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Locusts, other migratory pests and emergency operations group

DESERT LOCUST SITUATION SUMMARY AND FORECAST

No. 4 December 1978

SUMMARY

Saudi Arabia continued to receive swarms from across the Red Sea. These matured and laid in western coastal areas. Swarms were also present in Red Sea areas of Sudan where gregarious breeding was in progress. A similar situation probably exists in Red Sea coastal areas of Ethiopia. A number of new generation swarms were reported in the "Short Rains" breeding area in the Horn of Africa, where control operations against hoppers were concluded. The main winter breeding areas around the Red Sea and Gulf of Aden received only moderate rainfall. There was independent heavy rainfall in Senegal, Mauritania and Mali, and light-moderate rainfall in southern central and eastern Algeria in late November and early December.

In West Africa scattered locusts were reported from a few localities in Mauritania, north east Mali and north west Niger.

No locusts were reported from North West Africa.

In Eastern Africa a number of maturing and mature swarms were reported from the Tokar delta of Sudan, where gregarious breeding continued. There were no reports from the Red Sea coast of Ethiopia but similar infestations are likely. In the "Short Rains" breeding area of the Somali peninsula a number of new generation swarms were reported and control operations against hoppers were concluded.

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In the Near East there were numerous reports of swarms from the Tihama of Saudi Arabia. These almost certainly represented escapes from late summer breeding in northern Ethiopia. Most swarms stayed on the Tihama, matured and laid; gregarious breeding was in progress in many areas. Some swarms crossed the coastal mountains and reached the interior. Only scattered locusts were reported from the Yemen Arab Republic, the People's Democratic Republic of Yemen and south eastern Egypt.

In South West Asia there was an unconfirmed report of a swarm in the Mekran of Pakistan and scattered adults were seen at a number of localities in western Rajasthan in India.

DESERT LOCUST SITUATION - DECEMBER 1978

WEST AFRICA

Weather

A middle level trough developed diagonally over northern Africa during the last three days of November 1978, extending from Senegal to Iraq on 29 November. This system, which was virtually stationary for four days, caused widespread and heavy rainfall over large parts of Senegal, Mauritania and Mali (see attached map). While disintegrating, the system moved north during the first days of December, bringing rainfall to northern Mauritania and Mali.

The satellite image interpretation was confirmed by a report from Mauritania where Kiffa (1645N, 1130W) reported 39 mm on 29-30 November.

Scattered showers fell in early and late December in south eastern and eastern Mali and north western Nigeria.

MAURITANIA

Ecological conditions Several falls of rain were reported during the first few days of December; Aioun el Atrouss recorded 4.7 mm. Vegetation was reported to be green 50 km. north of Aioun el Atrouss, and in Aouker, Tichit and Oualata areas.

Adults Isolated adults were reported in western Mauritania north of 17°N and west of 12°W. Isolated mature adults were reported during the first week of December at 1806N, 1330W and between 1802N, 1348W and 1730N, 1229E.

Hoppers Young green hoppers were reported during the first week at 1806N, 1330W and between 1802N, 1348W and 1730N, 1229E.

MALI

Ecological conditions No rainfall reports were received from ground stations and the vegetation was reported to be dry.

Adults Isolated adults were reported at Arakad (1731N, 0215E), and at a density of 1-25 per hectare over an area of 250 hectares at In Aridal (1741N, 0205E). One adult was seen at Tamachaloudjen (1820N, 0230E) on 2 December.

NIGER

Ecological conditions Nomads reported significant rain at Mont Greboun (2000N, 0835E). In Air vegetation was dry except for Schouwia.

Adults In Tamesna two adults were seen at 1750N, 0525E and 1858N, 0606E. In Air fledglings were reported at a density of 6-20 per hectare at Akokom (1845N, 0730E) at the end of December. Isolated mature adults were reported in eastern Air.

No locusts were reported from CHAD.

NORTH WEST AFRICA

Weather

The weather system referred to above caused light-moderate rain in parts of southern, central and eastern Algeria in late November. The northern part of the North West African region was observed to be dry throughout the period.

No locusts were reported in LIBYA.

No reports have been received from MOROCCO, ALGERIA or TUNISIA.

EASTERN AFRICA

Weather

The key desert locust breeding areas in the Horn of Africa were observed to be cloudfree and dry for the total five-week period from 27 November to 31 December. No rainfall occurred in Somalia and Djibouti. Western and central Ethiopia received light to moderate showers during the first half of December. Surface observations received from Nairobi confirmed the existence of low level convergence over central Ethiopia on 12 and 15 December, when rain was judged to have fallen.

The Red Sea coastal areas of Sudan and Northern Ethiopia were observed to have received moderate rain from a local system of limited extent.

SUDAN

Adults During the last week of November and the first week of December four mature swarms totalling $14\frac{1}{2}$ sq. km. in area were reported in the Tokar delta, one swarm of mixed maturity measuring 2 sq. km. was reported at Jebel Tagdara (1814N, 3813E) and one immature swarm of 2 sq. km. was reported from Khor Labba (1836N, 3650E). In the second week there were two further reports of mature swarms totalling 12 sq. km. and two reports of swarms of mixed maturity totalling $3\frac{1}{2}$ sq. km. from the Tokar delta. There were further reports of two mature swarms totalling 2 sq. km. and four swarms of mixed maturity totalling 7 sq. km. from the Tokar delta in the second half of December. No other reports of adults in Sudan have been received.

Hoppers In the last week of November and the first week of December late instar hoppers were reported from four localities in the Sinkat area between latitudes 1828N and 1910N, and between longitudes 3631E and 3652E.

In the Tokar delta first and second instar hopper bands were present over an area of 900 hectares in the first week of December, and first instar bands were present over an area of 2,110 hectares in the second week. In the second half of December the area infested with hoppers had increased to 2,440 hectares.

Control measures Ground and aerial control measures were undertaken against all infestations. By 20 December 5,100 litres of Malathion had been applied by aircraft.

ETHIOPIA

Ecological conditions Heavy rain was reported between Mersa Teclai and Karora on 11-12 December and the vegetation on the Red Sea coast north of Massawa was reported to be green.

Adults An immature swarm was reported flying to the north at Gorrahei (0635N, 4425E) on 26 December. Fledglings were reported at 45 km. south west of Bohotleh in late December.

Hoppers Bands of late instar hoppers were reported with the fledglings 45 km. south west of Bohotleh in late December and there were reports of major hopper infestations in the Dagabur, Gabredarre and Gorrahei areas.

No reports of hoppers or adults have been received from the Red Sea coastal areas since late October.

SOMALIA

Ecological conditions Strong north easterly winds were reported in the last decade of December.

Adults New generation adults started to appear in the first decade of December. Medium to dense fledglings and pink swarms were reported from Dudimo (0930N, 4717E), Wad (0921N, 4706E) and Gowsaweyne (0923N, 4700E) during the first and second decades of December. On 15 December four swarms totalling 76 sq. km. were sighted east of Bohotleh flying south west into the Ogaden, and there was a further unconfirmed report of a swarm from the same area on 16 December. On 23 December several small-medium sized swarms were seen between Bohotleh and Duruksi. Further south three adults were seen at El Bur on 24 and 27 December and two immature adults were seen at Harardera on 28 December. There were unconfirmed reports of immature swarms in the Bulhar area on 9-11 December.

Hoppers Breeding was terminated by control measures during the second decade of December in the Dusa Mareb, Ghelinsor and Galkayo areas. Two small fifth instar bands were found at Arro (0511N, 4732E) in late December.

Control measures Control measures were concluded in the Dusa Mareb, Ghelinsor and Galkayo areas in the second decade of December. Two fifth instar bands were controlled at Arro (0511N, 4732E) in late December.

No reports were received from DJIBOUTI.

KENYA, TANZANIA and UGANDA remained free from locusts.

NEAR EAST

Weather

Substantial parts of Egypt received moderate precipitation during the last week of November and first week of December. Depressions moving eastward over the eastern Mediterranean littoral caused precipitation in southern Israel, southern Jordan, Iraq and north eastern Saudi Arabia.

Coastal and mountainous areas of western Saudi Arabia received moderate rainfall in the first half of December, whereas the Yemens, Oman, United Arab Emirates did not receive significant rain during the five week period.

SAUDI ARABIA

Ecological conditions On the Tihama some rain fell in the Shaqqah al Yamaniyah and Sha'ira areas between Lith and Qunfidah and in the Jizan area in early December. There was widespread heavy rainfall in the following areas in Western Saudi Arabia on 11 December: Jeddah, Mecca, Rabigh and Yenbo. Heavy rainfall was also reported in the second week of December in the Medina area. Taif, Bahra and Baljуреishi in the Hijaz mountains received rain during the month.

Ecological conditions were favourable for breeding from south of Qunfidah to Jeddah, in the Jeddah-Mecca area and in some parts of the northern Tihama.

Adults In early December immature adults were present in many areas between Jeddah, Mecca and Lith at densities of up to 2,000-3,000 per hectare. These were remnants of the swarms which reached the Tihama in late November. On 5 December there was evidence of a further invasion from across the Red Sea for a number of immature and maturing swarms were reported south of Qunfidah. Subsequently between 9 and 27 December there were some 33 reports of mature, laying swarms on the Tihama between Wadi Hali, south of Qunfidah and the Jeddah-Mecca area. The dates of the sightings suggest that there was a movement northwards along the Tihama during the month, and some swarms apparently crossed the Hijaz mountains for there were five reports of swarms from the Bisha area.

Adults at low densities were reported from Hail and Jizan.

Hoppers In the first week of December the first main hatching started around Sha'ira, north of Qunfidah and by the end of the month hopper bands were also reported south of Wadi Luma, at Shaqqah al Yamaniyah and Shaqqah ash Shamiyah. Fledging was reported at Sha'ira in early December.

Control measures Fifteen ground teams and an aircraft were employed to control both swarms and hopper bands. All swarms were sprayed or dusted by ground teams. Two thousand small first instar bands were controlled in the Sha'ira area in early December and the aircraft sprayed over a total area of 500 sq. km.

YEMEN ARAB REPUBLIC

Ecological conditions No rain was reported so the soil became dry.

Adults Immature and mature adults were present at densities of 20-50 per hectare in Wadi Hayran, Wadi Habl, Al-Jarr (1620N, 4254E) and Baghawiyah (1500N, 4308E). There was an unconfirmed report of swarms at Maldi on the Saudi border.

Hoppers Concentrations of late instar solitaricolor hoppers were found in Wadis Hayran and Habl.

PEOPLE'S DEMOCRATIC REPUBLIC OF YEMEN

Ecological conditions Coastal areas received isolated light to moderate showers on 5 and 15-16 December; Lahej recorded 16 mm. on 16 December. Floods were reported in some areas along the foothills on the western coast in the first week of December.

Adults Adults at low densities were reported from the coastal plains and from Dathina in the interior.

EGYPT

Ecological conditions Although rain was recorded in Wadis Yoider (2218N, 3620E) and Baueiwai (2220N, 3547E) on 9-10 December, conditions were not suitable for breeding in the south eastern desert area.

Adults Scattered adults were observed in the Abu Ramad (2220N, 3610E) and Shalatein (2310N, 3510E).

No reports have yet been received from BAHREIN, IRAQ, KUWAIT, LEBANON, OMAN, QATAR, SYRIA or the UNITED ARAB EMIRATES.

SOUTH WEST ASIA

The countries of the Southwest Asian region (Iran, Afghanistan, Pakistan and India) are not covered by the field of view of Meteosat, so no general statement can be made about the weather.

PAKISTAN

Ecological conditions Localised rainfall was recorded in northeastern Baluchistan on 13 December. No rain was reported in the second half of December and the vegetation was dry.

Adults There was an unconfirmed report of a swarmlet at Turbat on 13 December. Scattered adults were reported from the Mekran in the first half of December and three adults were observed in the Kharan area in the second half of the month.

INDIA

Ecological conditions Light showers fell in Rajasthan, Haryana and Punjab on 1-3 December and light rain fell in Gujarat in the second half of December, Bhuj recording 2 mm.

Adults Scattered adults at maximum densities of 4,050 per sq. km. were reported in Mohangarh and of 1,050 per sq. km. in Charanwala (2752N, 7210E) areas of Jaisalmer district and 450 in Barmer district in the first half of December. In the second half of the month adults were present at maximum densities of 825, 675, 600 and 375 in Phalsund (2624N, 7155E), Sanawra (2652N, 7134E), Bussi and Bular areas respectively of Pokaran tehsil in Jaisalmer district, and at a maximum density of 325 per sq. km. in Sheo tehsil in Barmer district.

Hoppers Two solitaricolor fifth instar hoppers were collected in the Mohangarh area in the first half of December.

AFGHANISTAN was reported clear of locusts.

No report has been received from IRAN.

FORECAST FOR LATE JANUARY 1979 - FEBRUARY 1979

In North West Africa small numbers of adults will persist in patches of greener vegetation in southern and central Algeria and some may be present in southern Morocco and southern Libya. Breeding could occur on a small scale in southern and central Algeria and perhaps in southern Morocco and southern Libya if adequate rain falls.

In West Africa small numbers of adults will persist in areas of greener vegetation in Air and Tamesna of Niger, Tamesna and the Adrar des Iforas in Mali, in southern and western Mauritania and Mauritanian and Moroccan Western Sahara. Scattered breeding may occur in southern and western Mauritania and in Western Sahara.

In Eastern Africa any escapes from the more southerly part of the "Short Rains" breeding area are likely to move west-south-west across southern Somalia and southern Ethiopia and some may invade the Northern Province of Kenya. It is possible that some swarms may reach the central highland areas of Kenya but more likely that they will move into the Rift Valley and then move north and north-east and reach the Railway Area of eastern Ethiopia. Some may move further and reach coastal areas of the Red Sea and Gulf of Aden. Some other escapes from the "Short Rains" breeding area may move more directly towards the Harar highlands or on to the coastal plains along the Red Sea and Gulf of Aden and could start to

breed in northern Somalia, Djibouti, north-eastern Ethiopia, People's Democratic Republic of Yemen, Yemen Arab Republic and Saudi Arabia. Breeding which is in progress in southern Red Sea coastal areas of Sudan will continue throughout the forecast period and will probably extend further north. Breeding is almost certainly in progress in Red Sea coastal areas of Ethiopia and numerous swarms may form there. If conditions become unsuitable for breeding these swarms could move north to Sudan or cross the Red Sea and invade Saudi Arabia.

In the Near East there will be further laying by swarms on the Tihama of Saudi Arabia between Qunfidah and Jeddah and there is likely to be an extension northwards of the infested areas as swarms move north. The Tihama could also be invaded by escapes from north eastern Ethiopia and from the "Short Rains" breeding area in eastern Africa, and these could start to lay towards the end of the forecast period. Swarms which have already crossed the Hijaz mountains may start to breed in the Najran, Bisha and Turaba areas. Swarms from eastern Africa could also reach the People's Democratic Republic of Yemen and the Yemen Arab Republic and start to breed in coastal areas, if conditions are favourable. If not, they could move into the interior of the Yemen and of Saudi Arabia and start to breed in the latter country. There are probably only small numbers of adults in Oman and the United Arab Emirates but these could start to breed.

There is little chance that countries to the north of Saudi Arabia will be invaded by swarms in the forecast period.

In South West Asia breeding is likely to start in southern coastal areas of Iran and adults could start to move into the interior of southern Iran. Similarly, breeding is likely to start in the Mekran of Pakistan and in some interior valleys, as adults start to move north.

Rome
22 January 1979

ORGANISATION DES NATIONS UNIES POUR
L'ALIMENTATION ET L'AGRICULTURE



ORGANIZACION DE LAS NACIONES UNIDAS
PARA LA AGRICULTURA Y LA ALIMENTACION

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DESERT LOCUST REPORTING AND FORECASTING SYSTEM

Rainfall Monitoring in the Desert Locust Invasion Area (excluding India, Pakistan and Afghanistan) with Meteosat Geostationary Satellite Imagery

Background

Since April 1978 over 90% of the Desert Locust Invasion Area has been covered by the geostationary environmental satellite Meteosat of the European Space Agency (ESA). This satellite, positioned at 0° longitude over the equator at a distance of 36,000 km. from the earth, views a major portion of the surface of the earth and its surrounding atmosphere simultaneously. The extremes of the full global disk viewed by Meteosat extend from Colombia in South America to Iran. The African continent is located more or less centrally in the full disk image.

The sensors of Meteosat, operating in the visible and thermal infrared wavelengths of the electromagnetic spectrum, provide both analog and digital data for the area viewed by the satellite at half hourly intervals with a spatial resolution of 2.5 km. for the visible channel and 5 km. for the thermal infrared channel immediately below the satellite.

The satellite is furthermore equipped with a sensor measuring the water vapour content of the atmosphere at half hourly intervals.

The high frequency large area coverage provided by Meteosat constitutes a very appropriate tool for general monitoring of the occurrence of rainfall in the desert locust recession area and the bordering invasion area where there is a sparse network of stations recording conventional meteorological data. Although no detailed quantitative rainfall estimates can be made from Meteosat imagery, due to the spatial resolution of the data and the scale of the imagery, the data does permit an assessment of the spatial distribution of the rainfall, including its intensity.

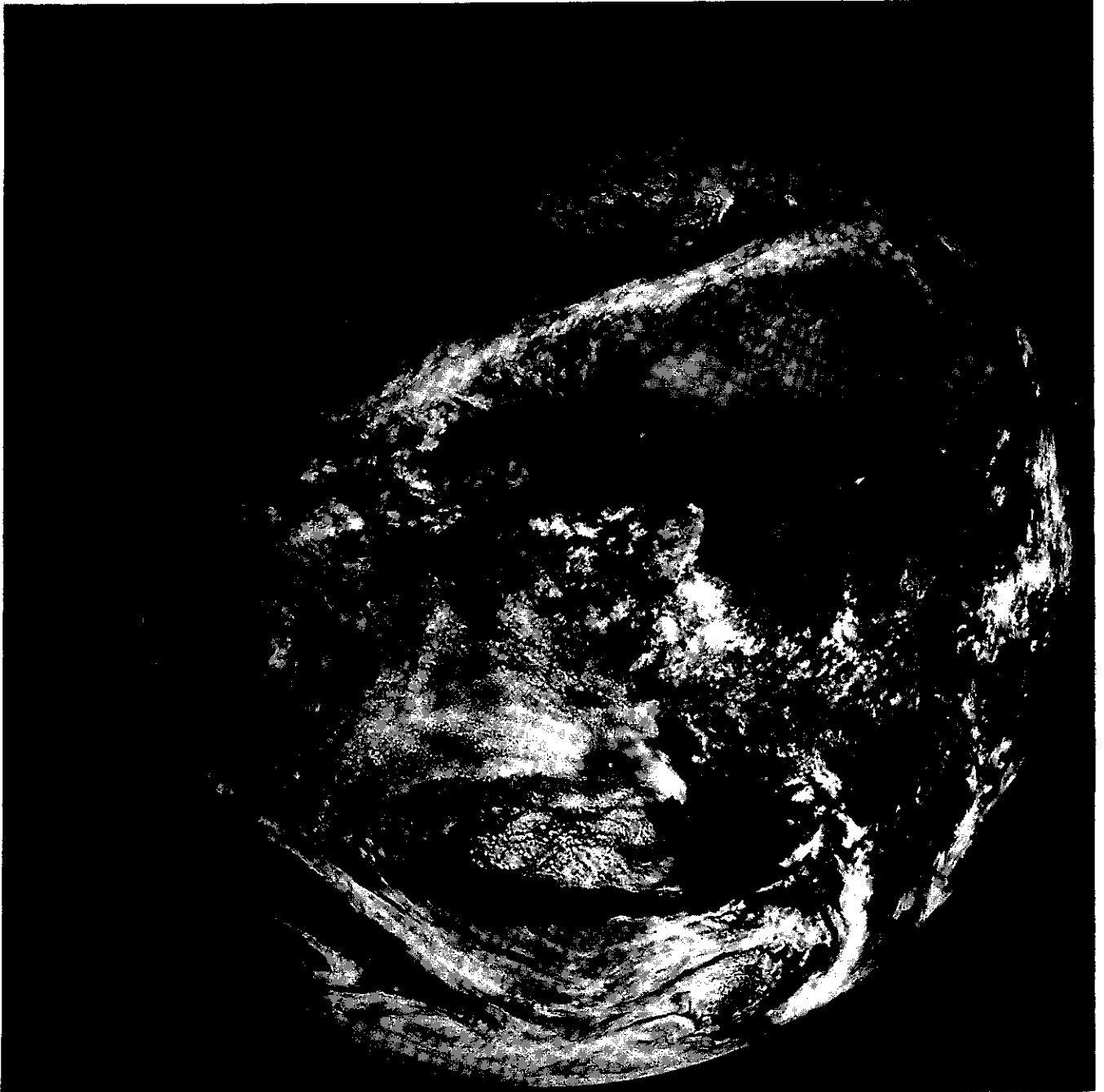
Since late November FAO has been receiving visible and thermal IR imagery from the European Satellite Operations Center (ESOC) in Darmstadt, Federal Republic of Germany, on a daily basis. The imagery is being used for monitoring rainfall for that part of the Desert Locust Invasion Area which is covered by the field of view of the satellite sensors. The imagery is acquired according to the following schedule:

Visible channel imagery: 0825 GMT, 1025 GMT, 1255 GMT
Thermal IR channel imagery: 0025 GMT, 0825 GMT, 1255 GMT,
1655 GMT, 2055 GMT

Upon receipt of the imagery, the total daily data set is analysed for rain-bearing cloud systems, rate of development and displacement. Subsequently, the most representative visible channel image is selected for a systematic rainfall estimation procedure by means of a 2° square grid, resulting in a three category (light, moderate and heavy) precipitation estimate for each 2° grid cell on a daily basis. These estimates are compiled weekly and monthly and will be distributed with the monthly Desert Locust Situation Summary and Forecast. At present the rainfall estimation can only be performed qualitatively as outlined above. In due course, daily rainfall observations from the meteorological stations in the Desert Locust Invasion Area will become available to FAO and will enable the qualitative estimates to be quantified. The first rainfall estimates are presented with the December Desert Locust Situation Summary and Forecast.

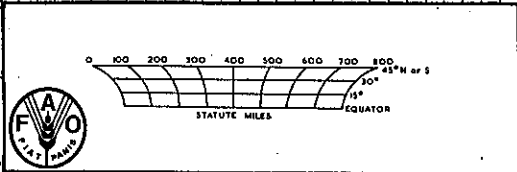
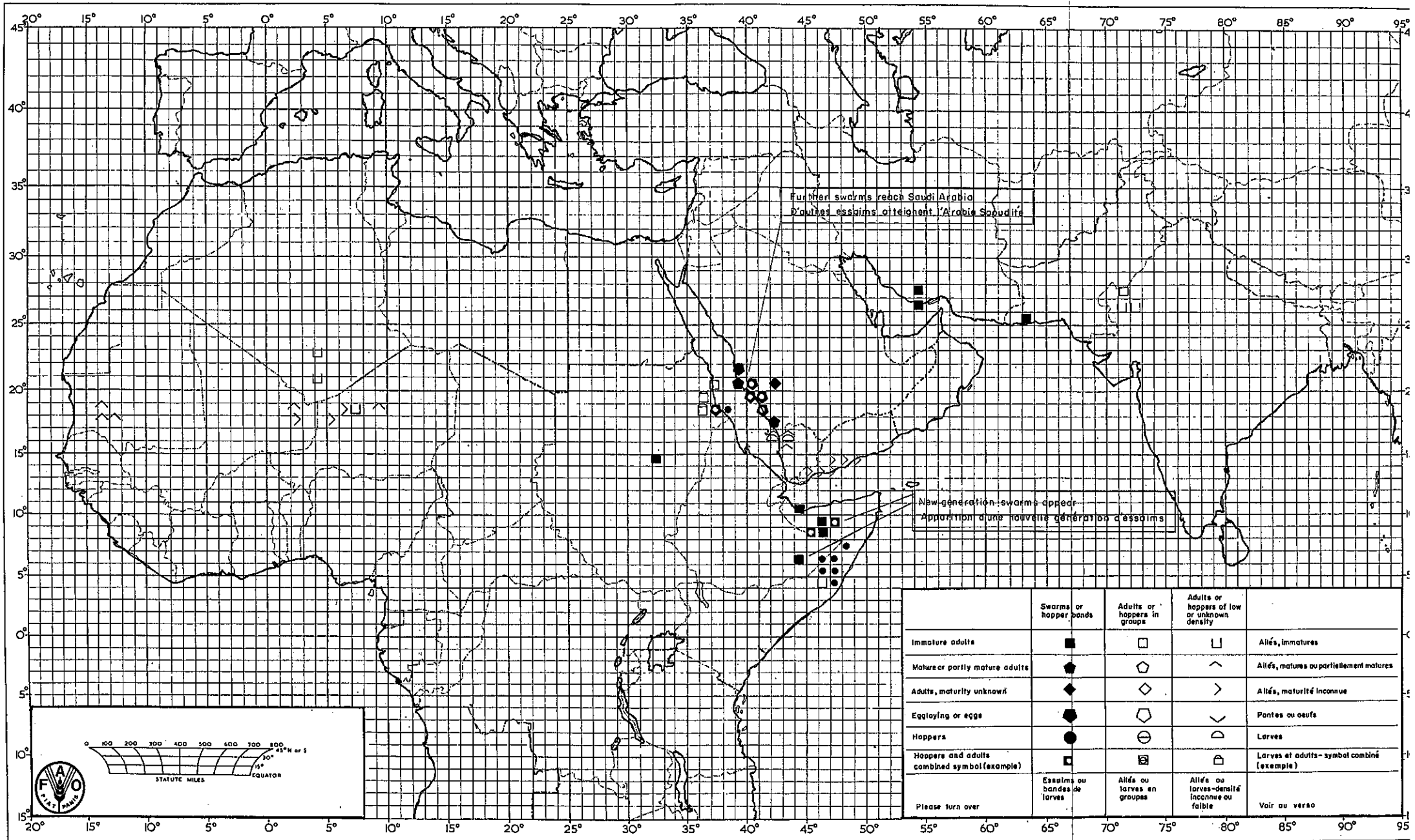
The attached Meteosat image was taken on 29 November 1978 at 1155 GMT by the visible channel sensor, which has a ground resolution of 2.5 km. The image shows the maximum development stage of the middle level trough extending diagonally over the Sahara from Senegal to Iraq in late November. Interpretation of this image, based on cloud type and cloud amount analysis, indicated that widespread and heavy rainfall occurred in several West African countries. This was later confirmed by meteorological station reports from Kiffa, which reported 39 mm. on 29-30 November and Aïoun, reporting 4.7 mm. on 29 November.

The image shows furthermore that dry conditions prevailed over much of the Desert Locust Invasion Area. Central and East Africa, as well as most of the Arabian Peninsula, are virtually cloudfree.

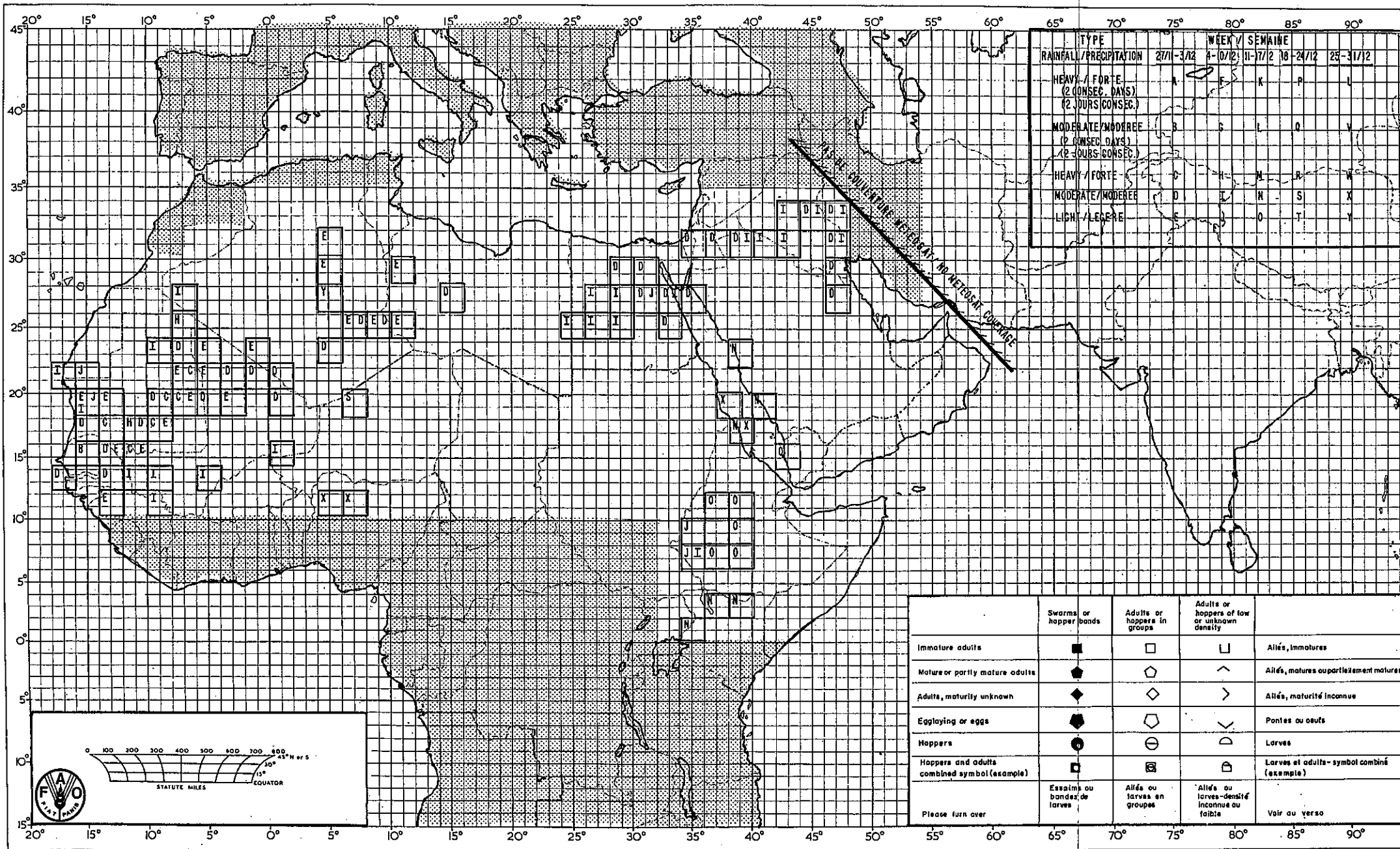


METEOSAT

1978 MONTH 11 DAY 29 TIME 0955 GMT (NORTH) CH. VIS 2
NOMINAL SCAN/PREPROCESSED SLOT 20 CATALOGUE 1012720122



	Swarms or hopper bands	Adults or hoppers in groups	Adults or hoppers of low or unknown density	
Immature adults	■	□	◻	Allés, immatures
Mature or partly mature adults	●	◐	◑	Allés, matures ou partiellement matures
Adults, maturity unknown	◆	◇	>	Allés, maturité inconnue
Egglaying or eggs	◆	◐	<	Pontes ou œufs
Hoppers	●	⊖	∪	Larves
Hoppers and adults combined symbol (example)	◻	◻	◻	Larves et adults - symbol combiné (exemple)
Please turn over	Essaims ou bandes de larves	Allés ou larves en groupes	Allés ou larves - densité inconnue ou faible	Voir au verso



TYPE	WEEK / SEMAINE				
RAINFALL / PRECIPITATION	27/11 - 3/12	4 - 10/12	11-17/12	18 - 24/12	25 - 31/12
HEAVY / FORTE (2 CONSEC. DAYS) (2 JOURS CONSEC.)	A	F	K	P	U
MODERATE / MODEREE (2 CONSEC. DAYS) (2 JOURS CONSEC.)	B	G	L	Q	V
HEAVY / FORTE	C	H	M	R	W
MODERATE / MODEREE	D	I	N	S	X
LIGHT / LEGERE	E	J	O	T	Y

	Swarms or hopper bands	Adults or hoppers in groups	Adults of low or unknown density	
Immature adults	■	□	◻	Alliés, Immatures
Mature or partly mature adults	◆	◊	◊	Alliés, matures ou partiellement matures
Adults, maturity unknown	♦	◇	>	Alliés, maturité inconnue
Egglaying or eggs	◆	◊	<	Ponées ou oeufs
Hoppers	●	⊖	∩	Larves
Hoppers and adults combined symbol (example)	◻	⊖	◻	Larves et adultes - symbol combiné (exemple)
Please turn over	Essais ou bandes de larves	Alliés ou larves en groupes	Alliés ou larves - densité inconnue ou faible	Voir au verso