

**Emergency Transboundary Outbreak Pests (ETOPs) Situation for April  
with a forecast through mid-June 2019**  
**résumé en français est inclus**

## SUMMARY

The **Desert Locust** (*Schistoseca gregaria* - **SGR**<sup>1</sup>) situation continued improving in winter breeding areas in the western outbreak region (WOR) and along both sides of the Red Sea coasts in the central outbreak region (COR), but remained active in spring breeding areas in the interior of Saudi Arabia, the Empty Quarters in Yemen and the southern Iran and Pakistan in the eastern outbreak region (EOR) during April. Control operations treated more than 122,404 hectares in Egypt, Saudi Arabia, Mauritania, Iran, and Pakistan combined during April.

**Forecast:** The SGR situation will remain relatively calm and only small-scale breeding may occur in Algeria and Morocco during the forecast period. Breeding will continue in the interior of Saudi Arabia, and Yemen and some locusts may appear in Oman and the Nile Valley in Sudan. Undetected locusts from southern Iran and Pakistan will likely move towards summer breeding areas along the Indo-Pakistan border during the forecast period.

**Red (Nomadic) Locust** (*Nomadacris septemfasciata*) (**NSE**): No reports were received from the primary outbreak areas in the southern and central outbreak countries in Africa during April. However, hoppers may have begun fledging and will likely form swarms during the forecast period.

**Tree Locust, *Anacridium sp.*** Tree locust outbreak was reported in Turkana, Kenya where control operations were launched by MinAgri during April.

**Central American Locust, *Schistocerca piceifrons piceiferons* (CAL):** No update was received at the time this Bulletin was compiled.

**South American Locust, *Schistocerca cancellata* (SCA):** No update was received at the time this Bulletin was compiled.

**Italian (CIT), Moroccan (DMA), and the Asian Migratory Locusts (LMI):** A late received update indicated that DMA began hatching in Afghanistan, Tajikistan and Uzbekistan later than usual due to a cool and wet early spring. In Kyrgyzstan, the pest started hatching in early April and it will continue developing in the CAC region during the forecast period.

<sup>1</sup> Definitions of all acronyms can be found at the end of the report.

**Fall Armyworm (*Spodoptera frugiperda*) (FAW):** FAW invasions continued in Africa and Asia during April. The pest was reported in Eastern Africa and in several provinces in China where it was reported causing damage to maize and other crops (refers to pages 6-8 for additional information).

**African Armyworm (AAW) (*Spodoptera exempta*):** No AAW outbreak was reported during April.

**Southern Armyworm (*Spodoptera eridania*) (SAW):** SAW presence or invasions has not been reported in Africa, or Asia during this month.

**Quelea spp. (QSP) birds:** DLCO-EA spray aircraft controlled QSP outbreaks in Dodoma and Mbeya in Tanzania during April.

*Active surveillance, monitoring, sharing information and implementing timely preventive interventions remain critical to abate the threats ETOPs pose to food security and livelihoods of vulnerable communities.*

*USAID/OFDA/PSPM monitors ETOPs regularly in close collaboration with its network of national PPDs/DPVs, regional and international pest monitoring and/or control entities, including FAO, CLCPRO, CRC, DLCO-EA, and IRLCO-CSA, as well as research centers, academia, private sector, NGOs and others and issues concise analytical reports and forecasts to stakeholders across the globe through its monthly Bulletins. **End summary***

## RÉSUMÉ

**La situation du Criquet pèlerin (*Schistoseca gregaria* - SGR)** la situation a continué de s'améliorer dans les zones de reproduction hivernale de la région de flambée occidentale (WOR) et des deux côtés des côtes de la mer Rouge dans la région de flambée centrale (COR), mais est restée active dans les zones de reproduction printanière de l'intérieur de l'Arabie saoudite au Yémen et dans le sud de l'Iran et au Pakistan dans la région de flambée orientale (EOR) en avril. Les opérations de contrôle ont traité plus de 122 404 hectares en Égypte, en Arabie saoudite, en Mauritanie, en Iran et au Pakistan réunis en avril.

**Prévisions:** La situation des SGR restera relativement calme et seule une reproduction à petite échelle pourrait avoir lieu en Algérie et au Maroc au cours de la période de prévision. La reproduction se poursuivra à l'intérieur de l'Arabie saoudite et au Yémen, et des criquets pourraient apparaître à Oman et dans la vallée du Nil au Soudan. Des criquets non détectés du sud de l'Iran et du Pakistan

se déplaceront probablement vers des zones de reproduction estivale le long de la frontière indo-pakistanaise au cours de la période de prévision.

**Criquet nomade rouge (*Nomadacris septemfasciata*) (NSE)**: Aucun rapport n'a été reçu des principales zones de flambée dans les pays de flambée du sud et du centre de l'Afrique en avril. Cependant, les larves ont peut-être commencé à s'envoler et formeront probablement des essaims au cours de la période de prévision.

**Criquet Amérique centrale, *Schistocerca piceifrons piceiferons* (CAL)**: Aucune mise à jour n'a été reçue au moment de la rédaction du présent Bulletin.

**Le criquet arborial, *Anacridium* spp.**: Une invasion de criquets pèlerins a été signalée à Turkana, au Kenya, où des opérations de lutte ont été lancées par MinAgri en avril.

**Criquet d'Amérique du Sud, *Schistocerca cancellata* (SCA)**: Aucune mise à jour n'a été reçue à la date de rédaction du présent Bulletin.

**Criquets italiens (CIT), marocains (DMA), Asian Migratory Locust (LMI)**: une mise à jour reçue tardivement indique que le DMA a commencé à éclore en Afghanistan, au Tadjikistan et en Ouzbékistan plus tard que d'habitude en raison d'un printemps frais et humide. Au Kirghizistan, le ravageur a commencé à éclore début avril et continuera à se développer dans la région de la CAC au cours de la période de prévision.

**Chenille Légionnaire d'automne (*Spodoptera frugiperda*) (FAW)**: les invasions de FAW se sont poursuivies en Afrique et en Asie en avril. L'organisme nuisible a été signalé en Afrique de l'Est et dans plusieurs provinces de Chine, où il a été signalé qu'il endommageait le maïs et d'autres cultures (pour plus d'informations, reportez-vous aux pages 6-8).

**Chenille Légionnaire africaine (AAW), *Spodoptera exempta***: aucun foyer d'AAW n'a été signalé en avril.

**La chenille légionnaire du Sud (*Spodoptera eridania*) (SAW)**: Aucune présence ou invasion de SAW n'a été signalée en Afrique ni en Asie au cours de ce mois.

**Quelea spp. oiseaux (QSP)**: les avions DLCO-EA ont contrôlé les foyers du QSP à Dodoma et à Mbeya en Tanzanie en avril.

La surveillance active, un suivi, le partage d'informations et la mise en place d'interventions préventives opportunes restent indispensables pour atténuer les menaces que les ETOP représentent pour la sécurité alimentaire et les moyens de subsistance des communautés vulnérables.

**L'USAID / OFDA / PSPM** surveille régulièrement les opérations ETOP en étroite collaboration avec son réseau de PPD / DPV nationaux, d'entités régionales et internationales de surveillance et / ou de lutte contre les ravageurs, notamment la FAO, la CLCPRO, le CRC, le DLCO-EA et l'IRLCO-CSA, ainsi que centres de recherche, universités, secteur privé, ONG et autres et publie des rapports analytiques concis et des prévisions aux parties prenantes du monde entier par le biais de ses bulletins mensuels. Fin du résumé

**Note:** *This ETOP Bulletin and previous SITREPs can be accessed on USAID Pest and Pesticide Management website: [USAID Pest and Pesticide Monitoring](#)*

### Weather and Ecological Conditions

During April, rainfall was insignificant in WOR and only light showers were reported in eastern Algeria and southwest Libya. Rainfall was above-average over parts of Cote d'Ivoire, Burkina Faso, Ghana, local areas in Nigeria, portions of CAR, DRC, central and northern Ethiopia, many parts of Tanzania, Zambia, northern Mozambique, portions of Angola, Botswana, northern Zimbabwe, South Africa, and portions of Madagascar. Below-average rainfall was observed over Guinea, Sierra Leone, local areas in Cote d'Ivoire, Nigeria, Cameroon, Equatorial Guinea, Gabon, Congo, western and northern DRC, western and southern Angola, local areas in CAR, South Sudan, southern and southeastern Ethiopia, Somalia, and local areas in Mozambique and Madagascar. Weekly rainfall surpluses exceeded 100 mm over parts of northeastern Ethiopia and eastern Tanzania during the first week of April. Rainfall was above-average over eastern Guinea, eastern (FAO-DLIS, CNLAA/Morocco, INPV/Algeria, CNLA/Mauritania, NOAA, 4/2019).

In **EOR**, light to moderate rainfall was reported in southwest Pakistan and southeast Iran during April and ecological conditions were favorable for locust breeding in those areas (FAO-DLIS).

**NSE Outbreak Regions:** Moderate to normal rainfall was reported in several places near NSE outbreak and invasion areas, including Wember and Rukwa plains, Malagarais Basin in Tanzania and Buzi-Gorongosa Dimba plains in Mozambique and Kafue Flats in Zambia during April (IRLCO-CSA).

In **CAC**, no update was received at the time this Bulletin was compiled, but cooler and wetter warmer is expected to have prevailed in the southern and central parts of the region during April.

**Note:** *Changes in the weather pattern and increased temperature can contribute to ecological shift in ETOP habitats and increase the risk of pest outbreaks, resurgence and emergence of new pests. In Uzbekistan, 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 ambient altitude due to warmer higher elevations.*

*The **Asian migratory locust**, an insect that normally breeds once a year, has begun exhibiting two generations per year. These anomalies which are largely attributed to the change in the weather patterns and associated ecological shift are serious concerns to farmers, rangeland managers, crop protection experts, development and humanitarian partners, etc. Regular monitoring, documenting and reporting anomalous manifestations in pest behavior and on habitat shifts remain critical to help*

*avoid/minimize potential damage to crops, pasture and livestock and reduce subsequent negative impacts on food security and livelihoods of vulnerable populations and communities.*

[http://www.cpc.ncep.noaa.gov/products/international/casia/casia\\_hazard.pdf](http://www.cpc.ncep.noaa.gov/products/international/casia/casia_hazard.pdf)

**End note.**

### Detailed Accounts of ETOP Situation and a Forecast for the Next Six Weeks are provided below

**SGR – WOR:** The SGR situation remained generally calm in WOR in April. Only localized small-scale breeding was detected and controlled on 88 ha in northern Mauritania. Elsewhere in the region ecological conditions remained unfavorable and only a few groups were detected near irrigated areas in Algeria and a few adults were detected in Tamenrasset and Adrar and some were detected mating in Illizi. Tunisia, Morocco, and Mali and a similar situation is likely in Burkina Faso, Niger, Chad, Senegal and Libya where updates were not received during April (CNLA/Mauritania, CNLAA/Morocco, CNLAP/Mali, DGVCIA/Tunisia, FAO-DLIS).

**Forecast:** Limited-scale breeding may occur during the forecast period in the Draa Valley in Morocco and in parts of the Sahara in Algeria where ecological conditions are favorable. The situation in other countries in the region will likely remain calm during the forecast period (CNLAA/Mauritania, CNLAP/Mali, CNLAA/Morocco, DGVS&CIA, FAO-DLIS).

**SGR – COR:** The SGR situation remained calm in winter breeding areas along both sides of the Red Sea coasts, but intensified in spring breeding areas in the interior of **Saudi Arabia** where aerial and ground control operations treated hopper groups and bands and small swarms on

27,812 ha in April. In the southern Empty Quarters in **Yemen**, swarms that were formed from earlier breeding spread throughout the interior of the country where survey and control operations were not possible and locals were observed catching and consuming the locusts. Swarms from Yemen were also moved to Najran, Saudi Arabia and a few adults from eastern **Yemen** spread to northern **Oman** where they started laying eggs. In Oman, control operations treated 12 ha in farmland during April. In other parts of the country, locusts were moving fast making it difficult to control. Groups of locusts that were detected in Khasab, Oman on April 25<sup>th</sup> were seen flying towards **Iran**. The Oman National Locust Control Center has advised all survey and control officers to remain alert and implement preventive interventions as needed. No locusts were reported in other countries in COR during this month (DLMCC/Yemen, LCC/Oman, FAO-DLIS, UNAA/Djibouti).

**Forecast:** In COR, breeding will continue in the interior of Saudi Arabia and form hopper bands. Hatching will increase locust numbers in the interior of Yemen and northern Oman. Small-scale breeding may occur in the Nile Valley in Sudan, but other countries in the region will likely remain relatively calm during the forecast period.

**SGR - EOR:** SGR situation intensified in southeastern Iran where aerial and ground control operations treated locust groups, hopper bands and swarms on more than 86,570 ha during April. Control operations also conducted on 540 ha in adjacent areas in Pakistan where small-scale breeding occurred during the month (FAO-DLIS).

**Forecast:** Undetected and uncontrolled populations will likely form groups and

swarms and move towards summer breeding areas along the indo-Pakistan borders during the forecast period (FAO-DLIS).

**Red (Nomadic) Locust (NSE):** No reports were received during April from the southern and central outbreak countries, but the presence of immature adults is likely in Ikuu-Katavi plains, Malagarasi Basin and Rukwa Valley plains in Tanzania; Kafue Flats in Zambia and Lake Chilwa/Lake Chiuta plains (IRLCO-CSA).

**Forecast:** Swarms and groups may start forming in Ikuu-Katavi, and North Rukwa plains, Malagarasi Basin, Tanzania; Lake Chilwa/Lake Chiuta plains in Malawi/Mozambique and the Kafue Flats, Zambia where successful breeding is expected to have occurred. Aerial surveys and timely control interventions remain necessary to abate any threats the pest poses to crops and pasture (IRLCO-CSA, OFDA/AELGA).

**Central American Locust - *Schistocerca piceifrons piceifrons* (CAL):** No update was received at the time this Bulletin was compiled.

**South American Locust, *Schistocerca cancellata* (SAL):** No update was received at the time this bulletin was compiled.

***Tropidacris collaris* (Tucura *quebrachera* – TCO - grasshopper-):** No update was received at the time this Bulletin was compiled.

**Italian (CIT), Moroccan (DMA) and Migratory (LMI) Locusts in Central Asia and the Caucasus (CAC):** DMA hatching continued in several countries in CAC during April. A late received report indicated DMA hatching in Balkh province of Afghanistan on 25 March.

**Forecast:** DMA will continue further developing in Afghanistan, Kazakhstan, Turkmenistan, Uzbekistan, Tajikistan, Kyrgyzstan and Georgia during the forecast period (OFDA/PSPM, FAO-ECLO).

**Tree locust: *Anacridium spp.*** Kenya MinAgri concluded control operation against tree locust outbreak during April (IRLCO-CSA).

### ***Fall armyworm (FAW) (S. frugiperda)***

FAW was reported in several countries during this month. In **Ethiopia**, FAW infestations continued in irrigated maize and sorghum crops in Oromya, Gambella, Amhara and SNNP administrative regions and 14,000 ha were reported infested during April. The pest was detected in nearly some 662 villages in 100 districts in 4 admin regions. Control operations treated more than 9,400 ha using pesticides and cultural means.

CBFAMFEW forecasters and community focal persons in **Ethiopia** reported moth catches in excess of 12,710 from 32 pheromone traps in 16 CBFAMFEW districts in during April. Moth catches enhanced alert and dissemination of FAW info to farmers and community leaders, field agents, and others through forecasters and lead farmers and intensified crop scouting and monitoring. **OFDA/PSPM is proud to share this important information - the fruit of the CBFAMFEW project.**

FAW was reported attacking maize and sorghum in **Kenya** and **Tanzania** during April. Control operations were launched by the affected farmers with technical and material assistance from the MinAgri. The pest was also reported attacking maize crops in several provinces in **China** during this month. It is likely that the

pest has been causing damage to seasonal and irrigated maize and other crops several regions in sub-Saharan Africa, Asia and elsewhere during April. In CBFAMFEW countries, sensitization of farmers on monitoring, surveillance and control is intensified (IRLCO-CSA, OFDA/PSPM, Reuters).

**Forecast:** FAW will likely continue affecting in-season and irrigated maize and other crops in several countries in sub-Saharan African and across Southeast Asia during the forecast period.

CBFAMFEW Community Forecasters and trap operators, scouting teams and extension agents must remain vigilance and alert PPD staff, farmers, local communities and concerned authorities on egg, larval and moth detections on a timely manner.

*The absence of reports on FAW in some FAW prone regions or countries does not necessarily mean non-presence of infestations given that both rain-fed and irrigated cereal and other crops are susceptible to the pest. OFDA/PSPM continues the search for additional information and issues updates and alerts as necessary (OFDA/PSPM).*

**Note:** *The presence of FAW in Sudan, more so along the Nile River, is a serious threat as it could spread northward affecting hundreds of miles of irrigation schemes along the Nile Valley and likely reaching the northeastern end of the continent (Egypt).*

*Seasonal movements of FAW coupled with trade, land, water and air travel can significantly contribute to the spread of FAW across nations, regions, and continents and lead to its establishment under suitable ecological conditions*

*With its voracious appetite and more than 186 species of plants to choose from, it is highly unlikely that FAW will ever go hungry under the current condition in anyone or more of its new territories.*

**End note.**

**Activity updates:**

**USAID/OFDA** co-sponsored community-empowerment FAW project that is being implemented by a consortium composed of the Center for Agriculture and Biosciences International (CABI), the Desert Locust Control Organization for Eastern Africa (DLCO-EA), the International Center of Insect Physiology and Ecology (ICIPE) and National MinAgries and other partners and managed by FAOSFE is progressing well. It has released the first edition of the much awaited Training of Trainers (ToT) manual on FAW:

<http://www.fao.org/3/CA2924EN/ca2924en.pdf>

CBFAMFEW project has also developed twenty eight (28) posters and fliers in 8 languages, including, Amharic, English, French, Luganda, Kinyarwanda, Oromfa, Runyankore and Swahili and disseminating across eastern Africa and the Horn.

USAID/BFS and OFDA co-funded IPM based FAW management guidance document is now available in English and French and will be available in Portuguese language:

[https://www.usaid.gov/sites/default/files/documents/1867/Fall-Armyworm-IPM-Guide-for-Africa-Jan\\_30-2018.pdf](https://www.usaid.gov/sites/default/files/documents/1867/Fall-Armyworm-IPM-Guide-for-Africa-Jan_30-2018.pdf)

USAID/BFS and CABI jointly developed a one-page pest management decision guide (PMDG) for dozens of countries across Africa. BFS and SAWBO (Scientific Animation Without Borders) jointly developed a short, animation video clip on FAW biology, detection, scouting, monitoring, control and awareness raising

for small-holder farmers <https://sawbo-animations.org/video.php?video=//www.youtube.com/embd/5rxlpXEK5q8>



A fall armyworm (FAW) larva (caterpillar) comfortably resting between rows of corn kernels (Photo courtesy: Didas Moshi, DLCO-EA-Tanzania, June, 2018).

USAID/OFDA senior technical advisor for pests and pesticides and project manager will be visiting OFDA CBFAMFEW project sites in participating countries in the coming months. The technical advisor will be monitoring and assessing project activities and discuss sustainability and the way forward beyond CBFAMFEW project.

**Note:** Several species of natural enemies of FAW have been identified in Ethiopia, Kenya, Tanzania, Madagascar, India, etc. and studies are being conducted on these natural enemies (parasites, parasitoids, predators and entomopathogens) to better understand their safety, efficacy, environmental impacts and other important traits. Some are being tested along-side other agro-ecological tools,, e.g., push-pull technology, etc., in an effort to develop effective, affordable, accessible, adaptable and sustainable means of managing the pest

<http://www.informaticsjournals.com/index.php/jbc/article/viewFile/21707/17850>. **End note.**

#### Additional sources on FAW

**Highly hazardous pesticides cannot and must not be considered or used for FAW control!**

USAID Pesticide Evaluation Report and Safer Use Action Plan (PERSUAP) contains a list of pesticides assessed as relatively safer for use against FAW: <https://ecd.usaid.gov/repository/pdf/50065.pdf>

CABI FAW Portal: identification guides, manuals (including the USAID/CIMMYT IPM manual), videos, photos, abstracts on the latest FAW research: <https://www.cabi.org/ISC/fallarmyworm>

*Bt maize and the fall armyworm in Africa* (Africa Center for Biodiversity, June 2018):

<https://acbio.org.za/sites/default/files/documents/BT%20Maize%20Fall%20Army%20Worm%20report.pdf>

Invasive Species Compendium Datasheets, maps, images, abstracts and full text on invasive species of the world:

<http://www.cabi.org/isc/datasheet/29810>

FAO FAWRisk-Map has been developed to provide information on the risk of household food insecurity due to FAW across Africa (see below)

<http://www.fao.org/emergencies/resources/maps/detail/en/c/1110178/>

FAO interactive FAW Risk-Index heat map to help monitor potential risk of FAW infestation in countries where the pest has been reported

<http://www.fao.org/emergencies/resources/maps/detail/en/c/1110178/>

NURU, a mobile phone application that detects FAW eggs, larvae, pupae and damage on maize crops is developed by Penn State University in collaboration with UNFAO:

<http://www.fao.org/news/story/en/item/1141889/icode/>

Dissemination of safer, affordable, socially acceptable IPM-based pest management and assessment tools remains critical in abating FAW infestations and minimizing crop damage.

**African Armyworm (AAW):** AAW outbreak has not been reported in the southern or eastern outbreak regions in Africa and no reports were received from

elsewhere during April (DLCO-EA, IRLCO-CSA).



**Forecast:** AAW activities may commence in the secondary breeding regions in its central and northern outbreak regions in Kenya and northern Tanzania during the forecast period. <http://www.armyworm.org/>

*Pheromone traps must be maintained and monitoring must commence at the foot-hills of the seasonal rains. Trap operators must collect trap data regularly and report to national forecasting officers. Timely and appropriate preventive interventions remain critical to avoid major crop damage (OFDA/AELGA).*

**Note:** OFDA/PSPM has developed printable and web-based interactive maps for AAW project sites in project countries and potential participating countries:

<http://usaid.maps.arcgis.com/apps/Viewer/index.html?appid=8ff7a2eefbee4783bfb36c3e784e29cb>.

<http://usaid.maps.arcgis.com/apps/Viewer/index.html?appid=9d2ab2f918284595819836d1f16a526f>

OFDA/PSPM is considering a similar map for the CBFAMFEW project sites

**Southern Armyworm (*Spodoptera eridania*) (SAW/SER).** SAW, a pest native to the Americas and present from southern region of the USA to Argentina, could be a serious threat to small-holder farmers across Africa, Asia and elsewhere where it may invade – much the same

way other invasive species, including FAW, tomato leaf miner, Mediterranean fruit fly, weeds, pathogens e.g., *Cuscuta*, Mesquite, Ug99, and many more, cause extensive damage to crops, natural resources and the environment, etc.

*Strong quarantine services and vigilance monitoring and surveillance remain essential to prevent such pests from entering and invading a new territory.*

**Quelea sp. (QSP):** QSP outbreaks were reported damaging irrigated rice, sorghum and millets in Dodoma Mbeya Regions in **Tanzania** and aerial control operations were carried out by DLCO-EA with material and ground support from the MinAgri. A similar situation is likely in other countries where small-grain crops are cultivated (DLCO-EA, IRLCO-CSA).

**Forecast:** QSP outbreaks are likely to continue being a problem during the forecast period and damaging small grain cereal growers in Kisumu, Busia, Siaya and Kirinyaga counties of Kenya, Mbeya, Shinyanga, Kilimanjaro, Dodoma, Tabora, Kagera, and Singinda regions in Tanzania, and elsewhere where small-grain crops are cultivated (IRLCO-CSA, OFDA/PSPM).

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

**Rodents:** No update was received on rodents during April, but the pest is a constant threat to field and storage crops.

**FACTS:** *On average, an adult rat can consume 3-5 gm of food (grain, etc.) per day; a population of 200 rats/ha (an extremely low density/unit area) can consume a quantity enough to feed an adult sheep/day, not to mention the amount of food the rats can damage, destroy, contaminate making it unfit for human consumption, not to mention the zoonotic disease this pest carries and can transmit.*

**All ETOP front-line countries** must maintain regular monitoring and surveillance. During crop in-seasons, scouting must be implemented on a regular basis. Invasion countries should remain on alert. DLCO-EA, IRLCO-CSA, DLCCs, DLMCC, CNLAs, national DPVs and PPDs, ELOs are encouraged to continue sharing ETOP information with stakeholders as often as possible and on a timely basis. Lead farmers and community forecasters must remain vigilant and report ETOP detections to relevant authorities immediately.

### **OFDA's Contributions to ETOP Abatement Interventions**

*USAID/OFDA/PSPM is sponsoring through Arizona State University an operational research on soil amelioration to manage the Senegalese grasshopper (OSE). OSE is a notorious pest of cereal crops and pasture causing serious damage to small-scale farmers in its wide geographic coverage which extends from the Canaries, Cape Verde to nearly all sub-Saharan regions of Africa to India and neighboring countries across a wide swath. OSE occurs more frequently than several other grasshopper/locust species and is a constant threat to small-scale farmers.*

*USAID/OFDA/PSPM is interacting with interested parties to explore means and*

*ways to expand innovative technologies to AAW affected countries to contribute to food security to benefit farmers and rural communities.*

*The online Pesticide Stock Management System (PSMS) that was developed by the UN/FAO with financial assistance from USAID/OFDA and other partners continues benefiting participating countries across the globe.*

**Note:** *A sustainable Pesticide Stewardship (SPS) can contribute to strengthening a pesticide delivery system (PDS) at the national and regional levels. A strong and viable PDS can effectively reduce pesticide related human health risks, minimize environmental pollution, reduce pest control cost, improve food security and contribute to the national economy. A viable SPS can be effectively established by linking key stakeholders across political borders and geographic regions. **End note.***

**OFDA/PSPM** encourages the use of alternatives to hard core (including highly hazardous) pesticides and promotes an IPM approach to minimize risks associated with pesticide stockpiling. A judiciously executed triangulation of surplus stocks from countries with large inventories to countries that can safely and effectively utilize can create a win-win situation worth considering.

### **Inventories of Pesticide Stocks for SGR Prevention and Control**

*Inventory of national strategic stocks of SGR pesticides changed during April with more than 122,592 ha treated in total in COR region (detail: Egypt – 7,470 ha; Iran - 86,570; Mauritania 88 ha; Pakistan 540 ha and Saudi Arabia 27,812 ha).*

Table 1. Inventory of Strategic SGR Pesticide Stocks in Frontline Countries

Country	Quantity (l/kg)*
Algeria	1,186,842~
Chad	34,100
Egypt	60,600~ (10,257 ULV, 49,770 I)
Eritrea	580~
Ethiopia	9,681~
Libya	25,000~
Madagascar	206,000~ + 100,000 <sup>D</sup>
Mali	3,600
Mauritania	39,840
Morocco	3,415,178 <sup>D</sup>
Niger	75,750~
Oman	9,988~
Saudi Arabia	25,184~ -2,628I?
Senegal	156,000~
Sudan	109,081
Tunisia	62,200 obsolete
Yemen	40,090 <sup>D</sup> + 180 kg GM~

\* Includes different kinds of pesticide and formulations - ULV, EC and dust;

~ data may not be the most current;

<sup>D</sup> = Morocco donated 100,000 l of pesticides to Madagascar and 10,000 l to Mauritania in 2015

<sup>D</sup> = In 2013 Morocco donated 200,000 l to Madagascar

<sup>D</sup> = Saudi donated 10,000 to Yemen and pledged 20,000 l to Eritrea

<sup>DM</sup> = Morocco donated 30,000 l of pesticides to Mauritania

GM = *GreenMuscle*<sup>TM</sup> (fungal-based biological pesticide)

### LIST OF ACRONYMS

AAW *African armyworm (Spodoptera expempta)*

AELGA *Assistance for Emergency Locust Grasshopper Abatement*

AFCS *Armyworm Forecasting and Control Services, Tanzania*

AfDB *African Development Bank*

AGRA *Agricultural Green Revolution in Africa*

AME *Anacridium melanorhodon (Tree Locust)*

APLC *Australian Plague Locust Commission*

APLC *Australian Plague Locust Commission*  
*Bands groups of hoppers marching pretty much in the same direction*

ASARECA *Association for Strengthening Agricultural Research in Eastern and Central Africa*

CABI *Center for Agriculture and Biosciences International*

CAC *Central Asia and the Caucasus*

CBAMFEW *Community-based armyworm monitoring, forecasting and early warning*

CERF *Central Emergency Response Fund*

CIT *Calliptamus italicus (Italian Locust)*

CLCPRO *Commission de Lutte Contre le Criquet Pélerin dans la Région Occidentale (Commission for the Desert Locust Control in the Western Region)*

CNLA(A) *Centre National de Lutte Antiacridienne (National Locust Control Center)*

COR *Central SGR Outbreak Region*

CPD *Crop Protection Division*

CRC *Commission for Controlling Desert Locust in the Central Region*

CTE *Chortoicetes terminifera (Australian plague locust)*

DDLC *Department of Desert Locust Control*

DLCO-EA *Desert Locust Control Organization for Eastern Africa*

DLMCC *Desert Locust Monitoring and Control Center, Yemen*

DMA	<i>Dociostaurus maroccanus</i> (Moroccan Locust)	LMC	<i>Locusta migratoriacapito</i> (Malagasy locust)
DPPQS	Department of Plant Protection and Quarantine Services, India	LMM	<i>Locusta migratoria migratorioides</i> (African Migratory Locust)
DPV	Département Protection des Végétaux (Department of Plant Protection)	LPA	<i>Locustana pardalina</i>
ELO	EMPRES Liaison Officers –	MoAFSC	Ministry of Agriculture, Food Security and Cooperatives
EMPRES	Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases	MoAI	Ministry of Agriculture and Irrigation
EOR	Eastern SGR Outbreak Region	MoARD	Ministry of Agriculture and Rural Development
ETOP	Emergency Transboundary Outbreak Pest	NALC	National Agency for Locust Control
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 Center for the Desert Locust Control, Libya
GM	GreenMuscle® (a fungal-based biopesticide)	NOAA (US)	National Oceanic and Aeronautic Administration
ha	hectare (= 10,000 sq. meters, about 2.471 acres)	NPS	National Park Services
ICAPC	IGAD's Climate Prediction and Application Center	NSD	Republic of North Sudan
IGAD	Intergovernmental Authority on Development (Horn of Africa)	NSE	<i>Nomadacris septemfasciata</i> (Red Locust)
IRIN	Integrated Regional Information Networks	OFDA	Office of U.S. Foreign Disaster Assistance
IRLCO-CSA	International Red Locust Control Organization for Central and Southern Africa	PBB	Pine Bark Beetle ( <i>Dendroctonus</i> sp. – true weevils)
ITCZ	Inter-Tropical Convergence Zone	PHD	Plant Health Directorate
ITF	Inter-Tropical Convergence Front = ITCZ)	PHS	Plant Health Services, MoA Tanzania
FAO-DLIS	Food and Agriculture Organizations' Desert Locust Information Service	PPD	Plant Protection Department
Hoppers	young, wingless locusts/grasshoppers (Latin synonym = nymphs or larvae)	PPM	Pest and Pesticide Management
JTWC	Joint Typhoon Warning Center	PPSD	Plant Protection Services Division/Department
Kg	Kilogram (~2.2 pound)	PRRSN	Pesticide Risk Reduction through Stewardship Network
L	Liter (1.057 Quarts or 0.264 gallon or 33.814 US fluid ounces)	QSP	<i>Quelea</i> species (Red Billed <i>Quelea</i> bird)
LCC	Locust Control Center, Oman	SARCOF	Southern Africa Region Climate Outlook Forum
		SCA	<i>Schistocerca cancellata</i> (South American Locust)
		SFR	<i>Spodoptera frugiperda</i> (SFR) (Fall armyworm (FAW))
		SGR	<i>Schistoseca gregaria</i> (the Desert Locust)
		SPI	<i>Schistocerca piceifrons piceiferons</i> (Central American Locust)
		SSD	Republic of South Sudan

SPB *Southern Pine Beetle (Dendroctonus frontalis) – true weevils*

SWAC *South West Asia DL Commission*

PBB *Pine Bark Beetle*

PSPM *Preparedness, Strategic Planning and Mitigation (formerly known as Technical Assistance Group - TAG)*

Triangulation *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 pests.*

UF *University of Florida*

USAID *the United States Agency for International Development*

UN *the United Nations*

WOR *Western SGR Outbreak Region*

ZEL *Zonocerus elegans, the elegant grasshopper*

ZVA *Zonocerus variegatus, the variegated grasshopper, is emerging as a fairly new dry season pest, largely due to the destruction of its natural habitat through deforestation, land clearing, etc. for agricultural and other development efforts and due to climate anomalies*

Tel.: + 1-202-712-1859 (landline)  
+ 1-703-362-5721 (mobile)

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### **Point of Contact:**

If you need more information or have any questions, comments or suggestions or know someone who would like to freely subscribe to this report or unsubscribe, please, reach out to:

Yeneneh Belayneh, PhD.  
Senior Technical Advisor and Project Manager  
USAID/DCHA/OFDA  
[ybelayneh@usaid.gov](mailto:ybelayneh@usaid.gov)