

A 21st Century Integrated Approach to Management of Desert Locusts



Proceedings
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Webinar held on
15th March 2021

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List of Abbreviations

AATF	The African Agricultural Technology Foundation
ARC-PHP	Agricultural Research Council- Plant Health and Protection
CABI	Centre for Agriculture and Bioscience International
CSOs	Civil Society Organisations
DLCO - EA	Desert Locust Control Organization for Eastern Africa
ETOP	Emergency Transboundary Outbreak Pests
EAC	East African Community
FAO	Food and Agriculture Organisation
IPM	Integrated Pest Management
NGO	Non-governmental Organisations
ULV	Ultra Low Volume
USAID	United States Agency for International Development
USDA-FAS	United States Department of Agriculture Foreign Agricultural Service



Speakers and Panelists



Dr Denis T Kyetere,
Executive Director, AATF



Dr. Ruth Kahuthia-Gathu,
Senior lecturer at the School
of Agriculture and Enterprise
Development, Kenyatta
University, Kenya.



Dr. Stephen Njoka,
Director of the Desert Locust
Control Organization for Eastern
Africa (DLCO - EA).



Dr. Daniel Kyalo Willy,
Programme Officer at the Policy
& Regulatory Affairs Unit at AATF.



Dr. Yene Belayneh,
Senior Technical Advisor for Pests
and Pesticides at the USAID's
Bureau for Humanitarian
Assistance, in Washington DC.



Dr. Ivan Rwomushana,
Senior Scientist in-charge of
Invasive Species at the Centre
for Agriculture and Bioscience
International (CABI).

Chapter 1

Preliminaries

1.1 Webinar Overview

AATF held its first webinar of 2021 themed '**A 21st Century Integrated Approach to Management of Desert Locusts**'. The Webinar converged international experts on migratory pests and policy to interrogate the ongoing locust invasion and its impact on food security in Africa. The panel discussion focused on why the Desert Locusts are so destructive and hard to control; the historical perspectives on Desert Locust invasion; the perspectives of development partners on management of Desert Locusts; perceptions and environmental concerns in Desert Locust control and the regulatory environment relevant for pesticide access and use. The event moderator was the AATF Executive Director, Dr Denis T. Kyetere. A total of 104 people attended the webinar through the Zoom platform and Facebook livestreaming. Audiences were drawn from the public and private sectors including seed companies, key agriculture sector players from research centers, Non-Governmental Organisations (NGOs), Civil Society Organisations (CSOs), academia, farmer groups, national research institutions and the media.

1.2 Objectives

The webinar sought to:

- i. Explore the historical perspectives of Desert Locust invasion in the Horn of Africa.
- ii. Determine the long-term strategies of Desert Locusts management from a developmental partners lens.
- iii. Demystify Perceptions and Environmental Concerns in Desert Locust Control.
- iv. Explore the Pesticide Regulatory Environment within East Africa and its Influence on Access to Pesticides for the Control of Desert Locusts.

1.3 Meeting Design

The meeting was a moderated panel discussion led by Dr Denis T. Kyetere. The panelists were renowned international experts on migratory pests and policy, carefully selected based on their areas of expertise as presented in Annex 1.

Chapter 2

Opening and Welcoming Remarks

Dr. Denis T. Kyetere, Executive Director, AATF



In welcoming participants to the first webinar of 2021, Dr Kyetere explained that the discussion would focus on interrogating the ongoing locust invasion, its impact on food security in Africa and explore management measures to control the invasion. He noted that the East Africa and Horn of Africa regions are currently facing one of the worst infestations of desert locusts, causing huge crop losses and worsening food insecurity in the affected countries.

Dr. Kyetere observed that Kenya is facing the worst locust invasion in 70 years, while Somalia and Ethiopia are experiencing their worst in 25 years. The invasion has compounded an already bleak food security situation amid the COVID-19 pandemic. He noted that the locust outbreak is at a critical point after the recent off-season rains in some parts of the region that have accelerated their breeding. Dr. Kyetere pointed out that forecasts from the latest **Global Report on Food Crises** estimated that over 25 million people would face acute food insecurity in the Eastern Africa region.

He called upon African governments, regional economic bodies and development partners to take actions that will create a conducive policy and regulatory environment to enable access to better pesticides and pest control products as well as equipment and tools needed for efficient control of Desert Locusts such as drones.

Chapter 3

Key Speaker Presentations

3.1 Influence of Desert Locusts anatomy on containment and management efforts.



Dr. Ruth Kahuthia-Gathu is a Senior lecturer at the School of Agriculture and Enterprise Development, Kenyatta University, Kenya.

Dr Kahuthia-Gathu highlighted the breeding and migratory nature of desert locusts. She noted that a single swarm can cover up to 1,200 square kilometers with a population between one and 80 million locusts per square kilometers and that they can live between three to six months. In terms of movement, she noted that Desert Locusts travel 100 to 200 kilometers in a day while flying up to about 2,000 meters above sea level. According to her, the factors which allow breeding include unusually good rains, suitable ecological conditions namely green vegetation and moist sandy soils. The direction of wind is also a major factor as it enables swarms to fly for long distances. These tendencies, she pointed out, explains why Desert Locusts are hard to control.

Dr. Kahuthia-Gathu observed that some of the challenges in controlling of Desert Locusts include inaccessibility of infested regions; lack of adequate funds; inadequate pesticides for control; unpredictable weather and inadequate trained personnel within the region. To address the above challenges, she suggested opportunities for capacity development in areas such as monitoring and surveillance; development of mobile apps; real time relay of information; cohesive regional cooperation and involvement of all stakeholders.

Dr. Kahuthia-Gathu called for the need to strengthen human capacity in the region to improve information collection, analysis and dissemination; expedite research for solutions, developing mobile applications to enhance monitoring and surveillance. Further, she noted that engagement with private sector to develop tools and systems that can boost surveillance, monitoring and response is critical in managing the locusts.

3.2 The historical perspectives on Desert Locust invasion.



Dr. Stephen Njoka, the Director of the Desert Locust Control Organization for Eastern Africa (DLCO - EA).

Dr. Njoka highlighted that Desert Locusts plagues affect the most vulnerable communities in rural areas of Africa who depend on subsistence farming for their livelihood and often have no access to alternative sources of income that would allow them to replenish their losses. This, he clarified, can lead to food crises that often require the intervention of Governments and donors through the provision of relief food.

He stated that Desert Locusts plagues have affected 20 per cent (28million Km²) of the earth's surface but they originate from a much smaller area (16millionKm²) known as the Recession Area which extends from Mauritania across the Sahara to the Red Sea Basin, the Horn of Africa and through the Arabian Peninsula into northwest India and south west Pakistan. Moreover, he pointed out that the Horn of Africa which covers Djibouti, Eritrea, Ethiopia, Kenya, Somalia, South Sudan, Sudan, Tanzania and Uganda is prone to Locusts attack mainly from across the Red Sea Basin.

Dr. Njoka noted that in 2007, swarms from Yemen invaded northern Somalia, Djibouti and eastern Ethiopia where substantial breeding occurred, leading to further invasion of southern Ethiopia, northeast Kenya (the first time in 50 years) and Eritrea. During the 2014 breeding season, efforts to contain the locusts failed primarily due to inadequate resources. Consequently, swarms crossed from Somaliland into Ethiopia and caused extensive damage.

He highlighted that the current invasion was first noted in eastern Ethiopia in June 2019, spread to the Somali region and entered Kenya by December 2019 through Manderla and spread to over 25 Counties in Kenya. They were reported in Moroto, northern Uganda in February 2019 and reported in Northern Tanzania in March 2020. He commended Eritrea and Sudan for having active on ground control of Locusts that minimised their spread to the rest of the Horn of Africa.

Dr. Njoka stated that DLCO-EA has continued to collaborate with the Member Countries and partners like Food and Agriculture Organisation (FAO) and the United States Agency for International Development (USAID) in training technical staff, deploying spray aircrafts to contain the locusts and continuous monitoring and forecasting of the situation. He noted that while these efforts had been fairly successful, cases of second wave are being encountered. He acknowledged that in the past, data collection and

recording was analogue and tedious but currently, the use of devices and Applications like E-Locust3, real time location and status of locust infestation is possible which helps in drawing fast solutions for the fight against the locusts.

Dr. Njoka emphasized the importance of collecting reliable data and transmitting it to central command for effective communication to the control agencies as a key requisite to manage the ongoing fight against Desert Locusts.

3.3 The perspectives of development partners on management of Desert Locusts



Dr. Yene Belayneh, the Senior Technical Advisor for Pests and Pesticides at the USAID's Bureau for Humanitarian Assistance, in Washington DC.

Dr. Belayneh discussed some of the priorities of development partners regarding management of Desert Locusts, including helping to build national and regional capacity and systems to manage the menace; promoting greater understanding of long-term sustainable approach for Emergency Transboundary Outbreak Pests (ETOPs) management; helping to build national and regional capacity and systems to manage ETOPs and leveraging the skills and knowledge of countries with the capacity to manage ETOPs. This, he noted was besides the use of new technologies for remote sensing, data collection, and improved forecasting.

To enhance value for money when implementing the Desert Locusts control strategies, Dr. Belayneh called for the need to promote and support collaborations among key actors; encourage and strengthen south-south partnership and collaboration to share experiences, knowledge, skills and tools; encourage and support establishment of functional relationships with neighboring countries.

Further, he noted that engagement of private sector to develop tools and systems that can boost surveillance, monitoring and response; strengthening knowledge dissemination and outreach among communities and reinforcing regional entities with mandate for emergency pest interventions, are critical in controlling the pests.

He stated that some of the strategies that Governments could employ to combat recurrence of pest invasions include increased collaboration with relevant stakeholders to adopt new technologies for improved data collection; robust surveillance and monitoring; establish and institutionalize a system to improve staff and community skills and knowledge through active training and strengthening the capacity to improve information collection.

3.4 Perceptions and Environmental Concerns in Desert Locust Control



Dr. Ivan Rwomushana, a Senior Scientist in-charge of Invasive Species at the Centre for Agriculture and Bioscience International (CABI).

Dr. Rwomushana discussed some modern methods for controlling Desert Locusts by FAO, DLCO-EA, and other agencies such as synthetic insecticides in Ultra Low Volume (ULV) formulation which are applied through aircrafts, vehicle mounted sprayers and motorized hand-held sprayers.

He noted that control of Desert Locusts operations should be done in a robustly coordinated effort, nationally and regionally, cautioning that individual farmers cannot effectively control locust swarms in their fields. Dr. Rwomushana observed that the products that are currently used for desert locusts control such as Fenitrothion, Chlorpyrifos and Fipronil are highly toxic and can cause harm to the environment, humans or non-target organisms such as bees, fish and water sources. To mitigate such environmental concerns, he recommended that their use be limited to areas with no residents and non-livestock grazing areas.

He called for adoption of alternative methods for controlling the Locusts that safeguarding the environment. These include use of biological control methods that kills only locusts and does not contaminate the environment. He said that use of such biological pest control products such as Green Muscle has been effective in countries such as Yemen and Tanzania for the control of desert locusts and red locusts respectively.

Dr. Rwomushana pointed out that biological methods have been proven to work better than chemicals, provided they are applied on time to hopper bands before swarming starts. He further pointed out that CABI has been piloting the use of drone technology to control the desert locust, to complement traditional surveillance measures.

3.5 The Regulatory Environment relevant for Pesticide access and use



Dr. Daniel Kyalo Willy, Programme Officer at the Policy & Regulatory Affairs Unit at AATF.

Dr. Kyalo defined an enabling environment in the pesticide industry as sets of policies, institutions, support services and other conditions that collectively create business setting where enterprises and business activities can start, develop and thrive. He noted that an enabling environment in the pesticide industry is important to ensure timely access to quality pesticides and pest control products that have passed through the right approval processes. He identified critical areas in the policy environment relevant for control of Desert Locusts to include testing of new pesticides and pest control products based on laid down protocols; emergency registration of pesticides and pest control products including bio-pesticides and pesticides used in transboundary desert locust control operations.

Dr. Kyalo highlighted that AATF had been working with United States Department of Agriculture Foreign Agricultural Service (USDA-FAS), the East African Community (EAC) Secretariat and other stakeholders to support the finalization of EAC harmonized system for testing and registration of pesticides. These efforts have yielded an EAC pesticides management guideline on efficacy trials, residue trials and registration requirements; three sets of EAC Guidelines for testing and registration of Biopesticides and Draft EAC Guidelines for Approving Pesticides for Emergency Uses. He stated that lack of harmonized regional regulations for emergency registration of pesticides is impeding registration of promising products during emergency invasions.

He called on governments to strengthen an enabling environment in the pesticides industry to ensure timely access to quality pesticides and pest control products that have passed through the right approval processes. He pointed out that future operations in control of locusts can benefit from conducting a pilot assessment on efficacy and impact of aerial sprays and other methods currently being used in the control of Desert Locusts.

Dr. Kyalo urged African countries to enhance regional cooperation as well as update their policy and regulatory frameworks to address desert locusts menace; utilize digital tools to track and monitor the Locusts and to draw learnings from the current invasions for future preparedness.

3.6 South Africa experience in managing Desert Locust.

Dr. Roger Price, Research Team Manager, the Agricultural Research Council- Plant Health and Protection (ARC-PHP)

In highlighting the desert control experience in South Africa, Dr. price noted that the unpredictable nature of locust outbreaks and transboundary invasions posed similar problems in east Africa as they did in Southern Africa. He pointed out that there are no historical records of Desert Locust swarms invading Southern Africa, and the current threat to Southern Africa from these locust invasions is very low.

He observed that Southern Africa has its own sub-species of the Desert Locust which is endemic to southern Africa and can be found as solitary adults across the semi-arid areas of South Africa, Namibia, southern Botswana and into southern Angola, causing massive destruction to cereal crops in the country including those of the neighboring countries. He called for regional collaboration and the pooling of experience and available resources to strengthen locust control in Africa.

Chapter 4

Question and Answer: Session with the Panelists

Q: Can people differentiate sprayed from unsprayed swarms?

If one is dealing with locusts that have been sprayed with pesticides, then most of them will die. Secondly, if it is something to do with microbial biopesticides, one would be able to see fungal growth on the cuticle. For others, one would need to investigate whether they have pesticide residue or not but for microbial, one would be able to tell that they have been sprayed because of the fungal growth.

Q: Area-wide or community pest management is one approach that can be effective against the control of transboundary pests. Are there any legal or policy framework to effect this? How best can we involve local communities to compliment government departments?

There are a range of pesticides in the region recommended for control of Desert Locusts and these pesticides are imported by member countries through the plant protection department. Those recommended pesticides are what is used to control Desert Locusts. DLCO - EA comes in to support in offering aerial apparatus like use of aircraft to spray the locusts in the region. For the participation of the local communities, it is very hard. There are people who eat the insects, but they should be cautioned not to eat insects that have been sprayed as they are poisonous but instead, go for insects that are not yet sprayed. Indeed, that makes it very challenging task.

Q: There are some reserved opinions that regional management of Desert Locusts without extensive international system cooperation could be counterproductive. What approach is the USAID using to support management of locust invasions?

USAID approach to locust management is more of a humanitarian approach while preventive intervention is strengthening governments' capacity to be able to manage and prevent Desert Locusts invasions. As at March 2021, USAID had provided more than \$ 26 million for East Africa Locust operations to manage the ongoing invasion. At the same time, USAID has projects with FAO to support locust research and capacity strengthening. USAID support both preventive interventions that involve capacity strengthening as well as campaign operations.

In terms of regional approach, locusts being transboundary pests do not stay in one place so if they are controlled for example in Kenya, they will migrate to neighbouring countries. Therefore, collaboration among countries is a key issue. Regional organisations like DLCO – EA have played a major role in capacity strengthening in locust operations. Supporting regional organizations of this nature is critical to sustain the realized gains. For more information, please visit: <https://www.dlco-ea.org/>

Q: Are there pesticides that target locusts only without affecting other species?

Most of the products that are being used are not specific to Desert Locusts, so they would likely affect other insects within the surrounding environment. There is need to do further research and come up with products that are specific to locusts or using alternative options such as biopesticides that will not affect non-target insects like bees. For more information, please visit: <https://www.cabi.org/>

Q: Are there policies that synchronize desert locust management between neighboring countries?

Policies on synchronizing management between neighbouring countries are in place. There is an added benefit in harmonising and synchronising policies at regional level specifically related to processes of registration and release on new products. Sometimes, there may be a product that has been released and registered in one country and since the pest is crossing to the neighbouring country, it becomes a challenge to use that product in the neighbouring country. If there are harmonised ways of handling pesticides testing and registration, then it becomes much easier for the country that has not yet released the pesticide to use the data in the neighbouring country provided that they are within the same regional body such as the EAC. There is value in harmonising efforts towards control of this pest simply because it is a transboundary pest.

The efforts should not just be around policy and legal framework but also joining hands in the control efforts and that is why DLCO - EA was founded to have coordinated inter-governmental approach towards the control of Desert Locusts.



Chapter 5

Conclusion

The panelists called upon African governments, regional economic bodies and development partners to take actions that will create a conducive policy and regulatory environment to enable access to better pesticides and pest control products as well as equipment and tools needed for efficient control of Desert Locusts such as drones. Further, opportunities for capacity development in areas such as monitoring and surveillance; development of mobile apps; real time relay of information; cohesive regional cooperation and involvement of all stakeholders including local communities were considered to be critical in the control of locusts. In addition, strategies such as increased collaboration with relevant stakeholders to adopt new technologies for improved data collection, robust surveillance and monitoring; establishment and institutionalising a system to improve staff and community skills and knowledge through active training and strengthening the capacity to improve information collection, analysis, dissemination and management were suggested for adoption by governments to combat recurrence of pest invasions. More importantly, the meeting called for use of alternative methods for controlling the Locusts while safeguarding the environment. These include use of biological control methods that kills target species without contaminating the environment. Lastly, governments were urged to promote an enabling environment in the pesticides industry to ensure timely access to quality pesticides and pest control products that have passed through the right approval processes and to prepare better for future invasions.

Chapter 6

Appendices

6.1 Panelists' Profiles

Dr. Denis T. Kyetere



Denis T. Kyetere has been the Executive Director of the African Agricultural Technology Foundation (AATF) since 2012. Before joining the AATF, he was the Director General of Uganda's National Agricultural Research Organization (NARO). Denis holds a PhD from The Ohio State University, a MSc from the University of Wales, Aberystwyth College - all in Genetics and Plant Breeding - and a BSc (Hons) in Botany and Zoology from Makerere University, Uganda. Denis holds several honors, among which is the 2008 Recipient, International Alumni Award from the College of Food, Agricultural and Environmental Sciences, OSU, Ohio, USA. He has published widely in peer-reviewed scientific journals, mainly in genetics and plant breeding.

Dr. Daniel Kyalo Willy



Dr. Kyalo is an accomplished agricultural economist with over 15 cumulative years of passionately working with smallholder farmers, particularly in designing and implementing inter-disciplinary agricultural research projects, household and market surveys and quantitative/qualitative data analysis. His research has mainly focused on sustainable agricultural intensification and productivity, technology adoption and transfer, impact assessment of agricultural technologies, institutional economic aspects of agriculture, agri-environmental interactions and agricultural value chains assessment. Daniel holds a PhD in Agricultural and Resource Economics from the University of Bonn, Germany. In his current responsibilities at AATF, Daniel supports Policy work to facilitate the creation of an enabling environment for Agricultural technology adoption, input and output market access as well as facilitating efficient value chains. Previously Daniel was a Lecturer at the Department of Agricultural Economics, Kenyatta University.

Dr. Yene Belayneh



Dr. Belayneh is the Senior Technical Advisor for Pests and Pesticides with USAID's Bureau for Democracy, Conflict and Humanitarian Assistance/Bureau for Humanitarian Assistance. Prior to 2002, Dr. Belayneh was a technical advisor with USAID/Africa Bureau with a portfolio on pests and pesticides, ecotoxicological and environmental sectors as well as emergency pest project manager. Under his portfolios with USAID, he has extensively travelled overseas – Africa, Asia, Europe, and the Middle East - to provide training, conduct field assessments and monitoring, project developments, and participating in and guiding workshops. Belayneh is on the editorial and scientific advisory board with International HCH and Pesticide Association. Prior to joining USAID, Dr. Belayneh was a university lecturer on Entomology, Zoology, Botany, Crop Protection, and Ecology.

Dr. Ivan Rwomushana



Dr. Rwomushana is a Senior Scientist, Invasive Species Management at CABI, based at the Africa Regional Centre, Nairobi, Kenya. An entomologist by training, Ivan's research focuses on the development of climate resilient Integrated Pest Management (IPM) options for the management of invasive insect pests that constrain crop production in sub-Saharan Africa. He employs balanced basic and applied research to unravel the invasion biology and ecology of key invasive pests of agricultural crops in Africa and using this knowledge towards the development of lower risk pest control options with a strong inclination towards biological solutions. His overall goal is to provide farmers with novel solutions that reduce the heavy reliance on chemical pesticides to pest control.

Dr. Ruth Kahuthia-Gathu



Dr. Kahuthia-Gathu is a senior lecturer, currently working at the Agricultural Sciences and Technology Department, Kenyatta University. She specializes in Agricultural Entomology. She holds a Doctorate degree in Agricultural Entomology from the University of Hannover, Germany with a bias in Biological Control. She does research in IPM strategies with an emphasis on biological control,

Zoology, Ecology, and Entomology. Her current project is 'Management of White Mango Scale_Biological Control'. She is currently working on a project on the species diversity of wood-boring beetles and their associated natural enemies. Previously, she worked at the International Centre of Insect Physiology and Ecology Kenya on the management of *Plutella xylostella* using natural enemies (*Diadegma semiclausum* and *Cotesia plutellae*).

Dr. Stephen Njoka



Dr. Njoka is an Entomologist now serving as the Director of DLCO-EA. Previously, he served at KARI /KALRO as a Scientist and Centre Director at Kibos and Embu Centres. He was also privileged to serve as the Project Coordinator of the Lake Victoria Environmental Management Project At DLCO-EA, he works to enhance Food and Health Security in the Eastern Africa Region by forecasting, monitoring and controlling migratory pests and vectors viz: Desert Locusts, *Quelea* birds, Army worms and Tsetse flies. The member countries of DLCO - EA are Djibouti, Eritrea, Ethiopia, Kenya Somalia, South Sudan, Sudan, Tanzania and Uganda.



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DLCO-EA

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