

**Emergency Transboundary
Outbreak Pest (ETOP) Situation
Update for May, 2016 with a
Forecast till mid-July**
Un résumé en français est inclus

SUMMARY

The **Desert Locust (SGR¹)** situation continued further developing in May in **Yemen** where groups of hoppers and adult locusts were reported in areas accessible to the locust monitoring and control team and controlled on some 39 ha. Other areas are either inaccessible due to insecurity reason or remoteness or resentments by beekeepers and herders that prohibited chemical spraying.

In **Morocco, Mauritania** and **Algeria** control operations treated a total of 1,631 ha combined during this month. Scattered solitary adults were reported in southern **Algeria**, southwestern **Libya**, northern **Mali** and northern **Niger**, but the rest of the Western Outbreak Region (WOR) remained calm during May.

Limited breeding was reported in northern **Oman** and near cropping areas in **Egypt** during May. No locusts were reported in the rest of the Central Outbreak Region (COR) or the Eastern Outbreak Region (EOR) during this month.

Forecast

Some swarms may migrate to the summer breeding areas in southern **Mauritania** where they may begin laying eggs at the foothills of the summer rains in the Sahel. Small-scale breeding may commence in southern **Algeria** and southwestern **Libya**. Adults may persist in northern **Mali** and **Niger**, but the rest of WOR will likely remain calm during the forecast period.

In **Yemen**, locusts in the interior of the country will likely remain and mature and begin breeding between Marib and Thamud and give rise to 2nd generation populations if more rains fall and vegetation remains green. However, if ecological conditions remain unfavorable, locusts will move south to the Gulf of Aden where the seasonal monsoon winds will carry them through the coast of **Oman** and the Arabian sea to the eastern outbreak region (EOR) along the **Indo-Pakistan** borders. A few adults will appear and begin breeding in areas of recent rain fall in eastern **Ethiopia**, northern **Somalia** and persist in **Sudan** and **Eritrea** and begin breeding during the forecast period.

Locusts may arrive from southern Yemen and begin breeding on a small-scale at the foothills of the monsoon rains along the **Indo-Pakistan** during the forecast period.

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

Active surveillance and timely preventive interventions are critical to abate any major threats.

It is worth noting that during the 2003-05 locust upsurges, locust-affected frontline countries in Sahel West Africa and North Africa lacked well-equipped, well-organized autonomous locust control units. The regional organization that was mandated coordination and strengthening regional collaborations was struggling to build its own capacity. Thanks to the efforts and commitments of national authorities and the supports from regional and international communities, development and humanitarian donors, including USAID, FAC, FAO, AFDB and many more, frontline countries, i.e., Algeria, Chad, Libya, Mali, Mauritania, Morocco, Niger, Senegal and Tunisia, have since established fully operational autonomous locust management and control entities at the national level. These entities have been able to abate several locust threats, including a potentially devastating locust emergency in 2012 and again in 2015. The coordination and support that CLCPRO has been providing to the frontline countries remain invaluable.

Red (Nomadic) Locust (NSE):

Aerial surveys over 17,000 ha detected the presence of NSE infestation in Kafue Flats in **Zambia** during May (see picture on adjacent column). These populations will likely

concentrate and form dense groups and swarms. A joint survey in Malawi detected the presence of locusts in Chilwa/Lake Chiuta plains and Mpatsanjoka Dambo. Locusts that were reported during April in Ikuu Plains and perhaps in Malagarasi Basin and North Rukwa plains in **Tanzania** are expected to have persisted through May. Infestations in **Malawi** and **Zambia** showed an increase over those of previous years suggesting that conditions were favorable for the locusts to persist and further develop. Surveys were not conducted in other outbreak countries and the situation remain unclear (IRLCO-CSA, OFDA/AELGA).



Damage caused to maize plants by NSE in Kafue Flats in Zambia (Source: IRLCO-CSA, May 2016).

Forecast: NSE that were detected in in **Zambia, Malawi** and **Tanzania** are likely to concentrate and form groups and swarms and if left unabated, the swarms will move to adjacent areas and cause damage to crops and pasture. Regular survey and monitoring as well as timely control interventions remain critical to preventive crop and pasture damage (IRLCO-CSA, OFDA/AELGA).

Madagascar Migratory Locust

(LMC): No update was received at the time this report was compiled, but the final phase of the 3-year campaign was in progress and reported treated/protected more than 2.1 million ha and significantly reduced locust populations.

Italian (CIT), Moroccan (DMA), Asian Migratory (LMI) Locusts, Central Asia and the Caucasus (CAC): Small-scale DMA hatching was observed on the escarpment of the Alazani Valley in Georgia during the second dekad of May

USAID/OFDA senior pest and pesticide management specialist visited joint locust survey operations in Georgia during the second dekad of May. He joined the survey team in Kakheti District in southern and southeastern parts of Georgia along the Caucas Mountains adjacent to Azerbaijan and Russian Federation,



During the survey operations, the technical advisor observed early hatching of the DMA (see pictures above).



African Armyworm (AAW): The AAW season has ended in the southern outbreak region and no outbreaks were reported in the central outbreak region during May.

Quelea (QQU): QQU bird outbreaks were reported in Dodoma, Tabora, Singida and Shinyanga regions in **Tanzania**. In **Kenya**, the birds were reported attacking rice in Kisumu county and wheat in Narok county (IRLCO-CSA).

USAID/OFDA/PSPM monitors ETOPs closely through its network with national PPDs/DPVs, Migratory Pest Units and international and regional organizations, including FAO, CLCPRO, CRC, DLCO-EA, IRLCO-CSA. It provides timely updates and advices to HQ, field staff, partners and others as often as necessary. **End summary**

RÉSUMÉ

Le (SGR) situation acridienne a continué à approfondir mai au Yémen, où des groupes de larves et d'ailés ont été signalés dans les zones accessibles à l'équipe de surveillance

et de lutte antiacridienne et contrôlés sur environ 39 ha. D'autres domaines sont soit inaccessibles en raison de la raison de l'insécurité ou de l'éloignement ou de ressentiments par les apiculteurs et éleveurs qui ont interdit la pulvérisation chimique.

Au Maroc, les opérations de contrôle Mauritanie et l'Algérie ont traité un total de 1.631 ha combinés au cours de ce mois. aîlés solitaires épars ont été signalés dans le sud de l'Algérie, le sud-ouest la Libye, le nord du Mali et du Niger, mais le reste de l'éclosion Région de l'Ouest (WOR) est restée calme en mai.

Une reproduction limitée a été signalée dans le nord d'Oman et à proximité de zones de culture en Egypte en mai. Aucun criquet n'a été signalé dans le reste de la région centrale du foyer (COR) ou de la Région de l'Est Outbreak (EOR) au cours de ce mois.

Prévision

Certains essaims peuvent migrer vers les zones de reproduction estivale du sud de la Mauritanie où ils peuvent commencer à pondre des œufs sur les contreforts des pluies d'été dans le Sahel. Une reproduction à petite échelle peut commencer dans le sud de l'Algérie et le sud-ouest de la Libye. Les adultes peuvent persister dans le nord du Mali et du Niger, mais le reste du WOR restera probablement calme au cours de la période de prévision.

Au Yémen, les criquets à l'intérieur du pays resteront probablement et mature et commencer la reproduction entre Marib et Thamud et donner lieu à des populations de 2e génération si de nouvelles pluies et de la végétation reste verte. Toutefois, si les conditions écologiques restent défavorables, les criquets se déplacer vers le sud dans le golfe d'Aden, où les vents saisonniers de mousson vont les mener à la côte d'Oman et la mer d'Arabie à la région de l'épidémie est (EOR) le long des frontières indo-pakistanaïses. Quelques adultes apparaissent et commencent à se reproduire dans les zones récemment chute de train dans l'est de l'Ethiopie, la Somalie et norther persistent au Soudan et de l'Érythrée et de commencer la reproduction au cours de la période de prévision. Criquets peuvent arriver du sud du Yémen et de commencer à se reproduire à petite échelle dans les contreforts des pluies de mousson le long de la frontière indo-pakistanaïse au cours de la période de prévision. La surveillance active et les interventions préventives en temps opportun sont essentielles pour réduire les menaces majeures.

Il est à noter qu'au cours de 2003-05 recrudescences acridiennes, les pays de première ligne acridienne touchées au Sahel en Afrique occidentale et en Afrique du Nord manquaient bien équipées, autonomes unités de lutte antiacridienne bien organisés. L'organisation régionale qui a été chargé de la coordination et le

renforcement de la collaboration régionale a du mal à construire sa propre capacité. Merci aux efforts et aux engagements des autorités nationales et les supports des communautés régionales et internationales, le développement et les donateurs humanitaires, y compris l'USAID, FAC, FAO, BafD et beaucoup d'autres, les pays de première ligne, à savoir, l'Algérie, le Tchad, la Libye, le Mali, la Mauritanie, Maroc, le Niger, le Sénégal et la Tunisie, ont depuis établi des entités de gestion et de lutte antiacridienne autonomes pleinement opérationnels au niveau national. Ces entités ont été en mesure de diminuer plusieurs menaces acridiennes, y compris une urgence acridienne potentiellement dévastateur en 2012 et de nouveau en 2015. La coordination et le soutien que CLCPRO a fourni aux pays de première ligne restent une valeur inestimable.

Rouge (Nomadic) Locust (NSE):

Des relevés aériens plus de 17.000 ha ont détecté la présence de la NSE infestation dans Kafue en Zambie en mai (voir photo sur la colonne adjacente). Ces populations vont probablement se concentrer et former des groupes denses et d'essaims. Une enquête conjointe au Malawi a détecté la présence de criquets dans Chilwa / plaines du lac Chiuta et Mpatsanjoka Dambo. Criquets qui ont été signalés au cours de Avril à Ikuu Plains et peut-être dans les plaines du bassin du Malagarasi et du Nord Rukwa en Tanzanie devraient avoir persisté

jusqu'en mai. Infestations au Malawi et en Zambie ont montré une augmentation par rapport aux années précédentes suggérant que les conditions étaient favorables pour les criquets persistent et se développent davantage. Les enquêtes ont pas été menées dans d'autres pays d'épidémie et la situation restent floues (IRLCO-CSA, OFDA / AELGA).

Prévisions: NSE qui ont été détectés dans la Zambie, le Malawi et la Tanzanie sont susceptibles de se concentrer et de former des groupes et des essaims et si on les laisse sans relâche, les essaims se déplacent vers les zones adjacentes et causer des dommages aux cultures et aux pâturages. enquête et une surveillance régulière ainsi que des interventions de contrôle en temps opportun restent essentielles à la récolte et le pâturage des dommages préventive (IRLCO-CSA, OFDA / AELGA).

Locust Madagascar migratrices (LMC): Aucune mise à jour a été reçue au moment où ce rapport a été établi, mais la phase finale de la campagne de 3 ans était en cours et a rapporté traité / protégé plus de 2,1 millions d'hectares et les populations de criquets considérablement réduits.

Italien (CIT), du Maroc (DMA), d'Asie migrants (IMT) Criquets, l'Asie centrale et du Caucase (CAC): À petite échelle DMA éclosion a été observée sur l'escarpement de la

vallée de Alazani en Géorgie au cours de la deuxième décade de mai

USAID / OFDA spécialiste de la gestion des ravageurs et des pesticides supérieurs a visité des opérations conjointes de l'enquête acridienne en Géorgie au cours de la deuxième décade de mai. Il a rejoint l'équipe d'enquête dans Kakheti district dans le sud et sud-est de la Géorgie le long des montagnes Caucase adjacentes à l'Azerbaïdjan et la Fédération de Russie, Au cours des opérations d'enquête, le conseiller technique observé début éclosion du DMA (voir les photos ci-dessus).

Chenillie de Légionnaire africaine (AAW): La saison AAW a pris fin dans la région sud de l'épidémie et aucun foyer n'a été signalé dans la région de l'épidémie centrale en mai.

Quéléa (qqu): foyers d'oiseaux de qqu ont été signalés dans les régions de Dodoma, Tabora, Singida et Shinyanga en Tanzanie. Au Kenya, les oiseaux ont été signalés attaquant le riz dans le comté de Kisumu et de blé dans le comté de Narok (IRLCO-CSA).

USAID / OFDA / PSPM surveille ETOPS de près grâce à son réseau avec PPDs / DPV, unités ravageurs migrants et les organisations internationales et régionales, y compris la FAO, la CLCPRO, CRC, DLCO-EA, IRLCO-CSA. Il fournit des mises à jour en temps opportun et de conseils à l'AC, le personnel de terrain, les partenaires

et les autres aussi souvent que nécessaire. Résumé de fin

OFDA's Contributions to ETOP Activities

The online Pesticide Stock Management System (PSMS) that was developed with financial assistance from USAID/OFDA and other partners has been installed in some 65 countries around the globe and is helping participating countries maintain inventories. Thanks to this tool many counties have been able to avoid unnecessary procurements and stockpiling of pesticides and helping them avoid costly disposal operations and improve safety and well-being of their citizens and shared environment.

The USAID/OFDA funded community-based armyworm monitoring, forecasting and early warning (CBAMFEW) project that was concluded last September has been incorporated in the annual work plan of the national crop protection departments in all participating countries <http://bit.ly/1C782Mk>. The project enabled farmers to be able to detect and report AAW and prevent major crop/pasture damage. Participating countries continue expressing their gratitude for having the project implemented in their countries. USAID/OFDA/PSPM will maintain a line of communication with participating countries and monitor progresses.

OFDA/PSPM is working with other partners to explore means and ways to expand this innovative technology to other AAW affected countries and benefit farmers and rural communities.

OFDA/PSPM's interests in sustainable pesticide risk reduction in low income

countries to strengthen their capacities and help improve safety of vulnerable populations and shared environment continued. OFDA-PSPM intends to extend this initiative to other parts of Africa, the Middle East, CAC etc., as needed.

OFDA continued its support for DRR programs to strengthen national and regional capacities for ETOP operations. The program which is implemented through FAO has assisted several frontline countries to mitigate, prevent, and respond to ETOP outbreaks. It has helped participating countries avoid potential emergencies from misuse and mishandling of pesticides, pesticide-incorporated materials and application platforms.

USAID/OFDA is sponsoring project activities through the UN/FAO to help strengthen/re-build national and regional capacity to prevent and control the threats the locusts pose to the 25 million plus vulnerable people that eke a living from agriculture and livestock in CAC. The program is on track and it has enabled collaboration among neighboring countries where joint monitoring, surveillance, reporting and preventive interventions have been realized to minimize the threats of ETOPs to food security and livelihoods of vulnerable population.

Note: ETOP SITREPs can be accessed on USAID Pest and Pesticide Management website: [USAID/OFDA PPM Website](#)

Weather and Ecological Conditions Western Outbreak region

In **Morocco**, ecological conditions remained favorable in a few areas in

Gueltat Zemmour and Oum Dreyga in the south during the 3rd dekad of May. In **Mauritania**, ecological conditions further deteriorated during May where most of the annual vegetation was dry in Bir Moghreïn and Zouerat in Tiris Zemmour and only very few patches of green vegetation were reported in wadis, sand dunes and ridges in Rich and Dahr Ahmed Maouloud towards the end of the month.

In **Mali** meteorological and ecological conditions remained unfavorable in during May. Cloudy skies covered most of the country reducing the temperature slightly from the previous month. Visibility was moderately reduced in Mopti, Timbuktu, Gao, Kidal and slightly affected in northern Kayes and Koulikoro in the western region. Southwesterly winds dominated over most of the country with the exception of the northeasterly winds in northern region in Kayes and Timbuktu, Gao and Kidal. The ITF was located on center of the country. The max temperatures of 35-45 were recorded in the Kayes, Koulikoro, Sikasso, Segou, Mopti and the District of Bamako region while slightly higher temps were recorded in Timbuktu, Gao and Kidal. The min temp were 24-33 in Kayes, Koulikoro, Sikasso, Segou, Mopti and the District of Bamako and 26-35 in Timbuktu, Gao and Kidal regions (CNLA/Mauritania, CNLAA/Morocco, CNLCP/Mali, FAO-DLIS).

Central Outbreak Region

Good rains fell in eastern **Ethiopia** and northern **Somalia** during May. These will create favorable conditions for the SGR to start appear in several locations. Rainfall was also reported in Sudan and Eritrea during May.

In **Yemen**, light to moderate rains fell in May in winter breeding areas in Tihama and Aden Gulf coastal plains, but no rains were reported in summer breeding areas during this month. However, ecological conditions were favorable in some places in the summer breeding areas east of wadi Hadhramout where good rains fell during April and vegetation was green and the soil was wet during the 2nd dekad of May.

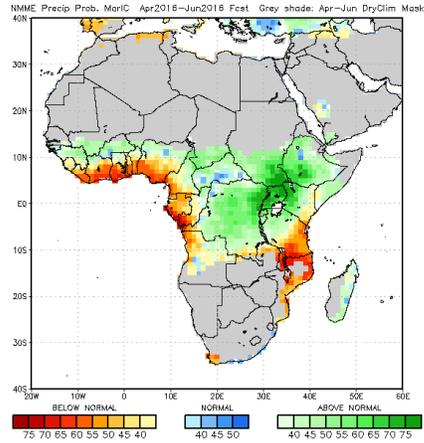


In the coastal areas in Shabwah, most of the vegetation was drying up and only patches of green vegetation were present during April (see picture, DLMCC/Yemen, 5/2016).

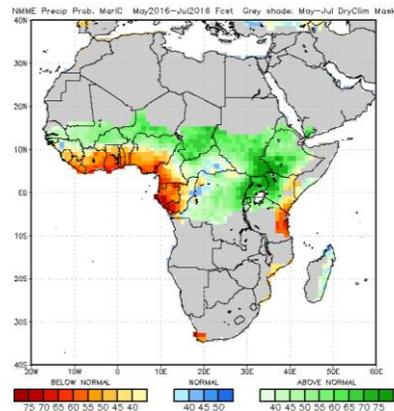


contrast, there is a moderate tilt to favor below-average rainfall along the Gulf of Guinea coast, and coastal East Africa (map 1: April – June, 2016, map2: May – July, 2016; NOAA’s North American Multi-Model Ensemble (NMME), precipitation probability forecasts).

Map 1



Map 2



Mostly hot, dry weather dominated the scheduled desert areas (SDA) in **India** where only light showers were reported during this month (DPPQS/India).

Moderate rainfall was reported in NSE outbreak areas in Mozambique and significant parts of Wembere plains continued to be flooded as a result of heavy rains. Otherwise, dry and cool weather prevailed in the rest of the NSE outbreak areas. In Lake Chilwa/Lake Chuita plains in Malawi vegetation dried up earlier than usual due to reduced rainfall. Flood plains have dried up in several places where below normal rainfall was recorded (IRLCO-CSA).

In **CAC**, below normal temperatures prevailed in locust breeding areas in Azerbaijan during April into early May, but gradually began increasing by mid-May. Above normal temps persisted across Central Asia across eastern Kazakhstan and likely to continue across Kazakhstan with near to below-normal temperatures expected for the remainder of the region. Widespread moderate to locally heavy rainfall (more than 50 mm) that occurred in Afghanistan, southern Kazakhstan, Tajikistan, Turkmenistan, and Uzbekistan from March 27 to April 2 created favorable conditions.

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

El Niño/La Niña and SGR outbreak

*El Niño often affects the Central Outbreak Region (the Horn of Africa and the Arabian Peninsula) due to the above average rainfall during winter and wetter than normal long spring (April-June). Rain has already increased across parts of eastern Africa and the Horn (NOAA, OFDA/Hydromet). Above-average rainfall over the Horn of Africa, southern Red Sea region and Gulf of Aden could mean increased SGR development in these areas, including northwest coast of **Somalia**, much similar to an event that occurred during the El Niño of 1997-1998. Above normal precipitation could also lead to increased AAW outbreaks.*

During the 1987-89 SGR plague, USG, primarily through OFDA, provided close to USD 60 million to support the international campaign that required more than USD 300 million to abate the plague. In the 2003-05 SGR upsurges that affected more than 25 countries across Sahel, North Africa, the Red Sea

coasts and the Middle East, USAID deployed a 30-day DART and contributed more than USD 21 million to abate the upsurges and assist communities that were severely affected by the SGR upsurges. The upsurges required hundreds of millions of USD to control and assist affected farmers and rural communities (OFDA).

Note: *Changes in the weather pattern and the rise in temperature can contribute to ecological shift in ETOP habitats and increase the risk of pest outbreaks, resurgence and emergence of new pests. 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 normal ambient altitude due to warmer higher elevations.*

*The **Pine Bark Beetle** appears has been escalating in the western hemisphere due to the rise in winter temperatures and decreased precipitation. Warmer weather means lesser egg/grub death from severe cold temperatures and less precipitation means weaker trees that succumb to the beetle attack.*

*The **Asian migratory locust**, an insect that bred just once a year, recently began exhibiting two generations per year. These anomalous manifestations and phenomena, which are largely attributed to the change in the weather pattern and associated ecological shift, are a serious concern to farmers, rangeland managers, crop protection experts, development and humanitarian partners and others. Regular monitoring, documenting and reporting anomalous manifestations in pest behavior and habitats remain critical to help avoid and*

*minimize potential damages to crops, pasture, livestock and reduce subsequent negative impacts on food security and livelihoods of vulnerable populations and communities. **End note.***

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

SGR – Western Outbreak Region:

Mature and immature adults persisted in northwestern Africa during May. In **Morocco, Mauritania** and **Algeria** control operations treated a total of 1,631 ha combined during this month. Scattered solitary adults were reported in southern **Algeria**, southwestern **Libya**, northern **Mali** and northern **Niger**, but the rest of the Western Outbreak Region (WOR) remained calm during May.

In **Morocco**, ecological conditions remained favorable in restricted areas in Gueltat Zemmour and Oum Dreyga during the 3rd dekad of May in the south where small groups of solitario-transient immature, maturing and mature adult locusts were controlled on some 100 ha between Gueltat Zemmour and Oum Dreyga during the 3rd dekad of May.

In **Mali**, a few adults were detected in Gao region in Wadi Elouedj (at 19°19'274"N/00°34'329"E) where at least 7 locust were captured on May 6 and 10 on May 15. Although adults were seen the security situation prevented to confirm the presence of more locusts in the areas. Solitary adults were also reported in northern **Niger**. No locusts Tunisia, Senegal or Chad during this month (CNLA/Mauritania, CNLAA/Morocco, CNLCP/Mali, CNLA/Tunisia, FAO-DLIS, NCDLC/Libya).

Forecast: Locusts will likely migrate from spring breeding areas in southern **Morocco** and northern **Mauritania** to summer breeding areas in southern **Mauritania** during the forecast period. Small-scale breeding may commence in southern **Algeria** and southwestern **Libya** and adults may appear in northern **Mali, Niger, Chad** and **Senegal** during the forecast period (CNLA/Mauritania, CNLAA/Morocco, FAO-ECLC, NALC/Chad, NLCC/Libya, OFDA/AELGA).

SGR (Desert Locust) - Central

Outbreak Region: SGR continued developing in **Yemen** in May where surveys were carried out in the summer breeding areas in Hadhramout. The survey and control teams were equipped with 3 tons of pesticides, 5 handheld micronair sprayers and 10 PPE and deployed to west Thamud and east wadi Hadhramout. During the 2nd dekad of the month, the teams detected 34 small to medium size high density 1st to 4th instar hopper bands in several wadis in the summer breeding areas east of Hadhramout Wadi and west of Thamud (see picture below, DLMCC/Yemen)



Two mating and egg laying adult groups were also reported on May 12 in Aldokhan Wadi (16 35 N/48 56E) west of Thamud. On May 16, 39 ha of the infested areas were treated in AlKhon Wadi (16 11N/49 11E) east of Tarem (16 07N/49 06E). On 23 May hopper bands

were reported in Zamakh 16 42N/48 12E) areas north of Hadhramout Wadi. No control operations were carried out in the other infested areas west of Thamud due to resentments by beekeepers and camel herders to pesticide spraying and only a few hopper bands were controlled mechanically on limited areas. 1st and 2nd instar hopper bands were also reported on May 11 in the coastal areas of Abyan east of Zijibar (13 09N/41 00E).

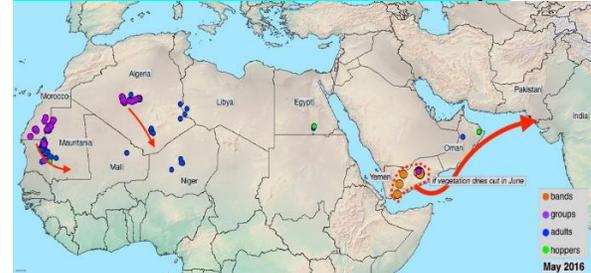
Limited breeding was reported in northern **Oman** and near cropping areas in **Egypt** during May. No locusts were reported in Sudan, Eritrea, Ethiopia, Djibouti, northern Somalia or Saudi Arabia during this period (DLMCC/Yemen, DLCO-EA, FAO-DLIS, LCC/Oman).

Forecast:

In **Yemen**, adult groups and swarms are expected to form and move to the summer breeding areas in the interior of the country and breed if rains fall and ecological conditions become favorable. Should conditions remain unfavorable, locusts will ride on the back of the trade winds and migrate eastwards to the summer breeding areas along the Indo-Pakistan borders towards the end of the forecast period (see mal from DLIS). Regular surveillance, monitoring and preventive interventions remain critical to avoid further locust developments and prevent any damage they could cause to crops, pasture and trees that sustain livelihoods of local farmers, beekeepers and herders during the coming months.

Small-scale breeding will likely commence in **Eritrea**, along the Nile Valley in **Sudan**, eastern **Ethiopia** and in adjacent areas in **northern Somalia** during the forecast period. All countries in COR must

remain vigilant and launch preventive interventions as early as needed and possible (DLCO-EA, DLMCC/Yemen, FAO-DLIS, LCC/Oman, OFDA/AELGA).



SGR - Eastern Outbreak Region:

No locusts were reported in the Eastern Outbreak Region (EOR) during May (DPPQS/India, FAO-DLIS).

Forecast: Locusts may arrive from southern Yemen and/or a few adults that persisted locally will likely begin breeding on a small-scale along the **Indo-Pakistan** at the foothills of the monsoon rains during the forecast period (FAO-DLIS, OFDA/AELGA).

Red (Nomadic) Locust (NSE):

Aerial survey conducted by IRLCO-CSA and MoA/Zambia detected the presence of NSE infestation in Kafue Flats in **Zambia**. The survey that covered an estimated 17,000 ha revealed the presence of medium density (3-9 m²) locust populations. These populations will likely concentrate into denser groups and form swarms as vegetation burning will reduce the presence of favorable habitat. A joint survey by IRLCO-CSA and MoA/Malawi was launched in Lake Chilwa/Lake Chiuta plains and Mpatsanjoka Dambo revealed the presence of locust concentrations at 3-7 insects/ m². The survey was sponsored by the FAO office in Malawi and MoA/Malawi. Locusts that were reported during ground survey in April in Ikuu Plains in **Tanzania** are expected to have persisted. NSE is also

expected to have persisted in Malagarasi Basin and North Rukwa plains in **Tanzania**.

NSE infestations in both Malawi and Zambia showed an increase over previous years suggesting that reduced flooding created favorable conditions for the locusts to persist and further develop. As survey operations were not conducted in other outbreak countries, the situation remain unclear (IRLCO-CSA, OFDA/AELGA).

Forecast: Red Locusts populations that were detected in the primary outbreak areas in Zambia, Malawi and Tanzania are likely be forced by vegetation burning to concentrate and form groups and swarms. If note abated, the swarms will move to adjacent areas and beyond and cause damage to crops and pasture. Other breeding areas in Mozambique and Tanzania could also witness swarms in areas where rainfall created favorable conditions for the locust to breed and develop. Regular survey and monitoring as well as timely control interventions remain critical to preventive crop and pasture damage (IRLCO-CSA, OFDA/AELGA).

Madagascar Migratory Locust (LMC): The final phase of the 3-year campaign that began on 26 August, 2015 is in progress and is expected to conclude by June 2016.

Forecast: Locusts will take a slow pace and remain localized in patches of green vegetation and develop in the southwest during the forecast period.

As of February, 2016, it has reported controlling more than 223,533 ha bringing total areas controlled/ protected to 2.1 million ha (USAID contributed close to \$4.55 M to the project/program

fund of \$37 M. the campaign reported received \$36 M as of March 15.

www.fao.org/emergencies/crisis/madagascar-locust/en/.

714,032 l Chlorpyrifos (OP) mixed with cypermethrin and deltamethrin, 259,912 l of an insect growth regulator - Teflubenzuron and 749 kg of a biopesticides - *GreenMuscle* are reported utilized to control the locusts and protect crops and pasture (FAO-ECLC).

Italian (CIT), Moroccan (DMA) and Migratory (LMI) Locusts in Central Asia and the Caucasus (CAC): Locust activities have commenced in most of the CAC region where ecological conditions continued to improve during the past months.



While blow normal temperature persisted during late winter into early spring in locust breeding areas in the Caucasus region, unusually warmer winter and early spring caused DMA to hatch in March in southern Central Asia - Kyrgyzstan, Tajikistan and Uzbekistan and a similar situation may have occurred in neighboring ares in Afghanistan and Turkmenistan. In April, hoppers developed in these countries and hatching commenced in Kazakhstan and Russia. In Azerbaijan and Georgia where largely wetter and cooler spring erved,

DMA began hatching towards late April into early May. Control operations that commenced in March in Central Asia continued into May.

Forecast: DMA hoppers groups and bands will continue forming in most of southern Central Asia and hatching will progress in Russia and the Caucasus. CIT and LMI will develop in several countries in the CAC during the forecast period (FAO-ECLO, OFDA/AELGA).

Italian, Migratory and Moroccan locusts are a constant threat to the CAC region. These pests can profusely multiply and attack tens of millions of hectares of crop and pasture and adversely affect food security and livelihoods of more than 20 million vulnerable inhabitants that eke a living primarily from farming and herding. With the ability to travel more than 100 km (60 miles) each day, these locusts can decimate dozens of hectares of cereal crops, pasture, cotton, fruit trees, leguminous plants, sunflower, tobacco, vineyard, vegetable and others over vast areas. Most of the countries affected by the three locust species lack well established capacity to effectively prevent and control these pests.

Timor and South Pacific: No update was received from East Timor during May, but it is likely that acridid pests continued to be present.

African Armyworm (AAW): The AAW season has ended in the southern outbreak region and no outbreaks were reported in either southern or the central outbreak region during May (DLCO-EA, IRLCO-CSA).

As part of its extended efforts, OFDA/PSPM continued developing and improving AAW information in both the SOR and COR. In addition to both printable and web-based maps that OFDA's in-house GIU-Mapping Center developed for the AAW COR, the unit has also developed a similar map for the AAW SOR (click on the below link to see the map):

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

Forecast: AAW will likely appear in **Kenya** and perhaps southern **Ethiopia** during the forecast period. AAW coordinators and CBAMFEW and non-CBAMFEW forecasters are advised to remain vigilant and report trap catches to concerned authorities on time for interventions (DLCO-EA, IRLCO-CSA, OFDA/AELGA).

Quelea (QQU): QQU outbreaks were reported damaging sorghum and millet crops in Dodoma, Mbeya, Singida and Shinyanga regions in **Tanzania** and MoA and DLCO-EA launched aerial control in several places. QQU outbreaks were also reported causing damage to irrigated rice in Kisumu County in **Kenya** where areal operations were launched by MoA in collaboration with DLCO-EA. QQU outbreak was reported in Kibimba Rice schemes in eastern Uganda during April. The birds were reported damaged 10% of the infested rice field.

Forecast: QQU birds will likely continue being a problem to small grain cereal growers in **Tanzania, Kenya**, irrigated wheat in **Zimbabwe** and rice crops in **Uganda**. The birds may also appear and threaten crops in **Ethiopia, Somalia** and other neighboring.

Facts: QQU birds can travel ~100 km/day in search of food. An adult QQU bird can consume 3-5 grams of grain and destroy the same amount each day. A medium density QQU 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 rodent outbreaks in May. However, these pests are a constant threat to crops in the field as well as storage and must be regularly monitored and abated.

Pine Bark Beetle Outbreaks:

Honduras, Central and North America are experiencing severe outbreaks of the pine bark beetle (PBB) or the southern pine beetle, **Dendroctonus frontalis**, which is destroying pine and other trees. GoH declared a national disaster and deployed armed forces to tackle the problem. The pest is reported affecting **Beliz, Brazil, El Salvador, Guatamala, Nicaragua** and impacting agroforestry and umber industry. The beetles are also affecting pine and other trees in the **USA, Canada** and **Mexico** where millions of trees are dying from beetle damage (see purple brown patches in the photo below

<http://phys.org/news/2015-12-honduran-army-war-invading-bugs.html>)

The PBB eggs and larvae (grubs) that cannot survive severe cold winter and hibernate under dead leaves and barks to survive or often die out can now adjust to the relatively mild winter temperatures caused by increasingly warmer winter weather in the Rocky Mountains over the past decade. Furthermore, the prolonged

below normal precipitation continuously weakens the trees. These two factors combined have created favorable conditions for the beetles to persist and cause large outbreaks over vast areas (NPS).

All ETOP front-line line countries must maintain regular monitoring. 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 and on a timely basis. Lead farmers and community forecasters must remain vigilant and report ETOP detections to relevant authorities immediately.

Inventories of Pesticide Stocks for ETOP Prevention and Control

Morocco, Mauritania and Algeria treated 218, 762 and 651 ha, respectively totaling 1,631 ha during May. Treatment updates were not available for CAC at the time report was compiled, but it is likely that control operations treated considerable numbers of ha during this month.

Note: SGR invasions countries in West and North West Africa reported large inventories of obsolete stocks, some dating as far back as 2003-05 locust campaigns and even earlier than that. Countries in Central Asia and the Caucasus also carry large stocks of obsolete pesticides that date as far back as the old Soviet era. Safe disposal of these stocks requires considerable resources, but can significantly minimize health risks and environmental pollution associated with the stocks. **End note.**

Note: A Sustainable Pesticide Stewardship (SPS) can strengthen the pesticide delivery system (PDS) at the national and regional levels. A strong PDS can effectively reduce pesticide related human health risks, minimize environmental pollution, increase food security and contribute to the national economy. An SPS can be effectively established by linking key stakeholders across political borders. **End Note.**

OFDA/PSPM/AELGA encourages exploring alternatives such as IPM to reduce risks associated with pesticide stockpiling. A judiciously executed triangulation of surplus stocks from countries with large inventories to countries in need is a win-win situation worth considering.

Table 3. ETOP Pesticide Inventory in Frontline Countries during March, 2016

Country	Quantity (l/kg)*
Algeria	1,189,349~
Chad	44,500
Egypt	68,070~ (18,300 ULV, 49,770 l)
Eritrea	18,250~ + 20,000 ^D
Ethiopia	10,000~
Libya	25,000~
Madagascar	206,000~ + 100,000 ^D
Mali	27,000
Mauritania	27,880 ^{DM}
Morocco	3,491,025 ^D
Niger	75,800~
Oman	10,000~
S. Arabia	100,000~
Senegal	156,000~
Sudan	171,780~
Tunisia	68,514 obsolete
Yemen	42,000 ^D + 180 kg GM~
*Includes different kinds of pesticide 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

^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)

LIST OF ACRONYMS

AAW	African armyworm (<i>Spodoptera expempta</i>)
AELGA	Assistance for Emergency Locust Grasshopper Abatement
AFCS	Armyworm Forecasting and Control Services, Tanzania
AfDB	African Development Bank
AME	<i>Anacridium melanorhodon</i> (Tree Locust)
APLC	Australian Plague Locust Commission
APLC	Australian Plague Locust Commission Bands groups of hoppers marching pretty much in the same direction
CAC	Central Asia and the Caucasus
CBAMFEW	Community-based armyworm monitoring, forecasting and early warning
CERF	Central Emergency Response Fund
CIT	<i>Calliptamus italicus</i> (Italian Locust)
CLCPRO	Commission de Lutte Contre le Criquet Pèlerin dans la Région Occidentale (Commission for the

	<i>Desert Locust Control in the Western Region)</i>	IRIN	<i>Integrated Regional Information Networks</i>
CNLA(A)	<i>Centre National de Lutte Antiacridienne (National Locust Control Center)</i>	IRLCO-CSA	<i>International Red Locust Control Organization for Central and Southern Africa</i>
COR	<i>Central SGR Outbreak Region</i>	ITCZ	<i>Inter-Tropical Convergence Zone</i>
CPD	<i>Crop Protection Division</i>	ITF	<i>Inter-Tropical Convergence Front = ITCZ)</i>
CRC	<i>Commission for Controlling Desert Locust in the Central Region</i>	FAO-DLIS	<i>Food and Agriculture Organizations' Desert Locust Information Service</i>
CTE	<i>Chortoicetes terminifera (Australian plague locust)</i>	Hoppers	<i>young, wingless locusts/grasshoppers (Latin synonym = nymphs or larvae)</i>
DDLC	<i>Department of Desert Locust Control</i>	JTWC	<i>Joint Typhoon Warning Center</i>
DLCO-EA	<i>Desert Locust Control Organization for Eastern Africa</i>	Kg	<i>Kilogram (~2.2 pound)</i>
DLMCC	<i>Desert Locust Monitoring and Control Center, Yemen</i>	L	<i>Liter (1.057 Quarts or 0.264 gallon or 33.814 US fluid ounces)</i>
DMA	<i>Dociostaurus maroccanus (Moroccan Locust)</i>	LCC	<i>Locust Control Center, Oman</i>
DPPQS	<i>Department of Plant Protection and Quarantine Services, India</i>	LMC	<i>Locusta migratoriacapito (Malagasy locust)</i>
DPV	<i>Département Protection des Végétaux (Department of Plant Protection)</i>	LMM	<i>Locusta migratoria migratorioides (African Migratory Locust)</i>
ELO	<i>EMPRES Liaison Officers -</i>	LPA	<i>Locustana pardalina</i>
EMPRES	<i>Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases</i>	MoAFSC	<i>Ministry of Agriculture, Food Security and Cooperatives</i>
EOR	<i>Eastern SGR Outbreak Region</i>	MoAI	<i>Ministry of Agriculture and Irrigation</i>
ETOP	<i>Emergency Transboundary Outbreak Pest</i>	MoARD	<i>Ministry of Agriculture and Rural Development</i>
Fledgling	<i>immature adult locust /grasshopper that has pretty much the same phenology as mature adults, but lacks fully developed reproductive organs to breed</i>	NALC	<i>National Agency for Locust Control</i>
GM	<i>GreenMuscle® (a fungal-based biopesticide)</i>	NC DLC	<i>National Center for the Desert Locust Control, Libya</i>
ha	<i>hectare (= 10,000 sq. meters, about 2.471 acres)</i>	NOAA (US)	<i>National Oceanic and Aeronautic Administration</i>
ICAPC	<i>IGAD's Climate Prediction and Application Center</i>	NPS	<i>National Park Services</i>
IGAD	<i>Intergovernmental Authority on Development (Horn of Africa)</i>	NSD	<i>Republic of North Sudan</i>
		NSE	<i>Nomadacris septemfasciata (Red Locust)</i>
		OFDA	<i>Office of U.S. Foreign Disaster Assistance</i>
		PBB	<i>Pine Bark Beetle (Dendroctonus sp. - true weevils)</i>
		PHD	<i>Plant Health Directorate</i>
		PHS	<i>Plant Health Services, MoA Tanzania</i>

PPD Plant Protection Department
 PPM Pest and Pesticide Management
 PPSD Plant Protection Services
 Division/Department
 PRRSN Pesticide Risk Reduction
 through Stewardship Network
 QQU *Quelea Quelea* (Red Billed *Quelea*
 bird)
 SARCOF Southern Africa Region
 Climate Outlook Forum
 SPB Southern Pine Beetle
 (*Dendroctonus frontalis*) – true
 weevils
 SGR *Schistoseca gregaria* (the Desert
 Locust)
 SSD Republic of South Sudan
 SWAC South West Asia DL Commission
 PBB Pine Bark Beetle
 PSPM Preparedness, Strategic Planning
 and Mitigation (formerly known as
 Technical Assistance Group - TAG)
 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.
 USAID the United States Agency for
 International Development
 UN the United Nations
 WOR Western SGR Outbreak Region
 ZEL *Zonocerus elegans*, the elegant
 grasshopper
 ZVA *Zonocerus variegatus*, the
 variegated grasshopper (This
 insect 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

perhaps due to climate anomalies,
 etc.).

Who you should contact:

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