

**Emergency Transboundary Outbreak Pests (ETOPs) Situation for
August with a forecast through mid-October 2019**
résumé en français est inclus

SUMMARY

The **Desert Locust** (*Schistoseca gregaria* - **SGR**¹): During August, the SGR situation continued developing in the central outbreak region (COR) and control operations treated some 4,221 ha in **Yemen, Saudi Arabia, Ethiopia** and **Sudan** combined. More swarms arrived in eastern **Ethiopia** from **Yemen** via **Djibouti** during this month and will likely continue. Mating and groups of immature adults were detected on the Red Sea coast in **Eritrea** and northwest **Somalia**, respectively. Breeding and massive hatching continued along both sides of the **Indo-Pakistan** borders in summer breeding areas in the eastern outbreak region (EOR) where close to 82,000 ha were treated. The western outbreak region (WOR) was relatively calm and only small-scale breeding was reported in **Chad** and control operations treated 110 ha in **Mali** and **Libya** combined.

Forecast: SGR will continue further developing in summer breeding areas in Yemen, Ethiopia, Eritrea, Sudan, India, and Pakistan during the forecast period. Small-scale breeding may also continue in Mali, Niger, Chad, and perhaps Niger and Libya and commence in southern Mauritania and cause locust numbers to increase. Intensive surveillance and timely preventive and curative interventions remain crucial to abate the threats the pest poses to food security and livelihoods of vulnerable people.

Red (Nomadic) Locust (*Nomadacris septemfasciata*) (**NSE**): With swarm formations expected to have intensified in the primary outbreak areas in Tanzania, Malawi, Zambia and Mozambique, NSE remains a concern. Active monitoring, surveillance and preventive interventions are critical to abate the threats the pest poses to food security and livelihoods of vulnerable farmers.

Tree Locusts, *Anacridium spp.* (**ASP**): No ASP report was received at the time this bulletin was compiled.

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

South American Locust, *Schistocerca cancellata* (**SCA**): No update was received during this month.

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

Italian (CIT), Moroccan (DMA), and the Asian Migratory Locusts (LMI):

DMA activities ended earlier than usual in most CAC countries due to hot, dry weather. CIT and LMI continued to breed, and further develop. A late received report indicated that some 220,000 ha were treated in July and a reduced number is expected during August.

Fall Armyworm (*Spodoptera frugiperda*) (FAW): FAW was reported in maize fields in several countries in eastern and southern Africa and a similar situation may have occurred in Asia and elsewhere during August (for more information, refer to pages 10-12).

African Armyworm (AAW) (*Spodoptera exempta*): No AAW outbreak was reported during this month.

Quelea spp. (QSP): QSP bird outbreaks were reported in Mashonaland West, Mashonaland Central and Manicaland provinces in **Zimbabwe**.

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

*USAID/OFDA/PSPM regularly monitors ETOPs in close collaboration with its network of national PPDs/DPVs, regional and international pest monitoring and/or control entities, including FAO, CLCPRO, CRC, DLCO-EA, and IRLCO-CSA, and research centers, academia, private sector, NGOs and others and issues concise, analytical bulletins to stakeholders. **End summary***

RÉSUMÉ

La situation du Criquet pèlerin (*Schistoseca gregaria* - SGR): En août, la situation de la SGR a continué de se développer dans la région de la flambée centrale et les opérations de lutte ont traité environ 4 221 ha au Yémen, en Arabie saoudite, en Éthiopie et au Soudan réunis. D'autres essaims sont arrivés dans l'est de l'Éthiopie en provenance du Yémen via Djibouti au cours de ce mois et vont probablement se poursuivre. Des accouplements et des groupes d'ailés immatures ont été détectés sur la côte de la mer Rouge, en Érythrée et dans le nord-ouest de la Somalie, respectivement. La reproduction et les éclosions massives se sont poursuivies des deux côtés de la frontière indo-pakistanaise dans les zones de reproduction estivale de la région est de la flambée épidémique, où près de 82 000 ha ont été traités. La région de la flambée occidentale (WOR) était relativement calme et seule une reproduction à petite échelle a été signalée au Tchad et les opérations de lutte ont traité 110 ha au Mali et en Libye réunis.

Prévisions: SGR poursuivra son développement dans les zones de reproduction estivale au Yémen, en Éthiopie, en Érythrée, au Soudan, en Inde et au Pakistan au cours de la période de prévision. Une reproduction à petite échelle pourrait également se poursuivre au Mali, au Niger, au Tchad et peut-être au Niger et en Libye et commencer dans le sud de la Mauritanie, entraînant une augmentation des effectifs acridiens. Une surveillance intensive et des interventions préventives et curatives en temps voulu restent indispensables pour réduire les menaces que l'insecte nuisible fait peser sur la sécurité alimentaire et les moyens de subsistance des personnes vulnérables.

Criquet nomade rouge (*Nomadacris septemfasciata*) (NSE) : Les formations d'essaims devant s'être intensifiées dans les principales zones touchées par la flambée en Tanzanie, au Malawi, en Zambie et au Mozambique, le NSE reste une préoccupation. Une surveillance active, une surveillance et des interventions préventives sont essentielles pour réduire les menaces que l'insecte nuisible fait à la sécurité alimentaire et aux moyens de subsistance des agriculteurs vulnérables.

Criquet Amérique centrale, *Schistocerca piceifrons piceiferons* (CAL): Aucune mise à jour n'a été reçue au moment de la rédaction du présent Bulletin.

Le criquet arborial, *Anacridium spp.*: Aucune mise à jour n'a été reçue au cours de ce mois.

Criquet d'Amérique du Sud, *Schistocerca cancellata* (SCA): Aucune mise à jour n'a été reçue au cours de ce mois.

Criquets italiens (CIT), marocains (DMA), Asian Migratory Locust (LMI): Les activités DMA ont pris fin plus tôt que d'habitude dans la plupart des pays de la CAC en raison du temps chaud et sec. CITI et LMI ont continué à se reproduire, à pondre et à se développer. Un rapport reçu tardivement indique que près de 220 000 ha ont été traités en juillet et un nombre réduit est prévu pour août.

Chenille Légionnaire d'automne (*Spodoptera frugiperda*) (FAW): FAW a été signalé dans des champs de maïs dans plusieurs pays d'Afrique orientale et australe et une situation similaire pourrait s'être produite en Asie et ailleurs en août (pour plus d'informations, reportez-vous aux pages 10 à 12).

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

***Quelea spp. oiseaux* (QSP):** QSP d'oiseaux ont été signalées dans les provinces de Mashonaland West, Mashonaland Central et Manicaland au Zimbabwe.

La surveillance active et le suivi, ainsi que le partage des informations ETOP et des interventions préventives opportunes restent essentiels pour atténuer les menaces que représentent les ETOP pour la sécurité alimentaire et les moyens de subsistance des communautés vulnérables.

USAID / OFDA / PSPM surveille régulièrement les ETOP en étroite collaboration avec son réseau de PPD / DPV nationaux, d'entités régionales et internationales de surveillance et / ou de lutte antiparasitaire, y compris la FAO, la CLCPRO, le CRC, le DLCO-EA et l'IRLCO-CSA, et des centres de recherche, universités, secteur privé, ONG et autres et publie des bulletins analytiques concis à l'intention des parties prenantes. Fin de résumé

Note: This and previous ETOP Bulletins and SITREPs can be accessed and downloaded on USAID Pest and Pesticide Monitoring website: [USAID Pest and Pesticide Monitoring](#)

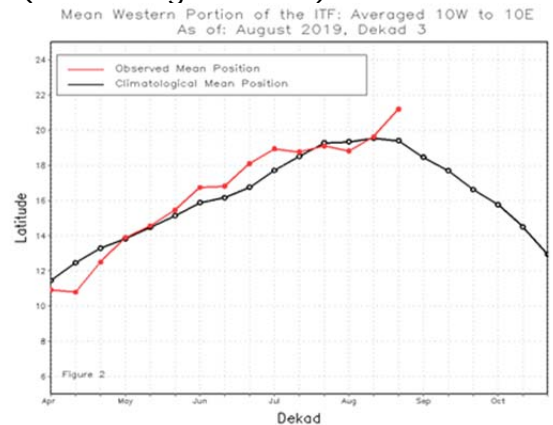
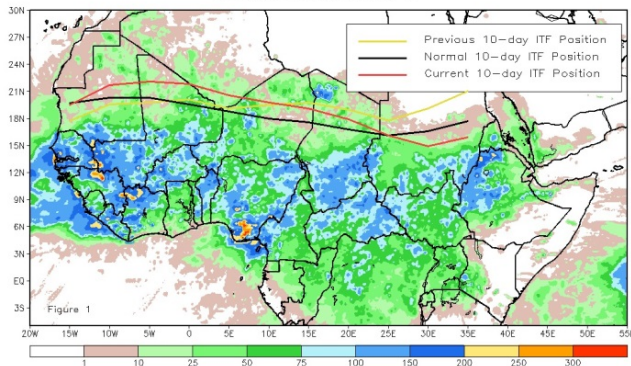
Weather and Ecological Conditions

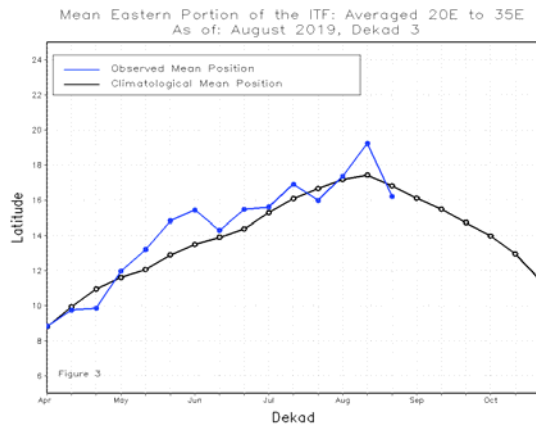
During 21-31, August, the ITF has straightened in far-west while it has moved southward in the far-east of northern Africa compared to the 2nd dekad of the month. The mean position of the ITF is approximated at 21.2N between 10W-10E, which represents a slight northward movement compared to the 2nd dekad. Between 15W-25E, the ITF moved northward compared to the normal position which could explain increased rainfall, floods and landslides in Senegal, Mauritania, Senegal, and southern Morocco.

In the eastern region, between 25E-35E, the ITF significantly moved southward more so at 30E and resulted below average rainfall over the central-eastern part of Sudan. In its far-eastern zone, ITF caused flood and landslides in Kenya and Uganda. The first figure in the adjacent column shows the current position (red) of the ITF relative to the long-term average position (black) during this dekad and its position during the 2nd dekad of August (yellow).

The graphic illustrations shown below are time series and show the latitudinal values of the western and eastern portions of the ITF, respectively, and their seasonal evolutions since April, 2019 (NOAA August 2019).

Current vs. Normal Dekadal ITF Position and RFE Accumulated Precipitation (mm) August 2019, Dekad 3





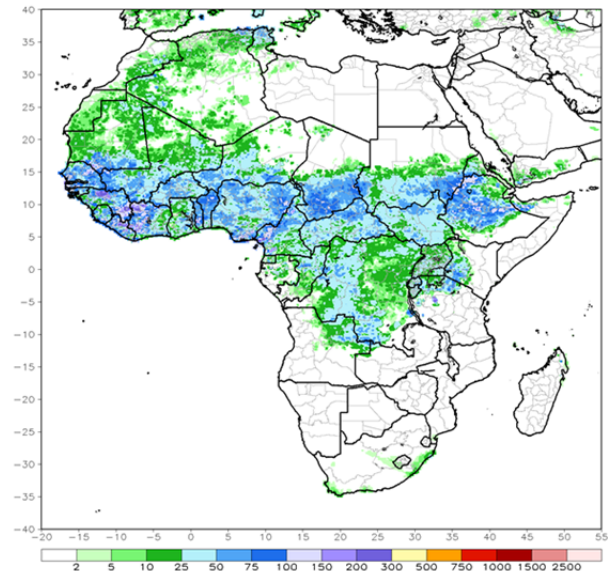
During the past 30 days, southwestern Mauritania, parts of Guinea-Bissau, local areas in eastern Liberia, parts of Ghana, local areas in Togo and Benin, portions of Nigeria and Cameroon, parts DRC, and local areas in South Sudan and Ethiopia had below-average rainfall. Rainfall was above-average over much of Senegal, Guinea, Sierra Leone, much of Liberia, Mali, Burkina Faso, Cote d'Ivoire, local areas in Ghana, Togo and Benin, much of Niger, portions of Nigeria, western Cameroon, much of Chad and CAR, parts of Congo, western DRC, Uganda, South Sudan, Sudan, many parts of Ethiopia, northern Tanzania, Uganda and western Kenya (NOAA, 9/2019).

In **Algeria**, ecological conditions are becoming favorable for locusts to develop in the periphery of agricultural areas and the extreme south of the country. In **Morocco**, the Draa Valley and southeastern part of the country may favor SGR development. In **Chad**, several areas in South of Fada, Kalait, west of Amdjaress, south of Iriba, Guéréda (Ennedi, Abéché), Ouaddaï, and north of Arada received light to good rains with the average temperature range of 25° to 38°C during August (CNLA/Mali, CNLA/Mauritania, CNLAA/Morocco, CNLA/Tunisia, INPV/Algeria).

In **COR**: Weekly rainfall totals exceeded 150 mm over local areas in portions of

Sudan and South Sudan, parts of Uganda and Ethiopia, and local areas in Kenya, and Somalia during the 2nd dekad of August. In Sudan, moderate to heavy showers were reported in summer breeding areas during the 1st week of August and during the same time, parts of DRC and Ethiopia received below average rainfall. In previous dekads, above-average rainfall was recorded over much of northern Congo, many parts of DRC, Uganda, South Sudan, Sudan, and parts of Ethiopia and western Kenya, but below-average rainfall was reported in parts DRC, and portions of Ethiopia. (NOAA, 8/2019, PPD/Sudan).

ARC2 7-Day Total Rainfall (mm)
Period: 26Aug2019 – 01Sep2019



Rainfall 26 25 August – 1 September
(NOAA, 9/2019)

In **Yemen**, heavy rain was reported on the Red Sea coast and the Aden coastal areas received light to moderate rain during August. Moderate to heavy rains associated with flooding were reported in West Shabwah and South Marib during the 1st dekad of the month. As a result, vegetation and soil moisture have improved along the Red Sea coasts and Gulf of Aden, including areas between

Almlah, North AlWaht and Modeah NE Zingbar (DLMCC/Yemen).

Forecast for 4-17, September, 2019

There is an increased chance for above-average rainfall over parts of Guinea-Bissau, Guinea, Sierra Leone, northern Cote d'Ivoire, and northern Liberia. There is an increased chance for above-average rainfall over southern Nigeria and central Cameroon. There is an increased chance for below-average rainfall over a portion of central DRC. There is an increased chance for above-average rainfall over parts of eastern CAR, northeastern DRC, South Sudan, and parts of southwestern Ethiopia. There is an increased chance for below-average rainfall over parts of Sudan and anomalous lower-level northerly flow is expected to suppress rainfall in the region. There is an increased chance for above-average rainfall across Guinea, Sierra Leone, southern Mali, northern Cote D'Ivoire, Burkina Faso, Northern Ghana, Togo, and Benin, Nigeria, Cameroon, southern Chad, and parts of CAR. There is an increased chance for above-average rainfall over parts of eastern DRC (NOAA September 2019).

In **EOR**, moderate to heavy rain was reported on both sides of the Indo-Pakistan borders during the 1st and 2nd dekads and light to moderate rain was recorded towards the end of the month in Tharparkar and Cholistan, Pakistan and adjacent areas in West Rajasthan, India. Monsoon rains continued bringing above normal rainfall (18% and 42% higher than normal in West Rajasthan and East Rajasthan, respectively). As a result of increased rainfall, breeding conditions remained favorable in both countries during this month (FAO-DLIS).

NSE Outbreak Regions: During August, a rise in temperature was witnessed

across the NSE outbreak regions heralding the coming of the hot dry season. This has caused vegetation in the primary outbreak areas in the Kafue Flats in Zambia, Ikuu-Katavi, Rukwa Valley and Malagarasi Basin in Tanzania to start drying. Extensive vegetation burning was reported in those regions and in Lake Chilwa plains in Malawi. On the contrary, vast area of Lake Chihuta plains are still submerged. Vegetation was relatively green in **Buzi–Gorongosa plains** in **Mozambique** largely due to residual moisture from extensive flooding from **Cyclone Idai** during March (IRLCO-CSA).

CAC Region

In the CAC region, hot and dry weather prevailed throughout the region with natural vegetation drying out in most of the locust breeding areas.

***Note:** Changes in the weather pattern such as increased or decreased temperature and precipitation can contribute to ecological shift in ETOP habitats and could increase or decrease the risk of pest outbreaks, resurgence and emergence of new pests. For example, in Uzbekistan, Moroccan locust (DMA) which is normally a low to medium altitude pest has shown a considerable vertical habitat expansion by up to 1,000 feet or 300 meters from its regular ambient altitude due to warmer higher elevations.*

*The **Asian migratory locust**, an insect that normally has one generation per year, has begun breeding twice per year. These anomalies which are largely attributed to the change in the weather patterns and associated ecological shift can become serious concerns to farmers, rangeland managers, crop protection experts, development and humanitarian partners, etc. Regular monitoring, documenting and reporting anomalies in*

pest behavior and on habitat shifts are crucial to help avoid/minimize potential damage to crops, pasture and reduce negative impacts on food security and livelihoods of vulnerable populations and communities.

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

End note.

Detailed Accounts of ETOP Situation and a Forecast for the Next Six Weeks are provided below

SGR – WOR: In WOR, small-scale breeding occurred in eastern Chad, and Mali during and a similar situation is likely in northern Niger in August. Isolated solitary adults were reported near irrigated areas in the central Sahara and West of Tamenrassat, and south of Adrar, Algeria. Control operations were reported on 70 ha in the southwest **Libya** near Ghat. No locusts were reported in Morocco or Tunisia during this time.

In **Chad**, four survey teams have been deployed to Fada (covering Ennedi East and West), Kalait (covering North Batha, South Ennedi), Arada (covering North Batha and South Ennedi) and Abeche (covering Ouaddai and East Batha) located in the eastern side of the country bordering western Sudan. Isolated solitary immature, maturing and mature adults and low density solitary 4th-5th instar hoppers were detected in the southeast between Kalait and Fada and southwest of Guereda during the 2nd and 3rd dekads of August. Hoppers were also detected north of Arada and southeast of Iriba during the 2nd dekad of the month. However, the situation was generally calm in areas that were surveyed. In **Mali**, ecological conditions continued improving in the outbreak areas and small-scale breeding and low numbers of adults were detected in parts of Adrar des Iforas and a mixture of solitary adult SGR

and migratory locusts were detected north of Timbuktu and treated on 40 ha west of Timbuktu near Lake Faguibine (ANLA/Chad, CNLA/Mauritania, CNLAA/Morocco, CNLA/Tunisia, CNLAP/Mali, FAO-DLIS, INPV/Algeria).

Forecast: In **Chad**, immature, maturing and mature adults mostly those that arrived from **Sudan** in June and July, and hoppers that were detected in several places in Fada, Kalait and eastern areas bordering Sudan will likely continue developing and start breeding in September and increase locust numbers. *In **Mauritania** ecological conditions will continue improving in summer breeding areas in the south and southeast where heavy rainfall was reported and allow locusts to start breeding and locust numbers to increase during the forecast period. In **Morocco** the situation will likely remain calm during the forecast period.* Vigilance remains critical to abate further breeding during the coming weeks and months. Elsewhere in the region, SGR situation will remain calm during the forecast period (ANLA/Chad, CNLAP/Mali, CNLA/Mauritania, CNLAA/Morocco, CNLA/Tunisia, FAO-DLIS, INPV/Algeria).

SGR – COR: In COR, SGR continued developing in Yemen, Ethiopia, Somalia, Sudan, Saudi Arabia and Eritrea during August. In **Yemen** SGR remained serious during August where numerous immature and mature swarms and groups of adult locusts continued to form and move to the coastal areas. Breeding began in the northern part of Tehama coastal planes where mature swarms and groups of adults were observed mating and laying eggs in several locations. Breeding continued near Bayhan in the interior of the country and on the southern coast near Lahij. DLMCC staff in Aden conducted limited survey and control (110 ha) in accessible areas in Shabwah,

Abyan and Lahij provinces with assistance from FAO. Sana'a based DLMCC officers were planning on conducting similar activities along the coastal planes in Tehama, Marib and Aljawf in the coming weeks. *The ongoing insecurity situation and lack of adequate resources continue undermining surveillance, monitoring and control to prevent the locust threat to livelihoods of affected communities. FAO and CRC are working with the national units and stakeholders to support the national locust team to carry out timely survey and execute control interventions.*

It is to be recalled that in the recent past, USAID supported the desert locust control units by rebuilding the center and offices, providing equipment and materials and supporting training of technical staff in locust surveillance, monitoring and control operations. Much of the equipment and materials, including vehicles, communication and camping gears that were provided by donors and the UN were looted, damaged or destroyed by the third party.

In **Ethiopia**, small-scale breeding continued and forming hoppers in eastern and northeastern parts of the country from swarms that arrived from Yemen through **Djibouti**. According to PPD/Ethiopia (Sep 3), at least three mixed immature and mature swarms were observed moving between Afar and Amhara Administrative regions (during the last few days of August and early September). Aerial and ground control operations were effected at least in four places. Intensive search for newly hatched hoppers and control are in progress. Technical experts from the PPD HQ have been deployed to the affected regions in the northern, northeastern and eastern parts and Dire Dawa. According to PPD, GoE has provided 10,000 l of pesticides and funds to support field

survey and control operations for two months. *PPD noted that additional resources are much needed to support survey, monitoring and control interventions for the next two months.* As of yesterday, ground and aerial control operations treated more than 435 ha. In northern **Somalia**, adult groups were formed and some moved to eastern Ethiopia. In **Sudan** mature and maturing adults were reported breeding near Umsayala and East Kassala Town and control operations treated 200 ha.



FAO-DLIS, September, 2019

In **Saudi Arabia**, immature adults were reported in several places and began mating near Jizzan. Ground operations treated 3,900 ha during this month. In **Oman**, low density solitary immature and mature adults were detected in northern part of the country, but did not necessitate interventions. In **Djibouti**, groups of immature and mature adults that may be remnants of swarms from Yemen were detected during surveys in the northwest between Tajourah and Moudo and in the south near Ali Sabiah, but control operations were not necessitated during this time. No locusts were reported elsewhere in the COR during this time (DLMCC/Yemen, FAO-DLIS, LCC/Oman, Media outlet, PPD/Djibouti, PPD/Ethiopia, PPD/Somalia, PPD/Sudan).

Forecast: *SGR situation will continue further developing and becoming more serious in COR. Swarms that moved to*

the highland areas in **Yemen** will likely continue arriving on the coastal areas and breed during the coming weeks. In **Ethiopia** swarms that arrived from Yemen through **Djibouti** and adult groups that moved from northwest **Somalia** to the eastern part of the country will likely continue developing and bands and perhaps fledglings will form during the forecast period.

Additional swarms from **Yemen** may arrive in eastern **Ethiopia** via **Djibouti** and start breeding in areas of recent rainfall. Should conditions become unfavorable in these regions, locusts will likely form groups and move further north and reach Eritrea and perhaps Sudan during the forecast period. In **Sudan** hatching will commence and cause locust numbers to increase during the forecast period. In **Eritrea**, breeding will likely start in the western lowlands and along the Red Sea coast where good rain was reported. In **Somalia**, locusts may continue appearing in northwest highlands near Hargaisa during the forecast period. In **Saudi Arabia** mating that was reported in the southern coastal areas will cause hatching and increase locust numbers during the forecast period. In **Oman**, ecological conditions remained unfavorable and locust activities are not expected during the forecast period. The rest of the COR will likely remain calm during the forecast period (DLMCC/Yemen, FAO-DLIS, FAO/Somalia, LLC/Oman, OFDA/PSPM, PPD/Djibouti, PPD/Ethiopia, PPD/Somalia, PPD/Sudan).

SGR - EOR: In EOR, SGR situation continued further developing *and becoming more serious in summer breeding areas in Southwest Asia along both sides of the **Indo-Pakistan** borders during this month.* In **India**, breeding continued in Barmer, Jaisalmer and Bikaner districts of western Rajasthan.

Intensive control operations treated more than 65,089 ha during this month. In **Pakistan**, 2nd generation breeding caused egg-laying and hopper developments in Cholistan, Nara and Tharparkar deserts where groups of adults were reported. Ground control operations treated more than 16,455 ha in **Pakistan** during this month.

Forecast: Breeding and hatching is expected to continue and form more locusts in areas that received good rain in both sides of the **Indo-Pakistan** borders. *Despite the increased ground control operations launched in both countries, there remains a risk of further breeding and new swarms starting to form during the forecast period (FAO-DLIS).*



FAO-DLIS, September, 2019 (green = calm/no threat to crops; yellow = caution/potential threat to crops, orange = threat to crops, red = significant threat to crops)

Active surveillance, monitoring, preparedness and timely preventive interventions remain critical to avert any significant locust developments and the potential threat they to food security and livelihoods of vulnerable communities (FAO-DLIS, OFDA/PSPM).

Red (Nomadic) Locust (NSE): NSE swarms persisted in Kafue Flats, **Zambia**. A similar situation was expected to exist in Ikuu–Katavi and Rukwa valley plains and Malagarasi Basins in **Tanzania** and Dimba plains in **Mozambique**. Survey

carried out by IRLCO-CSA in collaboration with MinAgri/Malawi from 19th to 31st August, in Mptasanjoka Dambo, Lake Chirwa/Lake Chiuta plains revealed the presence of scattered adults (3-5 locusts/m²) and low density swarmlets (3-8 locusts/m²)(IRLCO-CSA).

Forecast: NSE swarms will likely persist in the Ikuu-Katavi plains, Malagarasi Basin, Rukwa Valley in Tanzania, Kafue Flats in Zambia and Dimba plains in Mozambique. With the dry season progressing and vegetation areas shrinking, the locusts are expected to continue further concentrating and form denser groups and swarms. If left uncontrolled, the swarms are likely to migrate to cropping areas in the affected countries and neighboring countries and challenge food security of vulnerable people and communities (IRLCO-CSA).

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

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

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

Italian (CIT), Moroccan (DMA) and Migratory (LMI) Locusts in Central Asia and the Caucasus (CAC): A late received update indicated that DMA activities ended earlier than usual in most countries in the CAC largely due to hot and dry weather. CIT and LMI continued mating, egg-laying, and further developing during this month. A late received report indicated that close to

220,000 ha were treated in the CAC region during July and a reduced number is expected for August. *In 2019, close to 1.8 m ha were controlled against the three locust species in 10 countries combined* (FAO-ECLC, OFDA/PSPM).

Forecast: DMA seasonal activities have, for the most part, ended till next spring. CIT and LMI will continue further developing with egg-laying, hopper formations and fledging expected to progress in some parts of the CAC through the forecast period. Preventive interventions remain essential to abate any crop damage (FAO-ECLC, OFDA/PSPM).

Fall armyworm (FAW) (*S. frugiperda*) Low level FAW infestations were reported in irrigated maize in **Zimbabwe** and **Malawi** and control operations were undertaken by the affected farmers with technical and material support from MinAgri. The pest was also reported on maize crops in Dire Adwa as well as in Amhara, Binesahngul, Tigray and Oromo admin regions in **Ethiopia**. Traditional and chemical control operations were employed. Moderate outbreaks were reported in late planted maize in Central, Eastern and Coastal Regions of **Kenya** where control operations were carried out by the affected farmers with assistance from MinAgri. No updates were received in other regions at the time this Bulletin was compiled, however, it is likely that the pest has been a problem to maize and other cereal crops in different regions where it had been present (IRLCO-CSA, OFDA/PSPM).

Forecast: FAW will likely continue affecting rain-fed and/or irrigated maize and other crops in several countries across sub-Saharan Africa, southwest and southeast Asia, etc., during the forecast period (OFDA/PSPM).

Note: Seasonal movements of FAW coupled with trade and travel by land, water (sea) and air can significantly increase further spread of FAW across continents and will contribute to its establishment in suitable habitats and climatological conditions. With its voracious appetite and more than 186 species of plants to choose from, FAW is highly unlikely to ever go hungry and terminate its presence in maize and other crop growing countries (Reuters, OFDA/PSPM). **End note.**

Activity updates:

The USAID/OFDA sponsored community-based fall armyworm monitoring, surveillance and management project (CBFAMFEW) has been implemented in six countries in eastern Africa from 2017 through August, 2019. The two year project has trained hundreds of farmers, agricultural agents, district officers, village leaders, national plant protection staff and experts and others on FAW-360. CBFAMFEW project has established a network of forecasters and scouts across 300 villages in the six countries, developed training and awareness materials and information packages, including training of trainers manual, posters, flyers, etc. as well as established strong relationships and links among experts from participating countries and implementing partners. The project also was able to garner commitments to ensure sustainability of the initiative within the national entities. Similarly, commitments were secured from line Ministry stakeholders, and others to continue supporting the continuation of the CBFAMFEW-like.

Note: Several species of natural enemies of FAW have been identified in Ethiopia, Kenya, Tanzania, Madagascar, India, etc. and studies are being conducted on these natural enemies to better understand

their efficacy, environmental impacts and safety, etc. Some are being tested alongside other agro-ecological tools, e.g., push-pull technology, etc., in an effort to develop effective, affordable, accessible, adaptable and sustainable means of managing the pest

<http://www.informaticsjournals.com/index.php/jbc/article/viewFile/21707/17850>. **End note.**

Information resources

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

CBFAMFEW project has developed a ToT in English language and <http://www.fao.org/3/CA2924EN/ca2924en.pdf> twenty eight (28) posters and flyers in 9 languages, including, Amharic, English, French, Luganda, Kinyarwanda, Oromfa, Runyankore and Swahili for dissemination across eastern Africa and the Horn. Participating countries have expressed interest to further translate the flyers into additional local languages for wider distributions.

USAID/BFS and OFDA co-funded IPM based FAW management guidance document is available in English and French and will soon be available in Portuguese language:

https://www.usaid.gov/sites/default/files/documents/1867/Fal-l-Armyworm-IPM-Guide-for-Africa-Jan_30-2018.pdf

BFS and SAWBO (Scientific Animation Without Borders) animation video clip on FAW: <https://sawbo-animations.org/video.php?video=/www.youtube.com/embed/5rxlpXEK5q8>

USAID Pesticide Evaluation Report and Safer Use Action Plan (PERSUAP) contains a list of pesticides assessed as relatively safer for use against FAW:

<https://ecd.usaid.gov/repository/pdf/50065.pdf>

CABI FAW Portal: identification

guides: <https://www.cabi.org/ISC/fallarmyworm>

Bt maize and the fall armyworm in Africa (Africa Center for Biodiversity, June 2018):

<https://acbio.org.za/sites/default/files/documents/BT%20Maize%20Fall%20Army%20Worm%20report.pdf>

Invasive Species Compendium Datasheets, maps, images, abstracts and full text on invasive species of the world:

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

FAO interactive FAW Risk-Index heat map to help monitor potential risk of FAW infestation in countries where the pest has been reported

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

NURU, a mobile phone application detects FAW eggs, larvae, pupae and damage on maize crops is developed by Penn State University in collaboration with UNFAO:

<http://www.fao.org/news/story/en/item/1141889/icode/>

Dissemination of safer, affordable, acceptable IPM-based pest management and assessment tools remains critical in abating FAW infestations and to minimize crop damage.

African Armyworm (AAW): AAW was not reported in the southern and eastern outbreak regions or elsewhere during this month (DLCO-EA, IRLCO-CSA).

Forecast: AAW activities are not expected in southern Africa until perhaps late November/early December (OFDA/PSPM) <http://www.armyworm.org/>

Note: OFDA/PSPM has developed printable and web-based interactive maps for AAW project sites in project countries and potential participating countries:

<http://usaid.maps.arcgis.com/apps/Viewer/index.html?appid=8ff7a2eefbee4783bfb36c3e784e29cb>

<http://usaid.maps.arcgis.com/apps/Viewer/index.html?appid=9d2ab2f918284595819836d1f16a526f>

and it is considering a similar map for the CBFAMFEW project sites

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

Strong quarantine services and vigilance, monitoring and surveillance remain essential to prevent invasive pests invading a new territory.

Quelea sp. (QSP): QSP bird outbreaks were reported in Mashonaland West, Mashonaland Central and Manicaland provinces in **Zimbabwe** where some 27 roosts covering an estimated area of 287 ha were treated (IRLCO-CSA).

Forecast: QSP bird outbreaks are likely to be a problem to irrigated small grain cereal crops in Tanzania, Kenya,

Mozambique and Zimbabwe during the forecast period (IRLCO-CSA).

Facts: QSP birds can travel ~ 100 km/day in search of food. An adult Quelea bird can consume 3-5 grams of grain and destroy the same amount each day. A medium density Quelea colony can contain up to a million or more birds and is capable of consuming and destroying 6,000 to 10,000 kg of seeds/day, enough to feed 12,000-20,000 people/day (OFDA/AELGA).

Rodents: No update was received on rodents during this month, but the pest is a constant threat to field and storage crops and vigilance and rapid response remain essential to protect crops and produce.

FACTS: On average, an adult rat can consume 3-5 gm of food (grain, etc.) per day; a population of 200 rats/ha (an extremely low density/unit area) can consume a quantity enough to feed an adult sheep/day, not to mention the amount of food the rats can damage, destroy, contaminate making it unfit for human consumption, not to mention the zoonotic disease this pest carries and can transmit.

All ETOP front-line countries must maintain regular monitoring and surveillance as needed. During cropping seasons, regular scouting is critical to avoid crop damage/losses. Invasion countries should remain alert. DLCO-EA, IRLCO-CSA, DLCCs, DLMCC, CNLAs, national DPVs and PPDs, ELOs are encouraged to continue sharing ETOP information with stakeholders as often as possible. It is critical that lead farmers, field scouts, community forecasters and others remain vigilant and report ETOP detections to relevant authorities as quickly as immediately.

OFDA's Contributions to ETOP Abatement Interventions

USAID/OFDA/PSPM is sponsoring an operational research on soil amelioration to manage the Senegalese grasshopper (OSE) through Arizona State University. OSE is a notorious pest of cereal crops and pasture causing serious damage to small-scale farmers in its wide geographic coverage which extends from the Canaries, Cape Verde to nearly all sub-Saharan regions of Africa to India and neighboring countries across a wide swath. OSE occurs more frequently than several other grasshopper/locust species and is a constant threat to small-scale farmers.

USAID/OFDA/PSPM is interacting with interested parties to explore means and ways to expand innovative technologies to AAW, FAW and SGR affected countries to contribute to food security to benefit farmers and rural communities.

The online Pesticide Stock Management System (PSMS) that was developed by FAO with financial assistance from donors, including USAID/OFDA, continues benefiting participating countries across the globe. Thanks to the system, SGR frontline countries and others are effectively managing their strategic pesticide stocks and have been able to minimize/avoid accumulation of unusable and toxic obsolete pesticides and empty pesticide containers (see table 1).

Note: A sustainable Pesticide Stewardship (SPS) can contribute to strengthening a pesticide delivery system (PDS) at the national and regional levels. A strong and viable PDS can effectively reduce pesticide related human health risks, minimize environmental pollution, reduce pest control cost, improve food security and contribute to the national

economy. A viable SPS can be effectively established by linking key stakeholders across political borders and geographic regions. **End note.**

OFDA/PSPM discourages the use of highly hazardous pesticides and promotes an IPM approach to minimize risks associated with pesticide stockpiling, poisoning and pollution. A judiciously executed triangulation of surplus stocks from countries with large inventories to countries that can safely and effectively utilize and create a win-win situation worth considering

Inventories of Strategic Pesticide Stocks for SGR Prevention and Control

Inventory of strategic stocks of SGR pesticides changed during this month by close to 85,897 ha treated - 81,544 ha from EOR, 4,221 ha in COR and 110 in WOR.

Table 1. Inventory of Strategic SGR Pesticide Stocks in Frontline Countries

Country	Quantity (l/kg)*
Algeria	1,186,326~
Chad	34,100
Egypt	10,253 ULV, 45,825 l
Eritrea	580~
Ethiopia	9,246~
Libya	24,930~
Madagascar	206,000~ + 100,000 ^D
Mali	3,560
Mauritania	39,900
Morocco	3,404,372.5 ^D
Niger	75,750~
Oman	9,953~
Saudi Arabia	25,184~ (-42,628l?)
Senegal	156,000~
Sudan	106,507
Tunisia	62,200 obsolete
Yemen	35,369 ^D + 180 kg GM~

* Includes different kinds of pesticide and formulations - ULV, EC and dust;

~ data may not be the current;

^D = Morocco donated 100,000 l of pesticides to Madagascar and 10,000 l to Mauritania in 2015

^D = In 2013 Morocco donated 200,000 l to Madagascar

^D = Saudi donated 10,000 to Yemen and pledged 20,000 l to Eritrea

^{DM} = Morocco donated 30,000 l of pesticides to Mauritania

GM = *GreenMuscle*TM (fungal-based biological pesticide)

CBAMFEW *Community-based armyworm monitoring, forecasting and early warning*

CERF *Central Emergency Response Fund*

CIT *Calliptamus italicus (Italian Locust)*

CLCPRO *Commission de Lutte Contre le Criquet 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 Pest*

Fledgling *immature adult locust /grasshopper that has pretty much the same phenology as mature adults, but lacks fully developed reproductive organs to breed*

GM *GreenMuscle[®] (a fungal-based biopesticide)*

LIST OF ACRONYMS

AAW *African armyworm (Spodoptera expempta)*

AELGA *Assistance for Emergency Locust Grasshopper Abatement*

AFCS *Armyworm Forecasting and Control Services, Tanzania*

AfDB *African Development Bank*

AGRA *Agricultural Green Revolution in Africa*

AME *Anacridium melanorhodon (Tree Locust)*

APLC *Australian Plague Locust Commission*

APLC *Australian Plague Locust Commission Bands groups of hoppers marching pretty much in the same direction*

ASARECA *Association for Strengthening Agricultural Research in Eastern and Central Africa*

CABI *Center for Agriculture and Biosciences International*

CAC *Central Asia and the Caucasus*

ha	hectare (= 10,000 sq. meters, about 2.471 acres)	PBB	Pine Bark Beetle (<i>Dendroctonus</i> sp. – true weevils)
ICAPC	IGAD's Climate Prediction and Application Center	PHD	Plant Health Directorate
IGAD	Intergovernmental Authority on Development (Horn of Africa)	PHS	Plant Health Services, MoA Tanzania
IRIN	Integrated Regional Information Networks	PPD	Plant Protection Department
IRLCO-CSA	International Red Locust Control Organization for Central and Southern Africa	PPM	Pest and Pesticide Management
ITCZ	Inter-Tropical Convergence Zone	PPSD	Plant Protection Services Division/Department
ITF	Inter-Tropical Convergence Front = ITCZ)	PRRSN	Pesticide Risk Reduction through Stewardship Network
FAO-DLIS	Food and Agriculture Organizations' Desert Locust Information Service	QSP	Quelea species (Red Billed Quelea bird)
Hoppers	young, wingless locusts/grasshoppers (Latin synonym = nymphs or larvae)	SARCOF	Southern Africa Region Climate Outlook Forum
JTWC	Joint Typhoon Warning Center	SCA	<i>Schistocerca cancellata</i> (South American Locust)
Kg	Kilogram (~2.2 pound)	SFR	<i>Spodoptera frugiperda</i> (SFR) (Fall armyworm (FAW))
L	Liter (1.057 Quarts or 0.264 gallon or 33.814 US fluid ounces)	SGR	<i>Schistoseca gregaria</i> (the Desert Locust)
LCC	Locust Control Center, Oman	SPI	<i>Schistocerca piceifrons piceiferons</i> (Central American Locust)
LMC	<i>Locusta migratoriacapito</i> (Malagasy locust)	SSD	Republic of South Sudan
LMM	<i>Locusta migratoria migratorioides</i> (African Migratory Locust)	SPB	Southern Pine Beetle (<i>Dendroctonus frontalis</i>) – true weevils
LPA	<i>Locustana pardalina</i>	SWAC	South West Asia DL Commission
MoAFSC	Ministry of Agriculture, Food Security and Cooperatives	PBB	Pine Bark Beetle
MoAI	Ministry of Agriculture and Irrigation	PSPM	Preparedness, Strategic Planning and Mitigation (formerly known as Technical Assistance Group - TAG)
MoARD	Ministry of Agriculture and Rural Development	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.
NALC	National Agency for Locust Control	UF	University of Florida
NCDLC	National Center for the Desert Locust Control, Libya	USAID	the United States Agency for International Development
NOAA (US)	National Oceanic and Aeronautic Administration	UN	the United Nations
NPS	National Park Services	WOR	Western SGR Outbreak Region
NSD	Republic of North Sudan		
NSE	<i>Nomadacris septemfasciata</i> (Red Locust)		
OFDA	Office of U.S. Foreign Disaster Assistance		

- ZEL *Zonocerus elegans*, the elegant grasshopper
- ZVA *Zonocerus variegatus*, the variegated grasshopper, is emerging as a fairly new dry season pest, largely due to the destruction of its natural habitat through deforestation, land clearing, etc. for agricultural and other development efforts and due to climate anomalies

Contact Person:

If you need more information or have any questions, comments or suggestions or know someone who would like to freely subscribe to this report or unsubscribe, please, reach out to:

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For previous ETOP SITREPs/Bulletins, click on the following website:

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