

**Emergency Transboundary Outbreak Pest (ETOP) Situation Bulletin for
December 2021 with a forecast through mid-February 2022**
résumé en français est inclus

SUMMARY

The **Desert Locust** (*Schistoseca gregaria* - **SGR**¹): In the central outbreak region (COR), hopper bands were controlled on 24,356 ha in northeast Somalia where fledging that started at mid-month produced several small immature swarms. A few immature and mature swarms were present and controlled on 1,956 ha in southern Ethiopia. Control operations and below normal rainfall reduced further development the SGR in Somalia and Ethiopia during early December. Adult groups were controlled on 1,550 in the interior of Sudan where escapee adults moved to the Red Sea coast and formed scattered mature adults on the coastal areas in northeast. Localized breeding continues in southeast Egypt where adults were treated on 6 ha. Isolated adults were detected on the Red Sea coast in Eritrea. Scattered adults began breeding on small-scale on the Red Sea coast of Yemen. In the western outbreak region (WOR) scattered hoppers and adults from local breeding in Niger were reported. No SGR was reported in the eastern outbreak region (EOR) during this month.

Forecast: In COR, a few small immature swarms are likely to migrate from northeast Somalia to southern Ethiopia and northern Kenya in January and some swarms could also reach southern Somalia. The swarms are not expected to mature and breed until the long rains start around April. Undetected breeding from summer-bred mature swarms from Somalia may have occurred during December near the Ethiopia/Kenya border. Small-scale breeding will occur but may be limited by poor rains in coastal areas along both sides of the Red Sea in southeast Egypt, Sudan, Eritrea, Yemen, and Saudi Arabia, and on both sides of the Gulf of Aden. WOR will likely remain calm during the forecast period. Isolated adults may appear in spring breeding areas in EOR in Iran and Pakistan in February, but significant developments are not likely during the forecast period.

Red (Nomadic) Locust (*Nomadacris septemfasciata*) (**NSE**): NSE situation remained relatively calm during December. However, as breeding conditions are improving, hopper bands are expected to form in Lake Chilwa/Lake Chiuta and Mpatsanjoka Dambo plains in Malawi; in Ikuu-Katavi, Malagarasi, Rukwa plains and Bahi Valley in Tanzania; Kafue Flats in Zambia; and Buzi-Gorongosa and Dimba plains in Mozambique.

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

African Migratory Locust: *Locusta migratoria migratorioides (LMI)*: Isolated populations of LMI persisted in Simalaha Plains in Western Province in Zambia.

Malagasy locust (*Locust migratoria capito* – LMC): Aerial survey and control operations have begun in the Ihosy region where 4th and 5th instar hoppers and young adults are in the solitarious-transient phase.

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

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

South American Locust, *Schistocerca cancellata (SCA)*: 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 are expected to have remained calm in the CCA regions.

Fall Armyworm (*Spodoptera frugiperda*, J. E. Smith) (FAW): Low to moderate FAW infestations were reported affecting young maize in Malawi, Mashonaland Province of Zimbabwe, and Kisii County in Kenya. Control operations were carried out by the affected farmers with assistance from the Ministries of Agriculture. No reports were received elsewhere, but mild to high-level infestations are expected to have occurred across invaded regions.

African Armyworm (AAW) (*Spodoptera exempta*): AAW outbreaks were not reported during this month.

Quelea spp. (QSP): QSP outbreaks were reported in Laikipia County in Kenya, in Midland Province in Zimbabwe and in Kilimanjaro Region in Tanzania where control operations were under preparation at the time this bulletin was compiled.

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. **End summary**

RÉSUMÉ

La situation du Criquet pèlerin (*Schistoseca gregaria* - SGR): Dans la région centrale de la résurgence (COR), des bandes larvaires ont été maîtrisées sur 24 356 ha dans le nord-est de la Somalie, où la mue imaginale qui a commencé à la mi-mois a produit plusieurs petits essaims immatures. Quelques essaims immatures et matures étaient présents et maîtrisés sur 1 956 ha dans le sud de l'Éthiopie. Les opérations de lutte et les précipitations inférieures à la normale ont réduit le développement ultérieur de la SGR en Somalie et en Éthiopie début décembre. Des groupes d'ailés ont été contrôlés sur 1 550 dans l'intérieur du Soudan où des ailés évadés se sont déplacés vers la côte de la mer Rouge et ont formé des ailés matures épars sur les zones côtières du nord-est. Une reproduction localisée se poursuit dans le sud-est de l'Égypte où des ailés ont été traités sur 6 ha. Des ailés isolés ont été détectés sur la côte de la mer Rouge en Érythrée. Des ailés épars ont commencé à se reproduire à petite échelle sur la côte de la mer Rouge au Yémen. Dans la région ouest de la résurgence (WOR), des larves éparses et des ailés provenant d'une reproduction locale au Niger ont été signalés. Aucune SGR n'a été signalée dans la région épidémique de l'est (EOR) au cours de ce mois.

Prévisions: Dans le COR, quelques petits essaims immatures vont probablement migrer du nord-est de la Somalie vers le sud de l'Éthiopie et le nord du Kenya en janvier et certains essaims pourraient également atteindre le sud de la Somalie. Les essaims ne devraient pas arriver à maturité et se reproduire avant le début des longues pluies vers avril. Une reproduction non détectée à partir d'essaims matures reproduits en été en provenance de Somalie peut avoir eu lieu en décembre près de la frontière entre l'Éthiopie et le Kenya. Une reproduction à petite échelle aura lieu mais pourra être limitée par de faibles pluies dans les zones côtières le long des deux rives de la mer Rouge dans le sud-est de l'Égypte, du Soudan, de l'Érythrée, du Yémen et de l'Arabie saoudite, et des deux côtés du golfe d'Aden. WOR restera probablement calme pendant la période de prévision. Des ailés isolés peuvent apparaître dans les zones de reproduction printanière de l'EOR en Iran et au Pakistan en février, mais des développements significatifs ne sont pas probables au cours de la période de prévision.

Criquet nomade (*Nomadacris septemfasciata*) (NSE): la situation en matière de NSE est restée relativement calme en décembre. Cependant, à mesure que les conditions de reproduction s'améliorent, des bandes larvaires devraient se former dans les plaines du lac Chilwa/lac Chiuta et de Mpatsanjoka Dambo au Malawi; à Ikuu-Katavi, Malagarasi, les plaines de Rukwa et la vallée de Bahi en Tanzanie; Appartements Kafue en Zambie; et les plaines de Buzi-Gorongosa et Dimba au Mozambique

Criquet migrateur africain: *Locusta migratoria migratorioides* (LMI): Une population isolée de LMI a persisté dans les plaines de Simalaha, dans la province occidentale de la Zambie.

Criquet migrateur capito, (LMI-C): Des prospections aériennes et des opérations de lutte ont commencé dans la région d'Ihoso où se trouvaient des larves des 4e et 5e stades et de jeunes ailés en phase solitaire-transitoire.

Le criquet arborial, *Anacridium spp*: (ASP): Aucune activité de l'ASP n'a été signalée au cours de ce mois.

Criquet Amérique centrale (CAL): Aucune mise à jour n'a été reçue au moment de la rédaction de ce bulletin.

Criquet d'Amérique du Sud, *Schistocerca cancellata* (SCA/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 du DMA, du CIT et du LMI devraient avoir pris fin dans les régions du CCA.

Chenille Légionnaire d'automne (*Spodoptera frugiperda*, J. E. Smith) (FAW): Des infestations légères à modérées de FAW ont été signalées affectant le jeune maïs au Malawi, dans la province du Mashonaland au Zimbabwe et dans le comté de Kisii au Kenya. Les opérations de lutte ont été menées par les agriculteurs touchés avec l'aide des Ministères de l'Agriculture. Aucun rapport n'a été reçu d'autres pays, mais des infestations légères à élevées devraient se produire ailleurs dans les régions touchées.

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

***Quelea spp. oiseaux* (QSP):** Des foyers de QSP ont été signalés dans le comté de Laikipia au Kenya, dans la province de Midland au Zimbabwe et dans la région du Kilimandjaro en Tanzanie où des opérations de lutte étaient en préparation au moment de la rédaction de ce bulletin.

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. 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

Ecological conditions continued to dry out in the Horn of Africa, and the interior of Sudan and Yemen due to scarcity of rainfall. Light showers may have occurred near the Sudan/Egypt border and on the central coast of Saudi Arabia between Jeddah and Masturah at mid-month. Annual vegetation was green in some coastal and subcoastal areas of southeast Egypt between Sudan border and El Sheikh El Shazly, from Port Sudan to Eritrea coasts and near Akbanazouf Plain, as well as on the coast of Saudi Arabia near Jizan, Qunfi dah, and Masturah, and Yemen from Zabid to Suq Abs where precipitation may have occurred. A few places in northwest coast of Somalia are also experiencing vegetation greening.

In WOR, limited rains fell in a few places and light showers occurred in Dakhlet, western Inchiri and Nouadhibou in northwest Mauritania during the 2nd. A few favorable places were detected near irrigated areas in the Adrar Valley in central Sahara, west of Tamanrasset in the south, In Guezzam and near Niger

border in Algeria, but generally ecological conditions remained unfavorable to sustain locusts in the region.

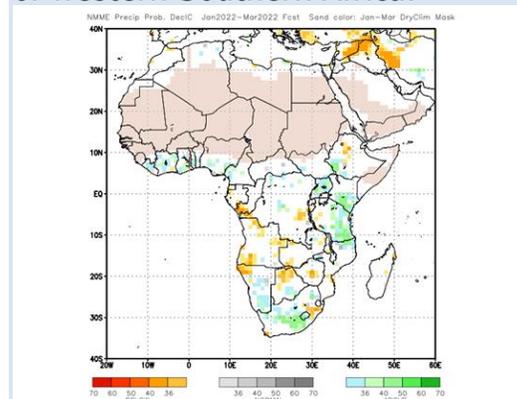
In EOR, dry and unfavorable conditions persisted during December.

In the NSE region, rain fall and regeneration of vegetation improved conditions for ETOPs to develop.

CCA Region: In the CC region, unfavorable weather condition continued during December.

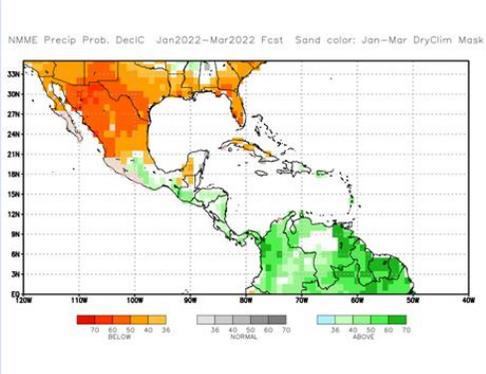
Weather forecast through January to March 2022 (NOAA, 12/21)

The forecasts call for a slight to tilt in the odds to favor above-average rainfall over local areas in the Greater Horn of Africa during the NH winter 2022. There is also a slight to moderate tilt in the odds to favor above-average rainfall over portions of western Southern Africa.

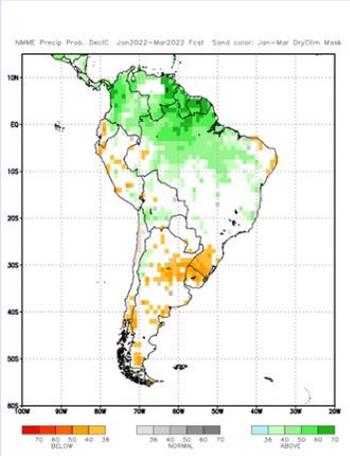


There is a slight to moderate tilt in the odds to favor below-average rainfall over Mexico and parts of the Caribbean in

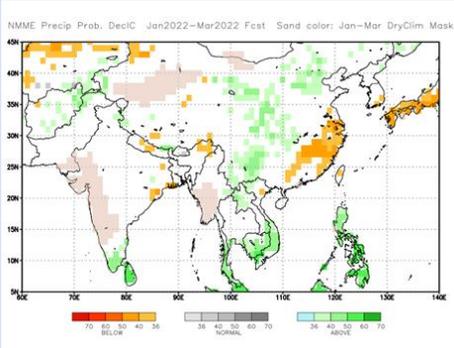
Central America.



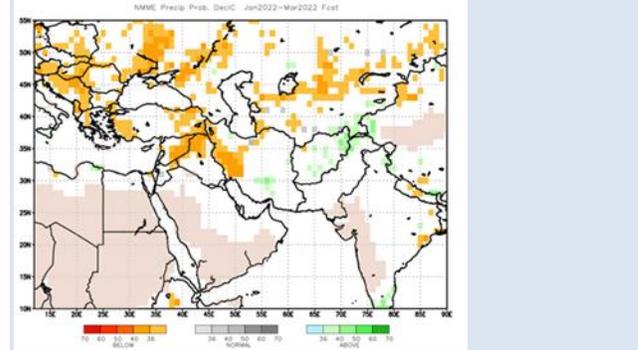
The forecasts call for a moderate tilt in the odds to favor above-average rainfall over northern South America.



There is a slight to moderate tilt in the odds to favor above-average rainfall over Southeast Asia.



There is a moderate tilt in the odds to favor-below-average rainfall over much of southern Kazakhstan during the spring of 2022.

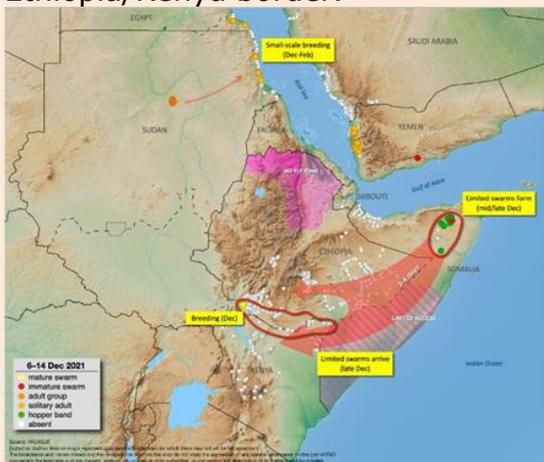


ETOP proliferation vis-a-vis climate factors

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 proliferation causing additional stresses to food security and livelihoods of the most 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 in 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

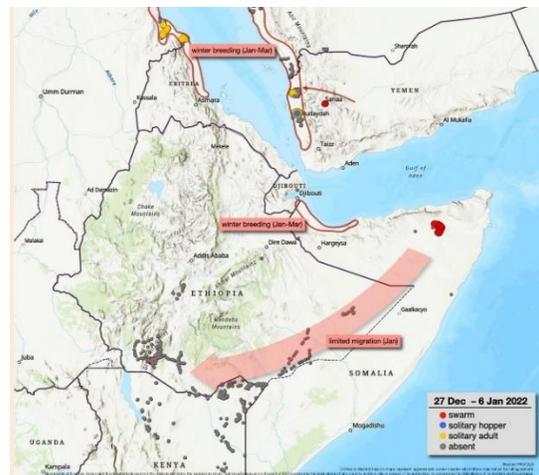
The **Desert Locust** (*Schistoseca gregaria* - **SGR**²): In COR, control operations treated late instar hopper bands on 24,356 ha in northeast Somalia where fledging that started in mid-month gave rise to several small immature swarms. A few immature and mature swarms from Somalia were controlled on 1,956 ha in (southern) Ethiopia. Undetected breeding by summer-bred mature swarms may have occurred during December near the Ethiopia/Kenya border.



SGR situation and forecast 12/21 (FAO-DLIS)

Control operations treated adult groups in 1,550 in the interior of Sudan in areas from where escapee adults moved to the Red Sea coast in the northeast and formed mature groups. Local breeding continued in southeast Egypt where adults were treated on 6 ha. Isolated adults were reported on the Red Sea coast in Eritrea, but significant development is not predicted. Small-scale breeding began on the Red Sea coast of Yemen.

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



Current situation and forecast (FAO, 1/22)

Forecast: In COR, a few small immature swarms are likely to migrate from northeast Somalia to southern Ethiopia and northern Kenya in January; some swarms could also reach southern Somalia. The swarms will likely mature and begin breeding at the foothills of the long rains sometime in April. In coastal areas along both sides of the Red Sea in southeast Egypt, Sudan, Eritrea, Yemen, and Saudi Arabia, and on both sides of the Gulf of Aden will likely experience small-scale breeding due to poor rains.

SGR – WOR: Ecological conditions remained unfavorable across WOR and only scattered hoppers and adults were observed from local breeding in Niger.

Forecast: In WOR the situation will likely remain generally calm during the forecast period.

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

Forecast: In EOR, isolated adults may appear in spring breeding areas in southeast Iran and southwest Pakistan in

February, but significant developments are not likely during the forecast period.

NOTE: *Though at an early stage, innovative technologies, such as drones, for high-resolution images in remote sensing are being explored. On trial bases, use of drones for locust monitoring, and limited control in localized and sensitive and hard to reach areas showed promising results. While the range of agricultural oriented drones may be limited for large-area pest control purposes, such as 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 sourcing and cloud sourcing for data collection, sharing, etc. are another effort that can be of value to ETOP operations. Dynamic population modeling and biotope modeling, from CIRAD and ICIPE, respectively, and accounting for associated parameters such as soil moisture, vegetation, etc. will likely contribute to better understand ETOP – DL phenology, ecology, habitat range, etc. **End note.***

Red (Nomadic) Locust (NSE): NSE situation remained relatively calm during the month. However, as breeding conditions are improving, hopper bands are expected to form in the primary outbreak areas in Lake Chilwa/Lake Chiuta and Mpatsanjoka Dambo plains in Malawi. A similar situation is likely occurred in Ikuu-Katavi, Malagarasi, Rukwa plains and Bahi Valley in Tanzania; Kafue Flats in Zambia; and Buzi-Gorongosa and Dimba plains in Mozambique as well.

Forecast: Low to medium size NSE hopper bands are likely to form in the

outbreak areas where significant residual parental populations persisted in Ikuu-Katavi, Rukwa plains, Wembere plains and Malagarasi Basin in Tanzania; Buzi and Dimba plains in Mozambique; and Lake Chilwa/Lake Chiuta plains in Malawi and the Kafue Flats in Zambia prior to the seasonal rains.

African Migratory Locust (LMI):

Isolated population of LMI persisted in Simalaha Plains in Western Province of Zambia, but additional info was not available at the time the Bulletin was compiled.

Forecast: LMI outbreak is likely in Southern and Western Provinces of Zambia. Surveillance and timely reporting on the presence of LMI remain critical to abate any major crop/pasture damage.

Malagasy locust (Locust migratoria capito – LMIC): *The Malagasy Migratory campaign is underway. FAO contracted helicopter arrived in Madagascar on 1 December 2021 and is being deployed to Tulear (south of Madagascar) to support survey operations. Another helicopter will be deployed in January for control operations. FAO locust expert is supporting campaign coordination and field raining on locust survey and management, and spraying techniques maintenance and safety measures. Aerial survey and control operations have begun in the Ihosy region where 4th and 5th instar hoppers and young adults in the solitarious-transient phase have been. It is to be recalled that in anticipation of the next breeding cycle that will follow the beginning of the seasonal rains from October 2021, and at the request of MoA/Madagascar, FAO-ECLO has prepared a joint action plan for the next campaign. The action plan focuses on*

four key components - 1. *Improve monitoring capacity and analysis of the locust situation*, 2. *Strengthen locust control capacity*, 3. *Protect human health safety and the environment as well as* 4. *coordinate and assess the action plan*. Resources have been pledged by the Government of Germany to support the proposed action plan. BHA/TPQ and the Geo team will continue monitoring the situation in collaboration with field staff and provide updates advice as often as necessary.

Forecast: Locusts will continue developing in the primary outbreak areas and will continue requiring control operations in the coming months.

Active surveillance, monitoring, preparedness and timely preventive and curative interventions are critical to avert significant locust developments and the potential threat they pose to food security and livelihoods of vulnerable communities (BHA/TPQ).

Central American Locust - *Schistocerca piceifrons* (SPI/CAL):

SPI (CAL): No update was received at the time this bulletin was compiled.

Forecast: Significant CAL populations are not predicted during the forecast period.

[**Note:** *CAL is a pest of economic importance in Mexico and in CA in general 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* (SCA) (a.k.a. Flying lobster):
No update was received at the time this bulletin was compiled.

<https://www.voanews.com/americas/argentina-battles-locust-plague-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, locust activities are expected to have remained calm in CCA regions.

Forecast: Locust activities will remain inactive during the forecast period.

Fall armyworm (FAW): Mild infestation of FAW were reported along lakeshore and Blantyre Agriculture development Division (ADD) in Malawi. The pest was reported attacking young maize. Mild infestation of FAW was also reported in Mbire district of Mashonaland Province in Zimbabwe. In Kenya FAW was reported in Kisii County where 8,000ha of nearly tasseling maize crop was affected. The affected farmers carried out control with technical and material support from Ministry of Agriculture. FAW infestations were also likely to have caused mild damage to young maize in Zambia, Tanzania, and Mozambique.

Forecast: FAW is likely to continue affecting rain-fed and/or irrigated maize and other cereal crops across sub-Saharan Africa, Asia, and elsewhere during the forecast period.

Active monitoring, surveillance, reporting, and timely control interventions remain critical to prevent any major damage to crops that can severely affect food security and economic well-being of resource challenged peoples and communities across FAW prone countries.

NOTE: The Food and Agriculture Organization of the United Nations (FAO)

engaged in a transformative, coordinated Global Action for Fall Armyworm Control (GAFC). With an estimated total budget of USD 500 million (USD 450 million for the Global Action and USD 50 million for Global Coordination), GAFC is planned to be implemented in 65 [target] countries across Africa, Near East and Asia-Pacific from 2020 to 2022.

The GAFC is a pioneering initiative that aims to take radical, direct, and coordinated measures to fight FAW at a global level with the 3 key objectives to:

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 with various partners on intervention projects to benefit small-scale farming communities in affected countries with the intention to scale-up gains across different FAW prone regions and 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, CGIARs, FAO, national partners, 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 (AAW): There were no reports of AAW outbreaks during this month. Only a few moth catches were recorded in Mashonaland Central (Mbire, Mushumbi and Mazowe) and West (Chegulu) Provinces of Zimbabwe.

Forecast: Significant AAW appearance is unlikely during the forecast period

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 outbreaks were reported in Kilimanjaro Region (Moshi rural, Mwanga Districts) in Tanzania where the pest was threatening irrigated rice crops and in Midlands Province in Zimbabwe and Laikipia County in Kenya. Control operations were expected to have been underway in affected countries.

Forecast: QSP outbreaks are likely to continue being a problem to small grain cereal growers across different regions.

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 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.*

NOTE: *Acute food insecurity hotspots outlook – the below map shows several countries and regions that are exposed to and/or are food insecure and vulnerable to ETOP invasions, including locusts, FAW and several other stressors, such as drought, COVID pandemic, flooding, conflicts, etc. (Map source: FAO-WFP, August to November 2021 prediction).*

END NOTE

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 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 will continue its support through a DRR project to strengthen national and regional capacity of the Caucasus and Central Asia (CCA) countries that are constantly affected by three major locust species – Moroccan locust, Italia locust and the Migratory locust. These locusts affect food security and livelihoods of more than 25 million people across CCA regions.

USAID/BHA/TPQ continues with its efforts and supports for applied/operational 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.

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. 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 December, aerial and ground operations treated 27,868 ha in total (6 ha in Egypt, 1,956 ha in Ethiopia, 24,356 ha in Somalia and 1,550 ha in Sudan), less than 10,651 ha than areas treated during November

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	110,543~
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	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

^{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)*
 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*
 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 Pèlerin dans la Région Occidentale (Commission for the*

Desert Locust Control in the Western Region)
 CNLA(A) *Centre National de Lutte Antiacridienne (National Locust Control Center)*
 COR *Central SGR Outbreak Region*
 CPD *Crop Protection Division*
 CRC *Commission for Controlling Desert Locust in the Central Region*
 CTE *Chortoicetes terminifera (Australian plague locust)*
 DDLC *Department of Desert Locust Control*
 DLCO-EA *Desert Locust Control Organization for Eastern Africa*
 DLMCC *Desert Locust Monitoring and Control Center, Yemen*
 DMA *Dociostaurus maroccanus (Moroccan Locust)*
 DPPQS *Department of Plant Protection and Quarantine Services, India*
 DPV *Département Protection des Végétaux (Department of Plant Protection)*
 ELO *EMPRES Liaison Officers –*
 EMPRES *Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases*
 EOR *Eastern SGR Outbreak Region*
 ETOP *Emergency Transboundary Outbreak Pest*
 Fledgling *immature adult locust /grasshopper that has pretty much the same phenology as mature adults, but lacks fully developed reproductive organs to breed*
 GM *GreenMuscle® (a fungal-based biopesticide); NOVACRID, Green Guard*
 ha *hectare (= 10,000 sq. meters, about 2.471 acres)*
 ICAPC *IGAD’s Climate Prediction and Application Center*
 IGAD *Intergovernmental Authority on Development (Horn of Africa)*
 IRIN *Integrated Regional*

<i>Information Networks</i>	<i>PPSD Plant Protection Services</i>
<i>IRLCO-CSA International Red Locust</i>	<i>Division/Department</i>
<i>Control Organization for Central</i>	<i>PRRSN Pesticide Risk Reduction</i>
<i>and Southern Africa</i>	<i>through Stewardship Network</i>
<i>ITCZ Inter-Tropical Convergence Zone</i>	<i>QSP Quelea species (Red Billed Quelea</i>
<i>ITF Inter-Tropical Convergence Front =</i>	<i>bird)</i>
<i>ITCZ)</i>	<i>SARCOF Southern Africa Region</i>
<i>FAO-DLIS Food and Agriculture</i>	<i>Climate Outlook Forum</i>
<i>Organizations' Desert Locust</i>	<i>SCA Schistocerca cancellata (South</i>
<i>Information Service</i>	<i>American Locust)</i>
<i>Hoppers young, wingless</i>	<i>SFR Spodoptera frugiperda (SFR) (Fall</i>
<i>locusts/grasshoppers (Latin</i>	<i>armyworm (FAW))</i>
<i>synonym = nymphs or larvae)</i>	<i>SGR Schistoseca gregaria (the Desert</i>
<i>JTWC Joint Typhoon Warning Center</i>	<i>Locust)</i>
<i>Kg Kilogram (~2.2 pound)</i>	<i>SPI Schistocerca piceifrons piceiferons</i>
<i>L Liter (1.057 Quarts or 0.264 gallon</i>	<i>(Central American Locust)</i>
<i>or 33.814 US fluid ounces)</i>	<i>SSD Republic of South Sudan</i>
<i>LCC Locust Control Center, Oman</i>	<i>SPB Southern Pine Beetle</i>
<i>LMC Locusta migratoriacapito (Malagasy</i>	<i>(Dendroctonus frontalis) – true</i>
<i>locust)</i>	<i>weevils</i>
<i>LMI Locusta migratoria migratorioides</i>	<i>SWAC Southwest Asia DL Commission</i>
<i>(African Migratory Locust)</i>	<i>PBB Pine Bark Beetle</i>
<i>LPA Locustana pardalina</i>	<i>PSPM Preparedness, Strategic Planning</i>
<i>MoAFSC Ministry of Agriculture, Food</i>	<i>and Mitigation (formerly known as</i>
<i>Security and Cooperatives</i>	<i>Technical Assistance Group - TAG)</i>
<i>MoAI Ministry of Agriculture and</i>	<i>TPQ Technical Program and Quality</i>
<i>Irrigation</i>	<i>Triangulation The process whereby</i>
<i>MoARD Ministry of Agriculture and</i>	<i>pesticides are donated by a</i>
<i>Rural Development</i>	<i>country, with large inventories, but</i>
<i>NALC National Agency for Locust Control</i>	<i>often no immediate need, to a</i>
<i>NCDLC National Center for the</i>	<i>country with immediate need with</i>
<i>Desert Locust Control, Libya</i>	<i>the help of a third party in the</i>
<i>NOAA (US) National Oceanic and</i>	<i>negotiation and shipments, etc.</i>
<i>Aeronautic Administration</i>	<i>Usually, FAO plays the third-party</i>
<i>NPS National Park Services</i>	<i>role in the case of locust and other</i>
<i>NSD Republic of North Sudan</i>	<i>emergency pests.</i>
<i>NSE Nomadacris septemfasciata (Red</i>	<i>UF University of Florida</i>
<i>Locust)</i>	<i>USAID the Unites States Agency for</i>
<i>OFDA Office of U.S. Foreign Disaster</i>	<i>International Development</i>
<i>Assistance</i>	<i>UN the United Nations</i>
<i>PBB Pine Bark Beetle (Dendroctonus sp.</i>	<i>WOR Western SGR Outbreak Region</i>
<i>– true weevils</i>	<i>ZEL Zonocerus elegans, the elegant</i>
<i>PHD Plant Health Directorate</i>	<i>grasshopper</i>
<i>PHS Plant Health Services, MoA</i>	<i>ZVA Zonocerus variegatus, the</i>
<i>Tanzania</i>	<i>variegated grasshopper, is</i>
<i>PPD Plant Protection Department</i>	<i>emerging as a relatively new dry</i>
<i>PPM Pest and Pesticide Management</i>	<i>season pest, largely due to the</i>
	<i>destruction of its natural habitat</i>

through deforestation, land clearing, etc. for agricultural and other development efforts and due to climate anomalies

Point of Contact:

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

Additional resources on SGR and other ETOPs

SGR

USAID Pest Monitoring: [USAID/BHA PPM Web](#)

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>

UN/FAO Desert Locust Watch

<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%2

[0Desert%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/>

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

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/>

IGAD Climate Predication and Application Centres

<https://www.icpac.net/news/desert-locust-projection-october-2020/>

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/ag/locusts/en/activ/DLIS/eL3suite/index.html>

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

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

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

USAID FAW PEA/PERSUAP
<https://ecd.usaid.gov/repository/pdf/50065.pdf>

FAO FAW Monitoring and Early warning System
<http://www.fao.org/3/CA1089EN/ca1089en.pdf>

FAO-USAID Global Action for FAW Control webinars <http://www.fao.org/fall-armyworm/education/webinars/en/>

FAO NURU FAW Application
<http://www.fao.org/news/story/en/item/1141889/icode/>

<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>

FAW management animation SAWBO

[https://sawbo-animations.org/video.php?video="//www.youtube.com/embed/5rxlpXEK5g8](https://sawbo-animations.org/video.php?video=)

AAW
<http://www.armyworm.org/latest-armyworm-forecast-irlco-csa-oct-2018/>
FEWS NET
<https://fews.net/>

NOAA CPC
<https://www.cpc.ncep.noaa.gov/products/international/itf/itcz.shtml>