

REPORT OF THE

Held in Rome, Italy
4-8 November 1974

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



FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

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

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Plant Production and Protection Division
Food and Agriculture Organization of the United Nations
Rome, 1974

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INTRODUCTION

The Seventeenth Session of the FAO Desert Locust Control Committee, which was held in Rome from 1 to 5 October 1973, recommended that the next Session should be convened by the Director-General of the Food and Agriculture Organization of the United Nations in October 1974. He invited the following Governments to be represented by delegates at the Eighteenth Session :

Afghanistan	Morocco
Algeria	Niger
Arab Republic of Egypt	Nigeria
Bahrain	Oman
Cameroon	Pakistan
Central African Republic	People's Democratic Republic of Yemen
Chad	Portugal
Dahomey	Qatar
Ethiopia	Saudi Arabia
France	Senegal
Ghana	Sierra Leone
Guinea	Somali Democratic Republic
India	Spain
Iran	Sudan
Iraq	Syrian Arab Republic
Israel	Tanzania
Ivory Coast	Togo
Jordan	Tunisia
Kenya	Turkey
Kuwait	Uganda
Lebanon	United Arab Emirates
Libyan Arab Republic	United Kingdom
Mali	United States of America
Mauritania	Upper Volta
	Yemen Arab Republic

The Session was opened by Dr. F. Albani, Director, Plant Production and Protection Division, who welcomed all the participants and gave a brief summary of the locust situation during the past twelve months. He stated that once again a potentially dangerous situation was created by the rapid build-up of the Desert Locust populations in the Indo/Pakistan sub-continent during the late summer of 1973 and an equally dangerous situation developed along the Red Sea during the spring of 1974. He thanked for the concerted efforts put in by various Governments and regional organizations which brought the situation under control. He stated that with the exception of scattered breeding in the People's Democratic Republic of Yemen and Sudan, all other countries in the Desert Locust invasion area were free from any significant populations or breeding. He continued that it was a matter of great satisfaction that the policy of control of the Desert Locust in its initial stages had borne fruit and no crop losses had been allowed to occur from the Desert Locust during the period under review. He, however, emphasized that there was no cause for relaxation and all Governments and regional organizations had to continue their work of survey and control in their respective areas with the same zeal if the recession was to be maintained. He assured the Committee that FAO was very much interested in the Desert Locust programme and would do everything to promote the work of this important project.

Officers of the Session

The Committee unanimously elected the following officers :

Chairman : Mr. Salem Ba Mufleh Hadramy (Saudi Arabia)

Vice-Chairman : Dr. Saïd Zitoune (Algeria)

Drafting Committee : Delegates of Algeria, Pakistan, Somali Democratic Republic, Sudan, representative of OCLALAV and the FAO Secretariat.

Messrs. Gurdas Singh, A. Khasawneh, N. Mahjoub, S.S. Pruthi and Miss C. Hemsted served as Technical Secretaries.

Acknowledgements

At the conclusion of the Session, the delegates expressed their cordial thanks for the efficient and tactful manner in which the Chairman and the Vice-Chairman had conducted the proceedings. They also thanked the FAO Secretariat for its efficient and prompt services.

PARTICIPATION IN THE SESSION

The following delegates from Member Nations of the Food and Agriculture Organization of the United Nations and Specialized Agencies, observers and members of the FAO Staff participated in the Session and contributed to the discussions summarized in this report :

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AGENDA

1. Opening of the Session (10.00 hours)
2. Election of the Chairman and Vice-Chairman
3. Adoption of the Agenda
4. Election of the Drafting Committee
5. The Desert Locust Situation during 1973/74 and Forecast
6. Anti-Locust Measures Undertaken by Various Countries and Regional Organizations (October 1973 to September 1974)
7. Report on the Study of the 1972/73 Upsurge of the Desert Locust (Schistocerca gregaria Forsk) and the Effect of the Control Operations Undertaken by National and International Organizations
8. Progress Report on Training Project in Crop Pest Control with Special Reference to Desert Locust Control and Research
9. Progress Report on FAO/SIDA and FAO/DANIDA Projects
10. Trust Fund 9161 - Contributions and Expenditure
11. Status of Various Desert Locust Regional Organizations :
 - (a) South-West Asia
 - (b) Near East
 - (c) Eastern Africa
 - (d) North-West Africa
 - (e) West Africa
12. Other Business
13. Date and Place of Next Session
14. Adoption of Report

SUMMARY OF DISCUSSIONS

Desert Locust Situation from October 1973 to October 1974

1. The Committee had before it a summary of the Desert Locust situation prepared by the FAO Secretariat. This was brought up-to-date by the additional information supplied by delegates and observers.

South-West Asia

2. No locusts were reported from Afghanistan from October 1973 until April 1974. During special survey in the beginning of May mature scattered adult population at a maximum density of 15,000 per square kilometer and widespread presence of I to IV instar hoppers including fresh emergences were recorded in Shorawak area of Kandahar province which warranted control. In early June hoppers of all instars, fledglings and new generation adults were observed over fairly large area in Shorawak valley. Control operations were carried out against these infestations during May and June. At the end of June the area was reported to be dry and thereafter no locust activity was reported up to October.

3. Although low population of adults and hoppers were reported from India and Pakistan during August 1973, subsequent reports indicated that from mid-August onwards undetected breeding on a considerable scale must have occurred in the Indo-Pakistan border area. In early September high density adult populations were reported in three districts in Sind desert area of Pakistan although only scattered adults were reported elsewhere in the summer breeding areas. In the second half of the month laying and hatching was reported over 36 square kilometers in the Mirpur Mathelo desert, second to fourth instar hoppers were reported over 104 square kilometers in the Nara desert in Pakistan, where control operations were started, and a countless adult population was reported at Ramgarh in Jaisalmer district in India. The first swarm was reported from Tappa Sutiara near Mirpur Mathelo on 26 September.

4. During October, 22 reports of mature and immature swarms, varying from 3 to 83 square kilometers in size, were received from the Cholistan and Nara deserts in Pakistan. Also there were eight sightings of mature and immature swarms in the Jaisalmer and Bikaner districts in India, the largest swarm reported covered 83 square kilometers. Over 200 hopper bands of all instars were reported from a total infested area of 600 square kilometers in Pakistan; in India the total area infested by adults and hoppers was estimated at 10,000 square kilometers. Laying continued until 19 October. Aerial and ground control operations continued in Pakistan, and ground operations commenced in India. Between 26 and 31 October a sudden rise in locust numbers was reported from Las Bela district and Karachi; this probably indicated the first westward movement of adults produced in the Nara, Cholistan and west Rajasthan desert areas.

5. In November hoppers continued to be found on both Pakistani and Indian sides of the border. In Pakistan the infested area was estimated at 15,540 square kilometers, and more than 2800 hopper bands, many very large and mostly late instar, were found and controlled. By the end of the month, more than 81,800 litres of liquid insecticide and 81 metric tons of BHC dust had been used. In India control, mainly of late instar hoppers, continued in the Jaisalmer district. Immature swarms, swarmlets and adult groups were reported throughout the month. In Pakistan some 70 swarmlets were located. Most of these were in Cholistan and Nara deserts and were controlled. A swarm covering 62 square kilometers was reported at Pasni on 1 November, and another at Gadani on 29 November. High density adult populations were also reported from Mirpur Khas, Las Bela and Mekran districts, and scattered adults were seen at Panjgur and Nushki in Baluchistan. Control operations in the Cholistan and Khairpur desert areas ended in November although a few immature swarms remained in Surian and Derawar sectors of the infested area in December. Other swarms appeared in the Thana Bula Khan, Las Bela, Mekran and Khuzdar areas in that month. A total of 35 reports of mostly immature swarms were received from Pakistan during December, and a further eight from Jaisalmer Tehsil in India. Fifth instar hoppers were reported in the first fortnight in Surian and Derawar sectors, but none were found subsequently.

6. Two immature swarms were reported from the border area of Iran and Pakistan at the end of November, and three more at the end of December. Groups of adults were also reported and controlled in the Jask and Bandar Abbas areas of coastal Iran in late November and December.

7. Four immature swarmlets were observed during January/February at Zaboli, Iranshahr and Khash in Iranian Baluchistan and high population of settled copulating adults was recorded in Iranshahr area in 34 hectares on 28 February and in approximately 500 hectares on 23 March. Low density yellow adult populations were observed in Chabahar area in the first fortnight of March and early April. During April scattered adults were also recorded in Bandar Abbas and Jiroft area. Soil moisture was generally favourable for oviposition. III and IV instar hoppers in about 2 square kilometers were controlled in Iranshahr in the beginning of April and II to III instar hoppers in 20 hectares in Chabahar area in May. Control was also carried out against adults in 450 hectares in Jazmurian in May. Scattered adults at a density of 3 - 4 thousand per square kilometer and six III - V instar solitary hoppers were observed between Lar and Bastak on 14-15 May. By May conditions for breeding became unfavourable except in cultivated fields and from June to September only a few scattered adults were recorded in Bandar Abbas, Jiroft and Chabahar areas.

8. In Pakistan, a number of pink swarms and swarmlets continued to be found in Bahawalpur and Sind deserts in the first fortnight of January when 16 fifth instar hopper bands and fledglings were reported from five localities in Cholistan desert which were controlled by dusting and exhaust nozzle spraying. Pink swarms were also reported from Kharan, Turbat, Khuzdar and Las Bela during this period. Large population and groups of immature adults were present along Las Bela and Mekran coasts and valleys in the hinterland. Low density population was recorded in Panjgur in the latter half of January and in Mekran, Khuzdar and Nushki in February. On 8 March, a large scattered pairing swarm was recorded in Kharan and on 9 March, another 5 square kilometers mixed swarm was sprayed in this area. Control against concentrations of mixed adults scattered in about 26 square kilometers in wheat cultivation was carried out in Kachhi district on 9 March. Although eggbeds were sprayed in Kharan, emergence occurred there and control was started in latter half of March which continued during April and May. Presence of hoppers and fresh emergence was recorded in Khuzdar during April and control in this area and Kachhi district was concluded during May.

9. Three small swarms were controlled near Kharan between 17-20 May and about the middle of May solitary hoppers of all stages were recorded in Kharan and Chagi district in a gross area of 1,950 and 520 square kilometers respectively. They concentrated and formed bands which resulted in loose swarmlets of varying sizes. Control was carried out against these infestations by exhaust nozzle sprayers and aircraft. Large population of solitary hoppers of all stages, mostly IV and V stages, reported from Bannu district in the North West Frontier Province (NWFP) during the first fortnight of June was controlled. Control operations in Chagi district along Afghanistan border against advanced stage hoppers, fledglings and two loose swarms measuring 104 and 125 square kilometers were concluded in the beginning of June. Escapes from winter/spring breeding started moving towards summer breeding areas in the beginning of June and on 4 June a loose mixed swarm heading east was observed at Nawabshah and this crossed into India. Thereafter no major locust activity was reported from Pakistan and only scattered mature and maturing adults were recorded in Las Bela district and Bahawalpur and Sind deserts from June to September.

10. Low density overwintering adult populations were observed in western Rajasthan in India from January to April. Infiltration of exotic adults started in May when a maximum population of 24,000 per square kilometer was recorded in Jaisalmer and in the beginning of June countless population was observed in Barmer district. This was followed by about half a dozen mature and of mixed maturity small to medium size swarms of moderate density and about 139 swarm movements were recorded from Jaisalmer, Jodhpur, Bikaner and Ganganagar districts between 13 June and 21 July.

11. Oviposition commenced on 14 June and continued up to 20 July. 143 villages with a gross area of 6,810 square kilometers were infested. The bands were mostly of small size although in a few localities large bands were also encountered. Control operations by BHC

dusting and exhaust spraying with dieldrin were carried out from 26 June to 19 August. Barrier spraying from air was also carried out in 80 square kilometers on two occasions on 20 and 24 July.

12. During August and September scattered adults were reported from several localities of western Rajasthan and Banaskantha district of Gujarat and the maximum population was countless in one locality of Phalodi tehsil of Jodhpur district. A few solitary hoppers of II to IV instars were also detected from Jodhpur and Nagaur districts. Drought conditions prevailed in the desert areas.

Near East

13. One influx of adults was recorded on the east coast of the Sultanate of Oman in early November, and another in mid-November. In the United Arab Emirates a low density population was observed on the Batinah coast on 27 November and a group of immature adults was seen at Sharjah on 3 December.

14. In the People's Democratic Republic of Yemen scattered hoppers and adults continued to be reported until October. Scattered mature and immature adults were reported from several places on the Tihama of the Yemen Arab Republic in August and September 1973, but no breeding of any importance took place. In the People's Democratic Republic of Yemen a swarm of mixed maturity was reported from Al Ghaydah on 8 November and from Sayhut on 13 November, following a short spell of northerly winds starting on 8 November. Groups of adults of mixed maturity were reported in coastal areas between Shihr and Abyan, and in the interior from Thamud to Beihan during November. In the Yemen Arab Republic an immature swarm was reported from Sana'a on 26 November, and a group of immature adults was seen at Kahoda on 22 November. Two immature swarms were reported near the border with Saudi Arabia in the first week of December, one on the Tihama and the other in the interior. Due to drought conditions prevailing in the People's Democratic Republic of Yemen and failure of winter rains in Yemen Arab Republic, most of the locust populations moved further north with the exception of a small number of adults which concentrated in the cultivated fields and subsequently laid eggs. Low density hopper populations were detected during January and February 1974 in these areas with the exception of Wadi Shabia, Wadi Meifa, and Ahwar where thick concentrations of I to V instar hoppers were observed against which control had to be undertaken. Again in July, a rise in adult population and low density solitary hoppers were noticed in Qusayir and Sayhut over about 500 square kilometers. During the same period thick hopper concentrations including marching bands were observed in Wadis Tamnod and Sakhof. Hoppers and fledglings were also located at Mayfash and were controlled. Hoppers of all instars were further noticed at Al-Hamiyah, Atiq, Nisab and Markha against which control was organized. A rise in population of both adults and hoppers was noticed in August and control was organized where hopper concentrations were found. In September, large-scale infestations of first to fifth stage hoppers including bands were located in 600 square kilometers at Wadi Ramh, Wadi Markha, Wadi Diysur and Shaab Bainah. Low density hopper infestations were also located at Iain in about 40 square kilometers, at Ahwar in about 60 square kilometers and high density locust population of mature adults persisted along the eastern coast between Shuqra and Ahwar. Control was organized in all the above areas. In Yemen Arab Republic sudden rise in locust numbers was observed in July and by mid-August a loose yellow swarm covering about 20 square kilometers was observed and controlled. Again in September concentrations of early stage hoppers were observed over an area of 30 square kilometers in Wadi Habel and were controlled. Ecological conditions in the People's Democratic Republic of Yemen were very favourable and breeding continued till October, against which control had since been concluded.

15. In Saudi Arabia isolated and scattered adults were reported from Najran, Asir and the Jizan and Quinfida Tihamas in October/November 1973. However, groups were reported in December and by early January 1974 several mature swarms were seen on the Tihama as far north as Quinfida. Winter rainfall had produced suitable conditions for breeding on the Saudi Arabian Tihama and by late December gregarious breeding was in progress. During January a number of mature swarms of varying sizes and densities ranging from 2 to 6 square

kilometers were observed coming from the west into Quinfida and Jizan area. Due to favourable ecological conditions prevailing in this area, the swarms laid eggs in several installations resulting in heavy hopper infestation by the end of that month. Control operations by ground teams were initiated. In February, there were further reports of swarms, ranging from 3 to 4 kilometers in size, from the same area. At the same time a large number of hopper bands of varying sizes were reported all over the area. In order to cope with the situation, an aircraft was obtained from DLCO-EA to supplement the ground operations. This helped considerably, to control the infestation in time. Although no more swarms were reported during March in Saudi Arabia, hopper bands of high density continued to be found during the month in Quinfida and Jizan area against which control operations concluded by the middle of the month. By the end of March, there were only scattered locust populations present in Southern Tihama, Asir, and a few solitary locusts were also observed in Dawadmi, Hariq and Yanbou areas. During April and May, some concentrations of adults and hoppers were reported in Quinfida and Jizan areas and the same were controlled. Although the ecological conditions were favourable in most parts of Saudi Arabia, only a few scattered locusts were seen elsewhere. In July good rainfall was received; this was followed by increase in locust population along the Southern Tihama and a further influx of adults was reported in August. Conditions in general were very suitable for breeding.

16. In eastern Sudan scattered locusts were reported during October and November. In early December there was a sudden rise in population in parts of the coastal plains of Sudan. In the first week of December, large groups of copulating adults covering about 5.2 square kilometers and an egg-field were reported at Dabbat Salim in the Tokar Delta, and control measures began. There was a report of a swarm on 15 December at Khore Karora on Sudan-Ethiopia border where an egg-field was found and groups of adults as well as the same swarm were reported heading south-west across the border with Ethiopia on 17 December. Hopper bands were reported in January 1974 near Jebel Meithtub (17.45N-38.25E) and Tokar Delta against which control was undertaken. By the end of February concentrations of green and black I to IV instar hoppers were reported near Karora and isolated adults at Khor Ashat. In April infestations were reported in Tokar Delta area and Khore Balatat against which control was undertaken. With the exception of scattered locusts which continued to be observed in central and eastern Sudan from May to August the country remained free from any gregarious infestations. In Sudan during September groups of mature adults were observed over an area of 8360 hectares at Gash delta against which control was carried out. On 19 October a thin mature swarm covering 10 square kilometers was sighted at Hudaliya. Groups of immature adults were reported from Shababiet, Baashin, Nabwa and Futa area. At the same time I to V instar thin hopper bands were observed over an area of 160 square kilometers in river Atbara. Control was carried out in all the above areas.

17. Other countries of the region were reported to be free from any locust activity with the exception of a few scattered locust observed in south-eastern desert of the Arab Republic of Egypt in early February 1974.

Eastern Africa

18. No locusts were reported from Ethiopia until late September 1973 when scattered locusts were found in cultivated areas at Tendaho; hoppers and adults persisted there in small numbers until November. In late August and September isolated and scattered adults were found in many localities both west and east of Berbera and inland at Las Dawa, Meleden and in the Gardo district. In November small numbers of immature and mature adults were found at four places east of Berbera; in December a scattered population of adults was reported from Bosaso to Loyada and along the border with the French Territory of Afar and Issa Peoples.

19. In early December there was a sudden rise in populations found in parts of the coastal plains of both Sudan and Ethiopia. In Ethiopia there were two reports of swarms at Thio on 7 and 8 December, and three reports of mature swarms in the Gulbub area; one mature swarm covering 15.5 square kilometers was confirmed at Embere on 11 December. Egg-fields and hopper bands of first to second instar were found over 388 square kilometers on 8 December in

the same area and control began on 14 December.

20. In January and February bands and groups of hoppers of all instars and fledglings were reported from the southern Red Sea coastal plains of Sudan and the adjoining plains of Ethiopia. Extensive ground and air control was carried out in these areas. In March only small groups and scattered adults were found in this area, and subsequently there were no large populations in this region. On the southern Red Sea coast of Ethiopia, in the Railway area, the French Territory of the Afar and Issa Peoples and the north of the Somali Democratic Republic, scattered locusts were reported.

21. An unconfirmed report of a swarmlet at Samre in Ethiopia was received during the first week of June. On the 23rd of the same month, a loose swarmlet was found over an area of 5 x 3 kilometers at Gam Ceua. The infested area was sprayed and subsequent aerial surveys only revealed the presence of a few scattered locusts. During the months of July, August and September only scattered locust populations were found in Ethiopia and the northern region of the Somali Democratic Republic.

North Africa

22. From October to December 1973, no locusts were reported in Algeria. During the first three months of 1974, about ten solitary adults were reported in Wadis In-Ziga and Irharhar in the south of Algeria. An immature male and an immature female were also found. In August and September several solitary locusts were observed in the same area; amongst the fifty-three locusts found, twenty were near sexual maturity.

23. In October, in some of the wadis of the southern Sahara, which were partly covered with green "Sehoumia", the presence of numerous solitary locusts was observed. By mid-October five copulating pairs were noted in two places (Wadi Djouden and Wadi Agdem) whereas a low density population of young green hoppers was noted in an area of about 100 hectares in Wadi Icheed.

West Africa

24. During the first three months of 1973 and the first six months of 1974 the Desert Locust situation was very calm due to unfavourable ecological conditions. From July 1974 onwards there were good monsoon rains over the whole of the Sahara. Some low density mature adults and hoppers were observed in Niger, Mali and Mauritania. From 10 September onwards important concentrations of adults were found in South-West Mauritania as a result of the rapid descent of the Intertropical Front associated with cold fronts on the north-west of the Sahara. Exceptionally favourable ecological conditions made it possible for important breeding in three places in the Sahara (Eugnent, Boutilimit, Latfatar) where 20,320 hectares of gregarious hoppers and young solitary adults were controlled.

25. In addition, it rained in September and in the beginning of October on the borders of the Mauritanian Adfar and the south of the Spanish Sahara. During early November these areas had favourable ecological conditions for survival and breeding. Concentrations of adults and breeding on a small scale in a limited area were also observed in Mali (Adrar des Iforas) and in Niger (Tamesna).

26. Since the decrease in temperature was very marked from the beginning of October, the possibility of movement toward North Africa was remote. Even if there was no further rain, ecological conditions would remain favourable until the end of 1974 in all the areas of the Sahara which received the latest rains.

Summary of Important Features

27. During the period under review a potentially dangerous situation developed in the summer breeding areas of the Indo/Pakistan sub-continent and in the winter/spring breeding areas in the countries surrounding the Red Sea and the Gulf of Aden and Pakistan.

28. There had been late monsoon rains in the summer breeding areas along the Indo/Pakistan border in 1973. This resulted in concentration of the locust populations in a comparatively limited sector. Due to favourable ecological conditions in the above area, late summer breeding continued until November. In spite of control operations undertaken, a few swarms escaped and moved north-westwards. Some of these reached as far as Iran and others overwintered in the mountains of Baluchistan of Pakistan and in the adjoining area of Afghanistan. With the advent of spring rains, the locusts started breeding in Kharan, Pakistan and in the neighbouring area of Afghanistan. Prompt control operations were undertaken in both areas. In the beginning of summer 1974, escapes from the above areas together with populations present in Iran and in Mekran of Pakistan moved eastwards into the summer breeding area of India and Pakistan. Due to suitable ecological conditions present in the Indian desert, breeding took place on a fairly large area resulting in numerous hopper bands which were timely controlled and only scattered locusts were reported from August onwards. The Pakistan summer breeding area remained almost free because most of the populations were swept eastwards with the prevailing high winds during the month of June. In the central region, serious infestations occurred on both sides of the Red Sea during the spring of 1974 resulting in numerous hopper bands and swarmlets. Prompt control operations in this area and in the Indo/Pakistan sub-continent had prevented the onset of another Desert Locust plague. With the exception of gregarious infestations of both hoppers and adults, which had occurred during August, September and October 1974 in the People's Democratic Republic of Yemen and in the Yemen Arab Republic and in Sudan during September and October, other countries had only scattered populations except in Mauritania where important breeding took place during September/October 1974.

Forecast

29. In Pakistan, there was no significant summer breeding, whereas in India breeding took place on a considerable scale against which effective control was carried out. As such, from there only scattered adults were likely to move to the spring breeding areas of Pakistan and south-east Iran.

30. The only situation, which gave cause for concern, was that in south-west of the Arabian Peninsula. The People's Democratic Republic of Yemen received widespread and well distributed rains during the summer months. These created favourable conditions resulting in extensive breeding from July onwards against which control was organized. Substantial populations both of hoppers and adults were still present in the Republic and were likely to breed further due to prevailing favourable ecological conditions. It was likely that a good number of locusts including swarms might invade areas to its north and possibly some might even reach northern region of the Democratic Republic of Somalia and Afar and Issa Territory. Otherwise, large numbers of Desert Locust were unlikely to be found elsewhere in Eastern Africa.

31. The Desert Locust populations resulting from the breeding in the Sahara from the monsoon season are now present in certain breeding areas in the southern Sahara, especially in Mauritania and southern Spanish Sahara. Some of these populations might reach southern Morocco and possibly Algeria.

Exchange of information on current Desert Locust situation

32. The various regional organizations/commissions continued to prepare their monthly locust situation summaries and distributed them among themselves in addition to the circulation of such reports within their respective member countries. All important locust information was communicated directly by cables to the countries in the immediate neighbourhood. At the same time, for certain serious anticipated developments in the locust situation, special locust situation reports were issued both from Headquarters in Rome and also by the various FAO Regional Secretariats. The Committee expressed its satisfaction for the prompt exchange of information on locust incidents between the various countries and the regions.

33. Referring to the recommendations of the Sixteenth Session of the Committee (Report, paragraph 30) concerning continued supply of copies of locust situation reports by the countries concerned to COPR London, the Committee reiterated its earlier recommendation and noted that the United Kingdom delegate, recognizing the value of maintaining a complete record of sightings of Desert Locusts for research purposes, and wishing to make its experience in assessing locust situations available to FAO and the countries within the Desert Locust invasion area, offered to continue to provide the above service free for a further period of two years as of 1 July 1975 and to continue to help in training appropriate staff of the regional and national organizations when requested.

Control operations carried out against the Desert Locust during 1973/74

34. A number of countries namely : Afghanistan, Ethiopia, India, Iran, Mauritania, Pakistan, People's Democratic Republic of Yemen, Saudi Arabia, Sudan and Yemen Arab Republic were infested with hopper bands and/or swarms during the period under consideration. Extensive control operations were undertaken by national and regional organizations both from the air and ground. Details are given in Appendix I.

35. The Committee noted with great satisfaction that the serious situation which developed in the Indo/Pakistan sub-continent and the Red Sea coastal plains was brought under control by prompt action undertaken by national and regional organizations with appropriate coordination and assistance provided by FAO. It recommended that the present policy of strict vigilance and control should continue to be followed on an intensified scale in all the areas in order to keep the recession in being.

36. The Committee emphasized the need for continuous vigilance during the coming months in the winter-spring breeding area of the Arabian Peninsula, particularly Yemen Arab Republic and southern Tihama of Saudi Arabia and western Red Sea coastal plains. There was also need for keeping continuous watch over suspected breeding areas of Mauritania and adjoining parts of Spanish Sahara. Surveys of southern Algeria and Morocco were also considered necessary. It would also be necessary to keep adequate resources in readiness to deal with any large-scale populations and possibly swarms.

37. The Committee expressed its deep concern on the world-wide shortage of insecticides and the long delays which have occurred in procurement and deliveries due to scarcity of adequate stocks with the suppliers in developing countries. Scarcity of pesticides has already proved a great hindrance in carrying out anti-locust operations in some countries. If the present trend continues the supply position of locusticides is likely to be more precarious in the future. It is high time that immediate consideration be given to remedy this deteriorating supply position.

38. The Committee learned with interest that in view of the general shortage of fertilizers, the World Food Conference was considering the establishment of a reserve stock of fertilizers. Insecticides are an equally important input to ensure good harvest and FAO should give consideration to the inclusion of insecticides as a part of the above proposed fertilizer reserve.

Upsurge of the Desert Locust Populations in 1972/73

39. The Committee highly appreciated the study made by Dr. A.M.H. Karrar on the 1972/73 upsurge of the Desert Locust populations in the countries along the Red Sea and the Gulf of Aden area, and discussed in detail the circumstances that led to the upsurge and the effect of control operations undertaken by various national and regional organizations to suppress it at its initial building-up stage.

40. During the summer of 1972, concentrations of adult Desert Locust populations and groups of hoppers including marching bands were observed in the Red Sea coastal plains of Saudi Arabia and in the People's Democratic Republic of Yemen. In late October and November, two cyclones crossed the northern coast of Somali Republic and the Gulf of Aden in their

passage westwards from the Arabian sea resulting in widespread and heavy rains over the above areas and as far as the Afar and Issa Territory. In addition, it is believed, the cyclones might have been responsible for carrying locusts into northern Somali Republic coast and Afar and Issa Territory from areas in southwest Arabia.

41. Ecological conditions prevailing in the areas surrounding the southern part of the Red Sea and the Gulf of Aden before and during early winter months were suitable for the locust multiplication and the same took place rather rapidly. It appeared to be almost certain that the local populations in the above areas were augmented by the locusts which had bred and multiplied unnoticed in some areas of Oman and possibly in inaccessible areas bordering Saudi Arabia, the two Yemens and Oman.

42. The multiplication and development of the locusts under suitable conditions resulted in hopper bands and ultimately swarms. It was concluded that the control operations carried out against the above infestations by the various national and regional organizations contributed towards curbing the further spread of the plague. At the same time, the poor rains following the winter/spring period arrested the cycle of further multiplication which might otherwise have continued at a high rate.

43. The Committee noted that regular surveys during the appropriate seasons were vital for timely organization of control operations which might be necessary to suppress sizable populations. It would not be prudent to overlook scattered populations specially in areas of good rainfall, as such populations could rapidly build-up into large numbers with potential for initiating a plague in the next one or two generations.

44. The Committee recommended continued implementation of the present preventive policy of locust control to be followed in all the countries, if future upsurges of Desert Locust populations were to be avoided.

45. The Committee noted with interest that action had already been initiated for undertaking similar studies of such occurrences in other areas.

Progress Report on the Training Project

46. The Committee noted with satisfaction that the project was finally approved by the UNDP in March 1974 and the first Training Course was held in Nairobi, Kenya, from 17 June to 13 July 1974. The Course was attended by 28 trainees from nine countries namely : Ethiopia, Ghana, Kenya, Nigeria, Sierra Leone, Somali Democratic Republic, Sudan, Tanzania and Uganda with three participants from the Desert Locust Control Organization for Eastern Africa (DLCO-EA). A very comprehensive problem-oriented syllabus was followed for which crop protection specialists, having wide knowledge and experience in their own field of specialization, were invited to lecture (Appendix II). The various topics were carefully chosen in order to provide the trainees both with theoretical background and practical experience in all aspects of pest control methods so that they, on return to their respective countries, could implement crop pest control programmes more effectively and efficiently.

47. The lecturers invariably presented the subjects lucidly and made the same understandable to the trainees with different educational backgrounds and experience. The lectures included projection of slides and documentary films, and display of charts. Each lecture was followed by questions, answers and detailed discussions. In order to prompt questions and discussions, the lecture notes of individual lecturers and other background material from previous training courses and re-prints of individual subjects were distributed in advance to all trainees. Complete texts of all lectures had been compiled and were under publication.

48. The second Training Course was held in Teheran from 21 September to 20 October and was attended by 14 trainees from five countries namely : Afghanistan, India, Iran, Pakistan and Turkey. This course covered almost the same subjects as in the Nairobi course except pest problems which affected the participating countries and with more emphasis on field trips and practical demonstrations.

49. The first Training Course on Radio Operations and Maintenance had commenced in Beirut on 24 October. It was being attended by 29 trainees from 22 countries. Instructions for trainees in Arabic, English and French were prepared in advance. The course was designed to give practical training in operation and maintenance of the type of radio transmitters and receivers generally used by the countries for anti-locust network. The course was due to conclude on 23 January 1975.

50. Based on the nominations received from the various Member Governments, a six-week group fellowship tour for seven participants from six countries was arranged from 29 September 1974. The group visited the United Kingdom, Cairo and the Desert Locust Control Organization for Eastern Africa (DLCO-EA). Selection had already been made of six candidates for long-term and short-term fellowships covering various subjects. Their nominations were being processed by the Fellowships Branch.

51. The Committee expressed its gratification at the prompt implementation of the training programme and appreciated the benefits being derived by the participants.

Progress Report on FAO/SIDA and FAO/DANIDA Projects

FAO/SIDA Project

52. The project was planned in view of the necessity for a permanent coordinated programme of locust control, the increasing objections to the use of persistent insecticides and the need to plan ahead for a possible plague resurgence following a decade of locust recession. A further need for work of this type was due to the world-wide shortage of pesticides which had resulted in materials of preference not being available when they were most required. Persistent chlorinated hydrocarbon insecticides were still widely used for locust and grasshopper control throughout the developing world. If satisfactory alternatives could be found and demonstrated, the discontinuation of the use of persistent chlorinated hydrocarbon insecticides would help to diminish the occurrence of these materials in the environment.

53. The project was initiated in November 1971 and was now (1973) due to run for five years with a diminishing FAO involvement in 1977 and 1978. The project was financed by the Swedish International Development Authority (SIDA) who had provided funds for the specialized and sophisticated equipment necessary for this type of work. By June 1972 most of the scientific equipment had arrived and the excellent, specially designed laboratories were occupied in the new Headquarters building of the Desert Locust Control Organization for Eastern Africa (DLCO-EA) at Addis Ababa.

54. The Committee noted that there were many non-persistent insecticides which would readily kill locusts and the work of the project would enable the most suitable materials to be found and establish the best methods of their use. The problem was, however, much greater than that implied from purely toxicological considerations as it was the actual persistence of the chlorinated hydrocarbon insecticides which made them so valuable in locust control operations. In fact a change over to less persistent insecticides might affect the whole basis of modern locust control which had been built up during the last 10-15 years by the appropriate regional and international organizations.

55. Tests with a number of insecticides to act as contact poison had been completed within the project. Chlorphosphos and cyanophos were available in suitable formulations and were equally or more toxic than fenitrothion. Propoxur and bendiocarb were just as toxic but formulations suitable for locust control had yet to be tested. Pirimiphos-methyl was less toxic than fenitrothion whilst the toxicities of hostathion, a carbaryl formulation, and leptophos were too low to justify further investigation. A report of this work was in preparation.

56. Effective insecticides for baiting were tested in relation to toxicity and speed of action of laboratory prepared baits to first and fifth instar nymphs and effectiveness of the insecticides after storage of the bait. The conditions of storage were designed to give an accelerated picture of what would happen to baits stored under tropical conditions. Gamma-BHC, as the standard, cyanaphos, fenitrothion and phoxim were tested. Even when

freshly prepared Gamma-BHC was more rapid in its action at the same concentration of active ingredient (0.1%) chemical estimations by gas chromatography showed that cyanaphos deteriorated rapidly under the conditions of storage as did fenitrothion, although less rapidly. Phoxim, however, remained fairly stable although it did appear to be less toxic after storage for 10 weeks at 50°C when offered to locust nymphs.

57. Work on insecticides which were persistent enough to act as stomach poisons when sprayed on vegetation, was in progress. Short reports on this had already been issued and published in the Technical Series.

FAO/DANIDA Project

58. The project was designed for monitoring of pesticides residues in areas sprayed for control of the Desert Locust. Four countries namely : Afghanistan, India, Iran and Pakistan were being covered under the project with its base at Teheran, Iran. DANIDA had provided a total amount of US\$ 309,624 for a period of three years (October 1974 to September 1977). Equipment needed for the project was ordered in advance and most of it had already arrived. An Insecticide Chemist had been appointed and he had joined his duties in Teheran on 12 October.

Status of the various Desert Locust Regional Organizations

Commission for Controlling the Desert Locust in North-West Africa

59. The Third Session of the Commission and the Second Session of its Executive Committee were held in Algiers, Algeria from 20 to 23 May and 15 to 17 May, respectively.

The Commission :

- (a) noted with satisfaction that the control operations undertaken in South-West Asia, Near East and Eastern Africa had enabled the existing recession in locust populations to be kept in being. It, however, recommended that strict vigilance should be kept and adequate resources maintained to face any eventuality;
- (b) requested FAO to secure additional assistance for OCLALAV, as the efficient functioning of this organization was of vital interest to North-West Africa, which was normally invaded from countries south of the Sahara;
- (c) emphasized the need for joint surveys;
- (d) requested FAO to prepare a manual on organizational and administrative matters related to the control of the Desert Locust and at the same time to prepare a complete bibliography for the research work done within the region in order to facilitate preparation of future research programmes.

60. The Committee drew attention to the recommendation made at the Third Session of the Commission for Controlling the Desert Locust in North-West Africa (Report, paragraph 19) and recommended that strengthening of OCLALAV was in the overall interest of the Desert Locust invasion area as a whole. It requested FAO and possible donor countries and organizations to consider providing necessary assistance in the form of insecticides and equipment so urgently needed by OCLALAV.

Commission for Controlling the Desert Locust in the Near East

61. The Fifth Session of the Commission was held in Jeddah, Saudi Arabia, from 12 to 16 September, preceded by a three-day Session of its Executive Committee.

The Commission :

- (a) noted with satisfaction that the timely action taken by the various national organizations assisted by FAO had once again avoided the chances of initiation of a new plague, thus saving the countries in the Near East and elsewhere from the devastation of the Desert Locust;
- (b) made several recommendations on field research programmes and emphasized the need for exchange visits between various research workers of the field research stations in the region;
- (c) approved the programme of work and budget for 1975 and accounts for 1973;
- (d) recommended to undertake special surveys in the Tihama of Saudi Arabia and in Oman by deputing locust officers from various member countries in the region;
- (e) decided that the Government of Saudi Arabia should purchase three aircraft to assist in survey and control operations. The Commission would help in recruiting appropriate staff and in actual operations. For this purpose, the Government of Saudi Arabia would provide additional funds over and above its annual contribution. The Commission requested FAO to prepare an appropriate project for submission to the Government of Saudi Arabia for its consideration and approval.

62. The Committee welcomed the proposal concerning establishment of an aerial unit for anti-locust operations by the Government of Saudi Arabia. This was regarded as a great step forward in intensification of locust control operations in one of the most strategic areas. The Committee considered it as a very valuable contribution by the Government of Saudi Arabia, from which not only Saudi Arabia but the entire Near East region would derive benefit.

Commission for Controlling the Desert Locust in the Eastern Region of its Distribution Area in South-West Asia

63. The Ninth Session of the Commission was held in Rome from 10 to 13 December 1973 and was preceded by a three-day session of its Executive Committee.

The Commission :

- (a) noted that there was a sudden development of locust populations during the months of September/October which resulted in the formation of small swarms and hopper bands and further noted that the countries concerned had undertaken appropriate measures and the situation was brought under control. Nevertheless, a few scattered swarms were still present in certain areas, against which the control operations were in progress. It was anticipated that some of the infestations which resulted from late breeding in India and Pakistan might overwinter in the same area and start breeding in early spring;
- (b) made several recommendations on field research programmes and in particular emphasized the need for continuing research of applied nature;
- (c) approved programme of work and budget for 1974 and 1975/1979, and accounts for 1971 and 1972;
- (d) made special arrangements for a survey of some of the strategic breeding areas along the Indo/Pakistan border where a rapid multiplication of populations resulted during 1973;
- (e) recognizing the importance of special surveys it was recommended that this work should be continued.

64. The next Session of the Commission was scheduled to be held in November 1974 and its main recommendations would be reported to the Nineteenth Session of the Committee.

Desert Locust Control Organization for Eastern Africa (DLCO-EA)

65. The organization continued to operate with its usual efficiency and successfully controlled the serious infestations during 1973/74 in its area. At the same time, it provided its spraying aircraft for operations in Saudi Arabia. This could only make possible the timely control of dangerous locust populations in that country. FAO continued to maintain good relations with DLCO-EA in matters of common interest.

Organisation Commune de Lutte Antiacridienne et de Lutte Antiaviaire (OCLALAV)

66. FAO maintained its interest in OCLALAV and supported an FAO/UNDP small-scale regional project to assist the organization (OCLALAV) in matters of field research. This project had been extended until July 1976. FAO was represented as usual at the 1974 Annual Session of the Administrative Council of OCLALAV.

Regional Officers

67. The Committee appreciated the contribution made by the FAO Regional Locust Officers in coordination of work of survey and control in their respective regions and in relation to rapid exchange of information on locust situations between the various regions and countries. The continuation of these posts was considered vital for the successful implementation of the Desert Locust programme.

68. Having learnt with regret that the UNDP would not continue supporting the Regional Officers' posts beyond 1975, the Committee requested the Director-General of FAO to include these posts in the Regular Programme from 1976 onwards as recommended by the Seventeenth Session of the FAO Conference (Report, paragraph 209). While considering the possibility to meet the cost of these posts from the respective Desert Locust Trust Funds, the Committee made it clear that the various Trust Funds were hardly sufficient for training, supplies, equipment and various other operational needs and Governments were not prepared to increase their contributions to cover the cost of these posts.

International Desert Locust Trust Fund - 9161

69. The Committee examined the statement of accounts for the year ending 31 December 1973, as given in Appendix III and considered it in order.

70. It was agreed that the Budget as approved by the Fourteenth Session of the Committee (Appendix IV) should be maintained with a provision that the Director-General of FAO could change, if need be, the allocation of sums allotted to different chapters within the limits of the total budget.

71. The Committee noted that the contributions (Appendix V) of a number of Governments were in arrears and requested the Director-General to approach them for making payments at an early date.

DATE AND PLACE OF NEXT SESSION

72. The Committee recommended that the Director-General of FAO should convene the next Session of the Committee, possibly in October 1975, at a place and date to be determined by him.

APPENDIX I

ANTI-LOCUST MEASURES UNDERTAKEN BY VARIOUS COUNTRIES AND REGIONAL ORGANIZATIONS (FROM OCTOBER 1973 TO OCTOBER 1974)

LOCALITY	MONTH AND YEAR	TYPE OF INFESTATION (SWARMS, SCATTERED ADULTS, HOPPERS)	INFESTED AREA IN SQ. KMS.	INSECTICIDE USED				METHOD OF APPLICATION (AIR OR GROUND)
				BHC DUST IN KGS.	MALA-THION ULV	BHC DIELDRIN	OTHERS IN LIT.	
<u>Afghanistan</u>								
Shorawak (Kandahar Province)	May-June 1974	Adults, Hoppers	2.35 (net)	3975	-	-	-	Ground
<u>India</u>								
Bikaner	June-Aug 1974	Hoppers	3400	13075	-	-	-	-do-
Jaisalmer	Oct-Dec 1973	Swarms, Adults Hoppers	10500	61785 + 10 kgs. 50% W.P.	70	7305	349	Air and Ground
Jaisalmer	July 74	Hoppers	60	1550	-	-	-	Ground
Jodhpur	June-July 1974	Hoppers	350	7750	-	920	-	Air and Ground

LOCALITY	MONTH AND YEAR	TYPE OF INFESTATION (SWARMS, SCATTERED ADULTS, HOPPERS)	INFESTED AREA IN SQ. KMS.	INSECTICIDE USED				METHOD OF APPLICATION (AIR OR GROUND)
				BHC DUST IN KGS.	BHC MALATHION ULV	BHC DIELDRIIN	OTHERS IN LIT.	
Ganganagar	July-Aug 1974	Hoppers	3000	9950	-	-	-	Ground
Iran								
Baluchistan Bendar Abbas Kerman	Nov. 73- May 74	Swarms, Adults, Hoppers	100	1670	-	987	-	-do-
Pakistan								
Rahimyar Khan Khairpur Bahawalpur deserts	Sept.- Dec. 73	Swarms, Adults, Hoppers	18588	79140 (12%) 1820	-	998	554	Air and Ground
Baluchistan	Jan-June 1974	Swarms, Hoppers	22070	5573 (12%) 1740	-	27795	5110	-do-
Bannu Dist. (NWFP Prov.)	-do-	Adults, Hoppers	415	-	-	545	-	-do-
People's Democratic Republic of Yemen								
Wadi Sohabia 1310N4505E	Jan. 1974	Hoppers I-V	1/50	100	-	-	-	Ground
Wadi Meifa 1415N4730E	Jan. 1974	Hoppers I-V	1/25	150	-	-	-	-do-
Ahwar 1325N4643E		Hoppers I-V	1	1500	-	-	-	-do-
Mayfaah	July 1974	Fledglings and Hoppers I-V	4	1500 1000 (Bait)	-	-	-	-do-
Sayhut, Wadi Tamunn	Aug. 1974	-do-	50	2500	-	200	-	-do-
Nisab Markha	Aug. 1974	-do-	75	5000 7000 (Bait)	-	60	-	-do-

LOCALITY	MONTH AND YEAR	TYPE OF INFESTATION (SWARMS, SCATTERED ADULTS, HOPPERS)	INFESTED AREA IN SQ. KMS.	INSECTICIDE USED				METHOD OF APPLICATION (AIR OR GROUND)	
				BHC DUST IN KGS.	MALA-THION ULV	BHC IN OIL	DIELDRIN IN LITRES		OTHERS IN LIT.
Wadi Arma, Shabwa	Aug. 1974	Fledglings and Hoppers IV-V	2	-	-	-	40	-	Ground
Al-Hamiyah	Aug. 1974	Fledglings and Hoppers III-V	2	400	-	-	-	-	-do-
Markha, Rumbh, Diysur, Sheah	Sept. - Oct. 1974	Hoppers		8,500	-	600	-	-	-do-
Bainah	-do-	-do-		5,000 (bait)	-	-	-	-	-do-
Iain	-do-	-do-		1,500	-	-	-	-	-do-
Ahwar	-do-	-do-		2,000	-	-	-	-	-do-
Saudi Arabia				1,500 (bait)	-	-	-	-	-do-
Quinfida	Feb. 74	Adults, Swarms Hoppers		-	5400	-	5000	-	Air
Jizan	Feb. 74	-do-	10,000	-	1280	-	3840	-	Air and Ground
Quinfida and Jizan	March 1974	-do-		-	-	-	2800	-	-do-
Quinfida and Jizan	Feb. March Apr. 74	-do-		90,000	-	-	-	-	Ground
				100,000 (Bait)	-	-	-	-	
Sudan									
Red Sea Coast	Nov. 73- March 74	Adults, Hoppers		960	1728	-	-	-	Air and Ground
Tokar Delta				13160 (Bait)	-	-	-	-	
Kassala and Nile Provinces	Sept./Oct. 74	Adults, Hoppers, Swarmlets		650 (Dust)	600	-	2,000	-	-do-
Ethiopia				30,000 (Bait)	-	-	-	-	
	Dec. 73	Hoppers		-	-	3456	2,795	-	Air
	Jan. Feb. 74	-do-		-	-	2910	4,007	-	Air and Ground
Yemen Arab Republic									
Wadi Habel	July 74	Adults, Hoppers	6	100	-	-	-	-	Ground
-do -	Aug. 74	-do-	26	200	-	-	50	-	-do-
				800 (Bait)	-	-	-	-	

SYLLABUS

<u>1974 Date</u>	<u>Lecture No.</u>	<u>Topic of Lecture</u>	<u>Lecturer</u>
17 June		Registration and Briefing, Opening of the Course by Mr. D.M. Thairu, Chief Research Officer of the Ministry of Agriculture of the Government of Kenya and Vote of Thanks by Mr. C.H.H. ter Kuile, FAO Senior Agricultural Adviser, on behalf of the Director-General of FAO.	
		- Break -	
	1	FAO's role in national, regional and international co-ordination of Locust Control and Research	G. Singh
		- Film Show -	
		- Discussion -	G. Singh
18 June	2	Orders and families of major insect pests of economic importance, and use of keys for identification of major insect groups	N. Jago
		- Discussion -	
		Identification with keys of the immature stages of insect pests	N. Jago
19 June	3	Modern Concepts of crop pest management	H. Huque
20 June	4	Airborne insects and the atmospheric environment	R.C. Rainey
		(a) Introduction	
		- Discussion -	
	5	(b) Physiology and behaviour of flying insects	R.C. Rainey
	6	(c) Migration and wind systems : ecological aspects	R.C. Rainey
		- Film Show -	
		- Discussion -	
	7	(d) Tactics and strategy of control of migrant pests	R.C. Rainey
		- Discussion -	
21 June	8	Development and operation of a forecasting service for migrant pests with special reference to the African Armyworm	P.C. Odiyo R.C. Rainey
		- Discussion -	

	9	The organization of training to ensure that the most appropriate communication techniques are used in order to achieve the desired results	Mrs. M. Needham
		- Discussion -	
	10	Survey methods and sampling of crop pest population	W.H. Lange
22 June	11	Desert Locust Survey Techniques and estimation of population	G. Popov
	12	Trapping techniques as employed for population studies and control	W.H. Lange
		- Discussion -	
23 June		S U N D A Y	
24 June	13	Principles of crop loss assessment	W.H. Lange
		- Discussion -	
	14	Evaluation of pre- and post-harvest damage by crop pests	W.H. Lange
		- Discussion -	
	15	Agro-ecosystem and integrated pest control methods	R. Gonzalez
25 June	16	Natural Mortality factors	R. Gonzalez
	17	Insect resistance to pesticides	R. Gonzalez
		- Discussion -	
26 June		FIELD TRIP to East African Agriculture and Forestry Research Organization, Muguga, Kenya	L.A.W. Hayward R. Gonzalez S.S. Pruthi
27 June	18	Selection of Insecticides for insect control and control of the Desert Locust	R.D. MacCuaig
		- Demonstration and discussion -	
	19	Toxicity, safe handling and storage of insecticides	R.D. MacCuaig
		- Discussion -	
28 June	20	Insecticide residues and unintended effects	R.D. MacCuaig
		- Discussion -	
		Practical insecticide formulations, dosing and handling of pesticides	R.D. MacCuaig
		FIELD TRIP to National Laboratories (Demonstration and talks on analytical equipment for residues determination)	

29 June	21	Classification of insecticides and their uses against various crop pests - Discussion - - Film Show -	W.W. Waihenya
30 June		S U N D A Y	
1 July	22	Economics and decision-making to launch control operations against pests of economic importance - Discussion -	T.A. Taylor
	23	Integrated pest control methods and their field applications	T.A. Taylor
2 July	24	Cultural behaviour control methods including development of pest resistant varieties - Discussion -	T.J. Crowe
3 July	25	Biological, microbial and other control methods against crop pests	T.J. Crowe
	26	Integrated control of coffee pests	R. Bardner
4 July	27	Rearing techniques and breeding of insect pests in the laboratory - Film Show - - Discussion - Practical demonstration on rearing techniques of parasites and predators	M.S. Hassanein T.J. Crowe W. Mathenge
5 July	28	The economic importance of crop storage - Film Show - - Discussion - - Demonstration -	L.A.W. Hayward
	29	Research into the control of grain-eating birds in Africa - Discussion -	J. Jackson
	30	Vertebrate pests - rodents and birds nuisance to agriculture and their control	H. Huque
6 July	31	Plant quarantine, its importance and impact on international trade, including phytosanitary regulations	G. Berg
	32	Organisation, logistics, administration and evaluation of large-scale pest control campaigns - Discussions - - Films -	C. Ashall

7 July		S U N D A Y	
8 July		Practical demonstration of, and discussion on plant protection equipment such as sprayers, dusters, fumigators, fogging, ULV applicators and granular applicators	G. Mathews C. Ashall
9 July		As for 8 July, including lecture on maintenance of equipment	G. Mathews C. Ashall
10 July	33	Locusts - past and present; the biogeographic basis of warning services and control organizations	E. Betts
11 July	34	Organization and management of aerial spraying and other salient features such as logistic support	D. Yeo
		- Discussion -	
	35	Assessment of droplet distribution and coverage of target surface	D. Yeo
		- Discussion -	
12 July		Demonstration on application equipment, calibration, use and maintenance of aerial equipment	D. Yeo L.A.W. Hayward M.S. Hassanein
13 July	36	Selection of aircraft for aerial crop spraying according to crop density, topography and ecological conditioning	D. Yeo
		- Discussion -	
14 July		S U N D A Y	
15 July	37	Important crop pests and selected problems affecting the region	J.N. Waiyaki
		- Discussion -	
	38	Important crop pests and selected problems affecting the region	T.R. Odhiambo
		- Discussion -	
	39	Important crop pests and selected problems affecting the region	J.W. Oloo
		- Discussion -	
16 July	40	Important crop pests and selected problems affecting the region	G. Buahin
		- Discussion -	
17 July		General discussion and outcome of the Training Course	
18 July		Winding up the Training Course and award of certificates	

APPENDIX III

TRUST FUND 9161 - INTERNATIONAL DESERT LOCUST CONTROL

Statement of Account as at 31 December 1973 (Final)
(expressed in US dollar equivalents)

Receipts

Balance as at 1 January 1973		249,990.41
Receipts	97,036.62	
Interest credited	<u>7,990.57</u>	<u>105,027.19</u>
		355,017.60

Deduct :

Cash Expenditure 1973

Personal Services	5,214.29	
Official Duty Travel	27,110.13	
Contractual Services	5,790.31	
General Operating Expenses	460.90	
Supplies and Materials	4,666.79	
Furniture and Equipment	11,740.16	
Acquisition and Improvement of Premises		
Fellowships, Grants and Contributions	<u>13,545.89</u>	
	68,528.47	
Project Servicing Costs 14%	<u>9,593.98</u>	<u>78,122.45</u>
Balance as at 31 December 1973		<u>276,895.15</u>

APPENDIX IV

INTERNATIONAL DESERT LOCUST TRUST FUND 9161
ANNUAL BUDGET 1 JULY 1971 ONWARDS

<u>Code</u>		<u>US\$</u>
10	<u>Personal Services</u>	
	Research projects, lecturers advisory visits, technical editors, etc.	10,000
20	<u>Travel on Official Business</u>	
	Research projects, advisory visits	15,000
30	<u>Contractual Services</u>	
	Research projects, publications and miscellaneous	30,000
50	<u>Expendable Supplies</u>	
	Research material	4,100
60	<u>Equipment</u>	
	Research and demonstration equipment	5,000
80	<u>Fellowships and Training</u>	5,000
90	Projects Service Costs (approximate) 14%	9,674
		<u>78,774</u>
	Unallocated Balance	<u>2,142</u>
		<u>80,916</u>

APPENDIX V

TRUST FUND 9.161 - INTERNATIONAL DESERT LOCUST CONTROL

Pledge Position as in October 1974

	Outstanding Contributions						TOTAL DUE
	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	
Afghanistan	-	-	-	-	1,910.00	1,910.00	3,820.00
Algeria	-	-	-	-	195.12	2,580.00	2,775.12
Bahrain	-	-	-	-	-	-	-
Chad	-	-	-	1,200.22	1,800.00	1,800.00	4,800.22
Egypt	-	-	-	-	3,920.00	3,920.00	7,840.00
Ethiopia	-	-	-	-	-	2,180.00	2,180.00
France (Somali)	-	-	-	-	-	420.00	420.00
Ghana	-	-	-	-	126.48	1,950.00	2,076.48
India	-	-	-	-	-	-	-
Iran	-	-	-	-	-	3,690.00	3,690.00
Iraq	-	-	-	-	-	-	-
Jordan	-	-	-	-	-	1,730.00	1,730.00
Kenya	-	-	-	-	-	1,800.00	1,800.00
Kuwait	-	-	-	-	-	420.00	420.00
Lebanon	-	-	-	-	-	1,350.00	1,350.00
Libya	-	-	-	-	-	-	-
Mali	1,800.00	1,800.00	1,800.00	1,800.00	1,800.00	1,800.00	10,800.00
Mauritania	-	-	-	-	1,101.27	1,720.00	2,821.27
Morocco	-	-	-	-	-	(404.24)	(404.24)
Niger	-	-	-	-	-	30.37	30.37
Nigeria	-	-	-	3,650.00	3,650.00	3,650.00	10,950.00
Pakistan	-	-	-	-	-	5,860.00	5,860.00
Qatar	-	-	-	-	-	-	-
Saudi Arabia	-	-	-	-	-	1,830.00	1,830.00
Senegal	-	-	-	-	-	888.31	888.31
Sierra Leone *	-	-	-	-	-	-	-
Somali Republic	-	-	-	-	-	-	-
Spain	-	-	-	-	-	-	-
Sudan	-	-	-	-	-	2,250.00	2,250.00
Syrian Arab Republic	-	-	-	297.78	2,010.00	2,010.00	4,317.78
Tunisia	-	-	-	-	-	1,990.00	1,990.00
Turkey	-	-	-	-	-	283.00	283.00
Uganda	-	-	-	-	-	-	-
Yemen	1,840.00	1,840.00	1,840.00	1,840.00	1,840.00	1,840.00	11,040.00
People's Democratic Republic of Yemen*	-	-	-	-	-	-	-
TOTAL : \$	3,640.00	3,640.00	3,640.00	8,788.00	18,352.87	47,497.44	85,558.31

* Sierra Leone and the People's Democratic Republic of Yemen have paid token contributions of \$981 (\$400) (1973) (Sierra Leone) and \$240 for 1968/69 and 1969/70 (PDR Yemen)

List of Working Papers

- AGP:LCC/74/1 - The Desert Locust Situation during 1973/74
- AGP:LCC/74/2 - Anti-locust measures undertaken by various countries and regional organizations (October 1973 to September 1974)
- AGP:LCC/74/3 - Study of the 1972/73 upsurge of the Desert Locust (*Schistocerca Gregaria*, Forsk) and the effect of the control operations undertaken by national and international organizations
- AGP:LCC/74/4 - Progress report on the Training Project (Report No. UNDP/DI./TC/1)
- AGP:LCC/74/5 - Progress Report on FAO/SIDA and FAO/DANIDA Projects
- AGP:LCC/74/6 - Trust Fund 9161 - Contributions and Expenditure
- AGP:LCC/74/7 - Status of various Desert Locust Regional Organizations
- AGPP:MISC/16 - Background Paper - Pesticides (Chapter 4-c)