

**Emergency Transboundary Outbreak Pest (ETOP) Situation Bulletin for September 2020 with a forecast through mid-November**  
**résumé en français est inclus**

## SUMMARY

The **Desert Locust** (*Schistoseca gregaria* - **SGR**<sup>1</sup>): The SGR situation remained worrisome in the central outbreak region (COR) as breeding continued in Eritrea, Ethiopia, Sudan, Somalia, Saudi Arabia and Yemen during September. Hatching, band and swarm formations continued in northeast Ethiopia and across Yemen where control operations treated 57,457 ha and 5,828 ha, respectively. In Eritrea, breeding continued along the Red Sea coast and control operations treated 5,082 ha. In Sudan, swarms that arrived in the Red Sea coastal region from Eritrea began breeding, and 9,900 ha were treated. In Saudi Arabia, hopper bands formed on the southwestern region and control operations treated 13,745 ha. In Somalia, immature swarms persisted in the north and control operations treated 17,477 ha. In Kenya, some 2,100 ha were controlled in the northwest. A swarm was reported in southern Oman but did not require control. The situation improved in the eastern outbreak region (EOR) and control operations treated 3,645 ha in Pakistan. No locusts were reported in India. In the western outbreak region (WOR), the situation remained generally calm, and only small-scale breeding occurred in Chad. <http://www.fao.org/ag/locusts/en/info/info/index.html>

**Forecast:** In COR, locusts will continue breeding and more swarms will form in northeast Ethiopia that could move to the Highlands and the Ogaden and other swarms from Yemen and northern Somalia will likely migrate south towards Kenya with the northerly wind. There will be an increase in locust numbers in the interior of Yemen, eastern Sudan, and in winter breeding areas along both sides of the Red Sea coasts in Eritrea, Sudan, Yemen and Saudi Arabia, allowing groups, bands and swarms to form. In EOR, the situation will become calm and only limited residual populations may persist in Lasbela Valley, Pakistan and perhaps Rajasthan, India. The WOR will likely remain calm and only limited small-scale breeding may occur in northwest Mauritania during the forecast period. <https://locust-hub-hqfao.hub.arcgis.com/>

**Red (Nomadic) Locust** (*Nomadacris septemfasciata*) (**NSE**): No update was received at the time this report was compiled, but it is likely that NSE persisted in the primary breeding areas in Malawi, Mozambique, Tanzania, Zambia and perhaps neighboring countries.

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

**African Migratory Locust:** *Locusta migratoria migratorioides (LMI)*: LMI has been reported in Botswana, Namibia, Zambia and Zimbabwe.

**Tree Locusts,** *Anacridium spp. (ASP)*: ASP report was not received during this month.

**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 on SCA at the time this bulletin was compiled.

**Italian (CIT), Moroccan (DMA), and Asian Migratory Locusts (LMI)**: DMA, CIT and LMI activities have ended and will remain so till next spring.

**Fall Armyworm** (*Spodoptera frugiperda*) (**FAW**): FAW was reported in Tanzania and it is likely that the pest was present in other maize growing countries.

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

**Quelea spp. (QSP)**: QSP outbreak was reported on small grain crops in Ethiopia.

*Active surveillance, monitoring and timely preventive and curative interventions as well as sharing ETOP information 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): La situation de la SGR est restée préoccupante dans la région centrale de l'épidémie (COR) alors que la reproduction s'est poursuivie en Érythrée, en Éthiopie, au Soudan, en Somalie, en Arabie saoudite et au Yémen en septembre. Les formations d'éclosion, de bandes et d'essaims se sont poursuivies dans le nord-est de l'Éthiopie et dans tout le Yémen, où les opérations de lutte ont traité respectivement 57 457 ha et 5 828 ha. En Érythrée, la reproduction s'est poursuivie le long de la côte de la mer Rouge

et les opérations de lutte ont traité 5 082 ha. Au Soudan, des essaims arrivés dans la région côtière de la mer Rouge en provenance d'Érythrée ont commencé à se reproduire et 9 900 ha ont été traités. En Arabie saoudite, des bandes larvaires se sont formées dans la région sud-ouest et les opérations de lutte ont traité 13 745 ha. En Somalie, des essaims immatures ont persisté dans le nord et les opérations de lutte ont traité 17 477 ha. Au Kenya, quelque 2 100 ha ont été contrôlés dans le nord-ouest. Un essaim a été signalé dans le sud d'Oman mais n'a pas nécessité de lutte. La situation s'est améliorée dans la région orientale du foyer (EOR) et les opérations de lutte ont traité 3 645 ha au Pakistan. Aucun criquet n'a été signalé en Inde. Dans la région ouest de l'épidémie (WOR), la situation est restée généralement calme et seule une reproduction à petite échelle a eu lieu au Tchad.

<http://www.fao.org/aq/locusts/en/info/info/index.html>

**Prévisions:** Au COR, les criquets continueront de se reproduire et d'autres essaims se formeront dans le nord-est de l'Éthiopie qui pourraient se déplacer vers les Highlands et l'Ogaden et d'autres essaims du Yémen et du nord de la Somalie migreront probablement vers le sud vers le Kenya avec le vent du nord. Il y aura une augmentation des effectifs acridiens dans l'intérieur du Yémen, dans l'est du Soudan et dans les zones de reproduction hivernale le long des deux côtés des côtes de la mer Rouge en Érythrée, au Soudan, au Yémen et en Arabie saoudite, permettant la formation de groupes, de bandes et d'essaims. En EOR, la situation deviendra calme et seules des populations résiduelles limitées pourraient persister dans la vallée de Lasbela, au Pakistan et peut-être au Rajasthan, en Inde. Le WOR restera probablement calme et seule une reproduction limitée à petite échelle peut avoir lieu dans le nord-ouest de la Mauritanie pendant la période de prévision.

<http://www.fao.org/aq/locusts/en/info/info/index.html>

**Criquet nomade (*Nomadacris septemfasciata*) (NSE):** Aucune mise à jour n'a été reçue au moment de la compilation de ce rapport, mais il est probable que l'ESN ait persisté dans les principales zones de reproduction au Malawi, au Mozambique, en Tanzanie et dans d'autres pays voisins.

**Criquet migrateur africain: *Locusta migratoria migratorioides* (LMI):** LMI a été signalé au Botswana, en Namibie, en Zambie et au Zimbabwe.

**Le criquet arborial, *Anacridium spp*: (ASP):** Le rapport ASP n'a pas été reçu ce mois-ci.

**Criquet Amérique centrale, *Schistocerca piceifrons piceiferons* (CAL):** Aucune mise à jour n'a été reçue au moment de la compilation de ce bulletin.

**Criquet d'Amérique du Sud, *Schistocerca cancellata* (SCA):** Aucune mise à jour n'a été reçue sur SCA au moment où ce rapport a été rédigé.

**Criquets italiens (CIT), marocains (DMA), Asian Migratory Locust (LMI):** Les activités DMA, CIT et LMI sont terminées et le resteront jusqu'au printemps prochain.

**Chenille Légionnaire d'automne (*Spodoptera frugiperda*) (FAW):** La CLA a été signalée en Tanzanie et il est probable que le ravageur était présent dans d'autres pays producteurs de maïs.

**Chenille Légionnaire africaine (AAW), *Spodoptera exempta*:** aucune épidémie d'AAW n'a été signalée ce mois-ci.

***Quelea spp. oiseaux* (QSP):** L'épidémie de QSP continue de menacer les cultures de petites céréales en Éthiopie.

La surveillance active, le suivi et les interventions préventives et curatives opportunes ainsi que le partage des information ETOP restent essentiels pour réduire les menaces que les ETOP font peser sur 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, including previous issues can be accessed and downloaded on USAID Pest and Pesticide Monitoring website: [USAID Pest and Pesticide Monitoring](#)

**Additional resources on ETOPs can be found on the last pages of this Bulletin.**

### Weather and Ecological Conditions

From September 21-30, the intertropical front (ITF) has moved slightly southward compare to the previous dekad. The western part, between 15W-5E has moved farther to the south compared to the climatological position which could

explain the end of rainfall over Mauritania and the northern part of Senegal. In contrast, the eastern part (between 25E-35E) is along the climatological position which could explain the seasonal rainfall over the central and southern part of Chad and Sudan. The mean eastern (20E-35E) portion of the ITF was located at 14.7N, which was well to the north of the mean position by 0.3 degrees. The mean western (10W-10E) portion of the ITF was located at 15.9N, which was located to the south of the mean position by 0.8 degrees. Figure 1 below shows the current position of the ITF relative to the climatological position during the 3<sup>rd</sup> dekad of September and its previous position during the 2<sup>nd</sup> dekad of

September. Figures 2 and 3 below are time series, illustrating the latitudinal values of the western and eastern portions of the ITF, respectively, and their seasonal evolutions since April, 2020 (NOAA 10/2020).

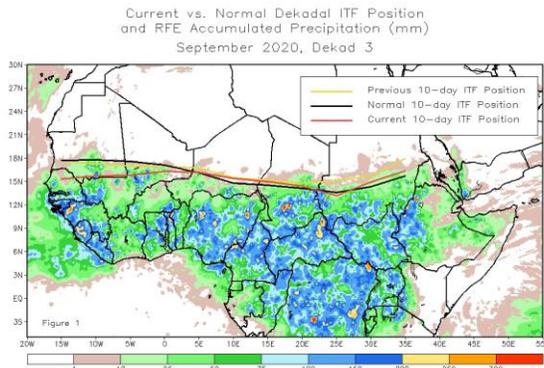


Figure 1

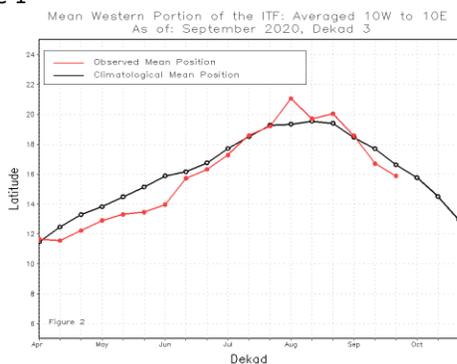


Figure 2 – Latitude value of ITF position in the western region (NOAA, 10/2020)

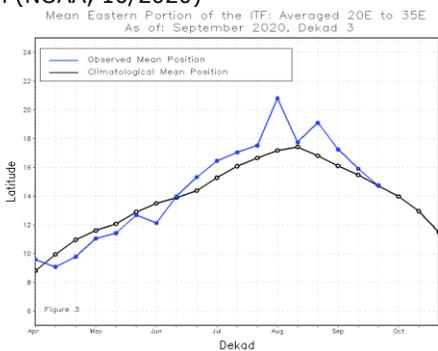


Figure 3. Latitude position of ITF in its eastern part (NOAA, 10/2020)

In EOR, above-normal rains in summer breeding areas along both sides of the Indo-Pakistan borders caused ecological

conditions to remain favorable during September. Towards the end of the month monsoon began its seasonal withdrawal to the south from Rajasthan, about one week later than normal. Dry conditions prevailed elsewhere in the region (FAO-DLIS).

The **NSE** outbreak regions remained largely hot and dry

**CAC Region:** In CAC, mostly warm/hot and dry weather prevailed during this month.

**SGR proliferation vis-a-vis climate factors**

**Note:** Changes in the weather pattern such as increased or decreased temperatures and precipitation can contribute to an ecological shift in ETOP habitats and could increase or decrease the risk of pest outbreaks, resurgence and/or emergence of new pests. The extended SGR outbreaks and upsurges are partially attributed to the change in the weather pattern, i.e., extensive and above normal rainfall partly associated with the occurrence of multiple cyclones over a period of less than two years – May 2018 to December 2019 in the COR region.

[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 – COR:** The **Desert Locust** (*Schistoseca gregaria* - **SGR<sup>2</sup>**): Ground and aerial control operations continued during September against swarms and

<sup>2</sup> Definitions of all acronyms can be found at the end of the report.

hoppers in the Horn of Africa and Yemen, however, the situation remains worrisome. Substantial hatching and hopper formations caused numerous immature swarms to form in northeast **Ethiopia**, and 57,457 ha were treated. Hopper bands and swarms continued to form in **Yemen**, and some swarms started to move to the southern coast, control operations treated 5,828 ha. An increasing number of swarms were reported in northern **Somalia** and control operations treated 17,477 ha. In Saudi Arabia, control treated 13,745 ha.



Immature swarm in northeastern Somalia (Source: FAO, 9/2020)

In **Eritrea** swarms, groups continued breeding along the Red Sea coasts and the western lowlands and control treated 5,013 ha. Swarms arrived in eastern Sudan from Eritrea and continue laying eggs and forming hopper bands and control operations treated 9,900 ha. In Kenya, control operations treated 2,100 ha during this month. A swarm was reported in southern Oman. In **Djibouti**, immature and mature adults were seen along the coastal plains on September 30<sup>th</sup>. A swarm was detected on the southwest in Oman, but no action was needed (DLCO-EA, DLMCC/Yemen, FAO-DLS, FAO/SSD, LCC/Oman, PPD/Sudan, SPPV/Djibouti).

**Forecast:** In COR, breeding will increase locust numbers in eastern Ethiopia,

northern Somalia, across Eritrea, Sudan, Saudi Arabia and Yemen where ecological conditions will remain favorable. Several swarms that invaded Eritrea from Ethiopia and southwest Saudi Arabia from Yemen will breed during the forecast period.



September, FAO-DLIS



SGR situation for August October-November 9/2020, FAO-DLIS)

With the trade winds coming from the north becoming established over the Horn of Africa, there will be an increased threat of swarm migration from Yemen, northeast Ethiopia and northern Somalia south to eastern Ethiopia and central Somalia in October that could extend to northern Kenya in November. Winter breeding that began earlier than usual along the Red Sea coast, an extra generation of breeding is likely this season and could substantially increase locust numbers in the region. **Unless control operations are intensified aggressively in the region in the coming weeks and months to prevent the repeat of the 2019 massive invasions and outbreaks** (DLCO-EA,

DLMCC/Yemen, FAO-DLIS, LCC/Oman, PPD/Ethiopia, SPPV/Djibouti)..

**SGR - EOR:** In the EOR, the upsurge ended, and only small residual infestations remained in Pakistan as the seasonal monsoon progressively withdrew from the summer breeding areas along both sides of the **Indo-Pakistan** border and thanks to the aggressive and extensive control campaign in both countries. Control operations treated some 3,645 ha against small infestations in the Lasbela Valley in **Pakistan** and no locusts were reported in **India** during September (FAO-DLIS).

**Forecast:** In EOR, only some residual populations will persist in Lasbela Valley in Pakistan and perhaps Rajasthan, India during the forecast period (FAO-DLIS).

**SGR – WOR:** In the WOR, the situation remained calm and only small-scale breeding occurred in Chad in northern Sahel, but locust numbers remained insignificant (ALNA/Chad, CNLAP/Mali, CNLA/Mauritania, CNLAA/Morocco, CNLA/Tunisia, FAO-DLIS, FAO-DLIS).

**Forecast:** In WOR, small-scale breeding may occur in northwest Mauritania during the forecast period (CLA/Mauritania, ALNA/Chad, FAO-DLIS) .

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

**Red (Nomadic) Locust (NSE):** No update was received at the time this report was compiled, however, it is likely that NSE groups and concentrations

persisted in patches of green vegetation in the primary breeding areas in Lake Chilwa/Lake Chiuta plains in Malawi, Dimba plains in Mozambique, Ikuu-Katavi plains and Malagarasi Basin in Tanzania, Kafue Flats, in Zambia, and elsewhere in the region. If left uncontrolled, the pest will likely migrate to challenge vulnerable people and communities (BHA/TPQ).

**Forecast:** As vegetation burning continuously reduced green areas, NSE populations will continue further concentrating and forming larger and denser swarms and begin breeding at the onset of the seasonal rains in November/December. Some swarms may escape from the Kafue Flats in Zambia, Ikuu-Katavi plains and Malagarasi Basin in Tanzania and Dimba plains in Mozambique before the onset of the rains and start breeding (BHA/TPQ)

**African Migratory Locust, LMI:** LMI has been reported in Botswana, Namibia, Zambia, Zimbabwe and neighboring countries. In Botswana, the pest was reported in Okavango and Chobe wetlands where MoA launched control operations against hoppers in Chobe district from 13-19 September. Hoppers and adults were also detected in Kachikau in the North Eastern district on 23 September. In Namibia, swarms are present in Katima Mulilo in the Zambezi region and MoA/Locust team is carrying out surveillance and control operations and FAO regional staff are assessing the situation. In Zambia, eight districts are currently facing locust outbreaks (Sesheke, Mwandia, Nalolo, Sikongo, Lukulu, Kanzungula, and Kaoma) and probably Livingstone. Hopper bands and swarms caused damage to off-season maize crops. National Disaster

Management and Mitigation Unit (DMMU) and IRLCO-CSA are conducting assessments and interventions. In Zimbabwe, the pest remains active in the southwestern and southern parts of the country and monitoring is in progress (FAO/Southern Africa, IRLCO-CSA).

*FAO Southern Africa regional office has developed a Southern Africa Regional Locust Response Action Plan (SALRAP) in collaboration with SADC, IRLCOCSA and other partners. The Action Plan estimated USD 3.877 M for locust operations through May 2021 and USD 15M for relief and rehabilitation and livelihood support. IFAO is in contact with SADC, MoAs, USAID, WB, DFiD, IRLCO-CSA. Following a SADC request FAO has released USD 500,000 from its TCP project to support response the surveillance and, to support the response. capacity strengthening in the most affected countries (FAO/Southern Africa).*

**Forecast:** Receding of flood water along the Zambezi River and its tributaries will create suitable conditions for egg laying during the forecast period. Continued breeding will likely allow swarm formations. The pest will likely start developing in northern Botswana (Chobe and Okavango) and adjacent areas in Namibia as well as other areas during the rainy season. *If left unattended, swarms will likely invade neighboring areas and threaten crops and pasture.* According to IRLCO-CSA, aerial surveillance to assess the situation in the Simalaha plains, northern parts of the Zambezi plains and the Kafue Flats remains critical. *It is to be recalled that LMI was detected in northern Botswana Okavango and Chobe and in northeastern Namibia as early as February 2020 and persisted through*

*June threatening crops and grazing land (FAO/ROSFS, PPD/Botswana, 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 (The pest was reported in Argentina, Bolivia, Brazil, Paraguay and Uruguay during July).

<https://www.voanews.com/americas/argentina-battles-locust-plaque-northern-province>.

**Italian (CIT), Moroccan (DMA) and Migratory (LMI) Locusts in Central Asia and the Caucasus (CAC):** Locust activities have ended in the region for the most part and no additional activities are expected till next spring (BHA/TPQ/P&PM) <http://www.fao.org/locusts-cca/en/>

**Forecast:** All three locusts will remain calm till next spring.

**Fall armyworm (FAW):** FAW infestation was reported in irrigated maize in Arusha and Kilimanjaro regions in Tanzania. Updates were not available from other regions at the time this Bulletin was compiled, but it is likely the pest persisted across maize, sorghum and perhaps rice growing areas in Africa, Asia, including China and other regions (BHA/TPQ, PHS/Tanzania, USDA/FAS).

**Forecast:** FAW will continue affecting rain-fed and irrigated maize and other cereal crops across sub-Saharan Africa, Asia, the Pacific Regions and elsewhere during the forecast period. Given its early appearance in some regions, example, northern China, etc. it is likely that FAW

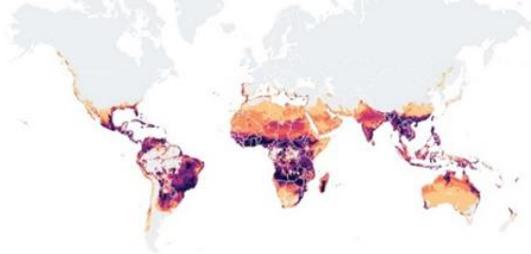
has become a resident pest in several places.

#### Areas suitable to Fall Armyworm

Regions with little forest cover, a minimum annual temperature of 18–26 °C and receiving 500–700 mm of rainfall in the three wettest months are prone to fall armyworm infestation as predicted by the species distribution models based on occurrences in Africa and the Americas.

#### ENVIRONMENTAL SUITABILITY INDEX

Not suitable Marginal Suitable Highly suitable  
0 10 20 30 40 50 60 70 80 90 100



Source: CABi, 2019. Invasive Species Compendium, Wallingford, UK: CAB International.  
P. K. Dutta, 19/06/2019

REUTERS

*Active monitoring, surveillance, reporting and preventive and curative actions remain critical to abate significant crop damage (BHA/TPQ).*

**Recent Events on FAW:** The first meeting of the Technical Committee of the Global Action for Fall Armyworm Control (GAFC) was conducted on **May 18, 2020**. The GAFC is a pioneering initiative that aims to mobilize USD 500 million over the period 2020–2022 to take radical, direct and coordinated measures to fight FAW at a global level. The 3 key objectives of the GAFC are to:

- Establish a global coordination and regional collaboration on monitoring, early warning, and intelligent pest management of FAW;
- Reduce crop losses caused by FAW and
- Reduce the risk of further spread of FAW to new areas (Europe and South Pacific).

**Key Activity update:** BHA/TPQ/FSL is working on innovative intervention projects to benefit large numbers of small-scale farming communities in affected countries with the intention to scale-up cross different FAW prone regions. This initiative will building on experiences gained over the past several

years, including through OFDA and RFS sponsored initiatives.

**Note:** Several species of FAW natural enemies have been identified in Ethiopia, Kenya, Tanzania, Madagascar, India, etc. and are being further studied to determine their efficacy, environmental impacts and safety. **End note.**

**African Armyworm (AAW):** AAW outbreaks were not reported during this month (DLCO-EA, PHS/Tanzania).

**Forecast:** AAW activities may commence in the northern and eastern outbreak regions in southcentral Africa following the seasonal rains (BHA/TPQ).

**Note:** OFDA developed printable and web-based interactive maps for AAW: <http://usaid.maps.arcgis.com/apps/Viewer/index.html?appid=8ff7a2eefbee4783bfb36c3e784e29cb> OFDA/PSPM is considering a similar map for the CBFAMFEW countries.

*Strong surveillance, monitoring and quarantine enforcement remain critical to prevent invasive pest species.*

**Quelea sp. (QSP):** QSP infestations were reported in eastern Ethiopia during September (DLCO-EA).

**Forecast:** QSP continue posing a threat to small grain irrigated cereal crops in several countries (BHA/TPQ).

**Facts:** QSP birds can travel ~100 km/day in search of food. An adult QSP can consume 3-5 grams of small grain and destroy the same amount each day. A medium density QSP 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 during this month, however, it is likely that the pest continued being a problem to crops and produce (BHA/TPQ).

**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 diseases the pest can carry/transmit.

**All ETOP front-line countries** must maintain regular monitoring and surveillance and launch control interventions as needed. Regular crop scouting is critical to avoid damage/losses. Invasion countries must also remain on alert. Regional and national ETOP entities - DLCO-EA, IRLCO-CSA, DLCCs, DLMCC, CNLAs, National DPVs and PPDs, ELOs, etc., are encouraged to continue sharing ETOP information with stakeholders as often as possible. Lead farmers, field scouts, community forecasters and others must remain vigilant and report ETOP detections to relevant authorities as quickly as possible.

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

USAID/OFDA/PSPM is sponsoring an operational research through Arizona State University to develop a tool to manage the Senegalese grasshopper (OSE).

OSE is a notorious pest of cereal and vegetable crops as well as pasture and causes serious damage to small-holder farmers in its wide geographic coverage extending from the Canneries, to Cape

Verde to nearly all sub-Saharan Africa regions to India and beyond. This pest occurs more frequently than several other grasshopper/locust species and is a constant threat to small-holder farmers. USAID/BHA/TPQ continuously explores parties interested in developing and expanding innovative technologies to help minimize the impacts of ETOPs on food security and livelihoods of the most vulnerable peoples and communities across regions.

The online Pesticide Stock Management System (PSMS) that was developed by FAO with financial assistance from donors, including USAID/OFDA, that continued benefiting participating countries across the globe was halted due to security and server switch. FAO will be reinstating the system. Thanks to the system, SGR frontline countries and others had been able to effectively manage their strategic pesticide stocks and minimize/avoid accumulation of unusable pesticides and empty pesticide containers.

**Note:** A sustainable Pesticide Stewardship (SPS) can contribute to strengthening 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 boundaries and geographic regions. **End note.**

**OFDA/PSPM** promotes an IPM approach to minimize risks associated with pesticide poisoning, stockpiling, and environmental contamination. An informed procurement and judiciously

executed triangulations of surplus stocks from countries with large inventories of usable products to countries where they are much needed is worth considering

### Inventory of Strategic Pesticide Stocks for SGR Control

During September, inventory of pesticide stocks changed in all regions except WOR and in total close to 115,160 ha were treated across all regions during this month (Note: 153,569 ha were treated in August).

Table 1. Estimated inventory of strategic SGR Pesticide Stocks in frontline and invasion countries.

Country	Quantity, l/kg*
Algeria	1,186,034~
Chad	34,100
Egypt	10,253 ULV, 45,796
Eritrea	527~
Ethiopia	110,543~
Libya	24,930~
Kenya	~
Madagascar	206,000~ + 100,000 <sup>D</sup>
Mali	3,540
Mauritania	39,803
Morocco	3,412,374 <sup>D</sup>
Niger	75,701~
Oman	9,953~
Saudi Arabia	23,379~
Senegal	156,000~
Somalia	~
Sudan	103,482
South Sudan	
Tunisia	62,200 obsolete
Uganda	
Yemen	35,000 <sup>D</sup> ; 180 kg GM~
*Includes different pesticides and formulations - ULV, EC and dust;	
~ data may not be 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 = *Green Muscle*<sup>TM</sup> (fungal-based biological pesticide, e.g., NOVACRID)

### 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*

	<i>Occidentale</i> (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)	LMI	<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
GM	GreenMuscle® (a fungal-based biopesticide); NOVACRID, Green Guard	NCDLC	National Center for the Desert Locust Control, Libya
ha	hectare (= 10,000 sq. meters, about 2.471 acres)	NOAA (US)	National Oceanic and Aeronautic Administration
ICAPC	IGAD's Climate Prediction and Application Center	NPS	National Park Services
IGAD	Intergovernmental Authority on Development (Horn of Africa)	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</i> 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 relatively 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*

#### **Point of Contact:**

For additional information or questions,  
comments or suggestions, etc., please  
reach out to:

**Yeneneh T. Belayneh**, PhD.  
Senior Technical Advisor and Project  
Manager, USAID/DCHA/OFDA:

[ybelayneh@usaid.gov](mailto:ybelayneh@usaid.gov)

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

To learn more about our activities and  
programs, please, visit our website:  
[https://www.usaid.gov/what-we-do/working-  
crises-and-conflict/responding-times-  
crisis/how-we-do-it/humanitarian-  
sectors/agriculture-and-food-security/pest-  
and-pesticide-monitoring](https://www.usaid.gov/what-we-do/working-crises-and-conflict/responding-times-crisis/how-we-do-it/humanitarian-sectors/agriculture-and-food-security/pest-and-pesticide-monitoring)

#### **Additional resources on SGR and other ETOPs**

SGR  
USAID Pest Monitoring:  
[https://www.usaid.gov/what-we-do/working-  
crises-and-conflict/responding-times-crisis/how-  
we-do-it/humanitarian-sectors/agriculture-and-  
food-security/pest-and-pesticide-monitoring](https://www.usaid.gov/what-we-do/working-crises-and-conflict/responding-times-crisis/how-we-do-it/humanitarian-sectors/agriculture-and-food-security/pest-and-pesticide-monitoring)

Archived ETOP Bulletins:  
[https://www.usaid.gov/what-we-do/working-  
crises-and-conflict/responding-times-crisis/how-  
we-do-it/humanitarian-sectors/agriculture-and-  
food-security/pest-and-pesticide-  
monitoring/archive](https://www.usaid.gov/what-we-do/working-crises-and-conflict/responding-times-crisis/how-we-do-it/humanitarian-sectors/agriculture-and-food-security/pest-and-pesticide-monitoring/archive)

UN/FAO Desert Locust Watch  
[http://www.fao.org/ag/locusts/en/info/info/index.h  
tml](http://www.fao.org/ag/locusts/en/info/info/index.html)

FAO Locust Hub  
<https://locust-hub-hqfao.hub.arcgis.com/>

FAO Locust Emergency Appeal for Greater Horn of  
Africa and Yemen

[http://www.fao.org/fileadmin/user\\_upload/emergencies/docs/Greater%20Horn%20of%20Africa%20and%20Yemen%20%20Desert%20locust%20crisis%20appeal%20%20May%202020.pdf](http://www.fao.org/fileadmin/user_upload/emergencies/docs/Greater%20Horn%20of%20Africa%20and%20Yemen%20%20Desert%20locust%20crisis%20appeal%20%20May%202020.pdf)

<http://www.fao.org/emergencies/crisis/desertlocust/en/>

FAO visuals on SGR

<http://tv.fao.org/>

FAO Desert Locust Crisis

<http://www.fao.org/emergencies/crisis/desertlocust/en/>

CIT, DMA and LMI – FAO-PPPD

<http://www.fao.org/locusts-cca/en/>

DLCO-EA

<http://www.dlco-ea.org/final/index.php/about-us>

FAO/Central Region Locust Control Commission

<http://desertlocust-crc.org/Pages/index.aspx?CMSId=8&lang=EN>

FAO/Western Region Locust Control Commission

<http://www.fao.org/clcpro/fr/>

FAO Locust Watch - Central Asia and Caucasus

<http://www.fao.org/locusts-cca/en/>

USAID supports for locust operations in the CAC

Region: <http://www.fao.org/locusts-cca/programme-and-donors/projects-donors/en/>

FAO SGR Response Overview Dashboard

<http://www.fao.org/locusts/response-overview-dashboard/en/>

FAO Locust Hub

<https://locust-hub-hqfao.hub.arcgis.com/>  
<http://www.fao.org/aq/locusts/en/activ/DLIS/eL3suite/index.html>

FAW

USAID FtF FAW

<https://www.agrilinks.org/post/fall-armyworm-africa-guide-integrated-pest-management>

FAW management animation SAWBO

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

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

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

FAO NURU FAW Application

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

USAID FAW PERSUAP

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

FAO FAW Monitoring and Early warning System

<http://www.fao.org/3/CA1089EN/ca1089en.pdf>

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

<https://www.invasive-species.org/wp-content/uploads/sites/2/2019/03/Fall-Armyworm-Evidence-Note-September-2017.pdf>

AAW

<http://www.armyworm.org/latest-armyworm-forecast-irlco-csa-oct-2018/>