

First Meeting of the Maize Lethal Necrosis (MLN) Phytosanitary Community of Practice



February 29, 2016
ICRAF Campus, Gigiri, Nairobi, Kenya



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Acronyms and Abbreviations

CEO	Chief Executive Officer
CGIAR	Consultative Group for International Agricultural Research
CIMMYT	International Maize and Wheat Improvement Center
CoP	Community of Practice
CRP	CGIAR Research Program
EAC	East African Community
EIAR	Ethiopian Institute of Agricultural Research
FERA-UK	Food and Environmental Research Agency - UK
GMP	Global Maize Program
ICRAF	World Agroforestry Center
ISTA	International Seed Testing Association
KEPHIS	Kenya Plant Health Inspectorate Service
MCMV	Maize Chlorotic Mottle Virus
MD	Managing Director
MoA	Ministry of Agriculture
MLN	Maize Lethal Necrosis
NARO	National Agricultural Research Organization
NPPO	National Plant Protection Organization
NPT	National Performance Trial
NSCP	National seed certification program
PCR	Polymerase chain reaction
PHS	Plant health services
RT	Real-Time
SOPs	Standard Operational Procedures
SPS	Sanitary and Phytosanitary
SSA	Sub-Saharan Africa
TOSCI	Tanzania Official Seed Certification Institute
USAID	USAgency for International Development

Executive Summary

The International Maize and Wheat Improvement Centre (CIMMYT) organized a one day meeting on Maize Lethal Necrosis (MLN) Phytosanitary Community of Practice (CoP) at the ICRAF campus in Nairobi, on February 29, 2016. The purpose of the MLN Phytosanitary CoP is a) to create and ensure a structure that allows stakeholders to promote best practices in controlling the spread and impact of MLN in SSA, b) build common capability in MLN-related phytosanitary procedures and practices across the organizations; and c) share knowledge and best practices on MLN diagnostics and management across borders. The aim of the meeting was to bring together relevant stakeholders in the maize value chain, namely NPPOs, MoA, commercial seed sector, CIMMYT, USAID, and a few subject matter specialists from appropriate organizations within or outside Africa. A total of 28 participants attended the meeting.

The meeting commenced with welcome and introductory remarks by CIMMYT, USAID and KEPHIS officials, before being officially opened by the Head of the Crop Protection Department, at Kenya's Ministry of Agriculture and Fisheries. An introductory presentation on MLN management in sub-Saharan Africa (SSA) was given by the Director of CIMMYT's Global Maize Program (GMP)&CRP MAIZE. This set the stage for discussion on several technical issues regarding training, seed movement regulations and the latest information on screening for MLN tolerance/resistance.

Representatives from the NPPOs of the five participating MLN-endemic countries (Kenya, Ethiopia, Uganda, Tanzania and Rwanda) gave presentations on the current initiatives in managing MLN in respective countries. Issues raised from these presentations were further discussed during a plenary session, which also featured highlights from group discussions held earlier in the meeting.

A presentation on the Community of Practice was later given by the ICRAF Capacity Development leader; the presentation touched on various issues on the factors behind the success/failure of a CoP.

The membership of the MLN Phytosanitary CoP comprised of members from the NPPOs, National seed quality organizations and the seed industry of the participating countries. Other members include the subject matter specialists, representatives from CIMMYT, USAID and Regional bodies like East African Community. It was also unanimously agreed that for the first year, the CoP will be chaired by Managing Director, KEPHIS, while the Director, NPPO (Ethiopia) serving as Vice-Chair.

The next face-to-face meeting of the CoP will coincide with the MLN Annual Project Meeting in October. Quarterly online meetings for a duration of 1.5 to 2 hours (via Webex) for participation of members from outside Kenya will be held on the 3rd Tuesday of the month, i.e., on 19th April, 2016, 19th July, 2016, 18th October, 2016, and 17th January, 2017.

The meeting was then concluded by closing remarks from the representatives of CIMMYT and USAID. The participants had an opportunity to visit the MLN Screening Facility at KALRO-Naivasha Center on March 1, 2016.

**Program of the First Meeting of the MLN Phytosanitary Community of Practice
(CoP)ICRAF Campus, Nairobi, Kenya, February 29 –March 1, 2016.**

Time	Activity
07.30	Arrival and Registration at ICRAF Campus
08.15	Welcome and introductions – Stephen Mugo (CIMMYT)
	Remarks by CIMMYT – B.M. Prasanna
	Remarks by USAID – Tracy McCracken
	Official Opening – Esther Kimani (KEPHIS)
09.15	MLN control and management in sub-Saharan Africa: Possible role of MLN Phytosanitary CoP – B.M. Prasanna
09.45 – 12.05	Technical Session 1: Country MLN situation Reports (Chair: MD, KEPHIS)
09.45	Ethiopia Report- NLN Situation in Ethiopia - Weldehawariat Asefa
10.15	Kenya Report – MLN Management, KEPHIS perspective –George Ngundo
10.45 – 11.00	Health Break / Group photo
11.05	Rwanda Report- MLN in Rwanda, Status and Interventions - Daniel Niyikiza
11.35	Tanzania Report-MLN Situation in Tanzania - Katemani Mdili
12.05	Uganda Report – MLN Country situation report – Stephen Byantwale
12.30 – 13.25	Lunch
13.30 – 16.45	Technical Session 2: Major issues that require the attention of the MLN phytosanitary CoP in Eastern Africa (Chair: Ian Barker)
13.30 – 14.55	Structured Group discussions to identify key issues in MLN phytosanitary, diagnostics, seed certification, and seed export/import procedures and standards (Form three groups with balanced membership in each to deliberate on the issues)
15.00 – 15.20	Health Break
15.30 – 16.00	Plenary – Group reports (10 mins each)
16.00 – 17.00	Session 3: Towards a successful MLN Phytosanitary CoP

	(Chair: Hiwot Lemma)
16.00	Elements for success of a Community of Practice ICRAF Capacity Development Leader – Mehmood Hassan
16.15	MLN Phytosanitary CoP ToRs, and proposed activities Stephen Mugo & Francis Mwatuni
16.45	Communications in the MLN Phytosanitary CoP Brenda Wawa
17.00	Wrap-up and closing remarks Kennedy Onchuru & B.M. Prasanna
Day 3: Tuesday 1st March 2016 Visit to MLN Screening Facility at KALRO – Naivasha	
07.15 - 07.30	Check-out from hotel and departure to Naivasha
09.00	Arrival at MLN Screening Facility Welcome remarks by Dr. Lanyasunya, DDI, KALRO Naivasha and Stephen Mugo (CRR-CIMMYT)
10.00	Greenhouse / lab area tour L.M. Suresh (CIMMYT)
11.30	Field screening tour Bish Das & L.M Suresh
12:00	Closing remarks
12.30	Departure to Nairobi

MLN CoP 1st Meeting Opening Session

1.1 Introduction and welcome remarks

The meeting kicked off at 8.45am with remarks by Dr. Stephen Mugo. He thanked all participants for making time to attend the meeting, despite immensely tight schedules. Dr. Mugo also led the introduction session.

1.2. Official opening session

Mr. Phineas Nyagah, Head of the Crop Protection Department at Kenya's Ministry of Agriculture and Fisheries, officially opened the meeting. He reiterated the importance of maize as a staple food crop and a cash crop for thousands of households in Kenya, while pointing out how MLN has compounded the already existing biotic and abiotic stresses to maize growing in the country. The Ministry estimates losses to up to KES 87 billion since the onset of the MLN epidemic in Kenya in late 2011.

Dr. B.M. Prasanna, Director of Global Maize Program, CIMMYT & CGIAR Research Program (CRP) MAIZE, introduced Mr. Francis Mwatuni, Project Manager for the USAID-funded MLN Diagnostics and Management Project. He gave an overview of the project and the five MLN endemic countries (Kenya, Uganda, Tanzania, Rwanda and Ethiopia), emphasizing that the project aims to support these countries to produce and deploy MLN-free seed, thus minimizing the spread and negative economic effects of the disease. MLN surveillance and monitoring will also be stepped up in three key non-endemic countries in southern Africa, namely Malawi, Zambia and Zimbabwe, as there are major commercial maize seed exporting countries operating in these countries and exporting commercial maize seed to other countries in sub-Saharan Africa (SSA).

Dr. Tracy MacCracken (USAID SPS Division, Kenya) emphasized on the importance of the MLN Diagnostics and Management Project for SSA. She informed the participants of the US Feed-the-Future initiative, which aims to strengthen food security of countries in light of dwindling resources and increasing population, especially in sub-Saharan Africa and in Asia. She thanked CIMMYT for the leadership in addressing the MLN challenge, and lauded the formation of the Community of Practice and challenged the team to be proactive for the project's success.

Mr. Simeon Kibet, who represented the MD, Kenya Plant Inspectorate Services (KEPHIS), assured participants that KEPHIS undertakes all phytosanitary and seed quality measures to produce MLN free seed. He said that KEPHIS capacity to test the seed and carry out surveillance and inspection for seed fields have proved fruitful.

1.3 Introductory presentation for the meeting

Dr. Prasanna gave a presentation on MLN control and management in sub-Saharan Africa and the role of MLN Phytosanitary Community of Practice. His presentation focused on the purpose of the project, which includes effective prevention of MLN spread, minimize effect of MLN in the project countries, and minimize MLN seed contamination and transmission. He explained the difference between seed transmission and seed contamination by MLN viruses. It was envisaged that the CoP will play a pivotal role in the implementation of the various activities

under the project and also propose other feasible activities otherwise not captured in the initial project document.

Primary focus of the CoP will be to create awareness on MLN, provide a platform for shared learning on existing and emerging issues on MLN, reducing costs of diagnostics, and standardized protocols on surveillance, seed certification and diagnostics. The CoP will link closely with NPPOs in the project countries for effective implementation of the Phytosanitary measures proposed to limit the spread of MLN and reduce its prevalence and incidence.

He also highlighted the progress made on breeding for MLN resistant varieties and the intensive screening for MLN resistant/tolerant inbreds and hybrids at the Naivasha MLN screening facility. There are five first-generation MLN tolerant hybrids already released in east Africa, and 15 second-generation MLN resistant hybrids are presently in NPTs in Kenya, Tanzania and Uganda.

1.4 Discussion

- Bob Shuma, CEO of the Seed traders association of Tanzania, raised an issue on the criteria for training of seed companies on internal control strategies. He was assured that the trainings will be all inclusive, but specific trainings can be organized by individual companies, with CIMMYT invited, due to budgetary constraints.
- David Wafula of the East Africa Community (EAC) suggested a regional approach for managing the disease and proposed a web portal for information sharing. He too was assured that the project has already proposed the MLN web portal, similar to the one for stem rust in wheat (UG99).
- There was also a concern to include Burundi and D.R.Congo in the project but it was agreed that a systematic survey has to be first done to determine the presence of the MLN pathogens in the said countries.

2.0 Implementing Country-wide MLN Surveillance

Each representative of the five MLN-endemic countries made a presentation on the MLN situation in the respective country. The presentations highlighted when the disease was first officially reported, the interventions taken by the concerned governments to address the MLN, and the challenges experienced in these efforts. A discussion was held for this session after all the countries had finished their presentations. A situation analysis of the issues discussed was developed that captures all the information generated from these presentations and discussion.

2.1 Ethiopia

The disease was officially reported in Ethiopia in 2014 hence threatening the maize crop, which is second most grown crop after Teff. Area under maize has increased from 50 to 66 percent in the recent past. It has been found that Maize Chlorotic Mottle Virus (MCMV) is the most prominent virus amongst the causative viruses in the MLN complex.

A multidisciplinary task force for MLN was initiated by the Ministry of Agriculture (MoA) and offers technical support for MLN control.

A survey was done in 2014 by MoA, Ethiopian Institute of Agricultural Research (EIAR) and CIMMYT-Ethiopia. MLN is currently found in the Rift Valley region of Ethiopia, with Oromia region having 13 districts affected and Southern region having 12 districts affected.

Diagnostics is done by EIAR using ELISA since the National Plant Protection Organization does not have testing capacity as yet. There are no seed certification protocols for MLN but zero tolerance has been adopted for seed maize though is still contended by stakeholders. Import export regulations in place and so far only popcorn from Brazil tested positive for MCMV.

2.2 Kenya

The disease was reported in 2011 and has spread to all maize growing regions in the country. A national Technical and Advisory Task Force is in place. KEPHIS quickly optimized diagnostic protocols (Real time RT PCR) following the NGS data for the Kenyan maize samples done by FERA, UK. Import/export regulations are in place and centralized at KEPHIS headquarters to limit unprocedural importations for grain, seed maize and for research materials. Surveillance ongoing and reporting done periodically.

Trainings have been done in collaboration with MoA under Kenya Agricultural Productivity and Agribusiness Project (KAPAP) to seed inspectors and MoA extension staff on symptom identification, surveillance and management options.

Seed certification protocol for MLN has not yet been produced, but 1% tolerance in field inspections and Zero tolerance in processed seed adopted. Plant quarantine station also offers training facilities for diagnostics in the region.

2.3 Tanzania

A national strategic plan for MLN management and control has been done. The following activities have been initiated;

- i. Awareness of and sensitization on the disease.
- ii. Rules have been formulated for prevention and control of MLN.
- iii. Several brochures both in Kiswahili and English distributed to farmers.
- iv. A video documentary on MLN also done.

The Tanzanian NPPO, Plant Health Services has so far initiated the following:

- i. Implemented surveillance activities.
- ii. Put in place early warning systems in all maize growing areas.
- iii. Seed testing for MLN done by Mikochoeni Agricultural Research station.
- iv. Collaboration with TOSCI on phytosanitary inputs in the seed certification procedures.
- v. Adoption of stringent import/export rules and enforcing domestic quarantine.

2.4 Uganda

Maize is an important food and cash crop in Uganda with 4milliontons produced every year.MLN was first reported in 2012 in Eastern Uganda bordering Kenya in WEMA plots. The disease has since been reported in central and western parts of the country. The NPPO has been coordinating the following activities:

- i. Diagnostic protocols optimized by NARO which includes DAS - ELISA, RT-PCR and immunostrips etc.
- ii. Collaborates with the National Seed Certification Program (NSCP) in seed certification and Variety Release Committee (VRC) for release of new varieties.
- iii. Seed certification protocols development though none available for MLN in regards to tolerance levels.
- iv. Capacity building and information exchange in mitigation of MLN.

2.5 Rwanda

The disease was reported in 2013 and is now prevalent in all maize growing regions. There have been several interventions initiated by the government through the Rwanda Agricultural Board as shown below.

- i. Formation of a National Task force for MLN mitigation.
- ii. Looking for grants of which two projects funded on MLN related issues.
- iii. Forging of partnerships for MLN mitigation which includes diagnostics training by KEPHIS, capacity building by USDA/Ohio State University.
- iv. Putting in place enabling policies.

2.6 Discussion

- *The roles of institutions in MLN management in Tanzania not well defined.* The Tanzanian presenter responded by explaining the roles of TOSCI, PHS and TRT. He also expounded on how the rules were developed by the ministry which has the mandate. This included technical inputs from several collaborative institutions.
- *Why there are stringent regulations in seed maize importation in Kenya while MLN is regarded as a regulated non-quarantine pest?* Response was that though it is a regulated non-quarantine, it has a potential of causing massive yield losses hence regulated.
- *Is frequent surveillance important and how are the results utilized?* Response was that the information is used for advising farmers to break the maize crop seasons with at least 2-3 months of maize-free period and synchronized plantings. The seed must undertake seed production in MLN-free areas and rigorously follow SOPs.
- *Are seed parental materials tested?* Response was not under regulations but seed companies advised to test the parents since there is possibility of spread to hybrids by the parental lines. Kenya seed has been sending their parental materials to KEPHIS for testing apart from the seed itself.
- Only one issue was raised on the capacity for the NPPO to test MLN viruses. He responded that NARO does the testing mostly using ELISA.
- An issue was raised on the rules for import, export and general phytosanitary if based on scientific principles or just unanimously agreed upon. It was clarified that the task force considered several scientific and phytosanitary issues in coming up with the said rules to curb spread of MLN in the country.

A situation analysis for the country presentations and discussion was developed and attached as Annex 1.

3.0 Group discussions and reporting

Three groups were formed, each having at least one representative from NPPO, MoA, Seed certification institutions, seed companies, seed traders' organizations and others. Structured group discussions to identify issues for MLN Phytosanitary CoP were prepared referencing previously raised issues and how the CoP can address them. Other topics for discussion were MLN general Phytosanitary issues, MLN Diagnostic (visual, leaf tissue and seed), seed certification and seed exports/imports. Each group gave a presentation on the discussion conclusions, which will go a long way in refining activities of the project within the funding regimes.

The outputs from the group discussions were packaged, as shown in Annex 2.

4.0 Presentation on Community of Practice

The ICRAF Head of Capacity Building gave a presentation on the Elements for success of a Community of Practice. The following points were highlighted in his presentation.

- Composition and roles of core CoP members to encourage active participation.
- The role of active members and how to stir up dormant members, and others who monitor the goings on of the CoP activities but do not participate actively.
- Keeping the CoP active by sharing information on the current trends and findings.
- The CoP's ability to evolve its activities and domain too hence flexibility to embrace the changes for the better functioning of the CoP.
- The CoP must be well-defined and the roles of the various members should be well-articulated.

The presenter concluded with an outline of the various success elements for a functional CoP.

The group discussion outputs will be combined in to a single document for the Project Management Committee to effectively address the issues raised, and which were not included in the original project document.

5.0 CoP Membership and meetings

5.1 Membership composition

The table 2 below shows the members of the CoP representing the five MLN endemic countries and the supporting institutions.

Table 1: Membership of the MLN Phytosanitary CoP

No	Category	Institution represented	Designation
1	Phytosanitary and seed quality	Ministry of Agriculture	CEO of phytosanitary unit.
		NPPO	Head of NPPO

	experts	Seed Quality Agency	Head of the Seed Quality Assurance
2	Seed industry	Regional umbrella body	MD, AFSTA
		National umbrella body	Seed Trade Association
		Major seed company	MD or Phytosanitary Officer
3	Subject matter specialists	Expert on CoP	Manager / member of a successful agricultural CoP
		Expert on MLN diagnostics	public/private expert on MLN diagnostics
4	CIMMYT	Management	CIMMYT-GMP Director; CRR, MLN Project Manager
		Pathology / Seed Health Unit	MLN Pathologist / Head, Seed Health Unit
5	USAID (Donor)	As observers	USAID representative responsible for MLN Project
6	Regional bodies	EAC, COMESA,	Relevant staff

5.2 Meeting schedule of the MLN Phytosanitary CoP

It was proposed that the following meetings for the CoP will be done.

1. First face-to-face inception meeting held on February 29, 2016.
2. Other face-to-face meetings to coincide with the Annual Project Meeting every October. Quarterly 1.5 to 2 hour meeting (via Webex) for participation of members from outside Kenya, to be held on the 3rd Tuesday of the month, i.e., 19th April, 2016, 19th July, 2016, 18th October, 2016, and 17th January, 2017.

These dates were agreed on unanimously. However, changes regarding the frequency of the meeting may be made, as the situation demands.

5.3 MLN Phytosanitary CoP Management

It was also unanimously agreed that for the first year (2016), the CoP will be chaired by Managing Director, KEPHIS, while the Director, NPPO (Ethiopia) will serve as the Vice Chair. Table 3 below outlines the details of the executive committee of the MLN Phytosanitary CoP.

Table 2: Executive Committee of the MLN Phytosanitary CoP for 2016.

Office	Source	Mode of selection	Duration	2016
Chair	To be selected by the CoP from among the members, excluding CIMMYT and USAID officials.	Election (<i>Proposal to have MD KEPHIS as first chair</i>)	Annual rotation	Managing Director, KEPHIS, Kenya (or designate)
Co-Chair	To be selected by the CoP from among the members, excluding	Election (<i>First Co-chair to be elected today</i>)	Annual rotation	Dr. Weldehawariat Asefa, DG, Animal & Plant Health & quality

	CIMMYT and USAID officials.			control Directorate.
Secretary	CIMMYT's MLN Project Manager	N/A	Permanent	Mr. Francis Mwatuni
Members	Current list of members from the five EA MLN endemic countries	N/A	Permanent	See list

6.0 Closing remarks

Dr. Prasanna gave his final remarks by urging the newly recruited Project Manager to start engaging the CoP members in active discussions on MLN control, and challenged seed companies to develop SOPs for MLN free seed production. He also advised the CoP and other project implementation teams to embrace new diagnostic technologies for time- and cost-effectiveness.

USAID SPS specialist Mr. Kennedy Onchuru, in his final remarks, thanked the participants for making the first CoP meeting a success, especially with the amount and quality of inputs. He also emphasized the US Government's focus on and commitment to alleviating hunger and improving food security situations in SSA through the Feed-the-Future initiative, as evidenced by USAID's generous funding of the MLN Project on Diagnostics and Management.

The meeting ended at 6.00p.m.

ANNEXES

Annex 1. Situation analysis in the five MLN endemic countries to guide the MLN Phytosanitary CoP

	Ethiopia	Kenya	Rwanda	Tanzania	Uganda
MLN General phytosanitary	<ul style="list-style-type: none"> • A multidisciplinary task force for MLN was initiated by the Ministry of Agriculture. • Initial survey of the MLN was done in 2014. 	<ul style="list-style-type: none"> • NPPO is supported by several laws. • Major countrywide survey done in 2012. • KEPHIS identified as the competent authority in the region. • MLN declared a regulated non quarantine disease. • KEPHIS participated in MLN manual development with assistance from FAO. • KEPHIS is a member of the National MLN Task force. • Extension staff, seed and plant inspectors have been trained on various MLN topics. • Technicians from the region trained on MLN testing i.e. ELISA and RT PCR by KEPHIS. 	<ul style="list-style-type: none"> • Ministerial & RAB guidelines have been put in place to control MLN. • NPPO supported by several laws. • Formation of a National Task force for MLN mitigation. • Two projects funded on MLN related issues. • Forging of partnerships for MLN mitigation. • Putting in place enabling policies. 	<ul style="list-style-type: none"> • A Strategic Plan for Management and Control of Maize MNL D was devised by PHS in Collaboration with DRD. • Border Inspectorate services in place. • Conducted Pest Risk Analysis. • Revised importation conditions for maize seeds. • Conducted a sensitization program to all major Maize Producing Regions (posters, stakeholders meeting). • Created the plant protection (prevention and control of maize lethal necrosis disease) rules. • Training extension officers on various aspects of MLN. • Developed training manuals, video documentaries. 	<ul style="list-style-type: none"> • MLN so far reported in eastern, central and western Uganda. • Sensitization on MLN done, but on a small scale. • Capacity building and information exchange in mitigation of MLN initiated. • Several studies on MLN going on.

	Ethiopia	Kenya	Rwanda	Tanzania	Uganda
Diagnostics protocols and standards	<ul style="list-style-type: none"> • NPPO doesn't have testing capacity. • Testing is handled by EIAR using ELISA. • No other protocols developed and/ or optimized. 	<ul style="list-style-type: none"> • KEPHIS identified as the competent authority. • Both RT-PCR and ELISA methods used in testing for MLN. • Staff trained at FERA –UK in 2013 on RT-PCR. • Three KEPHIS labs (HQ, Muguga, and Nakuru) functioning. • KEPHIS is currently involved in developing other MLN molecular based diagnostic methods. 	<ul style="list-style-type: none"> • MLN diagnostics training facilitated by KEPHIS. • More capacity building on diagnostics by USDA/Ohio State University. 	<ul style="list-style-type: none"> • Lab diagnostics is carried out at MARI, Mikochehi using ELISA and RT-PCR methods. • Lab Technicians were trained at the KEPHIS Plant Quarantine station. 	<ul style="list-style-type: none"> • Diagnostic protocols optimized by NARO. These include DAS - ELISA, RT-PCR and immunostrips etc. • NPPO has no testing capacity at the moment.
Seed certification procedures	<ul style="list-style-type: none"> • No MLN seed certification protocol in place. • Tolerance level currently is Zero but very contentious. • No scientific backing to many proposed measures. 	<ul style="list-style-type: none"> • No seed certification standards for MLN in the current law. • MLN testing compulsory for all seed lots (Imported and local). • Rejected seed sold to millers. • 1% MLN infection tolerance level in seed crop adopted, down from 10%, although this is still contentious. 	<ul style="list-style-type: none"> • No seed certification protocols in place. • MLN tolerance levels still contentious. • Seed lot testing initiated but sampling procedure still an issue. The ISTA method adopted by KEPHIS still having issues of 	<ul style="list-style-type: none"> • None currently. • Seed importers notify PHS through form No PQS-1. • A PRA is conducted based on importers details including country of origin. • A plant import permit is issued for importation. • Declaration at point of entry followed by testing. • Seed coated with insecticides and 	<ul style="list-style-type: none"> • NPPO collaborates with the National Seed Certification Program (NSCP) in seed certification and Variety Release Committee (VRC) for release of new varieties. • Seed certification protocols development in progress, though none available for

	Ethiopia	Kenya	Rwanda	Tanzania	Uganda
		<ul style="list-style-type: none"> • Screening NPT kits for MLN available. 	representation.	fungicides.	MLN in regards to tolerance levels.
Import/export procedures	<ul style="list-style-type: none"> • Import export regulations in place. • Popcorn from Brazil tested positive for MCMV. 	<ul style="list-style-type: none"> • KEPHIS centralized (HQ). • Only RT-PCR method used. • Seed sample shared and tested prior to importation. A notice to import must be issued. • Import / export restricted to seed merchants and research organizations. • PIP issued upon fulfillment of the required import conditions. 	<ul style="list-style-type: none"> • Normal export/import laws in place but not specific to MLN. 	<ul style="list-style-type: none"> • Import and export of grain and Maize seed based on the current phytosanitary regulations. 	<ul style="list-style-type: none"> • General import/export regulations in place used for the maize seed and grain.
Existing MLN surveillance initiatives	<ul style="list-style-type: none"> • First MLN disease surveillance done in 2014. • No periodic surveillances done. • No official MLN surveillance protocols. 	<ul style="list-style-type: none"> • MLN disease surveillance done regularly. • KEPHIS Pest Risk analysis unit. • KEPHIS MLN surveillance and monitoring program in place. • Stakeholder consultations done periodically. • Seed companies to 	<ul style="list-style-type: none"> • Surveillance activities ongoing. 	<ul style="list-style-type: none"> • Monitoring MLN spread to new areas ongoing. • Early warning and emergency response systems in place. • A Strategic Plan for Management and Control of MNL was devised by PHS in collaboration with DRD. 	<ul style="list-style-type: none"> • No documented surveillance done but plans under way for comprehensive surveillance program.

	Ethiopia	Kenya	Rwanda	Tanzania	Uganda
		implement MLN preventive measures (seed dressing with systemic insecticides). <ul style="list-style-type: none"> • Early detection and crop management options of MLN control. 			
How MLN Phytosanitary CoP can help to ensure MLN free seed production and distribution	<ul style="list-style-type: none"> • MLN disease surveillance protocols to be refined and applied. • Periodic surveillance and reporting to track disease extent and losses. • Develop a Seed certification and Phytosanitary protocol. • Build capacity of NPPO on rapid and affordable MLN testing methods. 	<ul style="list-style-type: none"> • Standardize seed certification standards. • Standardize phytosanitary measures for MLN. • Share information on MLN. • Prevent further virus spread by instituting targeted strategies. • Share experiences in preventing entry of other quarantine pests. 	<ul style="list-style-type: none"> • Standardization of MLN testing protocols on seed imports. • Surveillance programs to be in place. • Training on Symptom identification. • Linkage to rapid and affordable methods of MLN diagnostics. 	<ul style="list-style-type: none"> • Establish effective surveillance and monitoring programs. • Capacity building for the NPPO on MLN diagnostics. • Access to affordable methods of MLN diagnostics. • Training and development of seed certification and Phytosanitary protocols. 	<ul style="list-style-type: none"> • Training and development of surveillance protocols. • Standardization of the MLN testing protocols on seed imports. • Put in place surveillance programs for all maize growing regions. • Training on Symptom identification. • Linkage to rapid and affordable methods of MLN diagnostics.

	Ethiopia	Kenya	Rwanda	Tanzania	Uganda
Challenges	<ul style="list-style-type: none"> • Few trained personnel on MLN. • NPPO has no capacity for MLN testing. • Seed or grain that tested positive is usually difficult to dispose of. • No concrete measures to prevent MLN disease from spreading. • No official initiative to sensitize the farming community on MLN. 	<ul style="list-style-type: none"> • False test results. • Cost of testing high (RT - PCR) passed on to farmers. • Lack of ISTA standards on MLN testing. • Delays on MLN testing (14 days for RT-PCR). • Lack of skilled staff in the three labs currently testing MLN. • MLN negative seed gets infected when grown in MLN prone areas. • Fate of MLN positive seeds unknown. 	<ul style="list-style-type: none"> • Diagnostic protocol and procedures in place are expensive. Need for cheaper options. • Sampling procedure for seed testing still an issue. • Small number of staff trained on MLN. • Sensitization to the entire farming community about MLN lacking. 	<ul style="list-style-type: none"> • Labs and Human Resource (TPRI PEQ) Lab needs to be strengthened. • Diagnostic protocol and procedures available but expensive. • Strengthening border inspectorate services to prevent entry of seed from unofficial sources. • Ineffective Early warning and Emergency response system. • Need for funds to reach more farmers and stakeholders. • Information sharing missing. 	<ul style="list-style-type: none"> • NPPO has no capacity for MLN testing. • Seed importation procedures still not tailored to cater for MLN. • Diagnostic protocol and procedures not in place. • No early warning system for MLN in place. • Public/farming communities not adequately sensitized on MLN.

Annex 2: Comprehensive Structured Group Discussions to Identify Issues for MLN Phytosanitary CoP

	Issues	How CoP can address this issue (suggestions from participants)
MLN Phytosanitary Issues	<ul style="list-style-type: none"> ▪ Inadequate capacity to effect phytosanitary regulations. ▪ Inadequate awareness on MLN and its control among policy makers, extension, seed companies, research and farmers. ▪ Collaboration among seed company stakeholders and regulators. ▪ Lack of harmonized regulations for MLN phytosanitary issues. ▪ Lack of standards for MLN testing. ▪ Differences in import/export regulations. ▪ Differences in surveillance and monitoring plans for MLN. ▪ Differences in domestic quarantine measures. 	<ul style="list-style-type: none"> ▪ Create a regional center of excellence for MLN management and control. ▪ Organize training workshops with expertise from the region. ▪ Proactive awareness campaigns and information sharing. ▪ Develop a harmonized training manual on MLN phytosanitary issues. ▪ Institute and enforcing local and harmonized regional quarantine regulations. ▪ Work with EAC and COMESA to develop harmonized phytosanitary regulations. ▪ Develop standards for MLN testing in the MLN endemic countries. ▪ Expand the CoP to include all key players and countries. ▪ Map out stakeholders and conduct needs assessment to effect targeted training and awareness creation. ▪ Harmonization of surveillance and monitoring plans and protocols with reference to ISPM No.6. ▪ Develop an IPM package to be internalized by countries. ▪ Map out MLN free areas and provide advisory for seed production in those areas. ▪ Sharing of expertise, training materials and diagnostics infrastructure. ▪ Establishment of a web portal for information sharing.
MLN Diagnostics(visual)	<ul style="list-style-type: none"> ▪ Inadequate capacity for identification of symptoms. ▪ Wrong diagnosis based on visual symptoms. ▪ Difficult diagnosis in cases of latent or late infection of crops. ▪ Lack of standardized protocols for diagnosis (how to sample), sample size, and disposal of infected plants. ▪ Severity score standards and setting up of tolerance levels in seed fields. 	<ul style="list-style-type: none"> ▪ Development of a simple training manual / handbook / training material (e.g. audiovisual, android app, online system) that will assist in field diagnosis. ▪ Conduct training of trainers and field lab technicians and others on symptoms Identification at the center of excellence. ▪ Calibrate field diagnostics to the level that is confirmed by lab tests. ▪ Awareness creation for farmers to conduct scouting. ▪ Harmonized tolerance levels as per the stakeholders' professional inputs.
MLN Diagnostics(l	<ul style="list-style-type: none"> ▪ Lack of skilled man power for conducting field inspection. 	<ul style="list-style-type: none"> ▪ Training on sampling and sample processing. ▪ Develop standard protocol for sampling and testing.

	Issues	How CoP can address this issue (suggestions from participants)
leaf tissue)	<ul style="list-style-type: none"> ▪ Lack of awareness on the availability of affordable technology to test for MLN viruses. ▪ Sampling procedures in the field (to avoid cross contamination and have sample integrity). ▪ Sample storage and handling. ▪ Availability and affordability of effective test strips. ▪ Lack of standardized seed health certification across the seed industry. ▪ Lack of standardized protocol for conducting field inspection (sampling method, sample size, sampling stage, MLN leaf symptoms etc.). 	<ul style="list-style-type: none"> ▪ Work together to seek support for procuring effective immunostrips.
MLN Diagnostics(seed)	<ul style="list-style-type: none"> ▪ Lack of skills for seed testing using the diagnostic equipment. ▪ Non-harmonized techniques for seed sampling, sample sizes and general sampling procedures in the field and from seed consignment. ▪ Awareness on availability of affordable seed testing technology to test for MLN viruses. ▪ Sample storage and handling. ▪ Availability of immunostrips. ▪ Availability of ELISA facilities. ▪ Availability of RT-PCR kits and equipment for seed testing. ▪ Implications of seed contamination vs. seed transmission. ▪ Cross contamination when processing seed in the lab. ▪ Can the immunostrips be used to test seed directly? 	<ul style="list-style-type: none"> ▪ Capacity building on sampling and sample processing. ▪ Develop standard protocol for sampling and testing. ▪ Work together to seek support for procuring effective immunostrips, ELISA kits and other equipment (e.g. PCR). ▪ Research needs to determine the value of seed treatment on MLN management (in case of seed contamination). ▪ Use of specialized equipment to avoid cross contamination.

	Issues	How CoP can address this issue (suggestions from participants)
	<ul style="list-style-type: none"> ▪ MLN severity score standards and setting up of tolerance levels in seed testing. ▪ Lack of skills for seed testing using the diagnostic equipment. 	
Seed certification	<ul style="list-style-type: none"> ▪ Tolerance levels for seed certification. ▪ In-country quarantine regulations and enforcement. ▪ Certification duration may be lengthened because of MLND (e.g., the process stops while waiting for MLN testing). ▪ Effects of seed treatment. ▪ Seed certification protocol. 	<ul style="list-style-type: none"> ▪ Harmonization of seed certification regulations among participating countries. ▪ Development and deployment of cheaper and faster test methods for MLN. ▪ Research to collect information regarding seed treatments and seed certification thresholds.
Seed Exports / Imports	<ul style="list-style-type: none"> ▪ Tolerance levels for imported seed. ▪ Phytosanitary regulations may need to be harmonized. ▪ Membership to UPOV and OECD seed schemes. ▪ Harmonization of seed movement across borders. As well as addressing issues of destruction of contaminated seed. ▪ Standards for acceptable tolerance levels for exports/imports to endemic and free areas. 	<ul style="list-style-type: none"> ▪ Harmonization of phytosanitary import regulations among participating countries. ▪ Member states should consider joining international phytosanitary organizations and standards. ▪ Harmonized standards for import/export. Standards to non-endemic areas to be more stringent.

Annex 3: List of Participants at the MLN Phytosanitary CoP 1st Meeting

Category	Country	Name	Designation	Email
NPPO	Ethiopia	Mr. Weldehawariat Assefa	Director General - Animal & Plant Health Quality Control Directorate	hapru.assefa2@gmail.com
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	Tanzania	Watanga Chacha	Meru Agro and Tours	meruagro@yahoo.com
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