

REPORT OF THE

Held in Addis Ababa,
Ethiopia
16-20 April 1962

**SEVENTH SESSION OF THE
FAO DESERT LOCUST
CONTROL COMMITTEE**



FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

REPORT OF THE
SEVENTH SESSION OF THE
FAO DESERT LOCUST CONTROL COMMITTEE

Held in
Addis Ababa, Ethiopia
from
16 - 19 April 1962

Plant Production and Protection Division
Food and Agriculture Organization of the United Nations
Rome, Italy
April, 1962

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INTRODUCTION

The Sixth Session of the FAO Desert Locust Control Committee which met in Rome from 29 June to 4 July 1959 was largely devoted to developing a six-year inter-regional project on Desert Locust control for submission to the Managing Director of the United Nations Special Fund. This Project was approved by the Governing Council of the Special Fund in December 1959 and consequently the Director-General of the Food and Agriculture Organization of the United Nations convened a Special FAO Desert Locust Meeting in April 1960 to prepare a Plan of Operation and conclude other formalities which resulted in the United Nations Special Fund Desert Locust Project becoming operational in June 1960.

Owing to the Special Meeting, the Seventh Session of the Desert Locust Control Committee was postponed until April 1962 when at the kind invitation of the Government of Ethiopia the Director-General of FAO convened the meeting at Addis Ababa. He invited the following governments to be represented by delegates at the Session:

Afghanistan	Jordan	Somali Republic
Belgium	Kuwait	Spain
Cameroun	Lebanon	Sudan
Chad	Libya	Syria
Dahomey	Mali	Tanganyika
Ethiopia	Mauritania	Togo
France	Morocco	Tunisia
Ghana	Niger	Turkey
Guinea	Nigeria	United Arab Republic
India	Pakistan	United Kingdom
Iran	Portugal	United States of America
Iraq	Saudi Arabia	Upper Volta
Israel	Senegal	Yemen
Ivory Coast	Sierra Leone	

The Director-General also invited the League of Arab States, the United Nations Economic Commission for Africa, the United Nations Educational, Scientific and Cultural Organization, and the World Meteorological Organization to be represented by observers.

The Session was opened by Mr. Assefa Difayo, Assistant Minister of the Imperial Ethiopian Ministry of Agriculture, who welcomed all participants on behalf of the Minister of Agriculture of the Imperial Ethiopian Government. His Government greatly appreciated the spirit of cooperation and mutual understanding established between many countries in their joint operations to control the Desert Locust. It recognized that these developments were in great measure due to the whole-hearted support of FAO. The purpose of this Committee was to keep the overall Desert Locust situation under review, to explore how governments might best cooperate and to recommend what action FAO might take to support Desert Locust control on a national, regional and international basis.

Speaking on behalf of FAO, Mr. O.B. Lean, Chief of the Locust Control Office, Rome, regretted that the convening of the Session was unavoidably delayed. Priority had been given to launching the Special Fund Project. The FAO Technical Advisory Committee on Desert Locust Control, the Ninth and Tenth Sessions of which had been held in January 1960 and January 1961, had been designated as the expert advisory body to review progress and advise the Director-General of FAO on the future implementation of the Project. Though of paramount importance, the Special Fund Project was but one step towards the improvement of Desert Locust control and as required by the Plan of Operation, attention must be devoted by all interested governments on how certain aspects of the Project should be pursued after its conclusion in 1965. FAO believed that future action should be developed if not on a fully international basis, at least on a regional scale and, therefore, recommended that consideration of regional organizations should be given high priority by the present Committee.

Acknowledgements

At the conclusion of the Session the members of the Committee expressed their cordial appreciation of the hospitality provided and the facilities placed at the disposal of the Committee by the Imperial Ethiopian Government. They also expressed their thanks to the United Nations Economic Commission for Africa for permitting the use of Africa Hall. Furthermore, the delegates wished to place on record their keen appreciation of the efficient and tactful manner in which the Chairman had conducted the proceedings. They also thanked the FAO Secretariat for the way in which they had performed their various duties.

Officers of the Session

The Committee unanimously elected the following officers:

Chairman:	Mr. M.A. Cheema	Delegate of Pakistan
Vice-Chairmen:	Dr. A.A. Moursi	Delegate of the United Arab Republic
	Mr. Adefris Bellohu	Delegate of Ethiopia

Drafting Committee: The Delegates of Ethiopia, France, United Kingdom, and the United States of America.

Mr. O.B. Lean, FAO, served as Technical Secretary.

PARTICIPATION IN THE SESSION

The following delegations from Member Countries of the Food and Agriculture Organization of the United Nations, observers, and members of FAO staff participated in the Session and contributed to the discussions summarized in this report.

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SUMMARY OF DISCUSSIONS

The Desert Locust Situation in 1961/1962

1. The Committee received a summary of developments on the Desert Locust situation during 1961 and early 1962 prepared by the Desert Locust Information Service and supplemented by information provided by delegates. The main trends during the period under review were as follows:
2. The central and eastern parts of the Desert Locust invasion area were heavily infested during this period, whilst western and northern Africa remained substantially clear.
3. By March 1961, young swarms were appearing in the breeding areas along both coasts of the Red Sea, and widespread laying and hatching were in progress in central Arabia and southern and western Iran, as well as in Jordan, Israel and southern Syria. During April and early May, there were substantial northerly swarm movements in northern Arabia and the adjoining countries, including young swarms from the earlier winter breeding around the Red Sea. These movements resulted in a second wave of extensive laying in central Arabia, as well as in the invasion of Iraq, Kuwait and eastern Syria by other laying swarms; meanwhile breeding also became heavier in Iran.
4. By June young swarms resulting from this later spring breeding were widespread, particularly in central Arabia and in Iran. Pakistan and India had, exceptionally, remained completely clear of reported swarms from late March until after mid-June; but under the influence of an exceptional cyclonic depression from the Arabian Sea during the third week of June, Pakistan and India were invaded by swarms, heavily and almost simultaneously; and laying began almost immediately on the very heavy associated rains.
5. Meanwhile, there was a very much smaller-scale movement of some of the other young swarms from the northern Arabian area, across the Red Sea and south-eastern Egypt, and into the Sudan and northern Ethiopia, where they bred during July-September on a limited scale. The remaining swarms from these northern spring-breeding areas moved into southern Arabia, and bred during the summer in Asir, Yemen and the Aden Protectorates. Some of the resulting young swarms spread northwards again along the Arabian Red Sea coast from August to November, and laying and hatching along each side of the Red Sea and the Gulf of Aden were particularly extensive in Saudi Arabia and Yemen, and produced young swarms in these countries between October 1961 and March 1962, and in northern Ethiopia in early February.
6. Swarms spread into central Arabia in late October 1961, eastern Arabia in December, Kuwait in early February 1962, and north-western Arabia, Israel and Jordan in the earlier part of March. Iraq, which had been only lightly infested in late January and early February, was invaded by swarms from both east and south in late March and early April. Laying began in central Arabia in late January, Kuwait in early February and Iraq in late March, and the first hatching was reported from central Arabia in mid-February.
7. Widespread, heavy and prolonged breeding in north-western India and Pakistan produced many large young swarms between mid-August and November 1961. Although many of these moved westwards from mid-September onwards, others over-wintered in north-western India and West Pakistan, where, early in 1962, widespread

laying occurred in the last week of February and during March in the northern districts of Pakistan, and in March in some districts of northern India. Hatching began in both these countries in the latter part of March, when swarms were spreading farther east through Uttar Pradesh.

8. Immature swarms of very considerable size began invading Iran from the east in mid-September 1961, and became widespread throughout the southern provinces, with occasional reports from as far north as Khorassan; in 1962 laying occurred in Fars and Khuzistan in January and February and the first hatching began in mid-February. Some swarms were recorded in Afghanistan in December, January and February, when there was one report of a laying swarm.

9. Swarms also reached Oman in mid-September 1961, and breeding in November and December produced fledglings during January and February, which may have moved into Iran.

10. Reverting to eastern Africa during 1961, swarms bred in eastern Ethiopia and the Somali peninsula between late April and early-June, and the resulting young swarms concentrated in the northern part of the Somali peninsula during July-September. During October and November, they moved south-westwards, matured and laid mainly in the central and southern districts of the Somali Republic. Young swarms, which appeared during December and January, moved south-westwards into Kenya from late December onwards, and some reached the Kenya highlands and northern Tanganyika in the second week of February. Numerous young swarms, recorded in eastern Ethiopia, mainly in the Harar highlands, from late January 1962 onwards, may have been derived either from the Somali peninsula breeding or from limited breeding reported in the coastal districts of West Aden Protectorate in December and northern Somali Republic between late November and January; by mid-March these swarms were maturing and appeared to be spreading northwards through French Somaliland and the Danakil lowlands towards Arabia, and laying began in late March near Lake Zuai in Ethiopia and near Borama in the Somali Republic, Northern Region.

11. Western and north-western Africa remained clear until August 1961, but since then there have been several reports of limited breeding and occasional swarms. Laying and hopper bands were recorded in two localities of Niger Republic in August and September, and there were further reports of hopper bands in north-western Niger Republic in November, and of isolated hoppers and young adults in the same area in January and February. A small mature swarm was recorded in the Ahaggar Mountains of Sahara in early October, and there were isolated locusts in several localities of southern Sahara and groups of locusts near the Sahara and Mali border in October and November. In late January swarms were recorded almost simultaneously in north-eastern Chad Republic and southern Tunisia, and finally in early March, there was a report of "locusts" of unrecorded species in Portuguese Guinea.

12. In respect of the latter report from Portuguese Guinea referred to above, Mr. Mallamaire said that this would almost certainly be a specimen of Anacridium moestum var. melanorhodon.

Forecast

13. The following forecast, prepared by the Desert Locust Information Service, was presented and agreed by the Committee.

14. Spring breeding was in progress and will become widespread, and in some areas heavy, in central, northern and eastern Arabia, Iran, Afghanistan and West Pakistan. Laying swarms will probably spread further north in Iran, Iraq, Israel

and Jordan, and into Syria, and possibly into south-eastern Turkey and the Sinai Peninsula of Egypt.

15. Following the re-invasion of south-western Arabia further laying is likely in Asir and Yemen and may occur in the Aden Protectorates.

16. Laying is likely to become more widespread in eastern Ethiopia and the western districts of the Somali Republic (Northern Region) and laying swarms must be expected to spread across the Somali Peninsula during late April and May. Some breeding may also occur in north-western Kenya.

17. From May onwards young swarms will begin moving out of the breeding areas, notably from Arabia, Iran and West Pakistan. Most of these were expected to move into Pakistan and north-western India and start breeding with the onset of the monsoon. Others are likely to invade Egypt, the Sudan, northern Ethiopia and South-western Arabia, and some will probably reach Chad Republic and possibly Niger Republic and Mali.

Desert Locust Control Operations during 1961 and 1962

18. The Committee heard accounts of recent locust control operations from the Delegates of the following countries:

Ethiopia	Libya	Sudan
France on behalf of	Mali	Tanganyika
Algeria and Sahara	Mauritania	Turkey
India	Niger	United Arab Republic
Israel	Pakistan	United Kingdom on behalf
Ivory Coast	Saudi Arabia	of Kenya and Uganda
Jordan	Senegal	Upper Volta
Kuwait	Somali Republic	Yemen

together with a report submitted by the FAO Regional Locust Officer, Jeddah, on the recent operations in Arabia.

19. In considering the above reports, the Committee believed that steps should be taken to standardize the study and assessment of the effects of locust control operations on the relevant locust populations and therefore recommended that the Project Manager of the Special Fund Project take action under para. 80b of the Report of the Tenth Session of the FAO Technical Advisory Committee for Desert Locust Control, and convene in consultation with the Anti-Locust Research Centre a symposium to devise methods for the uniform and regular reporting of the progress of control campaigns.

20. The Committee noted with particular interest the following developments:

- a. The establishment of a national locust control service by the Government of Yemen. It believed that this would fill an important gap in locust control in the Arabian Peninsula and in this connection recommended that the FAO Arabian Peninsular Sub-Committee should meet at the earliest possible opportunity to consider how best to cover the further requirements of the Yemen.
- b. The increased help given by the Kuwait Government by means of direct participation in the international campaign in the Arabian Peninsula.

- c. The renewed participation of the Government of Syria in the Arabian Peninsula campaign.

21. Considering the international significance of locust breeding and the cooperative control efforts of many countries in the Arabian Peninsula, the Committee further recommended that special consideration should be given to that area in respect to the assessment of locust control operations. The advantages of aerial survey should be borne in mind for such studies.

22. The Committee hoped that the proposed symposium would report to the FAO Technical Advisory Committee at the earliest opportunity.

Cost of Anti-Locust Campaigns and the Crop Damages inflicted by the Desert Locust

23. The Committee recognized that the sole purpose of locust control was for the benefit of mankind by preventing losses of crops. Unfortunately all previous efforts to assess the economic importance of the Desert Locust had proved inadequate.

24. In 1953 FAO distributed a questionnaire requesting information on the cost of Desert Locust control, including crop damage. As referred to in the Report of the Fourth Session, para. 9, and the Fifth Session, paras. 7 - 11, replies had been incomplete. The matter was also referred to by the FAO Eastern African Desert Locust Control Sub-Committee (Ref. Reports of the Second Session, para. 36, and Third Session, paras. 26 - 28).

25. The Committee agreed that data on crop damage as well as information on the total cost of locust campaigns were essential for the full appreciation of the locust problem. It, therefore, recommended that FAO should reissue its questionnaire and request the full cooperation of governments in assembling the required data.

26. Nevertheless, it was pointed out that from time to time locust invasions inflicted crop damage on such a scale as to constitute a national disaster, and under such circumstances objective assessment of damage was impossible. The Committee agreed that, therefore, it was necessary to try to establish some method for assessing potential locust damage, so as to enable governments to evaluate the monetary return from their expenditure on protective measures.

27. The Committee welcomed the action taken by the Anti-Locust Research Centre in starting a research project designed to produce such an index of potential locust damage. In this connection, however, stress was laid on the inherent difficulties of any such project, particularly since basic data, such as crop acreage and yields were not easily available for several countries in the Desert Locust area. Furthermore, damage to pasture and grazing, a frequent consequence of locust invasions, was virtually impossible to assess. It, therefore, attached considerable importance to the questionnaire referred to above and also hoped that the help of the Statistical Division of FAO could be enlisted to aid in the solution of the problem, particularly in respect of crop forecasting. In this connection, information on the extent of recent crop damages and the costs of anti-locust control campaigns were provided by various delegates (Appendix III).

The United Nations Special Fund Desert Locust Project

28. In its capacity as the expert advisory body for the implementation of the Project, the FAO Technical Advisory Committee on Desert Locust control had, at its Tenth Session, January 1962, fully reviewed its progress. Subsequent developments were summarized as follows:

Ecological Survey

29. The Plant Ecologist working in western Africa was concluding his assignment and preparing his final report. He had been replaced by another Ecologist, who had joined the main Survey Team working in Saudi Arabia since January 1962 which would shortly move into the Yemen. This Team had been augmented by an Assistant Entomologist. The appointment of a Meteorologist was under discussion with the World Meteorological Organization. The possibility of appointing a part-time soil scientist was being explored.

Research Stations

30. Lists of the requirements for the various Research Stations had been submitted and approved by the United Nations Special Fund and the items were now under procurement.

National Reporting and Forecasting Services

31. Advisory Visits by the Officer in Charge, Desert Locust Information Service, to assist the national services in the United Arab Republic, the Sudan and Ethiopia had been undertaken. Visits to Iran, Iraq and Lebanon were imminent.

Desert Locust Information Service

32. The Committee recorded its appreciation of the services being provided by the Desert Locust Information Service and noted that increasing use was being made of current meteorological data in the preparation of their forecasts.

Training Courses

33. FAO organized the Second Desert Locust Training Course at Asmara and Massawa, Ethiopia, from 20 February to 12 April 1962, at the kind invitation of the Government of Ethiopia. All governments participating in the United Nations Special Fund Desert Locust Project were invited to nominate candidates for the Course. Thirty-two participants from the following countries attended the Course:

Ethiopia	Kuwait	Somali Republic
France	Libya	Sudan
India	Morocco	Syria
Iran	Nigeria	Tanganiyka
Iraq	Pakistan	Tunisia
Israel	Qatar	Turkey
Kenya	Saudi Arabia	United Arab Republic
		Yemen

34. The syllabus of the Course consisted of 50 lectures and a ten-day field trip for practical demonstration. A small collection of some of the important publications on the Desert Locust was maintained as a library at the Centre. It was fully utilized by the trainees. In addition, 23 complete typed lectures were distributed and adequate technical reference material was supplied to each trainee.

35. Most of the trainees had sufficiently high educational qualifications and others had good field experience and were capable of making full use of the practical instructions. Apart from direct training, the trainees very much appreciated the opportunity to meet co-workers from other countries in Africa and South West Asia and to exchange with them their ideas and problems concerning various aspects of the Desert Locust. This exchange of experience and personal contacts was extremely fruitful and was a major step towards closer international cooperation in the future.

36. The Committee unanimously expressed its keen appreciation of the facilities provided by the Imperial Ethiopian Government especially the services of the Director of the Course, Mr. Adefris Bellehu, and the part played by FAO, particularly the Associate Director, Mr. Gurdas Singh. The Committee also expressed its appreciation of the assistance given by the British Desert Locust Survey and the United States Regional Insect Control Project (RICP). The full cooperation of all lecturers and trainees also contributed to the outstanding success of the Course.

37. The Committee suggested that FAO may consider the possibility of holding the Third Training Course at Karachi, Pakistan, in early 1963 instead of existing arrangements (Ref. Plan of Operation para.41).

Scholarships, Fellowships, Exchange and Advisory Visits

38. Increasing numbers of awards were being made and arrangements for a further 18 visits were in hand.

Operational Research

39. The Project Manager and the Team Leader of Operational Research had paid an extended visit to India, Iran and Pakistan, with the object of initiating Operational Research in the Eastern Region. Plans for conducting operations in Indo-Pakistan frontier regions were under active preparation.

General Comments

40. FAO drew attention to para. 96 of the Plan of Operation which called on participating governments to consider the continuing aspects of the Project after its conclusion.

41. After considering the objectives of the UNSF Desert Locust Project as a whole, the Committee invited the Technical Advisory Committee to consider as a matter of urgency the formulation and prosecution of concerted programs of research on the biology of the Desert Locust as an essential means of convening Symposia as provided for under para. 80b of the Report of the Tenth Session of the FAO Technical Advisory Committee.

Regional Organizations

42. The Committee welcomed the steps being taken to form a Desert Locust Control Organization in Eastern Africa and urged that every effort be made by the governments concerned to secure early ratification of the Convention agreed at the Special FAO Meeting on Desert Locust Control in Eastern Africa, held in Rome in January 1962.

43. The Committee wished to record its great appreciation of the invaluable part played by FAO and its Regional Locust Secretariat in promoting the development of this Regional Organization. It recommended that all reserves of transport, equipment and insecticides contributed by governments should continue to be held by the FAO Regional Secretariat until a final decision is reached amongst the contributing governments regarding their ultimate disposal. Similarly, it was recommended that the uncommitted balance in the Trust Fund 61 held by FAO amounting to approximately US\$55,000 made up of voluntary cash contributions from governments of the Region, should for the present continue to be held by FAO pending consultation with the contributing governments regarding the Fund's disposal.

44. Furthermore, owing to the fact that the Regional Organization may take time to become established and fully operational, the Committee recommended that, in accordance with the recommendation of the Third Session of the FAO Eastern African Desert Locust Control Sub-Committee (Report para. 37), the Secretariat should, for the present, be maintained by FAO in order to ensure the closest possible coordination and liaison with the Regional Organization and between its associate member countries, particularly during the initial stages of development of the Organization.

45. The Committee welcomed Resolution No.9/61 adopted by the Eleventh Session of the FAO Conference (November 1961) concerning the establishment of a regional organization for the Eastern Region. It welcomed the steps being taken by FAO to convene a meeting of the countries concerned to implement this Resolution.

46. The Committee reviewed the cooperative efforts being made to control the Desert Locust in the Arabian Peninsula and recommended that FAO convene a meeting of the countries of the Near East and other countries concerned to consider establishing a permanent Near East regional organization as defined by the Seventh Session of the FAO Technical Advisory Committee para. 36.

47. The Committee heard with interest an account from Mr. Mallamaire on the organization and functions of OCLA and congratulated those countries participating in that Organization on the success it had achieved in the control of the Desert Locust and other orthopterous pests in western Africa. (see Appendix I)

48. The Committee recognized that OCLA operated at present as a regional organization in parts of western Africa and expressed the wish that OCLA be invited to participate in FAO meetings on Desert Locust control. It recommended that steps be taken by FAO to explore the possibility of developing a comparable organization in other areas of western Africa.

49. It further recommended:

- a. that as far as possible, the regional organizations should be based on a consideration of the biology and movement of the Desert Locust in the relevant area and that operations should be planned to keep the locust populations in the region continually under control;

- b. that regional organizations which should be envisaged as on a continuing basis, should concern themselves where possible with research as well as control;
- c. that the activities of the regional organizations, when formed, should be coordinated by FAO through its Desert Locust Control Committee which is open to all countries affected by the Desert Locust and those participating in international campaigns.

An International Desert Locust Control Emergency Force

50. The Committee, recalling the findings of the FAO Panel of Experts on the Strategy of Desert Locust Plague Control convened by FAO in May 1959, on the need for the formation of a mobile aerial strategic reserve, regretted that hitherto little attention had been paid to this recommendation, but pointed out that the program of work for the Operational Research chapter of the United Nations Special Fund Desert Locust Project, as recommended by the Tenth Session of the Technical Advisory Committee (Report paras. 54 - 68), included a study of this problem. The Committee therefore hoped that the findings of the Operational Research Team would be used as a basis for determining the practicability of such a reserve force.

51. The Committee, however, felt that this should not exclude the consideration of the establishment by any proposed regional organizations of suitable emergency aerial and ground services.

DATE AND PLACE OF NEXT SESSION

52. The Committee considered the date and place of its next session. It felt that this meeting should be convened by the Director-General of FAO at his discretion after the results of discussions on the formation of regional organizations had made headway. It suggested that the next session be convened in Rome.

ORGANISATION COMMUNE DE LUTTE ANTIACRIDIENNE - (OCLA)

For centuries swarms of the Desert Locust (Schistocerca gregaria Forsk), coming either from the East (Arabia, Ethiopia, India, Iran, Iraq, Pakistan, Sudan, etc.) or from North Africa, have invaded the vast savannah regions of tropical Africa. The eggs laid during the rainy season hatch into hopper bands that attack food crops and pastures, causing severe damage.

The countries of former French West Africa established a Federal Anti-Locust Service under the Plant Protection Service. Its main functions were the co-ordination of anti-locust campaigns, the allocation of credits, the distribution of materials and insecticides, and direct spearhead action in the worst infested areas, particularly in desert regions.

This Service had originally only ground equipment (trucks and dusters). Later it was gradually re-organized, new techniques were devised and the use of aircraft was adopted, initially for dusting operations and subsequently for spraying (with boom nozzle sprayers). Finally, the aircraft were fitted with atomizer equipment.

This change-over enabled the Service to cover much greater areas, and during 1957-58, over 1,360,000 hectares affected with hopper bands and early instars of both the Desert Locust and the Red Locust (Nomadacris septemfasciata) were treated within the countries of what was formerly French West Africa. In view of these outstanding achievements, the heads of the governments of the countries of former French West Africa unanimously requested the continuation of the anti-locust organization.

On 24 December 1959 their representatives signed a convention and on 1 February 1960 the present Organisation Commune de Lutte Antiaacridienne (OCLA) came into being, with the following republics as members: Dahomey, France, Ivory Coast, Mali, Mauritania, Niger, Senegal and Upper Volta.

Under the terms of its constitution, the purposes of this Organization were:

- (a) to take all possible steps to eliminate locusts from the territories of member states;
- (b) to conduct or subsidize all studies, research, scouting or surveys deemed necessary for the anti-locust campaign;
- (c) to take charge of or supervise, in part or in whole, the establishment of bases or stations, and the construction thereon of necessary facilities and their management, by agreement with interested states or organizations.

The Organization's strategic weapons include:

- (a) Wing No. 1 - based at Dakar:
Six aircraft (five Piper, PA 18, 150 HP and one De Havilland DH 89, 410 HP) fitted with Micronair equipment, together with 33 ground vehicles for scouting, transport, equipped for repairs and servicing.

(b) Wing No. 2 - based at Dakar:

Four aircraft (three Piper PA 18, 150 HP and one De Havilland DH 89, 410 HP) fitted with Micronair equipment and 19 vehicles.

(c) One twin engine aircraft for liaison purposes between the two wings (Piper APACHE, 300 HP).

(d) Three ground crews are based one at Gao (Mali), one at Zinder (Niger) and a third at Aioun el Atrouss (Mauritania). These have 26 vehicles equipped with exhaust nozzle sprayers and 54 vehicles for scouting, liaison, transport, with facilities for repairs and servicing.

These combined air and ground forces can cover about 1,200,000 hectares and in 1959, over 900,000 hectares infested with hopper bands and adult Desert Locusts were treated, a most encouraging achievement.

In its campaigns, the Organization deploys aircraft that spray a very powerful oil solution of the insecticide dieldrin which mineral oil solution, containing 5 percent of the insecticide, costs 100 fr per litre in 200-litre drums delivered at Dakar.

In order to economize, and considering that the lethal effect of dieldrin lasts for a month, the tactical lattice spraying system is adopted, that is, the airplanes treat 30 m strips, 200 m apart, and then cross them perpendicularly (thus actually covering only 1.64 m per hectare). As all locusts moving in any direction necessarily cross one of the treated strips they are killed within 24 hours. This is an extremely effective and very rapid method, since each plane can treat about 2,000 hectares a day in five to six hours of actual flying time (depending on the distance of the areas treated from the airstrips).

Therefore, the two air wings have a potential coverage of 20,000 hectares a day or 800,000 hectares in 40-45 campaign days (the period between first hatching and the swarming of the young adults).

However, such action can only be accomplished by excellent organization; permanent air-to-air, air-to-ground radio contact; a steady flow of supplies of about 15-20 tons per day (insecticides, automobile and aircraft fuels, spare parts, water and food supplies) and a six months' preparatory period (for checking all transport, campaign and liaison materiel, preparing airstrips, organizing stocks and depots, etc.).

The action of the ground forces, simpler though it is, also requires a plan of battle.

The spraying vehicles have to be equipped with some device fitted to the exhaust from which the insecticide is spread under pressure in very fine droplets carried on the exhaust gases. Here, too, a 5 percent dieldrin oil solution is used at the rate of 1.70 - 1 litre per hectare.

During spraying operations, three or four vehicles proceed abreast, 200 m apart, deploying in the same lattice pattern as the aircraft. Each vehicle can treat 300-500 hectares per day depending on the nature of the terrain, plant cover, winds, etc.

Otherwise servicing is the same, though again, meticulous preparation is necessary to get good results.

Recent locust campaigns in the States of former French West Africa have been vast in scope and important in their achievements, having demonstrated, by the gradual wiping out of the plague, that such campaigns are worthwhile.

Organization

Aim and Composition

I.

Article 1:

The governments of the following states hereby agree to found, under the name of Organisation commune de lutte antilobienne - OCLA, an association which will be governed by these statutes and the law of 1901:

- The Republic of Senegal
- The French Republic
- The Islamic Republic of Mauritania
- The Republic of the Ivory Coast
- The Republic of the Niger
- The Republic of Senegal**
- The Republic of Mali**
- The Republic of the Upper Volta

Article 2:

The headquarters of this Organization is temporarily established at Dakar. It may, however, be transferred elsewhere by simple decision of the Administrative Council.

Article 3:

The purposes of the Organization shall be:

- (a) to undertake all locust control work on the territory of the adhering states;
- (b) to pursue or subsidize studies, research, forecasting or surveys deemed necessary for antilobian campaign purposes;

* French organization, hence official French title only - English translation - Joint Anti-Locust Campaign Organization.

** Senegal and the Guinean Republic were formerly united into the Federation of Mali - now two separate republics: Senegal and Mali.

Organisation commune de lutte antiacridienne - OCLA*
Constitution

I. Aim and Composition

Article 1:

The governments of the following states hereby agree to found, under the name of Organisation commune de lutte antiacridienne - OCLA, an association which will be governed by these statutes and the Law of 1901:

The Republic of Dahomey
The French Republic
The Islamic Republic of Mauritania
The Republic of the Ivory Coast
The Republic of the Niger
The Republic of Senegal**
The Republic of Mali**
The Republic of the Upper Volta

Article 2:

The headquarters of this Organization is temporarily established at Dakar. It may, however, be transferred elsewhere by simple decision of the Administrative Council.

Article 3:

The purposes of the Organization shall be:

- (a) to undertake all locust control work on the territory of the adhering states;
- (b) to pursue or subsidize studies, research, prospecting or surveys deemed necessary for successful campaign purposes;

* French organization, hence official French title only - English translation - Joint Anti-Locust Campaign Organization.

** Senegal and the Sudanese Republic were formerly united into the Federation of Mali - now two separate republics: Senegal and Mali.

- (c) to undertake or supervise, partly or wholly, the establishment, construction or management of campaign bases or research centers in accordance with conventions drawn up with interested states or bodies.

Article 4:

OCLA shall be administered by a Council, composed of one representative for each Member State, as well as a representative of the Anti-Locust Office [Algeria] (Office Anti-Acridien), on a reciprocity basis.

The Council shall be convened by its President. In exceptional cases, a meeting may be called at the request of at least half of the Member States.

It may also request the attendance, in an advisory capacity, of any such person it may deem advisable.

Article 5:

The Administrator shall act in an honorary capacity. He shall continue in office for life, or until he resigns or notification of his withdrawal is given to the President by the authority or body he represents.

Article 6:

The President of the Administrative Council shall be appointed by the Council itself from among its members for one year.

Under him there shall be a Board of Directors, including a Chairman and two members appointed for two years each by the Council. This Committee shall meet whenever and wherever the President deems it advisable.

Article 7:

The Council shall meet regularly at least once a year, on the convocation of its President, at its headquarters or any other place set in advance.

One half plus one of its members in attendance shall be considered the quorum necessary for its discussions. In case any member is unable to attend, he may send as a proxy another administrator or some other person of his choice to act for him, though no administrator may be delegated by more than one person. Minutes will be kept of all meetings and signed by both the President and one of the administrators who attended.

Decisions of the Council shall be taken by majority vote of members present or represented.

Article 8:

The Administrative Council shall have the broadest powers to act in the name of the association and to authorize all acts pertinent to its purposes.

In particular it has the following express powers which, except insofar as delimited by these statutes, are unlimited in scope and circumstance:

- It shall appoint its own President and the Chairman of its Board of Directors, the members of the latter Board and the Director, as prescribed in Articles 6 and 9.
- It shall approve the annual campaign and research budget and prescribe the proper measures for the conduct of the campaign.
- It shall supervise the framing of the budget and expenditures under it, and audit the accounts.
- It shall make all purchases, sales, rentals of buildings, furniture and equipment, contract all loans, with or without mortgaging the assets of the Organization, authorize all commitments, acquiescences in or waivers of claims or withdrawals, and be responsible for all acquisitions or alienations and transfers of assets.

The Council shall be governed by its own rules of procedure. It may delegate all or part of its powers to the Board of Directors.

Article 9:

A Director of the Organization shall be appointed by a three-fourths majority and shall be responsible for the Organization's work to Council.

The Director shall act on behalf of the entire Organization in dealings with third parties.

He shall be authorized to open, maintain and draw upon current banking accounts or deposits in the name of the Organization; bring and prosecute legal cases before any courts, on behalf of the Organization, either as plaintiff or defendant; demand cancellation of liens against it, or that replevin be granted or the withdrawal of legal opposition to distraint action.

He shall have power to engage or dismiss non-official staff and set their pay, under conditions made by the Administrative Council.

He shall keep files on all official staff detached to the Organization.

He shall draw up, with the Board of Directors, the program of work and budget which he shall duly submit to the Council for approval.

He shall keep governments of Member States informed regarding conditions for carrying out the program of work approved by the Administrative Council.

Finally, he shall exercise all other powers delegated to him by the Administrative Council.

Article 10:

All acts and transactions of the Organization, as well as withdrawals of funds or securities, must be signed by the Director or a person to whom he delegates this function; otherwise the Organization shall not be responsible therefor.

Such delegation of powers must first be approved by the Board of Directors or the Council.

II. Resources of the Association

Article 11:

The Organization shall have the following resources:

- (1) annually set quotas paid by members;
- (2) contributions paid by each of the African states, members of the Organization;
- (3) France's contribution as technical assistance or under the heading of co-operation;
- (4) subsidies, donations or legacies for the anti-locust campaign, which shall be accepted by the Administrative Council;
- (5) revenues or income from its property and, generally speaking, any returns from its various activities under its statutes;

(6) loans contracted by the Administrative Council.

The budget shall be drawn up under the supervision of the Administrative Council or, in intervals between meetings, of the Board of Directors.

The fiscal year shall run from 1 February to 31 January of the following calendar year.

The Administrative Council shall appoint two auditors who shall perform their duties under the conditions set forth for limited-liability companies by the Law of 24 July 1837 and subsequent laws.

Article 12:

The Organization's accounts shall be kept according to the rules and in the form prescribed for industrial and commercial enterprises.

At the end of each fiscal year, the Director shall draw up an inventory and a balance sheet, as well as make up a profits and loss account which the Council shall close.

Any available balance shall go into a reserve fund, the maximum for which and its conditions of use shall be set by the Administrative Council.

III. Dissolution and Liquidation

Article 13:

In case of voluntary, statutory or forced dissolution of this Organization, the Administrative Council shall appoint one or several executors who shall have the completest power to determine the assets, pay off debts and carry out all necessary operations, in particular, the redistribution of remaining assets to contracting states of the Organization, taking into consideration contributions in kind made by them.

IV. Adhesion of New Members

Article 14:

States belonging to the French Community, other than the signatories to the Convention setting up OCLA may adhere to this Convention.

V. Life of the Organization

Article 15:

The Organization is of unlimited duration. It may be dissolved under Article 13. However, the withdrawal of one state does not in any way lead to the dissolving of the Organization or the restitution of its property and assets.

VI. Amendments

Article 16:

These statutes may be amended by unanimous consent of the Member States.

The Cost of Locust Control and Crop Damages
Some Recent Estimates

1. International Campaign in the Arabian Peninsula

Estimated expenditure on the 1960/61 campaign.

India	Mission	US\$	35,724
Jordan	"	"	4,993
Pakistan	"	"	37,285
Saudi Arabia ..	"	"	582,889
Sudan	"	"	60,446
UAR	"	"	90,035
Yemen	"	"	65,000
FAO	"	43,690

2. East Africa

The average recent annual cost of Desert Locust control in East Africa, borne jointly by the Governments of Kenya, Tanganyika, Uganda and the United Kingdom, amounted to the equivalent of US\$1,500,000.

Damage to crops in Kenya, Tanganyika and Uganda had been of no significance since 1955.

3. Ethiopia

After the summer breeding in 1958 it was estimated that about 150,000 metric tons of cereals were destroyed by locusts. This damage was valued at approximately US\$12 million and represented the food supplies of over a million people for one year. Some crop damage was caused during the past two years near Awash and Diredawa.

The annual budget for the Locust Control Division for the years 1961/62, and which will remain unchanged for 1962/63, amounted to the equivalent of US\$255,436.

In addition, contributions by local farmers in the form of voluntary labour were estimated at the equivalent of US\$241,546.

4. India

The average annual cost of control operations conducted by the Government of India was estimated at the equivalent of US\$629,987. In addition the value of annual operations conducted by the State Departments of Agriculture was estimated at approximately the equivalent of US\$104,998.

Estimates of the value of recent crop damage inflicted by the Desert Locust are:

1960	US\$157,497
1961	" 52,499
1962	" 63,915

5. Israel

Recent costs of control operations have been approximately:

1959/60	US\$400,000
1960/61	" 8,000

No major crop damage was caused during these years.

6. Kuwait

Annual expenditure on Desert Locust control amounted to the equivalent of US\$420,050.

7. Turkey

The average annual cost of the locust control service in Turkey amounted to approximately the equivalent of US\$75,000.

No crop damage has been inflicted recently.

8. Pakistan

The estimated total annual cost of control operations was estimated at the equivalent of US\$690,125.

The value of recent damage caused by flying swarms had been estimated at the equivalent of:

Karachi area	US\$ 734,985
Hyderabad	" 197,396
Khairfur Division	" 10,500
Rest of West Pakistan ..	" 109,198
	<u>US\$1,052,079</u>

9. United Arab Republic

Recent costs of locust control operations, excluding salaries, had been:

		<u>1959/60</u>	<u>1960/61</u>
In the United Arab Republic	US\$	152,964	227,055
By the Egyptian Mission in			
Saudi Arabia	US\$	121,893	119,503
	US\$	<u>274,857</u>	<u>346,558</u>

10. West Africa

Recent expenditure on control campaigns have been of the order of the following equivalents:

		US\$		
		<u>1960</u>	<u>1961</u>	<u>1962 (budget)</u>
OCLA	979,592	897,959	1,142,857	
Mali	61,224	-	81,633	
Mauritania	61,224	-	40,816	
Niger	61,224	40,816	81,633	
Senegal	138,775	110,204	122,200	
Total US\$	<u>1,302,039</u>	<u>1,048,979</u>	<u>1,469,139</u>	

Observations by the Delegate of Tanganyika

During the discussion on regional Desert Locust organizations, it was pointed out that several countries represented at the meeting subscribed to more than one international organization engaged in the control of other species of locusts by similar methods. Tanganyika, for instance, contributed to three such organizations -- the Desert Locust Service of the East African Common Services Organization, the International Red Locust Control Service and O.I.C.M.A. (the West African Migratory Locust Control Service). The invasion area and, therefore, the potential area of operations of all these three organizations overlap in the cases of Kenya, Uganda and Tanganyika. Secondly, in the case of the Red Locust in particular control measures have now reached a stage where aerial spraying at the appropriate time of the year appears to be all that is required to keep the locusts permanently confined to their breeding area. This, however, necessitates the maintenance of an efficient aerial control service which is under employed for part of the year.

There were possibilities of reducing the total overall expenditure on locust control by countries which contributed to more than one organization, through increasing liaison and cooperation between the various locust organizations.