# International Phytosanitary Conference 2016

***Theme: "Phytosanitary Regulation for Improved Trade Facilitation and Food Security"***

**Date**: 12th to 16th September 2016

**Venue**: KEPHIS Headquarters, Karen, Nairobi, Kenya.

**Workshop proceedings**

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## Cover Letter

**To**
**The IPC conference secretariat**
**Attention: Joseph Kigamwa**

**From**
**The IPC Conference rapporteur**
**Date: 28th September 2016**

**Re: IPC Conference proceedings**

The International Phytosanitary Conference took place from 12th to 16th September 2016, in Nairobi, Kenya. The organizer was Kenya Plant Health Inspectorate Service (KEPHIS) who is the National Plant Protection Organization of Kenya at their headquarters. The international conference was the first of its kind to be hosted by Kenya on Plant Health. 222 delegates from 25 Countries across the world gathered in Nairobi to discuss matters pertinent and emerging in plant health. Participants contributed papers of abstracts for oral or poster presentations within the eight thematic areas the main theme being "Phytosanitary Regulation for Improved Trade Facilitation and Food Security". The conference was carried out with oral presentations in the main hall, posters presentations, side meetings and exhibitions. Oral presentations were done in eight sessions each handling a specific thematic area.

Key outcomes of the conference were

1. Need for second International Phytosanitary Conference in 2018 as an International Plant Protection Convention (IPPC) calendar event. Venue and date to be communicated at a later date
2. Declaration of year 2020 as international Year of Plant Health
3. Proposed 6/12/2021 as cerebration date for The international day of Plant Health
4. Publication of the conference proceedings
5. Organization of the next international conference to be communicated
6.

Details for the conference deliberations are available at www.phytosanitaryconference.org

**List of acronyms and abbreviations**

| | |
|---|---|
| AATF | African Agricultural Technology Foundation |
| AFFA | Agriculture, Fisheries and Food Authority (AFFA) - Kenya |
| BecA | Biosciences Eastern and Central Africa |
| BGC | Blue Gum Chalcid |
| BLAST | Basic Local Alignment Search Tool |
| BOLD | Barcode of life database |
| CABI | Centre for Agriculture and Biosciences International |
| CABMV | Cowpea aphid-borne mosaic virus |
| CAVS | College of Agriculture and Veterinary Sciences |
| CBD | Convention on Biological Diversity |
| CBSV | Cassava Brown Streak Virus |
| CIP | International Potato Center |
| COMESA | Common Market for Eastern and Southern Africa |
| COPE | Centre of Phytosanitary Excellence |
| CS | Cabinet Secretary |
| CTAB | Cetyltrimethylammonium bromide |
| DCP | Department of Crop Protection |
| DNA | Deoxyribonucleic acid |
| EAC | East African Community |
| ELISA | Enzyme-linked immunosorbent assay |
| EMC | Elgeyo Marakwet County |
| EPPO | European and Mediterranean Plant Protection Organization |
| ETG | Export Trading Group |
| EU | European Union |
| SMAP | Standard and Market Access Programme |
| FAO | Food and Agriculture Organization |
| FTD | fly/trapday |
| GDP | Gross Domestic Product |
| GMFA | General Manager Finance and Administration |
| GMPS | General Manager Phytosanitary Services |
| H.E. | His Excellency |
| HCD | Horticulture Crops Directorate |
| HQ | Headquarters |
| ICARDA | International Center for Agricultural Research in the Dry Areas |
| ICIPE | International Centre of Insect Physiology and Ecology |
| ICRAF | World Agro-forestry Centre |
| ICRISAT | International Crops Research Institute for the Semi-Arid Tropics |
| ICT | Information Communication Technologies |
| IITA | International Institute of Tropical Agriculture |
| IPC | International Phytosanitary Conference |

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|---|---|
| IPPC | International Plant Protection Convention |
| ISPMs | international standards for phytosanitary measures |
| ISTA | International Seed Testing Association |
| IYPH | International Year of Plant Health |
| JKIA | Jomo Kenyatta International Airport |
| KALRO | Kenya Agricultural & Livestock Research Organization |
| KCB | Kenya Commercial Bank |
| KEFRI | Kenya Forestry Research Institute |
| KES | Kenya Shilling |
| KHC | Kenya Horticulture Council |
| KMFRI | Kenya Marine and Fisheries Research Institute |
| KEPHIS | Kenya Plant Health Inspectorate Service |
| KSTCIE | Kenya Standing Technical Committee on Imports & Exports |
| LAMP | loop-mediated isothermal amplification |
| MAT | male annihilation technique |
| MCMV | Maize Chlorotic Mottle Virus |
| MD | Managing Director |
| ME | Methyl Eugenol |
| MLND | Maize lethal necrosis disease |
| MoALF | Ministry of Agriculture Livestock and Fisheries |
| MSc | Master of Science |
| NCBI | National Centre for Biotechnology Information, USA |
| NIC | National Industrial Credit |
| NPPOs | National Plant Protection Organizations |
| OECD | Organization for Economic Cooperation and Development |
| OIE | World Organization for Animal Health |
| PCN | Potato Cyst Nematode |
| PCPB | Pest Control Products Board |
| PCR | Polymerase Chain Reaction |
| PhD | Doctor of Philosophy |
| PHIs | Plant Health Inspectors |
| PSS | Positively Selected Seed |
| PVY | Potato Virus Y |
| PVY-NTN | Potato Virus Y strain N - Tuber Necrotic |
| PVY-O | Potato Virus Y strain Ordinary |
| QDS | Quality Declared Seed |
| QMS | Quality Management Systems |
| RCBD | Randomized Complete Block Design |
| RECs | Regional Economic Communities |
| RIIP | Regional Integration Implementation Program |
| RT-PCR | Real-time Polymerase Chain Reaction |
| SADC | Southern African Development Community |

| | |
|---|---|
| SASHA | Sweet potato Action for Security and Health in Africa |
| SCMV | Sugarcane Mosaic Virus |
| SGS | SociétéGénérale de Surveillance |
| SOPs | Standard Operating Procedures |
| SPS | sanitary and phytosanitary |
| SSA | Sub-Saharan Africa |
| STDF | Standards and Trade Development Facility |
| TBT | Technical Barriers to Trade |
| TICAD | Tokyo International Conference on African Development |
| TML | Trimmed lure |
| TSWV | Tomato spotted wilt virus |
| TTT | Technical Task Team |
| UFEA | Uganda Flower Exporters Association |
| UNCTAD | United Nations Conference on Trade and Development |
| UNECE | United Nations Economic Commission for Europe |
| UPOV | International Union for the Protection of New Varieties of Plant |
| UPV | Ugandan Passiflora Virus |
| USAID- KAVES | United States Agency for International Development - Kenya Agricultural Value Chain Enterprises |
| WHO | World Health Organization |
| WTO | World Trade Organization |
| ZARI | Zambia Agriculture Research Institute |

**PREAMBLE**

The International Phytosanitary Conference took place from 12th to 16th September 2016, in Nairobi, Kenya. The organizer was Kenya Plant Health Inspectorate Service (KEPHIS) who is the National Plant Protection Organization of Kenya at their headquarters. The international conference was the first of its kind to be hosted by Kenya on Plant Health. Over 200 delegates representing 25 countries from across the world gathered in Nairobi to discuss matters pertinent and emerging in plant health. Participants were invited to contribute papers of abstracts for oral or poster presentations within the eight thematic areas. The conference was carried out with oral presentations in the main hall, posters presentations, side meetings and exhibitions. Oral presentations were done in eight sessions each handling a specific thematic area. The main theme was "Phytosanitary Regulation for Improved Trade Facilitation and Food Security"

**Conference themes**

There were eight Conference themes namely:

- Pest Surveillance in Phytosanitary Systems
- Import Control and Quarantine Regulations
- Pest Diagnostics in Phytosanitary Systems
- Export Control in Phytosanitary Systems
- Industry views on Phytosanitary Systems
- Technologies and Innovation in Phytosanitary Systems
- Field visit - Practical application of Phytosanitary requirements
- Emerging Phytosanitary Issues and capacity building

**Objectives**

There were five key objectives for the conference namely

- To provide a forum to share achievements, challenges and opportunities in application of phytosanitary measures towards assuring food security.
- To provide NPPOs with an opportunity to create linkages and promote market access regionally and internationally.
- To identify potential areas of collaboration on phytosanitary regulations at regional and international levels in trade facilitation.
- To share and develop solutions on phytosanitary issues with the industry.
- Prioritize per country and Focus on most important crops, trade and work funds available. Share available information and avoid duplication. Ensure sustainability

The emerging issues per session are summarized below:

**Session 1: Pest Surveillance in Phytosanitary Systems**

- Surveillance was noted as a process of collecting and recording data on pest occurrence or absence by survey, monitoring or other procedures
- Pests outbreaks do not stop at national borders, hence the need for national and even cross border cooperation in monitoring pest spread, raise awareness among farmers and promote appropriate control measures

- There is need for Regional capacity building and frameworks in pest monitoring and surveillance (e.g. fruit fly diagnostics)
- There was call for Involvement of various actors in Plant health systems in the development and utilisation of plant clinic data in surveillance and minimization of pesticides risks: the role of *Plantwise* as an interactive system for agricultural advisory service was noted.
- Notorious pests from the various presentations include; false codling moth (FCM), T*uta absoluta*, Fruit flies, maize lethal necrotic disease (MLND) among others.

**Session 2: Import control and Quarantine Regulations**

This session was noted as very though provoking.

- Initiative to declare 2020 as the international Year of Plant Health explained and the proposed date for cerebration was given as 6/12/2021
- Seed certification as a means of curbing emerging diseases e.g. MLND
- Pathways of pest introductions include: sea containers, planting material such as seeds, Germplasm and Packaging material
- Ghana, Zambia and Kenya demonstrated importance of seed certification standards as phytosanitary risk and NOT technical barriers to international seed trade
- Phytosanitary Concern in International Movement of Sea Containers discussed and noted that only Australia, United state and China have taken action.
- There is great concern for failure of other port agencies especially customs to declare wood as required by ISPM 15

**Special section on Challenges to international exchange of germplasm**

- Emphasis was given to safe germplasm with a statement adoption " there are no chances of recalling germplasm"
- Germplasm is a pathway of pest introduction and Policy gaps in restricting trans-boundary movement of pests through plant germplasm exchange
- There is need to sensitize breeders and
- It was noted that international plant protection convention ( IPPC) only listens to national plant protection organizations (NPPO) and not individuals
- There was a wakeup call on current requirements on Bio-safety and bio- security which WTO noted and accepted to take action.

**Session 3: Pest diagnostics in phytosanitary systems**

- New challenges as world has become a global village resulting challenges in diagnostic system for NPPOs in Africa
- Diagnosis need experience and adoption of new approaches and methods available which are quick and precise
- Simple tools demonstrated by Agdia-Biofords, France
- DNA bar-coding a new molecular tool for identification of insect pest and virus vectors in phytosanitary system
- Digital imagery of pests - LAMP-Loop-mediated isothermal amplification

- Tool kits required for physical identification of pest demonstrated - False Codling Moth (FCM )
- Several techniques to be used in testing for quarantine pests before Phytosanitary measures are applied
- Tanzania and Uganda demonstrated challenges due to porous borders with neighboring countries

**Session 4: Export control in phytosanitary systems**

- Work on technology, promote inter-regional trade but ensure safety – Africa imports more food than she exports
- The role of trade logistic providers in phystosanitary compliance – there is need for creating awareness based on fact that improper documentation results in massive rejections of exports/imports
- Application of ISPM 15 on wood packaging need to be enhanced to cover all consignments where wood packaging is used
- There are available resources for NPPOs at www.pytosanitary.info

**Session 5: Technologies and Innovation in Phytosanitary Systems**

- Technology is the way to ensure efficiency in service delivery and also in surveillance and solving other related phytosanitary challenges
- Use of ICT and other new technologies emphasized and tested methods discussed as below :

✓ ICT4 Plant Health- a new frontier for Early Warning Systems - CABI
✓ Inclusion of Small Scale Farmers in Global Value Chains: Kenyan Traceability Project for Beans and Peas in Pod Farmers - HCD and USAID
✓ Electronic solutions for agricultural systems – Muddy boots
✓ Monsanto Technologies - seed, water, yield… « when farmer succeeds we succeed »
✓ Ephyto application for enhanced phytosanitary compliance – KEPHIS
✓ Bio- pesticides – Real IPM, ICIPE
✓ Insurance of crop – Acre Africa funded by Syngenta foundation
✓ Bio-efficacy of some natural plants on the oil palm leaf miner

**Session 6: Industry views on phytosanitary systems**

- Role of insurance in mitigating against crop losses including those caused by pests to be explored
- Use of bio-pesticides as a component in IPM critical in the reduction of pesticide risks such as MRLs and resistance development.
- Need for NPPOs to be more responsive and involve private sector on solving Phytosanitary issues around Pest risk assessments ( PRAs), surveillance and interceptions
- Need to support small scale farmers access markets through training and awareness on SPS issues and compliance as well as early warning systems

**Session 7: Field Visit Practical application of Phytosanitary requirements**

- Great potential in the use of innovative technologies such as biogas facility to generate power in farms, use of nematodes in enhancing the performance of farm compost manure, development of bio-control products in the management of chronic pests.

**Session 8: Emerging Phytosanitary Issues, capacity building and communication**

- Phytosanitary systems/NPPOs at various levels of development - weak, strong or moderate
- Public, private partnerships is the way to go
- Awareness creation on the STDF facility
- Gaps exist in Phytosanitary research especially in Africa and STDF to consider this theme.
- What is ailing Phytosanitary systems in Africa: Policy, infrastructure, politics

**Way-forward**

Publication of the conference proceedings and organization of the next international conference to be communicated at a later date.

## I. Background Information and Introduction

KEPHIS is the National Plant Protection Organization of Kenya. The international conference was the first of its kind to be hosted by Kenya on Plant Health Conference in September 2016. Over 100 delegates from across the world will gathered in Nairobi to discuss matters pertinent and emerging in plant health. The event was slated for 12 to 16 September 2016 at KEPHIS headquarters, Nairobi.

Conference theme

The main conference theme was "Phytosanitary Regulation for Improved Trade Facilitation and Food Security". This was split to eight Conference themes namely:

- Pest Surveillance in Phytosanitary Systems
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## 2. Day 1: Opening remarks

Conference meeting stated as scheduled on day one with a Christian word of prayer.

The General Manager Phytosanitary services KEPHIS, welcomed all the delegates and recognized them as per country of origin. The major sponsors, key speakers and all the exhibitors of the conference were appreciated specifically KEPHIS, COPE, IITA, MONSANTO, SYNGENTA FOUNDATION, RIP, COMESA, EU, SMAP and CABI . The General Manager Quality Assurance KEPHIS, Mr. Simeon Kibet appreciated the importance of the conference highlighting that plant health is an assurance of food security.

**Remarks by Dr. Esther Kimani Managing Director KEPHIS**

The Managing Director KEPHIS, appreciated all those who supported, funded and participants of the phytosanitary conference being the first one ever in the world. She highlighted that it was a forum to exchange ideas and establish relationships that would enable delegates to network with each other in order to facilitate trade and address issues leading to creation of market access. She welcomed all the delegates to KEPHIS and gave a brief on the mandate of KEPHIS highlighting the fact that KEPHIS collaborates with international bodies such as ISTA, OECD, UPOV, WTO encouraging international trade.

**Remarks by Mr. B. Kaleve state department of trade**

Mr. B. Kaleve a representative from the state department of trade highlighted that Kenya had various institutions on which SPS issues are anchored. He noted that Kenya is pursuing the SPS protocol despite the main challenge, infrastructure. He thanked donors like UNIDO for support and appreciated the fact that Kenya through various institutions looks for lucrative markets for its products. He called upon responsible institutions to look into the handling of fresh produce meant for the local market which seems neglected.

**Remarks by Okisegere Ojepat Director Fresh Produce Exporters of Kenya (FPEAK)**

Oksiegere explained that FPEAK is the Association of fresh produce exporters and affiliate companies that offer goods and services related to horticulture and is a focal and coordination point for the horticulture export industry. The association supports both small and large scale growers. He appreciated the collaboration and support that the association receives from KEPHIS and other government agencies. Commended the organizers of the workshop and challenged the technical team meeting to discuss issues of SPS and come up with a way forward that is going to ensure that research findings already done will be easily be passed out to the growers and exporters for application and recommendations implemented. He pointed out that we need to have harmonized good practices for both large scale and small scale growers. He pointed out some challenges facing the industry such trade suspension on Avocado and pepper destined for South Africa due to fruit flies. We need collaboration to tap on opportunities resulting from the challenges faced by the fresh produce market. Invited scientist doing trials to do them on growers' farms and pack house facilities.

**Remarks by The Netherlands embassy**

He congratulated the MD for organizing the first International Phytosanitary conference in Kenya. He emphasized that there is an issue of food shortage globally and that Africa is a net importer of food which means that there is food shortage in Africa and claiming the continent is paying other countries to produce its food.

He spoke of the good relations between KEPHIS and The Netherlands pointing out that most of Kenya's horticultural produce especially roses go to The Netherlands.

**Remarks by ambassador, EU delegation to Kenya**

EU imports a lot of Agricultural products from various countries including Kenya. Kenya exports about 120 billion Kenya Shillings worth of Agricultural produce to the EU annually. This generates income for possibly more than one million Kenyans, mainly in rural areas. The EU is often criticized for having very stringent food safety requirements which sometimes subject food producers in the developing world to difficulties in trying to meet those standards.

In order to help developing countries meet European Sanitary and Phytosanitary standards, the EU offers trade related technical assistance, for example a EURO 30 million Programme to support ACP countries to strengthen their national (or regional) food safety policies to facilitate their access to international markets.

In Kenya, the EU currently have the EUR 12.1 million Standards and Market Access Programme (SMAP)-whose overall objective to enhance market access and competitiveness of Kenya's animal and plant-based products through greater adoption of relevant international standards, improved regulation and enforcement in the country. KEPHIS is one of the beneficiaries and to this end the EU will be supporting the Kenya Government with Laboratory equipment worth EUR 5.8 million to enhance their capacity in the enforcement of standards for animal and plant-based products and in service delivery.

Concerns on the presence of pesticides in imports of beans and peas originating from Kenya have been raised over the last years. For this reason, beans and peas from Kenya were subjected to increased levels of import control to the EU. The cost associated with these increased controls had a serious impact on Kenyan exports to the EU in terms of a substantial decline in export volumes and a decrease in income for firms and producers in Kenya. Due to the efforts of KEPHIS with support from the SMAP project, the challenges were addressed and beans are now no longer subject to these increased levels of control. He noted that issues discussed in the conference are an essential dimension for any country wanting to be part of the global trading system.

The EU promised that it will continue to partner with exporting countries to support them in not only meeting international Sanitary and Phytosanitary Standards for the export markets but also for the domestic markets and ensure that these standards do not become a barrier to trade.

**Remarks by the Director General of Inter- Africa phytosanitary council**

The Inter- Africa phytosanitary council brings together all African NPPOS. It was established in 1953. This organization endorses the participation of NPPOS regulations and there are currently nine regional NPPOS under this organization.

The Director General said he also represents Africa in AU as a technical person. The Director General commended KEPHIS for being a good image in helping to solve Africa's Agricultural problems. He cited main challenges as pest surveillance and information exchange between NPPOS. For example, African countries are not able to share the issue of pest lists and this blocks trade between countries and therefore hinder market access.

## 3. Session 1: Pest Surveillance in Phytosanitary Systems Chairperson: GM-PS KEPHIS, James Wahome

### a) Key note address Pest surveillance in phytosanitary systems by Marjan Folkers , NPPO Netherlands

National Plant Protection Organizations are responsible for the surveillance of plants. Early pest detection reduces cost. It is an obligation within IPPC for NPPO's to collect data on pest occurrences, within the purpose of reporting the occurrence, outbreak and spread of pests. It follows from the basic principles of IPPC on transparency, technical justification, non-discrimination, etc. At the same time it was explained how NPPOs' can benefit from knowledge on the presence and spread of pests in their country. Pest surveillance is an important tool to create awareness to local farmers and to develop domestic control systems to protect agriculture and to ensure food security. It will help NPPOs' to eradicate new introductions of pests in time. Official reports on confirmed absence of pests will help NPPOs to justify import requirements and be able to export agricultural products with the correct phytosanitary guarantees for the country of final destination. It is necessary to have official reports on the spread of pests in the country. As such, the surveillance system will contribute to the increase of export possibilities. The national economy will benefit as such from the efforts of NPPOs to keep records on pest occurrences or absences. Examples were given to illustrate how the surveillance Programme contributes to the development of a sound phytosanitary system, and why you need to conduct surveys in your own interest. The presentation included information on the IPPC standards that are relevant in this respect. A detailed Surveillance Program Design was outlined step by step on the base of the very helpful guidelines developed by the Australian NPPO. The Netherlands surveillance plan was used to show how it can work in practice, but also practical suggestions were given to conduct surveys even with limited resources.

### b) Towards the creation of mango fruit fly pest free area at Chemurugui area, Elgeyo Marakwet County by George Momanyi

As an intervention towards fixing the *B. dorsalis* menace, a surveillance program was launched at Chemurugui area of Elgeyo Marakwet County in July 2015. The aim of the surveillance was to monitor the pest populations over time, implement suppression/eradication strategy, establish, declare as well as maintain pest free area/area of low pest prevalence. The trapping and

monitoring activities have been conducted using lure-responsive trapping methods in mango orchards. At the start of the activity, the fruit fly populations were ranging at > 100 per trap per day (FTD) but after months of mass trapping, the populations went down to nil in November 2015. From mid- December 2015 to Mid- March 2016, the populations increased to about 10 FTD due to high pest pressure during the mango season. Since March 2016 however, the populations have gone down to 1-5 FTD. Lack of adequate farm sanitation where fallen fruits are left to rot in the farm has been a major challenge against the success of the initiative. It has however been observed that County governments keen on promoting mangoes as a key commercial crop offer great opportunities towards the success of the initiative.

**c) Countrywide Surveillance to Establish the Pest Status of Fruit flies In Zimbabwe by Jeremiah Masoka, Ministry of Agriculture Zimbabwe**

A surveillance to establish the status of fruit flies pest species in Zimbabwe was conducted by the National Plant Protection Organization of Zimbabwe (NPPOZW in 2010 to 2012. The surveillance covered the 10 provinces of the country focusing on fruit and vegetable production sites and along major road networks. Three para-pheromones (Cue lure, Methyl Eugenol and Trimed lure/ fruit fly lure) combined with a dichlorvos as an insecticide were used in McPhail type traps that is the Chempac Bucket trap . Trap densities in production sites varied according to the abundance of hosts. One trap was placed per every 100-150 km along major road networks. The three para-pheromones are target host specific. Methyl Eugenol (ME) targets the males of *Bactrocera dorsalis* species, Cue lure targeting the males of *Dacus* species and Trimed lure (TML) targeting the males of *Ceratitis* species. Over 15 indigenous and exotic fruit fly species were trapped during the surveillance period. Preliminary identification of trap captures was done by the NPPOZW and confirmation made by a regional taxonomist in the Republic of South Africa and the Royal Museum for Central Africa in Belgium. Population fluctuations were also observed in the different seasons of the year. These fluctuations are strongly suspected to be attributed to daily temperatures changes, host fruit availability and abundance. Fruit fly populations increased during summer seasons. The intensive surveillance led to the declaration of the presence of *B. dorsalis* in the Mashonaland Central Province of Zimbabwe, a province which borders Zimbabwe and Mozambique on the Northern Eastern parts of the country. The results of this surveillance served as a baseline for informed decision making on fruit fly management in Zimbabwe.

**d) Pest surveillance and pesticide risk reduction - the role of Plant wise, an interactive system for agricultural advisory service by Dr Lorna Migiro**

Prompt detection of and alert on new pests or pest situations have significant implications not only in crop production practices but also in trade. Restricting access to certain markets and loss of reputation of a country as a safe source of exports is best safeguarded by prompt action on emerging pests. Likewise, misuse of pesticides and presence of hazardous pesticides in produce compromises endeavors to demonstrate compliance with sanitary standards relating to contamination of food and feed by pesticides at levels greater than allowable Maximum Residue Limits. **Plantwise**, a global programme led by CABI to support extension systems in developing countries to provide smallholder farmers with good advice needed to reduce crop

loss due to plant health problems, generates useful data to support surveillance for pests and kinds of pesticides being recommended to manage pests. Plantwise is in 33 countries worldwide. Through three(3) key components namely, plant clinic networks, Knowledge Bank and linkages of stakeholders in extension, research, regulation, and input supply. Plantwise is increasingly providing countries with opportunities to manage plant health using own data. Plantwise activities, particularly documenting pests in crops complements the work of National Plant Protection Organizations. Plant clinic data is useable in general surveillance and as a source of Pest Risk information. Plant clinics have the potential to actualize the much needed early warning systems on emerging risks of pests and pesticides; thereby enabling governments to initiate processes for managing the risks effectively. The Plantwise knowledge bank can serve as a platform for plant health data management where information exchange within countries contributes to the global vigilance system for invasive species and regulated pests as well as emerging threats to plant health. This presentation showed that Plantwise has a complementary approach to phytosanitary and pesticide risk management.

**e) Presence and Distribution of *Tuta absoluta* (Meyrick 1917) (Lepidoptera: Gelechiidae) Affecting Tomato Plants in Rwanda by B. Uzayisenga**

*Tuta absoluta* (Southern American tomato leafminer) was suspected for the first time in Rwanda in 2015 through a plant health clinic. With subsequent field visits conducted in Bugesera District, Eastern Province of Rwanda, they notified the presence of lepidopteran green larvae causing typical mines symptoms on tomato leaves. In order to confirm the presence and the distribution of tomato leaf miner in Rwanda, delta traps with TUTRACK lures containing 0.8 gm of pheromone for trapping the male *Tuta absoluta* moth were put in different Districts representing all agri-ecological zones of Rwanda. Analysis of *Tuta absoluta* data showed independence between grouped number of *Tuta* moths and the area (Province and Districts) and an association between grouped number of *Tuta* moths two and seven days after traps were installed with farmers' land size. Adult moth of *Tuta absoluta* was found in all traps put in place.

**f) Phytosanitary concerns/Plant Health issues in Liberia by Mr. Jeremiah Matthew Swinteh**

Five (5) key concerns or Plant Health issues in Liberia are;-

- Enforcement of Legal Instruments, Regulations and Policies to protect Plant Health in Liberia and the West Africa Region as a whole.
- Inadequate information exchange and knowledge sharing for plant Health.
- Capacity building of the West African countries in Plant disease surveillance, diagnosis, inspection systems and reporting.
- Agro-chemical application methods and residual effects in plants and plant products.
- Frequent new outbreak of pests in the West African Region, Particularly (Liberia).

To adequately deal with these concerns, Liberia requires funding and technical expertise assistance. A regional policy on SPS issues to safeguard Liberia amongst other interventions also needed.

**Plenary questions and answers Q & A**

**Session 1; Pest surveillance in phytosanitary systems**

1. At what point do you put a newly introduced pest in a country as your target pest list without affecting trade? - Take emergency measures first by putting it in the preliminary list then do a pest risk survey to obtain data within ten years.
2. What is the status of Kenya's biological control agents in the Netherlands? -

There are regulations in the EU on biologicals that ought to be followed. These follow the EU biological agents' regulation.

3. Comments 1 - Consideration of the potential users (especially the small scale growers) of the Plant wise information which CABI is spending a lot on should be taken since this information can be of much importance in food security creation and market access. The information is also important in designing the insurance system in encouraging small holder growers to contribute in food security.
4. How sustainable is the pest free area considering that the mango is not grown in green houses in Kenya? - The counties have own extension staff who monitor closely the sanitary issues. These include The Production of cheaper and available IPM products and Farmers to own the product.
5. What are the successes in Elgeyo Marakwet County on the achievement of a pest free area? - It is a process; farmers have testified a big improvement in sellable mangoes.
6. What risks are registered in plant clinics? - Once a pest is noted, there is need to confirm if the pest is really new and confirmation requires several players.
7. Can the presenter from Zimbabwe explain further on the statement that no African country shares information on pests? - Some countries do not give a full list but only declare some areas as pest infested while they deliberately decide not to declare some areas as pest infested while they actually are infested.
8. Can we consider *Tuta absoluta* a regulated pest in Africa? - Regional approach should be used to effectively regulate the pest, awareness should be created and partners work together to develop pest management decisions.
9. Did you find abuse of chemicals during the survey on *Tuta absoluta* in Tanzania ? - Yes. But with awareness creation there is reduction on use of hazardous pesticides. Capacity building has been done to the plant doctors to ensure they give the right prescriptions.
10. What is the taxonomy of fruit fly? - KEPHIS has capacity to identify most of the local species and can share that information with other interested countries.
11. What measures are being put in place to control other species of fruit fly in Kenya? - The use of food baits which attract and kill all of the species of fruit fly i.e. The food baits are not specific to certain species and also ensuring the farmers adhere to sanitation in the farms.

**4. Day 1: Session 2: Import control and Quarantine Regulations - chair. Dr. Roger Day, CABI**

**a) Key note address:**

The initiative to declare 2020 as the International Year of Plant Health: Impacts and opportunities for authorities, private enterprises and phytosanitary research**.** Initiative to

declare 2020 as the international Year of Plant Health explained and the proposed date for cerebration was given as 6/12/2021

**b) Import controls and quarantine regulations in Ghana by Jennifer Addo**

Plant protection and Regulatory Services Directorate of the Ministry of Food and Agriculture is the National Protection (NPPO) of Ghana. It is mandated to regulate the import and export of plants. Trade in Plant products in Ghana is regulated articles guided by the National and International laws. Although there are challenges associated with this trade that pose risk to Agriculture in Ghana, mitigation measures have been put in place to reduce risks to acceptable levels.

**c) Enhancing plant biosecurity in Zambia; imminent threats from plant pests. by Marian L Mwanza**

The Plant Quarantine and Phytosanitary service (PQPS) which is the Zambian National Plant Protection Organization (NPPO) has embarked on strengthening its plant biosecurity capacity at pre-border, border, and post border frontiers. Plant biosecurity is for everyone not only for the Government. Countries should move from control to prevention of Phytosanitary risks associated with introduction of pests across borders.

**d) Phytosanitary concern in International movement of sea containers by James Wahome**

Sea containers in the form of 20 to 40 foot international freight or shipping containers play an increasingly important role in the transport of international traded goods. They also act as pathways for a wide range of species that present biosecurity risk to productive sectors and natural ecosystems. The threat of quarantine pests such as Khapra beetle, Asian Gypsy moth which may be introduced into the country through container pathway is really a great concern to Kenya. There is need for appropriate strategies to ensure inspection of empty containers since they have been reported as carriers of quarantine pests and other hikers.

**e) National Seed Certification Standards as Phytosanitary Risk And Technical Barriers to International Seed Trade: Case in Kenya By Ephraim Wachira**

The role of seed in dispersing pests and the resulting disasters has been documented. Seed certification assures seed quality standards, including freedom from seed borne diseases. Regulation of seed trade is done by various International organizations because movement of seed is a big phytosanitary risk in trade.

The IPPC provides for regulation against quarantine pests and regulated non-quarantine pests with seeds imported into Kenya being required to be free from quarantine seed borne diseases and be treated with appropriate seed dressing. In Kenya seed importation is governed by seed and plant varieties Act (Cap 326) and the plant protection Act (Cap 324) through KEPHIS. Countries should embrace harmonised certification standards and build capacity in seed testing laboratory to be able to accurately diagonise seed borne diseases so as to reduce risk of disease spread among countries through international seed trade.

### f) County Monitoring Of Imported Seaweed (*Kappaphycus Alvarezii*) In Kwale In Kenya By Thomas Kosiom

Seaweed is a worldwide pest. It has been reported in countries like Tanzania, China and the Philippines. Seaweed farming is viewed as a suitable form of aquaculture. Several species of seaweed such as *Eucheuma denticulatum* and Kappaphycusa alvarezii has been introduced in various countries such as Tanzania and Madagascar with various levels of success. When it was to be imported into Kenya a thorough risk assessment was done. Some species of seaweed namely *spinosum* and *cotonii* were introduced in Kwale at the Kenyan coast after a thorough risk assessment by the concerned bodies such as KSTCIE, KEPHIS and KMFRI. During the monitoring period it was observed that the seaweed was susceptible to fluctuations in environmental conditions which limited its establishment and invasiveness and hence it was concluded that the weed has no potential threat to marine movement.

### g) Seed Certification As A Means Of Curbing Emerging Diseases. A Case Study Of Maize Lethal Necrosis Disease In Kenya by Peter Shango

MLND is an emerging constraint in maize production in sub-Saharan Africa that threatens food security and poses challenge in trade. The disease is caused by a combination of sugarcane mosaic virus (SCMV) and maize chlorotic mottle virus (MCMV) which is transmitted by aphids and thrips respectively. Since maize is the staple food in Kenya, the report of MNLD in Kenya in 2011 necessitated establishment of mechanisms for combating the spread of the disease through seed. This resulted in the amendment of seed certification protocol which included testing of seed. This amendment has led to drastic reduction of MLND.

**Session 2: Import control and quarantine regulations Q & A**

1. Have you considered a SWOT for the International Year of Plant Health strategy? - A SWOT analysis has not been done but we are trying to invest in our future.
2. What is put in place in the International Year of Plant Health to ensure Africa is not left out? - NPPO's should start thinking of who will be their partners in the International Year of Plant Health and come up with national programs of what they want to do.
3. How do you recognize the indifference between the ISPM 15 and the fact that there is a concern on the use of untreated wood? - ISPM 15 specifies the type of wood that is excluded but our concern is on the wood that is not specified in the ISPM 15
4. How is Kenya ensuring that MLND does not come in to Kenya from other countries? - Harmonization of the EAC and COMESA standards will take care of this since the standards used in the region will be the same.

5. Which other tests are being used in MLND? - Packet diagnostics and immuno strips are also used but comparisons are done between the results of the different tests before deciding to use any one of them.
6. Do the Seed regulations in Ghana follow the phytosanitary regulations of seed in West Africa? - In Ghana the seed regulation is guided by the plant and fertilizer Act, the seed regulations are already drafted but not passed yet to be in line with the ECOWAS regulations.
7. In Ghana, do you have overlapping mandates with other organizations? - Have only one institution to regulate import and export of fresh produce only overlapping when looking at processed foods
8. Is the seed testing positive coming from the inspected farms and how do we ensure proper destruction of the positive seed? - Yes the seed is from inspected fields which may have had plants harboring the virus but not showing the symptoms during active growth. The rejected seed are destroyed under the supervision of an inspector; it is actually the duty of the inspector to follow up on seeds that test positive.
9. Is Kenya safe to only test MCMV while not testing the other potty-viruses? - MCMV was the major virus of concern to Kenya
10. There is nothing like zero tolerance of disease in field inspection, how come Kenya is talking of zero tolerance in MLND field inspection? - It means zero symptomatic plants at final inspection
11. Have you solved the problem of sea weed since in Sierra Leone it keeps coming back? - In Kenya the sea weed does not seem to be a problem since it is harvested for various economic uses though monitoring is still taking place.
12. Were the sea weeds seeds introduced to farmers before environmental impact assessment was concluded? - No. Introduction to farmers was only done after it was recommended for release. Monitoring continued even after release since KEPHIS was not sure how the sea weed would behave after several years.

**5.** Day 2: **Special section on Challenges to international exchange of germplasm Chair: Zambia NPPO**

**a) Key note address challenges to international exchange of germplasm by P. Lava Kumar** International Institute of Tropical Agriculture (IITA)

Kumar introduced by describing what are germplasm exchange programs and gene banks. He singled out the importance and impacts of food borne toxins such as Aflatoxins. Germplasm is a pathway of pest introduction and there are policy gaps in restricting trans-boundary movement of pests through plant germplasm exchange. There is need to sensitize breeders and It was noted that international plant protection convention (IPPC) only listens to national plant protection organizations (NPPO) and not individuals. There was a wakeup call to WTO on current requirements on Bio-safety and bio- security

**b) Managing sanitary barriers to trade: Controlling aflatoxin producing *Aspergillus flavus* S-strain in lower Eastern Kenya using atoxigenic *A. flavus L*-strain (Aflasafe KE01) by Asha Bakari Mohamed - University of Nairobi**

A study was conducted between year 2013 and 2014 in lower Eastern Kenya counties of Machakos, Makueni and KItui. This study was carried out to determine the extent of A. flavus S-strain contamination of maize and its possible management through the use of atoxigenic A. flavus L-strain isolate (Aflasafe KE01). Maize samples had high levels (61.8%) of A. flavus S-strain than other Aspergillus species. The A. flavus S-strain isolates produced high levels of aflatoxin B1 of up to 22,000 ng/g in maize in vitro. However, field application of atoxigenic A. flavus L-strain competitively excluded the aflatoxin producing A. flavus S-strain by up to 77% and reduced aflatoxin level in the harvested maize grains by 47%.

The study showed that Aflasafe KE01 is a promising biocontrol product in shifting the population of toxigenic strains of Aspergillus section Flavi and subsequently reducing aflatoxin levels in maize.

**c) Emerging phytosanitary challenges to international exchange of germplasm by P. Lava Kumar International Institute of Tropical Agriculture (IITA),**

There are many new challenges that face international gene banks, such as CGIAR centers. This is due o the fact that new technologies come up with new more efficient ways of confirming germplasm purity. CGIAR centers have about 174 genera conserved either as true seed crops, or vegetative propagules or clonal crops corrected from various countries around the world following the best phytosanitary procedures applicable at the time of correction.

There are no international regulations governing distribution of crop germplasm. CGIAR made their own guidelines which are also in use by other internationally known research institutions and gene banks. Procedures, including methods for generating pest and pathogen-free germplasm and diagnostic for assessing germplasm health and certification have been established for safe international exchange of germplasm between countries. These procedures depend on knowledge of the occurrence of pathogens or pests in a given species and geographic region and availability of reliable diagnostic tools.

Kumar discussed IITA point of view on the strengths and limitations of current screening procedures for testing staple crop germplasm, specifically banana, cassava and sweet potatoes.

**d) Phytosanitary challenges in tree germplasm exchanges within and among East African countries By Dr. Jane Njuguna (KEFRI)**

In Kenya, Forestry cultivation dates back to year 1900. Main challenges to implementing phytosanitary regulations on tree germplasm exchange include; Uncontrolled live materials movement, Uncontrolled tree seeds tradel, lack of tree seed/seedling quality stands legislations especially for tree indigenous tree species, ignorance of stakeholders on trees seedlings health, weak enforcement of phytosanitary measures and use of porous borders in cross border distribution.

KEFRI has stated registering tree seed distributors and nurseries. They also train the private nursery operators, national tree seed centers and other stakeholders in the tree business value

chain. Key training topics are pricing and distribution channel, nursery management, forest pests and diseases and different methods of importance in pest management.

**e) Safe movement of food and forage crops germplasm at ICARDA by Dr. S.G Kumari (ICARDA)**

ICARDA is crop breeding research centre which works on cereals and legumes quality and production improvement. ICARDA has established a robust and highly process oriented safe germplasm movement system for its mandated crops to prevent movement of quarantine pest risks such as insect pests, pathogens and weed associated with germplasm. The system which handles over 60,000 samples a year. They link the system with all collaborating NPPOs and also support on capacity building.

**f) Policy gaps in restricting trans - boundary movement of pests through plant germplasm exchange by Dr. R.K. Khetarpal (CABI)**

There are harsh facts indicating that we have serious policy gaps and with no standardized model to ensure exchange of pest-free germplasm. World over bad genes continue to be exchanged from one country to another. There is a request for International Plant Protection Convention (IPPC) of FAO. WTO and specific NPPOs to develop specific guidelines for germplasm exchange. main area of concern is the movement of plant germplasm intended for research, crop improvement and for enriching the national germplasm banks.
***Example and concern*** - currently there is no specific ISPM developed by IPPC for germplasm risk analysis prior to exchange and on procedure for processing for quarantine and post entry quarantine given the fact that they are exchanged in small quantities. This are often not subjected to sampling procedures.

**Q & A - Special section - Challenges to international exchange of germplasm**

1. Does *Aflasafe* contribute to reduction of Aspergillus flavus S-strain in stored maize? - *Aflasafe* controls *A.flavas* S- strain from pre-harvest to storage.
2. Does IITA keep GMO materials in the gene banks? - No GMOs in gene banks.
3. Has KEFRI thought of collaborating with stockists to reach everyone in Kenya? - KEFRI is doing a lot in seed distribution. Averages of 25 registered tree stockists are working with KEFRI though more sensitization to the public is needed since people rarely buy tree seeds from stockists. 38 field days are conducted yearly and KEFRI is working closely with Kenya Seed Company so that they can use their seed distributors as distribution centers for tree seeds. Kenya forestry services (KFS) centers are also potential distribution centers. KEFRI has also established seed collection point's e.g. in Narok, Turbo and TaitaTaveta.

4. What do you mean when you say NPPOS are not concerned with germplasm quarantine? - Generally NPPOS don't care about germplasm quarantine. NPPOS should write to IPPC to make standards concerning germplasm quarantine.
5. How do we control the insect pests in eucalyptus? - There are chemicals that can be effective but are not economical. KEFRI is working on biological controls that can be more sustainable.
6. What is KEFRI doing to give support for the roadside nurseries since they are not coming to an end any soon? - KEFRI is working to register nurseries and doing trainings on where to collect seed, good seedling nursery management. They are working together with KFS to organize these trainings.
7. Does IITA have a similar program to that of ICARDA in seed certification? – Yes, IITA has seed tested just like ICARDA does.
8. What is KEFRI doing in order to combat the invasive pest species on Eucalyptus trees in different parts of Kenya? (Western and Nandi) - KEFRI is working to find out what the issues are and on the best modalities of handling them.

**6. Session 3.Pest Diagnostics In Phytosanitary Systems (Chair, Ghana NPPO)**

a) **Key note address - By Prof. James Muthomi , University of Nairobi**

Diagnosis refers to finding a problem thus in plant health it refers to finding the problem with a plant or plant material. A plant may be injured due to pests or diseases. Pest diagnostics is a key factor for timely decision making in phytosanitary regulation. In Africa pest identification is a challenge mainly due to lack of trained personnel and resources. Recently there was a problem of Maize Lethal necrotic disease (MNLD) in Kenya which took time to be diagnosed. This contributed to loss of yields for the maize farmers that were affected. Therefore embracing new molecular technologies like sequencing and barcoding will strengthen national and regional diagnostic capacity for quick phytosanitary decision making and regulation.

Kenya has received diagnostic support from various bodies such as ICIPE, CABI, FERA UK, and IITA among others.

The following measures have been put in place to address the challenge of lack of diagnosis of pests

- Construction of laboratories
- Training of staff
- Reliable supply of molecular reagents and Elisa Kits
- Good support from International partners.
- sequencing

b) **Challenges in diagnostic system NPPOs in Africa; a case study of KEPHIS as NPPO in Kenya by Dr. Isaac Macharia KEPHIS Kenya**

Pest Diagnostics is accurate and efficient means of identifying pests to facilitate timely decision making in phytosanitary regulation. This has become important due to globalization where it now takes very few hours for pests to move from one country to another, climatic change and technological advancement.

Key challenges are inadequate human and infrastructure capacity. There has been several initiatives in Kenya with success especially in identification of Maize lethal Necrosis disease (MLND), quarantine Pectobacteria in seed potatoes, optimization and utilization of diagnostic methods for Cassava Brown Streak Virus (CBSV), and Potato Cyst Nematode (PCN). However, there was failure noted in identification of the virus complex causing MLND.
There is need to build regional (Africa) capacity and embrace new molecular technologies.

c) **The importance of diagnostics in phytosanitary systems. A perspective from the private sector by Marcos Amato, Agdia-Biofords, France**

Agdia-Biofords provides diagnostic solutions based on immunological and molecular technologies for plant pathogens and GMO. Products and services include; Elisa test, Flash kits- these are used in the field, for example in the greenhouses, Sensitivity. PCR, RNA/DNA hybridization, Amplify RP- which is easy to use and it gives results in 20 minutes.
The company provides products and services to different industries and professionals as seed, growers, plant research and diagnostic laboratories. They work with professionals in ornamentals, vegetables, fruits and field crops in management of plant pathogens, development of new varieties and targets production quality control.

d) **Adopting loop-mediated isothermal amplification (LAMP) as a diagnostic tool in support of passion fruit nursery certification by Florence Munguti, KEPHIS, Kenya**

Loop-mediated isothermal amplification (LAMP) is an accurate and precise diagnostic tool for detection of the disease on a real-time fluorometer Genie II (Optigene) developed for detection of Cowpea aphid-borne mosaic virus (CABMV) and Ugandan passiflora virus (UPV) reported to cause woodiness disease.
The method can be performed within a short time and can be adopted as a tool for onsite detection of other pests of phytosanitary concern especially at country's exit points hence facilitating implementation of quarantine regulations. The method has the potential to provide a valuable diagnostic during passionfruit nurseries certification programs hence facilitating an increase in production and distribution of clean planting materials to farmers.

e) **Use of DNA barcoding for identification of insect pests and virus vectors in phytosanitary systems (Dr.Isaac Macharia)**

DNA barcoding is a DNA based taxonomy which is a quick and reliable way of pest identification. This method can be useful in identifying quarantine pests in many Phytosanitary systems in Africa to ease the burden of lack of taxonomic expert in insect identification. It has been used in Kenya recently to identify 16 Species of Thrips affecting tomato plants. Some of these species were found to be resistant to pesticides.

f) **Evaluation of reaction of imported potato germplasm to late blight under field conditions in Kenya (Loice Kamuyu)**

This study evaluated the susceptibility of imported potato varieties from The Netherlands to Late blight in comparison to potato varieties from Kenya. The research was done in 2 climatic zones (Njabini and Kabete) favorable for potato production in Kenya and in Muguga gene bank. From the research it was found out that the Dutch varieties were more susceptible to late blight than the Kenyan varieties. There were very high yields from the resistant Kenyan varieties. It was therefore concluded that the susceptible Dutch varieties can only be grown by large scale farmers who can manage the pest.

g) **Occurrence of potato virus y (PVY) in major potato cultivars in Kenya (Onditi J.O).**

PVY is a serious disease of potatoes transmitted by aphids. It is especially more detrimental to potato seed growers. It is also a big threat to commercial farmers of potatoes as it leads to loss of yields due to reduced sizes in potatoes. Tests were done on various varieties of potatoes from major potato growing areas in Kenya. The results showed that the virus has tremendously reduced in the country compared to the results of 2006 and 2008. This has therefore prompted for further research for the scientist to confirm further whether the country will soon be completely free from this virus.

h) **Tanzania NPPO (Mr.Katumani)**

The mandate of this NPPO is to prevent the introduction of pests into Tanzania, to do timely discovery of disease and to do market negotiations. There are 165 inspectors manning the 36 declared border points in Tanzania. The NPPO's work is governed by rules and regulations such as the Plant protection Act, 1997. There have been a lot of interceptions in Tanzania at various entry points especially on mangoes infested with fruit flies. The main challenge they have is the rapid spread of pests and diseases from the neighboring countries.

**Q & A Session 3 - Pest diagnostics in phytosanitary systems**

1. What is the difference between *Spodoptera littoralis* and *Spodoptera* in rice?- Need to consult but given time can get the information. EAC has harmonised PRA quarantine pests for rice hence if you contact KEPHIS they can provide the current rice pest list for the region
2. Cost implications of the diagnostic tools by Agdia are too high, what is Agdia doing in order to reduce the cost implications? - Work together with all the stakeholders and understand the needs of different countries in order to come up with a sustainable cost. Some countries can even work together.
3. Should we not keep the diagnostics simple and visual? - Yes but for quarantine pests, we need to be accurate and the 2$^{nd}$ generation sequencing comes in handy, there is need for collaboration in order to achieve this great step in diagnostics.
4. Mr. Onditi, Why did you run short of samples in your potato study? - Only ran short of PVY positive samples but not just potato samples
5. What identification keys were being used for the identification of the moths in KEPHIS Muguga? - Keys used were from the Netherlands, they were first checked in comparison with the visual identification before being used to train other plant inspectors on the use of the same keys.

6. As we talk of capacity building, does an inspector inspect all the crops or specific crops? - A well trained inspector can be able to inspect different crops as is the case in the Kenyan context. STDF funds are available for capacity building under WTO and there will be a side event to explain on how to apply and capacity building opportunities that are available.
7. Are there minimum requirements for an organization to be called a fully functioning NPPO? - One person cannot be an NPPO since an NPPO should have several people with different job descriptions.
8. Is Africa ready for the harmonization of phytosanitary regulations? - Yes, since there is no turning back on the started process which is going to enhance regional approaches to facilitating trade and market access, in fact this phytosanitary conference is one means to achieving the linkages required to enable the harmonization process. Countries like Uganda have done their system analysis and are working on gaps to ensure that they meet the regional standards.
9. What is Agdia doing to ensure that the diagnostic kits are as effective as the other diagnostic methods? - The kits are validated internally and externally to evaluate and ensure that they are really working.
10. How is the availability of the kits and do the farmers know how to use them? - Agdia cannot be physically in all countries but are doing good to improve on their logistics to ensure that they reach more clients with ease. Important that KEPHIS collaborates with west Africa on Phytosanitary issues since East Africa is far ahead
11. During validation in the barcoding insect identification, what do you do if you have an unknown pest? - Extract DNA, go through the whole process of sequencing then run the question in the database to know if the pest is already known.
12. Does Agdia have diagnostic kits for other pathogens apart from viruses? - Yes they have for bacteria.
13. The false coddling moth has been seen in bean pods by Frigoken farmers, has anyone been able to find out if the moth has new hosts and not only fruits? - KEPHIS inspectors have only found it on Capsicums, avocadoes, citrus and roses for now but not yet on beans.
14. Do the research results reach the people on the ground? - KEPHIS trains stakeholders, both small and large scale growers on emerging issues and disseminates research results to them as well.

## 7. Session 4: Export control in phytosanitary systems Chair: Dr. Lava Kumar, IITA

### a) Key note address. Phytosanitary regulation in International trade (Dr. Roger Day, CABI, Kenya)

The European Union (EU) imports more Agricultural products more than they export. EU does capacity building of individuals and organizations such as National plant protection organizations (NPPOS) and flower growers. International plant protection convention (IPPC) has developed manuals on how NPPOS should be and how they should operate. This can be borrowed and would of great help also to regional plant protection organizations (RPPO).

NPPOs are encouraged to participate in IPPC meetings and support/contribute to Trade Facilitation Committees (TFC). Specifically NPPOs need risk based approaches to ensure proper risk management through phytosanitary regulations through trade facilitation committees. Due to food scarcity governments are torn between need for food security and food safety issues. It is very important to facilitate interregional trade but also ensure safety. Technology adoption would come in handy to inform other value chain activities.
WTO encourages inter-regional trade. USAID is funding phytosanitary issues in East Africa.
In Zambia, there is need to create more awareness on the IPPC standards so as to make stakeholders makes comments on them when required to do so. NPPOS should work as a team. NPPOS should be able to find information on the internet on their own.

**Q & A Plenary session**

1. Do we have classification of NPPOS in Africa based on their participation in the IPPC? - The WTO plans to delegate some of its mandate to RPPO. WTO has over 54 countries to cover despite its limited resources.
2. How can CABI help in training other disadvantaged countries? - The disadvantaged countries can identify a need then they can be sorted through funding if they do apply for facilitation.

**b) Devitalisation of cut rose flowers . effects of glyphogan and roundup on propagation ability and vase life Hilda Miranyi, KEPHIS, Kenya**

Devitalisation is a process by which the flowers are dipped in Glyphosate to make them non-viable. This is a requirement for Roses, Carnations and Hypericum destined for the Australian market. Reference is given to AQIS (Australia) guidelines of 2011A research was done with rose flowers from Sian Roses. They were dipped in roundup at the required depth and later checked on whether they can root again. Effect of devitalisation on vase life was also looked into. It was found out that actually devitalisation was effective at in all depth stem length, it reduces vase life and no roots were found to form on the devitalized flowers. The most important thing is to uphold transparency and integrity for growers to understand the importance of devitalisation and the impact if not done.
Adopt ISPM 14 critical control points to achieve the same objective of devitalisation and also ensure that importing country requirements are met.

**Q & A PLENARY SESSION**

1. If 15cm depth is enough during devitalisation, why should we dip up to the neck length? - Because we are fulfilling the Australian Market requirement, we are using their method as they have directed.
2. Have we tried to check other markets such as South Africa to know how they do their devitalisation? - Yes. However, South Africa has not given us a guideline, so we use only the Australian guideline to harmonize the devitalisation process.

**c) Measuring the trade effect of wood packaging standards on African exports: the case of ISPM 15 (prof.Luca Tasciotti)**

This research was done in four countries namely Botswana, Cameroon, Mozambique and Kenya. The use of methyl bromide in wood treatment has been banned in Europe; however it is still being used in Africa. Various stakeholders involved in handling wood packaging materials such as customs, NPPOS, Meat commission amongst others were interviewed.
From the study the following issues arose;

- It was realized that customs do not inform NPPOS on arrival of commodities packed in wood packaging material – e.g. kitchen wares, electronics and machine parts.
- The stamp on the wood should be comprehensible
- Heat treatment and the use of methyl bromide are the only methods that should be used to treat wood.
- The stamp should not be misused by the stakeholders – NPPOs need to ensure authenticity ensuring that stamp cannot be forged.

**d) Implementation of ISPM 15 in Kenya (Faith Ndunge)**

Various stakeholders in Kenya such as National environmental management authority (NEMA), customs, Pest control products board (PCPB) and the 19 wood treatment facilities were interviewed. It was found out that 16 facilities use Heat treatment as a method of wood treatment while the remaining 3 wood treatment facilities use methyl bromide.
From the study it was found that:

- Implementation of ISPM 15 according to the stakeholders requires high initial cost.
- High cost of electricity in the use of Heat treatment.
- Methyl bromide is expensive since it is imported.
- ISPM 15 has created employment to more than 400 people directly and many more indirectly contributing to the Kenyan economy.
- The cost of treatment need further research to give indicative cost per pallet treated.

**Q & A plenary session**
Question-What other options can be used to replace methyl bromide? - One can use firewood which is a cheaper method. Use of solar panels to store energy instead of electricity is also cheaper, but it is not in use currently.

**e) The role of Agricultural trade logistics providers in Phytosanitary compliance (Josiah Syanda)**

In the international trade of Agricultural produce there has been found to be a gap between NPPOS and logistic providers. These logistic providers connect the exporter and the importer being involved in movement of the plant materials to the final destination. They provide storage, consolidation, documentation and delivery. The logistic providers pose a phytosanitary risk of interfering with a consignment before it reaches its final destination. They can interfere with the composition, can substitute and can re-infest the consignment. They can also interfere with the documents before the products leaves after inspection.
Therefore the development of NPPO certification system should include the activities of the logistic providers.

**Q & A Plenary session**

1. Are there standards governing the Agricultural logistics providers? - There are no international phytosanitary standards for such.
2. How do the Agricultural logistic providers pose Phytosanitary risks? - When they interfere with the consignment and documents, this leads to non- compliance and hence interception in the destination market.

**f) Towards harmonized potato certification standards in the Eastern African region. What are the options? (Simon Maina)**

East African countries share common border share climate and phytosanitary challenges. Most of the time seed arrives in Kenya then it is distributed to other East African countries, so one is not sure what happens during this movement. It is therefore important to have harmonized standards so as to avoid phytosanitary risks. There is need to harmonize various issues in Individual country standards.

Setting regional standards is critical. Therefore it is important to have a tolerance level. Africa should set and own her standards, borrowing from existing ones and bench mark to the other global standards such as UNECE, OECD, UPOV, and STTA.

**g) Emerging Challenges In Meeting Export Market Requirements In The Fruits And Vegetable Sector, Phytosanitary Experiences From Uganda By Brenda Kisingiri**

Uganda has had various interceptions of their plant products in the EU due to the presence of pests' especially false codling moth since the year 2014. Some of these interceptions have been attributed to human factors. The farmers and exporters do not adhere to good Agricultural practices, the farmers are illiterate and many exporters are also business oriented and lack knowledge on SPS issues. There is also the challenge of weak private-public sector partnership. To curb these challenges Uganda NPPO has concentrated on production systems and pack houses to ensure they are compliant. They also do serious Pest risk analysis and establish pest free areas. Create awareness in the villages to disseminate information on SPS issues to farmers amongst other interventions.

**Q & A Plenary session**

There is need for value chain mapping the various key actors to know where SPS issues are concerned. In order to manage the SPS challenges in Uganda, there is need to shelf other challenges and deal with only building capacity on human and infrastructure.

1. What do you mean interception due to human factors? - This is because they are not aware of the causes but think that the farmers and exporters are not doing their job well.
2. Have you tried the use of plant botanicals in pest control? - Plant botanicals have been tried in Uganda, for example the use of cryptogram to control FCM, but there is a challenge of storage since Uganda is in the tropics where the temperatures are always high and these products require cool climate.

## 8. Session 5: Technologies and Innovation in Phytosanitary

### a) Interceptions In The EU due To Presence of False Codling Moth (FCM), *Theumatotibia Leucotreta* on Chillies by Hellen Mwarey

There have been a lot of interceptions due to FCM of chilies from Kenya going into the EU. These interceptions are available in the Europhyt website which everyone can access. If not dealt with, this pest is a threat to our trade. This is because their hosts are various other plants such as roses which Kenya exports in large quantities. Ghana as a country has been banned from exporting chilies to Europe due to FCM.

### b) False Codling Moth , *Theumatotibia Leucotreta* FCM Identification by Helen Mwarey

During the session, the participants were shown how to identify FCM and to differentiate it from other moths such as *Helicoverpa armigera* and *Spodoptera Lituralis*.

FCM is difficult to control because it flies at night and also the body is very hairy thus the use of contact chemicals to control it is difficult. The eggs are also very small to notice with the naked eye. It also lays its egg and the larvae develop inside the fruit thus difficult to reach.

### c) False Codling Moth (FCM) in Uganda, By Brenda Kisingiri

Uganda has had various interceptions on capsicums in the EU due to FCM since the year 2014 to date. Uganda has had to put various mitigation measures to deal with these interceptions. The NPPO of Uganda attributes these interceptions on the following:

- Inadequate number of inspectors - only 24 inspectors in the country.
- Limited number of technicians - only 2 laboratory technicians working for the NPPO.
- Illiteracy of the farmers - Most of the farmers have no knowledge on pests
- Lack of a horticultural policy
- Dubious business men who purchase chilies from none contracted growers.
- no major association of farmers

### d) Bio-efficacy of some natural plants on the oil palm leaf miner *Coelaenomenodera lameensis berti* and mariau (*coleoptera: chrysomelidae*) by Raymonda Johnson, Sierra Leone

Presented the findings of toxicity test of three indigenous plants of the against oil palm leaf miners. The toxicity test were done on extracts from leaves, barks and roots of *Zanthoxylum xanthoxyloides, Moringa oleifera, Securidaca longepedunculata* which were assessed for bio-efficacy against adults' *C. lameensis.*

The results of the study present the extracts of the three plants as useful bio-pesticides which can be incorporated in integrated pest management plans for oil palm leaf miner. The toxicity effects of the solvents used on the oil palm leaf miner need further research and investigation.

**e) ICT4 Plant Health- a new frontier for Early Warning Systems Dr. MaryLucy Oronje, CABI, Kenya**

CABI is working with other partners in their plant doctors clinics commonly referred to as "Plantwise". Through these partnerships they have developed a mobile phone friendly Plantwise data collection App and the Factsheet Library App. This allows over 200 plant doctors and clinics to share information per country in five countries.
Data gathered is available for sharing with NPPO in the five countries that program is working namely Zambia, Ghana, Kenya, Rwanda and Uganda.
CABI has demonstrated that ICT4Plant health is a good tool for providing a real-time means of collecting, verifying and disseminating pest information thereby creating a strong framework for surveillance and early warning systems.

**f) Worldwide overview of Ephyto application and (ephyto) for enhanced phytosanitary compliance in Kenya Josiah Syanda, KEPHIS, Kenya**

There are over 600 commodities being traded worldwide. There ahs nbeen a major challenge in the use of conventional paper Phytosanitary certificates
The Electronic Phytosanitary Certification (ePhyto) is an IT innovation which allows countries to generate as well as receive electronic formats of consignment phytosanitary data. ePhyto certification process includes collection of phytosanitary data, creation of encrypted electronic phytosanitary certificate, transmission of the certificate and decryption of the certificate at the destination point. Benefits of ePhyto include reduced fraud, certification system reliability, reduced costs, enhanced verification of consignments during inspection and improved government to government and government to business communication.

**g) Inclusion of Small Scale Farmers in Global Value Chains: A Case of Kenyan Traceability Project for Beans and Peas in Pod Farmers Josephine N. Simiyu, Horticulture Crops Directorate, Kenya & Dr Steve New KAVES-USAID**

The National Produce Traceability System which on trial was developed by Horticulture Crops Directorate (HCD) and USAID – KAVES. The program is very useful especially noting that it allows for small holders inclusion in the value chain.The piloting indicates that the system is credible and comprehensive. The Piloting was done with 12 green beans and Snow peas exporter and two flower exporters operating in 14 counties in Kenya.
The project has developed a Mobile Data collection application software developed whose features included geo-referencing of farm location, capturing of production data and generation of unique farmer ID and Trace Code based on the products delivered at the collection center and pack house. The system has an online module for the exporter and the regulator which is platform where all geo-referenced farms together with traceability data can

be accessed on real time. The system also allows for printing traceability information for all outgoing shipments on the product label.

**h) Monsanto Technologies for crop protection Monsanto Kenya by G. Shukla**

The demand for Monsanto Agriculture services is due to the increasing population and demands for more food in the world. In Africa the company has offices in South Africa and the Headquarters are in Nairobi. The main activities are in crop protection products, seeds for fruits, vegetables and key crops – such as corn, soybeans and cotton. Monsanto company works in partnership with other agents on soil health, help farmers use data to improve farming practices and conserve natural resources especially water. The company also works in plant breeding, data science, precision agriculture and biotechnology.

**i) Electronic solutions for agricultural systems by David Lawrence-Brown, MuddyBoots, Kenya**

Muddy Boots has unique field assessment and pack house tools for use by technical staff, farmers and extension agents. The programs allow the user to measure and monitor the performance of fields/sites, suppliers, products and staff performance. The company explained four products available and in use along the value chains by all actors from production to marketing. Exporters noted to be the first to embrace muddy boots technological solutions due to the high demand for compliance.

**9. Day 3 - Session 6: Industry views on phytosanitary systems - chaired by Jane Ngige the CEO of Kenya Flower council**

**a) Industry national mechanism of compliance -** Jane gave a brief of the industry national mechanism of compliance which is an intergovernmental control system with an inclusion of the county and national government agencies. The system gives the industry compliance based on the agriculture standard KS 1758. It emphasizes on traceability and is managed by a national task force which is an intergovernmental working group with support from the Dutch government.

**b) Key note address by Sylvie Mamias, Union Fleurs, International Flower Trade Association, Brussels**

Sylvie explained the mission and objectives of Union Fleurs which is International Flower Trade Association based in Brussels, Belgium. Union Fleurs – International Flower Trade Association is the international umbrella organization representing and promoting the worldwide interests of national associations and companies active in the floricultural trade (cut flowers, foliage and pot plants); it gathers over 3000 companies active in the trade of cut flowers and pot plants worldwide; that account for more than 80% of the total value of the worldwide trade. The goal is trade facilitation for members.

She demonstrated the growth of flowers trade from in last twenty five years USD one billion in 1988 to over USD 10 billion in 2013 and noted that 85% of export flower trade in the world is done by five countries namely Netherlands, Kenya, Ecuador, Columbia and Ethiopia. The major importers of flowers are Germany, United Kingdom, USA and Russia. Trade is mainly controlled

by the product specificity which include the product perish ability, various/ assorted types of flowers while the peak market seasons are Valentine's Day and mother's day. Traditionally the key factors considered for trade have been efficient logistics and stringent market requirements. The new market drivers are social, political, economical and technological concerns.

To ensure sustainability of supply chains, phytosanitary requirements must be respected by the exporting and importing destinations. Sylvie noted that the key challenges facing flower trade are Compliance to Phytosaniatry systems especially on documentation; industry/ private operator's compliance to ensure market access; perceptions of the operators; cost efficiency and inadequate operator's communication.

From the lessons learnt in the last few years it was noted that actors along the value chain need to ensure collective efforts especially per country or region. It is important for industry players and NPPOs to keep on challenging one another constructively in a responsible and transparent manner.

## Q & A Plenary session

1. Question 1-How is it possible to ensure water and environment sustainability in the flower industry? Answer-The industry is efficient in the use of water. In order to avoid environmental pollution, we are thinking of sea freight but it is very expensive.
2. Question2-How does consumer lobbies affect the EU industry? Answer- The consumer groups are very vocal and are easily heard.

### c) Insurance as a Mitigation Tool against Crop Diseases by Benjamin Njega

Acre Africa is an insurance farm that develops insurance products for farmers. The firm looks into the risks such as pests and diseases of farmers. Pests and diseases leads to loses in crop production. If a farmer has insurance and gets loss due to pests and diseases he/she gets compensation. This insurance covers uncontrollable pests and diseases.

### d) The role of Bio-pesticides in management of Phytosanitary challenges by Henry Wainwright, Real IPM, Kenya

The increasing concern on food safety in relation to use of pesticides has been of great concern. This has led to development of other safe products by companies such as Real IPM. It is a privately owned company which produces microbes and bio-pesticides that are used to control pests and diseases. The use of bio pesticides reduces the use of chemicals. Bio pesticides do not harm beneficial insects, they are environmental friendly and do not develop resistance and are highly specific. Real IPM explained their Kenya's commercial experience in the development of a biological control programme for fruit flies for mangoes in Kenya. An example of "lure and infect" traps was explained and its success in the control of fruit flies in Kenya.

### e) Role of Bio-pesticides in pest management, food safety and phytosanitary compliance by Allan Mweke of ICIPE

Bio-pesticides are made from bacteria, fungi and viruses. They have been used for years since the 17thcentury. What is needed is to create more awareness to farmers on the use of bio-pesticides to control pests since they are pollution free
The Recommendation to Phytosanitary science was:

- To develop policies to streamline and fast track registration and use of biopesticides
- Requirement for strong partnerships-researchers/ private sectors to promote biopesticide technologies, help farmers master the necessary skills and encourage them to use pollution-free biological products
- To investment in information dissemination to encourage farmers(smallholders) to use biopesticides
- To encourage development of microbials isolated in Kenya into biopesticides

**Q&A Plenary session**

1. Question 1-Did you look into developing a bio-pesticide for *Tuta absoluta*? Answer-Not yet but it can be done. We are already developing one for thrips.
2. Question 2-How can one use the bio-pesticides to control the pupa of thrips which is usually in the soil? Answer-We recommend ground spraying of the product to kill the pupa.
3. Question 3-Is there any international standards for the use of bio pesticides? Answer-there is no international standards. We only have the national standards.

**f) Improving access to niche European market for fresh vegetables through reduction of phytosanitary and pesticide residue constraints By W.LENGAI of University of Nairobi**

Horticulture industry in Kenya in terms of vegetable production is very big and is a key foreign exchange earner. Farmers want to make maximum yields enough for export and also for local consumption. Sometimes in order to get the best quality vegetables farmers use excess chemicals to control pests and diseases. This leads to exceedance of maximum residue levels and this reduces market access especially the European market. Farmers are therefore advised to adhere to Good Agricultural Practices. Kenya as a country has taken serious measures on this and it has seen our produce have reduced checks from 10% to 2% in the European market. Farmers need to adopt the use of pest resistant varieties, use of bio-pesticides to control pests, and generally the use of IPM.

**g) Capacity building in Early warning systems to enhance market access for small holder cut flower growers in Kenya. Public-private sector collaboration by Patrick Chege , small scale grower in Kenya**

This presentation was on the training of 97 farmers of summer flowers in Nyandarua County, Kenya on the knowledge of early warning system. It was necessitated by high number of rejections of their Eryngium flowers at JKIA due to the presence of leaf miner (*Liriomyza spp*) and also high incidences of interceptions of the flowers in Europe in the year 2011-2012. The farmers were trained by KEPHIS and the Kenya Flower Council.

They needed to know when what pest is prevalent and therefore control it on time. The farmers were taught on how to monitor weather patterns, scout data and on pest detection and monitoring.
The outcome of the training was; reduced rejections of flowers at JKIA, few interceptions in Europe in the year 2014, increased income and direct linkages to international buyers.
The farmers have the capacity to train others on early warning systems and it is bearing very good results.

**h) Status of seed potato supply systems and phytosaniatry issues in Kenya by Mumia I. Bornventure, University of Nairobi, Kenya**

He presented a study Status of seed potato supply systems which found out that in Kenya the potato farmers depend on their own saved seeds which they use year in year out. This seed has poor phytosanitary status since it has no quality control and accumulates seed borne pests. The phytosaniatry challenges with these potatoes saved seeds include nematodes such as PCN, pests such as wireworms, and potato tuber moth. There are also diseases such as late blight, bacterial wilt, viral diseases such as the PVY and PVX and fungal diseases.
To avoid the above challenges the farmers need to use certified potato seeds. This can be through increased and decentralized production of certified seed, improved certification standards, improved seed potato technologies and equipping of laboratories.

**i) Industry viewpoints towards International phytosaniatry standards compliance by Gerald Nyumu, Flamingo Horticulture, Kenya**

The industry is very pleased with the work of regulators in tackling SPS issues and helping them understand market access requirements and in fulfilling these requirements. However, the industry feels that the NPPO should not employ unjustified disciplinary actions to exporters due to interceptions resulting from non-compliance of their produce in Europe. There also needs to be collaboration and involvement of the private sector in the areas of pest risk assessments (PRA) and the management of rapid response incidents where interceptions are involved. There is need to benchmark SPS standards with the private standards to harmonize trust between NPPOS and the private sector.

**j) Enhancing competitiveness of French beans in the export market by overcoming phytosaniatry and quality challenges by A.M Fulano, University of Nairobi**

In order to improve on the quality of Kenyan French beans exported to the European market and for local consumption, there is need to reduce on the use of synthetic chemicals on the produce to control pests and diseases. Farmers need to embrace the use of IPM strategies and especially on the use of bio pesticides. Awareness creation is needed on the use of bio-pesticides and a policy needs to be created on formulation of bio-pesticides.

## 10. Session 7: Field Visit Practical application of Phytosanitary requirements

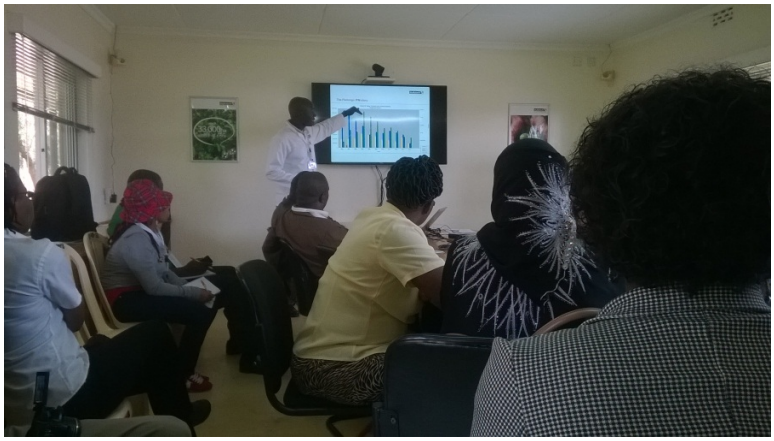
The field visit to Naivasha and Thika farms was a practical demonstration on application of Phytosanitary requirements

Thika - The delegates visited Kakuzi Ltd where they were taken through the production and packaging of avocadoes and pineapples for export. A visit to FPEAK tree seedling nursery was also made and delegates appreciated the phytosanitary aspects involved in fruit tree nursery production

Naivasha – a visit to Vegpro Gorge (vegetables) farm and Oserian (flowers) farm demonstrated Great potential in the use of innovative on farm technologies and application of IPM. Green energy technology was demonstrated such as biogas and geothermal power production facility to generate electrical power in farms. In both farms biopesticides were in use.


The farm manager giving the participants a brief at Vegpro.

Visit to DuduTech demonstrated development and production of bio-control products in the management of chronic pests. These include compost manure production by use of earthworms, multiplication of predatory mites and nematodes for enhancing the performance of farm and reduction of use of synthetic pesticides.



**John Ogecha training the partcipants at Dudutech in Naivasha**


**Samples of Mytech**

## I I. Session 8: Emerging Phytosanitary Issues, capacity building and communication Chair: Sierra Leon NPPO

### a) Capacity building under STDF for phytosanitary challenges by Dr Roshan Khan

The history and structure of The Standards and Trade Development Facility (STDF) was outlined and its value added highlighted as a global coordination/knowledge hub. STDF key activities are coordination and funding mechanism to support SPS project development and implementation. Dr Khan also highlighted the results of some key STDF projects in the area of plant health indicating their success. Mode of application of the funding facility for NPPOs was explained.

### b) Regional SPS frameworks; Is Africa done enough? by Dr Edewa of Standard and Market Access Programme (SMAP)

Presented a paper on the performance of eight (8) different Regional Economic Communities which showed that:

- While the Regional Economic Communities open up opportunities for increased intra-Africa trade, African countries continue to face serious SPS related challenges in trade and development.

- SPS related concerns remain a major obstacle to boosting Africa's Agricultural productivity and trade
- Africa must put its house in order by establishing the SPs requisite conditions for facilitating agro-food trade
- Emphasis should be put on conducting systematic assessments of SPS capacity development needs

**c) Technical Assistance and Implementation of Sanitary and Phytosanitary Standards: Towards Market Compliant Horticultural Exports by Joseph Kigamwa, KEPHIS**

Presented results of a study that had a review of journal articles and other papers on transfer of knowledge, compliance infrastructure, training, and research and monitoring of SPS measures in the context of technical assistance.

According to the reviewed articles, technical assistance is necessary as SPS measures keep changing due to the need to address new and emerging SPS risks and exporting developing countries will need support to meet such dynamic measures.

All five variables assessed showed a positive contribution to SPS compliance.

**d) Maize Lethal Necrosis Disease: Surveillance Report for Zambia – by Mable Mudenda of ZARI Zambia**

Reported on a surveillance undertaken in eight provinces of Zambia on Maize Lethal Necrosis Disease (MLND). The surveillance showed that; MLND vectors were present in Zambia, alternative weed hosts such as Napier and guinea grass were present, 50% of the farmers plant local varieties, 20% plant recycled seed and 90% do not practice crop rotation, MLND was not present in all the eight provinces.

Prudent and stringent plant biosecurity measures need to be put in place and adhered to by all stakeholders in the country if the absence of MLND is to be maintained.

**e) Maize Chlorotic mottle virus (MCMV) in Maize seed in Kenya by Dr Esther Kimani of KARLO**

Presented preliminary results of detection of MCMV- Kenya isolate in maize seed obtained randomly from thirteen counties in Kenya. The preliminary results show that 20% of the samples tested were positive for MCMV therefore a conclusion that MCMV is present in the seed in Kenya. Further analysis and transmission studies are on-going.

**g) Prevalence of Maize Lethal Necrosis Disease in major maize seed production areas in Kenya by Joyce Waithera of KEPHIS**

Presented results of a study carried out in 12 counties to determine the prevalence of MLND in major maize seed production areas in Kenya.

The results showed that MCMV is widely distributed within the maize growing regions and most of the maize varieties are susceptible to infection with the virus. MLND incidence was significantly high within the counties and among varieties hence the need to establish the role of seeds in disease transmission.

**h) First report of *Tuta absoluta* (Tomato Leaf Miner) in Zambia by Abass M. of ZARI Zambia**

Presented findings of a survey conducted to detect the pest in reported areas in February 2016
The preliminary survey results show that the pest is present in six provinces of Zambia.
A wider surveillance of the pest has been scheduled. Zambia has updated its phytosanitary import conditions for tomato since this confirmation and drafted the legislation to regulate movement of tomatoes. Notification for this report has since been sent to the International Plant Protection Convention (IPPC).

**i) Potato cyst nematodes *Globoderarostochiensis* in Kenya: The way forward Dr. G. M. Kariuki of Kenyatta University**

Presented the findings of a survey conducted in four potato growing areas of Nyandarua County in Kenya.
The results confirmed the presence of the potato cyst nematode in Kenyan soils.
The result of this study has become a very strong foundation of further research work consisting of a consortium of KEPHIS, KALRO, ICIPE, IITA, state department of agriculture and public universities who are now jointly looking at capacity building, characterization, occurrence, distribution, density and pathogenicity of the nematode in various potato growing areas in Kenya with an aim of managing the spread of nematode and identifying clean sites for certified potato seed production.

**j) Incidence and prevalence of potato cyst nematode in major potato growing regions of Kenya by Mr. George Momanyi of KEPHIS Kenya**

Presented the findings of both active and passive surveys t carried out in potato growing areas since January year 2015. The surveys were on incidence and prevalence of potato cyst nematode in major potato growing regions.
The results of the study show that:

- There is high prevalence of PCN in many of the sampled regions with a prevalence of over 70%.
- There is an urgent need to conduct a more thorough countrywide survey to comprehensively establish the distribution of PCN and
- Need to investigate the possible mitigation measures such as instituting strict movement restrictions of risky material as well as the use of resistant varieties in an integrated pest management strategy
- There is need to identify PCN free farms and zone them for seed potato production as a PCN mitigation measure.

**j) Plant biosecurity challenges, opportunities and collaboration in Africa by Mary Githinji of KEPHIS**

Presentation of a paper which emphasized those harmful pests can impact on food safety, trade, market access, market development and the profitability of plant production and trade
There is need to re look into the plant biosecurity system to create collaboration and create a continuum. Partnerships between industry and community and government are key in the management of biological risks that impact on food security and global trade.

**Q & A Plenary Session for session 8**

1. Is STDF also interested in bio-controls? - The mandate of STDF is to work on phytosanitary related issues.
2. How are the observers to the STDF committee chosen? - Organizations with interested SPS groups write to the secretariat for consideration.
3. Has the impact of STDF activities been assessed over the years? - Yes and it has shown that the projects have considerable impact
4. What preventive measures are Zambia taking since Tanzania their neighbor has MLND already? - Pest risk analysis was done and seed established as the main pathway hence measures on imports are being applied already.
5. How can a plant doctor in the plantwise clinics tell that a plant is infested by cyst nematode? - Damage is on the roots, but there is need for capacity building on identification of cyst nematode on the tubers.

## 12. Conference evaluation

Overall, 97 % of participants rated the IPC conference as good, very good or excellent, based their total experience at the meeting. They indicated that they were l were satisfied with the quality of papers offered, posters, exhibition, field visits and conference facilities. The networking cocktails and dinners were also rated very high having given the participants freedom to mingle freely. Participants agreed that the conference programme and structure needs to be improved to allow inclusion of smaller sessions, roundtable discussions and also include more time per presenter with adequate time for questions and discussions. It was noted that the exhibitors were not given enough audience and should not be treated as a side event in future. See full report as **annexure 1**

## 13. Way-forward

Publication of the conference proceedings and organization of the next conference will be communicated at a later date.

## 14. Closing session of the conference

After eventful five days of exchanging ideas and learning new things in Sanitary and Phytosanitary systems from different countries, the conference came to a closure with the following remarks:

**Dr. Khan** of the WTO thanked the organizers of the conference and emphasized that communication and intervention is the key to tackling SPS issues. She said that the themes of the conference were rich and fulfilling. She concluded by thanking all the speakers, the chairs of sessions during the conference and everyone who was in the room, the African continent and Kenya.

**Dr. Roger** of CABI said he is happy to have been involved in organizing the conference behind the scenes. He mentioned that it was nice to have been with people of like minds and he emphasized on the need to keep on communicating until the next conference is organized. He further urged regulators to be diplomatic, facilitating and negotiating as they deal with SPS matters which are complex roles.

**Dr. Smith** of FERA pointed out that the battle of SPS issues is being won by having such conferences. He was also impressed by a good representation of the private sector in the conference. He mentioned that there is need for a global partnership since so many diseases and pests are coming up. He concluded by thanking everyone.

**Jennifer Addo** of Ghana NPPO while representing all the other African NPPOS described the conference as being insightful and had a lot of knowledge exchange. She pointed out that both challenges and positives had been shared. She urged the participants to build on these positives and challenges. She concluded her remarks by thanking everyone and welcoming everyone to Ghana.

**Dr. Esther Kimani, MD, KEPHIS** was very happy that the conference was successful. She pointed out that it was a dream and actually it came to be. She explained how the KEPHIS project office initiated the organization of the conference, mentioned the idea to the ministry of foreign affairs and then finally the KEPHIS board accepted the idea. She thanked Dr. Roger of CABI for ensuring participants came for the conference. She said that as Africa we need to keep moving ahead and actualize our ideas. Africa should not be discouraged by lack of funds, when an idea is viable, funds can be availed. She further urged NPPOS to apply SPS measures without compromising. She emphasized that SPS challenges create opportunities for business and this contributes to development and innovations.

She concluded her remarks by acknowledging the following among others:-

- Board of Directors, KEPHIS
- Ministry of Agriculture for support
- Development partners-RIIP(COMESA),MONSANTO,EU (SMAP),SYNGENTA, SYNGENTA FOUNDATION,IITA, CABI,FERA,AUSTRALIAN GOVERNMENT
- Posters presenters, Exhibitors and those that wrote papers
- Organizers- Management of KEPHIS
- Director, Ministry of Agriculture
- MD,HCD
- MD, PCPB
- MD, KHC
- KALRO
- University of Nairobi
- EU delegation to Kenya
- The Netherlands embassy
- Dr.Kedera a private consultant
- Director ALFA
- Planning committee of KEPHIS

## 15. Presentation of Certificates

All the participants of the conference were presented with certificates of participation.

## 16. List of participants

During the five days conference 222 delegates from 25 Countries across the world participated in the gathering in Nairobi to discuss matters pertinent and emerging in plant health. See full list as **annexure 2.**

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| 2. Benin |
| 3. Colombia |
| 4. Finland |
| 5. France |
| 6. Ghana |
| 7. India |
| 8. Kenya |
| 9. Lebanon |
| 10. Liberia |
| 11. Malawi |
| 12. Mexico |
| 13. Namibia |
| 14. Netherlands |
| 15. Nigeria |
| 16. Rwanda |
| 17. Sierra leone |
| 18. South Africa |
| 19. Switzerland |
| 20. Tanzania |
| 21. Uganda |
| 22. UK |
| 23. Zambia |
| 24. Zimbabwe |
| 25. Cameroun |