

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

SUMMARY

The **Desert Locust (SGR¹)** situation continued developing in March in winter breeding areas in northwest Africa and the southern coast of **Yemen, Morocco** and **Mauritania** controlled 6,309 ha combined during this period. Solitary adults were reported in northern **Mali** and **Niger** and Central western Sahara **Algeria**. A few copulating adults were observed on March 2nd in Titaghsin wade and northwest Ghat in **Libya**. No locusts were reported in **Chad, Senegal** or **Tunisia** during this time.

Yemen reported locust groups, some mating and breeding as well as a swarm during March along the southern coastal plains in Shabwah governorate. The locusts were detected between Arkha and Bir Ali in an area stretching over 120 km long and 20 km wide. No locusts were reported in northern **Oman** where good rains were recorded or in **Sudan** where surveys covered more than 11,800 ha In March. No locusts were reported in **Ethiopia, Eritrea, Djibouti, northern Somalia** or **Saudi Arabia** and the situation remained

calm in the eastern outbreak region in **Iran, Pakistan** and **India** in March.

Forecast: SGRs that escaped control in **Mauritania** and **Morocco** will form groups and move to areas of green vegetation before they migrate to spring breeding areas in southeastern **Morocco** and **Algeria**. In **Libya** isolated adults may appear in the southwest near Ghat and breed. As vegetation dries up in southern **Yemen**, locusts will form groups and small swarms and move to the interior of the country and perhaps northern **Oman** and begin breeding during the forecast period. A few adults may appear in the eastern outbreak region in southeast **Iran** and southwest **Pakistan** and begin breeding in the coming months.

OTHER ETOPS

Red (Nomadic) Locust (NSE): The NSE situation was reported relatively calm in the primary outbreak areas in **Tanzania, Malawi** and **Zambia** in March. However, favorable ecological conditions may have caused hopper bands to further develop. If left unabated, hoppers will fledge and form adult groups and swarmlets during the forecast period and begin migrating to neighboring areas and threaten crops (IRLCO-CSA).

Madagascar Migratory Locust (LMC): The final phase of the three-year campaign is in progress. As of end of February 2016, the project reported treated/protected more than

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

2.1 million ha causing a significant reduction in locust populations and areas infested (FAO-ECLO).

Italian (CIT), Moroccan (DMA), Asian Migratory (LMI) Locusts, Central Asia and the Caucasus (CAC): CAC is expected to have experienced some hatchings of DMA. Joint survey operations are planned for early spring (FAO-ECLO).

African Armyworm (AAW): AAW outbreaks were not reported in the IRLCO-CSA member-states during March.

Quelea quelea (QQU): QQU bird outbreaks were reported in several districts in **Tanzania** in March and control operations were in progress at the time this report was compiled. QQU outbreaks were also reported in **Kenya** during this period.

Pine Bark Beetle Outbreaks

The pine bark beetle (PBB) *Dendroctonus sp.* Caused significant damage to trees in **Honduras** during the past months. GoH declared a national disaster and deployed armed forces to tackle the problem. The pest was also reported damaging trees in Central and South American, including **Belize, Brazil, El Salvador, Guatemala, and Nicaragua**. The pine beetles were also reported affecting millions of trees in the **USA, Canada and Mexico**. In North America (the Rocky Mountains) the PBB/SBP outbreaks are attributed to

favorable ecological conditions created by warmer than normal winter temperatures and sustained the pest. This is exacerbated by the lower than normal precipitation that weakens the trees (NPS).

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.

Increased awareness in affected countries and support from USAID/OFDA, FAO and other humanitarian/development partners helped frontline and primary invasion countries in Northern Africa and Sahel West Africa, i.e., Algeria, Chad, Libya, Mali, Mauritania, Morocco, Niger, Senegal and Tunisia to establish autonomous unit at the national level for the prevention and control of SGR.
End summary

RÉSUMÉ

Le **(SGR)** situation relative au Criquet pèlerin a poursuivi le développement de Mars dans les zones de reproduction hivernale en Afrique du nord et la côte sud du **Yémen**. Le **Maroc** et la **Mauritanie** contrôlés 6,309 ha combinés au cours de cette période. Les ailés solitaires ont été signalés dans le nord du **Mali** et du **Niger** et ouest de l'**Algérie** centrale.

Quelques adultes ont été observés en train de copuler le 2 Mars à Titaghsin wade et au nord-ouest de Ghat en **Libye**. Aucun criquet n'a été signalé au **Tchad**, au **Sénégal** ou en **Tunisie** durant cette période.

Yémen a signalé des groupes de criquets, certains l'accouplement et la reproduction ainsi qu'un essaim au cours de Mars le long des plaines côtières du sud dans le gouvernorat de Shabwah. Les criquets ont été détectés entre Arkha et Bir Ali dans une zone allant de plus de 120 km de long et 20 km de large. Aucun criquet n'a été signalé dans le nord d'Oman où de bonnes pluies ont été enregistrées ou au **Soudan**, où des enquêtes ont couvert plus de 11.800 ha En Mars. Aucun rapport n'a été reçu en **Ethiopie**, en **Erythrée**, **Djibouti**, nord de la **Somalie** ou de **l'Arabie Saoudite** et la situation est restée calme dans la région de l'Est épidémie en **Iran**, au **Pakistan** et en **Inde** au cours de Mars.

Prévisions: SGR qui ont échappé à un contrôle en **Mauritanie** et au **Maroc** formeront des groupes et se déplacer vers les zones de végétation verte avant qu'ils migrent vers les zones de reproduction de printemps dans le sud du **Maroc** et de **l'Algérie**. En **Libye** adultes isolés peuvent apparaître dans le sud-ouest, près de Ghat et de la race. Comme la végétation se dessèche dans le sud du Yémen, les criquets vont former des groupes et de petits essaims et se déplacer à l'intérieur du pays et peut-

être le nord d'**Oman** et de commencer l'élevage au cours de la période de prévision. Quelques adultes peuvent apparaître dans la région de l'épidémie dans le sud-est du sud-ouest **Iran** et le **Pakistan** et commencer la reproduction au cours de la période de prévision.

AUTRES ETOPS

Rouge (Nomadic) Locust (NSE): La situation NSE a été rapporté relativement calme dans les zones de foyer primaire en en **Tanzanie**, au **Malawi** et en **Zambie** en Mars. Cependant, les conditions écologiques favorables peuvent avoir causé des bandes larvaires se développer davantage. Si laissé sans relâche, les larves se mue imaginaire et forment des groupes adultes et de petits essaims au cours de la période de prévision et de commencer la migration vers les zones voisines et menacer les cultures (IRLCO CSA).

Locust Madagascar migrants (LMC): La phase finale de la campagne de trois ans est en cours. À la fin de Février 2016, le projet a rapporté traité / protégé plus de 2,1 millions d'hectares entraînant une réduction significative des populations acridiennes et les zones infestées (FAO-ECLO).

Italien (CIT), du Maroc (DMA), d'Asie migrants (IMT) Criquets, l'Asie centrale et du Caucase (CAC): CAC devrait avoir connu quelques hachures de DMA. Les opérations

conjointes de l'enquête sont prévus pour le début du printemps (FAO-ECLO).

Chenille Légionnaire africaine

(AAW): foyers AAW ont pas été signalés dans les IRLCO CSA Etats membres au cours de Mars.

Quéléa (qqu): foyers d'oiseaux de qqu ont été signalés dans plusieurs districts de la **Tanzanie** en Mars et les opérations de contrôle étaient en cours au moment où ce rapport a été compilé. épidémies qqu ont également été signalés au **Kenya** au cours de cette période.

Pine Bark Beetle Éclosions

Le scarabée d'écorce de pin (PBB) *Dendroctonus* sp. Caused des dommages importants aux arbres au **Honduras** au cours des derniers mois. GoH déclaré une catastrophe nationale et a déployé des forces armées pour lutter contre le problème. Le ravageur a également été signalé par trois dommageables dans le centre et Amérique du Sud, y compris le **Belize**, le **Brésil**, **El Salvador**, le **Guatemala** et le **Nicaragua**.

Les dendroctones du pin ont également été signalés touchant des millions d'arbres aux **Etats-Unis**, le **Canada** et le **Mexique**. En Amérique du Nord (les montagnes Rocheuses) les foyers PBB / SBP sont attribués à des conditions écologiques favorables créées par plus chaudes que les

températures hivernales normales et soutenu le ravageur. Cette situation est aggravée par la baisse des précipitations que la normale qui affaiblit les arbres (NPS).

USAID / OFDA / PSPM surveille ETOPS de près grâce à son réseau avec PPDs / DPV, unités ravageurs migrateurs 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.

Sensibilisation accrue dans les pays touchés et le soutien de l'USAID / OFDA, la FAO et d'autres partenaires humanitaires / développement a aidé les pays d'invasion de première ligne et primaire en Afrique du Nord et du Sahel Afrique de l'Ouest, à savoir, l'Algérie, le Tchad, la Libye, le Mali, la Mauritanie, le Maroc, le Niger, le Sénégal et la Tunisie pour établir l'unité autonome au niveau national pour la prévention et le contrôle des SGR. Résumé de fin

USAID / OFDA / PSPM surveille de près ETOPS à travers un dialogue régulier avec PPDs / DPV, unités nuisibles migrateurs nationales et les organisations régionales et internationales, dont 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.

Sensibilisation accrue des autorités nationales et l'appui de l'USAID / OFDA et d'autres partenaires humanitaires / développement ont aidé les pays de première ligne et d'invasion primaire en Afrique du Nord et du Sahel en Afrique de l'Ouest, à savoir, l'Algérie, le Tchad, la Libye, le Mali, la Mauritanie, le Maroc, le Niger, le Sénégal et la Tunisie à établir unité autonome au niveau national pour la prévention et le contrôle des SGR.
Résumé 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 bit.ly/1PAydht. 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

In **Mauritania**, continuous drying of the annual vegetation was detected around Bir Moghreïn and Tamreiket to Tisram in the northern part of the country. However, a few places between Rich Anajem and Dahr Ahmed Maouloud still harbor some green vegetation especially on sand dunes where soil moisture varied between 15 to 20 cm during the last dekad of March (CNLA/Mauritania).

In **Chad**, the weather conditions were moderate to hot sunny sky with temperatures ranging from 38 to 43°C during the day. No rainfall was recorded in the gregarious areas of the desert locust. Vegetation cover remained and overall conditions were unfavorable for SGR to survive or breed (NLCA/Chad).

In **Morocco**, ecological conditions remain favorable for survival and reproduction of the desert locust in some places in the south, in the region of Adrar Settouf during the second dekad of March. The minimum temperatures range was -06° C to 1° C on the Atlas side and between 02° C and 08° C in the east and southeast. Coastal areas reported 9° C and 14° C coast in the center and the southern provinces. Maximum temperature ranged between 25° C and 30° C in the southeast, central and the interior plains and between 30° C and 36° C in the southern provinces. No precipitation was reported during this period.

In **Tunisia**, very light showers (2-4 mm) were reported in March in southeastern and the extreme south (2 mm in Sidi Boubaker- Gafsa and 4 mm in Zannouch-Gafsa). The average maximum and minimum temperatures in the southwest and the extreme south of the country were 23°C and 9.7°C. In **Libya**, the maximum and minimum temperatures ranged 7-15°C and 19-36°C. A satellite imagery indicated some greenness in a few places in the west (Alhamada Ahamra), southwest (Titaghsin and wade Armit), southeast (Eastern Lawenat & Arkno) and the center (Alharouj Alaswad) during the first dekad this month (CNLC/Libya). No update was received from **Algeria, Mali** or **Niger** at the time this report was compiled, but ecological conditions are expected to have become less and less favorable in most of the SGR breeding areas in March to sustain SGR.

In **Sudan** ecological conditions remained unfavorable in March with vegetation and soil remaining dry or drying out in all surveyed areas except for a few small patches in Toker Delta. No precipitation was recorded during this period.

No precipitation was reported in SGR breeding, outbreak and or primary invasion areas in **Eritrea, Ethiopia, Djibouti** or northern **Somalia** during March and much of the vegetation was drying or dry and a few patches of green spots may be present in low laying areas.

In **Yemen**, many of the winter breeding areas were not accessible to assess ecological conditions. However, in Shabwah patches of green vegetation were reported as most of the vegetation was drying up. In **Oman**, light to heavy rains that were reported in Sharqiya, Dakhiliya, Battinah, Bureimi and

Musandam Regions during the 2nd and 3rd dekads of February caused ecological conditions to improve for the SGR (DLMCC/Yemen, LCC/Oman).

Mostly dry weather with hot days and cool nights dominated the scheduled desert areas (SDA) in Rajasthan, **India** during the first fortnight of March. Only light showers were reported near Jodhpur and north-east of Jaisalmer close to the **Indo-Pakistan** border and light to moderate rain was also reported in the desert areas in Churu districts in Rajasthan India during the 1st dekad of March (DPPQS/India).

Normal to below normal rains were recorded at some of the locations near NSE outbreak areas (Table 1). Flooding of the Wembere plains in **Tanzania** persisted and may have negatively affected successful breeding.

Table 1: Rainfall (millimeters) recorded at locations near NSE outbreak areas March (source: IRLCO-CSA).

Country, Station, outbreak area	Rainfall /mm
Tanzania	
Masenge: Wembere lains	111.9
Kaliua: Malagarasi Basin	294.3
Mpanda: Iku-Katavi plains	120.7
Muze: Lake Rukwa plains	65.8
Mozambique	
Nhamatanda: Buzi-Gorongosa plain	102
Mafambise: Buzi-Gorongosa plain	104
Gorongosa: Buzi-Gorongosa	104
Caia: Dimba plain	107
Zambia	
Namwala: Kafue Flats	313.4

In CAC, temperature is gradually rising with spring season heralding during March.

El Niño/La Niña and SGR outbreak.

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 outbreaks. 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/grab 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: In **Mauritania**, different instars of hoppers were reported at 23°14'N /12°18'W and 23°17'N /12°16'W where annual vegetation (*Schovia thebaica* *Lupinus digitatus* ...) is still green in some places north and north-east of Tiris Zemmour and Nouadhibou Dakhlet. Mature and immature adult locust groups with densities ranging from a few hundred to 3,200 insects/ha were detected in March. Control operations treated 1,214 ha of adults with Chlorpyrifos 240 and hoppers with *GreenMuscle* north of Zouerate during this month with cumulative areas treated since the beginning of the current campaign on November 2nd rising to 5,918 ha.

In **Morocco**, CNLAA dispatched four teams - three for survey and control and for monitoring and evaluation - in the Adrar Settouf region in southern **Morocco** during the second dekad of March. Ground control operations were conducted against hopper bands and

adults in 18 sites in the vicinity of Aousserd and Tichla each measuring from 65 to 150 ha. The teams treated 5,095 ha Chlorpyrifos 240 ULV March (the cumulative ha treated since the current campaign began on December 23th, 2015 is 8,759 ha. CNLAA's two Turbo Thrash spray planes are on stand-by. In **Libya**, SGR situation remained calm in March and only a few copulating adults were observed on March 2nd in Titaghsin wade (35 31 45N/10 00 56E) NW Ghat (344°). No locusts were detected during survey in mid-March in Titaghsin, Maghdit and Tanazoft wades. Solitary adults were reported in northern **Mali** and **Niger** and Central western **Algeria**, but no locusts were reported in **Chad, Tunisia** or **Senegal** during March (CNLA/Mauritania, CNLAA/Morocco, CNLA/Tunisia, FAO-DLIS, NALC/Chad).

Forecast: Locusts that escaped control in northern **Mauritania** will form groups and move to areas of green vegetation before they progress to spring breeding areas in southeastern **Morocco** and **Algeria** during the forecast period. Progressively drying up of vegetation in the Adrar Settouf region in Aousserd and Tichla in **Morocco** will force mature and immature adults and hoppers that escaped ground control to regroup in areas where favorable ecological conditions still exist before they begin moving north to Gueltat Zemmour. CNLAA's Turbo Thrush aircraft are on stand-by for any unexpected occurrences. Isolated adults may appear in southwest near Ghat in **Libya** and breed where rainfall was reported earlier. **Chad, Senegal** and **Tunisia** will likely remain calm during the forecast period (CNLA/Mauritania, CNLAA/Morocco, FAO-ECLO, NALC/Chad, NLCC/Libya, OFDA/AELGA).

Increased vigilance and timely preventive interventions remain imperative to minimize any significant SGR impact on food security and livelihoods of vulnerable populations.

SGR (Desert Locust) - Central

Outbreak Region: SGR has been reported breeding along the coastal plains in **Yemen** where the extremely heavy rains that fell late last year following tropical cyclones Chapala and Megh and some rains that fell thereafter created favorable conditions (see photo below, DLMCC/Yemen, March 2016). The National Desert Locust Monitoring and Control Center (DLMCC) detected the locusts during the first dekad of March for the first time since the tropical storms.



The green vegetation in northeast of Bir Ali (1401N/4820E) in the foothills of the mountains and between Horah (135058N/473741E) along the Shabwah coastal areas and Balhaf area west of Bir Ali sustained small hopper bands and groups of various instars mixed with immature adults. Mating and egg laying were also observed in different locations between Arkha and Bir Ali (see picture below DLMCC/Yemen, March 2016). The locusts were reported in multiple locations over areas stretching some 120 km long and 20 km wide. These areas are mostly inhabited by beekeepers, camel herders and nomads making it difficult to use conventional chemical pesticides to control the locusts (in the past

biopesticides were used to control the pest with the approval of the local communities, mainly beekeepers and herders).



On March 31st, DLMCC detected a small immature swarm on the southern coast of Shabwah between Arkha (1340N/4724E) and Morasi (1341N/725E) 115 km west of Bir Ali (1401N/4820E). The swarm was observed flying west and northwest. The team also reported several groups of immature adult locusts on April 2nd. The locusts were observed flying west and northwest towards Eanbamabad (1401N/4757E) 44 km west of Bir Ali and between Al Hami (135606N/474055E) and Horah (1350N/4736E) about 52 km from Eanbamabad on the coast of Shabwah and adjacent areas (DLMCC/Yemen).

DLMCC/**Yemen** is preoccupied with lack of adequate resources and the insecurity situation that continue undermining comprehensive survey and monitoring operations. Unless timely survey and monitoring are launched and preventive control interventions are effected, the SGR situation could further develop and pose a threat to crops and pasture of rural communities whose food security and livelihoods are already precarious. DLMCC received some assistance from CRC to carry out survey operations and requested additional assistance from external sources to continue survey and

prepare for control interventions (DLMCC/Yemen).

In **Sudan** the SGR situation remained calm during March and no locusts were detected during surveys carried out over 11,800 ha in winter breeding areas in the Red Sea State from Toker Delta to the southern border of the country. Isolated immature adults were detected in the southeast in **Egypt**. No locusts were reported in **Eritrea, Ethiopia** or **Djibouti** or northern **Somalia** in March. DLCO-EA coordinates deployment of one of its spray aircraft to Dire Dawa, **Ethiopia** to support aerial surveillance/control operations in northern **Somalia** and neighboring areas as needed.

In **Oman**, despite the good rains that fell in parts of the northern region of the country the SGR situation remained calm during March. Only low numbers of isolated solitary mature adults, some mating and laying eggs were detected during surveys carried out on 16 March in Bidiya (2222N/ 5856E), North Sharqiya Region(LCC/Oman).

Forecast: As vegetation dries up along the coastal areas in **Yemen**, locusts will form groups and small swarms and move to the interior of the country and likely begin breeding in areas of recent rainfall in Marib, Shabwah and Ḥaḍramūt regions. Some locusts may also move eastward into Oman. Intensive surveillance and timely preventive interventions are necessary to abate further developments and prevent any damages to beekeepers, camel herders and the nomads. SGR will disperse and remain in solitary form in winter breeding areas in **Sudan** and significant activities are not expected in **Ethiopia, Egypt, Eritrea, Djibouti** or northern **Somalia** during the forecast

period (DLMCC/ Yemen, FAO-DLIS, LCC/Oman, PPD/Sudan).

SGR - Eastern Outbreak Region: No locusts were detected during surveys carried out in the scheduled desert areas in Rajasthan, India were reported in **Iran** or **Pakistan** during March (DPPQS/India).

Forecast: Small-scale breeding may occur in southeast **Iran** and southwest **Pakistan** during the forecast period (FAO-DLIS, OFDA/AELGA).

Red (Nomadic) Locust (NSE): Major NSE activities were not reported during March in the primary outbreak countries. The absence of effective surveys has caused uncertainty on the locust situation in the primary outbreak areas in Wembere, Ikuu-Katavi, Lake Rukwa plains, Malagarasi Basin and Bahi Valley in **Tanzania**. A similar obstacle caused lack of current information on the NSE situation in Lake Chlwa/Lake Chiuta plains in **Malawi**, Buzi-Gorongosa plains in **Mozambique**, Kafue Flats, Lukanga Swamps and Mweru wa Ntipa plains in **Zambia**. It is likely that different instar hoppers are present in the primary outbreak areas especially in areas where favorable ecological conditions exist - in Ikuu-Katavi, Malagarasi Basin in **Tanzania** Lake Chilwa plains in **Malawi** and the Kafue Flats in **Zambia** during February and March (IRLCO-CSA).

Forecast: NSE is likely to fledge and form small swarms and groups in some primary outbreak areas where there was successful breeding in Tanzania, Malawi and or Zambia. Regular surveys in all primary outbreak areas are critical to avoid any potential invasions and/or outbreaks (IRLCO-CSA).

Madagascar Migratory Locust (LMC):

The final phase of the three-year campaign that began in August, 2015 is in progress. An update on March activities was not received at the time this report was compiled, but by the end of February, the campaign reported close to 2.1 million ha tread/prevented. Continued preventive and curative control interventions resulted in significant reductions in both locust populations as well as areas infested aligning survey and control operations to focus in strategic areas in the southwest outbreak zone. The locust campaign utilized largely an organophosphate Chlorpyrifos, mixed with pyrethroids cypermethrin and deltamethrin. Insect growth regulator (e.g., Teflubenzuron) and GreenMuscle (a biopesticides) were also utilized.

Forecast: With below normal rainfall reported during this season, locusts will likely regroup in patches of green vegetation and breed in the southwest during the forecast period.

It is worth noting that during the course of the three phase locust campaign, **Algeria, Mauritania, and Morocco** donated close to 455,600 l of pesticides to **Madagascar** through a triangulation coordinated by UN/FAO (**Morocco** donated 395,600 l while **Algeria** and **Mauritania** donated 30,000 l each). As of February, 2016, close to 974,233 l of pesticides were reported used to control the Malagasy locust, and to some extent, the red locust.

Italian (CIT), Moroccan (DMA) and Migratory (LMI) Locusts in Central Asia and the Caucasus (CAC): Locust activities are expected to have gradually begun in the CAC region where ecological

conditions are expected to improve with the onset of spring.

Forecast: Hoppers are expected to begin developing and forming groups during the forecast period (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.

SGR - Eastern Outbreak Region: No locusts were detected during surveys carried out in the scheduled desert areas in Rajasthan, India were reported in **Iran** or **Pakistan** during March (DPPQS/India). **Forecast:** Small-scale breeding may occur in southeast **Iran** and southwest **Pakistan** during the forecast period (FAO-DLIS, OFDA/AELGA).

Timor and South Pacific: No update was received from East Timor during March, but it is likely that the acridid development has commenced.

African Armyworm (AAW): AAW outbreaks were not reported in the IRLCO-CSA member-states during March.

Forecast: The Armyworm season is in progress in **Kenya** and **Tanzania**.

AAW coordinators and CBAMFEW and non-CBAMFEW forecasters are advised to remain vigilant and rapidly report trap catches to concerned authorities for timely interventions. The AAW season will have ended in the southern outbreak region in **Malawi, Mozambique, Zambia** and **Zimbabwe** during the forecast period (IRLCO-CSA, OFDA/AELGA).

Tree locust - *Anacridium sp.*

No update was received in March on the tree locust outbreak that occurred in Turkana County in **Kenya** in January and February (IRLCO-CSA).

Quelea (QQU): QQU outbreaks were reported in Kondo, Singinda, Dodoma, Shinyanga and Mbeya district **Tanzania** where control operations by the Plant Health Services of the Ministry of Agriculture, Food Security and Cooperatives in collaboration with Desert Locust Control Organization for Eastern Africa were in progress. QQU outbreaks were also reported causing damage to irrigated rice in Kisumu county **Kenya** during March. Plans by Crop Protection Branch of the Ministry of Agriculture to carry out control operations were underway at the time this report was being compiled (IRLCO-CSA).

Forecast: QQU birds are likely to continue being a problem to small grain cereal growers Shinyanga, Dodoma, Tabora, Singinda and Mbeya Regions of **Tanzania**; Kisumu, Busia, Siaya, Kirinyaga counties of **Kenya** and in winter wheat growing provinces in **Zimbabwe**.

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 pests for March. However, rodents 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 [Wikipedia](http://en.wikipedia.org/wiki/Dendroctonus_frontalis)

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 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 bases. 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 and Mauritania respectively treated 5,095 ha and 1,214 ha in March reducing their pesticide inventories by that amount. Madagascar is expected to have reduced its inventory by the amount used for control operations in March.

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	1,190,000~
Chad	44,500
Egypt	68,070~ (18,300 ULV, 49,770 I)
Eritrea	18,250~ + 20,000 ^D
Ethiopia	10,000~
Libya	25,000~

Madagascar	206,000~ + 100,000 ^D
Mali	27,000
Mauritania	30,000 ^{DM}
Morocco	3,497,864 ^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~
<p>*Includes different kinds of pesticide and formulations - ULV, EC and dust;</p> <p>~ data may not be current;</p> <p>^D = Morocco donated 100,000 l of pesticides to Madagascar and 10,000 l to Mauritania in 2015</p> <p>^D = In 2013 Morocco donated 200,000 l to Madagascar</p> <p>^D = Saudi donated 10,000 to Yemen and pledged 20,000 l to Eritrea</p> <p>^{DM} = Morocco donated 30,000 l of pesticides to Mauritania</p> <p>GM = <i>GreenMuscle</i>TM (fungal-based biological pesticide)</p>	

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*

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

CAC *Central Asia and the Caucasus*

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 Pèlerin dans la Région Occidentale (Commission for the Desert Locust Control in the Western Region)*

CNLA(A) *Centre National de Lutte Antiacridienne (National Locust Control Center)*

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)*

DPPOS *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*

ETOP *Emergency Transboundary Outbreak Pest*

Fledgling *immature adult locust /grasshopper that has pretty much*

	<i>the same phenology as mature adults, but lacks fully developed reproductive organs to breed</i>	NPS	National Park Services
GM	GreenMuscle® (a fungal-based biopesticide)	NSD	Republic of North Sudan
ha	hectare (= 10,000 sq. meters, about 2.471 acres)	NSE	Nomadacris septemfasciata (Red Locust)
ICAPC	IGAD's Climate Prediction and Application Center	OFDA	Office of U.S. Foreign Disaster Assistance
IGAD	Intergovernmental Authority on Development (Horn of Africa)	PBB	Pine Bark Beetle (Dendroctonus sp. – true weevils)
IRIN	Integrated Regional Information Networks	PHD	Plant Health Directorate
IRLCO-CSA	International Red Locust Control Organization for Central and Southern Africa	PHS	Plant Health Services, MoA Tanzania
ITCZ	Inter-Tropical Convergence Zone	PPD	Plant Protection Department
ITF	Inter-Tropical Convergence Front = ITCZ)	PPM	Pest and Pesticide Management
FAO-DLIS	Food and Agriculture Organizations' Desert Locust Information Service	PPSD	Plant Protection Services Division/Department
Hoppers	young, wingless locusts/grasshoppers (Latin synonym = nymphs or larvae)	PRRSN	Pesticide Risk Reduction through Stewardship Network
JTWC	Joint Typhoon Warning Center	QQU	Quelea Quelelea (Red Billed Quelea bird)
Kg	Kilogram (~2.2 pound)	SARCOF	Southern Africa Region Climate Outlook Forum
L	Liter (1.057 Quarts or 0.264 gallon or 33.814 US fluid ounces)	SPB	Southern Pine Beetle (Dendroctonus frontalis) – true weevils
LCC	Locust Control Center, Oman	SGR	Schistoseca gregaria (the Desert Locust)
LMC	Locusta migratoriacapito (Malagasy locust)	SSD	Republic of South Sudan
LMM	Locusta migratoria migratorioides (African Migratory Locust)	SWAC	South West Asia DL Commission
LPA	Locustana pardalina	PBB	Pine Bark Beetle
MoAFSC	Ministry of Agriculture, Food Security and Cooperatives	PSPM	Preparedness, Strategic Planning and Mitigation (formerly known as Technical Assistance Group - TAG)
MoAI	Ministry of Agriculture and Irrigation	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.
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		
NOAA (US)	National Oceanic and Aeronautic Administration		

- 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:

If you have any questions, comments or suggestions or know someone who would like to freely subscribe to this report, please, feel free to contact us:

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