

Maize Lethal Necrosis (MLN): A Technical Manual for Disease Management



Editor
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In collaboration with international and national research
and development partners

Chapter 10

MLN Management: Conclusions and Future Perspective

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1. Introduction

MLN management must be effectively addressed through several simultaneously implemented strategies, including development and deployment of elite MLN resistant varieties, agronomic mitigation practices, crop rotations (especially with legumes), etc. (Prasanna et al., 2020). Prophylactic measures are very important to prevent further spread of MCMV/MLN from the presently prevalent to the non-endemic areas either within a country or across countries. While significant success has been achieved so far in preventing the spread and impact of MLN from the eastern African countries to the MLN-free southern Africa or West Africa (which are also major maize-growing regions), there is no scope for complacency. The best management practices outlined in this Manual need to be rigorously implemented by stakeholders at various levels.

2. Key Responsibilities of Different Stakeholders for Effective Management of MLN

MLN management requires coordinated and synergistic efforts of various institutions engaged in maize R&D, support from the policy makers and the Governments, and greater commitment from all the players involved in the maize seed value chain in Africa.

Governments

- Mandate and enforce synchronized maize planting, maize-free time windows (at least 2-3 months each year), and maize crop rotation with legumes in MLN-affected areas to break the MLN virus cycle.
- Strengthen national phytosanitary capacities for effective surveillance and monitoring of major crop pathogens and pests in the region by linking the NPPOs.
- Implement harmonized MLN surveillance and diagnostic protocols.
- Mobilize a dynamic extension system to create adequate awareness among the farming communities on appropriate MLN diagnosis and management measures.

NPPOs

- Ensure proper phytosanitary certification to ensure that MLN-contaminated commercial seed is not exchanged even involuntarily between MLN-prevalent and MLN-free countries.
- Establish MLN quarantine sites in countries where the disease is not prevalent for safe exchange of maize germplasm for research-for-development.
- Use accredited laboratories with harmonized MLN virus diagnostic protocols to test for MLN viruses and issue appropriate certification.

Researchers

- Identify, validate and deploy effective measures to curb the spread and impact of MLN, and to eliminate the possibility of MLN-contaminated commercial seed.
- Proactively develop and deploy elite varieties with MLN resistance and other farmer-preferred traits.
- Analyze and recommend economically viable options in terms of agronomic management, including crop diversification, crop rotations etc. in MLN-affected areas/countries.

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Commercial Seed Companies

- Rigorously Implement the checklist with SOPs, as described in this Manual, to produce MLN-free seed all along the seed value chain.
- Commercialize ONLY MLN-free seed to farming communities within or across countries.

Extension Service Providers

- Provide well-informed, science-based, and clear instructions to the farmers as to the actions to be taken for proper diagnosis and management of MLN.
- Create awareness among farming communities and encourage use of integrated MLN management practices, including use of certified seed of elite MLN-resistant varieties, synchronized plantings, proper agronomic management of maize fields, maize-free time windows (for at least 2-3 months in a year), crop rotations with non-cereals (especially legumes) etc.

Farmers

- Adopt and use proven practices for integrated MLN management, especially in the prevalent areas/countries.
- Share indigenous knowledge and technologies related to MLN management to enhance generation of sustainable solutions in terms of MLN disease management.

3. Conclusions

MLN management in sub-Saharan Africa (SSA) is a complex challenge. Nevertheless, through extensive partnerships, research and development institutions have been able to respond rapidly to this serious threat to the food security, income and livelihoods of millions of smallholder farmers and their families in SSA. MLN management has been effectively addressed through several simultaneously-implemented strategies, including a) development and deployment of elite MLN tolerant/resistant varieties adapted to Africa; b) strong engagement of the NARES and NPPOs on MLN surveillance; c) synergistic multi-disciplinary efforts of various national and international institutions; d) intensive awareness creation among stakeholders, and capacity building of relevant public and private sector institutions on MLN diagnostics and management; e) codeveloping with national partners, and implementing harmonized checklists and SOPs for MLN-free commercial seed production and exchange, etc. (Prasanna et al., 2020).

While significant progress has been made on curbing the spread and impact of MLN in Africa (Prasanna et al., 2020), it is important to continue implementing an integrated disease management approach for sustainable management of the disease in the MLN-prevalent countries whether in Africa, Americas or Asia, and continued efforts on MLN disease monitoring and surveillance globally. Elite maize hybrids with climate resilience and tolerance/resistance to major diseases and insect-pests must be deployed at scale. Good agronomic practices (e.g., maize-free window for at least 2-3 months in areas where monocropping is being practiced; crop rotation with legumes, etc.) are critical to break the cycle of MLN-causing viruses like MCMV. Intercropping of maize with suitable leguminous crops is also key for effective management of diseases like MLN and insect-pests like fall armyworm (*Spodoptera frugiperda*) (Prasanna et al., 2018, 2021).

4. References

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