

**Global Emergency Transboundary Outbreak Pest (GETOP) Situation  
Bulletin for October with a forecast through mid-December 2023  
résumé end français est inclus**

**SUMMARY**

The **Desert Locust** (*Schistoseca gregaria* - **SGR**<sup>1</sup>): The SGR situation remained generally calm in most of the Central Outbreak Region (COR) during October and only limited control operations were conducted against hoppers and adults in Sudan (3,403 ha), Saudi Arabia (1,170 ha) and Yemen (2 ha). Some isolated adults were detected in southeastern Red Sea coast of Egypt and northwest Somalia. No locusts were reported in Djibouti, Eritrea, Ethiopia, or other COR countries during this month. Isolated scattered hoppers and adults were detected northern Mauritania, Niger, and Chad and a few isolated adults were observed in southern Algeria and the extreme south of Morocco in the Western Outbreak Region (WOR). No locusts were reported in the Easter Outbreak Region (EOR) in Afghanistan, India, Iran, or Pakistan during this month.

**Forecast:** In COR, locusts will continue moving from summer breeding areas in the interior of Sudan, Eritrea, Yemen, and Saudi Arabia to winter breeding areas in the Red Sea coast and Gulf of Aden where El Nini induced above normal and heavy rains resulted in favorable ecological conditions (increased soil moisture and vegetation) allow continued locust breeding well into early 2024. In WOR, low numbers of hoppers and adults will likely remain in northwest and northern Mauritania and parts of southern Morocco and decline in Niger and Chad where vegetation will continue drying during the forecast period. In EOR, significant SGR development is unlikely during the forecast period. *SGR presence and developments can be abated through coordinated and well planned surveillance and preventive interventions - by the N-PPD, and regional organizations provided adequate resources are made available by host authorities coupled with deterrence of anthropogenic anomalies (e.g., conflicts, security incidences, road and runway blockage, delayed resource release, asset diversions, etc.).*

**Red (Nomadic) Locust** (*Nomadacris septemfasciata*) (NSE): Concentrations of various density NSE persisted in the primary outbreak areas in Malawi, Tanzania, Zambia and Mozambique.

**African Migratory Locust** (*Locusta migratoria migratorioides*) (LMI - AML): Low-density populations of AML persisted in Western Province of Zambia.

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<sup>1</sup> Definitions of all acronyms and useful weblinks can be found on the last few pages of the bulletin.

**Malagasy locust** (*Locust migrator capito*) (LMC): No update was received during this month and locust activities are not expected.

**Tree locusts**, *Anacridiums spp.* (ASP): There was a report of a suspected ASP outbreak in Tanzania (Mpwapwa district) and control operations were launched by Tanzania Plant Health and Pesticide Authority.

**Central American Locust**, *Schistocerca piceiferons* (CAL): No update was received, however should precipitation improve, CAL population will likely increase in northeast Mexico, western Guatemala (bordering El Salvador).

**South American Locust**, *Schistocerca cancellata* (SAL): No locusts were reported, and the situation remained calm.

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

**Fall Armyworm** (*Spodoptera frugiperda*, J. E. Smith) (FAW): FAW infestations were reported in irrigated maize in Zimbabwe, Malawi and Mozambique and likely elsewhere where maize and other similar crops are present.

**African Armyworm** (*Spodoptera exempta*) (AAW): AAW infestations were not reported in all outbreak areas during this month.

**Quelea species** (QSP): QSP outbreaks were reported attacking rice in Morogoro Region, Tanzania and wheat in Mashonaland Central and Masvingo Provinces in Zimbabwe.

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

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

## **RÉSUMÉ EN FRANÇAIS**

**La situation du Criquet pèlerin (*Schistoseca gregaria* SGR):** La situation dans la SGR est restée globalement calme dans la majeure partie de la région épidémique centrale (COR) en octobre. Seules des opérations de lutte limitées ont été menées contre les larves et les ailés au Soudan (3 403 ha), en Arabie Saoudite (1 170 ha) et au Yémen (2 ha) au cours du mois. Peu d'ailés isolés ont été détectés sur la côte sud-est de la mer Rouge en Égypte et dans le nord-ouest de la Somalie. Aucun criquet n'a été signalé à Djibouti, en Érythrée, en Éthiopie ou dans d'autres pays du COR au cours de ce mois. Dans la Région épidémique occidentale (WOR), des larves et des ailés isolés et épars ont été détectés dans le nord de la Mauritanie, au Niger et au Tchad et quelques ailés isolés ont été observés dans le sud de l'Algérie et l'extrême sud du Maroc. Aucun criquet n'a été signalé en Afghanistan, en Inde, en Iran ou au Pakistan dans la région de l'épidémie de Pâques (EOR) au cours de ce mois.

**Prévisions:** Dans la région du COR, les criquets continueront de se déplacer des zones de reproduction estivale de l'intérieur du Soudan, de l'Érythrée, du Yémen et de l'Arabie Saoudite vers les zones de reproduction hivernale de la côte de la mer Rouge et du golfe d'Aden où les conditions écologiques sont favorables (augmentation de l'humidité du sol et régénération de la végétation). ) du phénomène El Nini, les fortes pluies supérieures à la normale permettent aux criquets de poursuivre leur reproduction jusqu'au début de 2024. Dans la région du WOR, de faibles effectifs de larves et d'ailés resteront probablement dans le nord-ouest et le nord de la Mauritanie et dans certaines parties du sud du Maroc, tandis qu'ils diminueront au Niger et au Tchad. où la végétation continuera à sécher pendant la période de prévision. Dans le domaine de l'EOR, un développement significatif est peu probable au cours de la période de prévision. La présence et les développements importants de SGR peuvent être atténués grâce à une surveillance et des interventions préventives coordonnées et bien planifiées par le N-PPD et les organisations régionales, à condition que des ressources adéquates soient mises à disposition par les autorités hôtes, associées à une dissuasion rapide des anomalies anthropiques (par exemple, conflits, incidents de sécurité, blocage des routes et des pistes, retard dans la libération des ressources, détournement d'actifs, etc.).

**Criquet nomade (*Nomadacris septemfasciata* - NSE):** des concentrations de NSE de différentes densités ont persisté dans les principales zones de résurgence au Malawi, en Tanzanie, en Zambie et au Mozambique.

**Criquet migrateur africain (AML/LMI):** migratorioides) (LMI – AML): Des populations de faible densité de AML ont persisté dans la province occidentale de la Zambie.

**Criquet migrateur capito, (LMC):** Aucune mise à jour n'a été reçue au cours de ce mois et des activités sont attendues.

**Le criquet arborial, *Anacridium spp*: (ASP):** Un foyer suspecté d'ASP a été signalé en Tanzanie (district de Mpwapwa) et des opérations de contrôle ont été lancées par l'Autorité tanzanienne de la santé des végétaux et des pesticides.

**Langosta Centroamericana, *Schistocerca piceiferons* (CAL) (Criquet Amérique centrale (CAL):** aucune mise à jour n'a été reçue, mais à mesure que les précipitations s'améliorent, la population de CAL augmentera probablement dans le nord-est du Mexique et l'ouest du Guatemala (à la frontière du Salvador).

**Criquet d'Amérique du Sud, *Schistocerca cancellata* (SAL):** Aucune mise à jour n'a été reçue, mais si les précipitations s'améliorent, la population de CAL augmentera probablement dans le nord-est du Mexique et l'ouest du Guatemala (à la frontière du Salvador).

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

**Chenille Légionnaire d'automne (*Spodoptera frugiperda*, J. E. Smith) (FAW):** des infestations de CLA ont été signalées dans du maïs irrigué au Zimbabwe, au Malawi et au Mozambique et probablement ailleurs où le maïs et d'autres cultures similaires sont présents.

**Chenille Légionnaire Africaine (*Spodoptera exempta*) (AAW):** Des infestations de chenille légionnaire africaine n'ont pas été signalées dans toutes les zones d'épidémie pendant cette période.

***Quelea specis oiseaux (QSP):*** des foyers de QSP ont été signalés, attaquant le riz dans la région de Morogoro, en Tanzanie, et le blé dans les provinces du Mashonaland Central et de Masvingo au Zimbabwe.

La surveillance active des ETOP, le suivi, le partage d'informations et l'exécution d'interventions préventives en temps opportun restent essentiels pour réduire les menaces que les GETOP font peser sur la sécurité alimentaire et les moyens de subsistance des personnes et des communautés vulnérables.

**USAID / BHA / TPQ** surveille régulièrement les GETOP en étroite collaboration avec son réseau mondial de PPD/DPV/PHS nationaux du MoA, les entités régionales et internationales de surveillance et de contrôle des ravageurs, la FAO,

la CLCPRO, le CRC, la DLCO-EA et l'IRLCO-CSA, les centres de recherche, le milieu universitaire, le secteur privé, la société civile, les ONG et autres, et compile et publie des bulletins analytiques mensuels GETOP (veuillez vous référer à la liste des acronymes sur les dernières pages). Fin du résumé

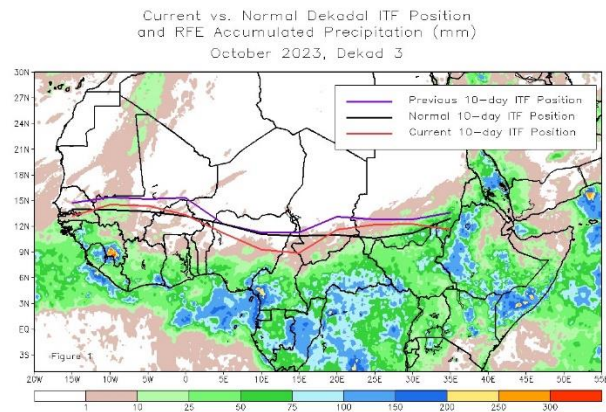
**Note:** All previous and current GETOP Bulletins can be accessed here: [USAID Pest and Pesticide Monitoring](#)

**Additional GETOP resources can be found on the last pages.**

**Weather and Ecological Conditions**

From 21-31 October, the Inter-tropical front (ITF) moved south relative to the previous position along its entire length. The western (10W-10E) portion of the ITF was located approximately at 12.5N, which was below the climatological position by 0.3 degrees. Also, at the eastern (20E-35E) portion, the ITF was approximated at 11.9N, which was above the long-term average position by 0.5 degrees. Figure 1 displays the current position of the ITF relative to the climatological position during the 3rd dekad of October and its previous position during the 2nd dekad of October.

Figure 1.



Figures 2 and 3 are time series, illustrating the latitudinal positions for the western and eastern portions of the ITF, respectively, and their seasonal

evolutions since the beginning of April 2023 (NOAA, 11/2023).

Figure 2.

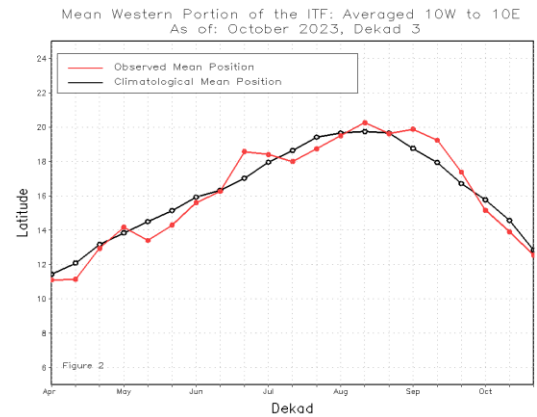
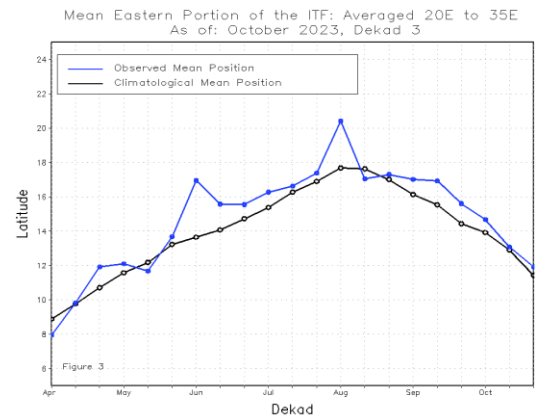


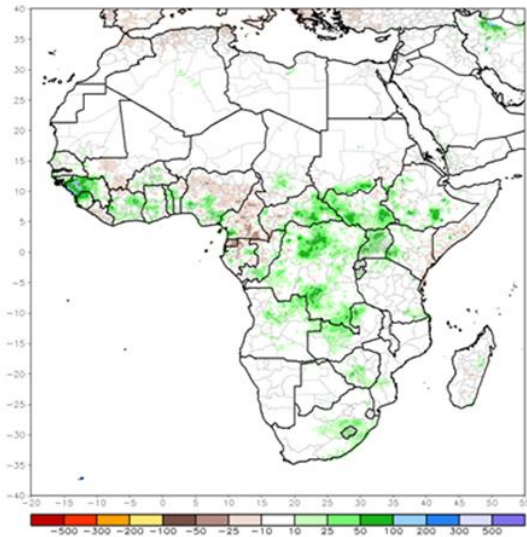
Figure 3.



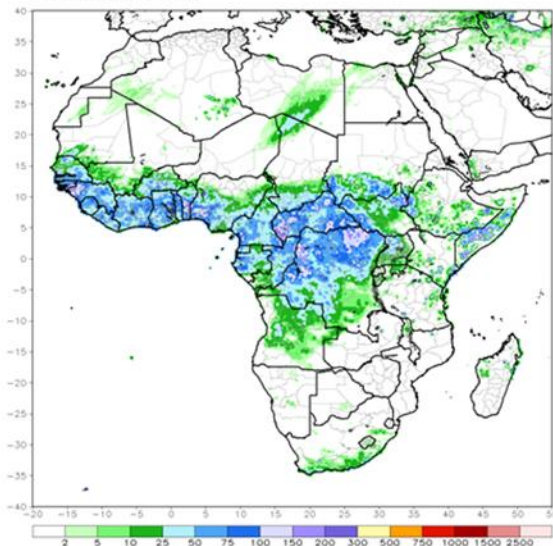
Most of the **NSE** regions received light - from 5 mm in Buzi plain, Mozambique - to moderate rain - 48.5 mm in Malagarasi, Tanzania and 43.2 mm in Kafue Flat, Zambia and in between in other NSE regions during this month.



RFE2 7-Day Total Rainfall Anomaly (mm)  
Period: 09Oct2023 - 15Oct2023



RFE2 7-Day Total Rainfall (mm)  
Period: 03Oct2023 - 09Oct2023



**CCA:** Moderate to heavy precipitation was observed over parts of eastern/central Kazakhstan. Light precipitation fell over eastern Kyrgyzstan parts of Tajikistan, northern Pakistan, and northwestern Iran. Some locations in East Kazakhstan and northern Karaganda provinces, as well as northern Pakistan received 25-50mm liquid equivalent which was 10-25 mm above average for the week. The 30-day precipitation product shows surpluses

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

of 10-50+ mm covering southwestern, northern, and eastern Kazakhstan.  
[https://www.cpc.ncep.noaa.gov/products/international/casia/casia\\_hazard.pdf](https://www.cpc.ncep.noaa.gov/products/international/casia/casia_hazard.pdf)

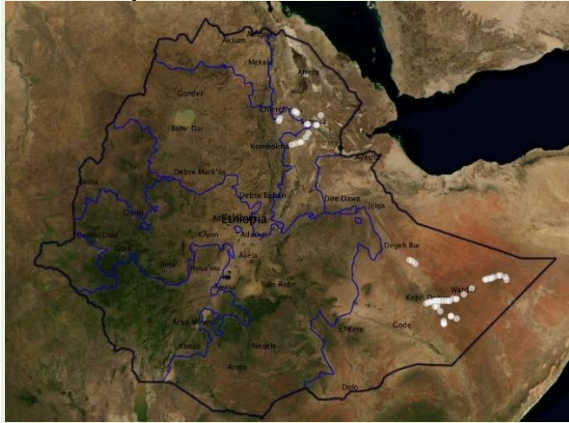
**Detailed Accounts of Monthly GETOP Situation and Forecast for the Next Six Weeks**

The **Desert Locust** (*Schistoseca gregaria* - **SGR<sup>2</sup>**): In COR, the SGR situation remained generally calm. In Sudan, survey operations continued in the Red Sea, River Nile, Kassala states. Ground control operations treated 3,403 ha against immature swarms, different instar hopper bands and groups in the River Nile and the Red Sea states as well as groups of immature and mature adults from south Sinkat to the borders of northwest Kassala state. Groups and scattered hoppers of the 2<sup>nd</sup> and 3<sup>rd</sup> instar hoppers were detected in Baiyuda Desert in the River Nile state, and scattered adults were observed breeding in the Toker Delta, Red Sea state. Scattered immature/mature adults were detected in several locations in the winter breeding areas on the Red Sea coast and subcoastal areas during surveys that covered 133,771 ha in October.

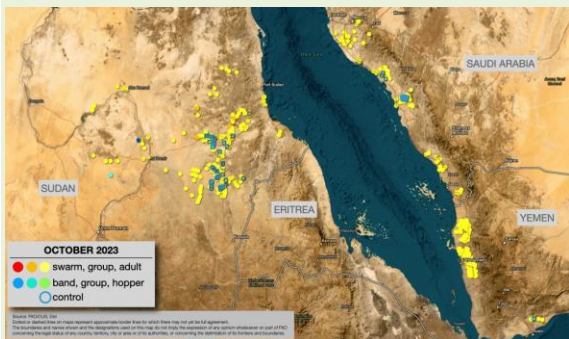
In Eritrea, vegetation was drying in summer breeding areas and no surveys were conducted and no locusts were reported during October. Vegetation is beginning to green and soil moisture is improving in winter breeding areas where moderate to heavy rain was recorded during the 2<sup>nd</sup> and 3<sup>rd</sup> dekads of the month.

In Ethiopia, survey operations continued in October and covered more than 23,940 ha. Annual vegetation is green, and soil is

wet in some locust breeding areas in Somali region that received light rain during the 2<sup>nd</sup> dekad of the month (see map below, MOA/PPDETHIOPIA, 10/2023).

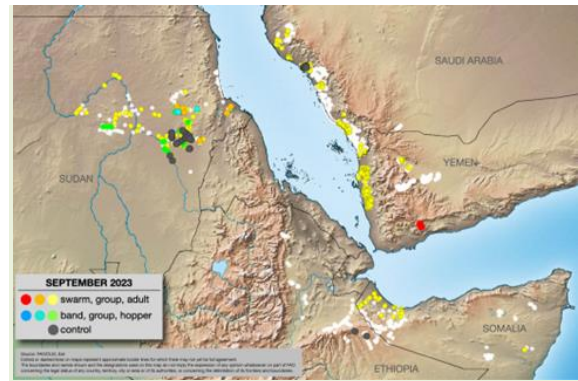


PPD/ETHIOPIA (11/2023)



FAO, 11/2023

In Yemen, surveys covered winter breeding areas on the Red Sea coastal plains in Sana'a and in Gulf of Aden during October. Of the 107,680 ha that were surveyed, locusts were detected in 332 locations and control operations treated just 2 ha during this time. Vegetation is green and soil is wet in the wadis and dunes in most surveyed areas.



FAO, 10/2023

*NOTE: El Nino induced above average rainfall is recorded in locust breeding countries and likely to continue over the coming months; heavy rains from the tropical cyclone Tej that recently made a landfall in Yemen brought above normal precipitation in Yemen and Oman and parts of Saudi Arabia - conditions likely to contribute to a potentially dangerous locust breeding. Taking these into account, is planning a precautionary action. Considering this, the Locust Control Commission for the Central region (FAO/CRC) - the Red Sea, the Horn of Africa, and Middle East regions - has called for a high-level regional meeting to discuss the locust situation and actions to consider in the coming months. The meeting is scheduled for 29-30 November 2023 to be held in Cairo, Egypt. END NOTE.*

*NOTE: Some frontline countries have expressed a concern that limited resources and the ongoing security situation could hinder timely surveillance and control, a situation that could lead to invasions and outbreaks exacerbated by the above normal precipitation in the forecast. If unabated, the situation could mimic the 2018/19 locust invasion that began in Sudan and spread to neighboring countries and required massive campaign to control the locusts that could have otherwise severely impacted food security and livelihoods of*

millions of people across multiple regions.  
**END NOTE.**

*Active surveillance and timely preventive interventions remain critical to avert a possibility for a repeat of the 2019-2022.*

**SGR – WOR:** In WOR, the SGR situation remained generally calm during this month.

In Algeria, a few solitary adult locusts were detected in Hoggar and agricultural areas and the extreme south where annual vegetation is green.

In Niger two survey teams that were deployed in Tamesna and Air reported a few isolated solitary mature and immature adults and 3<sup>rd</sup> to 5<sup>th</sup> instar hoppers in a few places. Ecological conditions to sustain SGR are limited to a few places in the summer breeding and gregarization areas.

In Chad, the SGR situation remained generally calm in areas that were surveyed and only isolated low density solitary adults and hoppers were observed in Fada, Mao, Kalait, Bahai and east of Salal.

In Mali, ecological conditions for the survival and reproduction of the SGR are limited to the primary outbreak areas. However, no locusts were reported, and the situation remained calm throughout the month.

In Mauritania isolated and scattered hoppers and adults were reported in the northern Sahel areas.

In Morocco, favorable ecological conditions are limited to a few places in the extreme south of the country where a few maturing, solitary and isolated adults were observed during this month.

No locusts were reported in Burkina Faso, Libya, Senegal, or Tunisia, during this month.

**Forecast:** In WOR, only low numbers of hoppers and adults may persist in northwest and northern Mauritania and parts of southern Morocco but will decline in Niger and Chad as vegetation continues drying up. Algeria, Burkina Faso, Libya, Senegal, and Tunisia will remain calm during the forecast period.

**SGR - EOR:** No locusts were present during this month.

**Forecast:** Significant developments are unlikely during the forecast period.

**Red (Nomadic) Locust (NSE):** NSE concentrations of different densities will persist in Lake Chilwa/Lake Chiuta plains, Mpatsanjoka Dambo in Malawi, Buzi Gorongosa, Dimba plains in Mozambique, Kafue Flats, in Zambia, Iku-Katavi plains, Wembere plain, Bahi Valley, Malagarasi Basin, Rukwa valley in Tanzania, during the forecast period.

**Forecast:** Hatching and hopper formation is expected to start from December on at the foothills of moderate to light rains in Lake Chilwa/Lake Chiuta plains in Malawi, Buzi Gorongosa plains and Dimba plains in Mozambique, Kafue Flats in Zambia and Iku Katavi plains, Malagarasi Basin, Lake Rukwa Valley and Bahi Valley in Tanzania. With the presence of significant parental populations in most of the outbreak areas, hoppers and bands are likely to form during January/February 2024.

*Resources remain critical to undertake timely surveillance and monitoring and launch preventive interventions to curtail the development of significant locust*



populations that could cause severe damage to crop and pasture.

**African Migratory Locust (AML - LMI):** Low density AML populations (1-3 locusts/m<sup>2</sup>) persisted in Simalaha plains in Zambia. Monitoring and surveillance remain critical to abate any threats the pest could pose.

**Malagasy locust (Locust migratoria capito - LMC):** LMC activities were not reported during this month.

**Tree locust - Anacridium wernerellum - AWE:** An outbreak of a tree locust species (AWE) was reported in Mpwapwa district in Tanzania where the pest was detected attacking Acacia and Mango trees and Sorghum crop on an estimated area of 178 ha. The national Plant Health and Pesticide authority sprayed fenitrothion 96% with motorized sprayers. Regular monitoring and surveillance remain critical to abate any threats the pest poses.

**Central American Locust - Schistocerca piceifrons (CAL):** No update was received, however as precipitation improves, CAL population will likely increase in areas where favorable ecological conditions exist northeast Mexico, western Guatemala (bordering El Salvador).

[**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 CA region, 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, and several species

of fruit trees (Pech, CESVY-SENASICA, Mexico)

**South American Locust, Schistocerca cancellata (SAL) (a.k.a. Flying lobster):** SAL was not reported during this month.

**Italian (CIT), Moroccan (DMA) and Migratory (LMI) DMA, CIT and LMI** have come to an end.

**Forecast:** All three species will remain dormant until next spring.

**Fall armyworm (FAW):** Heavy FAW infestations were reported in irrigated schemes in Mildland Province, Zimbabwe. Light to moderate infestations were reported in irrigated maize in Salima, Blantyre, Lilongwe, Karonga, Mzuzu, Kasungu, Shirevalley and Machinga Agriculture Development Divisions in Malawi, in Dondo and Nhamatanda, Mozambique. Affected farmers carried out control operations with technical and material assistance from Ministries of Agriculture.

It is likely the pest is causing damage to field and/or irrigated maize in other countries across different regions where it has become a resident pest.

**Forecast:** FAW has become a resident pest in several countries across the globe outside its region of origin, the Americas. Since its first appearance was reported in its new habitat in 2016, FAW continues causing damage to field and irrigated maize and other crop.

### **FAO-led Global Action for Fall Armyworm Control**

**NOTE:** The Food and Agriculture Organization of the United Nations (FAO) and CIT 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: [FAO GLOBAL ACTION FOR FAW CONTROL](#)

GAFC is a pioneering initiative that aims to take radical, direct, and coordinated measures to fight FAW at a global level. Its three 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 collaborating closely with various partners 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 and host-country strategies. These initiatives are built on experiences gained over the past several years, including outcomes of projects and programs supported through USAID legacy OFDA, legacy BFS, national partners, CGIARs, FAO, and several other entities.

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partners, CGIARs, FAO, and several other entities.

**Note:** Several species of natural enemies of FAW have been identified in Ethiopia, Kenya, Tanzania, Madagascar, India, China, and elsewhere and have been determine their efficacy, effectiveness, environmental impacts, safety, and other relevant parameters and some have been in use as part of an IPM approach. According to FAO's July FAW Newsletter, a package of biological control against FAW was demonstrated in a new video from Syria presented that *Trichogramma pretiosum*, an egg parasitoid, can be mass released to control the FAW egg populations. Bacterial insecticide, *Bacillus thuringiensis* is sprayed four to five days after a *Trichogramma pretiosum* parasitoid was released to control any surviving FAW larvae. The third component in the package is a mass release of a larval parasitoid *Habrobracon hebetor* that further disrupts the life cycle of the pest (FAW). Ecologically safer alternatives are also being tried and utilized to prevent, mitigate FAW in many countries across the globe Biocontrol on FAW Nepal End note.

**African Armyworm (*Spodoptera exempta*, Walker) (AAW):** AAW activities were not reported during September.

**Forecast:** The AAW will likely commence its seasonal appearance in the southern outbreak region during the forecast period.

Active surveillance and monitoring remain critical to forecast and report pest presence to plan timely control interventions. Trap management and scouting remain critical to determine population levels and forecasting.

*It is to be recalled that USAID legacy OFDA through DLCO-EA and host-country partners sponsored a project in East Africa and the host-countries and launched training farmers and technical staff in AAW identification, detection, monitoring, surveillance, trap operations and management, reporting as well as control operations. Note: Legacy OFDA developed printable and web-based interactive AAW maps and BHA/TPQ considers a similar map for the CBFAMFEW countries.*

**Quelea species (QSP):** QSP bird outbreaks were reported in Morogoro Region (Kilosa District) in Tanzania where ground control operations were launched by the Tanzania Plant Health and Pesticide Authority using fenthion 640 ULV with motorized sprayers. QSP bird outbreaks were also reported in Mashonaland Central and Masvingo Provinces in Zimbabwe where responsible entities carried out control operations.

No updates were received from other QSP prone countries, but it is likely the bird is attacking small-grain cereal crops where that are yet to be harvested.

**Forecast:** QSP will likely continue being a problem to small grain cereals in field and irrigated crops.

**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 update was received during this month, but the pest remains a

perennial problem to pre- and post-harvest crops across various regions.

**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.

**Coconut rhino beetle (CRB) (Oryctes rhinoceros – ORH):** ORH outbreak was reported in the **Republic of Marshall Island** where the pest was reported attacking coconut plants. Actions to respond the CRB are underway.

CRB was reported in **Vanuatu**. This invasive pest species breeds profusely and attacks several plants, including coconut and palm oil trees, and several other crops across the southern Pacific regions.

**All GETOP front-line countries must maintain regular monitoring and surveillance as well as launch preventive control interventions in a timely manner. Regular crop scouting is critical to avoid damage/losses. Invasion countries must also remain 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 and reports with stakeholders, including neighboring countries, and humanitarian and development partners, etc., as early and often as possible. Lead farmers, field scouts, community forecasters and others must remain vigilant and report ETOP**



detections to relevant authorities in their jurisdictions as quickly as possible. Strong surveillance, monitoring and quarantine enforcement remain critical to prevent invasive pest species.

**NOTE – Advanced Technologies for GETOP Surveillance, Early Warning and Forecasting Enhance Effective GETOP Management:** Though at a relatively early stage for large-scale ETOP interventions, innovative technologies, such as drones, for high-resolution images in remote and hard-to-reach inaccessible areas are being explored. On trial bases, use of drones for locust monitoring, and surgical and localized control in sensitive, and hard to reach areas showed promising results. While the range of agriculture-oriented drones may be limited for large-scale area-wide ETOP interventions, such as controlling massive swarms and hopper bands, countries and partners have expressed interests to pursue supporting work on key parameters associated with these technologies, including permitting protocols for air space access and other issues.

Crowd and cloud sourcing for data collection, sharing, etc. are another set of assets that can be of great value for GETOP operations. Dynamic population and biotope modeling, from CIRAD and ICIPE, respectively, and accounting for associated parameters such as soil moisture, vegetation index, etc. that involved multiple partners – USAID, Penn-FAO, NOAA, NASA, CIRAD, ICIPE, National and International Research institutions, academia, private 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.**

### **ETOP Proliferation and Climatic Factors**

**Note:** Climate aberrations/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 [into 2022] End note; Scientific review of the impact of climate change on plant pests – A global challenge to prevent and mitigate plant pest risks in agriculture, forestry, and ecosystems. Rome. FAO on behalf of the IPPC Secretariat.  
<https://www.fao.org/documents/card/en/c/cb4769en>.

### **BHA’s Contributions to ETOP Abatement Interventions**

USAID/BHA/TPQ continues its effort in strengthening national and regional capacity in GETOP prone countries across several regions. The supports for GETOPs include projects on FAW in Eastern Africa, the Horn, the Red Sea region, as well as three major locust species – Moroccan



*locust, Italian locust and the Migratory locust - that continue threatening food security and livelihoods of tens of millions of people across the Caucasus and Central Asia (CCA) countries.*

*BHA/TPQ/FSL also co-sponsors through the UN/FAO a multi-year project that focus on strengthening surveillance, monitoring, early detection and warning as well as management of G of the SGR(DL) to contribute to food security and livelihoods of vulnerable communities and contribute to the overall national economy of response intervention of prone and affected countries across the outbreak in the central region.*

*In Eastern Africa and the Horn, the multi-year DRR project that targets community based FAW monitoring forecasting and early warning continues in five countries (Ethiopia, Malawi, Rwanda, Uganda, and Zambia) under the auspice 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 the three major locust species – BHA is co-funding a multi-year DRR project. The project is being implemented under the leadership of UNFAO in close collaboration with the affected countries in the region [BHA CCA Locust Support](#).*

*The DRR in the CRC region, which covers The CRC DRR project which includes strengthening capacities on the desert locust (SGR) monitoring, surveillance, early warning, and forecasting will be strengthened at the country level employing modern technologies, such as eLocust3m as well as further testing drones for survey and critical*

*control interventions. It is also aimed at improving SGR activities at the global level through mentoring young and aspiring junior experts to foster timely assessments and forecasting.*

*The project also works on improving country level capacities for preparedness, early response, prevention, and risk reduction by fostering preparedness and early reaction through updated contingency plans, maintaining, and supporting countries' capacity for preventive interventions and early response, promoting the use safer, accessible, and affordable biopesticides and other alternative tools. It also supports deployment of the updated (Locust)-Pesticide Management System and enhance post-upsurge management activities. The CRC DRR project also works on supporting and enhancing national capacities and specialized expertise on Environmental and Health Safety Standards (EHS) in the GETOP*

*USAID/BHA/TPQ/FSL also supports a DRR project through Arizona State University through integration of alternative locust and grasshopper management tools into community and National Plant Protection Departments practices. This project is being implemented in West Africa in collaboration with Senegal/PPD, University of Gaston Berker University, St Lous, Senegal, CIRAD, French Institute of Development Research (IRD).*

*USAID/BHA/TPQ continues with its effort in promoting the support for applied and operational research in testing, improving, and expanding innovative technologies to help minimize the impacts of ETOPs on food security and livelihoods*

*of vulnerable people and communities across low-income countries and regions and encourages collaboration among countries and potential partners. Through these efforts, spread of the ETOPs among and between 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 benefited participating and other countries across the globe was overhauled. FAO is implementing an updated version of the PSMS with a more user-friendly digital mode. Thanks to the system, SGR frontline countries and others have been able to effectively manage their strategic [pesticide] stocks and avoid accumulations of unnecessary and toxic stockpiles as well as empty pesticide containers that pose a serious threat to the human health, the environment and non-target and beneficial organisms.*

**Note:** A sustainable Pesticide Stewardship (SPS) can contribute to strengthening pesticide delivery system (PDS) at the national and regional levels. A viable and effective SPS can be established by linking 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, the Agency policies and procedures, to help minimize health risks and protect the environment from misuse and mismanagement of pesticides, pesticide containing materials and empty containers, improve safer and effective pest control interventions. An informed

procurement and use as well as judiciously executed triangulations of surplus stocks are worth considering.

**Inventory of Strategic Pesticide Stocks for SGR Control**

In October, the SGR strategic pesticide stocks were slightly reduced where by 4,575 ha were treated in total during this month (3,403 ha in Sudan, 1,170 ha in SA and 2 ha in Yemen).

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

Country	Quantity, l/kg
Algeria	1,184,761~
Chad	65,270~
Egypt	9,857 ULV, 43,111~
Eritrea	9,859~
Ethiopia	56,020
Libya	24,930~
Kenya	?
Madagascar	9,335~+
Mali	240~ biopesticides
Mauritania	31,759 + 316.5kg <sup>GM</sup>
Morocco	3,375,082, <sup>D</sup>
~Niger	62,000
Oman	4,940~
Saudi Arabia	- 20,200 ~
Senegal	156,000~
Somalia	?
Sudan	10,320~
South Sudan	?
Tunisia	62,200 <sup>OB</sup> +200 <sup>OBML</sup> +1,025 <sup>LV</sup>
Uganda	?
Yemen	8,528; 180kg <sup>GM</sup> ~

\*Includes different pesticides and formulations - ULV, EC and dust.

~ data may not be current.

+ = other MoA stocks are not included

? = data not available

GM = GreenMuscle™ (fungal-based –  
*Metarhizium acridum* - biological  
pesticide, e.g., NOVACRID)

OB = obsolete

ML = malathion

LV = Larvos

**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 in the same direction*  
ASARECA *Association for Strengthening Agricultural Research in Eastern and Central Africa*  
BHA *Bureau for Humanitarian Assistance (USAID)*  
CABI *Center for Agriculture and Biosciences International*  
CAL *Central American Locust Schistocerca piceifrons piceiferons*  
CBAMFEW *Community-based armyworm monitoring, forecasting and early warning*  
CCA *Caucasus and Central Asia*  
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*  
CRB *Coconut rhino beetle (Oryctes rhinoceros – ORH)*  
CRC *Commission for Controlling Desert Locust in the Central Region*  
CTE *Chortoicetes terminifera (Australian plague locust)*  
DDLCC *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 Pests*  
FAW *Spodoptera frugiperda (SFR) (Fall armyworm (FAW))*  
Fledgling *immature adult locust /grasshopper that has the same phenology as mature adults, but lacks fully developed reproductive organs to breed*  
GM *GreenMuscle® (a Metharhizium fungal-based biopesticide); NOVACRID, Green Guard*  
ha *hectare (= 10,000 sq. meters, about 2.471 acres)*

ICAPC IGAD's Climate Prediction and Application Center	NSD Republic of North Sudan
IGAD Intergovernmental Authority on Development (Horn of Africa)	NSE Nomadacris septemfasciata (Red Locust)
IRIN Integrated Regional Information Networks	OFDA Office of U.S. Foreign Disaster Assistance
IRLCO-CSA International Red Locust Control Organization for Central and Southern Africa	PBB Pine Bark Beetle ( <i>Dendroctonus</i> sp.: <a href="#">Curculionidae</a> – true weevils)
ITCZ Inter-Tropical Convergence Zone	PHD Plant Health Directorate
ITF Inter-Tropical Convergence Front = ITCZ)	PHS Plant Health Services, MoA Tanzania
FAO-DLIS Food and Agriculture Organizations' Desert Locust Information Service	PPD Plant Protection Department
Hoppers young, wingless locusts/grasshoppers (Latin synonym = nymphs or larvae)	PPM Pest and Pesticide Management
JTWC Joint Typhoon Warning Center	PPSD Plant Protection Services Division/Department
Kg Kilogram (~2.2 pound)	PRRSN Pesticide Risk Reduction through Stewardship Network
L Liter (1.057 Quarts or 0.264 gallon or 33.814 US fluid ounces)	QSP <i>Quelea</i> species (Red Billed <i>Quelea</i> bird, etc.)
LCC Locust Control Center, Oman	SAL South American (Locust <i>Schistocerca cancellata</i> )
LPA <i>Locustana pardalina</i>	SARCOF Southern Africa Region Climate Outlook Forum
LMC/ML <i>Locusta migratoriacapito</i> (Malagasy locust)	SGR <i>Schistoseca gregaria</i> (the Desert Locust)
<i>Metrihizium acridum</i> (a fungal entomopathogen used for locust and grasshopper control, e.g., NOVACRID (Benin isolate; Green Muscle (Niger and CIRO isolates); The entomopathogen was formerly named <i>M. anisopliae</i> var <i>acridum</i> and before that it was referred to as <i>M. flavoveridea</i> and <i>Metarhizium</i> sp.)	SSD Republic of South Sudan
MoAFSC Ministry of Agriculture, Food Security and Cooperatives	SPB Southern Pine Beetle ( <i>Dendroctonus frontalis</i> ) – true weevils
MoAI Ministry of Agriculture and Irrigation	SWAC Southwest Asia DL Commission
MoARD Ministry of Agriculture and Rural Development	PBB Pine Bark Beetle
NALC National Agency for Locust Control	PHS Plant Health Services
NCDLC National Center for the Desert Locust Control, Libya	PSPM Preparedness, Strategic Planning and Mitigation (formerly known as Technical Assistance Group - TAG)
NOAA (US) National Oceanic and Aeronautic Administration	TPQ Technical and Program Quality Triangulation Transfer of donated pesticides from countries with large inventories with no immediate need to countries with immediate need through a third party negotiation and shipments, etc. Usually, FAO plays the third-party role in the case of locust and other emergency pests.
NPS National Park Services	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 has emerged as a relatively new, dry season pest, largely associated with the destruction of its natural habitat through deforestation, land clearing for agricultural and other development efforts and climate anomalies.*

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To learn more about our activities and programs, and/or download archived GETOP Bulletins, please, visit our website: [USAID/BHA PPM](https://www.usaid.gov/bha/ppm)

**Additional resources on GETOPs**

USAID/BHA Pest and Pesticide Monitoring and GETOP Bulletins: [USAID/BHA PPM](https://www.usaid.gov/bha/ppm)  
USAID Pest Management Guidelines  
[USAID PMG](#)  
[US EPA IPM](#)

**SGR:**

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

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](#)

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](#)  
FAO Locust Watch – Caucasus and Central Asia [CCA Locust Watch](#)  
  
IGAD Climate Predication and Application Centres [ICPAC Climate SGR](#)

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

**FAW:**

USAID FtF FAW [USAID FAW](#)  
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](#)  
FAW management animation SAWBO [FAW Management Animation](#)  
[FAW GAFC Map 2022](#)

[CABI on FAW](#)

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

**AAW:**

[Armyworm](#)

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

NOAA Climate Prediction Center [NOAA CPC](#)