Emergency Transboundary Outbreak Pest (ETOP) Situation Bulletin for April with a forecast through mid-June 2022

résumé en français est inclus

SUMMARY

The **Desert Locust** (*Schistoseca gregaria* - **SGR**[1]): The desert locust (SGR) situation remained calm in April in the Central Outbreak Region (COR), and only a few isolated immature swarms were treated on 30 ha in southern Ethiopia, and hoppers were treated on 340 ha on the southern Red Sea coast in Egypt. Isolated adults prevailed in a few places on the Gulf of Aden coast in Yemen. Overall ecological conditions remained dry, and no locusts were reported elsewhere in COR. The Western outbreak region (WOR) remained calm. In the Eastern outbreak region (EOR), only few isolated adults and hoppers were detected in coastal areas of southeast Iran and southwest Pakistan.

Forecast: Ecological conditions continue drying up in COR causing locust numbers to further decline. Escapee locusts from southern Ethiopia will likely move northward to the Somali administrative region and likely breed on a small-scale in areas where soil is moist, and vegetation is green in areas where rainfall occurs. The southern coast of Yemen will experience a decline in locust numbers with vegetation continue drying out and adults moving to the interior where breeding may commence at the foothills of rainfall. Low numbers of solitary adults may appear in areas of recent rainfall in the interior of Saudi Arabia, but breeding is expected to be limited with the rise in temperature and drying up of vegetation. Poor rain is expected to limit any SGR developments during the forecast period in Saudi Arabia and Yemen and significant development is unlikely in COR in general during the forecast period. In WOR, low numbers of adults may persist in northern Mali and Niger, but significant developments are unlikely in the region during the forecast period. In EOR, isolated adults may appear, but poor rain in the following month will significantly suppress any breeding through June. The forecast for above normal summer rains from July to September may cause some breeding with a potential increase in SGR numbers in Sahel Africa, the Horn and Yemen, but significant developments are unlikely and additional breeding is not expected in primary breeding areas elsewhere, including in the EOR.

Red (Nomadic) Locust (*Nomadacris septemfasciata*) (NSE): NSE swarms are expected to have begun developing in the primary outbreak areas in Malawi, Mozambique, Tanzania, and Zambia.

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

African Migratory Locust (*Locusta migratoria migratorioides) (AML*): Isolated populations of AML persisted in Zambia and low populations of adults and hoppers were detected in multiple provinces in Zimbabwe.

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.

Central American Locust, *Schistocerca piceiferons* **(**CAL): The CAL situation remained generally calm in Mexico and Central America where a few solitary adults are expected to have started mating.

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 hatching began early March in Tajikistan and from mid- to late March in Afghanistan and Uzbekistan. CIT is expected to have begun hatching towards the end of April. LMI activities were not expected during April.

Fall Armyworm *(Spodoptera frugiperda, J. E. Smith) (FAW)*: FAW infestations continued affecting maize in several counries/districts in Kenya and Tanzania respectively, and control operations were launched by the affected farmers with assistance from their respective line Ministries.

African Armyworm (*Spodoptera exempta*) (AAW): AAW outbreaks were reported in nine districts in Tanzania and 33 counties in Kenya where affected farmers carry out control operations with support from their respective MoAs.

Quelea species (QSP): QSP outbreaks were reported in several districts in Tanzania where control operations treated 745 ha. The pest was reported attacking sorghum and millet crops in several provinces in Zimbabwe. In Kenya QSP was reported attacking rice, and plans were in progress to control the pest.

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 National MoA PPDs/DPVs/PHSs, 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 (please refer to list of acronyms on the last pages).* ***End summary***

RÉSUMÉ

La situation du Criquet pèlerin (*Schistoseca gregaria* - SGR): La situation relative au criquet pèlerin (SGR) est restée calme en avril dans la région centrale de l'épidémie (COR), et seuls quelques essaims immatures isolés ont été traités sur 30 ha dans le sud de l'Éthiopie, et des larves ont été traitées sur 340 ha sur la côte sud de la mer Rouge en Egypte. Des ailés isolés prédominaient dans quelques sites de la côte du golfe d'Aden au Yémen. Dans l'ensemble, les conditions écologiques sont restées sèches et aucun criquet n'a été signalé ailleurs dans la COR. La région occidentale de l'épidémie (WOR) est restée calme. Dans la région orientale du foyer (EOR), seuls quelques ailés et larves isolés ont été détectés dans les zones côtières du sud-est de l'Iran et du sud-ouest du Pakistan.

Prévisions: Les conditions écologiques continuent de se dessécher dans la COR, entraînant une nouvelle baisse des effectifs acridiens. Les criquets échappés du sud de l'Éthiopie se déplaceront probablement vers le nord jusqu'à la région administrative somalienne et se reproduiront probablement à petite échelle dans les zones où le sol est humide et la végétation est verte dans les zones où il pleut. La côte méridionale du Yémen connaîtra une diminution des effectifs acridiens avec la poursuite du dessèchement de la végétation et le déplacement des ailés vers l'intérieur où la reproduction pourra commencer sur les contreforts des pluies. De faibles effectifs d'ailés solitaires peuvent apparaître dans les zones de pluies récentes de l'intérieur de l'Arabie saoudite, mais on s'attend à ce que la reproduction soit limitée avec l'augmentation des températures et le dessèchement de la végétation. De faibles précipitations devraient limiter tout développement de SGR au cours de la période de prévision en Arabie saoudite et au Yémen et un développement significatif est peu probable dans le COR en général au cours de la période de prévision. Dans la région WOR, de faibles effectifs d'ailés peuvent persister dans le nord du Mali et du Niger, mais des développements significatifs sont peu probables dans la région au cours de la période de prévision. Dans la région EOR, des ailés isolés peuvent apparaître, mais de faibles pluies le mois suivant supprimeront de manière significative toute reproduction jusqu'en juin. La prévision de pluies estivales supérieures à la normale de juillet à septembre pourrait entraîner une certaine reproduction avec une augmentation potentielle du nombre de SGR en Afrique sahélienne, dans la Corne et au Yémen, mais des développements significatifs sont peu probables et

une reproduction supplémentaire n'est pas attendue dans les principales zones de reproduction ailleurs, y compris dans l'EOR.

Criquet nomade (*Nomadacris septemfasciata*) (NSE): On s'attend à ce que les essaims de NSE aient commencé à se développer dans les principales zones de foyer au Malawi, au Mozambique, en Tanzanie et en Zambie.

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): La situation CAL est restée généralement calme au Mexique et en Amérique centrale où on s'attend à ce que l'accouplement de quelques ailés solitaires ait commence.

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 éclosions de DMA ont commencé début mars au Tadjikistan et entre mi et fin mars en Afghanistan et en Ouzbékistan. CIT devrait avoir commencé à éclore vers la fin avril; Aucune activité d'IMT n'était prévue au cours de ce mois.

Chenille Légionnaire d'automne (Spodoptera frugiperda, J. E. Smith) (FAW): Les infestations de légionnaire d'automne ont continué d'affecter le maïs dans plusieurs pays/districts au Kenya et en Tanzanie respectivement, et des opérations de lutte ont été lancées par les agriculteurs touchés avec l'aide de leurs ministères de tutelle respectifs.

Chenille Légionnaire africaine (Spodoptera exempta) (AAW): Des épidémies de AAW ont été signalées dans neuf districts de Tanzanie et 33 comtés du Kenya où des opérations de lutte sont menées par les agriculteurs touchés avec le soutien de leurs ministères de l'agriculture respectifs.

***Quelea sppecis oiseaux* (QSP):** Espèce de Quelea (QSP): Des foyers de QSP ont été signalés dans plusieurs districts de Tanzanie où les opérations de lutte ont traité 745 ha. Le ravageur a été signalé attaquant les cultures de sorgho et de mil dans plusieurs provinces du Zimbabwe. Au Kenya, le QSP a été signalé attaquant le riz et des plans étaient en cours pour lutter contre le ravageur.

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.

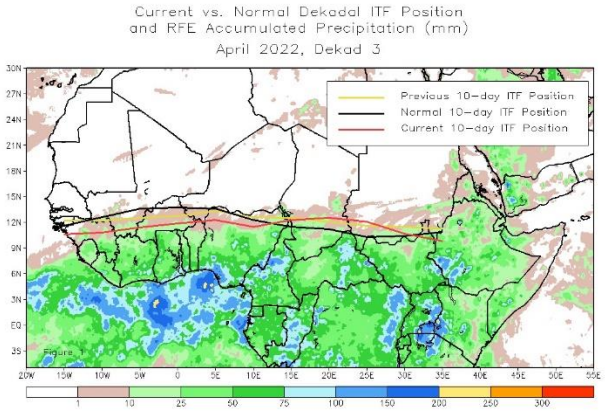
USAID / BHA / PSPM surveille régulièrement les ETOP en étroite collaboration avec son réseau de MoA / PPD / DPV nationaux, d'entités régionales et internationales de surveillance et / ou de lutte antiparasitaire, y compris la FAO/ECLO, la CLCPRO, le CRC, le DLCO-EA et l'IRLCO-CSA, et des centres de recherche, 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

During the 3rd dekad of April from 21-30, the Inter-Tropical Front (ITF) moved south relative to its previous position, which resulted in an overall anomalous southerly position except for the eastern portion (15E-30E). The western (10W-10E) portion of the ITF was located approximately at 11.6N, which is below the climatology position by 1.6 degrees. The eastern (20E-35E) portion of the ITF was approximated at 11.3N, which is above the climatological position by 0.6 degrees. Figure 1 displays the current position of the ITF relative to the long-term average position during the 3rd dekad of April and its previous position during the 2nd dekad of the month.

Figure 1.



The Figures 2 and 3 below show time series, illustrating the latitudinal values of the western and eastern portions of the ITF, respectively, and their seasonal evolutions since the beginning of April 2022 (NOAA, 5/22).

Figure 2.

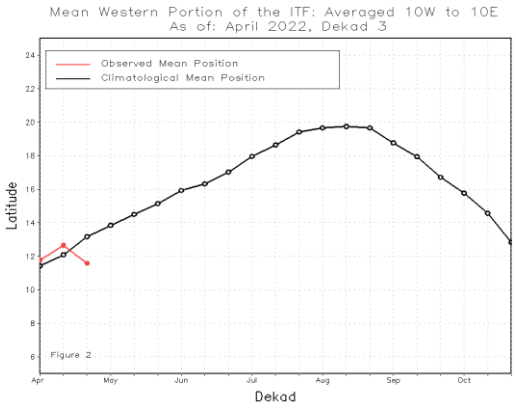
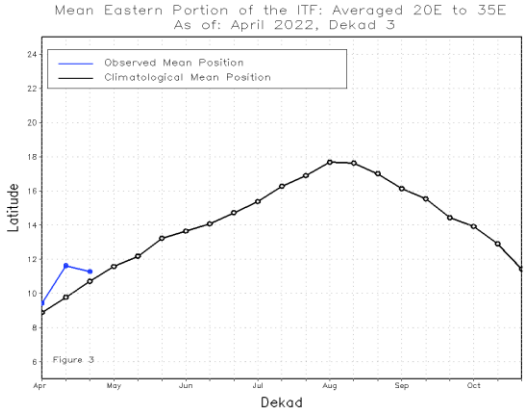


Figure 3.



During the 2nd dekad of April from 11-20, the ITF moved further north relative to its position during the 1st dekad of the month, an overall anomalous northerly position. The western (10W-10E) portion of the ITF was located approximately at 12.7N, which is above the climatology position by 0.6 degrees. The eastern (20E-35E) portion of the ITF was approximated at 11.6N, which is above the climatological position by 1.8 degrees for this period (NOAA, 4/22).

In **COR**, there was no significant rainfall, only light 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, most of the outbreak areas received rain: 77 ml in Mafambisse (Buzi plain), 88 ml in Gorongosa (Gorongosa plain), 65 ml in Caia (Dimba plains), 73 ml in Buzi, and 73 ml in Dimba in Mozambique. In Tanzania, the following were recorded: 71 ml in Masenge (Wembere Plain), 86 ml in Kaliua (Malgarasi Plain, 148 ml in Muze (Rukwa Valley) and 77 ml during Aptil. In Zambia, 90.1 ml was recorded in Namwala (Kafue Flats), while other NSE areas remained largely dry.

In Madagascar, rainfall deficit (less than 17 ml) was recorded in all of the **LMC** outbreak areas except in the Karimbola plateau, at Beloha-Androy, where the maximum ten-day rainfall reached 21.4 ml, and the ten-day average temperature remained around 28.1% in Betioky-Sud. In Sofia, precipitation was recorded at 0.0 ml. Vegetation greening coverage in moist areas was under 85% and less than 30% in the drier areas. The grass layer had a height of 20 to 100 cm.

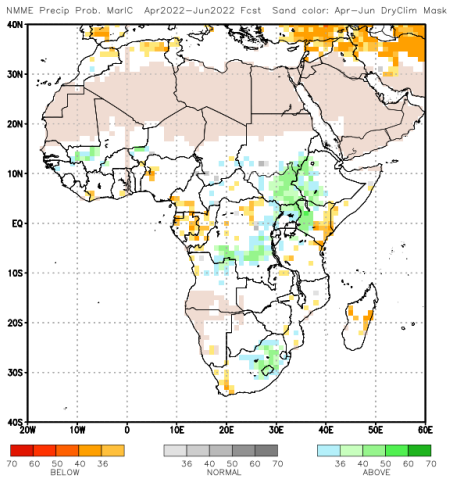
No update was received in **CCA** for April at the time this bulletin was compiled, however, in March relatively higher temperatures and precipitation were recorded in Central Asia (CA) region while relatively cooler and drier conditions are expected to have persisted with a gradual rise in April in the Caucasus countries.

Some locust breeding areas in the **Central America** and perhaps **Southern America** regions where precipitation commenced are expected to have continued receiving rain during April.

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).

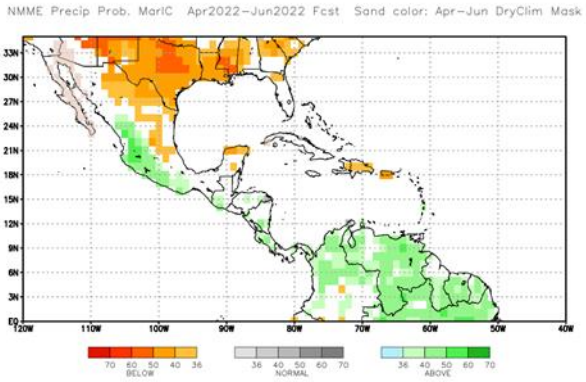


There is a slight to moderate tilt in the odds to favor below-average rainfall along the Gulf of Guinea coast, portions of Central Africa, and pockets of equatorial East Africa and Southern Africa (NOAA, March,2022).

Central America:

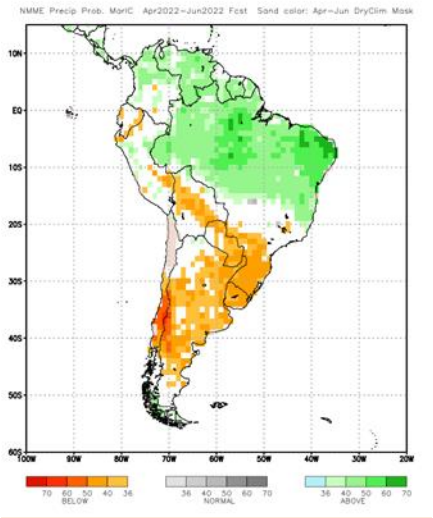
There is a slight to moderate tilt in the odds to favor below-average rainfall over parts of northern and eastern Mexico, and pockets of the Caribbean.

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



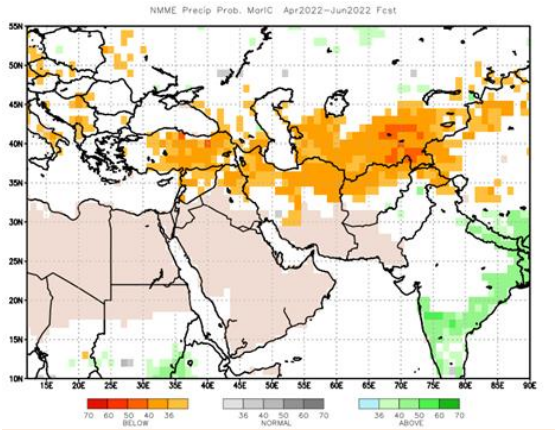
South America:

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* - **SGR**[2]): In COR, in April only light rain fell in southern Ethiopia and elsewhere in the region and vegetation was dry causing SGR to remain generally calm during the month. Surveys covered 95,110 ha in southern and eastern Ethiopia, and a few small remnant immature swarms were detected and controlled on 30 ha in Teltele District in Southern Oromia admin region of Ethiopia during the 1st dekad of April. Ground survey is in progress in the eastern parts of Somali and Southern Oromia admin regions. In Egypt, hoppers were treated on 340 ha in southeastern part of the country. In Yemen, isolated adults persisted on the southern coast. No locusts were reported elsewhere in the Horn of Africa or the Red Sea region during this month.

Forecast: Escapee locusts from southern Ethiopia will likely move north towards eastern parts of the Somali administrative region where they will likely mature and begin breeding on a small scale in areas where the soil is moist, and vegetation is green. In Yemen, locusts could move from their current location in the southern coast to the interior of the country where they may start breeding on a small scale in areas that may receive/received rain. 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 breeding, if any, will be on a very limited

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

scale due to dry conditions from the absence of rain.

SGR – WOR: No locusts were reported in WOR, and the situation remained calm in April throughout the region.

Forecast: Low numbers of adults may persist in northern Mali and Niger, but significant developments are unlikely in the region during the forecast period.

SGR - EOR: The annual joint survey covered 17 000 km in southeast Iran and southwest Pakistan and detected isolated adults and hoppers in a few coastal areas, confirming that very little breeding occurred this spring.

Forecast: Locusts will decline in Iran and Pakistan, and additional breeding is not expected.

Note: *The longer-term outlook indicates above-normal rainfall in the northern Sahel of Africa, the interior of Yemen, and northeast Ethiopia. An active early monsoon season along the Indo-Pakistan border is in the forecast from July to September. However, a significant increase in the SGR numbers that could cause reach a threat level will require generations of multiple breeding; hence, the situation is expected to remain calm, at least through October (FAO-DLIS).* ***End note.***

NOTE – Innovative Technologies for ETOP Surveillance, Early Warning and Forecasting for Stronger and Effective ETOP Management: *Though at a relatively early stage for 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 tackling massive swarms and hopper bands, countries and partners have expressed interests to pursue supporting work on key parameters associated these 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 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, 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.***

Red (Nomadic) Locust (NSE): NSE fledging is expected to have taken place and immature adults present in all outbreak areas. It is likely swarms will continue developing in Lake Chilwa/Lake Chiuta plains, Mpatsanjoka and Dambo in Malawi. A similar situation is likely in Kafue Flats in Zambia, Iku-Katavi and Wembere plains and Malagarasi Basin in Tanzania as well as in Buzi Gorongosa, Dimba plains in Mozambique. IRLCO-CSA continues with it appeal to its member-states and partners to avail resources to undertake timely survey and control interventions to avoid any threats to food security and livelihoods of affected communities and people.

Forecast: With the rain season ending, vegetation drying locusts that have fledged and developed in the primary breeding areas will likely concentrate and start forming swarms. Resources remain essential for IRLCO–CSA and its national partners to undertake surveillance and control where necessary.

African Migratory Locust (AML): In Zambia, MoA staff in Western and Southern parts of the country carried out ground surveys in April using eLocust3M (an application developed for locust surveillance by the UNFAO in collaboration with its partners) and covered 1,548 ha. Isolated and scattered populations were detected during survey operations, but due to low density AML, control operations were not warranted at the time the survey was conducted. In Zimbabwe, low density solitary adults and hoppers mixed with *Cataloipus spp*., an economically important crop and pasture pest, were detected during ground survey launched in Masvingo, Manicaland, Midlands and Matabeleland North Provinces by the MoA staff and covered over 241 ha. The pests were observed in low density solitary stages and did not warrant control at the time surveys were executed.

Forecast: AML outbreaks are likely to cause damage to crops in Kenya and Tanzania during the forecast period.

Malagasy locust (Locust migratoria capito – MLC): In Morondava plain, groups of immature and mature adult populations, at 5 to 50 adults/m² were observed mixed with L2 to L4 instar hopper bands (L3 dominating) at 5-150 hoppers/m². In Manja, L2-L5 hopper bands at a density of 40 to 140 hoppers/m² and groups of immature and mature adults at 1 to 3 adults/m² were reported with immature adult dominating up to 5,000 adults/ha. In Basibasy plain, L2-L5 hopper bands (L5 dominant)) were present at a density of between 5 and 70 larvae/m². On the left bank of Mangoky and the Befandriana-South plain, hopper bands continued to be present. The hoppers were at L2 to L5 with the L5 dominating with a density varying from 5 to 50 larvae/m² mixed with immature adults with a density ranging from 250 to 1,900 insects/ha.

In the interior Mahafaly Arc, the immature adults at 60 to 1,800 adults/ha were reported. L4 and L5 hoppers at a density of 200 to 2,000 larvae/ha were also present with L5 dominating.

On the Vineta plateau, patches of transiens hoppers of all stages with a dominance of L4 were observed, at an average density of 50 hoppers/m². Mixed populations of hoppers, immature and mature adults were at an average density of 8,000 adults/ha.

On the Bekily-Fotadrevo peneplain, hoppers composed of L1 to L3 solitaro-transiens were observed, at a density of between 3 to 10 larvae/m² in limited areas. They were mainly located in wetter and greener areas. In upper Menarandra basin, scattered population of L1 and L2 hoppers at less than 1,300 larvae/ha were observed. Immature and mature adults composed at a density of 300 to 950 adults/ha were present.

In the grangerization areas on the Mahafaly plateau, in Beomby, a few transient hopper bands at L2 to L4 with L3 dominant at densities varying from 2 to 8 larvae/m² were observed. Transient immature and mature adults' density ranging from 650 to 1,100 adults/ha, were also observed. In the Southern

Transient Multiplication area, L4 and L5 hoppers were present at a density of less than 800 hoppers/ha and immature adult density varied from 100 to 800 adults/ha.

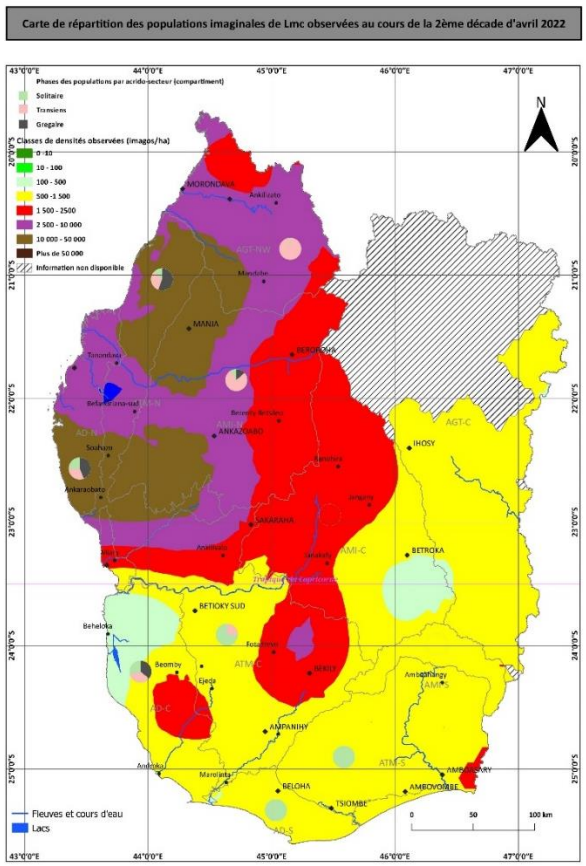
In Madagascar, NSE final molting continued in the South where individual locusts were immature and mature. The density of adults was 1,600 insects/ha in Belomotra plateau while hopper densities varied from 500 to 1000 larvae/ha in mixed populations and up to 10 hoppers/m² in hopper groups. On the Tsiribihina delta, the average immature adult density was 2,500 to 3,000 adults/ha in the breeding areas. On the Mahafaly plateau, the immature adult populations gradually reached a density ranging from more than 300 to 450 adults/ha in the breeding areas. On the left bank of the Mangoky and the Basibasy plain, their densities were lower than 2,600 adults/ha and with 2,400 hoppers/ha. In these localities, a mixed populations of LMI and NSE were observed.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.

Treatment and Control: During the 1st two dekads of April, from 1-20 April, 615 ha were treated and protected against LMC and NSE by land in Ambovombe, Morombe Districts (Befandriana-Sud, Sakaraha and Toliara II) bringing the total areas treated by ground means as of April 20, 2022, to 7,292 ha. Aerial control did not take place during the 1st dekad or April, but 14,650 ha were treated and protected in the Manja region during 2nd delkad of the month bringing total areas treated and protected to 115,306 ha since the current campaign began.

Forecast: The 3rd generation LMC is expected to have begun developing and will continue causing hoppers to form in Morondava plain, in Manja and Marerano, and the basin of Bemarivo; Befandriana-Sud and the cuestas of Sikily and Mikoboka; in lowlands in the Bekily-Fotadrevo peneplain, and south of the Horombe plateau, in Ianakafy/ Analamary). Swarms are also expected to form at low densities between Morondava and Manombo rivers, in Maharivo, Maintapaka, Lapaolo, Manja, the Magoky delta, the Befandriana-Sud plain, the Mikea clearing and Mikoboka Cuesta. Locust density and size will be determined by the eco-meteorological conditions and vegetation formations, primarily the low land savannahs with mixed vegetation and grasses.

NSE, fledging that have already reached L5 to L6 instars will continue to occupy more space in tall grass and cause more damage, while waiting for the end of their development, to move into winter refuge areas, similar to the first-generation locusts.

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).



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

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

Central American Locust - Schistocerca piceifrons (CAL): CAL situation remains calm in Mexico where the outbreaks that were reported in early February, 2022 in La Cáscara, Nuevo Leon were effectively controlled Nuevo Leon Locust Outbreak. No updates were received elsewhere in the region at the time this Bulletin was compiled.

Forecast: With the seasonal rains commencing in some parts of Mexico and the CA region, mating of solitary adults is expected to have begun with the first-generation hoppers likely to start appearing sometimes in June. Preparations are underway in Mexico deploying GIS and remote sensing facilities to determine potential sites where outbreaks will likely begin appearing (Pech, CESVY-SENASICA, México).

[***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, several fruit trees (Pech, CESVY-SENASICA, 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-plague-northern-province.

Italian (CIT), Moroccan (DMA) and Migratory (LMI) Locusts in Caucasus and Central Asia (CCA): According to a late received update, DMA hatching began in Tajikistan early March and in Afghanistan and Uzbekistan during the 2nd and 3rd dekads of March. Although no update was received at the time this bulletin was compiled, DMA hoppers developments are expected to have continued in Tajikistan, Afghanistan and Uzbekistan; and hatching is expected to have begun in Azerbaijan, Armenia, Georgia and Russian Federation as well as in Kyrgyzstan, Turkmenistan during April. Control operations treated DMA on a total of 2,950 ha in Tajikistan and Uzbekistan. CIT is expected to have begun hatching in the southern parts of CCA towards the last dekad of April, but

no LMI activities are expected to have commenced during April.

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

Fall armyworm (FAW): FAW infestations were reported affected early plated maize in most of the Western and Southern Rift Valley counties in Kenya during April. Affected farmers executed control operations with material and technical support from MoA. In Zimbabwe, FAW infestations continued attacking irrigated maize at vegetative stage in Muzarabani and Chiredzi districts. Affected farmers carried out control with material and technical support from the MoA. Although no updates were received in other IRLCO-CSA member states (Malawi, Mozambique, Tanzania, Zambia, and Zimbabwe), and elsewhere across different regions was at the time this Bulletin was compiled, it is likely FAW infestations and outbreaks occurred in irrigated and/or late planted maize and other susceptible crops.

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 were reported in Manyoni, Handeni, Sumbawanga, Longido,Nkasi, Ngorongoro, Siha, Rolya DC, Tarime DC,and Musoma DC districts in Tanzania where MoA provided supplies and technical support to the affected farmers to launch control operations. In Kenya the pest was reported in 33 Counties, including Taita Taveta, Tana River, Kwale, Kilifi, Lamu, Makueni, Nakuru, Narok, Kajiado, Bomet, Kakamega, Kericho, Migori, Busia, Homabay, Trans Nzoia, Kiambu, Vihiga, Bungoma, Kisii, Muranga, Tharaka Nithi, Uasin Gishu, Nyamira, Kirinyaga, Kitui, Nandi, Machakos, Elgeyo Marakwet, Kisumu, Siaya, Nyandarua and Vihiga. MoAC/Kenya provided supplies and technical assistance to the affected farmers to carry out control. No updates were available in other AAW prone countries at the time this bulletin was compiled.

Forecast: There is a likelihood of AAW infestations continue attacking young and late planted maize and other crops as well as pasture in Tanzania and Kenya, and perhaps other countries during the forecast period.

Active monitoring, reporting and timely control interventions remain critical to avert any major threat/damage to food security and livelihoods of affected communities.

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

***Quelea* species (QSP):** QSP outbreaks were reported damaging rice and sorghum in Kishapu, Kibondo, Uyui, and Geita districts in Tanzania. Where control operations were carried out by the MoA/Plant Health Services of the Ministry of Agriculture with aerial supports by the DLCO-EA. The outbreaks were controlled in 745 ha. In Kenya, the pest was reported attacking rice in West Kano Irrigation Scheme, Ahero Irrigation Scheme, Southwest Kano Irrigation Schemes and other community-based irrigation schemes in Kisumu County. Preliminary surveillance identified a few roosts and preparations were underway at the time this bulletin was.

In Zimbabwe, QSP outbreaks were reported in Norton and Kadoma in Mashonaland West Province; Kairezi, Bere, Chibombo, Hoya, Keche, Chimbobo, Dambakurima, 5 Chimoyo, Chiwenga and Nzoubvunda in Muzarabani District in Mashonaland Central Province; Chisumbanje, Save River, Chikono Village, Mutandawe Village, Green Fuel and Rimbi in Manicaland Province; Gwanda (West Nicolson) in Matabeleland South Province and Pandamatenga in Matabeleland North Province. The pest was detected attacking sorghum and millet crops. Controls operations were carried out using pesticides. Although updates were not received at the time this bulletin was compiled, it is likely that the continues attacking small grain cereal crops elsewhere in other countries and regions.

Forecast: QSP outbreaks are likely to continue posing a problem to small grain cereal growers across different regions where the rainfed and/or irrigated crops are still out in the fields.

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 April, 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 April, strategic pesticide stocks (SPS) barely changed, and only ground control operations were launched on a total of 370 ha - 30 ha in Ethiopia and 340 ha in Egypt - against immature swarms and hoppers respectively).

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, 45,456~
Eritrea	10,750~
Ethiopia	110,113~
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*™ (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 (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 Criquett Pélerin 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 Pests
FAW Spodoptera frugiperda (SFR) (Fall armyworm (FAW)
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 Information Networks
IRLCO-CSA International Red Locust Control Organization for Central and Southern Africa
ITCZ Inter-Tropical Convergence Zone
ITF Inter-Tropical Convergence Front = ITCZ)
FAO-DLIS Food and Agriculture Organizations' Desert Locust Information Service
Hoppers young, wingless locusts/ grasshoppers (Latin synonym = nymphs or larvae)
JTWC Joint Typhoon Warning Center
Kg Kilogram (~2.2 pound)
L Liter (1.057 Quarts or 0.264 gallon or 33.814 US fluid ounces)
LCC Locust Control Center, Oman
LPA Locustana pardalina
LMC/ML Locusta migratoriacapito (Malagasy locust)
MoAFSC Ministry of Agriculture, Food Security and Cooperatives
MoAI Ministry of Agriculture and Irrigation
MoARD Ministry of Agriculture and Rural Development
NALC National Agency for Locust Control
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 Nomadacris septemfasciata (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
PHS Plant Health Services
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 Unites 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

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

Yeneneh T. Belayneh, PhD
Senior Technical Advisor and Project Manager, USAID/BHA/TPQ:
ybelayneh@usaid.gov

Tel.: + 1-703-362-5721 (mobile)

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 Predication 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