

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

SUMMARY

The **Desert Locust** (*Schistoseca gregaria* - **SGR**¹): During October, SGR remained active in the central outbreak region (COR) in **Ethiopia, Sudan, Somalia, Saudi Arabia**, and **Yemen** where more than 8,925 ha were treated. In the eastern outbreak region (EOR), SGR activities continued in **India** and **Pakistan** where control operations treated more than 105,870 ha during this month. The western outbreak region (WOR) remained relatively calm and only 44 ha were treated in **Algeria** and **Niger** combined during this month.

Forecast: In COR, SGR will likely continue breeding in Sudan, Eritrea, Yemen, and Saudi Arabia. Swarms will likely form in Ethiopia and move to northern Somalia and Eritrea, northern Kenya and southern Ethiopia following the seasonal wind. Some swarms may also arrive in northeast Oman from summer breeding areas along Indo-Pakistan region in EOR while a few swarms may also begin moving to spring breeding areas in western Pakistan and eastern Iran during the forecast period. In WOR, small-scale breeding may occur in northwest Mauritania and southern Algeria.

Red (Nomadic) Locust (*Nomadacris septemfasciata*) (**NSE**): NSE swarms persisted in Ikuu Katavi plains, Malagarasi Basins, Rukwa Valley in **Tanzania** and in Dimba plains in **Mozambique** during October. A similar situation is likely in Mptasanjoka Dambo, Lake Chirwa/Lake Chiuta plains, Malawi where scattered low density swarmlets persisted.

Tree Locusts, *Anacridium spp.* (**ASP**): ASP outbreak presented in Turkan county **Kenya** during October.

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.

Italian (CIT), Moroccan (DMA), and Asian Migratory Locusts (LMI): Locust activities had ended in CAC and the region will remain calm until next spring.

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

Fall Armyworm (*Spodoptera frugiperda*) (**FAW**): FAW infestations were reported in irrigated maize in Malawi and Zimbabwe and the pest is expected to have continued being a problem to rainfed and irrigated crops across invasion countries (for more information, please refer to pages 9-10).

African Armyworm (AAW) (*Spodoptera exempta*): AAW outbreak was not reported during this month.

Quelea spp. (QSP): QSP bird outbreaks were reported in sorghum fields in northern Showa in Ethiopia and in Mwea Irrigation Scheme in Kirinyaga County, Kenya.

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 octobre, SGR est resté actif dans la région épidémie centrale en Éthiopie, au Soudan, en Somalie, en Arabie saoudite et au Yémen, où plus de 8 925 ha ont été traités. Dans la région est de l'épidémie (EOR), les activités SGR se sont poursuivies en Inde et au Pakistan, où les opérations de lutte ont couvert plus de 105,870 ha au cours de ce mois. La région de la flambée occidentale (WOR) est restée relativement calme et seuls 44 ha ont été traités en Algérie et au Niger combinés au cours de ce mois.

Prévisions: Au COR, SGR poursuivra probablement sa reproduction au Soudan, en Érythrée, au Yémen et en Arabie Saoudite. Des essaims vont probablement se former en Éthiopie et se déplacer vers le nord de la Somalie et de l'Érythrée, le nord du Kenya et le sud de l'Éthiopie à la suite des vents saisonniers. Certains essaims peuvent également arriver dans le nord-est d'Oman en provenance de zones de reproduction estivale situées le long de la région Indo-Pakistan, alors que quelques essaims pourraient également commencer à se déplacer vers des zones de reproduction printanière dans l'ouest du Pakistan et l'est de l'Iran pendant la

période de prévision. Dans le WOR, une reproduction à petite échelle peut avoir lieu dans le nord-ouest de la Mauritanie et le sud de l'Algérie.

Criquet nomade rouge (*Nomadacris septemfasciata*) (NSE): Des essaims de NSE ont persisté dans les plaines d'Ikuu Katavi, les bassins de Malagarasi, la vallée de Rukwa en Tanzanie et dans les plaines de Dimba au Mozambique en octobre. Une situation similaire est vraisemblable à Mptasanjoka Dambo, dans les plaines du lac Chirwa / du lac Chiuta, au Malawi, où des essaims épars de faible densité ont persisté.

Le criquet arborial, *Anacridium spp*: Épidémie d'ASP présentée dans le comté de Turkana au Kenya en octobre.

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

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 acridiennes étaient terminées à CAC et la région restera calme jusqu'au printemps prochain.

Chenille Légionnaire d'automne (*Spodoptera frugiperda*) (FAW): des infestations ont été signalées dans le maïs irrigué au Malawi et au Zimbabwe et il est probable que l'organisme nuisible continue de poser problème aux cultures pluviales et irriguées dans les pays d'invasion (pour plus d'informations, reportez-vous aux pages 9 et 10).

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

***Quelea spp. oiseaux* (QSP):** Des épidémies d'oiseaux QSP ont été signalées dans des champs de sorgho dans le nord de Showa en Éthiopie et dans le système d'irrigation de Mwea dans le comté de Kirinyaga, au Kenya.

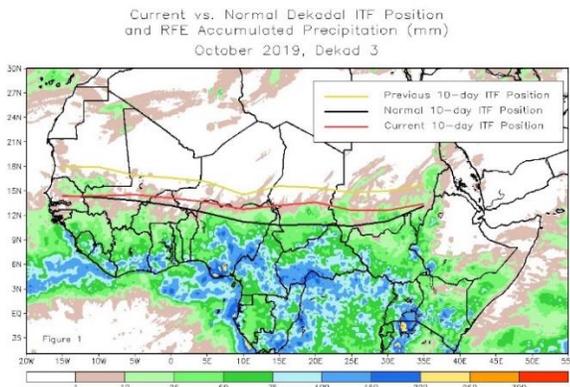
La surveillance active et le suivi, ainsi que le partage des informations ETOP et des interventions préventives opportunes restent essentiels pour atténuer les menaces que représentent les ETOP pour la sécurité alimentaire et les moyens de subsistance des communautés vulnérables.

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

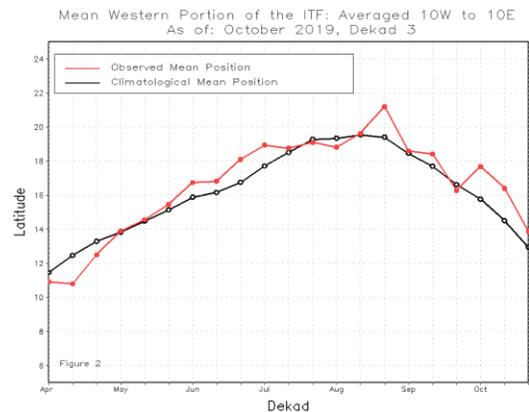
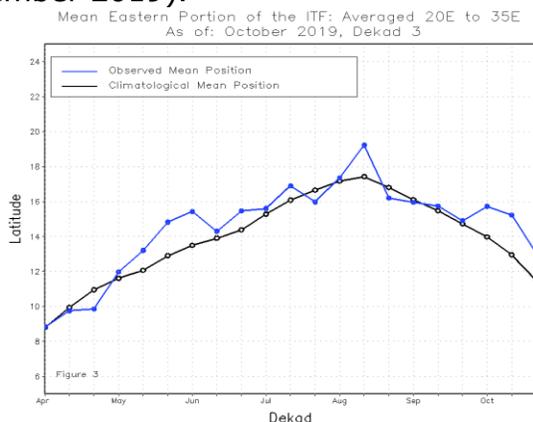
Note: All ETOP Bulletins and SITREPs, including previous ones can be accessed and downloaded on USAID Pest and

Pesticide Monitoring website: [USAID Pest and Pesticide Monitoring](#)

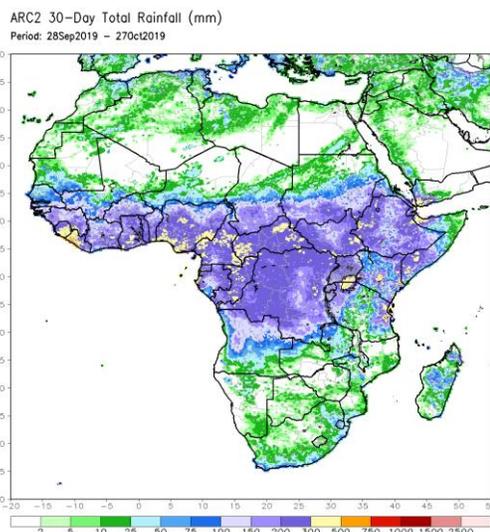
Weather and Ecological Conditions



The above figure shows the 3rd dekadal position (red) of the ITF relative to the long-term average position (black) during this dekad and its position during the 3rd dekadal of September (yellow). The graphic illustrations below and adjacent column depict latitudinal values of the western and eastern portions of the ITF, respectively, and their seasonal evolutions since April, 2019 (NOAA November 2019).



During October, rainfall was above-average over southern Mauritania, many parts of Senegal, Guinea-Bissau and Guinea, Sierra Leone, Liberia, southern



Mali, Burkina Faso, Ghana, Cote d’Ivoire, Togo, Benin, much of Nigeria, portions of Cameroon, central and southern Chad, much of CAR and Congo, portions of Gabon, many parts of DRC, much of South Sudan, Sudan, Ethiopia, Eritrea, Uganda, Tanzania, Somalia, Kenya, portions of Angola, eastern Zambia, and local areas in Namibia and Mozambique, portions of Madagascar, local areas in Guinea and Mali, parts of Cameroon, many parts of Gabon, portions of Angola and DRC, eastern Namibia, western Zambia, Botswana Zimbabwe, southern Madagascar and many parts of South Africa had below-average rainfall.

In **COR**: Good rain was reported along the Red Sea coastal areas in Eritrea, Sudan, Saudi Arabi and Yemen and moderate to light rains fell in eastern Oman from Cyclone Kyarr. Summer breeding areas in Sudan received moderate to light rain during early to mid-October, but rain declined and disappeared towards the end of the month. Light to moderate rain was reported in eastern Ethiopia during early dekads of October and declined later in the month in the northeastern parts of the country. Heavy rains and flush floods were reported in central Somalia during October (ANLA/Chad, CNLA/Mali, CNLA/Mauritania, CNLAA/Morocco, CNLA/Tunisia, FAO-DLIS, INPV/Algeria).

In **WOR**, ecological conditions were favorable in the extreme south in the Hoggar region, In Salah and irrigated areas in Adrar in Algeria, in [western] Adrar des Iforas and Timetrine and elsewhere. In Mali good rains were reported and annual [*Schouwia*, etc.] and perennial vegetation were present in primary breeding areas. Relatively warm and stable weather persisted in the Adrar Settoutf and southeastern Morocco and some localities between Guéréda and Bahai, south of Amdjarass and between Kalait and Fada in Chad where rainfall was recorded during the previous dekad of October. Cool and dry weather persisted in Tunisia and no reports were received from other countries in the region (ANLA/Chad, CNLA/Mali, CNLA/Mauritania, CNLAA/Morocco, CNLA/Tunisia, INPV/Algeria).

In **EOR**, monsoon rains extended through the first dekad of October than usual maintaining favorable ecological conditions on both sides of the Indo-Pakistan borders in Cholistan, Nara, and Tharparkar desert in Pakistan and Rajasthan, India. Light to moderate rain

was reported in spring breeding areas in Baluchistan in southeastern Iran and southwestern Pakistan, a situation that may allow vegetation to remain green although cold weather may delay locust development (FAO-DLIS).

Forecast: 29 October-4 November, there is an increased chance for above-average rainfall over Sierra Leone, southern Guinea-Conakry, Liberia, parts of Cote d'Ivoire, Ghana, Togo, Benin, Nigeria, Cameroon, Equatorial Guinea, Gabon, and portions of Congo-Brazzaville; there is an increased chance for below-average rainfall over southern DRC and Zambia; there is an increased chance for above-average rainfall over parts of Botswana and South Africa and there is an increased chance for above-average rainfall over northeastern DRC and parts of Uganda and Rwanda and there is an increased chance for above-average rainfall over parts of Ethiopia, Kenya, and Somalia.

From 5-11 November, there is an increased chance for above-average rainfall over parts of southern Cameroon, Equatorial Guinea, Gabon, southwestern Congo-Brazzaville, western DRC, and western Angola; there is an increased chance for below-average rainfall over parts of eastern Angola, southern DRC, and much of Zambia and there is an increased chance for above-average rainfall over parts of Ethiopia, Kenya, and Somalia (NOAA 10/2019).

From 12-18 November, there is an increased chance for above-average rainfall across Equatorial Guinea, Gabon, southern Congo, parts of western DRC and western Angola. There is an increased chance for below-average rainfall over eastern DRC, much of Uganda, western Kenya, Rwanda, Burundi and northern Tanzania. There is

an increased chance for above-average rainfall over eastern South Africa, Lesotho, Eswantini and southern Mozambique (NOAA 11/2019).

Areas with above average rainfall will yield favorable ecological conditions for ETOPs to persist, and/or start breeding and further develop.

NSE Outbreak Regions: Tanzania and Mozambique received substantial amount of rainfall causing grasses to start sprouting in Ikuu-Katavi, Rukwa Valley and Malagarasi Basin in Tanzania and Dimba and Buzi – Gorongosa plains in Mozambique. Hot and dry weather prevailed in Zambia, Zimbabwe and Malawi in NSE outbreak areas in Kafue Flats and Lake Chilwa/Lake Chiuta Plains (IRLCO-CSA).

CAC Region: In the CAC, no update was received at the time this bulletin was compiled, but cooler and drier weather is expected to have gradually kicked in during October (OFDA/PSPM).

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: SGR situation remained generally calm in WOR during October. In **Algeria**, preventive control treated 15 ha against groups of mature adults near agricultural areas in Aoulef south of Adrar during October. In **Morocco**, a few isolated immature solitary adults were observed in Oued Sakia El Hamra and the Draa Valley and south and southeastern parts of **Mauritania** during October. In **Niger**, scattered immature and mature adults were reported in Tamesna Plains between Tassara and Algerian border and ground operations controlled 29 ha of adults during October. In **Mali**, surveys were not possible due to ongoing insecurity situation and no reports were received from the nomads or local villagers during October. In **Chad**, the situation remained calm and no locusts were reported in **Tunisia** and no update was received in Libya and elsewhere in the region during October (ANLA/Chad, CNLA/Mauritania CNLAA/Morocco, CNLA/Tunisia, CNLAP/Mali, FAO-DLIS, INPV/Algeria).

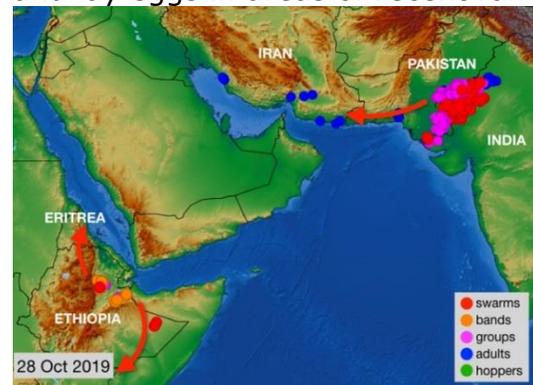
Forecast: As vegetation dries up in summer breeding areas in WOR, small

groups will form and begin breeding in a few places in Mauritania, and perhaps Niger and Algeria during the forecast period, but significant development is not likely (ANLA/Chad, CNLAP/Mali, CNLA/Mauritania, CNLAA/Morocco, CNLA/Tunisia, FAO-DLIS, INPV/Algeria).

SGR – COR: SGR continued developing in Yemen, Ethiopia, Sudan, Somalia, and Saudi Arabia during October. In **Ethiopia**, swarms and hoppers continued appearing in Afar, Amhara, Trigray, Somali (Ogaden), eastern Ormonia. Somali and along the railway line between Dire Adwa and Djibouti. On *October 25th a medium size locust swarm was observed flying over the city of Dire Dawa, eastern Ethiopia - source: DLCO-EA. Aerial and ground control operations are in progress in most of the affected areas. In Tigray, hundreds of youth were deployed during the 3rd dekad of October to chase the locusts away from the region.* As of late October, aerial and ground operations treated more than 4,060 ha in **Ethiopia**. Although significant crop damage has not yet been reported, it is highly likely that the pest is threatening grazing land and cropping areas in neighboring areas. So far, material and financial assistance for surveillance, monitoring, control interventions and operational costs have been covered by the MinAgri and regional admins. DLCO-EA has contributed two fixed-wing spray aircraft as well as its senior locust experts and technical staff in support of the ongoing locust campaign in Ethiopia. Should the SGR situation continue further developing, there is a likelihood of the operations needing external assistance. Vigilance and active surveillance remain critical to abate any major crop/pasture damage (OFDA/PSPM, PPD/Ethiopia).

Mature swarms were reported in northern **Somalia**. In **Sudan**, locust groups and swarms were detected in summer breeding areas in Northern Kordofan, Riven Nile, Red Sea and Kassala States and control operations treated immature and mature adults in more than 3,025 ha during October. In **Yemen**, breeding continued along the Red Sea coast in northern Tehama where mature groups and swarms were reported and hatching was observed from October 19th and 32 ha were treated. **Survey and control operations were carried out in Yemen with financial assistance from the FAO/Sana'a office.** In **Saudi Arabia**, 1,805 ha were treated during this month. In **Oman**, the situation remained calm and only low density solitary immature adults were detected in a few places in Al Sharqiah South and North, Al Batinah South and North, Al Buriemi, Musandam, Al Dhahira, Al Dakhyiah and Dhofar (DLMCC/Yemen, LCC/Oman, FAO-DLIS, PPD/Somalia, PPD/Sudan).

Forecast: In **Ethiopia** more swarms will likely appear in Ogaden and elsewhere and lay eggs in areas of recent rainfall



and some swarms may reach Eritrea, northeastern Kenya, southern Ethiopia. Swarms may also begin moving further south towards northeast Kenya (Moyale – Mander – Wajir), southern Somalia and southern and southwestern Ethiopia during the coming months. *Breeding will continue on the Red Sea coasts in*

Sudan, Eritrea, Yemen, and Saudi Arabia. In **Oman**, ecological conditions are improving in Al Wasta in the eastern central region due to moisture from cyclone Hikka. More areas will likely be receiving rain from cyclone Kyarr and ecological conditions will likely improve for local populations and swarms which may be brought from the Indo-Pakistan area by strong winds associated with the cyclone (DLMCC/Yemen, FAO-DLIS, LCC/Oman, OFDA/PSPM, PPD/Ethiopia, PPD/Somalia, PPD/Sudan).

NOTE: During the 2007 SGR outbreak, swarms that arrived from **Yemen** invaded **Ethiopia** and **Somalia** bred and rapidly spread to the southern, southwestern and western parts of **Ethiopia**, reached as far west as Kenos and Wellega. Some swarms also invaded northern **Kenya**. The outbreak caused damage to crops and pasture and required substantial amount of resources in response interventions.

*It is important that the tri-states - Ethiopia, Somalia and Kenya – keep an eye on any locust movements, share locust information on as timely manner and execute preventive interventions to the extent possible. **END NOTE***

A few years ago, USAID sponsored rehabilitation of the Yemeni desert locust control center by refurbishing the offices and warehouses and replacing many of the equipment and materials that were damaged, destroyed or looted by the rebels. These materials and equipment, including vehicles, camping gears, communication tools were provided through multiple donations for locust surveillance, monitoring, and control. USAID also supported training technical staff in locust surveillance, monitoring and control as well as safe pesticide management.

SGR - EOR: Control operations continued against swarms and groups and treated 82,944 ha in **India** and 22,930 ha in Pakistan along the **Indo-Pakistan** border during October (FAO-DLIS).

Forecast: With ecological conditions drying up, increasing number of small swarms will move from the **Indo-Pakistan** borders to spring breeding areas in Baluchistan in southwest **Pakistan** and southeast **Iran**. Strong wind associated with cyclone **Kyarr** may carry a few swarms from the **Indo-Pakistan** border area to the northern and eastern coasts of **Oman** and some reach eastern **Yemen** (FAO-DLIS).

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 Ikuu Katavi plains, Malagarasi Basins, and Rukwa Valley in Tanzania and in Dimba plains in Mozambique during October. A similar situation is likely in Mptasanjoka Dambo, Lake Chirwa/Lake Chiuta plains, Malawi where scattered (3-5 locusts/m²) to low density swarmlets (3-8 locusts/m₂) persisted. IRLCO-CSA and Zambia MinAgri carried out survey and controlled swarms on 2,300 ha in Kafue Flats from 9th to 28th October 2019 (IRLCO-CSA).

Forecast: NSE populations will present in the primary outbreak areas in Tanzania, Malawi, and Mozambique and form large breeding populations. Should favorable ecological conditions prevail through February 2020, a significant NSE increase is likely. Hopper surveillance and timely control operations are critical to abate the

threats the pest poses (IRLCO-CSA, OFDA/PSPM).

Tree Locusts, *Anacridium spp.* (ASP): ASP outbreak presented in Turkana county Kenya during October.

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): No update was received at the time this bulletin was compiled, nonetheless, it is expected that locust activities have, for the most part, ended in the region (FAO-ECLO, OFDA/PSPM).

Forecast: All locust activities will remain calm till next spring (FAO-ECLO, OFDA/PSPM).

Fall armyworm (FAW) (*S. frugiperda*) FAW infestations were reported in irrigated maize in Masvingo and Matebeleland Provinces in Zimbabwe. Increased pheromone trap catches were reported in Malawi during October. Affected farmers are receiving material and technical support from MinAgri to control the pest. No update was received elsewhere in outbreak and invasion areas, but it is likely that the pest continued being a problem to rainfed and irrigated cereal and other susceptible

crops across countries (IRLCO-CSA, OFDA/PSPM).

Forecast: FAW will likely continue affecting rain-fed and irrigated maize and other crops across sub-Saharan Africa, Asia, the Pacific Regions and elsewhere during the forecast period. Active monitoring, surveillance, reporting and preventive interventions remain critical to abate the damage (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 100 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 project has trained close to 1,400 senior PPD staff, district officers, lead farmers, agricultural agents, lead farmers and village leaders and sensitized more than 10,000 farmers and villagers on FAW-360 across the all participating countries. Through the project, a network of forecasters and scouts were established across 300 villages in the six project countries.

CBFAMFEW project has produced a high quality ToT Manual in English language <http://www.fao.org/3/CA2924EN/ca2924en.pdf> and twenty eight (28) communication materials in poster and flyer formats in 9

languages, including, Amharic, English, French, Luganda, Kinyarwanda, Oromfa, Runyankore and Swahili and widely disseminated across eastern Africa and the Horn. Participating countries have expressed interest to further translate the flyers into additional local languages for wider distributions.

The project forged strong relationships and links among experts from participating countries and implementing partners. It has also garnered strong commitments from participating countries that will ensure sustainability of collective and individual gains of this initiative.

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!

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/Fall-Armyworm-IPM-Guide-for-Africa-Jan_30-2018.pdf

BFS and SAWBO (Scientific Animation Without Borders) developed a video clip on FAW:
<https://sawbo-animations.org/video.php?video=//www.youtube.com/embed/5rxlpXEK5g8>

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 during this month.

Forecast: AAW activities may commence during the forecast period in southern Africa during November/December (OFDA/PSPM).

Note: OFDA/PSPM has developed printable and web-based interactive maps for AAW project sites in project countries and potential participating countries and it is considering a similar map for the CBFAMFEW project sites:
<http://usaid.maps.arcgis.com/apps/Viewer/index.html?appid=8ff7a2eefbee4783bfb36c3e784e29cb>.

<http://usaid.maps.arcgis.com/apps/Viewer/index.html?appid=9d2ab2f918284595819836d1f16a526f>
<http://www.fao.org/3/CA1089EN/ca1089en.pdf>

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 Mwea Rice Irrigation Scheme, Kirinyaga County in **Kenya** where aerial control was launched by PPD/MinAgri and DLCO-EA with DLCO-EA spray aircraft. QSP was also reported attacking sorghum in northern Showa in **Ethiopia** and preparations were underway to launch aerial control using DLCO-EA spray aircraft (DLCO-EA, IRLCO-CSA PPD/Ethiopia,).

Forecast: QSP activities will decline in the southern and some parts of the eastern and northeastern outbreak areas where the pest will go into breeding. However, it will likely remain being problem in other areas where small grain crops are still in season.

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 pre- and post-harvest threat to 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, and contaminate making it unfit for human consumption, and the zoonotic disease this pest carry/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 Canneries, 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 of vulnerable people and 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.

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 Control

Strategic Stocks of Pesticides (SSP) for SGR in COR slightly changed during

October where 8,910 ha were treated (Ethiopia = 4,063 ha, Saudi Arabia = 1,805 ha, Sudan = 3,025 ha and Yemen = 32 ha). Very limited control was undertaken in WOR where 15 ha and 29 ha were controlled in Algeria and Niger, respectively. In EOR, more than 105,874 ha were treated (82,944 ha in India and 29,930 ha in Pakistan) during this month.

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

| Country | Quantity (l/kg)* |
|--------------|----------------------------------|
| Algeria | 1,186,311~ |
| Chad | 34,100 |
| Egypt | 10,253 ULV, 45,825 l |
| Eritrea | 527~ |
| Ethiopia | 10,543~ |
| Libya | 24,930~ |
| Madagascar | 206,000~ + 100,000 ^D |
| Mali | 3,540 |
| Mauritania | 39,900 |
| Morocco | 3,412,374 ^D |
| Niger | 75,701~ |
| Oman | 9,953~ |
| Saudi Arabia | 23,379~(-46,821?) |
| Senegal | 156,000~ |
| Sudan | 103,482 |
| Tunisia | 62,200 obsolete |
| Yemen | 35,092 ^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™ (fungal-based biological pesticide)

LIST OF ACRONYMS

| | | | |
|---------|---|-----------|---|
| AAW | African armyworm (<i>Spodoptera expempta</i>) | CTE | <i>Chortoicetes terminifera</i> (Australian plague locust) |
| AELGA | Assistance for Emergency Locust Grasshopper Abatement | DDLC | Department of Desert Locust Control |
| AFCS | Armyworm Forecasting and Control Services, Tanzania | DLCO-EA | Desert Locust Control Organization for Eastern Africa |
| AfDB | African Development Bank | DLMCC | Desert Locust Monitoring and Control Center, Yemen |
| AGRA | Agricultural Green Revolution in Africa | DMA | <i>Dociostaurus maroccanus</i> (Moroccan Locust) |
| AME | <i>Anacridium melanorhodon</i> (Tree Locust) | DPPQS | Department of Plant Protection and Quarantine Services, India |
| APLC | Australian Plague Locust Commission | DPV | Département Protection des Végétaux (Department of Plant Protection) |
| APLC | Australian Plague Locust Commission Bands groups of hoppers marching pretty much in the same direction | ELO | EMPRES Liaison Officers – |
| ASARECA | Association for Strengthening Agricultural Research in Eastern and Central Africa | EMPRES | Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases |
| CABI | Center for Agriculture and Biosciences International | EOR | Eastern SGR Outbreak Region |
| CAC | Central Asia and the Caucasus | ETOP | Emergency Transboundary Outbreak Pest |
| CBAMFEW | Community-based armyworm monitoring, forecasting and early warning | Fledgling | immature adult locust /grasshopper that has pretty much the same phenology as mature adults, but lacks fully developed reproductive organs to breed |
| CERF | Central Emergency Response Fund | GM | GreenMuscle® (a fungal-based biopesticide) |
| CIT | <i>Calliptamus italicus</i> (Italian Locust) | ha | hectare (= 10,000 sq. meters, about 2.471 acres) |
| CLCPRO | Commission de Lutte Contre le Criquet Pèlerin dans la Région Occidentale (Commission for the Desert Locust Control in the Western Region) | ICAPC | IGAD's Climate Prediction and Application Center |
| CNLA(A) | Centre National de Lutte Antiacridienne (National Locust Control Center) | IGAD | Intergovernmental Authority on Development (Horn of Africa) |
| COR | Central SGR Outbreak Region | IRIN | Integrated Regional Information Networks |
| CPD | Crop Protection Division | IRLCO-CSA | International Red Locust Control Organization for Central and Southern Africa |
| CRC | Commission for Controlling Desert Locust in the Central Region | 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) | SFR | <i>Spodoptera frugiperda</i> (SFR) (Fall armyworm (FAW)) |
| JTWC | Joint Typhoon Warning Center | SGR | <i>Schistoseca gregaria</i> (the Desert Locust) |
| Kg | Kilogram (~2.2 pound) | SPI | <i>Schistocerca piceifrons piceiferons</i> (Central American Locust) |
| L | Liter (1.057 Quarts or 0.264 gallon or 33.814 US fluid ounces) | SSD | Republic of South Sudan |
| LCC | Locust Control Center, Oman | SPB | Southern Pine Beetle (<i>Dendroctonus frontalis</i>) – true weevils |
| LMC | <i>Locusta migratoriacapito</i> (Malagasy locust) | SWAC | South West Asia DL Commission |
| LMM | <i>Locusta migratoria migratorioides</i> (African Migratory Locust) | PBB | Pine Bark Beetle |
| LPA | <i>Locustana pardalina</i> | PSPM | Preparedness, Strategic Planning and Mitigation (formerly known as Technical Assistance Group - TAG) |
| MoAFSC | Ministry of Agriculture, Food Security and Cooperatives | 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. |
| MoAI | Ministry of Agriculture and Irrigation | UF | University of Florida |
| MoARD | Ministry of Agriculture and Rural Development | USAID | the United States Agency for International Development |
| NALC | National Agency for Locust Control | UN | the United Nations |
| NCDLC | National Center for the Desert Locust Control, Libya | WOR | Western SGR Outbreak Region |
| NOAA (US) | National Oceanic and Aeronautic Administration | ZEL | <i>Zonocerus elegans</i> , the elegant grasshopper |
| NPS | National Park Services | ZVA | <i>Zonocerus variegatus</i> , 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 |
| NSD | Republic of North Sudan | | |
| NSE | <i>Nomadacris septemfasciata</i> (Red Locust) | | |
| OFDA | Office of U.S. Foreign Disaster Assistance | | |
| PBB | Pine Bark Beetle (<i>Dendroctonus</i> 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 | <i>Quelea</i> species (Red Billed <i>Quelea</i> bird) | | |
| SARCOF | Southern Africa Region Climate Outlook Forum | | |
| SCA | <i>Schistocerca cancellata</i> (South American Locust) | | |

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