

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

SUMMARY

The **Desert Locust** (*Schistoseca gregaria* - **SGR**¹): The SGR situation remained extremely serious in the Horn of Africa in the central outbreak region (COR) where hoppers, adults and swarms continued developing in **Kenya, Ethiopia** and **Somalia** during March. In South Sudan, several mature swarms from Kenya appeared in the southeast during the 2nd dekad of March and flew later eastward towards southwestern Ethiopia on March 23rd. In **Sudan**, vegetation continued drying up on the Red Sea coast and only a few scattered adult locusts were present on the south coast. In **Eritrea**, ground control operations continued against groups of late instar hoppers and immature adults on the southern Red Sea coastal areas. In **Djibouti**, immature adult locusts and hoppers were detected in Kalaf in Tadjoura northwest of the country. In **Yemen**, scattered immature and mature adults were detected on the northern Red Sea coast in Tihama and hopper bands continue appearing and immature adults are starting to form groups on southern coast near Aden. In **Saudi Arabia**, limited control operations were carried out against a few mature adult groups in the interior in the north. In **Oman**, control operations continued against hopper groups in northern interior and new groups that just hatched on north coast. Close to 98,000 ha were controlled in COR during March. In the eastern outbreak region (EOR), hatching and late instar hopper band formations continued in southwestern parts of **Iran** and hopper groups continued forming in Baluchistan in western **Pakistan** and control operations treated more than 67,330 ha against hoppers and immature adults. The western outbreak region (WOR) remained calm during this month <http://www.fao.org/ag/locusts/en/info/info/index.html>

Forecast: Swarms will continue maturing and breed; hoppers, hopper bands, adult groups will dramatically increase in the Horn of Africa – Ethiopia, Kenya, and Somalia during the forecast period. Breeding will also occur in spring breeding areas in the interior of Saudi Arabia, Iran and Pakistan and activities will continue in Oman and Yemen during this time. Limited locust activities may begin appearing in northern Mali, southern Algeria. FAO estimates more than 24 million people in the Greater Horn of Africa are facing severe food insecurity. With locust breeding to coincide with the main growing season, these figures could likely increase. Efforts must be made to prevent the current upsurge from reaching a plague stage. Host country governments in the region have been leading intensive surveillance and control operations and yet the needs are outpacing their efforts.

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

If swarms remain unabated in the coming several weeks and months, we could see dramatic population increase by June, much worse than the situation witnessed during the past several months. Timely preventive/curative control must be supported with adequate resources to detect and abate locust populations as quickly as possible. Resources are also needed to protect the livelihoods of farmers and pastoralists and ensure they meet their immediate food needs and inputs to restore production. The Food and Agriculture Organization of the United Nations (FAO) has revised its Horn of Africa appeal to USD 153.2 million of which donors and international organizations have generously contributed or pledged some USD 110 million as of March 2020. This will enhance coordination and preparedness and enable partners and host country governments to intensify surveillance, monitoring, control operations, and safeguard livelihoods of vulnerable communities. FAO also launched a proactive appeal for USD 15.8 to support Sudan and Yemen in the coming several months. It is critical that all frontline and invasion countries remain vigilant and intensify surveillance, monitoring and rapid and timely control interventions. Development and humanitarian partners are encouraged to maintain their generosity and continue with their support to reduce the burden of the locust invasions on food security and livelihoods of vulnerable peoples and communities. <https://locust-hub-hqfao.hub.arcgis.com/>

Red (Nomadic) Locust (*Nomadacris septemfasciata*) (**NSE**): NSE is expected to have begun fledging and form swarms in the primary outbreak areas during March.

Tree Locusts, *Anacridium spp.* (**ASP**): No ASP report was received during March.

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

South American Locust, *Schistocerca cancellata* (**SCA**): SCA outbreaks were reported in Argentina, Uruguay and neighboring areas South America during the past months.

Italian (CIT), Moroccan (DMA), and Asian Migratory Locusts (LMI): Locust activities will remain calm until spring.

Fall Armyworm (*Spodoptera frugiperda*) (**FAW**): FAW was reported in cereal crops in several countries in southcentral Africa during March. Zimbabwe, Tanzania and Malawi were most affected. Control operations were undertaken by affected farmers with technical and material support from Ministries of Agriculture.

African Armyworm (AAW) (*Spodoptera exempta*): AAW outbreaks were reported in Zimbabwe, Mozambique and Malawi where control was undertaken by affected farmers with technical and material support from Ministries of Agriculture.

Quelea spp. (QSP): QSP bird outbreaks were reported damaging rice in Kisumu and Kirinyaga Counties in Kenya, Mwanza, Tabora, Shinyanga, Iringa and Mbeya Regions in Tanzania during March.

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 SGR est restée extrêmement grave dans la Corne de l'Afrique dans la région centrale de l'épidémie (COR) où des larves et des bandes massives ont continué à se développer au Kenya et en Éthiopie en mars et certains ont signalé la formation d'essaims au cours de ce mois. Les opérations de contrôle aérien et terrestre se poursuivent. Au Soudan du Sud, plusieurs essaims matures du Kenya sont apparus au cours de la 2e décennie de mars dans le sud-est et ont volé vers l'est vers le sud-ouest de l'Éthiopie le 23 mars. Au Soudan, la végétation se desséchait sur la côte de la mer Rouge et seuls quelques ailés épars étaient présents sur la côte sud. En Érythrée, les opérations de lutte se sont poursuivies contre des groupes de larves du dernier stade et des ailés immatures dans les zones côtières du sud de la mer Rouge. À Djibouti, des criquets et des larves adultes immatures ont été détectés à Kalaf dans la région de Tadjoura au nord-ouest du pays. Au Yémen, des ailés épars ont été détectés sur la côte nord de la mer Rouge et des bandes larvaires continuent d'apparaître et des ailés immatures commencent à former des groupes sur la côte sud près d'Aden. En Arabie saoudite, des opérations de lutte limitées ont été menées contre quelques groupes d'ailés matures à l'intérieur du nord. À Oman, les opérations de lutte se sont poursuivies contre les groupes larvaires de l'intérieur du nord et de nouveaux groupes qui venaient d'éclore sur la côte nord. Près de 98 000 ha ont été contrôlés dans le COR en mars. Plusieurs essaims ont été signalés ces derniers jours, y compris aujourd'hui, le long des deux côtés de la frontière entre Oman et le Yémen à l'intérieur et sur la côte. Dans la région de l'épidémie orientale (EOR), des

formations de bandes larvaires d'éclosion et de stade larvaire se sont poursuivies dans le sud-ouest de l'Iran et des groupes larvaires ont continué de se former au Baloutchistan dans l'ouest du Pakistan et les opérations de lutte ont traité plus de 67330 ha contre les larves et les ailés immatures. La région ouest de l'épidémie (WOR) est restée calme au cours de ce mois <http://www.fao.org/ag/locusts/en/info/info/index.html>

Prévisions: Prévisions: Les essaims continueront de mûrir et de se reproduire et les larves, les bandes larvaires et les groupes d'adultes augmenteront considérablement dans la Corne de l'Afrique - Éthiopie, Kenya et Somalie au cours de la période de prévision. Une reproduction aura également lieu dans les zones de reproduction printanière de l'intérieur de l'Arabie saoudite, de l'Iran et du Pakistan et certaines activités sont probables à Oman et au Yémen pendant cette période. Des activités acridiennes limitées pourraient commencer à apparaître dans le nord du Mali, en Algérie. La FAO estime que plus de 24 millions de personnes dans la Grande Corne de l'Afrique sont confrontées à une grave insécurité alimentaire aiguë (phases 3 de la classification intégrée de la sécurité alimentaire [IPC] et plus). La principale saison de croissance étant au maximum pendant la période de prévision dans la région, les invasions acridiennes augmenteront probablement ce chiffre. Des efforts doivent être faits pour empêcher que la recrudescence actuelle n'atteigne un stade de peste. Les gouvernements des pays hôtes de la région mènent des opérations intensives de surveillance et de contrôle, mais les besoins dépassent leurs efforts. Si les essaims restent inchangés dans les semaines et les mois à venir, nous pourrions voir une augmentation spectaculaire de la population d'ici juin, bien pire que la situation des derniers mois. La lutte préventive / curative en temps opportun doit être appuyée par des ressources adéquates pour détecter et réduire les populations acridiennes le plus rapidement possible. Des ressources sont également nécessaires pour protéger les moyens de subsistance des agriculteurs et des éleveurs et s'assurer qu'ils répondent à leurs besoins alimentaires immédiats et à leurs intrants pour rétablir la production. L'Organisation des Nations Unies pour l'alimentation et l'agriculture (FAO) a révisé son appel à la Corne de l'Afrique à 153 millions USD, dont les donateurs et les organisations internationales ont généreusement contribué ou promis 110 millions USD en mars 202. Cela améliorera la coordination et la préparation et permettra aux partenaires et aux gouvernements des pays hôtes d'intensifier la surveillance, le suivi, les opérations de contrôle et de sauvegarder les moyens de subsistance des communautés vulnérables. La FAO a également lancé un appel proactif de 15,8 USD pour soutenir le Soudan et le Yémen au cours des prochains mois. Il est essentiel que tous les pays de première ligne et d'invasion restent vigilants et intensifient la surveillance, le suivi et les interventions de contrôle rapides et opportunes. Les partenaires au développement et les partenaires humanitaires sont aimablement encouragés à maintenir leur générosité et à poursuivre leur soutien pour réduire le fardeau des invasions acridiennes sur la sécurité alimentaire et les moyens de

subsistance des populations et communautés vulnérables. <https://locust-hub-hqfao.hub.arcgis.com/>

Criquet nomade (*Nomadacris septemfasciata*) (NSE): NSE On s'attend à ce que le NSE commence à envol et forme des essaims dans les principales zones épidémiques en mars.

Le criquet arborial, *Anacridium spp*: Aucun rapport ASP n'a été reçu en mars.

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): SCA ont été signalés en Argentine, en Uruguay et dans les régions voisines d'Amérique du Sud au cours des derniers 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): La FAW a été signalée dans les cultures céréalières de plusieurs pays du centre-sud de l'Afrique en mars, le Zimbabwe, la Tanzanie et le Malawi étant les plus touchés. Le contrôle a été entrepris par les agriculteurs touchés avec le soutien technique et matériel de MinAgris.

Chenille Légionnaire africaine (AAW), *Spodoptera exempta*: Des flambées de AAW ont été signalées au Zimbabwe, au Mozambique et au Malawi, où la lutte a été entreprise par les agriculteurs touchés avec le soutien technique et matériel des ministères de l'agriculture.

***Quelea spp. oiseaux* (QSP):** Des foyers d'oiseaux QSP n'ont pas été signalés endommageant le riz dans les comtés de Kisumu et Kirinyaga au Kenya, Mwanza, Tabora, Shinyanga, Iringa et Mbeya en Tanzanie en mars.

La surveillance active, le suivi et les interventions préventives et curatives opportunes ainsi que le partage des informations 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

In **COR**, widespread and heavy rains that were reported in the Horn of Africa and eastern Yemen and good rains in northern Oman during the third dekad of March. Light rains were reported near Sharurah on the southern border of Saudi in the Empty Quarter adjacent to northern border of Yemen during 2nd dekad of March. These will create favorable conditions for locusts to breed and significantly increase in these areas in the coming months (DLMCC/Yemen, FAO-DLIS, NOAA, PPD/Djibouti).

In **EOR**, widespread heavy rains were reported in southern Iran during the third dekad of March. Moderate rains were reported in northern Pakistan and southeast Iran and light showers were reported in southwest Iran during previous dekads of March and these will create favorable conditions for locusts to breed and significantly increase during the forecast period (FAO-DLIS).

In **WOR**, ecological conditions remained generally dry during March except a few places in the Draa Valley south of the Atlas Mountains in Morocco where light showers were reported and in southwest

Libya near Ghat where patches of green vegetation persisted (ANLA/Chad, CNLA/Mauritania, CNLAA/Morocco, CNLA/Tunisia, CNLAP/Mali, FAO-DLIS).

Seasonal rains continued in **NSE** outbreak regions, with above average rains recorded in Tanzania and Mozambique and normal rain reported in Zambia. Ecological conditions remained favorable for NSE to continue further developing (IRLCO-CSA)

CAC Region: Cool and dry weather is expected to have prevailed in CAC during this month.

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 ongoing SGR extended outbreaks and upsurges are also partially attributed to the change in the weather pattern – extended and above normal rainfall partly associated with 4-5 cycles that made landfall in the COR region, extending from Oman, Yemen, Southern Arabian Sea and the Horn of Africa between May 2018 to December 2019.

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 a year. This phenomenon is largely attributed to change in weather pattern resulting in ecological shift and 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 – COR: The SGR situation remained extremely worrisome in **Ethiopia, Kenya** and **Somalia** as the pest continued developing and further spreading during March. Hopper bands and swarms continued forming in northern and central **Kenya**, southern **Ethiopia** and **Somalia** causing a serious threat to food security and livelihoods of hundreds of thousands of rural communities and people as it will coincide with the onset of the long rains and the planting season. Ground and aerial control operations are in progress in the Horn of Africa and treated more than 97,770 ha during March.

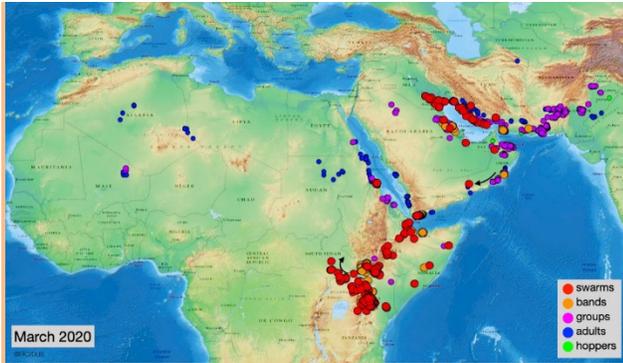
Resources availed by host countries, and generous contributions from the donor communities, including USAID, the UN, bilateral and multilateral organizations, etc., are supporting surveillance, monitoring and control operations as well as availing the necessary materials,

supplies, tools and equipment, e.g., spray and surveillance aircraft, transportation facilities, pesticides, PPE, surveillance tools, as well as supporting training, ensuring human and environmental safety and relief and rehabilitation.

In **Ethiopia**, hoppers continued to form bands and groups in SNNPR in the south central part of the country; immature and mature adults and swarms were detected in the southern Oromiya supposedly from previous invasions from adjacent areas in Somalia and aerial and ground control operations continued and treated 39,656 ha during March (an updated report indicated that during February, PPD/Ethiopia controlled locusts on more than 50,000 ha) (FAO-DLIS).

In **Kenya**, aerial and ground control operations continued treated close to 33,968 ha during March. SGR has been detected in 27 or the 47 counties with an estimated 1 million food insecure people located in the locust affected counties, including Garissa, Mandera, Marsabit, Turkana and Wajir. Hoppers and swarms were reported in the central and northern countries, including Isiolo, Marsabit, Mandera, Samburu, Liakipia, Embu, Meru and Turkana during March (FAO-DLIS).

In **Somalia**, late instar hopper bands and immature adult groups were reported in the northwest; a mature swarm was detected a nearby and adult groups were seen laying eggs east of Barbara during early March. In the northeast, hopper groups and bands, adults and a mature swarm were detected near Garowe. In central area, a hopper band was reported north of Belet Weyne and a mature swarm was seen laying near Dusa Mareb on the 18th of March. In the south, an immature swarm was seen west of Mogadishu by mid-Month.



FAO-DLIS, 3/2020

In **Sudan**, survey and control operations continued along the Red Sea coasts and controlled 870 ha. Two immature swarms were detected crossing southern border of Sudan with Eritrea, but overall locust numbers declined due to control operations and unfavorable ecological conditions towards the end of March (FAO-DLIS, PPD/Sudan).

In **Eritrea**, survey and control operations continued along the southern side of the Red Sea coast where groups of immature adults and hoppers were controlled on some 5,640 ha during March (FAO-DLIS).

In **Djibouti**, hopper bands and immature swarms were detected on the coast between Tajoura and Obock and a few swarms were reported near Djibouti and south of Arta during March (FAO-DLIS, PD/Djibouti).

In **Uganda**, several swarms from northwestern **Kenya** appeared in Amudat district in the northeast part of the country in the past few days. Control operations treated close to 607 ha during March (a late received report indicated that 3,467 ha were treated in February) (FAO-DLIS).

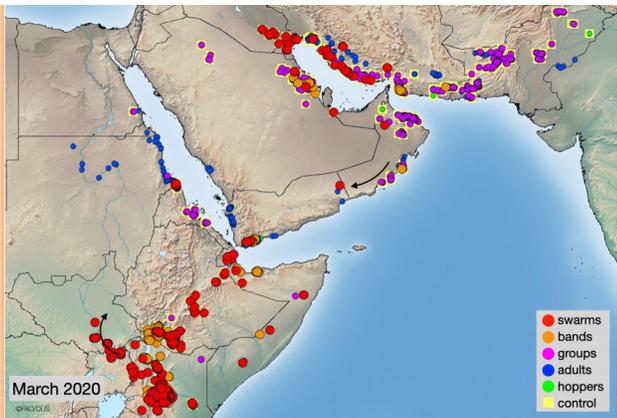
In **South Sudan (SSD)**, several mature swarms arrived in the Torit areas in the south in mid-March and a few days later one swarm flew northwest and reached

Juba by 21st March and it then continued north to Bore and on the 23rd it flew towards western Ethiopia. Another mature swarm was detected near Uganda border and Loboni Payam on March 29th. No Survey and monitoring were in progress and no swarm settled or bred nor caused pasture or crop damage. Training was conducted by FAO-DLCO-EA in Torit and Kapoita from February 24 to March 5 (DLCO-EA, FAO-DLIS, FAO-SSD).

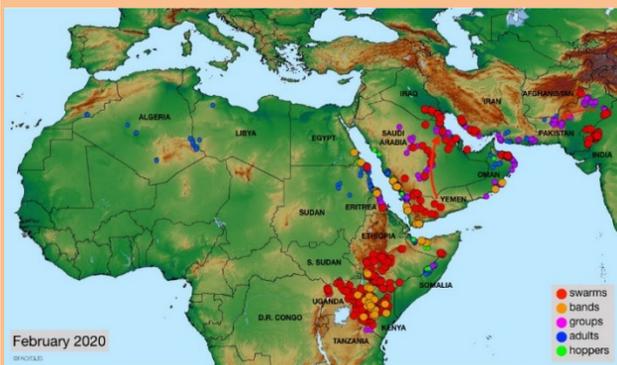
No activities were reported in **Tanzania** or **DRC** during this month and further developments are not expected in these countries during the forecast period.

In **Yemen**, hopper bands, adult groups and swarms were reported in winter breeding areas on the coastal plain in the Gulf of Aden in Lahij and Abyan Provinces during March. Immature adult groups and small swarms were detected northwest of Aden towards the end of the month. DLMCC carried out ground control operations against hopper bands on some 3,200 ha in Lahij north of Aden with the assistance of during the first decade of March. On April 1st, an immature swarm from south Oman was reported arrived near Shehn in Al Mahara Province and later moved to the southwest towards AlGaydah. Several swarms were reported along both sides of the **Oman/ Yemen** border in the interior and on the coast during early April (DLMCC/Yemen, FAO-DLIS).

In **Oman**, breeding continued in the northern interior and eastern parts of the country where hoppers formed groups and fledglings. An immature swarm was detected on March 31st southwest of Ibrī and other immature adults were observed moving south towards Thumrait during the last dekad of the month. Ground control treated 1,657 ha during this month (FAO-DLIS, LCC/Oman).



In **Saudi Arabia**, only a few mature solitary adults remained near Quinfidah in winter breeding areas on the Red Sea coast. A mature swarm was detected in spring breeding area in the interior of the country near the Persian Gulf where adult groups were laying during the first half of March and by the end of the month, hatching occurred. Groups of mature adults were reported in the north between Hail and Al Jawif. Ground control treated close to 10,390 ha during this month. In **Iraq**, mature swarms were reported in Basrah and Al Muthanna governorates and later spread to Thiqr governorate. Ground operations controlled 1,625 ha during this month (FAO-DLIS).



FAO-DLIS, 2 March 2020

Forecast: In the coming months, locust numbers will significantly increase in the COR due to the presence of ample parental populations and the widespread

and heavy rains that fell during late March. Egg laying, hatching and hopper, group and swarm formations will continue in southern Ethiopia, Somalia, and northern and central Kenya. Several newly formed swarms in Kenya will settle, mature and lay eggs, while some may move to Uganda, South Sudan and Ethiopia. Eggs laid from the new swarms will hatch by May and form hopper bands and develop into new swarms by late June and July to coincide with the beginning of the harvest season. Moderate to heavy rains that fell in **Yemen** will allow additional breeding and cause hopper bands to significantly increase locust numbers during the forecast period. In **Sudan** locust numbers will continue declining along the Red Sea coast and small scale breeding could occur in the Nile Valley during the forecast period. In **Somalia**, breeding will likely occur in the northwest, central and the south from Garowe to the Kenya border where rainfall occurred and increase locust numbers during the forecast period. In **Djibouti**, breeding may occur in areas of recent rainfall in the southern interior of Djibouti near Yokobi. In **Uganda**, any successful egg laying that may have occurred during the past several weeks may hatch and form hoppers. Swarms from Kenya may arrive in the northeast and continue moving northward by the prevailing wind during the forecast period. In **Oman**, swarms and groups will likely form in the northern and eastern coast and northern interior of the country. Swarms may begin moving along the Yemen border southward in early April. In **Saudi Arabia**, hatching will occur in early April and form hopper

bands near the Persian Gulf and fledging may start in early May and give rise to a few immature groups and small swarms. In **Iraq**, a few swarms may appear in al Muthanna governorate during the southerly wind (DLMCC/Yemen, FAO-DLIS, LCC/Oman, PPD/Djibouti, PPD/Sudan).

SGR - EOR: In **Iran**, egg laying occurred over some 900 km long southern coast from Iraq to Chab Derza. A few immature groups and swarms were observed along the southwestern coast. Hatching and a breeding continued in several places including along the Pakistan border and ground and aerial control treated some 39,968 ha during this month (FAO-DLIS).

In **Pakistan**, breeding continued in Baluchistan and hopper groups of all instars were present south of the Afghan border. Fledging began forming immature adult groups by the end of the month. Egg laying was observed in a few places north of Dera Ismail Khan. Ground control treated 27,675 ha and aerial operations treated 200 ha during this month (FAO-DLIS).

Forecast: In **Iran**, hatching will increase along the southeast and southwest coasts and sub-coastal areas and form adult groups and swarm and another generation of breeding by mid-May. In **Pakistan**, hopper groups and bands, immature groups and small swarms will form in Baluchistan and the Indus Valley. Adults will mature and start breeding during the forecast period (FAO-DLIS).

SGR – WOR: Ecological conditions were favorable for the survival of locusts in some parts in the western outbreak areas, but overall, the SGR situation in the region remained calm. Only isolated and scattered mature and immature

adults and groups were detected by the watch brigades in patches of green vegetation in the Timetrine in **Mali** and a few scattered adults were reported in Algeria during March (ANLA/Chad, CNLA/Mauritania, CNLAA/Morocco, CNLA/Tunisia, CNLAP/Mali, FAO-DLIS).

Forecast: Small-scale breeding is likely in northwest Mauritania, Algeria, Libya and Morocco, but the situation will generally remain calm (ANLA/Chad, CNLAP/Mali, CNLA/Mauritania, CNLAA/Morocco, FAO-DLIS, INPV/Algeria).

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): NSE is expected to have continued fledging in the outbreak areas in Ikuu/Katavi plains, Malagarasi Basin, Wembere plains and North Rukwa Valley in Tanzania, Lake Chilwa/Lake Chiuta plains and Mptasanjoka Dambo in Malawi; Dimba and Buzi-Gorongozo plains in Mozambique; Kafue Flats in Zambia. Swarms may have begun to form. The IRLCO–CSA is working with Member States to secure resources for surveillance and control operations (IRLCO-CSA).

Forecast: Immature adults will continue developing and concentrating and form swarms in the primary outbreak areas in Tanzania, Malawi and Mozambique. Timely surveillance and control interventions remain critical to prevent swarms from forming in large numbers and moving into cropping areas and

cause damage (IRLCO-CSA, OFDA/PSPM).

African Migratory Locust, *Locusta migratoria migratorioides* (Linnaeus) (LMM): A late received update indicated an LMM outbreak in Ngamiland, Okavango and Chobe areas in Northern Botswana. Neighboring countries including Zambia and Zimbabwe are maintaining vigilance against any cross-border invasions (IRLCO-CSA).

Tree Locusts, *Anacridium* spp. (ASP): No infestations were reported during this month.

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

South American Locust, *Schistocerca cancellata* (SAL): SCA outbreaks were reported in Argentina, Uruguay and neighboring areas South America during the past months.

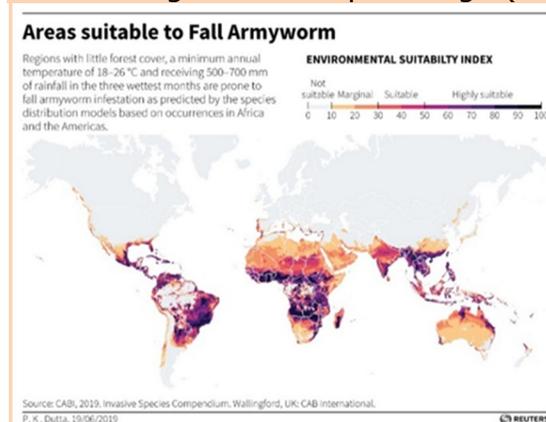
***Tropidacris collaris* (*Tucura quebrachera* - TCO - grasshopper-):** No update was received at the time this Bulletin was compiled.

Italian (CIT), Moroccan (DMA) and Migratory (LMI) Locusts in Central Asia and the Caucasus (CAC): No locusts were reported in CAC regions and activities are not expected until spring (FAO-ECLC, OFDA/PSPM).

Fall armyworm (FAW) (*S. frugiperda*): Light to dense infestations of FAW were reported causing damage to maize in Msvingo, Mashonaland East, West and Central Provinces of Zimbabwe, Northern, Central and Southern Regions

in Malawi and Mozambique. In Tanzania FAW outbreaks were reported in Morogoro and Iringa regions. Control operations were carried out by affected farmers with material and technical support from MinAgrsi. In Kenya, Mozambique and Zambia, limited infestations are expected on late planted maize and other cereal crops. The pest is also expected to have continued affecting maize and other crops that are at vulnerable stages in several regions. During February, FAW was reported on mainland Australia and in Timor Leste attacking maize plants in February. To date, the pest has reached most of Southeast Asia and Pacific regions (IRLCO-CSA).

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 preventive interventions remain critical to abate significant crop damage (OFDA).



Key Activity update: The USAID/OFDA sponsored Community-Based FAW Monitoring, Surveillance and Management project (CBFAMFEW) was implemented in six countries in eastern Africa from 2017 to August 2019. The project trained close to 1,400 senior PPD staff, district

agricultural experts, extension agents, lead farmers and village leaders. More than 10,000 farmers and villagers were sensitized on FAW-360 in participating countries. A network of forecasters and scouts were established across 300 project villages. Strong relationships were established among experts and implementing partners with commitments from participating countries garnered to ensure sustainability of project gains.

Scaling up of similar projects will ensure large number of farming communities in several countries across different regions can benefit and is worth considering.

Note: *Several species of natural enemies of FAW have been identified in Ethiopia, Kenya, Tanzania, Madagascar, India, etc. and are being further studied to determine their efficacy, environmental impacts and safety. Some are being tested along-side other agro-ecological tools, e.g., push-pull technology, to develop effective, affordable, accessible, adaptable and sustainable means of managing the pest. End note.*

Safer, affordable, and adaptable IPM-based pest management and assessment tools remains critical in abating FAW infestations and minimize crop damage.

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

African Armyworm (AAW): AAW outbreaks were reported in Chisumbanje, Masvingo Province in Zimbabwe; Sofala Province in Mozambique and Lilongwe, Nsanje and Chikwawa Districts in Malawi during March. Affected farmers were provided with material and technical support by respective MinAgris to control the pest (IRLCO-CSA).

Forecast: AAW activities will likely continue in the southern outbreak region and likely appear in the eastern outbreak zone during the forecast period (IRLCO-CSA, OFDA/PSPM).

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.

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

Strong surveillance, monitoring and quarantine enforcement remain critical to prevent invasive pests invading a new territory.

Quelea sp. (QSP): QSP bird outbreaks were reported causing damage to early planted sorghum in Mashonaland Central, Zimbabwe. In Tanzania the pest was reported in Mwanza, Shinyanga, Tabora, Iringa and Mbeya Regions and MinAgri requested spray aircraft from DLCO-EA. In Kenya low-density QSP populations were reported in Kirinyaga and high-density populations were detected causing damage to rice fields in Kisumu where MinAgri planned to launch control operations (DLCO-EA, IRLCO-CSA).

Forecast: QSP outbreaks are expected to continue being a problem to small grain cereal growers in Tanzania, Zimbabwe and Kenya. Increased vigilance and timely interventions remain critical to avert crop damage (DLCO-EA, IRLCO-CSA).

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 during this month, but rodent pests are constant pre- and post-harvest threats 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 through an operational research Arizona State University on soil amelioration to manage the Senegalese grasshopper (OSE). OSE is a notorious pest of cereal crops and pasture causing serious damage to small-scale farmers in its wide geographic coverage which extends from the Canneries, Cape Verde to nearly all sub-Saharan regions of Africa to India and neighboring countries. 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 countries affected by AAW, FAW and SGR 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, that continued benefiting participating countries across the globe was halted due to lack of resources to maintain the system. FAO has agreed to search for resources and revive the PSMS system. 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 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 does not support highly hazardous pesticides. It promotes an IPM approach to minimize risks associated with pesticide poisoning, stockpiling, and environmental pollution. 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 and can be safely and effectively utilized is worth considering

Inventory of Strategic Pesticide Stocks for SGR Control

Inventory of Strategic SGR Pesticide Stocks changed in all regions as close to 165,151 ha were reported treated in total during March (Egypt = 15; Eritrea = 5,640, Ethiopia = 39,656; 50,350 in February), Iran = 39,676, Iraq = 1,625; Kenya = 33,968, 15,278 in February); Kuwait = 21; Oman = 1,657, Pakistan = 27,675, Saudi Arabia = 10,319; Somalia = 159; Sudan = 870, UAR = 2; Uganda = 607, 3,467 in February) and Yemen = 3,190 (DLMCC/Yemen, FAO-DLIS, LCC/Oman, PPD/Ethiopia, PPD/Sudan).

Table 1. Estimated inventory of strategic SGR Pesticide Stocks in Frontline Countries during this month

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 ^D
Mali	3,540
Mauritania	39,803
Morocco	3,412,374 ^D
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 ^D ; 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 = *Green Muscle*TM (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	DPV	Département Protection des Végétaux (Department of Plant Protection)
AME	Anacridium melanorhodon (Tree Locust)	ELO	EMPRES Liaison Officers –
APLC	Australian Plague Locust Commission	EMPRES	Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases
APLC	Australian Plague Locust Commission Bands groups of hoppers marching pretty much in the same direction	EOR	Eastern SGR Outbreak Region
ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa	ETOP	Emergency Transboundary Outbreak Pest
CABI	Center for Agriculture and Biosciences International	Fledgling	immature adult locust /grasshopper that has pretty much the same phenology as mature adults, but lacks fully developed reproductive organs to breed
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	Calliptamus italicus (Italian Locust)	IGAD	Intergovernmental Authority on Development (Horn of Africa)
CLCPRO	Commission de Lutte Contre le Criquet Pèlerin 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	Chortoicetes terminifera (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	Dociostaurus maroccanus (Moroccan Locust)	LCC	Locust Control Center, Oman
DPPQS	Department of Plant Protection and Quarantine Services, India	LMC	Locusta migratoriacapito (Malagasy locust)
		LMM	Locusta migratoria migratorioides (African Migratory Locust)
		LPA	Locustana pardalina

MoAFSC	Ministry of Agriculture, Food Security and Cooperatives	PSPM	Preparedness, Strategic Planning and Mitigation (formerly known as Technical Assistance Group - TAG)
MoAI	Ministry of Agriculture and Irrigation	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.
MoARD	Ministry of Agriculture and Rural Development	UF	University of Florida
NALC	National Agency for Locust Control	USAID	the United States Agency for International Development
NCDLC	National Center for the Desert Locust Control, Libya	UN	the United Nations
NOAA (US)	National Oceanic and Aeronautic Administration	WOR	Western SGR Outbreak Region
NPS	National Park Services	ZEL	Zonocerus elegans, the elegant grasshopper
NSD	Republic of North Sudan	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
NSE	Nomadacris septemfasciata (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	<i>Schistocerca cancellata</i> (South American Locust)		
SFR	<i>Spodoptera frugiperda</i> (SFR) (Fall armyworm (FAW))		
SGR	<i>Schistoseca gregaria</i> (the Desert Locust)		
SPI	<i>Schistocerca piceifrons piceiferons</i> (Central American Locust)		
SSD	Republic of South Sudan		
SPB	Southern Pine Beetle (<i>Dendroctonus frontalis</i>) – true weevils		
SWAC	South West Asia DL Commission		
PBB	Pine Bark Beetle		

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<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/archive>

UN/FAO Desert Locust Watch

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

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/>

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/ag/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/jisc/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-Armym-worm-Evidence-Note-September-2017.pdf>

AAW

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