

**Emergency Transboundary
Outbreak Pest (ETOP) Situation
Update for May with a Forecast till
mid-July, 2015**

SUMMARY

The Desert Locust (SGR¹) situation remained calm in all breeding areas during May.

In **Sudan**, control operations were not conducted and only a few scattered adults were detected in a few places. A similar situation is likely along the Red Sea coast in **Eritrea** and **Saudi Arabia**. The situation remained calm in **Yemen, Oman, Ethiopia, Somalia** and elsewhere in the central outbreak region during this month.

The western outbreak region - **Chad, Libya, Mali, Mauritania, Morocco, Niger** and **Tunisia** remained calm and only a few scattered solitary adults were reported in central Sahara in **Algeria** during May.

A few scattered adults were detected in southeastern **Iran**, but no locusts were reported in **India** or **Pakistan** during this month.

Forecast: Small-scale breeding may occur in a few locations in spring breeding areas in northwest Africa, the

interior of the Sudan, Arabian Peninsula, southeast Iran and southwest Pakistan during the forecast period, but significant developments are not likely.

OTHER ETOPS

Red (Nomadic) Locust (NSE): NSE continued to concentrate and form small groups and swarms in the primary outbreak areas in Ikuu and North Rukwa plains in **Tanzania**. A similar situation is expected to occur where control operations were not launched in **Tanzania** as well as in **Malawi, Mozambique** and **Zambia**.

Forecast: Continued vegetation burning and dry weather will force more locusts to further concentrate and form swarms, which, if left uncontrolled, will migrate to neighboring areas and threaten crops and pasture (IRLCO-CSA).

Madagascar Migratory Locust (LMC): During May, swarms and hopper bands were reported controlled and/or prevented from causing damage to crops and pasture on more than 145,000 ha in the central Transitory Outbreak Area and in the southern and eastern in the Central Invasion Areas (FAO-DPV).

Moroccan (DMA), Italian (CIT), Asian Migratory (LMI) Locusts in Central Asia and the Caucasus (CAC): A late received update indicated delayed hatching of DMA, late March to April in the region. Control operations

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

were reported on more than 60,000 ha in Tajikistan and Uzbekistan through May 1st. Hatching, hopper formations and fledglings are expected during the forecast period (FAO, OFDA/AELGA).

African Armyworm (AAW): AAW outbreaks were not reported in the IRLCO-CSA or DLCO-EA member states during May. Armyworm monitoring sites in **Kenya** or **Tanzania** where OFDA technical advisor for plant health and pesticides visited during May did not report any major AAW moth presence (DLCO-EA, IRLCO-CSA, OFDA/AELGA, MoA/Eth)

Forecast: AAW outbreaks will further diminish in **Kenya** and northern **Tanzania**, but limited activities may appear in **Ethiopia** during the coming months (IRLCO-CSA, OFDA/AELGA).

Quelea quelea (QQU): QQU bird outbreaks were reported causing damage to rice and other small grain cereal crops in **Kenya** and **Tanzania** during May where control operations were in progress at the time this report was compiled (IRLCO-CSA, OFDA/AELGA).

Forecast: QQU bird outbreaks will continue threatening small grain crops in **Kenya** and **Tanzania** during the forecast period (IRLCO-CSA, OFDA/AELGA).

Active surveillance, monitoring and timely preventive interventions remain essential to avoid unexpected surprises

in all ETOP breeding and outbreak countries. Invasion countries are advised to remain vigilant and execute essential preventive interventions as often as necessary to secure their crops and pasture

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

*Thanks to increased awareness among national authorities and the support from key development partners, including USAID, SGR frontline and invasion countries (FC and IC) in Northern Africa and Sahel West Africa, namely **Algeria, Chad, Libya, Mali, Mauritania, Morocco, Senegal, Niger and Tunisia** have established autonomous national unit for the prevention and control of locusts.*

OFDA ETOP Activities and Benefits/Impacts

Resources 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 that aims at reducing the threats of AAW to food security and livelihoods of vulnerable populations through improved information collection, analysis and reporting has significantly contributed to farmers' skills, knowledge and perceptions of AAW.



A farmer forecaster in Naivasha Sub-County, Karati sub-location, Nyondia village in Kenya posed near a pheromone trap and a rain gauge explaining AAW recording procedures. The farmer forecaster received AAW training through OFDA funded project (photo courtesy: Yeneneh Belayneh).

OFDA Advisor for Pesticides and Pests visited more than 18 CBAMFEW project implementation and monitoring sites in Kenya and Tanzania during the second

and third dekads of May, 2015. The advisor was pleased with farmer forecasters' knowledge, skills and experiences they acquired through the CBAMFEW project and the confidence they have built to stand up to the challenges posed by AAW.

In all the 18 project sites that OFDA advisor recently visited in Kenya and Tanzania, he witnessed farmer forecasters declaring that AAW outbreaks are no longer a mystery or curse or a threat. And thanks to USAID, DLCO and MoA, they now know how to prevent AAW outbreaks from occurring and stop the caterpillars from causing damage to their crops and pasture.

The CBAMFEW project is implemented in more than 240 villages in 30 districts in three countries in close collaboration with DLCO and national partners in **Ethiopia, Kenya and Tanzania** – click bit.ly/1C782Mk to view approximated project sites in the three countries (this map is work in progress and will be continuously updated with verified coordinates and additional important data layers, including cropping pattern, AAW outbreak, request for plant health intervention, demographics, population, rainfall, etc. from national staff and DLCO).

As of now, CBAMFEW project has successfully completed 67 of the 87 milestones, excluding 4 quarterly reports and 3 milestones that are in progress.

Over the course of the past two years and a half, several training programs, national, district and village meetings and workshops have been completed. The project also launched an innovative mobile phone-based data collection and management technology. This innovative technology has been implemented in Ethiopia, piloted in Tanzania and will soon be fully implemented in Tanzania and Kenya. OFDA/TAG intends to work with other partners to expand this innovative technology to benefit other AAW affected countries.

In his recent visit, OFDA advisor observed farmer forecasters being trained in mobile technology exclusively developed for monitoring and reporting AAW.



The training was led by the national armyworm monitoring unit and the DLCO base manager in Tanzania. OFDA advisor provided advice to partners on the implementation of the technology (see photo above, courtesy: Y. Belayneh).

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. The program strives to improve national and regional capacities as well as

promote collaboration among neighboring countries and encourages coordination of joint monitoring, surveillance, reporting and preventive interventions to help 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:

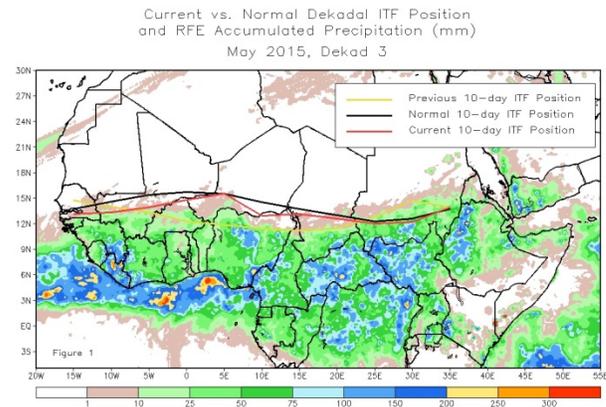
<http://www.usaid.gov/what-we-do/working-crises-and-conflict/responding-times-crisis/how-we-do-it/humanitarian-sectors/agriculture-and-food-security/pest-and-pesticide-monitoring>

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

Weather and ecological conditions:

From 21 – 31, May, the position of the Inter-Tropical Front (ITF) moved further north in the west, but slightly retreated southward in the east compared to its position during mid-May. The western (10W-10E) position of the ITF was approximated at 14.1N, which is below the climatological normal position (15.5N) for the 2nd consecutive dekads. The mean eastern (20E-35E) position of the ITF was approximated at 12.7N, falling slightly below the climatological normal position (12.9N) for late May. The figure shown below depicts the current position of the ITF relative to its climatological position during the 3rd dekad of May and its position during the 2nd dekad of May

(NOAA, 6/2015).



During the 2nd dekad of May, the ITF experienced northward advancement in the west, and some southerly retreat in the east compared to its previous position during the mid-May. The western (10W-10E) position of the ITF was around 14.1N, but still remained below the climatological normal position (15.5N) for the 2nd consecutive dekads. The mean eastern (20E-35E) position of the ITF was approximated at 12.7N, which fell slightly below the climatological normal position (12.9N) for late May. The figure below shows the current position of the ITF relative to its climatological position during the 3rd dekad of May and its previous position during the 2nd dekad of May (NOAA, 5, 2015).

During the 1st dekad of May, from 1-10, the ITF experienced a considerable northward advancement compared to its previous position during late April. The western averaged latitudinal position of the ITF (10W - 10E) was approximated at 13.9N, slightly above the climatological normal position (13.8N), although much lagging was still observed over parts of northern Nigeria and Cameroon. The mean eastern portion of the Front was approximated at 12.8N. Since mid-April, the mean eastern position of the ITF has rapidly advanced, and now surpassed the

climatological normal position by over 1 degree in latitude (NOAA, May, 2015).

The rainy season is tapering off in the NSE outbreak areas in Tanzania, Malawi and Mozambique. Only light to moderate rains were recorded in a few places during May (see table below, IRLCO-CSA).

Country	Station	Rainfall mm
Tanzania	Masenge (Wembere plains)	0.00
Tanzania	Kaliua (Malagarasi Basin)	52
Tanzania	Mpanda (Ikuu-Katavi plains)	29.2
Tanzania	Muze (Rukwa Valley Plain)	13
Malawi/ Mozambique	Ntanja (Lake Chilwa/ Lake Chiuta plains)	-
Mozambique	Caia (Dimba plains)	11
Mozambique	Nhambatanda (Buzi-Gorongosa plain)	15
Mozambique	Buzi (Buzi-Gorongos plains)	12
Mozambique	Mafambisse (Buzi-Gorongosa plains)	8
Mozambique	Dimba (Dimba plain)	8

Cooler than usual weather prevailed in CAC during March into April causing delayed hatching of DMA. In Madagascar, dry and cold weather has set in on the plateaus, but warm weather still prevailed in the mid to lower altitude zones and rainfall was insignificant during May.

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 a univoltin (a single generation per year) insect, recently began exhibiting two generations per year. These anomalous manifestations and phenomena are a serious concern to farmers, rangeland managers, crop protection experts and others. Regular monitoring and documenting anomalous manifestations in pest behavior and habitats and timely reporting remain critical. **End note.***

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

SGR – Western Outbreak Region: The SGR situation remained calm in **Chad, Libya Mali, Mauritania, Niger** and **Tunisia** during May. Only a few scattered solitary adults were reported in **Algeria** (CNLA/Chad, CNLCP/Mali, CNLA/Mauritania, CNLAA/Morocco, CNLA/Niger CNLA/Tunisia, NCDLC/Libya).

Forecast: Small-scale breeding may occur in spring breeding areas in **Algeria** and perhaps **Morocco** during the forecast period, but significant activities are not likely.

SGR (Desert Locust) – Central Outbreak Region: In **Sudan**, surveys were not carried out and significant locust populations were not reported during May. A similar situation was also observed on the Red Sea coasts in **Saudi Arabia** and perhaps, in **Eritrea** during this period. The situation remained calm in **Yemen** and no locusts were reported in **Oman, Ethiopia, Somalia** or elsewhere in the central outbreak region during this month (PPD/Sudan).

Forecast: A few adults may appear and begin breeding in areas where ecological conditions are favorable and vegetation is green, but

overall the situation will remain calm during the forecast period (DLMCC/Yemen, FAO-DLIS LCC/Oman, PPD/Sudan).

SGR - Eastern Outbreak Region: The SGR situation remained calm in **India** and **Pakistan** and only a few isolated adults were observed in southeastern **Iran** during May. **Forecast:** The SGR situation will remain calm in the eastern outbreak region and only small-scale breeding will likely occur along the southeastern **Iran** and southwestern **Pakistan** borders during the forecast period.

Red (Nomadic) Locust (NSE): Residual populations of NSE continued to concentrate and form small swarms in Ikuu and North Rukwa plains in **Tanzania**. A similar situation is expected in Malagarasi Basin and Wembere plains in Tanzania; in Lake Chilwa plains shared by Malawi and Mozambique; in Buzi-Gorongosa and Dimba plains in Mozambique and in Kafue Flats in Zambia.

Forecast: Vegetation burning coupled with dry weather conditions will force locusts to further concentrate during the forecast period. Swarms and concentrations will likely further increase with vegetation burning in progress in the outbreak areas. If not controlled, they will likely invade cultivated crops/pastures and threaten food security. Low density locust populations that were not treated in the primary outbreak areas in **Tanzania** will form swarms. A similar situation is likely in **Malawi, Mozambique** and **Zambia (IRLCO-CSA)**.

Frontline countries need to continue collaborating with the IRLCO-CSA and carry out intensive surveys to establish the status of NSE populations and ready for preventive and curative control interventions to avoid

losses to crops and pasture.

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.

Madagascar Migratory Locust (LMC): During May, swarms and hopper bands were controlled in the Central Transitory Outbreak Area and the southern and eastern Central Invasion Areas. Mature and immature adult swarms measuring up to 300 ha were reported in the Invasion and the Outbreak Areas during the last dekad of May. Two mobile aerial bases were redeployed to Miandrivazo (11-21 May and May 27) and Morondava (22-26). The 2nd base was deployed at Fenoarivo (12-23 May) and Ihosy (24-28). Control operations treated and/or prevented 146,350 ha, nearly 20% of areas treated and/or protected since the beginning of the 2nd phase of the campaign, i.e., 608,860 ha.

Given the prevailing situation, one of the two aerial bases was demobilized on 29 May and the other base is being maintained through 15 July, 2015 to ensure survey and control in the Central Invasion Area and the Outbreak Area. The locust situation will then be assessed by end of June and the need to maintain the aerial base beyond 15 July.

Note: The three year locust campaign that was aimed at: 1) Improving monitoring and analysis of the locust situation; 2) Launching large-scale aerial control operations; 3) Monitoring and mitigating human and environmental impacts of the locust control operations and, 4) Assessing effectiveness of the campaign and impacts of locusts on crops and pastures, appealed for USD 39.4 million

and has since received USD 32 million from donors and the GoM (As of now, financial and or material contributions have been received from, Algeria, Austria, Belgium, the European Union, FAO/TCP, France, Italy, Japan, Madagascar (as part of loans from the World Bank and the International Fund for Agricultural Development), Mauritania, Morocco, Norway, Turkey, the United Nations Central Emergencies Response Fund (CERF) and the United States of America.).

A successful completion of the campaign will depend on closing the gap of USD 7.4 million by making resources available in time to help expedite repositioning of supplies and equipment and launch aerial survey and control operations and finish the job. The 2nd phase of the three-phase locust campaign began in September 2014 and expected to be concluded in August, 2015. **End Note.**

Forecast: Locusts will continue appearing and threaten food security and livelihoods of hundreds of thousands of vulnerable populations in the country.

Italian (CIT), Moroccan (DMA) and Migratory (LMI) Locusts in Central Asia and the Caucasus (CAC): A late received update indicated delayed hatching of DMA, late March to April in the region. Control operations were reported covering some 60,000 ha in Tajikistan and Uzbekistan from last week of March into May 1st. Hatching, hopper formations and/or fledglings are expected to continue during the forecast period (FAO, OFDA/AELGA). **Forecast:** CAC region will likely experience increased locust activities during the forecast period (OFDA-AELGA).

Italian, Migratory and Moroccan locusts are a constant threaten to the CAC region. These pests can profusely multiply and attack tens of millions of hectares of cropping land pasture land and affect livelihoods of 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 cereal crops, pasture, cotton, fruit trees, leguminous plants, sunflower, tobacco, vineyard, vegetable and others over vast areas. Most of the countries affected by the three locust species are relatively new and lack the capacity to effectively prevent and control the pest (The once robust centralized 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 sponsoring a modes grant through the UN/FAO to help strengthen/build national and regional capacity to prevent and control the threats these notorious pests pose to vulnerable populations in these regions.

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

African Armyworm (AAW): Late received information indicated the presence of AAW caterpillars in southern **Ethiopia** in April, but details were not available (MoA/Eth). **Tanzania, Kenya, or Malawi** did not report AAW activities during May and low trap catches were observed in OFDA funded CBAMFEW project sites in **Tanzania** and **Kenya** (DLCO-EA, IRLCO-CSA, OFDA/AELGA) **Forecast:** AAW outbreak will continue diminishing during the forecast period (IRLCO-CSA, OFDA/AELGA).



OFDA technical advisor inspecting a pheromone trap during the recent TDY to Tanzania and Kenya (Photo courtesy: Y. Belayneh)

Quelea (QQU): QQU outbreaks were reported causing damage to irrigated rice crops in Busia, Kisumu, Siaya and Taita Taveta counties in **Kenya**. The birds were also reported attacking sorghum and irrigated rice in Dodoma, Manyara, Mbeya, Morogoro, Shinyanga, Singinda and Tabora regions in **Tanzania**. Control operations were in progress in both countries at the time this report was compiled (DLCO-EA, IRLCO-CSA, MoALF/Kenya and MoAFRDC/Tanzania). **Forecast:** QQU birds will likely continue posing a problem to small grain cereal growers (rice, sorghum, wheat) in **Kenya Tanzania** during the forecast period (IRLCO-CSA, OFDA/AELGA).

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: Rodent outbreaks were reported in Tanzania where the pest has been a major threat to crops. Rodents are a constant threat to crops and other produce and require 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 were carried on 145,000 ha against LMC in Madagascar during May and inventory for this month changed accordingly.

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 reduce 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	-16,897~
Ethiopia	-3,975~
Libya	25,000~
Madagascar	206,000~
Mali	32,000 ^D
Mauritania	43,400
Morocco	3,757,000~ ^D
Niger	75,800
Oman	14,440
Senegal	156,000~ ^D
Sudan	632,718~
Tunisia	36,575~
Yemen	22,000@ + 300 kg GM~

[§]Includes 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>	AfDB	<i>African Development Bank</i>
AELGA	<i>Assistance for Emergency Locust Grasshopper Abatement</i>	AME	<i>Anacridium melanorhodon</i>
AFCS	<i>Armyworm Forecasting and Control Services, Tanzania</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	<i>Commission de Lutte Contre le Criquet Pélerin dans la Région Occidentale (Commission for the Desert Locust Control in the Western Region)</i>
		CNLA(A)	<i>Centre National de Lutte Antiacridienne (National Locust Control Center)</i>
		CRC	<i>Commission for Controlling Desert Locust in the Central Region</i>
		CTE	<i>Chortoicetes terminifera</i>
		DDLC	<i>Department of Desert Locust Control</i>
		DLCO-EA	<i>Desert Locust Control Organization for Eastern Africa</i>
		DMA	<i>Dociostaurus maroccanus</i>
		DPPOS	<i>Department of Plant Protection and Quarantine Services</i>
		DPV	<i>Département Protection des Végétaux (Department of Plant Protection)</i>
		ELO	<i>EMPRES Liaison Officers</i>
		EMPRES	<i>Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases</i>
		ETOP	<i>Emergency Transboundary Outbreak Pest</i>

<i>Fledgling</i>	<i>immature adult locust /grasshopper that has pretty much the same phenology as mature adults, but lacks fully developed reproductive organs to breed</i>		<i>Assistance</i>
		<i>PHD</i>	<i>Plant Health Directorate</i>
		<i>PHS</i>	<i>Plant Health Services, MoA Tanzania</i>
		<i>PPD</i>	<i>Plant Protection Department</i>
		<i>PPSD</i>	<i>Plant Protection Services Division/Department</i>
<i>GM</i>	<i>GreenMuscle® (a fungal-based biopesticide)</i>	<i>PPRSN</i>	<i>Pesticide Risk Reduction through Stewardship Network</i>
<i>ha</i>	<i>hectare (= 10,000 sq. meters, about 2.471 acres)</i>	<i>QU</i>	<i>Quelea bird</i>
<i>IRIN</i>	<i>Integrated Regional Information Networks</i>	<i>SARCOF</i>	<i>Southern Africa Region Climate Outlook Forum</i>
<i>IRLCO-CSA</i>	<i>International Red Locust Control Organization for Central and Southern Africa</i>	<i>SGR</i>	<i>Schistoseca gregaria</i>
		<i>SWAC</i>	<i>South West Asia DL Commission</i>
		<i>TAG</i>	<i>Technical Assistance Group</i>
<i>ITCZ</i>	<i>Inter-Tropical Convergence Zone</i>	<i>Triangulation</i>	<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>
<i>ITF</i>	<i>Inter-Tropical Convergence Front = ITCZ)</i>		
<i>FAO-DLIS</i>	<i>Food and Agriculture Organizations' Desert Locust Information Service</i>		
<i>Hoppers</i>	<i>young, wingless locusts/grasshoppers (Latin synonym = nymphs or larvae)</i>		
<i>Kg</i>	<i>Kilogram (~2.2 pound)</i>		
<i>L</i>	<i>Liter (1.057 Quarts or 0.264 gallon or 33.814 US fluid ounces)</i>	<i>USAID</i>	<i>the United States Agency for International Development</i>
<i>LMC</i>	<i>Locusta migratoriacapito</i>	<i>UN</i>	<i>the United Nations</i>
<i>LMM</i>	<i>Locusta migratoria migratorioides (African Migratory Locust)</i>	<i>ZEL</i>	<i>Zonocerus elegans, the elegant grasshopper</i>
<i>LPA</i>	<i>Locustana pardalina</i>	<i>ZVA</i>	<i>Zonocerus variegatus, the variegated grasshopper (This insect is emerging as a fairly new</i>
<i>MoAFSC</i>	<i>Ministry of Agriculture, Food Security and Cooperatives</i>		<i>distractive dry season pest, largely due to the destruction of its natural habitat through deforestation, land clearing, for agricultural and other development efforts and from associated weather variability.)</i>
<i>MoARD</i>	<i>Ministry of Agriculture and Rural Development</i>		
<i>NCDLC</i>	<i>National Desert Locust Control, Libya</i>		
<i>NOAA (US)</i>	<i>National Oceanic and Aeronautic Administration</i>		
<i>NSD</i>	<i>Republic of North Sudan</i>		
<i>NSE</i>	<i>Nomadacris septemfasciata</i>		
<i>OFDA</i>	<i>Office of U.S. Foreign Disaster</i>		

Who to Contact:

If you have any questions, comments or suggestions, or know someone who would like to subscribe to this report, please, feel free to contact:

Yeneneh Belayneh, ybelayneh@usaid.gov

Tel.: + 1-202-712-1859

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