

Septembre 2006



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DESERT LOCUST CONTROL COMMITTEE

Thirty-eighth Session

Rome, 11-15 September 2006

REVIEW OF THE SURVEY AND CONTROL OPERATIONS UNDERTAKEN ¹ (Agenda Item 6a)

1. SURVEY OPERATIONS

During the 2003-05 Desert Locust upsurge, national locust teams conducted survey operations by ground or air in 26 countries. Initially, the surveys were undertaken on the ground using four-wheeled drive vehicles due to the limited resources that were available and the relatively small infestations. As locust numbers increased and the situation deteriorated and as funding became available, aerial survey operations were mounted. Aerial surveys were conducted in 2004 and continued until the end of October 2005 in eight countries using helicopters or fixed-wing aircraft². All of the countries indicated that they were able to cover much larger areas with helicopters, including visiting remote places, in an easier and quicker manner than with vehicles on the ground. Helicopters were advantageous over fixed-wing aircraft because they could land frequently and the survey officer could get out and make a quick assessment on foot.

2. CONTROL OPERATIONS

2.1. Overview

Between October 2003 and December 2005, 23 countries³ treated 13.2 million ha of Desert Locust infestations by ground and air (see Annex 1). Nearly all of the control operations (12.7 million ha or 96%) were conducted in 14 countries in the Western Region while only limited operations were conducted in nine countries⁴ in the Central Region (nearly 0.5 million ha or 4%). In the Western Region, ten Sahelian countries⁵ treated nearly 3 million ha compared to 9.8

¹ The figures used in this paper are those reported by the countries to the FAO Desert Locust Information Service (DLIS) at FAO Headquarters where they were checked and corrected as necessary

² Algeria, Chad, Mali, Mauritania, Morocco, Niger, Saudi Arabia, Senegal

³ Algeria, Burkina Faso, Cape Verde, Chad, Cyprus, Egypt, Eritrea, Ethiopia, Gambia, Guinea, Guinea Bissau, Israel, Jordan, Lebanon, Libya, Mali, Mauritania, Morocco, Niger, Saudi Arabia, Senegal, Sudan, Tunisia

⁴ Cyprus, Egypt, Eritrea, Ethiopia, Israel, Jordan, Lebanon, Saudi Arabia, Sudan

⁵ Burkina Faso, Cape Verde, Chad, Gambia, Guinea, Guinea Bissau, Mali, Mauritania, Niger, Senegal

million ha in the four Maghreb countries⁶. Initially, only small areas required treatment during the outbreak stage (7,446 ha in October 2003) but this rapidly changed as locust infestations increased in size and number during the upsurge (from 250,000 ha treated in January 2004 to 2.4 million ha in November 2004). Morocco and Algeria treated the largest area, 4.8 million ha and 4.5 million respectively, accounting for 71% of the total area treated during the upsurge. The majority of the control operations were undertaken in Northwest Africa against adult groups and swarms and their offspring (hopper bands) during the spring of 2004, and again in the autumn of the same year against invading swarms that developed in the summer breeding areas in the Sahel of West Africa.

2.2. Aerial operations

Aircraft sprayed nearly 6.8 million out of the 13.2 million ha treated during the 2003-05 upsurge. On a national level, aerial operations accounted for some 29% (Mali) to 88% (Morocco) of all control. Aerial treatments first began in November 2003 in Saudi Arabia and Morocco, followed by Algeria, Mauritania, Tunisia, Libya, Mali, Niger, Senegal and Chad in 2004 and early 2005. Aerial control operations in Morocco and Algeria were the determining factor in the success of the campaign in the Western Region. A fleet of 42 aircraft treated 83% of the total area controlled in Morocco during the nine-month campaign in the winter/spring of 2004 and 51 aircraft treated 93% of the total during the five-month campaign in the autumn/winter of 2004/05. Algeria mobilised 12 aircraft for the first campaign, and 52 for the second. In 2004, Saudi Arabia used four aircraft early in the year, Tunisia used seven aircraft during the spring, Senegal used 22 aircraft, Mauritania used 21, Mali used 13, and a lesser number were used in Niger and Chad. All aerial operations had concluded by the end of March 2005.

2.3. Pesticides

Most of the pesticides used in the control operations were products that have been shown to be effective against Desert Locust as indicated by the independent Pesticide Referee Group (PRG). The products were applied by national teams in the affected countries as full-cover applications according to standard methods indicated in the *FAO Desert Locust Guidelines* in which the pesticide must be applied directly on the locust. Aerial control operations mainly treated settled infestations and only a limited amount of air-to-air spraying of flying swarms was done. Barrier applications in which strips of pesticides were applied every 0.5-1.0 km, leaving untreated ground in between, were undertaken only in Mauritania where ground teams protected an estimated 137,132 ha from November 2003 to March 2004. The biological control agent, *Metarhizium anisopliae* var. *acridum*, was tested against hopper infestations in Niger (December 2003 – January 2004; October-November 2005) and Algeria (April-May 2005) with good results.

2.4. Difficulties

During the upsurge, affected countries faced several difficulties in monitoring and controlling locust populations. Despite intensive ground and aerial surveys, not all areas could be accessed and checked for locust infestations, making it impossible to determine precisely the extent of locust infestations in any given country. This led to uncertainty about the magnitude of the problem and the amount of resources required for its control. Control operations suffered initially from a lack of pesticides, sprayers, vehicles, aircraft and qualified technical personnel. Late arrival of the necessary resources greatly hampered operations and, in some exceptional cases, control had to cease. Despite the increased efficiencies of aerial control operations, the logistics of their support proved to be difficult to manage in most countries. Consequently, FAO deployed logisticians to help support aerial control operations.

Even in countries that are well prepared to conduct large-scale control operations, such as Morocco and Algeria, it was not possible to prevent swarm formation and migration to other countries, for example, the invasion of the Sahel in West Africa during the summer of 2004 by swarms produced in the spring breeding areas of Northwest Africa. Certainly control operations

⁶ Algeria, Libya, Morocco, Tunisia

reduced the scale of the invasion but it does raise the question of the ability to stop an invasion given favourable weather and ecological conditions.

3. CONCLUSION

As the 2003-2005 upsurge developed, control operations increased and expanded to include aircraft as locust targets became more substantial and sufficient funds were made available. These operations were initiated quicker in those countries that had ready access to the required resources. The DLCC should consider the following questions during the discussion:

- (a) FAO DLIS did not receive complete control data (hectares treated by ground and air, pesticides used) on a regular and timely basis during the campaign. Some data still remains incomplete. How can the collation and reporting of control data by affected countries be improved?
- (b) Should aircraft be deployed earlier in an upsurge for survey and control operations? If so, can countries maintain their own fleet of aircraft?
- (c) As Desert Locust infestations increase, should countries shift to aerial control, including air-to-air spraying, and rely less on ground control?
- (d) If additional resources would have been available in Northwest Africa during the spring of 2004, could the swarm invasion of the Sahel in West Africa during the summer have been prevented?

Annex 1. Number of hectares treated against Desert Locust, October 2003 – December 2005

These figures are those that were reported to FAO DLIS by affected countries. The figures have been checked and corrected whenever necessary. Countries are encouraged to check these figures and provide any updates or modifications to the Secretariat.

	Oct-03	Nov-03	Dec-03	Jan-04	Feb-04	Mar-04	Apr-04	May-04	Jun-04	Jul-04	Aug-04	Sep-04	Oct-04	Nov-04	Dec-04	Jan-05	Feb-05	Mar-05	Apr-05	May-05	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05	Dec-05	total	corrected	% aerial
Algeria	528	2,932	1,663	59	6,023	95,741	349,913	443,715	924,209	844,249	7,019	2,800	131,745	685,371	441,341	218,716	316,921	36,175	547	1,570	1,200	200	770	315	5,120	905	425	4,520,172	4,520,172	
Burkina Faso	0	0	0	0	0	0	0	0	0	0	200	12,247	14,712	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27,159	27,159	
Cape Verde	0	0	0	0	0	0	0	0	0	16	0	500	497	1,874	450	80	0	0	0	0	0	0	0	0	0	0	0	3,417	3,417	
Chad	0	0	0	0	0	0	0	0	0	0	0	8,801	8,423	0	0	0	0	0	0	0	4,272	1,320	0	0	0	0	0	22,816	22,816	
Cyprus	0	0	0	0	0	0	0	0	0	0	0	0	462	0	0	0	0	0	0	0	0	0	0	0	0	0	0	462	462	
Egypt	203	613	13	0	895	2,704	43	1,433	1,672	1,793	0	6	8,650	162,900	51,185	2,084	155	1,640	542	510	50	0	0	0	0	0	0	237,091	237,091	
Eritrea	0	0	0	0	1,920	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8,933	11,117	85	0	0	0	22,055	22,055	
Ethiopia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	63	17	184	0	0	0	0	264	264	
Gambia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8,385	6,037	0	0	0	0	0	0	0	0	0	0	0	14,422	14,422	
Guinea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,900	5,450	15,000	0	0	0	0	0	0	0	0	0	24,350	24,350	
Guinea Bissau	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7,368	0	0	0	0	0	0	0	0	0	0	7,368	7,368	
Israel	0	0	0	0	0	0	0	0	0	0	0	0	0	NR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Jordan	0	0	0	0	0	0	0	0	0	0	0	0	0	4,520	2,003	0	0	0	0	0	0	0	0	0	0	0	0	6,523	6,523	
Lebanon	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	10	10	
Libya	0	900	0	800	0	0	28,961	72,670	59,147	3,095	0	1,060	4,925	44,646	5,340	220	0	0	0	0	0	0	0	1,005	0	100	0	222,869	222,869	
Mali	80	12,573	17,437	0	0	0	0	0	0	6,285	16,403	218,081	106,582	5,050	3,100	0	0	0	0	0	0	0	0	0	0	0	0	385,591	347,374	29
Mauritania	1,612	12,702	50,056	135,010	81,749	24,728	14,627	1,527	1,194	5,071	34,636	202,112	458,366	312,368	59,987	0	0	0	0	0	0	0	0	0	0	0	1,001	1,396,746	1,396,746	71
Morocco	0	8,873	13,796	26,622	97,354	446,936	346,202	452,593	736,750	724,913	5,433	505	459,033	1,075,260	384,796	68,412	6,110	570	0	47	6	0	0	0	0	0	0	4,854,211	4,854,211	88
Niger	192	90	3,792	1	1,088	2,930	1,600	0	200	1,075	4,397	98,025	96,383	10,700	2,535	0	0	0	0	1,200	271	0	0	0	125	0	0	224,604	272,428	55
Saudi Arabia	0	3,000	26,336	89,727	24,572	2,375	1,040	0	0	0	0	0	60	1,100	20	0	0	0	2,707	5,155	600	0	0	0	0	0	0	156,692	163,321	40
Senegal	0	650	0	0	0	0	0	0	30	3,673	56,948	211,397	378,536	60,542	52,484	5,921	4,200	210	0	0	0	0	0	0	0	0	0	774,591	767,137	52
Sudan	4,836	12,000	1,836	542	308	959	596	6	0	0	0	0	0	0	0	1,320	2,685	4,776	0	0	0	1,726	12,289	159	0	0	0	44,038	44,038	
Tunisia	0	0	0	0	0	0	0	79,943	NR	NR	0	0	14,185	11,606	0	630	350	10	0	0	0	0	0	0	0	0	0	106,724	241,550	45
total	7,451	54,333	114,929	252,761	213,909	576,373	742,982	1,051,887	1,723,202	1,590,170	125,036	755,534	1,682,559	2,375,947	1,011,626	307,320	343,239	58,381	3,796	8,482	6,462	12,196	24,360	1,564	5,245	1,005	1,426	13,052,175	13,195,783	