

The Locust Problem in Ethiopia  
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by

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SUMMARY

An unusual build-up of pests has occurred in Africa this year in response to the growth of vegetation and crops, and favorable weather conditions. In Ethiopia, grasshopper populations have increased considerably. This has caused concern for crop loss in certain areas in the northern part of the country, but the dispersal of pesticides and spray equipment to farmers is proceeding. There has also been confusion between grasshopper and locust infestations, but in general, the earlier desert locust infestation in the coastal region has been controlled, and now more effort is being directed toward control of grasshoppers. In-country survey teams (aerial and ground) are still on the alert for any sign of a build-up of locusts. Over the short-term (4-5 months), locust and grasshopper problems can be responded to and can be controlled. The most important concern now should be the long-term efforts that will be needed to secure an effective control program for migratory pests in this country.

I. BACKGROUND

A. Introduction

This report reviews the present situation with regard to locusts in Ethiopia. Control operations and the progress made so far will be discussed and recommendations will be made regarding future efforts. It is important to note that this report is based only on analysis of existing field surveys and discussions held over a few days in Addis Ababa with representatives of the Crop Protection Department of the Ministry of Agriculture (MCA), the Desert Locust Control Organization (LLCO), FAC, USAID and various voluntary organizations. Personal field work was not possible during the

short time involved; therefore field observations were limited to one author's recent field experience in the area around Kassala in the Sudan. The authors would also like to state that the views expressed are their own and should not be construed as those of the United States Government or any of its agencies.

The locust most often referred to in this report is the desert locust. The biology of this insect is summarized in Appendix 1. In addition to this species, the African migratory locust (Appendix 2) and several species of grasshoppers are of economic importance in Ethiopia. Tree locusts also occur here, but are not considered an important pest.

The main control efforts used to control locusts are aerial and ground spray applications, as virtually no biocontrol or effective mechanical method of control are yet known.

#### B. Coastal Region

The major locust activities in Ethiopia occurring this year were located in the four northern provinces (Figure 1). Early reports this year (July 1956) indicated a locust infestation along the Red Sea coast north of Massawa (Figure 2) in the region between Imberimi and Kemechiwa. This infestation was not dense, but it did cover 3,000 sq. km and consisted of mixed populations of non-swarming desert locusts, African migratory locusts and grasshoppers. Grasshoppers were also reported inland from the coast at Nakfa. By early August, the DLCO had sprayed the area covering 2,400 sq. km of the infested region. From July through mid-August, an MOA ground team had sprayed 1,500 hectares in this region.

On August 18 a helicopter survey from Asmara to Afabet and a ground survey in Afabet-Kemechiwa (40 km) revealed only a very small concentration of solitary locusts (5-7 per hectare). Some ground spraying was carried out in this area, and later, on August 24, ground surveys between Asmara and Massawa provided no evidence of either locusts or grasshoppers.

As of the beginning of September, the DLCC believes that the locust situation in the coastal region is largely in hand. It intends to resurvey this area in October, but it feels now that any existing bands of locusts have moved to their summer breeding ground in the west (hence the reports of hoppers in western Eritrea, see below).

It is assumed that locust bands will now begin their return move from these summer breeding grounds in the west back across Eritrea and Tig'ay to the coastal region to their traditional winter breeding grounds (see desert locust migration patterns and breeding grounds in Figure 3).

### C. Western Eritrea

In addition to the grasshoppers reported at Nakfa in July, locusts were reported in western Eritrea south of Aligidet near the Sudan/Ethiopia border (Figure 2). An aerial survey was carried out August 20 from Asmara to Teseney in western Eritrea. This last town is near the Sudan/Ethiopia border just north of the region where locusts were sighted. Such aerial surveys are useful for spotting locust swarms (small, medium or large) over large areas. However, it is not possible to detect solitary adults or hoppers from the air. Therefore a ground survey was carried out. This survey (11 km to the south of Teseney near Aligidet) revealed negligible locust infestations, but high densities of grasshoppers. Meanwhile, on the other side of the border at Kassala, fifth instar desert locusts (hopper stage) were found marching out of Eritrea into Sudan. This region (52 sq. km around Malasse and Hafra) has been treated in Sudan with ground spraying and baiting, and control programs are still in operation. On September 1, a medium density population of desert locust was found due east of Kassala, about 5 km from the Sudan/Ethiopia border, and it was subjected to ground treatment (Dr. Schaefer's, personal observation).

The DLCC and FAC now feel that the locust situation in Eritrea cannot be considered alarming. Dangerous population build-ups during winter breeding (beginning in November) cannot be excluded. But it is predicted that the general migration pattern (Figure 3) will lead any potential locust swarms back to the coastal region, and it is there that the next control effort should be concentrated.

### D. Tigray-Gonder Region

Several surveys have been conducted in this region, all necessarily of a limited duration because of the inaccessibility and security risks in some sectors. These surveys are summarized as follows:

1. 20-25 August- MCA ground surveys and limited spray operations were made around Rama, Dalol, Chercher/Koreq and Shehet where some armyworms, grasshoppers and tree locusts were found.
2. 22 August- A helicopter survey from Asmara to Humera in western Gonder and ground team survey from Humera to Cmhaber (8 km) found only grasshoppers (5 per sq. meter).
3. 25 August- Helicopter and ground surveys were made from Abderabi up to 10 km south found grasshoppers on grassland (20-30 per sq. meter).

4. 26 August- Helicopter and ground surveys of the Genda-Waha area revealed no locusts or grasshoppers.

In general these few surveys indicate a predominance of grasshoppers rather than locusts. Much of the crop damage, for example, reported by the ICRC in Inderta Awiaja in Tigray could not specifically be traced to locusts. And recently the MOA has determined that there has been an unprecedented upsurge in grasshopper activity throughout all provinces this year. They especially point to the high grasshopper densities seen in Shoa region, the Wollo highlands and the area around Teseney (near the Sudan/Ethiopia border). The senior entomologist at the MOA has commented that there has not been a preponderance of locusts in Ethiopia for the past eight years. How many people are identifying grasshoppers as locusts, but most of the specimens that are brought to him are definitely grasshoppers. He also made the point that any locusts existing in the Tigray-Gonder region are probably solitary specimens. If large locust swarms existed there, the general effect on local people is unmistakable; it is virtually impossible for large swarms (and the damage they cause) to go unnoticed.

## II. SURVEYS AND THE RELIABILITY OF INFORMATION

At present, several organizations are supplying information and carrying out surveys relative to the locust situation; for example, the MOA, FAC, DLCC and PVCs (especially OXFAM and ICRC). The information varies from informal observations of individual insect sightings and insect damage reports, to aerial surveys carried out by the MOA or DLCO using helicopters or fixed-wing aircraft. These last are very useful for spotting locust swarms. However, the actual quantitative assessment must still be done on the ground.

It is possible to assess the amount of green vegetation present as an indicator of potential locust substrate and/or damaged vegetation as evidence of locust activity using remote sensing imagery. However, this does not exclude other major pests, such as armyworm and grasshoppers, and it also requires ground truthing.

To date, the most accurate survey work has been carried out by the ground survey teams of the MOA and DLCO. The mobilization of the MOA/FAO Ground Survey/Control Teams will be a decided asset in this work. These teams will consist of a self-contained unit with 10-12 personnel, one Land Rover, one pick-up, and one Bedford truck to carry camping equipment, pesticides and application equipment. The teams will receive training from the DLCO. The MOA with the help of FAO will be producing an Operational Plan for these teams toward the end of September. Two teams will be mobilized shortly using recently donated equipment, and three teams will be assembled later, in 1987.

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One of the most important problems in the survey work carried out so far has been the correct identification of the insect species involved. There has been a great deal of confusion especially when grasshoppers are mistaken for locusts. Fortunately the MOA has a valuable resource in Addis in the office of the Chief Entomologist. In this case the MOA has access to a good, well-kept collection of reference materials. They also have personnel in that office with the technical background necessary for the job of proper identification. The DLCC headquarters, which is close-by, also has several staff members who have a large amount of practical experience in this field. Much of the confusion and misidentification could be avoided if a uniform reporting system were set up and used by all parties concerned.

In spite of all the survey work on locusts done so far, there is still one area from which little or no information is available. This is the rectangle shown in Figure 2, bounded by Teseney, Aksum, Lalibela and Gonder. Because of difficult terrain and security risks in the area, the only practical means of gathering information may be the use of questionnaires to assess the present locust situation. Some voluntary agencies have already handed out a simple format questionnaire (Appendix 3) that may meet with some success. These forms, once filled out, are to be returned along with specimens of the pest. Unfortunately, nothing has been received so far by the voluntary agencies because of a misunderstanding about the procedure used in returning the forms. However this technique will provide valuable information, especially if the forms can be redesigned by the MOA and then sent out accompanied by a simple pictorial pamphlet from the DLCC describing the insect pests concerned.

### III. LOCUST CONTROL

#### A. Background

In Ethiopia, non-migratory agricultural pests are the responsibility of the farmer. The MOA assumes responsibility for all migratory pests and normally provides cost-free service for their control. Among the migratory pests, armyworm and quelea bird are considered of most importance. Locusts receive attention only during times of outbreak or when large infestations arrive from outside the country. This year because of the unusual outbreak of grasshoppers, the MOA is providing chemicals and application equipment to the farmers at no cost, even though the grasshopper is considered a non-migratory pest. Because grasshoppers have been identified as a pest of major concern in the Eritrea-Tigray-Gonder region, the MOA plans to provide chemicals (fenitrothion, malathion and diazinon) and backpack sprayers to farmers in this region.

Some materials have been air transported to farm centers in the region, but some observers feel that there still is a problem in terms of farmer training in the proper use and handling of pesticides. There are also many logistical problems in transport and distribution of pesticides and application equipment in this region.

Where locusts are concerned (e. g., the Red Sea coastal region), the MOA provides pesticides, equipment and supervision to farmers free of charge. For the most part, however, locust control operations are primarily in the hands of the DLCO. During the DLCC locust control effort along the coastal region in August, a barrier spray was applied along with the usual target spray. This barrier spray is done in order to restrict the movement of locusts within the spray area. During July and August, MOA ground teams then sprayed an additional 1,500 ha in the region. Thus, while DLCC has the predominate capability to design and implement control operations, the Crop Protection Department of the MOA assists in their implementation. By operating in tandem, and with good coordination between them, they apparently do a very effective job.

Control efforts in certain parts of the Eritrea-Tigray-Gonder region are not undertaken by the DLCO or MOA because of uncertain security. Little is known about locust control activities in these areas. However, it is generally felt that control efforts here are limited to ground control by farmers with knapsack sprayers. At present the farmers in Eritrea seem to be adequately supplied. As for locust control in Gonder, the two MOA/FAO Ground Survey/Control Teams that were discussed above will be mobilized and in place in western Gonder later this year in order to control any locust outbreak that might occur. The rest of this region, especially the area demarcated in Figure 2, remains a problem. Although the MOA will be distributing pesticides and spray equipment for use in grasshopper control here (and this could be used in ground control of locusts if need be), there is virtually no provision for aerial spray operations in the event of an outbreak or locust invasion from outside the region.

#### B. Pesticides and Equipment Resources

The MOA has seriously drawn down its pesticide inventory because of the armyworm campaign this year. In order to effectively mount this year's locust control program, they have submitted an MOA/FAO request to donors for the following: 60,000 liters of fenitrothion (or diazinon); 3,000 knapsack sprayers, and 15 vehicles. Of this, they require 20,000 liters of pesticide as soon as possible. These requirements seem reasonable given the present situation. Also it seems that

these requirements will be met by donors so that the equipment and supplies will be in place in the event that a winter breeding infestation takes place along the Red Sea coastal region later this year and the beginning of next year.

Part of this equipment will be used to form the MCA/FAO Ground Survey/Control Teams which will begin operations in October. In this regard, four Land Rovers (two station wagons and two pick-ups) have already arrived in Addis Ababa which were donated by OXFAM through an ODA grant. Meanwhile, two Bedford trucks have been pledged by CRDA, who will make two trucks available until the bedfords arrive in-country.

In addition to the above supplies and equipment, there are other potential sources of supplies, e.g., the EEC Rehabilitation and Revival Plan. Specifically, this includes 20,000 liters of fenitrothion (95%), 135,000 kg of carbaryl (85%), 4,000 knapsack sprayers (CP-15), 3,000 ULV sprayers and 20 prefabricated sheds. It was not evident in our discussions whether any of this material could be made available as a buffer stock in the event of a locust outbreak, but obviously the sprayers represent a large resource in the event they are needed.

DLCO maintains a separate stock of pesticides for its program in-country and currently are conducting an inventory of available materials. Much of its present stock has been in storage for several years and is of questionable efficacy. However, they feel that they will have enough pesticides to carry activities through December. We would recommend that some of the pesticide that MCA/FAO is requesting from donors could be earmarked for use by DLCO as a buffer stock.

At present, adequate resources seem to be available, or will shortly be committed, to handle any short-term (4-5 month) locust outbreak in Ethiopia. However, long-term plans are now needed in order to strengthen the in-country efforts of the MCA and the DLCO. Priority needs in this regard would include contingency planning for pesticide stores, training MCA personnel, and application equipment for use in regions where hilly terrain predominates.

#### IV. COORDINATION

Early coordination of locust control activities in Ethiopia was carried out by the FAO ad hoc working group. Since early July this committee has been meeting on a regular basis. It is made up of representatives from the Crop Protection Department (MCA); Christian Relief and Development Association (CRDA); European Economic Community (EEC); World Bank (ILRD); U.K. Office of Emergency Operations in Ethiopia (UNOEOE); OXFAM/UK;

USAID; and the FAC. It has recently begun producing a "Locust Report". In addition, the FAO representative has been reporting on the locust situation to the monthly informal meetings of bilateral donors.

The second level of coordination is done on the part of the Government, where the MCA has established Regional Locust Steering Committees in Tigray and Eritrea provinces. These are composed of MCA Regional Office staff and representatives of the peasant associations, regional administration, army and police.

A third level of coordination would be the coordination that exists between the Crop Protection Department (MCA) and the ELCO. This is mostly coordination at the technical level in terms of actual operations, and therefore it is a specialized type of coordination. However, during the present locust emergency, several major donors, some Government officials and some non-governmental organizations were unaware of the functions of the ELCO and its role in cooperative, in-country operations.

Recently the Government has also established a National Advisory Committee for Locust Control. This is chaired by the head of the Crop Protection Department who reports directly to the Minister of Agriculture. Members of the committee are the staff responsible for plant protection in the Ministry for State Farm Development, the Relief and Rehabilitation Commission, and the Institute for Agricultural Research.

In summary, four levels of coordination exist. Presumably the National Committee will supersede all others, but it remains to be seen whether this present situation will allow major donors to have a better opportunity to express their concerns, offer advice, and discuss assistance priorities. In addition, it may be to the advantage of the MCA to have a permanent unit in place that acts as a reporting unit (and also a survey and coordination unit) for migratory pests. This would avoid the problem of having to set up separate units whenever locusts, armyworm, quelea birds, rodents, etc. build up to unusual or threatening proportions.

## V. RECOMMENDATIONS

### A. Short-term (4-5 months)

- o A revised locust questionnaire, which would include a simple illustrated brochure from the ELCO, should be widely circulated throughout the northern provinces.

- o All locust questionnaires (for which a uniform format should be developed), specimens and reports should be directed to one central facility.
- o There should be wider dissemination of information on locusts, such as the FAO Situation Reports, the MCA/FAO ground survey information, and information on the role and function of the DLCO.
- o An up-dated inventory is needed of all pesticide stocks, spray equipment and available storage facilities in the country. Of special use would be to have the inventory arranged by regions.

#### E. Long-Term (4-5 years)

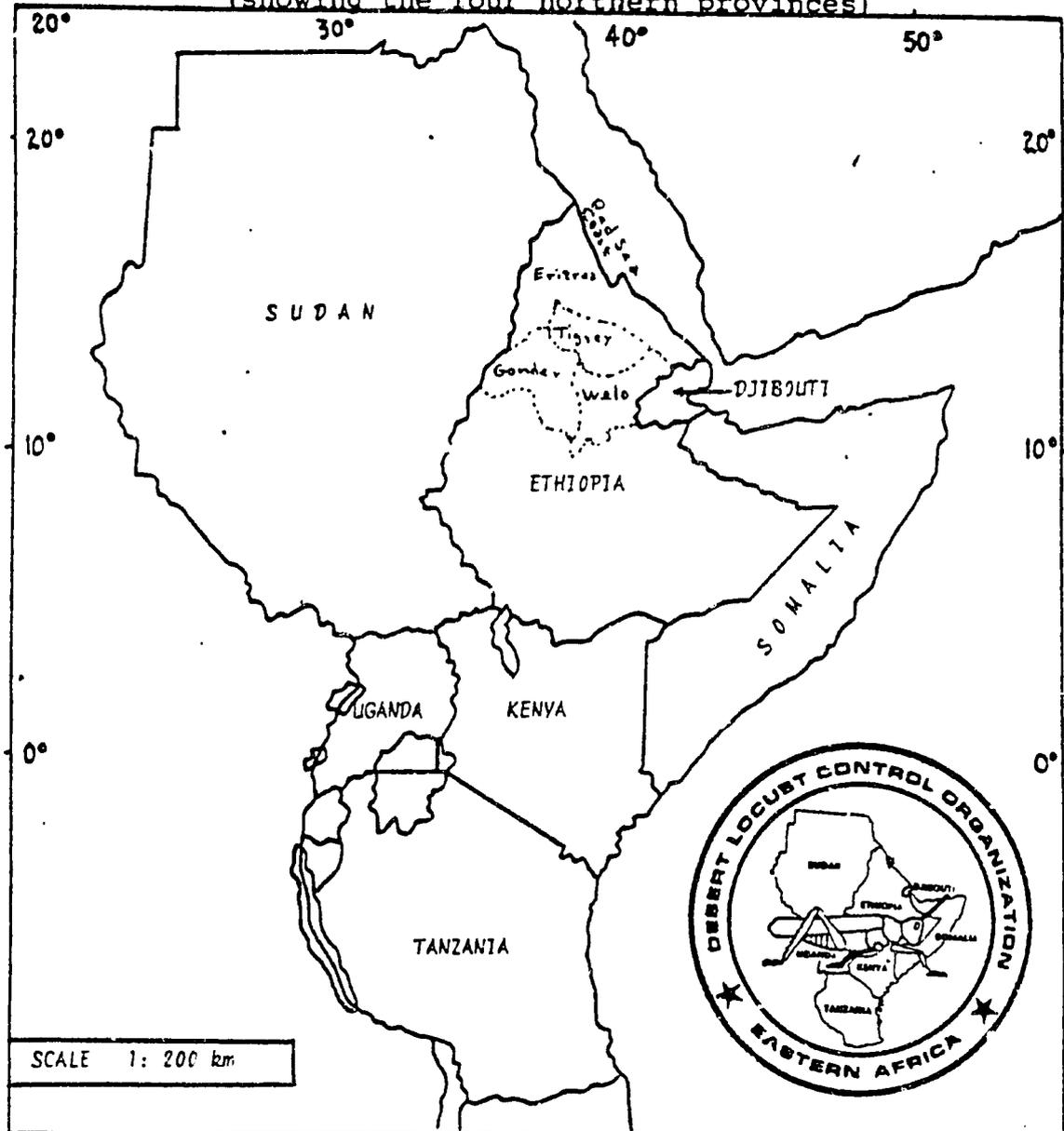
- o A migratory pest unit should be set up similar to the Armyworm Reporting Unit. This unit could pass on monthly situation reports to national and regional offices in order to up-date and alert locust control personnel.
- o A detailed outline is needed of long-term national and regional requirements, including aircraft, equipment, training, storage and safety data on pesticides, and research. Also, an extension program is needed for farmers, especially on the safe use and handling of pesticides.
- o An outline of regional requirements is needed, such as a regional data base and regional training program in terms of migratory pest control.

#### VI. INDIVIDUALS CONTACTED IN ADDIS ALABA

Mr. Nicholas Winer, OXFAM  
Dr. Ingo R. Loeferbroks, FAO  
Dr. I. A. Musa, DLCO  
Mr. Ahmed Ibrahim, DLCO  
Mr. Amha Alemu, Crop Protection Department, MOA  
Dr. Markos Deribe, Crop Protection Department, MCA  
Mr. Abdurahmen Abdulai, Crop Protection Department, MOA  
Mr. Walter Stoker, ICRC

The DLCO  
 THE DESERT LOCUST SITUATION MAP  
 (showing the four northern provinces)

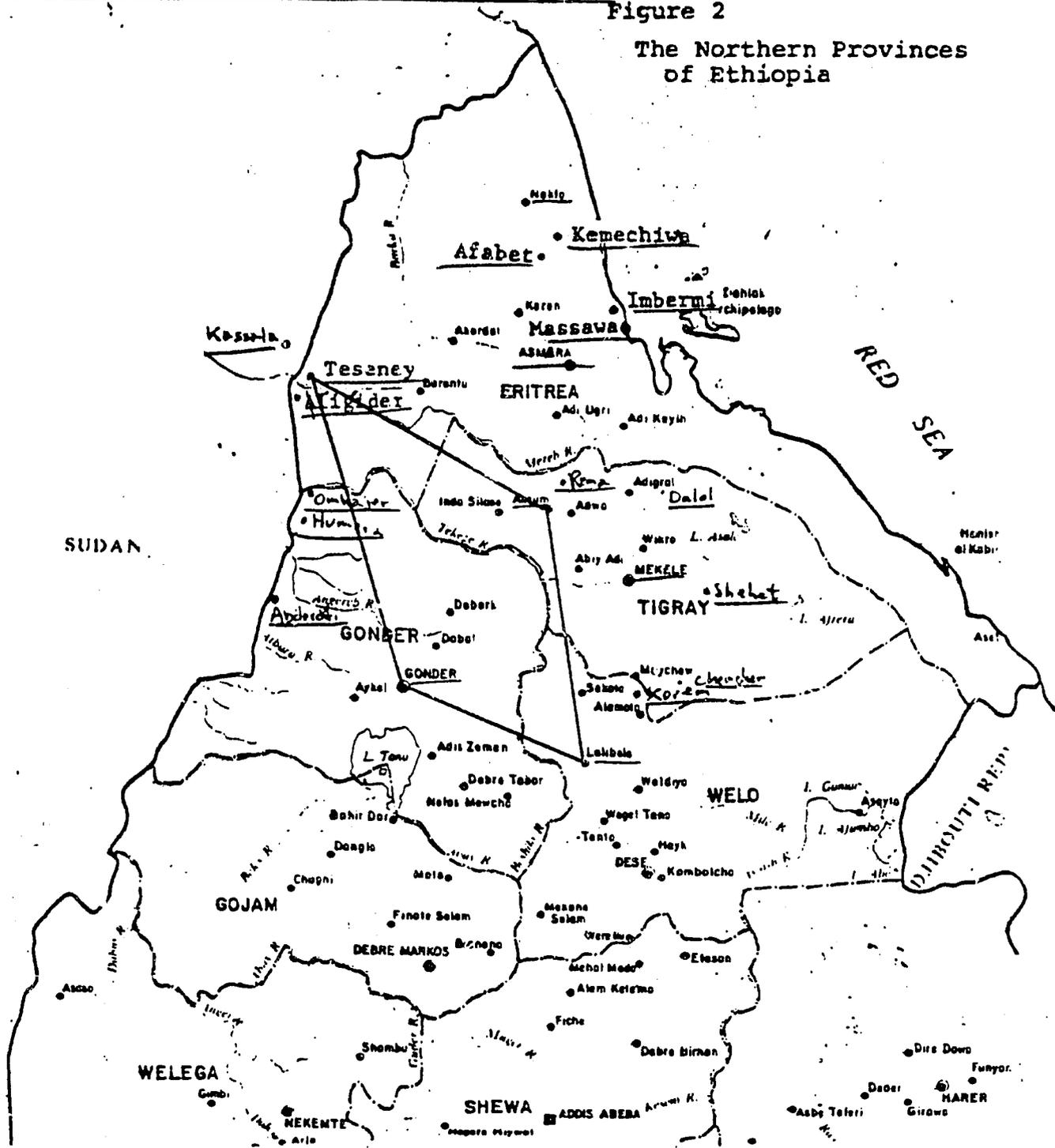
Figure 1



	Swarms or hopper bands	Adults or hoppers in groups	Adults or hoppers of low or unknown density
Immature adults	■	□	⊏
Mature or partly mature adults	●	◊	∧
Adults, maturity unknown	◆	◇	>
Egglaying or eggs	⬢	◻	∨
Hoppers	●	⊖	∩
Hoppers and adults - combined symbol (example)	◻	⊖	⊖

Figure 2

The Northern Provinces of Ethiopia



# ETHIOPIA

## LOCUST BREEDING & INVASION AREA

### LEGEND

-  Winter & Spring Breeding Zone
-  Summer Breeding Zone
-  Short Rain Breeding Zone
-  Long Rain Breeding Zone
-  Desert Locust Control Base
-  Swarm Movement From Summer & Short Rain Breeding Areas With Probable Date
- T** Flying Swarm
- X** Eastern Adults
- G** Summer Migration in the Area

Swarm Movement From Summer & Short Rain Breeding Areas With Probable Date

