

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

SUMMARY

The **Desert Locust** (*Schistoseca gregaria* - **SGR**¹) situation remained generally calm in the western outbreak region (WOR) and only small-scale breeding was reported in Mauritania and Algeria and a few adults were detected in northern Niger during January. In the central outbreak region (COR), SGR continued developing and adults and small swarms were reported on the Red Sea coasts in Egypt, Sudan, and Eritrea and a few swarms moved to northern coast of Saudi Arabia. Swarms from the Empty Quarter invaded the interior of Saudi Arabia and a single swarm reached UAE during January. Aerial and ground control treated close to 55,000 ha in COR during this month. In the eastern outbreak region (EOR) adult groups from the Arabian Peninsula moved to the southern coast of Iran at the end of January.

Forecast: Adult locusts will continue appearing in Mauritania, Mali, Niger and Algeria and small-scale breeding will commence in parts of Mauritania and Morocco during the forecast period provided favorable ecological conditions exist. 2nd generation breeding will increase locust numbers and swarms in Egypt, Sudan and Eritrea. A few swarms from northern Sudan will likely cross the Red Sea and reach coastal areas and the interior of Saudi Arabia during the forecast period. Egg laying and hatching will likely occur on the southern coast of Iran and hoppers and bands as well as adult groups may move towards southwest Pakistan during the forecast period.

Red (Nomadic) Locust (*Nomadacris septemfasciata*) (**NSE**): NSE situation remained calm during January.

South American Locust, *Schistocerca cancellata* (SCA): An outbreak of SCA occurred in Boqueron Paraguay in January and control operations were carried out by the Senave. Solitary adults and hoppers were reported in Argentina and adults were detected in Bolivia during this period.

Italian (CIT), Moroccan (DMA), and the Asian Migratory Locusts (LMI): The locust situation in the CAC region remained calm during January.

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

Fall Armyworm (*Spodoptera frugiperda*) (**FAW**): FAW outbreaks were reported in Zambia, Zimbabwe, Mozambique and Malawi and control operations were carried out by the affected farmers with technical and material assistance from the MinAgries (for more info, refer to pages 8-11).

African Armyworm (AAW) (*Spodoptera exempta*): Moderate AAW outbreaks were reported in maize fields in Zimbabwe during January.

Quelea birds (QQU): QQU bird roosts with large numbers of birds were located in Mwea Rice Irrigation Scheme in Kenya.

Active surveillance, monitoring, reporting, sharing information and timely implementation of 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 concernant le criquet pèlerin (*Schistoseca gregaria* - SGR) était généralement calme dans la région de flambée occidentale (WOR) et seule une reproduction à petite échelle a été signalée en Mauritanie et en Algérie et quelques adultes ont été détectés dans le nord du Niger en janvier. La RGG a continué à se développer dans la région centrale de l'épidémie (COR), et des adultes et de petits essaims ont été signalés sur la côte de la mer Rouge en Égypte, au Soudan et en Érythrée, et certains essaims se sont déplacés vers la côte nord de l'Arabie saoudite. Des essaims du quartier vide ont envahi l'intérieur de l'Arabie saoudite et un seul essaim a atteint les Emirats Arabes Unis en janvier. Les contrôles aériens et terrestres ont traité près de 55 000 ha de COR au cours de ce mois. Dans la région de la flambée orientale (EOR), des groupes d'adultes de la péninsule arabique se sont déplacés vers la côte sud de l'Iran à la fin du mois de janvier.

Prévision: les criquets adultes continueront à apparaître en Mauritanie, au Mali, au Niger et en Algérie et une reproduction à petite échelle commencera dans certaines parties de la Mauritanie et du Maroc pendant la période de prévision, à condition que les conditions écologiques soient favorables. Une reproduction de 2e

génération augmentera les effectifs acridiens et les essaims en Égypte, au Soudan et en Érythrée. Certains essaims du nord du Soudan traverseront probablement la mer Rouge et atteindront les zones côtières et l'intérieur de l'Arabie saoudite au cours de la période de prévision. Des pontes et des éclosions d'œufs auront probablement lieu sur la côte sud de l'Iran, tandis que la truite, les bandes et les groupes d'ailés pourraient se déplacer vers le sud-ouest du Pakistan au cours de la période considérée.

Criquet nomade rouge (*Nomadacris septemfasciata*) (NSE): La situation en matière de sécurité naturelle est restée calme en janvier.

Criquet d'Amérique du Sud, *Schistocerca cancellata* (SCA): Un foyer de SCA est apparu à Boqueron au Paraguay en janvier et les opérations de lutte ont été menées par Senave. Des adultes solitaires et des larves ont été signalés en Argentine et des adultes en Bolivie au cours de cette période.

CIT Asie, Marocain (DMA) et Criqueurs migrants d'Asie (LMI): La situation acridienne dans la région de la CAC est restée calme en janvier.

Chenille Légionnaire d'automne (*Spodoptera frugiperda*) (FAW): Les rapports FAW ont été signalés en Zambie, au Zimbabwe, au Mozambique et au Malawi et des opérations de lutte ont été menées par les agriculteurs concernés avec l'assistance technique du MinAgries (pour plus d'informations, voir pages 8- 11).

African Armyworm (AAW) (*Spodoptera exempted*): Des foyers modérés d'AAW ont été signalés dans des champs de maïs au Zimbabwe en janvier.

Oiseaux Quelea (QQU): Des nids d'oiseaux QQU avec un grand nombre d'oiseaux étaient situés dans le système d'irrigation du riz de Mwea au Kenya.

La surveillance active, la surveillance, la notification, le partage d'informations et les interventions préventives en temps opportun restent critiques en tout temps pour réduire les menaces que posent les ETOP pour les cultures et les pâturages.

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

OFDA's Contributions to ETOP Abatement Interventions

USAID/OFDA co-sponsored FAW disaster risk reduction project continued being implemented. To date the project has completed national level Training of Trainers (ToT); trained several dozen officers/staff in Burundi, Ethiopia, Kenya, Rwanda, Tanzania and Uganda. It has launched consultative district level meetings for stakeholders involving more than 300 farmer focal persons, village chiefs, agricultural development agents and others in 300 villages, in 50 districts in six countries. Monitoring using pheromone traps and scouting are widely implemented in all project villages. Mobile phones are being utilized for monitoring, documenting and reporting the FAW situation in all countries.

The OFDA-BFS co-funded FAW Field Guide for Integrated FAW Management https://feedthefuture.gov/sites/FallArmyworm_IPM_Guide_forAfrica.pdf and FAO's FAW IPM Manual for FFS were utilized for the training and scouting along with those of CABI, DLCO-EA, ICIPE and FAO.

The community/farmers' ToT field manual that CABI (Nairobi) has developed has been finalized and will soon be available for dissemination and use. The Manual heavily references to the USAID FAW IPM field guide, FAO's FAW manual, and other relevant sources. It focuses on district officers, extension staff and rural communities and others.

OFDA/PSPM is working with interested parties to explore means and ways to expand innovative technologies to FAW/AAW affected countries to contribute to food security and benefit farmers and rural communities.

OFDA/PSPM's interests in sustainable pesticide risk reduction in low income countries to strengthen their capacities and help avoid potentially threatening pesticide related contaminations and improve safety of vulnerable communities and their shared environment remain high on the agenda.

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. Thanks to this tool, ETOP-prone countries and others have been able to avoid unnecessary procurements and stockpiling of pesticides. This practice has significantly contributed to host-countries' ability to effectively monitor, manage, minimize and avoid costly disposal operations and thereby improve safety and well-being of their citizens and their shared environment.

USAID/OFDA-sponsored DRR projects have strengthened national and regional capacity for emergency locust control and prevention and helped tens of millions of farmers, pastoralists across Sahel West Africa, Northwest Africa, Eastern and Northeastern Africa, the Middle East and Caucasus and Central Asia (CAC). The projects created, facilitated and improved collaborations among neighboring countries for joint monitoring, surveillance, information sharing and technical support. The projects supported several dozen trainings on ETOP monitoring and control. Thanks to these and other similar efforts, potentially serious locust outbreaks and invasions had been abated several times in many countries across the primary outbreak regions for more than a decade and those that have benefited through this efforts continue leading SGR monitoring,

surveillance, and control interventions, etc.

Technical and material supports that have been provided to participating frontline countries and DLCO-EA through the USAID/OFDA-FAO-DLCO-EA co-sponsored Horn of Africa emergency desert locust management project has strengthened capacity to better monitor, report, prevent, and abate locusts in the sub-region.

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

Weather and Ecological Conditions

In **WOR**, ecological conditions remained generally unfavorable as there has not been significant rainfall in the region during the month. Only patches of green vegetation were observed between Akjoujt to Oujeft in northwest **Mauritania**. In **Algeria**, weak rainfall was reported in Tassili and Hoggar, but the soil was mainly wet near irrigated fields in Adrar and Tamanrasset during January. In **Morocco**, patches of green vegetation persisted in a few places in the Draa and ZizGhris valleys.

In **COR**, light to moderate rains were recorded on the Red Sea coast near Tokar Delta in **Sudan** and light showers were reported on the **Eritrean** coastal plain. Ecological conditions were favorable on the Red Sea coast and subcoastal areas in southeastern **Egypt**. In **Saudi Arabia**, good rain was reported on parts of the Red Sea coastal plain from Masturah and Dubaand between Riyadh and Gassim as well as in Eritrea, on the central Red Sea coast near Jeddah in Saudi Arabia and the eastern coast of Oman during this month. Conditions were also favorable along the southern coastal

edge of the empty quarter in Saudi Arabia near the Yemen/Oman Border due to the October Cyclone Lubar and conditions were also favorable in southeastern Yemen and near Oman borders (FAO-DLIS, LLC/Oman, PPD/Sudan).

Dry conditions prevailed throughout the region in the **EOR** during January and only little rain and showers occurred on the southern coastal plains in Iran and coastal and subcoastal areas in Baluchistan Pakistan during January (FAO-DLIS).

NSE Outbreak Regions: Normal to above normal rains were recorded near NSE outbreak areas. At the Masenge Station near Wembere Plains and Kaliua station near Malagarasi Basin in Tanzania, 246.8 ml and 264.4 ml were recorded respectively during this month. In Mafambisse station near Buzi Plain and Gorongosa station near Gorongosa Plain in Mozambique 188.0 ml and 132.0 ml respectively were recorded. In Zambia at the Namwala Station near Kafue Flats, 203.2 ml were reported (IRLCO-CSA).

In **CAC**, no update was available at the time this Bulletin was compiled, but cold and dry weather is expected to have prevailed in the region during January.

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

End note.

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

SGR – WOR: Small-scale breeding occurred in northwest **Mauritania** where some 100 ha were treated. In southern **Algeria**, ecological conditions were relatively favorable for the survival and reproduction of the SGR in Hoggar and the irrigated agricultural areas and low numbers of solitary hoppers and immature adults were detected in Tamanrasset during January. In **Niger**, immature and mature adults were detected in a few places in the Air Mountains during January.

In **Mali**, no locusts were reported during this period although pockets of favorable ecological conditions were present in some gregarization areas. In **Morocco**, annual vegetation remained green and well developed north of Bir Anzarane and Gueltat Zemmour in Oued Eddahab as well as in the South of the Oriental and

pockets of green vegetation persisted in the Wadi in the Drâa and Ziz-Ghris valleys, but no locusts were reported during this month. Ecological conditions remained largely unfavorable and no locusts were reported in **Tunisia** during January and no reports were received in Burkina Faso, Chad, Libya or Senegal or other countries in the region during this period (CNLA/Mauritania, CNLAA/Morocco, CNLAP/Mali, FAO-DLIS, INPV/Algeria).

Forecast: In WOR, small-scale breeding will likely continue in northwest **Mauritania**, and may occur in northern part of the country with the temperature rising. Low numbers of adults will likely appear and persist and **Mali** and **Niger**. In southern **Algeria** immature adults resulting from breeding in the extreme south will persist in the Hoggar region during winter and gradually move to spring breeding areas in the Central Sahara and in irrigated areas and may start to breed at the foothills of spring rains and warmer temperatures. In **Morocco**, isolated adults may start breeding in southern part of the country towards late March. The situation will remain calm during the forecast period in other countries in the region (CNLA/Mauritania, CNLAP/Mali, CNLAA/Morocco, CNLA/Tunisia, FAO-DLIS, INPV/Algeria).

SGR – COR: In COR, an outbreak occurred on the Red Sea coast of **Sudan** where control operations continued and treated hoppers, adult groups and swarms on close to 55,000 ha during January. In Sudan, DLCO-EA and PPD aircraft were deployed in the Red Sea coastal areas and control operations treated more than more than 34,000 ha through the end of January. More than 16 swarms, hoppers and adult groups were controlled during this period. Locust

numbers increased along the southern Red Sea coast in Egypt and swarms were reported in Saudi Arabia, Oman, and UAE (DLCO-EA, PPD/Sudan).

In **Eritrea**, ground control operations treated 1st – 4th instar hoppers, immature and mature locusts on more than 6,965 ha in the northern and central parts of the Red Sea coast and between Qarura and Marsa Coba and near Massawa during January (DLCO-EA).

Small-scale breeding occurred in southeast **Egypt**, the Red Sea coast of **Saudi Arabia**, and southern **Oman** during this month. Control operations treated 1,660 ha in **Egypt** and 12,165 ha in **Saudi Arabia** during January. Several swarms were detected in Saudi Arabia and one swam was reported in UAE by mid-January. Mature gregarious adults were detected copulating in Wadi Seaf in **Yemen** in the eastern province of Al Maharah Province during late January. Two generations of breeding are thought to have occurred in this province on the southern edge of the Empty Quarter along the Oman border where good rains fell in May and October 2018 from cyclones Mekunu and Lunan. No locusts were reported in **Oman** or other countries in the COR during this period (DLCO-EA, FAO-DLIS, LCC/Oman, PPD/Sudan).

Forecast: 2nd generation breeding will continue and hatching will occur and hoppers and immature adults and will increase on the Red Sea coast in Sudan, Egypt, and Eritrea and Saudi Arabia and perhaps form more swarms during the forecast period provided ecological conditions remain favorable. Locust movements between countries will likely increase. There is a risk of adults and/or and small swarms from the Arabian Peninsula arriving in Bahrain, Kuwait,

Qatar, and UAE during the forecast period (DLCO-EA, FAO-DLIS, LCC/Oman, PPD/Sudan).

SGR - EOR: Groups of immature and mature adults were detected on the southwestern coastal areas between Bushehr and Bander-e Lengeh during last few days of January. The locusts likely arrived from the Arabian Peninsula from breeding that occurred in the southeastern Empty Quarters during December and no locusts were reported and significant developments are not likely during the forecast period (FAO-DLIS).

Forecast: There is a slight risk of a few more adults and small swarms arriving from the Arabian Peninsula. Once arrived, locusts will likely breed and form hoppers and bands in Bander-e Lengeh in Iran in areas where rainfall occurred. A few adult groups may also appear in Baluchistan the western coastal areas of Pakistan and may breed in areas of recent rainfall, but significant development is not likely during the forecast (FAO-DLIS).

Active monitoring, timely reporting and preventive interventions remain critical to abate any major developments that could pose serious threats to crops and pasture in areas where locust activities are present.

*The **USAID/OFDA-FAO-DLCO-EA** sponsored Horn of Africa emergency desert locust management project contributed to strengthening national and regional capacity for SGR surveillance, monitoring and control. Technical and material supports that have been provided through the project enabled front-line countries and DLCO-EA to better monitor, report, and build capacity to prevent, and abate locusts in the sub-region.*

Red (Nomadic) Locust (NSE): NSE situation remained relatively calm as there were no outbreaks in any of the primary outbreak areas. However, hatching of eggs in the outbreak areas is expected to have occurred and hopper and band formations to have begun during February in Ikuu-Katavi, Rukwa Valley plains, Wembere plains and Malagarasi basin in Tanzania; Lake Chilwa/Lake Chiuta plains that are shared by Malawi and Mozambique; Buzi plain, Dimba plain in Mozambique and in the Kafue Flats in Zambia where substantial parental populations had persisted prior to the onset of the rains (IRLCO-CSA).

Forecast: NSE hoppers and bands are likely to form in some of the outbreak areas in the region where significant parental population were present before the onset of the rains in November/December 2018. Fledging is expected to commence during the forecast period in the primary outbreak areas. IRLCO-CSA intends to undertake intensive ground and aerial surveillance to establish pest intensity in collaboration with its member-states. Control operations will be carried out where high NSE populations are detected. Continued collaborations between the IRLCO-CSA and its member-states remain crucial to avert serious crop damage by NSE (IRLCO-CSA, OFDA/AELGA).

South American Locust, *Schistocerca cancellata* (SAL): A small-scale SAL outbreak occurred in Boqueron department in Paraguay in January. The outbreak included a small swarm. Control operations were carried out by the Senave of Paraguay. Solitary adults were also reported in Argentina and Bolivia. Hoppers were detected in the primary breeding areas in Argentina during January (Senesa Argentina).

Forecast: SCA is being tracked near the town of Mariscal José Félix Estigarribia (Paraguay) where the pest will likely continue being present. Timely cross-border surveillance and monitoring remain essential to detect and abate the pest (Senesa/Argentina).

Italian (CIT), Moroccan (DMA) and Migratory (LMI) Locusts in Central Asia and the Caucasus (CAC): Locust situation in CAC is expected to have remained calm during this time.

Forecast: The CAC region will remain calm till next spring.

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

In **Malawi**, FAW outbreaks were reported affecting crops in Lilongwe, Machinga, Blantyre, Shire Valley, Karonga, Kasungu, Muzuzu and Salima Agricultural Development Divisions (ADD). Infestation levels were reported mild to moderate with estimated 162 825 ha of maize, sorghum and millet being infested. Control was carried out by the affected farmers with technical and material assistance from the Ministry of Agriculture and Food Security. By the end of January, over 10 000 lts of pesticides had been reported distributed to the affected areas (IRLCO-CSA).

In **Mozambique** FAW outbreaks were reported affecting most of the provinces and a total of 196 ha had been reported attacked in Sofala province. Control was carried out by the affected farmers with material and technical assistance the the Ministry of Agriculture and Food Security (IRLCO-CSA).

In **Zimbabwe**, widespread outbreaks of FAW occurred in most of the provinces while minor outbreaks of African Armyworm were reported in Manicaland

and Mashonaland West Provinces. The pests were reported attacking mainly maize. Limited damage occurred due to timely control and farmers' sensitization by the Ministry of Agriculture staff. Control was carried out by affected farmers using pesticides supplied by the Ministry of Agriculture.

In **Zambia**, FAW outbreaks were reported in all nine provinces. The caterpillars were reported attacking maize crop. The damage to the crop was reported to be mild to moderate. Control was carried out by the affected farmers using inputs provided by the Ministry of Agriculture.

Forecast: FAW will continue occurring in IRLCO-CSA member-states, including Malawi, Mozambique Zambia and Zimbabwe. It may also appear in Kenya, Tanzania and other countries in the region during the forecast period. The pest will also appear in irrigated and rain-fed maize and other crops across several regions in Africa and Asia where the cropping season is in progress and/or has kicked in (IRLCO-CSA, OFDA/PSPM).

Activity updates:

USAID/OFDA-funded community empowerment project on FAW monitoring, early warning and management continued in the participating six eastern and the Horn of African countries.

USAID/OFDA senior technical advisor for pests and pesticides and project manager participated in the project mid-term review in Kigali, Rwanda during the last week of November 2018. The mid-term review discussed accomplishments, identified constraints encountered, and remedial actions taken and outlined follow on activities. The review lasted three days and reviewed several issues

including but not limited to information dissemination materials, training of trainers manual and posters, etc.



CFAMFEWM project mid-term review participants, Kigali, Rwanda, November 28-30, 2018 (Courtesy: FAOSFE).

Reinforcing and ensuring retention of knowledge and skills (KS) in FAW biology, behavior, monitoring, scouting, and management, as well as sensitization on human and animal health risks associated with consumption of fungal-infected grains were emphasized and discussed at length. Actions taken in strengthening and bolstering community KS on natural enemies, including fungal pathogens, predators and parasitoids and other natural means for FAW management were discussed at length.



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

Note: Several species of natural enemies, including parasites, parasitoids, predators and entomopathogens have been discovered in Ethiopia, Kenya, Tanzania

Madagascar, and India. Further studies are being conducted on the natural enemies both in Africa and Asia to better understand their safety, efficacy and adaptability along-side other agro-ecological means, including push-pull technology, etc. End note.

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

<https://www.thehindu.com/news/national/karnataka/ravaged-by-a-caterpillar/article25010469.ece>
http://www.nbair.res.in/recent_events/Pest%20Alert%2030th%20July%202018-new1.pdf,
http://www.exeter.ac.uk/news/featurednews/title_676373_en.html,

<http://www.fao.org/news/story/en/item/1148819/icode/>

<https://www.cimmyt.org/fall-armyworm-reported-in-india-battle-against-the-pest-extends-now-to-asia/>

USAID/BFS and OFDA co-funded IPM based FAW management guidance document is now available in English and French: [Fall Armyworm in Africa: A Guide for Integrated Pest Management](#) and will be available in Portuguese language.

USAID/BFS has developed an easy-to-use one-page pest management decision guide (PMDG) in collaboration with CABI for dozens of countries across Africa and continues working on affordable tools. The PMDG is being translated into local languages to benefit rural communities. 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/embbed/5rxlpXEK5g8>

<https://ecd.usaid.gov/repository/pdf/50065.pdf>

FAO and its partners developed an interactive FAW Risk-Index heat map to help monitor the potential level of risk of FAW situation in affected countries across Africa, Yemen, etc. As of now, the pest has been reported

in nearly all sub-Saharan African countries, including Seychelles. Only Eritrea and Lesotho have not yet reported its presence.

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

Safer and affordable, ecologically sustainable, economically sound, socially acceptable IPM based proven pest management intervention methodologies and assessment tools need to be available and widely disseminated to manage the threat/damage pests pose to the farming communities, more so small-holder farmers.

Additional sources on FAW

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

Armyworm Network: A web resource for armyworm in Africa and their biological control: <http://www.armyworm.org/>

<https://www.plantwise.org/pesticide-restrictions>

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>

Drought and armyworm threaten Africa's food security:

<http://www.theeastafrican.co.ke/news/Drought-and-armyworm-threaten-Africa-food-security/2558-3996692-ggws8q/index.html>

<http://www.fao.org/food-chain-crisis/how-we-work/plant-protection/fallarmyworm/en/>

http://www.fao.org/fileadmin/templates/fcc/map/map_of_affected_areas/Fall_Armyworm_brief_-_15Dec2017_.pdf

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/>

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/>

FAO monitoring and interactive FAW map:

<https://app.powerbi.com/view?r=eyJrIjoiMzMxY2NmYmYtZDEwMS00ZTU0LTgwMzQtMDZhZjE3NDVjOTQ3IiwidCI6IjE2M2FjNDY4LWFiYjgtNDRkMC04MWZkLWQ5ZGIxNWUzYjY5NiIsImMiOiJh9>

<https://play.google.com/store/apps/details?id=org.fao.faw>

<https://entomologytoday.org/2018/11/20/not-just-maize-africas-fall-armyworm-crisis-threatens-sorghum-other-crops/>

African Armyworm (AAW): Moderate AAW outbreaks were reported in maize fields in Zimbabwe during January (IRLCO-CSA).

Forecast: AAW outbreaks are likely to continue in Malawi, Mozambique, Zambia and Zimbabwe affecting late planted cereal crops and may begin appearing in Uganda, Tanzania and Kenya. Trap operators are advised to continue collecting moth catches and share trap data with the national forecasting officers. Active surveillance and appropriate preventive interventions remain critical to avoid major crop damage (OFDA/AELGA).

Note: USAID/OFDA has developed printable and web-based maps for AAW trap monitoring locations, for participating outbreak and invasion

countries in the central region:

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

A similar map is also being developed for the southern region:

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

(click the links for the maps). OFDA/PSPM intends to develop interactive map for the FAW DDR project).

Quelea (QQU): QQU bird outbreaks were reported in Kenya in Mwea Rice Irrigation Scheme of Kirinyaga County. Two roosts with large numbers of birds had been located. Plans to carry out aerial control by Crop Protection Services Division of the MinAgri were at an advanced stage. QQU birds were not reported causing damage to small grain cereal crops in Mozambique, Malawi, Tanzania, Zambia or Zimbabwe and no reports were received from other QQU outbreak prone countries during this time (DLCO-EA, IRLCO-CSA).

Forecast: Quelea birds are likely to occur in Kenya, Tanzania, and Mozambique where rain-fed and irrigated small grain cereal crops are getting to susceptible stage during February to April 2019 (IRLCO-CSA, OFDA/AELGA).

Facts: QQU birds can travel ~100 km/day in search of 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 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 January, 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.

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 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 January where close to 55,000 ha were treated.

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

Country	Quantity (l/kg)*
Algeria	1,186,842~
Chad	34,100
Egypt	68,070~ (18,300 ULV, 49,770 l)
Eritrea	2,227~ + 20,000 ^D
Ethiopia	9,681~
Libya	25,000~
Madagascar	206,000~ + 100,000 ^D
Mali	3,600
Mauritania	39,900
Morocco	3,490,732 ^D
Niger	75,750~
Oman	10,000~
S. Arabia	77,192~
Senegal	156,000~
Sudan	133,403~
Tunisia	62,200 obsolete
Yemen	40,090 ^D + 180 kg GM~

*Includes different kinds of pesticide and formulations - ULV, EC and dust;
 ~ data may not be current;
^D = Morocco donated 100,000 l of pesticides to Madagascar and 10,000 l to Mauritania in 2015
^D = In 2013 Morocco donated 200,000 l to Madagascar
^D = Saudi donated 10,000 to Yemen and pledged 20,000 l to Eritrea

DM = Morocco donated 30,000 l of pesticides to Mauritania

GM = GreenMuscle™ (fungal-based biological pesticide)

LIST OF ACRONYMS

AAW	African armyworm (<i>Spodoptera expempta</i>)	CRC	Commission for Controlling Desert Locust in the Central Region
AELGA	Assistance for Emergency Locust Grasshopper Abatement	CTE	<i>Chortoicetes terminifera</i> (Australian plague locust)
AFCS	Armyworm Forecasting and Control Services, Tanzania	DDLCC	Department of Desert Locust Control
AfDB	African Development Bank	DLCO-EA	Desert Locust Control Organization for Eastern Africa
AGRA	Agricultural Green Revolution in Africa	DLMCC	Desert Locust Monitoring and Control Center, Yemen
AME	<i>Anacridium melanorhodon</i> (Tree Locust)	DMA	<i>Dociostaurus maroccanus</i> (Moroccan Locust)
APLC	Australian Plague Locust Commission	DPPQS	Department of Plant Protection and Quarantine Services, India
APLC	Australian Plague Locust Commission Bands groups of hoppers marching pretty much in the same direction	DPV	Département Protection des Végétaux (Department of Plant Protection)
ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa	ELO	EMPRES Liaison Officers –
CABI	Center for Agriculture and Biosciences International	EMPRES	Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases
CAC	Central Asia and the Caucasus	EOR	Eastern SGR Outbreak Region
CBAMFEW	Community-based armyworm monitoring, forecasting and early warning	ETOP	Emergency Transboundary Outbreak Pest
CERF	Central Emergency Response Fund	Fledgling	immature adult locust /grasshopper that has pretty much the same phenology as mature adults, but lacks fully developed reproductive organs to breed
CIT	<i>Calliptamus italicus</i> (Italian Locust)	GM	GreenMuscle® (a fungal-based biopesticide)
CLCPRO	Commission de Lutte Contre le Criquet Pèlerin dans la Région Occidentale (Commission for the Desert Locust Control in the Western Region)	ha	hectare (= 10,000 sq. meters, about 2.471 acres)
CNLA(A)	Centre National de Lutte Antiacridienne (National Locust Control Center)	ICAPC	IGAD's Climate Prediction and Application Center
COR	Central SGR Outbreak Region	IGAD	Intergovernmental Authority on Development (Horn of Africa)
CPD	Crop Protection Division	IRIN	Integrated Regional Information Networks
		IRLCO-CSA	International Red Locust Control Organization for Central and Southern Africa
		ITCZ	Inter-Tropical Convergence Zone
		ITF	Inter-Tropical Convergence Front = ITCZ)

FAO-DLIS	Food and Agriculture Organizations' Desert Locust Information Service	SCA	<i>Schistocerca cancellata</i> (South American Locust)
Hoppers	young, wingless locusts/grasshoppers (Latin synonym = nymphs or larvae)	SFR	<i>Spodoptera frugiperda</i> (SFR) (Fall armyworm (FAW))
JTWC	Joint Typhoon Warning Center	SGR	<i>Schistoseca gregaria</i> (the Desert Locust)
Kg	Kilogram (~2.2 pound)	SPI	<i>Schistocerca piceifrons piceiferons</i> (Central American Locust)
L	Liter (1.057 Quarts or 0.264 gallon or 33.814 US fluid ounces)	SSD	Republic of South Sudan
LCC	Locust Control Center, Oman	SPB	Southern Pine Beetle (<i>Dendroctonus frontalis</i>) – true weevils
LMC	<i>Locusta migratoriacapito</i> (Malagasy locust)	SWAC	South West Asia DL Commission
LMM	<i>Locusta migratoria migratorioides</i> (African Migratory Locust)	PBB	Pine Bark Beetle
LPA	<i>Locustana pardalina</i>	PSPM	Preparedness, Strategic Planning and Mitigation (formerly known as Technical Assistance Group - TAG)
MoAFSC	Ministry of Agriculture, Food Security and Cooperatives	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.
MoAI	Ministry of Agriculture and Irrigation	UF	University of Florida
MoARD	Ministry of Agriculture and Rural Development	USAID	the United States Agency for International Development
NALC	National Agency for Locust Control	UN	the United Nations
NCDLC	National Center for the Desert Locust Control, Libya	WOR	Western SGR Outbreak Region
NOAA (US)	National Oceanic and Aeronautic Administration	ZEL	<i>Zonocerus elegans</i> , the elegant grasshopper
NPS	National Park Services	ZVA	<i>Zonocerus variegatus</i> , 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
NSD	Republic of North Sudan		
NSE	<i>Nomadacris septemfasciata</i> (Red Locust)		
OFDA	Office of U.S. Foreign Disaster Assistance		
PBB	Pine Bark Beetle (<i>Dendroctonus sp.</i> – true weevils)		
PHD	Plant Health Directorate		
PHS	Plant Health Services, MoA Tanzania		
PPD	Plant Protection Department		
PPM	Pest and Pesticide Management		
PPSD	Plant Protection Services Division/Department		
PRRSN	Pesticide Risk Reduction through Stewardship Network		
QQU	<i>Quelea quelea</i> (Red Billed Quelea bird)		
SARCOF	Southern Africa Region Climate Outlook Forum		

Point of Contact:

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