

**Emergency Transboundary Outbreak Pest (ETOP) Situation Bulletin for
March with a forecast through mid-May 2022**
résumé en français est inclus

SUMMARY

The **Desert Locust** (*Schistoseca gregaria* - **SGR**¹): The desert locust (SGR) situation remained generally calm in the Central Outbreak Region (COR) during this month, and only a few immature swarms were treated on 400 ha in southern Ethiopia. A few scattered adults were also detected in northern and southern coastal areas in Sudan and southern coast of Egypt, but control operations were not necessitated. Isolated adults were reported in a few places on the Gulf of Aden coast in southern Yemen. No locusts were reported elsewhere in the region. The Western (WOR) the Eastern (EOR) Outbreak Regions remained calm.

Forecast: Ecological conditions continue drying up in the COR causing locust numbers to further decline. Only low numbers of adults may appear in spring breeding areas in the interior of Saudi Arabia and Yemen, but poor rains are expected to limit breeding during the forecast period. In WOR, limited breeding may occur in Morocco and Algeria should there be more rain in the coming months. In EOR, isolated adults are likely to appear, but any breeding will be on a very limited scale due to poor rainfall in the forecast

Red (Nomadic) Locust (*Nomadacris septemfasciata*) (NSE): NSE situation remained calm in the primary outbreak areas during March. Fledging was expected to have occurred in Lake Chilwa/Lake Chiuta plains and Mpatsanjoka Dambo in Malawi; Ikuu-Katavi, Malagarasi, Rukwa plains and Bahi Valley in Tanzania; Kafue Flats in Zambia; and Buz Gorongosa and Dimba plains in Mozambique.

African Migratory Locust (*Locusta migratoria migratorioides*) (AML): Isolated populations of AML persisted in Simalaha Plains in Zambia. Significant outbreaks were not reported in Zimbabwe during this month.

Malagasy locust (*Locust migratoria capito*) (LMC): In Madagascar, aerial and ground survey and control operations continued against hopper groups and bands and immature and mature adults.

Tree Locusts, *Anacridium spp.* (ASP): ASP activities were not reported during this month.

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

Central American Locust, *Schistocerca piceiferons* (CAL): No update was received on CAL

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

Italian (CIT), Moroccan (DMA), and Asian Migratory Locusts (LMI): DMA, CIT and LMI activities remained calm in the CCA regions.

Fall Armyworm (*Spodoptera frugiperda*, J. E. Smith) (FAW): FAW infestations persisted in all maize growing regions in Zambia; in Blantyre Agriculture Development Division in Malawi; in Masvingo, Mazowe, Gokwe, Lupane and Hwange areas in Zimbabwe. In Kenya, FAW was reported attacking maize in Narok, Bomet, Kakamega, Bungoma and Busia Counties. No reports were received elsewhere during this time.

African Armyworm (*Spodoptera exempta*) (AAW): AAW outbreaks were reported in Tanzania, Malawi, and Kenya where affected farmers carried out control operations with the support from their respective MoAs.

Quelea species (QSP): QSP outbreaks were reported in Ethiopia, Tanzania, and Zimbabwe where the pest was causing damage to wheat, rice, and/or sorghum.

Active surveillance, monitoring and timely preventive and curative control as well as timely sharing of information on ETPs remain critical to abate the threats ETOPs pose to food security and livelihoods of vulnerable communities.

USAID/BHA/TPQ regularly monitors ETOPs in close collaboration with its global network of PPDs/DPVs, regional and international pest monitoring and control entities, FAO, CLCPRO, CRC, DLCO-EA, and IRLCO-CSA, and research centers, academia, private sector, NGOs and others and issues monthly analytical ETOP Bulletins to stakeholders (refer to list of acronyms on the last pages). **End summary**

RÉSUMÉ

La situation du Criquet pèlerin (*Schistocerca gregaria* - SGR): La situation relative au criquet pèlerin (SGR) est restée généralement calme dans la région centrale de l'épidémie (COR) au cours de ce mois, et seuls quelques essaims immatures ont été traités sur 400 ha dans le sud de l'Éthiopie. Quelques ailés épars ont également été détectés dans les zones côtières nord et sud du Soudan et sur la côte sud de l'Égypte, mais des opérations de lutte n'ont pas été

nécessaires. Des ailés isolés ont été signalés dans quelques sites de la côte du golfe d'Aden, dans le sud du Yémen. Aucun criquet n'a été signalé ailleurs dans la région. Les régions d'éclosion de l'ouest (WOR) et de l'est (EOR) sont restées calmes.

Prévisions: Les conditions écologiques continuent de se dessécher dans le COR, entraînant une nouvelle baisse des effectifs acridiens. Seuls de faibles effectifs d'ailés peuvent apparaître dans les zones de reproduction printanière de l'intérieur de l'Arabie saoudite et du Yémen, mais on s'attend à ce que de faibles pluies limitent la reproduction pendant la période de prévision. Dans la région WOR, une reproduction limitée peut avoir lieu au Maroc et en Algérie en cas de pluies supplémentaires dans les mois à venir. Dans la région EOR, des ailés isolés sont susceptibles d'apparaître, mais toute reproduction sera à une échelle très limitée en raison des faibles précipitations prévues.

Criquet nomade (*Nomadacris septemfasciata*) (NSE): La situation de la NSE est restée calme dans les principales zones de résurgence en mars. On s'attendait à ce que l'envol se produise dans les plaines du lac Chilwa/lac Chiuta et à Mpatsanjoka Dambo au Malawi; Ikuu-Katavi, Malagarasi, les plaines de Rukwa et la vallée de Bahi en Tanzanie; Kafue Flats en Zambie; et les plaines de Buz Gorongosa et Dimba au Mozambique.

Criquet migrateur africain (AML/LMI): Des populations isolées d'AML ont persisté dans les plaines de Simalaha en Zambie. Aucune flambée importante n'a été signalée au Zimbabwe au cours de ce mois.

Criquet migrateur capito, (ML/LMC): À Madagascar, les opérations de prospection et de lutte aériennes et terrestres se sont poursuivies contre des groupes et bandes larvaires et des ailés immatures et matures.

Le criquet arborial, *Anacridium spp.* (ASP): Les activités de l'ASP n'ont pas été signalées au cours de ce mois.

Criquet Amérique centrale (CAL): Aucune mise à jour n'a été reçue sur CAL

Criquet d'Amérique du Sud, *Schistocerca cancellata* (SAL): Aucune mise à jour n'a été reçue au moment de la rédaction de ce bulletin.

Criquets italiens (CIT), marocains (DMA), Asian Migratory Locust (LMI): Les activités DMA, CIT et LMI ont rappelé le calme dans les régions CCA.

Chenille Légionnaire d'automne (*Spodoptera frugiperda*, J. E. Smith) (FAW): Les infestations de FAW ont persisté dans toutes les régions productrices de maïs en Zambie; à la Division du développement agricole de Blantyre au Malawi; dans les régions de Masvingo, Mazowe, Gokwe, Lupane et Hwange au Zimbabwe. Au Kenya, la FAW aurait attaqué le maïs dans les comtés de Narok, Bomet, Kakamega, Bungoma et Busia. Aucun rapport n'a été reçu ailleurs pendant cette période.

Chenille Légionnaire africaine (*Spodoptera exempta*) (AAW): Des foyers d'AAW ont été signalés en Tanzanie, au Malawi et au Kenya, où les agriculteurs touchés ont mené des opérations de lutte avec le soutien de leurs ministères de l'agriculture respectifs.

Quelea specis oiseaux (QSP): Des foyers de QSP ont été signalés en Éthiopie, en Tanzanie et au Zimbabwe, où le ravageur causait des dégâts au blé, au riz et/ou au sorgho.

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 / BHA / 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/ECLO, 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 (se référer à la liste des acronymes sur les dernières pages). 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 for ETOPs can be found on the last pages of this Bulletin.

Weather and Ecological Conditions

In **COR**, significant rainfall was not reports in the SGR, only some rain was

reported in the Somali administrative region and a few localities in the southern region of Ethiopia.

In **WOR**, Ecological conditions remained generally unfavorable, and no significant precipitation was recorded.

In **EOR**, dry and unfavorable conditions persisted with no significant precipitation recorded.

In the **NSE** region, normal to above normal rainfall was reported in most of

the NSE areas during March – 1,580 mm in Mafambisse (Buzi plain), 200 mm in Gorongosa plain), 169 mm in Caia (Dimba plains), 190 mm Buzi, and 187 mm in Dimba in Mozambique. In Tanzania, the following numbers were reported: 458 mm in Kaliua (Malgarasi Plain), 138 mm in Muze (Rukwa Valley), and 88 mm in Masenge (Wembere Plain). In Zambia, 71.50 mm was recorded in Namwala (Kafue Flats).

In Madagascar in the **LMC** habitats, rain deficit in the southern half and heavy in Sofia due to cyclone GOMBE) were recorded in the primary locust breeding, grangerization, and invasion areas during the March. Vegetation greening and regeneration of grasses were intense in the order of 95% in some places with grass heights higher than 60 cm in areas that received normal to above normal rainfall.

No update was received in the **CCA** region at the time this bulletin was compiled, however, precipitation is expected to have begun in some parts of the region during March.

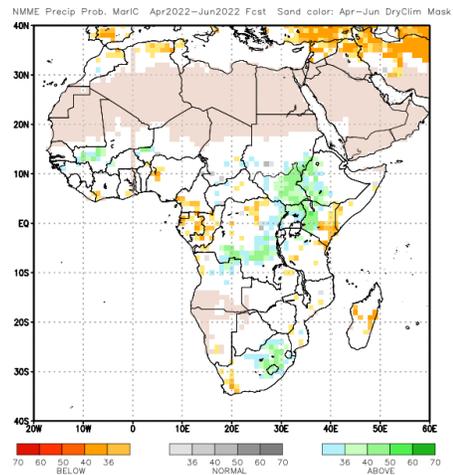
Some breeding areas in the **Central** and **South America** regions are expected to have received precipitation while others likely remained dry.

Weather forecast April-June 2022 (NOAA, March 2022)

Africa:

The forecasts call for a slight to tilt in the odds to favor above-average rainfall over parts of the Greater Horn of Africa and South Africa through the northern hemisphere spring 2022. There is also a tilt in the odds to favor above-average rainfall across much of the Sahel, extending into southern Sudan and

western Ethiopia during the northern hemisphere summer 2022 (see map below).

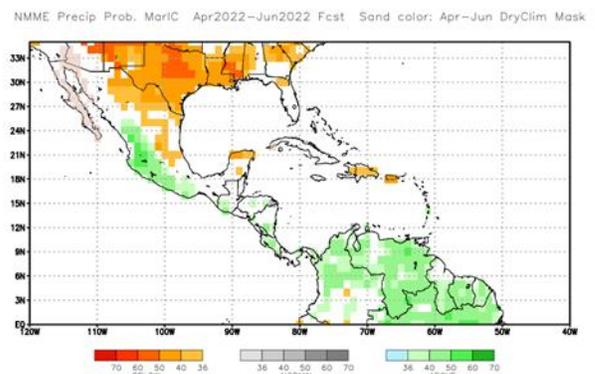


There is a slight to moderate tilt in the odds to favor below-average rainfall along the Gulf of Guinea coast, portions of Central Africa, and pockets of equatorial East Africa and Southern Africa (NOAA, March,2022).

Central America:

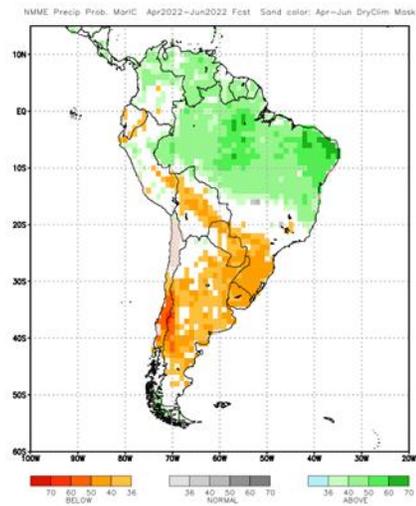
There is a slight to moderate tilt in the odds to favor below-average rainfall over parts of northern and eastern Mexico, and pockets of the Caribbean.

There is a slight tilt in the odds to favor above average rainfall over much of Central America.



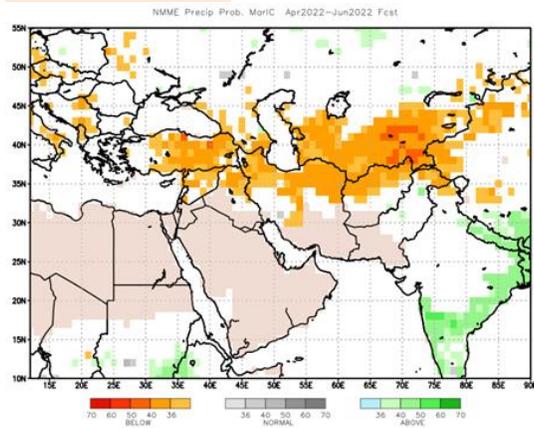
South America:

The forecasts call for a moderate tilt in the odds to favor above-average rainfall over northern South America. There is a moderate tilt in the odds to favor below-average rainfall over Southeast Brazil and the southern areas of South America



Central Asia, Middle East, and Southwest Asia:

There is a moderate tilt in the odds to favor-below-average rainfall over parts of Central Asia.



ETOP Proliferation and Climatic Factors

Note: Climate change induced weather anomalies contribute to an ecological

shift in ETOP habitats, triggering risks in the outbreaks and resurgence of ETOPs and/or the emergence of new and invasive pest species. The frequency, extent and payload of ETOP prevalence, appearances, and upsurges are partially attributed to the changes in the weather patterns - extensive, and above normal rainfall partly associated with the occurrence of multiple cyclones or persistent drought that significantly impact pest presence, proliferation causing additional stresses to food security and livelihoods of vulnerable communities and populations – case in point: multiple cyclones that occurred in the western Indian Ocean, in the Arabian Peninsula and the Horn of Africa region within a time span of less than two years, from May 2018 to December 2019, lead to major SGR upsurges and outbreaks that continued impacting the COR region through 2021

http://www.cpc.ncep.noaa.gov/products/international/casia/casia_hazard.pdf **End note.**

Detailed Accounts of Monthly ETOP Situation and Forecast for the Next Six Weeks

The **Desert Locust** (*Schistoseca gregaria* - **SGR²**): In COR, the SGR situation continued declining across the Horn of Africa, Eastern Africa, and the Red Sea region where ecological conditions remained unfavorable and aggressive surveillance and preventive interventions were implemented. Only a few immature adults were controlled on 400 ha in southern Ethiopia. A few insignificant scattered adults were detected in northern coastal areas in Sudan and in southern coast of Egypt and Sudan, but control operations were not necessitated.

² Definitions of all acronyms can be found at the end of the report.

Isolated adults were reported in a few places on the Gulf of Aden coast in southern Yemen during this month.

Forecast: In COR, any escapee adults from southern Ethiopia may move north to areas of recent rainfall in the Somali administrative region. Locust numbers will continue declining along the Red Sea and Gulf of Aden coasts where vegetation and soil remained dry. A few solitary adults may appear in the interior of Saudi Arabia and Yemen where breeding, if any, will be on a very limited scale due to poor rain in the forecast.

SGR – WOR: Ecological conditions remained dry, and no locusts were reported across the region during this month.

Forecast: In WOR, limited breeding may occur in Morocco and Algeria should there be more rain in the coming months.

SGR - EOR: The EOR region remained calm, and no locusts were reported in Afghanistan, India, Iran, or Pakistan during this month.

Forecast: Isolated adults are likely to appear in southeast Iran and southwest Pakistan in EOR, and any breeding will be on a very limited due to poor rainfall in the forecast

NOTE – Innovative Technologies for ETOP Surveillance, Early Warning and Forecasting for Stronger and Effective ETOP Management: *Though at an early stage, innovative technologies, such as drones, for high-resolution images in remote and hard-to-reach inaccessible areas are being explored for ETOP operations. On trial bases, use of drones for locust monitoring, and surgical control in*

*localized, sensitive, and hard to reach areas showed promising results. While the range of agricultural oriented drones may be limited for large-scale area-wide pest control purposes, such as tackling massive swarms and hopper bands, there are interests among countries and partners to work on several parameters associated with such technologies, including air space access protocols and other issues. Crowd and cloud sourcing for data collection, sharing, etc. are another set of assets that can be of great value for ETOP operations. Dynamic population modeling and biotope modeling, from CIRAD and ICIPE, respectively, and accounting for associated parameters such as soil moisture, vegetation index, etc. that has involved multiple players – USAID, Penn-FAO, NOAA, NASA, CIRAD, National and International Research institutions, academia, pvt sector, and many more will certainly contribute to better understand ETOP – DL phenology, ecology, habitat range, etc. with an ultimate goal to manage them safely and effectively. **End note.***

Red (Nomadic) Locust (NSE): NSE situation remained relatively calm during this month. However, hatching and hopper formation were expected to have occurred in Lake Chilwa/Lake Chiuta plains, Mpatsanjoka Dambo in Malawi; Kafue Flats, in Zambia; in Iku-Katavi plains, Bahi Valley, Malagarasi Basin, and Rukwa Valley in Tanzania; in Buzi Gorongosa, and Dimba plains in Mozambique where ecological conditions remained favorable due to the seasonal rainfall. IRLCO-CSA Member-country support for routine surveillance and timely control operations remain critical to avoid any unnecessary stress to vulnerable farming and pastoralist communities. IRLOC-CSA strongly recommends that surveillance and timely

control interventions need collective attentions.

Forecast: Hoppers are expected to complete fledging in outbreak areas in Ikuu-Katavi, Rukwa plains, Wembere plains and Malagarasi Basin in Tanzania; Buzi and Dimba plains in Mozambique; Lake Chilwa/Lake Chiuta plains in Malawi and the Kafue Flats in Zambia. It is likely that swarms will start forming in some of the outbreak areas during the forecast period. IRLCO-CSA continue with its appeal for resources to be able to carry out timely survey and launch control before swarms develop and cause damage to crops and pasture.

African Migratory Locust (AML):

Isolated scattered AML populations persisted in Simalaha plains in Western province of Zambia and Chisumbanje area in Manicaland province in Zimbabwe. No significant AML infestations were reported in Zimbabwe where survey operations were conducted in Masvingo, Manicaland and Matebeleland North Provinces. No AML infestation was reported elsewhere at the time this bulletin was compiled.

Forecast: AML outbreaks are likely in Southern and Western Provinces of Zambia and in primary outbreak areas in Zimbabwe. Extension staff and farmers are encouraged to continue surveillance to the extent possible and report any detection of the pest to the relevant authorities.

Malagasy locust (Locust migratoria capito – MLC): Mixed populations of LMC and NSE hoppers and 2nd generation immature and mature adult population of LMC were observed on Morondava plain and in the Tsiribihina delta during the

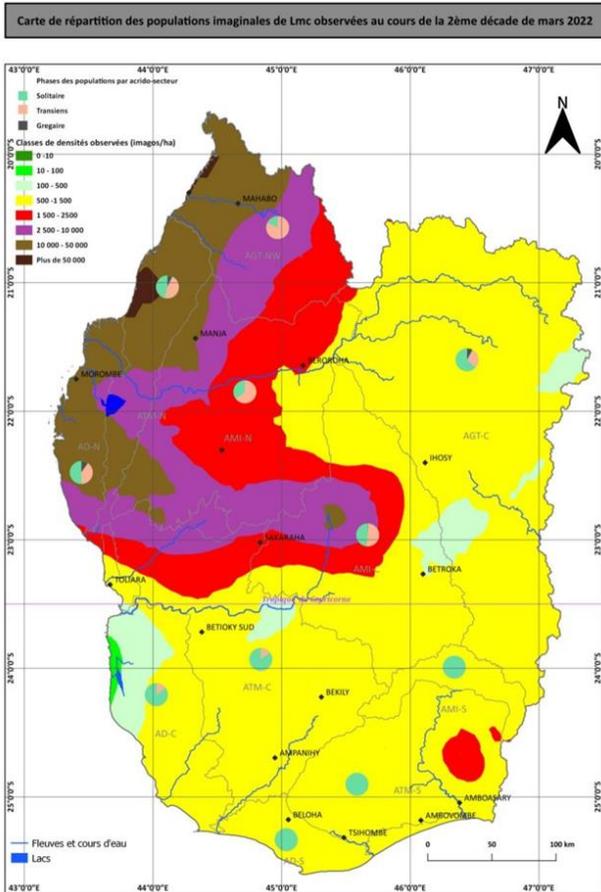
March. In the primary breeding areas in Manja (on the Maintapaka and on the Lapaolo) immature and mature adults as well as late (5th) instar hoppers were observed. In the Sofia basin, outside the grangerization areas, low density late instar transient hoppers were detected. During the 1st dekad of March, 7,450 ha were treated by air (FAO dispatched two helicopters for the aerial survey and control operations). As of the first dekad March, 83,890 ha have been controlled/protected (ground control treated 5,232 ha in total against LMC and NSE in the Morombe (Befandriana-Sud), Sakaraha, Toliara II, Ihosy, Belo-sur-Tsiribihana, Antsohihy, Befandriana-Nord, Mandritsara, Port-Bergé and Analalava districts).

NOTE: The Malagasy locust campaign has been generously funded through contributions from the Government of Germany (USD 1.M) and the UNFAO (USD 600,000 (FAO) and through a project from the World Bank (USD 6.8 M) END NOTE.

Forecast: LMC populations will continue developing in invasion, grangerization and breeding areas, surveillance and timely control interventions will be maintained.

Active and timely surveillance, monitoring, preparedness, and interventions remain critical to minimize significant locust developments and avert potential threats they pose to food security and livelihoods of vulnerable communities that have already been affected by multiple stressors, including prolonged drought, etc. (BHA/TPQ).

BHA/TPQ continuous monitoring the situation in collaboration with FAO and field staff and provide updates and advice.



Population distribution of the Malagasy locust during the 2nd dekad of Marcy 2022 (FAO)

Central American Locust - *Schistocerca piceifrons* (CAL): SPI (CAL): No update was received on CAL. The outbreak that was reported in La Cáscara, Nuevo Leon, Mexico (Pech) during previous months [Nuevo Leon Locust Outbreak](#) is expected to have been put under control, and a significant threat is not expected.

[**Note:** CAL is a serious pest in 10 states in Mexico (Campeche, Chiapas, Hidalgo, Oaxaca, San Luis Potosí, Tabasco, Tamaulipas, Veracruz, Quintana Roo and Yucatán - MoA/México), and in Central America and it is known to attack hundreds of species of plants of economic importance, including agave, banana, beans, corn, cotton, peanut, rice,

sesame, soybean, sorghum, sugarcane, several fruit trees]. SENESA, Pech – SENESA, Mexico)

South American Locust, *Schistocerca cancellata* (SAL) (a.k.a. Flying lobster): No update was received at the time this bulletin was compiled. <https://www.voanews.com/americas/argentina-battles-locust-plaque-northern-province>.

Italian (CIT), Moroccan (DMA) and Migratory (LMI) Locusts in Caucasus and Central Asia (CCA): No update was received at the time this Bulletin was compiled and no locust activities are expected.

Forecast: With the seasonal weather precipitation and temperatures rising, and ecological locusts improving, locusts will begin appearing during the forecast period.

Fall armyworm (FAW): Moderate FAW infestations continued in all 10 Provinces of Zambia. In Zimbabwe, most of the provinces continued reporting mild infestation, and in Malawi, 31 districts with the total area of 240,530.5 ha reported low to moderate infestation with some damage to maize and sorghum. In Narok, Bomet, Kakamega, Bungoma and Busia Counties in Kenya, the pest was reported causing damage to early-planted maize. Control operations were launched by the affected farmers with material and technical support from their respective MoAs. FAW outbreaks were not reported in Mozambique or Tanzania. However, infestations are expected to have occurred in areas where maize and other susceptible crops are in the field. No updates were received elsewhere in their invasion countries.

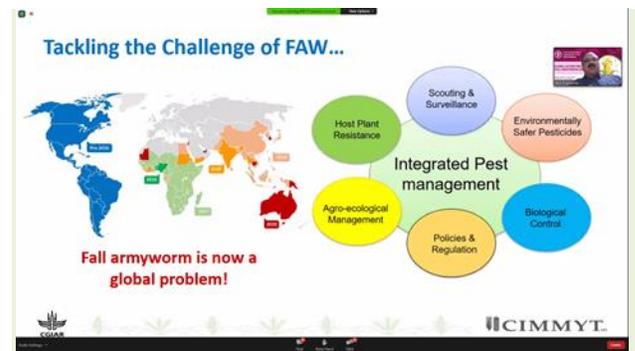
Forecast: FAW will likely persist and continue affecting rain-fed and/or

irrigated maize and other crops across sub-Saharan Africa, Asia, and elsewhere during the forecast period.

FAO-led Global Action for Fall Armyworm Control

NOTE: The Food and Agriculture Organization of the United Nations (FAO) is actively engaged in a transformative, coordinated Global Action for Fall Armyworm Control (GAFC) which it launched in December 2019 as an urgent response to the rapid spread of FAW. GAFC is intended to be implemented in 65 [target] countries across Africa, Near East and Asia-Pacific from 2020 to 2022: [FAW Secretariat, Global Action on FAW Control](#). GAFC is a pioneering initiative that aims to take radical, direct, and coordinated measures to fight FAW at a global level. Its 3 key objectives are: 1. Establish a global coordination and regional collaboration on monitoring, early warning, and intelligent pest management of FAW; 2. Reduce crop losses caused by FAW and, 3. Reduce the risk of further spread of FAW to new areas (Europe and South Pacific).

BHA/TPQ is working closely with various partners in implementing projects that are to benefit farming communities and host-gov partners with the intention to scaling up and spreading gains across different FAW prone regions, consistent with the spirit of GAFC. These initiatives build on experiences gained over the past several years, including outcomes of projects and programs supported through legacy OFDA, legacy BFS, national partners, CGIARs, FAO, and several other entities.



(Source: Prasanna, 2021)

Note: Several species of natural enemies of FAW have been identified in Ethiopia, Kenya, Tanzania, Madagascar, India and elsewhere and are under rigorous investigations to determine their efficacy, effectiveness, environmental impacts, safety, and other relevant parameters before they are released for extensive use. **End note.**

African Armyworm (Spodoptera exempta, Walker) (AAW):

AAW outbreaks persisted in Morogoro, Arusha, Manyara, Tanga, Dodoma, Lindi, Geita, Katavi, Kilimanjaro, Coastal and Singida regions in Tanzania. Infestations were also reported in Phalombe, Neno, Mulanje, Kasungu and Chiradzulu in Malawi. Mild infestations were reported in Makueni and Taita Taveta counties in Kenya. Control operations were carried out by the affected farmers with material and technical support from their respective MoAs.

Forecast: There is a likelihood of AAW infestations continue attacking young and late planted maize and other crops as well as pasture in Tanzania, Kenya, Malawi, Mozambique, and Zimbabwe. The pest will likely appear in other infestation countries as well.

Active monitoring, reporting and timely control interventions remain critical to avert any major threat/damage to crops.

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

Quelea species (QSP): QSP bird outbreaks were reported in Midlands, Mashonaland Central and Masvingo Provinces in Zimbabwe where surveys were conducted in breeding and roosting areas to launch control operations. The pest was also reported causing damage to irrigated wheat in Ethiopia and rice in Tanzania and aerial control was launched by the DLCO-EA in collaboration with the respective MoA in both countries. A late received report indicated QSP invasion in Kigoma region, Tanzania. QSP outbreak was also reported in Kisumu County, Kenya where plans were plans to launch control operations were underway at the time this bulletin was compiled.

Forecast: QSP outbreaks are likely to continue posing a problem to small grain cereal growers across different regions in Ethiopia, Kenya, Tanzania, Zimbabwe and elsewhere where small grain crops have not yet been harvested and the pest is frequent.

Facts: QSP 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 kg to 10,000 kg of seeds/day – amount enough to feed 12,000-20,000 people/day.

Rodents: No updates were received during this month, but it is likely that the

pest continues being a problem to pre- and post-harvest crops and produce across regions and will likely remain being a problem.

FACTS: On average, an adult rat can consume 3-5 gm of food (grain, etc.) per day; a population of 200 rats/ha (a very low density/unit area) can consume a quantity enough to feed an adult sheep/day, not to mention the multiple times that amount of food the rats can damage, destroy, and contaminate making it unfit for human consumption; rats are also zoonotic diseases vectors and transmitters.

All ETOP front-line countries must maintain regular monitoring and surveillance operations as well as launch control interventions in a timely manner. 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, ELOs, National DPVs and PPDs, etc., are encouraged to continue sharing ETOP information with stakeholders, including neighboring countries, and humanitarian and development partners, etc., as often as possible. Lead farmers, field scouts, community forecasters and others must remain vigilant and report ETOP detections to relevant authorities in their jurisdiction as quickly and as often as possible. Strong surveillance, monitoring and quarantine enforcement remain critical to prevent invasive pest species.

BHA's Contributions to ETOP Abatement Interventions

USAID/BHA/TPQ is supporting operational research through a DRR with Arizona State University (ASU) to develop a tool to manage the Senegalese grasshopper (OSE) with a vision for translating the

usability of these tools across regions and perhaps across continents.

OSE is a notorious pest of cereal and vegetable crops and pasture and causes serious damage to small-holder farmers across 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 farmers and pastoralists.

USAID/BHA/TPQ continues its efforts in strengthening national and regional capacity in ETOP (including SGR FAW, etc.) prone countries in several regions across the globe.

In addition to the OSE project that is being implemented in West Africa by ASU and partnering with experts from target countries in the region as well as international experts, BHA is also supporting DRR projects in Eastern Africa, the Horn, the Red Sea region, Caucasus, and Central Asia (CCA) countries. These projects focus on surveillance, monitoring, and management of ETOP of economic importance, among others. In Eastern Africa and the Horn, the multi-year DRR project targets FAW and is being implemented under the leadership of the International Center for Insect Physiology and Ecology [ICIPE](#) in close collaboration with participating countries. In the CCA region, where more than 25 million farmers and herders are constantly affected by three major locust species – Moroccan locust, Italia locust and the Migratory locust) - BHA is funding a multi-year DRR project. The project is being implemented in close collaboration with the affected countries under the leadership of UNFAO [BHA CCA Locust Support](#).

USAID/BHA/TPQ continues with its efforts and promote and support applied/operational and DRR research in testing, improving, and expanding innovative technologies to help minimize the impacts of ETOPs on food security and livelihoods of vulnerable peoples and communities across low-income countries and regions and promotes and encourages collaboration among countries and potential partners. Through these efforts, potential spread of the ETOPs to other countries can be minimized.

The online Pesticide Stock Management System (PSMS) that was developed by FAO with financial assistance from donors, including USAID Legacy OFDA, that continued benefiting participating countries across the globe was halted due to an IT issue - internet security and server switch. FAO is working on reinstating the system with an improved and user-friendly mode. Thanks to the system, SGR frontline countries and others had been able to effectively manage their strategic [pesticide] stocks and avoid unnecessary accumulations of unusable stocks and empty containers.

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

BHA/TPQ promotes an IPM approach, consistent with the Agency policies and

procedures, to help minimize health risks and environmental contamination associated with misuse and management of pesticides. An informed procurement and judiciously executed triangulations of surplus usable stocks between countries is worth considering.

Inventory of Strategic Pesticide Stocks for SGR Control

During March, pesticide stocks barely changed and only ground/aerial control operations against immature swarms consumed pesticides on 400 ha in southern Ethiopia.

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

Country	Quantity, l/kg*
Algeria	1,186,034~
Chad	65,270
Egypt	10,253 ULV, 45,796~
Eritrea	10,750~
Ethiopia	110,143~
Libya	24,930~
Kenya	?
Madagascar	9,335~+
Mali	3,540~
Mauritania	39,803~
Morocco	3,412,374 ^{D~}
~Niger	75,701~
Oman	5,000~
Saudi Arabia	23,379~
Senegal	156,000~
Somalia	?
Sudan	103,482~
South Sudan	?
Tunisia	62,200 obsolete
Uganda	?
Yemen	10,000; 180 kg GM~
*Includes different pesticides and formulations - ULV, EC and dust.	

~ data may not be current
^D = Morocco donated 100,000 l of pesticides to Madagascar and 10,000 l to Mauritania in 2015 through triangulation
^D = In 2013 Morocco donated 200,000 l to Madagascar
^D = Saudi donated 10,000 to Yemen and pledged 20,000 l to Eritrea
+ = other MoA stocks are not included
? = data not available
^{DM} = Morocco donated 30,000 l of pesticides to Mauritania
GM = *GreenMuscle*TM (fungal-based biological pesticide, e.g., NOVACRID)

LIST OF ACRONYMS

- AAW *African armyworm (Spodoptera exempta)*
- 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)*
- AML *African Migratory (Locust Locusta migratoria migratorioides)*
- 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*
- BHA *Bureau for Humanitarian Assistance*
- CABI *Center for Agriculture and Biosciences International*
- CAL *Central American Locust Schistocerca piceifrons piceiferons*

CBAMFEW	Community-based armyworm monitoring, forecasting and early warning		adults, but lacks fully developed reproductive organs to breed
CCA	Caucasus and Central Asia	GM	GreenMuscle® (a fungal-based biopesticide); NOVACRID, Green Guard
CERF	Central Emergency Response Fund	ha	hectare (= 10,000 sq. meters, about 2.471 acres)
CIT	<i>Calliptamus italicus</i> (Italian Locust)	ICAPC	IGAD's Climate Prediction and Application Center
CLCPRO	Commission de Lutte Contre le Criquet Pélerin dans la Région Occidentale (Commission for the Desert Locust Control in the Western Region)	IGAD	Intergovernmental Authority on Development (Horn of Africa)
CNLA(A)	Centre National de Lutte Antiacridienne (National Locust Control Center)	IRIN	Integrated Regional Information Networks
COR	Central SGR Outbreak Region	IRLCO-CSA	International Red Locust Control Organization for Central and Southern Africa
CPD	Crop Protection Division	ITCZ	Inter-Tropical Convergence Zone
CRC	Commission for Controlling Desert Locust in the Central Region	ITF	Inter-Tropical Convergence Front = ITCZ)
CTE	<i>Chortoicetes terminifera</i> (Australian plague locust)	FAO-DLIS	Food and Agriculture Organizations' Desert Locust Information Service
DDLC	Department of Desert Locust Control	Hoppers	young, wingless locusts/ grasshoppers (Latin synonym = nymphs or larvae)
DLCO-EA	Desert Locust Control Organization for Eastern Africa	JTWC	Joint Typhoon Warning Center
DLMCC	Desert Locust Monitoring and Control Center, Yemen	Kg	Kilogram (~2.2 pound)
DMA	<i>Dociostaurus maroccanus</i> (Moroccan Locust)	L	Liter (1.057 Quarts or 0.264 gallon or 33.814 US fluid ounces)
DPPQS	Department of Plant Protection and Quarantine Services, India	LCC	Locust Control Center, Oman
DPV	Département Protection des Végétaux (Department of Plant Protection)	LPA	<i>Locustana pardalina</i>
ELO	EMPRES Liaison Officers -	LMC/ML	<i>Locusta migratoriacapito</i> (Malagasy locust)
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 Pests	MoARD	Ministry of Agriculture and Rural Development
FAW	<i>Spodoptera frugiperda</i> (SFR) (Fall armyworm (FAW))	NALC	National Agency for Locust Control
Fledgling	immature adult locust /grasshopper that has pretty much the same phenology as mature	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, etc.)

SAL South American (*Locust Schistocerca cancellata*)

SARCOF Southern Africa Region Climate Outlook Forum

SGR *Schistoseca gregaria* (the Desert Locust)

SSD Republic of South Sudan

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

SWAC Southwest Asia DL Commission

PBB Pine Bark Beetle

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

TPQ Technical Program Quality 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

[USAID PM Guidelines](#)

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To learn more about our activities and programs, please, visit our PPM website:
[USAID/BHA PPM](#)

Additional resources on ETOPs

USAID/BHA Pest and Pesticide Monitoring and ETOP Bulletins: [USAID/BHA PPM](#)

USAID/BHA Archived ETOP Bulletins
[Archived ETOP Bulletins](#)

USAID Pest Management Guidelines
[USAID PM Guidelines](#)

[US EPA IPM](#)

SGR:

UN/FAO Desert Locust (SGR) Watch [FAO Desert Locust Watch](#)

FAO Locust Hub [SGR HUB](#)

FAO Locust Emergency Appeal for Greater Horn of Africa and Yemen [SGR Appeal for GHA and Yemen](#)

FAO Desert Locust Crisis [SGR Crisis](#)

The Desert Locust Control Organization for Eastern Africa [DLCO-EA](#)

FAO/Central Region Commission for the SGR Control [SGR CRC](#)

FAO/Western Region Commission for SGR Control [SGR CLCPRO](#)

FAO SGR Response Overview Dashboard [FAO SGR Dashboard](#)

IGAD Climate Prediction and Application Centres [ICPAC Climate SGR](#)

CCA Locusts:

FAO Locust Watch – Caucasus and Central Asia [CAC Locust Watch](#)

USAID/BHA supports for locust operations in the CCA Region [BHA CCA Locust Support](#)

FAW:

USAID FtF FAW [USAID FAW](#)

CABI on Invasive species [Invasive Species Compendium](#)

USAID FAW PEA/PERSUAP [FAW PERSUAP](#)

FAO FAW Monitoring and Early warning System [FAW EW&M](#)

FAO-USAID Global Action for FAW Control webinars [GAFC](#)

FAO NURU FAW Application [Nuru the talking app for FAW](#)

[CABI on FAW](#)

FAW management animation SAWBO [FAW Management Animation](#)

AAW:

[Armyworm](#)

Famine Early Warning System Network [FEWS NET](#)

NOAA Climate Prediction Center [NOAA CPC](#)