

**Emergency Transboundary
Outbreak Pest (ETOP) Situation
Update for January with a
Forecast till Mid-March, 2015**

SUMMARY

The Desert Locust (SGR¹) situation continued developing in January in winter breeding areas along the Red Sea coasts.

In **Sudan**, groups of adult locusts and hopper bands were controlled on more than 22,360 ha on the Red Sea coastal areas between Arbaat and Toker Delta stretching to Aiterba areas during January. Ground operations also controlled hoppers and adults in **Eritrea** and **Saudi Arabia**.

Low density adults were detected in several places around Tihama and in Hodeida in **Yemen**. A similar situation was reported on the coastal plains northwest and north of Aden and east Zinjibar. No locusts were reported in **Ethiopia**, **Somalia**, **Oman** or elsewhere in the central outbreak region during this month.

A few scattered adults and hoppers were reported north of Timbuktu and Kidal in **Mali**, but could not be confirmed due to the ongoing

¹ Definitions of all acronyms can be found at the end of the report.

insecurity situation. A few adults were reported in two locations near Assa in southern **Morocco**. The eastern outbreak region remained calm during this period.

Forecast: In **Sudan**, unfavorable ecological conditions in winter breeding areas along the Red Sea coast will likely force locusts to move to the interior of the country. A similar situation is likely in **Eritrea** and **Saudi Arabia** where locusts will move to the highlands in the interior of the countries and perhaps begin breeding. In **Yemen**, small-scale breeding is likely in areas where rains fell recently. Other countries in the central, the western and the eastern outbreak regions will likely remain calm during the forecast period.

Active surveillance and monitoring remain critical to avoid unexpected surprises along the Red Sea coasts and elsewhere in the outbreak regions.

OTHER ETOPS

Red (Nomadic) Locust (NSE): NSE breeding was in progress in the primary outbreak areas in **Tanzania**, **Malawi**, **Mozambique** and **Zambia** and hatching is expected to have commenced in some places (IRLCO-CSA).

Forecast: Large-scale breeding is likely in the primary outbreak areas in **Tanzania** and **Mozambique**, and perhaps in **Malawi** and **Zambia** during the forecast period (IRLCO-CSA, OFDA/AELGA).

Madagascar Migratory Locust

(LMC): UN/FAO issued a press release on January 21, 2015 appealing for additional resources to abate a potentially serious locust threat and complete the job that began in September, 2013. *The threat the pest poses to food security and livelihoods of 13 million chronically food-insecure people is too big to ignore.*

Moroccan (DMA), Italian (CIT), Asian Migratory (LMI) Locusts in Central Asia and the Caucasus (CAC): No locusts were reported in CAC region in January. Hatching may begin at the foothills of the rising temperature in spring, but significant developments are not likely during the forecast period (OFDA-AELGA).

African Armyworm (AAW): AAW outbreaks were reported attacking cereal crops and pasture in **Zimbabwe, Mozambique** and southern **Tanzania** in January (DLCO-EA, IRLCO-CSA).

Forecast: Armyworm outbreaks will continue through the forecast

period in the southern outbreak areas until they gradually taper off with the diminishing seasonal rains. Outbreaks will commence in central **Tanzania** and **Kenya** during the forecast period (IRLCO-CSA, OFDA/AELGA).

Quelea quelea (QQU): Some 9.8 million QQU birds were prevented from causing damage to crops in **Kenya** during January (DLCO-EA, IRLCO-CSA).

Forecast: QQU bird outbreaks will decline in **Kenya**, but small cereal grain farmers in **Tanzania, Mozambique** and **Zambia** will likely experience QQU invasions during the forecast period (DLCO-EA, IRLCO-CSA).

OFDA/TAG's Pest and Pesticide unit (Assistance for Emergency Locust/Grasshopper – Pest - Abatement) will continue monitoring ETOP situations closely and issue alerts and updates and provide advice as often as necessary. **End summary**

*SGR frontline countries (FCs) in Sahel West Africa and Northern Africa, namely **Mali, Mauritania, Niger, Chad, Algeria, Libya, Morocco** and **Tunisia** have established autonomous national locust control unit responsible for all SGR activities.*

OFDA ETOP Activities and Benefits/Impacts

Financial assistance from USAID/OFDA and other donors enabled FAO to establish an online Pesticide Stock Management System (PSMS) in more than 50 countries around the globe. Thanks to the PSMS system, participating countries can now maintain up to date inventories and make informed decisions to prevent unnecessary accumulations of obsolete pesticide stocks. This system has enabled many countries to prevent unnecessary procurement or hoarding of pesticides, avoid costly disposal operations, improve health and safety of their citizens and protect their shared environment.

The OFDA-sponsored tri-state program on scaling up community-based armyworm monitoring, forecasting and early warning (CBAMFEW) is on track. The program aims at reducing the threats of AAW to food security and livelihoods of vulnerable populations through improved information collection, analysis and reporting. OFDA Advisor for Pesticides and Pests visited several localities in Ethiopia where CBAMFEW activities are being implemented. The advisor was pleased with farmer forecasters' ability to carry out project activities on their own.

The CBAMFEW project is being managed by DLCO-EA and jointly

*implemented in close to 300 villages in 30 districts in collaboration with partners in **Ethiopia, Kenya and Tanzania** - click <http://bit.ly/1C782Mk> - to view project villages in the three countries.*

The CBAMFEW has successfully conducted several training programs and launched an innovative mobile phone-based data collection and management technology. This innovative technology is being scaled up in Ethiopia and implemented in Kenya and Tanzania. OFDA/TAG intends to work with other partners to expand this innovative technology to benefit other AAW affected countries.

OFDA continued its support for sustainable pesticide risk reduction initiatives through stewardship network (SPRRSN). This initiative is aimed at strengthening capacities of host-countries and partners to help reduce the risks of pesticide to safety of vulnerable populations and their assets as well as the environment. OFDA/TAG has successfully launched two sub-regional SPRRSNs in Eastern Africa and the Horn. The Horn of Africa SPRRSN initiative has created an Association dubbed as Pesticide Stewardship Association-Ethiopia (PSA-E) and PSA-E is considered a model for future similar initiatives. OFDA-TAG has plans to extend the SPRRSN initiative to other parts of Africa, the Middle East, CAC and other

regions. In his recent visit, OFDA Senior Technical Advisor for Pesticides and Pests observed PSA-N activities in Ethiopia and noted progresses and constraints among beneficiaries.

OFDA continued its support for capacity strengthening programs through an agreement with FAO. This DRR program assists frontline countries to mitigate, prevent, and respond to ETOP outbreaks and reduce potential emergencies and help avoid misuse and mishandling of pesticides, pesticide-incorporated materials and application platforms.

OFDA DRR program which is aimed at strengthening national and regional capacities for ETOP operations in Central Asia and the Caucasus (CAC) is on track. In addition to improving national and regional capacities, this program also promotes collaboration and coordination of joint monitoring, surveillance, reporting and preventive interventions to minimize ETOP threats to food security and livelihoods of vulnerable populations.

Note: All ETOP SITREPs can be accessed on USAID/OFDA Pest and Pesticide Management website: <http://www.usaid.gov/what-we-do/working-crises-and-conflict/responding-times-crisis/how-we-do-it/humanitarian-sectors/agriculture-and-food-security/pest-and-pesticide-monitoring>

Detailed information on the ETOP situation, the weather and ecological conditions and forecast is provided hereafter.

Weather and ecological conditions:

The weather conditions remained fairly dry and ecological conditions are unfavorable in most of the western outbreak region for locusts to breed and develop. In **Morocco**, ecological conditions are somewhat favorable in localized areas in the Draa and Ziz-Ghrsi Valleys, Oued Sakia El Hamra as well as the southeast for locusts to survive and reproduce. In **Mauritania**, favorable ecological conditions were reported in Bir Moghreïn, but remained less favorable in Zouerat and the rest of the country for SGR to survive and reproduce. Dry weather with high temperature and southerly and southwesterly winds dominated most of **Chad** making conditions unfavorable for locust to survive or breed. In **Mali**, low temperatures, moist air and light rains were reported in the northern region in Timbuktu (CNLA/Chad, NCDLC/Libya, CNLA/Mauritania, CNLAA/Morocco, CNLA/Tunisia).

In **Sudan**, ecological conditions remained favorable along the Red Sea coast through the second dekad of January, but began declining thereafter making conditions less favorable for SGR to further develop. In **Eritrea**, vegetation is green in a few places along the northern Red Sea coast. In **Ethiopia**, light to moderate rains were reported during the 2nd and 3rd dekads of the month, but overall ecological conditions remained dry in most of the SGR regions. Ecological conditions remained unfavorable for SGR to

develop in **Somalia**. Light to moderate rains were recorded on 19 and 20 January in northern **Oman** causing ecological conditions to improve (LCC/Oman).

Lake Chilwa and Chiuta plains shared by **Malawi** and **Mozambique** and one of the NSE primary breeding areas received heavy rains that caused flooding and damaged homes, crops and affected livestock. Flooding was also reported along the Pungwe and Buzi rivers in **Mozambique** where the NSE breeding areas in Buzi-Gorongosa plains are located. Heavy to light rains were reported in several places in the NSE outbreak areas in **Tanzania** and **Zambia**. Ecological conditions remained favorable in Ikuu-Katavi plains, Malagarasi Basin, Wembere plains and Rukwa Valley, Buzi-Gorongosa and Dimba plains as well as in Kafue Flats for NSE to breed and further develop. Light rains were reported in **Kenya** in a few places in mid-January, but overall hot and dry weather persisted here and in adjacent areas in the sub-region.

***Note:** Changes in the weather pattern can contribute to ecological shift in ETOP habitats and increase the risk of pest outbreaks, resurgence and even emergence of new pests. Moroccan locust (DMA) which is normally a low to medium altitude pest has shown a considerable vertical habitat expansion by up to 1,000 feet or 300 meters from its normal ambient altitude in **Uzbekistan**.*

*The **Asian migratory locust** once known as univoltin (a single generation per year) in the recent past exhibited two generations per year. These*

*phenomena are a serious concern to farmers, rangeland managers, crop protection experts and others. Regular monitoring and documenting as well as timely reporting of anomalous manifestations in pest habitats and behavior remain critical. **End note.***

Detailed Accounts of ETOP Situation and Forecast for the Next Six Weeks

SGR – Western Outbreak Region: In **Mali**, the SGR situation remained generally calm, but unconfirmed reports from Aguelhoc indicated the presence of adults and scattered hoppers in A Horadj (Timetrine), Inchekar and Igar far north of Timbuktu and Kidal where patches of green vegetation are present. Survey and control teams could not be deployed to those areas due to the insecurity situation. In **Mauritania**, the situation remained calm throughout winter breeding areas and in **Morocco**, survey operations began on January 28 in the Guelmim-Es Smara region in the southern part of the country where maturing and mature solitary adults were observed at two sites south of Assa. No locusts were reported in **Chad**, **Libya** or **Tunisia** and no reports were received from **Algeria**, **Niger** or **Senegal** during this month (CNLA/Chad, CNLA/Mauritania, CNLCP/Mali, CNLAA/Morocco, CNLA/Tunisia, NCDLC/Libya).

Forecast: Major developments are not likely in the western outbreak region during the forecast period. Regular surveillance remains necessary to check the impact of rising temperatures on locusts during the forecast period. **SGR (Desert Locust) - Central Outbreak Region:** SGR situation in **Sudan** continued developing in winter breeding areas in the central outbreak region in January. Survey and control

operations continued against mature adults and late instar hoppers between Arbaat (north of Port Sudan) and Toker Delta stretching to Aiterba areas where mature swarms and hoppers were treated on 22,361 ha from 1-28, January. In **Eritrea**, the SGR situation remained serious in January on the coastal areas where 2nd generation breeding began in December. Ground operations controlled hopper bands and immature and mature adults on 1,475 ha during this month. A joint surveillance was carried out on 17-18 January along the Sudanese and Eritrea borders. The **Sudanese** locust control team will be launching aerial control in **Eritrea** during the forecast period (PPD/Sudan). **Saudi Arabia** continued control operations against hoppers and adults. In **Yemen**, FAO/TCP sponsored survey detected low density scattered (~80 insects/ha) adults in winter breeding areas in north, central and south Tihama (between Al Zuhran and Midi) and south of Hodeida. A few adult locusts were also detected northwest and north of Aden and in east Zinjibar during this month (DLMCC/Yemen).



SGR situation during January, 2015; FAO-DLIS
The SGR situation remained calm in **Ethiopia, Somali, Oman** and other countries in the central outbreak region in (DLMCC/Yemen, DLCO-EA, FAO-DLIS, LCC/Oman, PPD/Sudan).

Forecast: Adult locusts will likely move from winter breeding areas to the interior

of **Sudan** and begin breeding during the forecast period. A similar situation is likely in **Eritrea** and **Saudi Arabia** where locusts will move from the coastal areas into the highlands in the interior of the countries and, perhaps, begin breeding in areas of recent rainfall during the forecast period. In **Yemen**, small-scale breeding is likely in areas of recent rainfall, but overall the situation is expected to remain relatively calm during the forecast period. Low numbers of adults may appear and begin breeding in Battinah, Jama'a in wadis in al Amiry and Aswad in Dhahera Region and Wadi Sal in Sharqiya Region, **Oman** (DLMCC/Yemen, FAO-DLIS, LCC/Oman, PPD/Sudan).

SGR - Eastern Outbreak Region: The SGR situation remained calm in January.

Forecast: The SGR situation will remain relatively calm in the eastern outbreak region along the Iran-Pakistan borders during the forecast period.

Red (Nomadic) Locust (NSE): NSE breeding progressed in the primary outbreak areas in **Tanzania, Malawi, Mozambique** and **Zambia** where hatching is expected to have commenced in some places and perhaps band and group formations began during this month (IRLCO-CSA).

Forecast: Ecological conditions are expected to remain favorable and allow NSE to further develop and locust numbers increase significantly in the next months. Large numbers of hopper bands and groups will likely form in In Ikuu-Katavi, Malagarasi Basin, Wembere, Rukwa Valley, Bahi Valley in **Tanzania**; Buzi-Gorongosa and Dimba in **Mozambique** and Kafue Flats in **Zambia** during the forecast period. Fledging will

begin by late March into April to be followed by swam formations. *Active surveillance, monitoring and preventive interventions remain critical to detect and abate the movement of hopper bands and swarms from breeding habitat and cause significant damage to crops and pasture.*

The International Red Locust Control Organization for Central and Southern Africa continues appealing for resources from its member-states and partners to launch timely and essential survey and control operations in frontline countries and abate potentially devastating threats to food security and livelihoods of vulnerable populations in the region.

Madagascar Migratory Locust (LMC):

No update was received at the time this report was compiled. UN/FAO issued a press release on January 21, 2015 emphasizing the importance of making additional resources available to counter a potentially devastating locust threat and to complete locust control and prevention job that began during the last week of September, 2013. Locusts continue threatening food security and livelihood of some 13 million people in the south and southwestern parts of the country.

Forecast: In Madagascar, locusts will continue breeding and threaten food security and livelihoods of 13 million people, particularly in the south and southwester parts of the country that is already impacted by heavy rains, floods and drought (OFDA/AELGA, DPV-FAO).

Italian (CIT), Moroccan (DMA) and Migratory (LMI) Locusts in Central Asia and the Caucasus (CAC): No update was received at the time this report was compiled or no activities are expected during this time (OFDA-AELGA).

Forecast: CAC region may see small-

scale locust activities during the forecast period (OFDA-AELGA).

Italian, Migratory and Moroccan locusts are a constant threaten to Central Asia and the Caucasus. These pests can profusely multiply and attack tens of millions of hectares and affect more than 20 million vulnerable rural inhabitants that eke a living primarily from farming and herding. With the ability to travel more than 100 km (60 miles) each day, these locusts can decimate dozens of hectares of crops and pasture, including, cereal crops, cotton, fruit trees, leguminous plants, sunflower, tobacco, vineyard, vegetable, etc. over vast areas. Most of the countries affected by the three locust species are relatively new and lack the capacity to effectively control the pest (The once known as the centralized robust pest control capacity in these countries disappeared with the downfall of the Soviet system leaving each country to fetch for itself).

Currently, USAID/OFDA is providing a modest financial assistance through a grant to the UN/FAO to help strengthen/build the capacity at the national and regional levels to prevent and control the threats these notorious pests pose to vulnerable populations and the nations as a whole.

Timor and South Pacific: No update was received from East Timor in January, but ETOP presence is likely.

African Armyworm (AAW): AAW outbreaks were reported attacking maize and other cereal crops, mostly at the advanced stages of growth, and pasture in six of the ten provinces, i.e., Harare, Mashonaland Central, Mashonaland West, Mashonaland East, Manicaland and

Midlands in **Zimbabwe** in January. The Plant Protection Research Institute of the Ministry of Agriculture has launched damage assessment and control operations.

In **Tanzania** AAW outbreaks were reported in the Lindi in the southern region of the country. The pest was reported infested 625 ha of cereal crops and pasture. In **Mozambique** AAW outbreak was reported in Manica, Sofala, Gaza and Niassa provinces. Teams from the Ministry of Agriculture were assisting farmers in carrying out control in the affected provinces during January (DLCO-EA, IRLCO-CSA).

Forecast: Armyworm outbreaks will continue through the forecast period in the southern outbreak areas until they taper off after the seasonal rains diminish. The pest will soon commence its outbreak season in central **Tanzania** and **Kenya**. Forecasters in frontline countries must remain vigilant and monitor traps and rain gages and report to concerned authorities promptly (IRLCO-CSA, OFDA/AELGA).

Quelea (QQU): An estimated 9.8 million QQU birds were prevented from attacking irrigated rice in Siaya and Busia Counties in **Kenya**. Aerial preventing control operations were launched by the Ministry of Agriculture with the assistance from the DLCO-EA spray aircraft (DLCO-EA, IRLCO-CSA, OFDA/AELGA).

Forecast: QQU bird outbreaks will likely decline in **Kenya**, but small cereal grain farmers in **Tanzania**, **Mozambique** and **Zambia** will likely experience QQU invasions during the forecast period. Active surveillance, monitoring and timely preventive interventions remain critical to

avoid severe avian attacks (IRLCO-CSA).

Facts: QQU birds can travel ~100 km/day looking for food. An adult QQU bird can consume 3-5 grams of grain and destroy the same amount each day. A medium density QQU colony can contain up to a million or more birds and capable of consuming and destroying 6,000 to 10,000 kg of seeds/ day, enough to feed 12,000-20,000 people/day.

Rodents: No update was received on rodents in January. However, this pest is a constant threat to crops and produces and requires active surveillance and preventive interventions to avoid any major threats (OFDA/AELGA).

Front-line countries must remain vigilant. Invasion countries should maintain regular monitoring. DLCO-EA, DLCCs, IRLCO-CSA, national PPDs, CNLAs, DPVs, ELOs, etc., are encouraged to continue sharing ETOP information with stakeholders as often and as early as possible. Lead farmers and community forecasters must remain vigilant and report ETOP detections to relevant authorities immediately.

Inventories of Pesticide Stocks for ETOP Control

Control operations treated 22,361 ha in **Sudan** and 1,475 in **Eritrea** during January.

Note: Some of the data on pesticide inventories provided in the following table are not necessarily current due to the fact that some countries tend to issue updates after activities are concluded and/or use pesticides for other pests. **End note.**

OFDA/AELGA encourages countries to continue exploring alternatives such as IPM to minimize and prevent risks

associated with pesticide stockpiling. A judiciously executed triangulation of surplus stocks from countries with large inventories to countries where they are much needed is a win-win situation worth considering.

Note: *A Sustainable Pesticide Stewardship (SPS) can considerably strengthen pesticide delivery system (PDS) at the national and regional levels. A strong PDS can effectively reduce pesticide related human health risks, minimize environmental pollution, increase food security and ultimately contribute to the national economy. An SPS can be effectively established by linking key stakeholders in neighbouring countries.*

End note.

Table 1. ETOP Pesticide Inventory in Frontline Countries

Country	Quantity (l/kg) [§]
Algeria	1,190,000~ ^D
Chad	43,400
Eritrea	-15,473~
Ethiopia	-3,975~
Libya	25,000
Madagascar	351,565~
Mali	32,000 ^D
Mauritania	43,400
Morocco	3,757,000~ ^D
Niger	42,805~
Oman	14,440
Senegal	156,000~ ^D
Sudan	642,167~
Tunisia	36,575~
Yemen	22,000@ + 300 kg GM~
[§] Include different kinds of pesticides in ULV, EC and dust formulations	

~ data not current

^D = Morocco, Mauritania and Algeria donated/pledged 200,000, 25,000 l, and 30,000 l of pesticides to Madagascar in 2013; Mali donated 21,000 l for NSE to Malawi, Mozambique and Tanzania in 2012 and FAO facilitated the triangulation Mauritania donated 25,000 and 30,000 l of pesticides to Libya in 2012 and Madagascar in 2013;

GM = *GreenMuscle*TM (fungal-based biological pesticide);

@includes donations from Saudi Arabia

LIST OF ACRONYMS

AAW	<i>African armyworm (Spodoptera expempta)</i>
AELGA	<i>Assistance for Emergency Locust Grasshopper Abatement</i>
AFCS	<i>Armyworm Forecasting and Control Services, Tanzania</i>
AfDB	<i>African Development Bank</i>
AME	<i>Anacridium melanorhodon</i>
APLC	<i>Australian Plague Locust Commission</i>
APLC	<i>Australian Plague Locust Commission</i>
Bands	<i>groups of hoppers marching pretty much in the same direction</i>
CAC	<i>Central Asia and the Caucasus</i>
CBAMFEW	<i>Community-based armyworm monitoring, forecasting and early warning</i>
CERF	<i>Central Emergency Response Fund</i>
CIT	<i>Calliptamus italicus</i>

CLCPRO	Commission de Lutte Contre le Criquet Pélerin dans la Région Occidentale (Commission for the Desert Locust Control in the Western Region)	ha	hectare (= 10,000 sq. meters, about 2.471 acres)
		IRIN	Integrated Regional Information Networks
		IRLCO-CSA	International Red Locust Control Organization for Central and Southern Africa
CNLA(A)	Centre National de Lutte Antiacridienne (National Locust Control Center)	ITCZ	Inter-Tropical Convergence Zone
CRC	Commission for Controlling Desert Locust in the Central Region	ITF	Inter-Tropical Convergence Front = ITCZ)
CTE	Chortoicetes terminifera	FAO-DLIS	Food and Agriculture Organizations' Desert Locust Information Service
DDLC	Department of Desert Locust Control	Hoppers	young, wingless locusts/grasshoppers (Latin synonym = nymphs or larvae)
DLCO-EA	Desert Locust Control Organization for Eastern Africa		
DMA	Dociostaurus maroccanus	Kg	Kilogram (~2.2 pound)
DPPOS	Department of Plant Protection and Quarantine Services	L	Liter (1.057 Quarts or 0.264 gallon or 33.814 US fluid ounces)
DPV	Département Protection des Végétaux (Department of Plant Protection)	LMC	Locusta migratoriacapito
		LMM	Locusta migratoria migratorioides (African Migratory Locust)
ELO	EMPRES Liaison Officers	LPA	Locustana pardalina
EMPRES	Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases	MoAFSC	Ministry of Agriculture, Food Security and Cooperatives
ETOP	Emergency Transboundary Outbreak Pest	MoARD	Ministry of Agriculture and Rural Development
Fledgling	immature adult locust /grasshopper that has pretty much the same phenology as mature adults, but lacks fully developed reproductive organs to breed	NCDLC	National Desert Locust Control, Libya
		NOAA (US)	National Oceanic and Aeronautic Administration
		NSD	Republic of North Sudan
		NSE	Nomadacris septemfasciata
		OFDA	Office of U.S. Foreign Disaster Assistance
GM	GreenMuscle [®] (a fungal- based biopesticide)	PHD	Plant Health Directorate

PHS	<i>Plant Health Services, MoA Tanzania</i>	<i>natural habitat through deforestation, land</i>
PPD	<i>Plant Protection Department</i>	<i>clearing, for agricultural</i>
PPSD	<i>Plant Protection Services Division/Department</i>	<i>and other development efforts and from associated weather variability.)</i>
PRRSN	<i>Pesticide Risk Reduction through Stewardship Network</i>	
QU	<i>Quelea bird</i>	
SARCOF	<i>Southern Africa Region Climate Outlook Forum</i>	
SGR	<i>Schistoseca gregaria</i>	
SWAC	<i>South West Asia DL Commission</i>	
TAG	<i>Technical Assistance Group</i>	
Triangulation	<i>The process whereby pesticides are donated by a country, with large inventories, but often no immediate need, to a country with immediate need with the help of a third party in the negotiation and shipments, etc. Usually FAO plays the third party role in the case of locust and other emergency cases.</i>	
USAID	<i>the United States Agency for International Development</i>	
UN	<i>the United Nations</i>	
ZEL	<i>Zonocerus elegans, the elegant grasshopper</i>	
ZVA	<i>Zonocerus variegatus, the variegated grasshopper (This insect is emerging as a fairly new distractive dry season pest, largely due to the destruction of its</i>	

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