

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

SUMMARY

The **Desert Locust** (*Schistoseca gregaria* - **SGR**¹): During November, the SGR situation was extremely serious in the central outbreak region (COR) where swarms and hoppers continued developing and causing damage to crop and pasture in **Ethiopia** and **Somalia**. Locusts were also reported in **Eritrea, Sudan, Yemen, Oman** and **Saudi Arabia** during this month. Aerial and/or ground control operations treated tens of thousands of ha in **Ethiopia, Sudan, Eritrea, Yemen, Saudi Arabia** and **Oman**. Extensive control operations were also conducted in the eastern outbreak region (EOR) in **India** and **Pakistan** and limited control was carried out in southeastern **Iran**. The western outbreak region (WOR) remained generally calm during the month.

Forecast: Due to the presence of favorable ecological conditions, thanks to the unusual rainfall over the past months, coupled with the presence of parental populations, more swarms will likely develop in Ethiopia and northern Somalia and if left unattended will spread to northeastern Kenya, adjacent areas in Somalia and Eritrea and perhaps Djibouti. Swarms will threaten crops and pasture. Breeding will also continue on both sides of the Red Sea coasts. Swarms from summer breeding areas in EOR will continue moving westward to spring breeding areas in southeastern Iran and western Pakistan. Small-scale breeding is likely in northwest Mauritania, Mali and Niger during the forecast period.

Red (Nomadic) Locust (*Nomadacris septemfasciata*) (**NSE**): NSE populations were detected in the primary outbreak areas in **Tanzania** where mating has begun. A similar situation is expected in the primary outbreak areas in Malawi, Mozambique and Zambia during November.

Tree Locusts, *Anacridium spp.* (**ASP**): ASP outbreak persisted in Turkan and Marsabit countries in **Kenya** where acacia trees have been infested.

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

South American Locust, *Schistocerca cancellata* (**SCA**): No update was received during this month.

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

Italian (CIT), Moroccan (DMA), and Asian Migratory Locusts (LMI): Locust activities had ended in CAC and the region will remain calm until next spring.

Fall Armyworm (Spodoptera frugiperda) (FAW): FAW infestations were reported in Ethiopia, eastern Kenya and Uganda and likely persisted in rainfed/irrigated areas in other countries (for more information, please refer to pages 9-10).

African Armyworm (AAW) (Spodoptera exempta): AAW outbreak was not reported during this month.

Quelea spp. (QSP): QSP bird outbreaks were reported attacking sorghum in northeastern Ethiopia and aerial control was conducted.

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

USAID/OFDA/PSPM regularly monitors ETOPs 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, and research centers, academia, private sector, NGOs and others and issues concise, analytical bulletins to stakeholders. **End summary**

RÉSUMÉ

La situation du Criquet pèlerin (Schistoseca gregaria - SGR): En novembre, la situation en matière de SGR est restée extrêmement grave dans la région de la flambée centrale où les essaims et les larves ont continué à se développer et à causer des dommages aux cultures et aux pâturages en Éthiopie et en Somalie. Des criquets ont également été signalés en Arabie Saoudite, en Érythrée, au Yémen, au Yémen et au cours de ce mois. Des opérations de lutte aérienne et / ou terrestre ont traité des dizaines de milliers d'hectares en Éthiopie, au Soudan, en Érythrée, au Yémen, en Arabie Saoudite et à Oman. Des opérations de lutte d'envergure ont également été menées dans la région de la flambée orientale en Inde et au Pakistan et des opérations limitées dans le sud-est de l'Iran. La région de la flambée occidentale (WOR) est restée globalement calme au cours du mois.

Prévisions: En raison de la présence de conditions écologiques favorables, en raison de la pluie inhabituelle de ces derniers mois et de la présence de populations parentales, davantage d'essaims se développeront probablement en Éthiopie et dans le nord de la Somalie. Somalie et Érythrée et peut-être Djibouti. Les essaims menaceront les cultures et les pâturages. La reproduction se

poursuivra également des deux côtés des côtes de la mer Rouge. Les essaims provenant des zones de reproduction estivale de la ROE continueront de se déplacer de l'ouest vers les zones de reproduction printanière du sud-est de l'Iran et de l'ouest du Pakistan. Une reproduction à petite échelle est probable dans le nord-ouest de la Mauritanie, du Mali et du Niger au cours de la période de prévision.

Criquet nomade rouge (*Nomadacris septemfasciata*) (NSE): Des populations NSE ont été détectées dans les principales zones d'épidémie en Tanzanie, où l'accouplement a commencé. Une situation similaire est attendue dans les principales zones d'épidémie au Malawi, au Mozambique et en Zambie en novembre.

Le criquet arborial, *Anacridium spp*: le foyer d'ASP a persisté dans les pays de Turkan et de Marsabit au Kenya, où des acacias ont été infestés au cours de ce mois.

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

Criquet d'Amérique du Sud, *Schistocerca cancellata* (SCA): Aucune mise à jour n'a été reçue au cours de ce mois.

Criquets italiens (CIT), marocains (DMA), Asian Migratory Locust (LMI): les activités acridiennes étaient terminées à CAC et la région restera calme jusqu'au printemps prochain.

Chenille Légionnaire d'automne (*Spodoptera frugiperda*) (FAW): Des infestations de FAW ont été signalées en Éthiopie, dans l'est du Kenya et en Ouganda et ont probablement persisté dans les zones pluviales / irriguées d'autres pays (pour plus d'informations, veuillez vous reporter aux pages 9 à 10).

Chenille Légionnaire africaine (AAW), *Spodoptera exempta*: aucun foyer d'AAW n'a été signalé au cours de ce mois.

Quelea spp. oiseaux (QSP): Des épidémies d'oiseaux des épidémies d'oiseaux ont été signalées lorsqu'elles attaquent le sorgho dans le nord-est de l'Éthiopie. et le contrôle aérien a été effectué.

La surveillance active et le suivi, ainsi que le partage des informations ETOP et des interventions préventives opportunes restent essentiels pour atténuer les menaces que représentent les ETOP pour la sécurité alimentaire et les moyens de subsistance des communautés vulnérables.

USAID / OFDA / PSPM surveille régulièrement les ETOP en étroite collaboration avec son réseau de PPD / DPV nationaux, d'entités régionales et internationales de surveillance et / ou de lutte antiparasitaire, y compris la FAO, la CLCPRO, le CRC, le DLCO-EA et

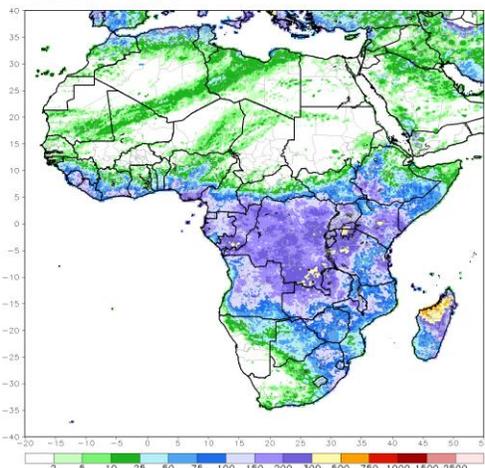
l'IRLCO-CSA, et des centres de recherche, universités, secteur privé, ONG et autres et publie des bulletins analytiques concis à l'intention des parties prenantes. Fin de résumé

Note: All ETOP Bulletins and SITREPs, including previous ones can be accessed and downloaded on USAID Pest and Pesticide Monitoring website: [USAID Pest and Pesticide Monitoring](#)

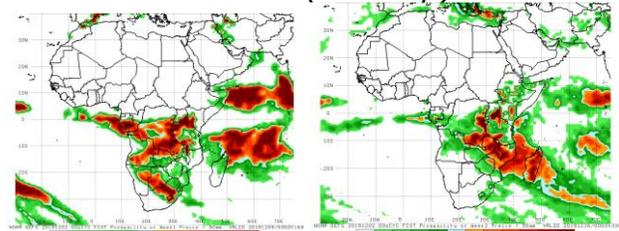
Weather and Ecological Conditions

During the past 30 days, rainfall was above-average over local areas in Guinea, Sierra Leone, Liberia, southern Cote d'Ivoire, local areas in Ghana, southern Benin, portions of Nigeria, local areas in Cameroon and CAR, northern and southern Congo, northwestern and southeastern DRC, local areas in South Sudan, western and southern Ethiopia, Uganda, Kenya, Tanzania, southern Somalia, local areas in northeastern Botswana, much of Zambia, Zimbabwe, eastern South Africa, Malawi, northern Mozambique, and many parts of Madagascar. Parts of Cameroon, Equatorial Guinea, Gabon, central Congo, much of Angola, many parts of DRC, Namibia, much of Botswana, parts of southern Mozambique, and western and southern South Africa had below-average rainfall (total rainfall during November NOAA 12/2019).

ARC2 30-Day Total Rainfall (mm)
Period: 02Nov2019 – 01Dec2019



Forecast for 3-9 December: there is an increased chance for weekly rainfall totals to exceed 50mm over southern Gabon, southern Congo, portions of Angola and DRC, Rwanda, Burundi, southeastern Uganda, southwestern Kenya, northern and western Tanzania, northern Zambia, eastern Namibia, southern Botswana, and central South Africa (left map).



Forecast for 10-16 December: there is an increased chance for weekly rainfall totals to exceed 50mm over eastern and southern DRC, southeastern Uganda, local areas in Ethiopia and Kenya, parts of Tanzania, Malawi, eastern Zambia, northern Mozambique and much of Madagascar (right map, NOAA, 12/2019)

NSE Outbreak Regions: Heavy rainfall was reported near breeding areas in Wembere Plain (324 mm), Malagarasi Basin (385.7 mm) and Lake Rukwa Plains (126.9 mm) in **Tanzania** and moderate rains fall in **Mozambique** and **Zambia** (IRLCO-CSA).

CAC Region: In the CAC, no update was received at the time this bulletin was compiled, but cooler and drier weather is expected to have prevailed across most of the region (OFDA/PSPM).

Note: Changes in the weather pattern such as increased or decreased temperature and precipitation can contribute to ecological shift in ETOP habitats and could increase or decrease the risk of pest outbreaks, resurgence

and emergence of new pests. For example, 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 regular ambient altitude due to warmer higher elevations.

The **Asian migratory locust**, an insect that normally has one generation per year, has begun breeding twice per year. These anomalies which are largely attributed to the change in the weather patterns and associated ecological shift can become serious concerns to farmers, rangeland managers, crop protection experts, development and humanitarian partners, etc. Regular monitoring, documenting and reporting anomalies in pest behavior and on habitat shifts are crucial to help avoid/minimize potential damage to crops, pasture and reduce 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: SGR situation remained generally calm and limited breeding occurred in Algeria, Chad, Mauritania, and Niger during November. In **Algeria**, preventive control treated 272 ha against groups of mature adults near agricultural areas in Aoulef south of Adrar. In **Chad**, some immature, maturing and mature solitary adults were detected in Bahaï and Amdjarass, Kalait, and north of Djedda and limited breeding was reported during November. Due to ongoing insecurity situation in northern **Mali**, routine monitoring and surveillance continued

hampered and hence, updates were not available during this time. No locusts were reported in **Tunisia** and no update was received in Libya and elsewhere in the region for November (ANLA/Chad, CNLA/Mauritania, CNLAA/Morocco, CNLA/Tunisia, CNLAP/Mali, FAO-DLIS, INPV/Algeria).

Forecast: WOR, small-scale breeding will occur and increase locust numbers in northwest Mauritania and perhaps Niger and Algeria, but significant development is not likely in the region during the forecast period (ANLA/Chad, CNLAP/Mali, CNLA/Mauritania, CNLAA/Morocco, CNLA/Tunisia, FAO-DLIS, INPV/Algeria).

SGR – COR: SGR continued developing in Ethiopia, Eritrea, Sudan, Somalia, Yemen, Saudi Arabia and Oman in November.

In Ethiopia, aerial and ground control operations were launched in Amhara, Affar, Somali, and Tigray administrative regions and Dire Dawa where massive swarms/hoppers were reported causing damage to sorghum and other crops in several places (a video clip - <https://www.youtube.com/watch?v=tq-bDdXo0B4>) Hatching and hoper formations are in progress in Ogaden in Somali administrative region and a spray aircraft has been deployed in the region. During the 2nd dekad of November, swarms spread northward and reached southern Red Sea coasts in Eritrea and likely reached Saudi Arabia.

Although some locusts, perhaps from Somali admin region have been reported in Oromia admin region, the overall situation in the latter is still unclear due to lack of routine surveillance and monitoring that has been hampered by the ongoing insecurity situation in some places from restricted movements of

materials, equipment, supplies and staff to the locust affected areas. It must be known that a situation like this has a serious implication on food security and livelihoods of vulnerable communities in the region and needs to be resolved sooner than later.

Systematic crop loss assessments have not been conducted yet. However, visual inspections of field staff in several places have suggested damage ranges from a 100% loss to minor damage. Without appropriate surveillance, monitoring and timely control operations, there is a high risk of more crop and pasture losses.



FAO-DLIS, 11/2019)

MoA/Ethiopia has deployed dozens of technical and operational staff, vehicles, four spray aircraft (2 from DLCO-EA and 2 hired from South Africa and a local company), pesticides, supplies and invested considerable amount of resources on the locust campaign. However, given the severity of the ongoing locust invasions and outbreaks and potentially considerable crop and pasture losses, GoE/MoA through FAO, appealed to its development and humanitarian partners and international community to support ongoing campaign and bolster surveillance, monitoring, and control interventions as well as strengthening technical and material capacity of the MoA/PPD. In light of this, USG through its Mission in Addis declared a disaster and is currently working with FAO and other partners to provide

support for the ongoing campaign. Other bilateral and multilateral donors, FAO and other international organizations are also stepping in or are expected to assist GoE's effort to support the ongoing campaign operations (DLCO-EA, OFDA/PSPM, PPD/Ethiopia).

In **Somalia**, mating adults and hoppers as well as swarms were detected in northwestern part between Bulhar and Silil. Hoppers and immature adults were also reported on the northwestern plateau and a swarm was detected between Burau and Ethiopian border. Immature adults formed swarms on the plateau some of which moved to adjacent areas in Ethiopia. Late instar hopper bands were reported south of Bossaso, south of Las Anod near the border of Ethiopia and in Galmudug near Galkayo towards the end of the month. FAO Office has allocated funds for training, aerial control and support activities. DLCO-EA is preparing to engage in refresher training for technical staff and others and expects to deploy a spray aircraft in Hargeisa or Puntland (Deployment of aircraft to "security threat areas" requires an increased insurance coverage). DLCO-EA has been discussing with Mogadishu to work out a plan for locust operations in the central, southern and southwestern parts of the country (DLCO-EA, FAO-DLIS, PPD/Somalia).

In **Sudan**, the desert locust (SGR) situation continued being a concern and ground and aerial survey operations were launched in the River Nile State, Northern State, and North Kordofan State. Some immature and mature adult groups were detected on the Red Sea coast in Toker Delta and in Aeterba near the Eritrean border and breeding was observed at Kamawaib in northern Port Sudan. Ground and aerial control operations were carried out against low density maturing,

immature adults and 3rd to 5th instar hopper bands and fledglings during and covered more than 27,000 ha during this month (FAO-DLIS, PPD/Sudan).

In **Eritrea**, survey and ground control operations were launched on the northern Red Sea coastal areas around Shieb, Gahtielay, Wengebo and Beareze from 20 November. Control operations were also carried out against swarms of Tree locusts in southern Eritrea around Tserona, Mai-seraw, Quatit and Digma on November 12. The swarms are believed to have arrived from Tigray, northern Ethiopia. At this time, Eritrea has not requested an aerial support. Should ecological conditions continue improving in the Red Sea coastal areas and the locust situation further develops and perhaps compounded by additional escapee swarms and groups from neighboring countries, than more resources may be required (DLCO-EA, PPD/Eritrea).

In **Oman**, mature swarms and adult groups that are believed to have arrived from Iran/ Pakistan reached coastal areas in the Northern and Eastern parts of Oman – Al Sharqyah. In Al Batinah, two swarms were reported crossing the Al Rusqa and Shimas mountains, but later disappeared perhaps into areas of recent rainfall or neighboring countries. Solitary immature adults were detected in several places in Al Dhahiran in the northwest and solitary hoppers were detected in Musandam in the far northeast. Control operations were conducted against adult locusts, but some had already copulated and began laying eggs. Hopper groups were controlled on 116 ha during November (LCC/Oman, FAO-DLIS).

In **Yemen**, breeding continued along the northern Red Sea coast in Tehama where mature groups and swarms were reported

and hatching continued and control operations treated some 5,700 ha during November. Financial resources for survey and control operations were generously availed by the FAO/Sana'a office. In **Saudi Arabia**, 1,511 ha were treated along the southern Red Sea coastal areas during this month (DLMCC/Yemen, FAO-DLIS).

*The insecurity situation and lack of resources in **Yemen** significantly contributed to unabated locust developments which resulted in multiple swarms from the country invading northeastern and eastern **Ethiopia**, northern **Somalia** and the Red Sea coastal areas during the past months. Unabated and undetected swarms/locusts from **Yemen** also invaded **Saudi Arabia** and to a lesser extent, **Oman** during the past months.*

Forecast: In **Ethiopia** swarms and hoppers from Ogaden will likely appear in Oromia admin region. If left unabated, swarms may spread to northeastern **Kenya** (Moyale – Mandera – Wajir), adjacent areas in southwestern **Somalia**. Some locusts from eastern Ethiopia may also migrate to **Djibouti** and northern Somalia, and perhaps **Eritrea** during the forecast period. Breeding will continue on both sides of the Red Sea coasts in **Sudan, Eritrea, Yemen, and Saudi Arabia**. In **Oman** some activities will likely occur in areas where ecological conditions remain favorable due to rainfall from Cyclone Kyarr (DLCO-EA, DLMCC/Yemen, FAO-DLIS, LCC/Oman, OFDA/PSPM, PPD/Ethiopia, PPD/Somalia, PPD/Sudan).

NOTE: *During the 2007 SGR outbreak, swarms from **Yemen** invaded **Ethiopia** and **Somalia** and bred and rapidly spread to eastern **Ethiopia**, southern and western **Somalia**, northeastern **Kenya***

and southern and western **Ethiopia** where they caused severe damage to crops and pasture. Control operations needed substantial amount of resources.

*It is important that the tri-states - Ethiopia, Somalia and Kenya – plus other neighboring countries keep an eye on any locust movements, share locust information on a timely manner and execute preventive interventions to the extent possible. **END NOTE***

SGR - EOR: Control operations continued against swarms and locust groups and treated 34,074 ha in **India**, 60,970 ha in **Pakistan** along the **Indo-Pakistan** border and in 1,511 ha in southeastern **Iran** during November (FAO-DLIS).

Forecast: With ecological conditions gradually drying up in summer breeding areas along the **Indo-Pakistan** borders, more swarms will likely migrate westward to spring breeding areas in Baluchistan and southwest **Pakistan** and southeast **Iran** (FAO-DLIS).

Active surveillance, monitoring, preparedness and timely preventive interventions remain critical to avert any significant locust developments and the potential threat they to food security and livelihoods of vulnerable communities (FAO-DLIS, OFDA/PSPM).

Red (Nomadic) Locust (NSE): IRLCO-CSA and MoA/Tanzania conducted joint aerial survey over 131,100 ha in Wembere, Ikuu-Katavi and Lake Rukwa plains and Malagarasi Basin and Bahi Valley to assess the presence of adult NSE populations and identify potential breeding grounds. Of the 131,100 ha surveyed, isolated and scattered NSE populations ranging from 1-3 insects/m² were detected on 35,875 ha in Bahi Valley, Malagarasi Basin, North and South

Rukwa and Wembere plains. Groups of 3-7 insects/m² were also observed in the Ikuu-Katavi plains. Substantial number of mature adults likely persisted in Lake Chilwa/Lake Chiuta plains of Malawi, Buzi Gorongosa and Dimba plains in Mozambique and the Kafue Flats in Zambia. Breeding conditions continued to improve in the primary outbreak areas following good seasonal rains that occurred October/November (IRLCO-CSA).

Forecast: Hatching is expected to commence in January and begin forming hoppers in the primary outbreak areas during the forecast period. Fledging and group and swarm formations will follow later in the season. Routine surveillance and timely preventive interventions remain critical to abate any major crop damage and protect food security (IRLCO-CSA, OFDA/PSPM).

Tree Locusts, *Anacridium spp.* (ASP): ASP outbreak persisted in Turkan and Marsabit countries in Kenya where acacia trees have been infested during this month (IRLCO-CSA).

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): No update was

received at the time this bulletin was compiled, nonetheless, it is expected that locust activities have ended in the region (FAO-ECLO, OFDA/PSPM).

Forecast: Locust activities are not expected in the region till next spring (OFDA/PSPM).

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

FAW infestations were reported in rainfed maize and other crops in several dozen districts in six administrative regions in **Ethiopia** during November. FAW was also reported attacking early planted maize crops in eastern **Kenya** and detected in several districts across maize growing regions in **Uganda** with an estimated average incidence of 40% and overall crop damage of <10% due to increased impacts of natural enemies, heavy rains and timely preventive interventions by affected farmers. Infestations of FAW in rainfed and irrigated crops are also likely in other countries across sub-Saharan Africa, Asia and the Pacific Regions and likely continued causing damage (DLCO-EA, IRLCO-CSA, OFDA/PSPM, PPD/Ethiopia, PPD/Uganda).

Forecast: FAW will likely continue affecting rain-fed and irrigated maize and other crops across sub-Saharan Africa, Asia, the Pacific Regions and elsewhere during the forecast period. Active monitoring, surveillance, reporting and information sharing as well as timely preventive interventions remain critical to abate major crop damage (OFDA/PSPM).

Note: *With its voracious appetite and more than 100 species of plants to choose from, it is highly unlikely it will ever go hungry and terminate its presence in affected countries (Reuters, OFDA/PSPM).* **End note.**

Key Activity update: The USAID/OFDA sponsored community-based fall armyworm monitoring, surveillance and management project (CBFAMFEW) was implemented in six countries in eastern Africa from 2017 through August 2019. The project trained close to 1,400 senior PPD staff, district agricultural experts, lead farmers, extension agents, lead farmers and village leaders. It sensitized >10,000 farmers and villagers on FAW-360 in all participating countries. Hanks to the project, a network of forecasters and scouts were established across 300 villages in the six project countries. Through this project, strong relationships were established among experts and implementing partners and garnered commitments from participating countries to ensure sustainability of collective and individual gains of this initiative.

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 to better understand their efficacy, environmental impacts and safety, etc. Some are being tested alongside 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.**

Information resources

NOTE: Highly hazardous pesticides cannot and must not be considered or used for FAW control. END NOT

USAID/BFS and OFDA co-funded IPM based FAW management guidance document is available in English and French and will soon be available in Portuguese language: https://www.usaid.gov/sites/default/files/documents/1867/Fall-Armyworm-IPM-Guide-for-Africa-Jan_30-2018.pdf

CBFAMFEW project sites:

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

BFS and SAWBO (Scientific Animation Without Borders) developed a video clip on FAW:

<https://sawbo-animations.org/video.php?video=/www.youtube.com/embed/5rxlpXEK5q8>

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: <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 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 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, acceptable IPM-based pest management and assessment tools remains critical in abating FAW infestations and to minimize crop damage.

African Armyworm (AAW): AAW was not reported during this month.

Forecast: Some AAW activities may commence in southern Africa during the forecast period (OFDA/PSPM).

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

and potential participating countries and it is considering a similar map for the CBFAMFEW countries.

<http://usaid.maps.arcgis.com/apps/Viewer/index.html?appid=9d2ab2f918284595819836d1f16a526f>
<http://www.fao.org/3/CA1089EN/ca1089en.pdf>

Southern Armyworm (*Spodoptera eridania*) (SAW/SER). SAW, was not reported during this month.

Strong quarantine services and vigilance, monitoring and surveillance remain essential to prevent invasive pests invading a new territory.

Quelea sp. (QSP): QSP bird outbreaks were reported attacking sorghum in Wello and Showa in the Amhara administrative region in **Ethiopia**. Aerial control operations by DLCO-EA/MoA/PPD treated QSP roosts on some 200 ha during the 2nd dekad of November. In Uganda, QSP population were detected in Kibimba Rice Schemes and survey operations were planned at the time this bulletin was compiled. No QSP outbreaks were reported in IRCLO-CAS member states during this month (DLCO-EA, IRLCO-CSA, PPD/Ethiopia).

Forecast: QSP will likely continue being a problem to irrigated and/or rainfed small grain crops during the forecast period (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 this month, but the pest is a constant pre- and post-harvest threat to crops, produce and infrastructure. Vigilance and rapid responses remain critical to abate major damage.

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, and contaminate making it unfit for human consumption, and the zoonotic disease this pest carry/transmit.

All ETOP front-line countries must maintain regular monitoring and surveillance as needed. During cropping seasons, regular scouting is critical to avoid crop damage/losses. Invasion countries should remain 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. It is critical that lead farmers, field scouts, community forecasters and others remain vigilant and report ETOP detections to relevant authorities as quickly as immediately.

OFDA's Contributions to ETOP Abatement Interventions

USAID/OFDA/PSPM is sponsoring an operational research on soil amelioration to manage the Senegalese grasshopper (OSE) through Arizona State University. 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 Canneries, 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, FAW and SGR affected countries to contribute to food security and livelihoods of vulnerable people and communities.

The online Pesticide Stock Management System (PSMS) that was developed by FAO with financial assistance from donors, including USAID/OFDA, continues benefiting participating countries across the globe. Thanks to the system, SGR frontline countries and others are effectively managing their strategic pesticide stocks and have been able to minimize/avoid accumulation of unusable and toxic obsolete pesticides and empty pesticide containers.

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 does not support highly hazardous pesticides. It promotes an IPM approach to minimize risks associated with pesticide poisoning, stockpiling, and pollution. An informed procurement and judiciously executed triangulations of surplus stocks from countries with large inventories of usable products to

countries where they are needed and can be safely and effectively utilize can be a win-win option worth considering

Inventories of Strategic Pesticide Stocks for SGR Control

The amount of country-level Strategic Pesticide Stocks (SPS) for SGR showed a significant reduction in COR and EOR during November. In COR, more than 51,930 ha in total were treated during November (10,822 ha in Ethiopia, 27,165 ha in Sudan, 6,060 ha in Eritrea, 7,770 ha in Saudi Arabia, 5,760 ha in Yemen and 116 ha in Oman). In EOR, control operations treated 96,555 in total during this month (34,074 ha in India, 60,970 ha in Pakistan and 1,511 in Iran). In WOR, only 272 ha were treated in Algeria during this period. With the locust invasions likely to persist in COR, and EOR, and begin developing in WOR during the forecast period, SPS use will likely increase across frontline countries.

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

Country	Quantity (l/kg)*
Algeria	1,186,059~
Chad	34,100
Egypt	10,253 ULV, 45,825
Eritrea	527~; -6,060?
Ethiopia	10,543~; -5,401
Libya	24,930~
Madagascar	206,000~ + 100,000 ^D
Mali	3,540
Mauritania	39,900
Morocco	3,412,374 ^D
Niger	75,701~
Oman	9,953~; -116
Saudi Arabia	23,379~(-46,821)
Senegal	156,000~
Sudan	103,482; -13,585
Tunisia	62,200 obsolete

Yemen	35,092 ^D ; -2,860; 180 kg GM~
*Includes different kinds of pesticide and formulations - ULV, EC and dust;	
~ data may not be the 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 = <i>GreenMuscle</i> TM (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	GM	GreenMuscle® (a fungal-based biopesticide)
CBAMFEW	Community-based armyworm monitoring, forecasting and early warning	ha	hectare (= 10,000 sq. meters, about 2.471 acres)
CERF	Central Emergency Response Fund	ICAPC	IGAD's Climate Prediction and Application Center
CIT	<i>Calliptamus italicus</i> (Italian Locust)	IGAD	Intergovernmental Authority on Development (Horn of Africa)
CLCPRO	Commission de Lutte Contre le Criquet Pélerin dans la Région Occidentale (Commission for the Desert Locust Control in the Western Region)	IRIN	Integrated Regional Information Networks
CNLA(A)	Centre National de Lutte Antiacridienne (National Locust Control Center)	IRLCO-CSA	International Red Locust Control Organization for Central and Southern Africa
COR	Central SGR Outbreak Region	ITCZ	Inter-Tropical Convergence Zone
CPD	Crop Protection Division	ITF	Inter-Tropical Convergence Front = ITCZ)
CRC	Commission for Controlling Desert Locust in the Central Region	FAO-DLIS	Food and Agriculture Organizations' Desert Locust Information Service
CTE	<i>Chortoicetes terminifera</i> (Australian plague locust)	Hoppers	young, wingless locusts/grasshoppers (Latin synonym = nymphs or larvae)
DDLC	Department of Desert Locust Control	JTWC	Joint Typhoon Warning Center
DLCO-EA	Desert Locust Control Organization for Eastern Africa	Kg	Kilogram (~2.2 pound)
DLMCC	Desert Locust Monitoring and Control Center, Yemen	L	Liter (1.057 Quarts or 0.264 gallon or 33.814 US fluid ounces)
DMA	<i>Dociostaurus maroccanus</i> (Moroccan Locust)	LCC	Locust Control Center, Oman
DPPQS	Department of Plant Protection and Quarantine Services, India	LMC	<i>Locusta migratoriacapito</i> (Malagasy locust)
DPV	Département Protection des Végétaux (Department of Plant Protection)	LMM	<i>Locusta migratoria migratorioides</i> (African Migratory Locust)
ELO	EMPRES Liaison Officers –	LPA	<i>Locustana pardalina</i>
EMPRES	Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases	MoAFSC	Ministry of Agriculture, Food Security and Cooperatives
EOR	Eastern SGR Outbreak Region	MoAI	Ministry of Agriculture and Irrigation
ETOP	Emergency Transboundary Outbreak Pest	MoARD	Ministry of Agriculture and Rural Development
Fledgling	immature adult locust /grasshopper that has pretty much the same phenology as mature adults, but lacks fully developed reproductive organs to breed	NALC	National Agency for Locust Control
		NCDLC	National Center for the Desert Locust Control, Libya
		NOAA (US)	National Oceanic and Aeronautic Administration
		NPS	National Park Services
		NSD	Republic of North Sudan
		NSE	<i>Nomadacris septemfasciata</i> (Red Locust)

OFDA Office of U.S. Foreign Disaster Assistance

PBB Pine Bark Beetle (*Dendroctonus* sp. – 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

QSP *Quelea* species (Red Billed *Quelea* bird)

SARCOF Southern Africa Region Climate Outlook Forum

SCA *Schistocerca cancellata* (South American Locust)

SFR *Spodoptera frugiperda* (SFR) (Fall armyworm (FAW))

SGR *Schistoseca gregaria* (the Desert Locust)

SPI *Schistocerca piceifrons piceiferons* (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

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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:

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