahnoj
27 Apr	Kahnoj - Sowlon - Jaz Murrian - Zei Khalat - Kahnoj	Kahnoj
28 Apr	Kahnoj - Dalgan - Iranshahr	Iranshahr
28 Apr	Iranshahr - Sardegah - W. Jaz Murian - Iranshahr	Iranshahr
29 Apr	Iranshahr - Zahedan; start report; <i>send 2nd half results</i>	Zahedan
30 Apr	Finish; <i>send final report to DLIS</i>	Zahedan
1 May	Pakistan team cross border at Mirjaveh/Taftan*	

* 10 AM (Pakistan time) = 9:30 AM (Iran time)