

2019



REGIONAL WORKSHOP ON DESERT LOCUST INFORMATION MANAGEMENT IN THE WESTERN REGION

**FAO COMMISSION FOR CONTROLLING THE DESERT
LOCUST IN THE WESTERN REGION (CLCPRO)**

No. 9

**8–11 April 2019
Tunis, Tunisia**



**Food and Agriculture Organization
of the United Nations**

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Rome, 2019

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Regional Workshop on Desert Locust management in the Western Region

8–11 April 2019 (Tunis, Tunisia)

1. Introduction

The FAO Commission for Controlling the Desert Locust in the Western Region (CLCPRO) sponsored a regional workshop for Desert Locust Information Officers (DLIOs) in the Western Region. The CLCPRO secretariat organized the workshop in Tunis, Tunisia on 8–11 April 2019. The FAO Senior Locust Forecasting Officer, Keith Cressman, and the CLCPRO Programme Officer, Hichem Dridi, conducted the workshop in English and French, respectively.

DLIOs attended the workshop from nine countries in the Western Region. A technical officer from the AGRHYMET Regional Centre also participated (Annex 1). The Libyan DLIO could not attend.

This year's workshop was the ninth annual DLIO regional workshop since 2007.

2. Programme

In 2018, the three Desert Locust regional commissions – the FAO Commission for Controlling the Desert Locust in the Western Region (CLCPRO), in the Central Region (CRC) and in South-West Asia (SWAC) – decided to standardise on the Mac platform for national Desert Locust Information Officers (DLIOs) in the frontline countries in order to improve the global Desert Locust reporting early warning system¹. DLIOs are now using MacBookPro laptops with the latest MacOS (10.14.4, Mojave) for managing eLocust3 data, operating the RAMSES (Rv4.1) geographic information system, preparing locust bulletins and data, and creating eLocus3D packages for the eLocust3 tablet². The standard Mac applications (Pages, Numbers and Keynote) are used for reports, data, maps and presentations, respectively in lieu of the PC Microsoft equivalents of Word, Excel and Powerpoint.

Apple hardware and software offer increased stability, security, less viruses, better performance, and a more enjoyable computing experience. Furthermore, less support is required from DLIS and the commissions than for PCs because multiple brands of computers and versions of operating systems with their associated nuances and bugs can be avoided. In the past, a full day of the annual DLIO workshop was devoted to fixing PC problems. Now, less than one hour is required for the Macs.

Training on the use of the MacBookPro laptops, MacOS and standard applications was provided at the DLIO workshops last year in each region. CLCPRO gave specific training to the DLIO from Morocco who could not attend last year's workshop.

As all DLIOs have become sufficiently proficient in the use of the MacBookPro, the focus of this year's four-day workshop was on data analysis (two days); review of MacOS and the

¹ CLCPRO: Algeria, Chad, Libya, Mali, Mauritania, Morocco, Niger; CRC: Egypt, Eritrea, Ethiopia, Oman, Saudi Arabia, Sudan, Yemen; SWAC: India, Iran, Pakistan; DLCO-EA

² 13-inch 2017, 2.3 GHz i5 128/16GB. MacOS 10.14.4

standard applications, improvements to Desert Locust bulletins (one day); preparing eLocust3D packages for eLocust3 and miscellaneous items (one day) (Annex 2).

Each participant completed a pre- and post-evaluation in order to measure progress achieved in the workshop (Annex 4).

2.1 Desert Locust bulletins

It was noted that all countries in the Western Region continue to maintain a high standard of reporting that is the basis for the global Desert Locust early warning system. Nevertheless, there is always room for improvements to ensure high quality and timely information on a regular basis. Rather than presenting the status of reporting by locust-affected countries through the traditional evaluation of quality, timeliness and frequency of reports, the participants peer-reviewed a bulletin from each country and provided suggestions for improvements. This was supplemented by additional recommendations from the trainers.

Similar to last year's workshop, the main area for improvement in all countries continues to be the inclusion of captions for maps that indicate the title and a brief explanation or interpretation of the map. While DLIOs are likely to understand the map, most readers may not be able to do so easily or sensibly. Hence, a well-written concise caption describing the map would help to provide more understanding. It is also extremely important to include satellite-derived rainfall maps with survey results of soil moisture, greenness maps with survey results of vegetation, and locust situation maps. It is not necessary to include such maps in the absence of rainfall, green vegetation or locust surveys. If surveys were not conducted and no locusts were reported, this should be clearly written in the bulletin to avoid any unnecessary confusion or expectations. A brief summary of the Rv4.1 data should be included when sending the data file to DLIS. The data and the contents of reports and bulletins should always match.

It is important to present an analysis of the situation, not just a summary of locust presence. The analysis should link the weather and ecological conditions to the locust situation, including results of the breeding estimates. From this, a sensible and meaningful forecast can be prepared. Further instruction and explanation on this topic was provided at this year's workshop.

2.2 MacBookPro and MacOS

The participants reviewed the standard applications (Pages, Numbers, Keynote, Safari, Preview, Photos, Mail) and utilities (Calendar, Contacts, Reminders, Notes, Search, Siri, Dictionary) that come free with every Mac computer as well as the many gestures of the Track Pad. About half of the DLIOs had not updated the MacOS from 10.13 (High Sierra) to 10.14 (Mojave) because of slow and unreliable Internet connection in their country. This was done at the workshop and all MacBookPros were checked to ensure that the latest version of the standard applications as well as Sophos anti-virus were installed and functioning correctly. It was noted that a few laptops were improperly configured to use iCloud for storing the Documents folder, which resulted in exhausting the 5GB storage cloud limit. This was reconfigured to use the laptop hard disk.

2.3 RAMSESV4 (Rv4.1)

Rv4.1 is currently used in 18 frontline countries of the Desert Locust recession area where survey and control operations are carried out and data are collected that need to be managed and analysed on a regular basis³. The application may eventually be established in other countries such as Senegal, Somalia and Tunisia, depending on needs and capacities. RAMSESV4, became operational on 1 January 2015, after it was extensively redesigned as open-source software and containing a single unified database. It was updated as Rv4.1 in May 2016.

Intensive training was provided to the workshop participants on how to use the breeding query to estimate the dates of laying, hatching and fledging of copulating adults, hoppers and fledglings. A colour-coded calendar in the Numbers app was introduced as a means of displaying the results in a graphical manner to make it easier for DLIOs to understand the overall breeding period and to determine if more than one generation of breeding occurred during the season (Annex 3). The participants were shown two examples, winter breeding in Sudan starting with November 2018 and summer breeding in Niger starting from August 2018.

Estimating breeding is fundamental to the analysis of any locust situation. From such estimates, the timing of rainfall and favourable ecological conditions can be determined from remote sensing and survey results to better understand the evolution of locust development.

The participants were taught the essential components and methods of summary and analysis, emphasising the development of breeding estimates and the systematic organization and use of monthly layers of rainfall, vegetation, soil moisture, locust behaviour and locust type. It is important to remember that the locust situation can be considered one long, uninterrupted story in which each month is a new chapter but in the same book. Therefore, it is necessary to refer to previous months and to make sure to go back far enough in time to commence with the very first seasonal rains. Given the effects of climate change, such rains may occur at unusual times, e.g. the summer and autumn rains in 2018 that led to an outbreak in winter breeding areas along both sides of the Red Sea during which winter rainfall was nearly absent.

The participants were divided into three groups and spent a full day practicing the analysis of the Desert Locust outbreak in Eritrea⁴. The analysis started with January 2019 and worked backwards to the initial rains that fell during the previous summer, and worked forwards to include a forecast for March and April 2019. Such a case study exercise for the Western Region could not be undertaken due to a calm locust situation in the past few years and a lack of hopper bands, swarms and control data. Each group prepared maps and showed their results during a ten-minute presentation. All participants and trainers voted for the best analysis using the Menti online interactive tool⁵.

³ Algeria, Chad, Djibouti, Egypt, Eritrea, Ethiopia, India, Iran, Libya, Mali, Mauritania, Morocco, Niger, Oman, Pakistan, Saudi Arabia, Sudan, Yemen, and DLCO-EA

⁴ Mali-Algeria-Tunisia; Mauritania-Niger-Senegal; Chad-Morocco-Burkina Faso (voted as best analysis)

⁵ [menti.com](https://www.menti.com) and [mentimeter.com](https://www.mentimeter.com)

The DLIOs were given an overview of the Inter-Tropical Convergence Zone (ITCZ) and its relation to rainfall during the summer in the Sahel of West Africa. They were taught how to download ITCZ data, plot it in Rv4.1 and convert the points to lines using the Sextente plugin⁶. Participants practiced downloading a decadal ITCZ data file, displaying it in Rv4.1 and comparing it to the long-term mean position. It is important to include ITCZ analysis in the monthly bulletins of Senegal, Mauritania, Mali, Niger and Chad during the summer. DLIS has prepared a video that shows the above information⁷. It will be updated soon for the Mac but the procedure remains the same.

The participants were also shown how to open additional shapefiles and CSV files in Rv4.1. The latter is useful to display custom towns in a country. In this case, the DLIO should prepare a file in the Numbers app that has three columns of data: town name, latitude and longitude (in decimal format, DD.DDDD, that can be determine by using Google Earth). The file should be exported as CSV format. The CSV plugin in Rv4.1 is used to open the CSV file and indicate the delimitation (comma or semi-colon) and the correct columns for longitude (X) and latitude (Y) so that the towns are plotted correctly. DLIOs practiced by preparing a file with a few custom town names and displaying it in Rv4.1.

2.4 eLocust3D

The DLIOs were reminded of the usefulness of the eLocust3D app on the tablet to help guide survey teams to areas of recent rainfall and vegetation based on the latest available imagery from IRI⁸. In order for this functionality to be available for survey teams, the DLIO must use the desktop version of eLocust3D on the MacBookPro to prepare a package that is transferred to the eLocust3 tablet. The participants were instructed how to make a baseline package of background maps and practiced this during the workshop by defining a relatively small region of about 3x3 square degrees, installing the relevant Landsat, TPC, elevation and boundary files from the MacBookPro hard disk, and saving this to a specific region folder in RAMSES\eLocust3D desktop. Prior to use in the field, the baseline package should be updated with the latest decadal rainfall and greenness maps. If teams remain in the field for several weeks or longer, a supervisor team could bring the latest package on a micro-SD card to exchange with the previous one. DLIOs were encouraged to make the baseline package for each region in their country in advance.

2.5 eLocust3

Countries were reminded that every survey and control team should use eLocust3 to record their observations in the field and transmit them in real-time via satellite to their National Locust Centre. During survey and control operations, DLIOs should use GeoFlex to monitor field activities on a daily basis⁹.

Novacom recently updated eLocust3 v2.6 software to fix a small bug to ensure that reports with control data are saved to the tablet. This update will be available soon to all countries. Some countries reported the need for additional antenna cables and chargers to replace

⁶ <https://sites.google.com/site/rv4elocust3updates/ramsesv4/reinstall> (Plugins_installer)

⁷ <https://youtu.be/hM7X-877KR8>

⁸ <https://youtu.be/XEV3a1uXfdk>

⁹ <https://web-humanav.novacom-services.com/novacom-gwt-generic/index.jsp>

those that have broken or been lost. CLCPRO should maintain a small stock of these items in order to meet such needs by countries. DLIOs were reminded to check the batteries of stored eLocust3 tablets every month to ensure that the battery level remains at about 40% charge. In case the internal clock battery loses its charge, the tablet should be plugged in and charged for three days (72 hours) non-stop without interruption. The tablet should be left on but the screen can be turned off during this period. It may be necessary to repeat this several times before the clock battery is fully charged and maintains its charge.

3. Conclusion

All participants benefited from the workshop as indicated in the results of the pre- and post-evaluations (Annex 4). Non-frontline countries (Burkina Faso, Senegal, Tunisia) improved the most, which is to be expected as participants from these countries were less familiar with the early warning tools (eLocust3, eLocust3D, Rv4.1) at the beginning of the workshop compared to frontline countries that regularly use such tools. Nevertheless, DLIOs from each frontline country also improved their knowledge and skills.

This workshop continues to represent an important mechanism of providing updated and refresher training on a regular basis to DLIOs on the early warning tools developed by DLIS as well as the MacOS in order to ensure the smooth operating of the global reporting and early warning system, which is the basis for preventive control. The participants reaffirmed the importance of and the need to continue these workshops on an annual basis.

The participants expressed their desire that Rv4.1 continues to be updated so that it can provide the necessary functionality for summarising and analysing data, and to simplify tasks. However, DLIOs should improve their knowledge and use the full functions of Rv4.1. DLIS and the Commissions should continue to be responsible for providing the necessary training to DLIOs on Rv4.1 functionality and new technologies while users should make full use of the custom application for data management and analysis.

Again it was noted during the workshop the importance of a fast and reliable Internet connection in the National Locust Centres. This is critical because an increasing portion of a DLIO's work relies on such connectivity, for example, receipt of eLocust3 data from the field, monitoring survey and control activities in the field, access to remote sensing imagery of rainfall and green vegetation in order to prioritise surveys, guide teams and analyse situations, exchanging data with DLIS, CLCPRO and other countries, and timely reporting.

For those countries that have two DLIOs, such as Mauritania, it would be useful if an additional Mac could be provided, perhaps a desktop iMac, so that each DLIO has a Mac.

4. Acknowledgements

The participants expressed their appreciation to the CLCPRO for the good arrangements and coordination of the workshop's logistics that contributed greatly to its success. The warm welcome of the Host Government and the support provided was indicative of the sincere commitment of the country to the locust programme. Lastly, the participants were grateful for the tireless efforts of CLCPRO Programme Officer and the Senior Locust Forecasting Officer who provided the training during the workshop.

Annexes

Annex 1. Workshop participants

	CLCPRO participants
Algeria	Billel Ahmed Serir
Burkina Faso	Abdel Wahab Sadago Sawadogo
Chad	Rassei Neldjibaye
Mali	Youssef Diallo
Mauritania	Bocar Lemine Sakho
Morocco	Jamal Chihrane
Niger	Idrissa Yacouba
Senegal	Tata Faye Fatou
Tunisia	Mouna Mhafdhi
CLCPRO	Mohamed Lemine Hamouny

	AGRHYMET participants
AGRHYMET	Idrissa Maiga

	Trainers
FAO	Keith Cressman
CLCPRO	Hichem Dridi

Annex 2. Workshop programme

MON 8 APR	09:30	Opening and introduction
	10:00	Break
	10:30	MacBookPro laptop & pre-installed apps
	12:30	Lunch
	14:00	Review of national bulletins
	15:30	Break
	16:00	Improvements to reporting and bulletins
	17:30	End of day
TUE 9 APR	09:00	Introduction: estimating breeding using Rv4.1 and making calendar
	10:30	Break
	11:00	Demonstration: Sudan breeding & calendar (Oct 2018 – March 2019)
	12:30	Lunch
	14:00	Exercise: Estimating breeding in Saudi Arabia (Dec 2018 – March 2019)
	15:30	Break
	16:00	Introduction: Components of analysis
17:30	End of day	
WED 10 APR	09:00	Group exercise: Analysis of DL situation in Eritrea for Jan 2019
	10:30	Break
	11:00	(cont.)
	12:30	Lunch
	14:00	Group exercise: prepare analysis maps & presentation
	15:30	Break
	16:00	Presentations of analysis by each group (10 min) & award
17:30	End of day	
THR 11 APR	09:00	Introduction: eLocust3D and preparing regional packages
	10:30	Break
	11:00	Exercise: preparation of eLocust3D regional package
	12:30	Lunch
	14:00	Shape files, CSV plug-in & towns file
	15:30	Break
	16:00	ITCZ analysis, eL3 problems; introduction to drones
17:30	Closing of workshop	

Annex 3. Estimating Desert Locust breeding

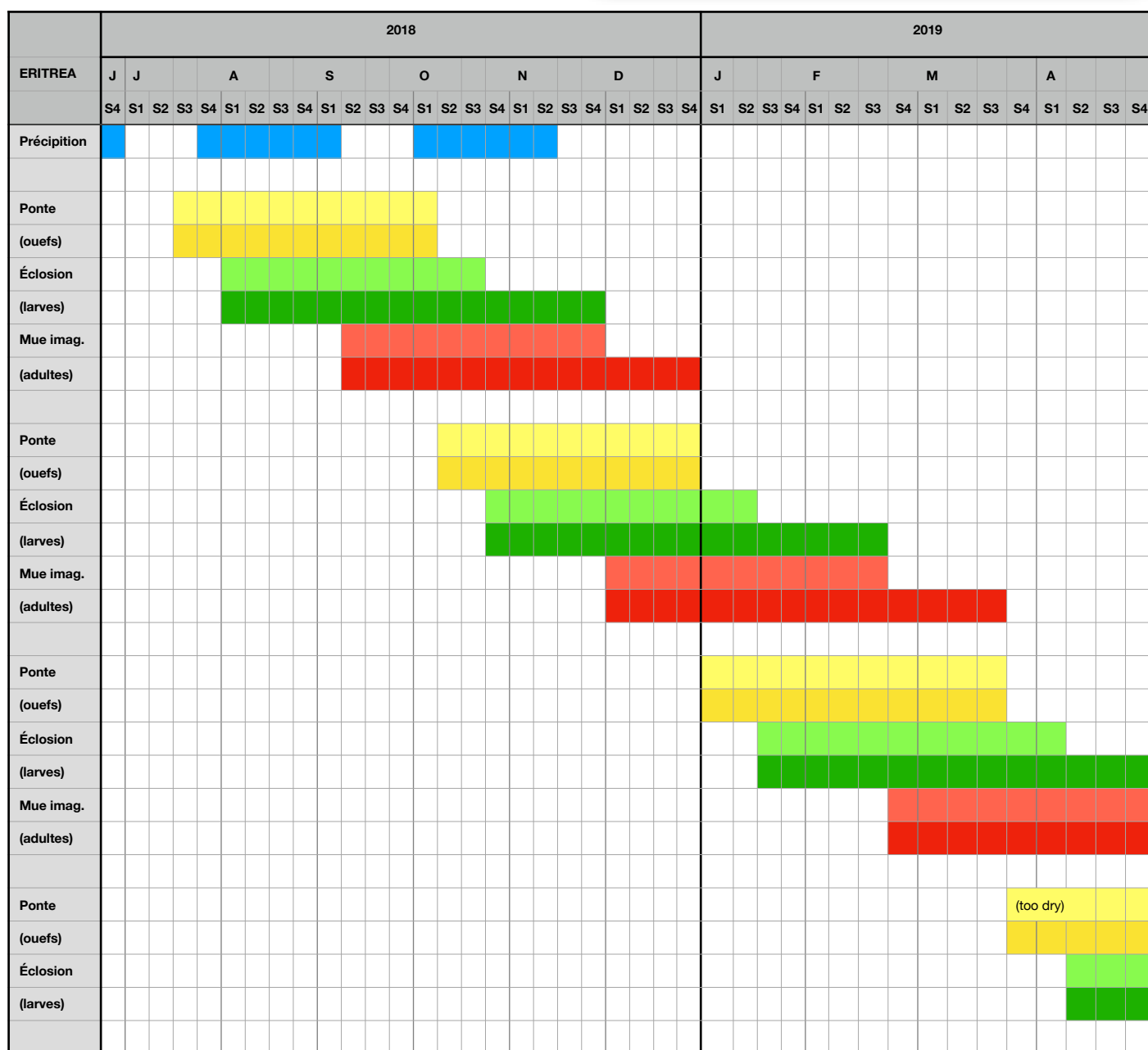
The results of an exercise using Rv4.1 data and breeding estimates from November 2018 to February 2019, show that three generations of breeding occurred on the Red Sea coast in Eritrea from July 2018 to March 2019 because of exceptionally and unusually good rainfall in August and October. A fourth generation was not possible because of control operations and conditions had become dry by the end of March 2019.

Reported breeding 01/12/2018 - 31/12/2018 in Eritrea

Locust	Stage	First date	Last date	Site(s)
Copulating/laying Solitary adult	[Copulating]	19/12/2018	26/12/2018	3
Copulating/laying Gregarious adult	[Copulating]	26/12/2018	30/12/2018	5
Min Solitary Hopper	2	12/12/2018	20/12/2018	8
Max Solitary Hopper	F	15/12/2018	22/12/2018	2
Min Transient Hopper	2	12/12/2018	19/12/2018	3
Max Transient Hopper	F	15/12/2018	15/12/2018	1
Min Gregarious Hopper	2	12/12/2018	20/12/2018	9
Max Gregarious Hopper	F	02/12/2018	31/12/2018	43

Breeding estimates (DLIS model)

Stage	Normal condition		Warm condition	
	From	To	From	To
Laying	13/10/2018	30/12/2018	29/10/2018	30/12/2018
Hatching	27/10/2018	13/01/2019	08/11/2018	09/01/2019
Fledging	02/12/2018	18/02/2019	02/12/2018	02/02/2019
Previous generation fledging	13/09/2018	30/11/2018	08/10/2018	09/12/2018
Next generation laying	01/01/2019	20/03/2019	23/12/2018	23/02/2019



Annex 4. Pre- and post-evaluations

The same pre- and post-evaluation assessment was given to participants, consisting of 25 questions. The results indicated that there were substantial gains in individual performances by the end of the workshop.

