

SPS Capacity Building

**NATIONAL PLANT PROTECTION ORGANIZATIONS’**

**TECHNICAL WORKING GROUP**

**REGIONAL WORKSHOP**

**NAIROBI, KENYA: 9 APRIL 2019**

Report compiled by:

Marianna Theyse

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1. **Introduction**

The COMESA SPS program works across COMESA and the tripartite (COMESA, EAC and SADC), to promote a harmonized risk based regulatory environment and strengthened biosecurity systems that enhance food and nutrition security and facilitate agricultural trade, exports and investments. The initiative provides a framework for (i) connecting biosecurity systems to enable cross border sourcing and investments (ii) harmonizing SPS regulatory frameworks to secure market access, and (iii) mitigating transboundary biosecurity risks for improved food and nutrition security.

A COMESA regional workshop on pest listing and pest risk analysis in Eastern and Southern Africa took place from 5-7 June 2017 in Johannesburg, South Africa. The objectives of this workshop were to (1) technically support National Plant Protection Organizations (NPPOs) in updating their quarantine pest lists for maize (seed and grain) and other prioritized crops in selected countries, (2) provide support to NPPOs to endorse the updated quarantine pest lists, and (3) facilitate an agreement on the sub-regional response to the Fall Army Worm (FAW). During this workshop a prioritized list of ten crops that are commonly traded in the COMESA-EAC-SADC region, namely maize, wheat, rice, groundnuts, sorghum, beans, cotton, soybeans, sunflower and seed potato was developed. Ten (10) tripartite countries, namely; Uganda, Kenya, Rwanda, Burundi, Zambia, Malawi, Mozambique, Tanzania Zimbabwe and Malawi undertook to harmonize quarantine pest lists and mitigation strategies. As a follow-up action of the workshop, delegates undertook to share existing national quarantine pest lists for these priority crops to enable COMESA to compile a consolidated quarantine pest list for each of the priority crops as a first step towards harmonized quarantine pest lists.

The workshop also deliberated on national and regional strategies and activities to improve linkages for improved pest listing and pest reporting and identified two areas for further action:

1. A regional approach for joint pest risk analysis through the establishment of a Technical Working Groupon Plant Health
2. A regional information sharing platform/ database

On 31 July and 1 August 2017, a validation workshop on pest listing, and pest risk analysis was held in Livingstone, Zambia to (1) validate the pest list data submitted for consolidated regional quarantine pest lists, and (2) follow-up and further deliberate on the establishment of a technical Working Group for joint Pest Risk Analysis (PRA) and (3) discuss the development of a regional platform for pest information sharing. NPPO nominations were accepted during and after the workshop to establish the Technical Working group to be appointed under the COMESA SPS Sub-Committee and constituted by NPPOs from Members States.

The workshop delegates worked on the framework for the Terms of Reference and the appointed Technical Working Group on Plant Health were tasked to develop Terms of Reference for developing a Regional Approach on PRA.

The Technical Working Group on Plant Health proceeded after the workshop to develop a regional guideline for PRA and established the following three technical task teams:

- Task Team on Pest Risk Analysis (PRA)

- Task Team on Diagnostics

- Task Team on a Regional Pest Database

Prioritizing risks, promoting common approaches to risk assessment (e.g. pest risk analysis for horticulture products or chemical risk assessment for processed food products) is one way of narrowing regulatory barriers that constrain cross border trade in food and agricultural products. COMESA continue to monitor the national action plans developed by the ten tripartite countries and a second workshop on pest risk analysis was held 8-9 April 2019.

1. **Objectives of the Technical Working Group Workshop on 8-9 Aril 2019**

Technical Working Group delegates met to revise the available pest listing information and determine what the Technical Group’s next steps would be in terms of:

- expanding/ improving the national quarantine pest lists

-  developing a regional harmonized list (in support of intra-regional trade), and

- sharing information on risk management (with intention of developing harmonized mitigation options for the region, where possible)

1. **Technical Working Group Workshop Outcomes**

During the workshop the Technical Working Group identified and proceeded with the following actions:

* 1. **To improve and revise national quarantine pest lists**

National quarantine pest lists that were submitted by participating NPPOs, were combined by the consultant before the workshop in April 2019 and circulated to the Technical Working Group as consolidated quarantine pest lists for each of the ten (10) commodities listed (Annexure A – Commodity Matrix) in a single Excel database. The Technical Working Group members (list of members attached as Annexure B) were requested to verify and prepare any additions and/or amendments to the list at the workshop. Technical questions were raised by the consultant and some delegates regarding the confirmation of pest status and pathway risks for some of the pests listed on national quarantine pest lists. The Technical Working Group discussed additions and the consultant updated the lists for circulation after the workshop.

* 1. **Developing a regional harmonized list (in support of intra-regional trade)**

The Technical Working Group identified pests of regional and common quarantine concern (10 commodities) and drafted consolidated quarantine pest lists that are attached to this report as Annexure C.

The list consolidates all the quarantine pests and regulated non-quarantine pests that have been submitted by the participating NPPOs but does not indicate by which countries the different pests are regulated. This detail is available in the Excel database that was circulated to the Technical Working Group members. The Working Group will maintain and continue to update the lists as new information becomes available or NPPOs update their national quarantine pest lists.

* 1. Sharing information on risk management (with intention of developing harmonized mitigation options for the region, where possible)

The Technical Working Group identified and listed common pest mitigation measures for pests of common quarantine concern for maize. The list is attached as Annexure D.

* 1. Drafting of a regional PRA Guideline

A task team coordinated by KEPHIS and constituted by Senior fellows AAPBP (Kenya, Mozambique, Tanzania, Uganda, Malawi, Zimbabwe, Zambia and RSA) were tasked to draft a regional guideline document for Pest Risk Analysis (PRA).

The Task team coordinator circulated two regional guideline drafts for PRA for discussion at the Technical Working Group workshop on 09 April 2019:

* Guideline draft for pest-initiated PRA
* Guideline draft for pathway-initiated PRA

Both documents were presented at the workshop and delegates requested more time for review of the workshop. Technical Work team members will provide comments after the workshop. and finalize the two drafts by 31 May 2019.

* 1. Decisions on the way forward after 09 April 2019 Workshop

The Technical Working Group members will:

* Continue to revise and expand national quarantine pest lists for the ten (10) commodities
* Submit their updated national quarantine pest lists and import conditions for maize to Technical Working Group coordinator by 31 May 2019
* Share national import conditions for maize with rest of Technical Working Group
* Technical Working Group coordinator will update and circulate revised list of consolidated pests lists and mitigation options in the Excel database to Technical Working Group members
* Technical Work team members will provide comments on the two PRA drafts by 31 May 2019

3..6. Malawi presented a proposal on developing a regional position for IPPC CPM participation. The proposal was discussed and supported by the Technical Working Group.

1. **Recommendations and requests from the Technical Working Group to the SPS Sub Committee**

The Technical Working Group requested the SPS Sub-Committee to:

* recognize the progress made, and to endorse further work on the harmonization of pests lists and mitigation options
* encourage countries to submit national pests lists and national quarantine pests’ lists
* recognize the progress made on the drafting of a Regional PRA Guideline and to endorse further work of the Technical Working Group to finalize the PRA Guideline
* adopt the proposal by Malawi on developing a regional position for IPPC CPM participation

**ANNEXURE A**

**COMMODITY MATRIX**



**ANNEXURE B**

**The Technical Working Group on Plant Health**

NPPO nominations were accepted during and after the PRA workshop in August 2017 to establish the Technical Working group to be appointed under the COMESA SPS Sub-Committee and constituted by NPPOs,as follows:

|  |  |  |
| --- | --- | --- |
| **TECHNICAL WORKING GROUP ON PLANT HEALTH** | | |
| **Name** | **Country** | **E-mail** |
| ***Group coordinator*:**  **Dr Isaac Macharia** | **Kenya** | [**macharia.isaac@kephis.org**](mailto:macharia.isaac@kephis.org) |
| **Dr Kenn Msiska** | **Zambia** | [**msiska12@yahoo.co.uk**](mailto:msiska12@yahoo.co.uk) |
| **Ms Ephrance Tumboine** | **Uganda** | [**etumuboine@agriculture.go.ug**](mailto:etumuboine@agriculture.go.ug) |
| **Mr David Kamangira** | **Malawi** | [**davidkamangira1@gmail.com**](mailto:davidkamangira1@gmail.com) |
| **Ms Antonia Vaz** | **Mozambique** | [**avaz5099@gmail.com**](mailto:avaz5099@gmail.com) |
| **Dr Godfrey Chikwenere** | **Zimbabwe** | [**goddypasu@gmail.com**](mailto:goddypasu@gmail.com) |
| **Mr Bheki Nzima** | **Swaziland** | [**nzimambheki@gmail.com**](mailto:nzimambheki@gmail.com) |
| **Mr Patrick Tshikudo** | **South Africa** | [**phumudzoT@daff.gov.za**](mailto:phumudzoT@daff.gov.za) |
| **Ms. Beatrice Uwumukiza** | **Rwanda** | [**buwumukiza@gmail.com**](mailto:buwumukiza@gmail.com) |
| **Mr Eliakim SAKAYOYA** | **Burundi** | [**sakayoyaeliakim@yahoo.fr**](mailto:sakayoyaeliakim@yahoo.fr) **or** [**esakayoya@gmai.com**](mailto:esakayoya@gmai.com) |
| **Mr Cornelius Fabian Mkondo** | **Tanzania** | [**phs@kilimo.go.tz**](mailto:phs@kilimo.go.tz) |
| **Ms Martha Byanyima** | **COMESA** | [**byany38@gmail.com**](mailto:byany38@gmail.com) |

Dr Isaac Macharia, from KEPHIS, was elected as the coordinator of the Technical Working Group**.**

**ANNEXURE C**

**COMESA Lists of pests of potential quarantine concern**

1. **MAIZE**

**Weeds**

*Abutilon theophrasti*

*Argemone mexicana*

*Ambrosia artemisfolia*

*Asphadelus tenuisfolius*

*Cardaia draba*

*Cirsium arvensis*

*Conyza canadensis*

*Fumaria officinalis*

*Mimosa diprotricicha*

*Polygonum ariculare*

*Setaria viridis*

*Sorghum halepense*

*Spergula arvensis*

*Striga angustifolia*

*Striga asiatica*

*Striga forbesii*

*Striga hermonthica*

*Raphanus raphanistrum*

*Tavaxcum officinale complex*

**Bacteria**

*Acidovorax avenae sub. Sp avenae*

*Burkholderia glumae*

*Claivibacter michigansensis sbsp nebraskensis*

*Pantoea stewartii*

*Pseudomonas fuscovaginae*

*Pseudomonas syringae pv. Coronafaciens*

*Xanthmonas oryzae pv.oryzae*

*Xanthmonas vesicatoria pv. holcicola*

**Viruses**

Barley Yellow Dwarf Virus

Maize Chlorotic mottle virus

The Maize Lethal Necrosis Disease (MLND) is a result of a combination of two viruses, the Maize Chlorotic Mottle Virus (MCMoV) and any of the cereal viruses in the Potyviridae group, like the Sugarcane Mosaic Virus (SCMV), Wheat Streak Mosaic Virus (WSMV) or Maize Dwarf Mosaic Virus (MDMV). The double infection of the two viruses gives rise to what is known as MLND, also referred to as Corn Lethal Necrosis (CLN).

Maize dwarf mosaic virus

Maize mosaic virus

"Maize Streak Virus"

Sugarcane mosaic virus

Wheat streak mosaic virus

**Fungi and Oomycetes**

*Acremonium strictum*

*Balansia oryzae-sativae*

*Claviceps gigantea*

*Claviceps purpurea*

*Cochliobolus carbonun*

*Cochliobolus heterostrophus*

*Cochliobolus lanatus*

*Emericella nidulans*

*Gibberella avenacea*

*Glomerella graminicola*

*Harpophora maydis*

*Lasiodiplodia thebromae*

*Peronosclerospora maydis*

*Peronosclerospora phillipinensis*

*Peronosclerospora sacchari*

*Peronosclerospora sorghi*

*Puccinia polysori*

*Puccinia sorghi*

*Pythium graminicola subram*

*Pythium irregulare*

*Pythium spinosum*

*Pythium spendens*

*Pythium ultimum*

*Sclerophthora macrospora*

*Sclerophthora oryzae*

*Sclerophthora rayssiae var.zeae*

*Sclerospora graminicola*

*Setosphaeria turcica*

*Sphacelotheca reiliana*

*Sphaerulina oryzina*

*Stenocarpella maydis*

*Tilletia baclayana*

*Tilletia laevis*

*Ustilaginoides virens*

*Ustilago maydis*

*Ustilago zeae*

**Insects**

*Adoretus sinicus*

*Ancistotermes latinotus*

*Busseola fusca*

*Cardra cautella*

*Caulophilus oryzae*

*Chaetochnema pulicaria*

*Chilo partellus*

*Corcyra cephalonica*

*Diabrotica virgifera*

*Eurygaster integriceps*

*Listronotus bonariensis*

*Macrotermes spp*

*Mayetiola destructor*

*Mocis latripes*

*Nomadacris septemfasciata*

*Prostephanus truncatus*

*Oryzaephilus surinamensis*

*Rhizopertha dominica*

*Rhopalosiphum maidis*

*Sesamia calamistis*

*Sesamia cretica*

*Sitrotroga cereaella*

*Sitophilus granarius*

*Spodoptera exempta*

*Spodoptera frugiperda*

*Stobion avenae*

*Tenebroides mauritanicus*

*Tribolium castaneum*

*Trichoderma granarium*

*Trogoderma granarium*

*Trogoderma variabile*

*Xestia nigrum*

**Nematodes**

*Ditylenchus angustus*

*Ditylenchus destructor*

*Paratrichodorus porosus*

*Pratylenchus thornei*

1. **WHEAT**

**Weeds**

*Ambrosia artemisiifolia*

*Anagalis arvensis*

*Cardaria drada*

*Cirsium arvense*

*Fumaria officinalis*

*Lolium temulentum*

*Lollium multiflorum*

*Melilotus indica*

*Papaver rhoeas*

*Phalaris minor*

*Raphanus raphanistrum*

*Spergula arvensis*

*Thlaspi arvense*

**Bacteria**

*Acidovorax avenae subsp. Avenae*

*Clavibacter iranicus*

*Clavibacter michiganensis ssp. nebraskensis*

*Clavibacter tritici*

*Erwinia stewartii*

*Pseudomonas fuscovaginae*

*Pseudomonas syringae*

*Xanthomonas campestris pv. transslucens*

*Xanthomonas translucens pv. undulosa*

**Viruses**

Barley stripe mosaic virus

Brome mosaic virus

**Fungi and Oomycetes**

*Alternaria triticina*

*Claviceps purpurea*

*Fusarium sporotrichioides*

*Gaeumannomyces graminis var. graminis*

*Gibberella avenacea*

*Gibberella zeae*

*Monographella nivalis*

*Phaeosphaeria nodorum*

*Pyrenophora chaetomiodes*

*Pyrenophora semeniperda*

*Pyrenophora tritici-repentis*

*Sclerophthora macrospora*

*Tilletia controversa*

*Tilletia indica*

*Tilletia laevis*

*Tilletia tritici*

*Typhula idahoensis*

*Ustilago nuda f.sp. tritici*

*Urocystis agropyni*

*Urocystis tritici*

*Ustlago hordei*

*Ustilago tritici*

**Insects**

*Diabrotica virgifera*

*Oryzaephilus surinamensis*

*Prostephanus truncatus*

*Rhizopertha dorminica*

*Sitophilus granarius*

*Sitotroga cerealella*

*Tribolium castaneum*

*Trogoderma granarium*

**Nematodes**

*Anguina tritici*

*Ditylenchus dipsaci*

*Ditylenchus africanus*

*Heterodera avenae*

1. **GROUNDNUTS**

**Viruses**

Cowpea mild mottle virus

Impatiens necrotic spot tospovirus

Peanut stunt virus

Peanut mottle virus

Peanut clump virus

**Fungi and Oomycetes**

*Didymosphaeria arachidicola*

*Glomerella cinguilata*

*Phymatotrichopsis omnivore*

*Verticillium albo- atrum*

*Verticillium dahlia*

**Insects**

*Bruchus serratus*

*Caryedon acaciae*

*Caryedon fuscus*

*Caryedon serratus*

*Caryedon sibutensis*

*Icerya genistae*

*Trogoderma granarium*

**Nematodes**

*Ditylenchus africanus*

1. **RICE**

**Weeds**

*Abutilon theophrasti*

*Ambrosia artemisfolia*

*Asphadelus tenuisfolius*

*Cardaia draba*

*Conyza canadensis*

*Cyperus difformis*

*Cyperus iria*

*Echinochloa crus-galli*

*Fimbristylis dichotoma*

*Fumaria officinalis*

*Imperata cylindrica*

*Leersia hexandra*

*Mimosa diprotricicha*

*Murdannia nudiflora*

*Oryza punctata*

*Panicum repens*

*Polygonum aviculare*

*Saccharum spontaneum*

*Setaria viridis*

*Tavaxcum officinale complex*

**Bacteria**

*Acidovorax avenae subsp. Avenae*

*Burkholderia glumae*

*Claivibacter michigansensis sbsp nebraskensis*

*Erwinii stewartii*

*Pseudomonas fuscovaginae*

*Xanthomonas oryzae pv oryzicola*

*Xanthomonas oryzae pv.oryzae*

*Xanthomonas vasictoria pv. holcicola*

**Viruses**

Rice yellow mottle virus

Wheat streak virus

**Fungi and Oomycetes**

*Alternaria padwickii*

*Balansia oryzae-sativae*

*Cercospora oryzae*

*Claviceps gigantea*

*Claviceps purpurea*

*Cochliobolus carbonun*

*Cochliobolus heterostrophus*

*Cochliobolus lanatus*

*Cochliobolus miyabeanus*

*Emericella nidulans*

*Gibberella avenacea*

*Khuskia oryzae*

*Magnaporthe grisea*

*Magnaporthe salivinii*

*Monographella nivalis*

*Nigrospora oryzae*

*Pythium graminicola subram*

*Pythium irregulare*

*Pythium spinosum*

*Pythium spendens*

*Pythium ultimum*

*Sarocladium oryzae*

*Sclerophthora macrospora*

*Sclerophthora oryzae*

*Sclerophthora rayssiae var.zeae*

*Sclerophaeria holmi UGANDA*

*Sphaerulina oryzina*

*Stenocarpella maydis*

*Thanatephorus praticola*

*Tilletia barclayana*

*Tilletia laevis*

*Trichoconiella padwickii*

*Ustilaginoidea virens*

*Ustilago zeae*

**Insects**

*Cardra cautella*

*Caulophilus oryzae*

*Cicadulina mbila*

*Corcyra cephalonica*

*Cryptolestes feralgineus*

*Eldina saccharina*

*Eurygaster integricepes*

*Leptocorisa oratorius*

*Leptoglossus gonagra*

*Liposcelis entomophila*

*Mayetiola destructor*

*Mocis latripes*

*Naranga aenescens(diffusa)*

*Prostephanus truncatus*

*Oryzaephillus surinamensis*

*Rhizopertha dominica*

*Sesamia calamistis*

*Sesamia cretica*

*Sitrotroga cereaella*

*Sitophilus granarius*

*Sogatella furcitera*

*Stobion avenae*

*Tenebroides mauritanicus*

*Tribolium casteneum*

*Trichoderma granarium*

*Trogoderma granarium*

*Trogoderma variabile*

*Xestia nigrum*

*Zabrus tenebrioides*

**Mites**

*Tyrophagus putrescentiae*

**Nematodes**

*Aphelenchoides besseyi*

*Ditylenchus angustus*

*Ditylenchus destructor*

*Meloidogyne graminicola*

*Paratrichodorus porosus*

*Pratylenchus thornei*

1. **SORGHUM**

**Weeds**

*Abutilon theophrasti*

*Ambrosia artemisfolia*

*Asphadelus tenuisfolius*

*Cardaia draba*

*Conyza canadensis*

*Fumaria officinalis*

*Mimosa diprotricicha*

*Parthenium hysterophorus*

*Polygonum aviculare*

*Setaria viridis*

*Sorghum halepense*

*Striga angustifolia*

*Striga asiatica*

*Striga forbesii*

*Striga hermonthica*

*Tavaxcum officinale complex*

**Bacteria**

*Acidovorax avenae sub. Sp avenae*

*Burkholderia andropogonis*

*Burkholderia glumae*

*Claivibacter michigansensis sbsp nebraskensis*

*Pantoea stewartii*

*Pseudomonas fuscovaginae*

*Pseudomonas rubrisubalbicans*

*Pseudomonas syringae*

*Pseudomonas viridiflava*

*Xanthomonas campestris*

*Xanthomonas campestris pv. Holicicola*

*Xanthmonas oryzae pv.oryzae*

*Xanthmonas vesicatoria pv. holcicola*

**Viruses**

Wheat streak Mosaic virus

**Fungi and Oomycetes**

*Ascochyta sorghi*

*Balansia oryzae-sativae*

*Choanephora cucurbitarum*

*Claviceps gigantea*

*Claviceps purpurea*

*Cochliobolus carbonun*

*Cochliobolus heterostrophus*

*Cochliobolus lanatus*

*Emericella nidulans*

*Fusarium sporotrichoides*

*Glomerella graminicola*

*Periconia circinata*

*Peronosclerospora sorghi*

*Pyricularia setaria*

*Pythium graminicola subram*

*Pythium irregulare*

*Pythium spinosum*

*Pythium spendens*

*Pythium ultimum*

*Sarocladium oryzae*

*Sclerophthora oryzae*

*Sclerophaeria holmi (Uganda)*

*Sclerospora graminicola*

*Sclerospora macrospora*

*Sclerophthora rayssiae var.zeae*

*Sphaerulina oryzina*

*Sporisorium sorghi*

*Stenocarpella maydis*

*Tilletia baclayana*

*Tilletia laevis*

*Tolyposporium ehrenbergii*

*Ustilaginoidea virens*

*Ustilago zeae*

**Insects**

*Busseola fusca*

*Cardra cautella*

*Caulophilus oryzae*

*Chilo partellus*

*Corcyra cephalonica*

*Cryptolestes feralgineus*

*Eurygaster integricepes*

*Mayetiola destructor*

*Mocis latripes*

*Plodia interpunctella*

*Prostephanus truncatus*

*Oryzaephillus surinamensis*

*Rhizopertha dominica*

*Sesamia calamistis*

*Sesamia cretica*

*Sitrotroga cereaella*

*Sitophilus granarius*

*Sogatella furcitera*

*Stobion avenae*

*Tenebroides mauritanicus*

*Tribolium castaneum*

*Trogoderma granarium*

*Trogoderma variabile*

*Xestia nigrum*

*Zabrus renebroides*

**Mites**

*Tyrophagus putrescentiae*

**Nematodes**

*Ditylenchus angustus*

*Ditylenchus destructor*

*Paratrichodorus porosus*

*Pratylenchus thornei*

1. **BEANS**

**Weeds**

*Abutilon theophrasti*

*Agropyron repens*

*Ambrosia artemisiifolia*

*Argemone mexicana*

*Cirsium arvense*

*Convulvulus arvensis*

*Digitaria ciliaris*

*Elymus repens*

*Lolium temulentum*

*Orabance crenata*

*Papaver rhoeas*

*Parthenium hysterophorus*

*Polygonum aviculare*

*Sorghum halepense*

*Taraxacum officinale*

**Bacteria**

*Curtobacterium flaccumfaciens pv. flaccumfaciens*

*Pseudomonas fuscovaginae*

*Pseudomonas savastonoi pv. Glycinea*

*Pseudomonas savastanoi pv. phaseolicola*

*Pseudomonas syringae pv phaseolicola*

*Rhodococcus fascians*

*Xanthomonas axonopodis pv. phaseoli*

**Viruses**

Bean Common mosaic virus

Bean golden mosaic virus

Bean yellow mosaic virus

Pea early-browning virus

Peanut stunt virus

Southern bean mosaic virus

Tomato black ring virus

Tobacco necrosis virus

Tobacco ring spot virus

Tobacco streak virus

Urid bean leaf crinkle virus

**Fungi and Oomycetes**

*Aschochyta boltshauseri*

*Chalara elegans*

*Choanephora cucurbitarum*

*Cercospora canescens*

*Cercospora cruenta*

*Colletotrichum lindemuthianum*

*Diaporthe phaseolorum var. sojae*

*Diaporthe phaseolorum var. meridionalis*

*Elsinoe phaseoli*

*Erysiphe polygoni*

*Gibberella avenacea*

*Fusarium oxysporum f. sp. Tracheiphilum*

*Mycovellosiella phaseoli*

*Rhizoctonia solani*

*Phaesariopsis griseola*

*Uromyces phaseoli*

**Insects**

*Callosobruchus analis*

*Delia platura*

*Deudorix antalus*

*Polyphagotarsonemus latus*

*Zabrotes subfasciatus*

**Mites**

*Brevipalpus obovatus*

**Nematodes**

*Ditylenchus africanus*

*Ditylenchus dipsaci*

*Heterodera glycines*

*Meloidogyne javanica*

*Pratylenchus penetrans*

1. **COTTON**

**Bacteria**

*Xanthomonas axonopodis pv. Malvacearum*

*Xanthomonas campestris pv.*

*Xanthomonas malvacearum*

**Viruses**

Cotton anthocyanosis virus

Cotton leaf crumple virus

Cotton leaf curl virus

Tobacco streak virus

**Fungi and Oomycetes**

*Alternaria macrospora*

*Ascochyta gossypii*

*Colletotrichum gossypii*

*Fusarium oxysporum*

*Fusarioum oxisporum f.sp vasinfectum*

*Ramularia areola*

*Verticillium albo-atrum*

*Verticillium dahlia*

**Insects**

*Anthonomus grandis*

*Aphis gossypii*

*Bemisia tabaci*

*Calidea dregii*

*Diparopsis castanea*

*Dysdercus fasciatua*

*Dysdercus cardinalis*

*Dysdercus spp*

*Earias biplaga*

*Earias insulana*

*Empoasca lybica*

*Empoasca facialis*

*Helicoverpa armigera*

*Heliothis armigera*

*Oxycarenus hyanipennis*

*Plastydra gossypiella*

*Spodoptera littoralis*

*Sylepta derogata*

*Tragisicoschema nigroscriptum*

*Tribollium castaneum*

*Trogoderma granarium*

*Zonocerus elegans*

1. **SOYABEAN**

**Bacteria**

*Corynebacterium fascians*

*Curtobacterim flaccumfaciens pv Flaccumfaciens*

*Pseudomonas savastanoi pv glycinea*

*Xanthomonas axonopodis pv. glycines*

**Viruses**

Tomato black ring virus

Tobacco ringspot virus

Tomato Spotted Wilt Virus

Tobacco streak virus

**Fungi and Oomycetes**

*Cercospora kikuchii*

*Cercospora sojina*

*Chalara elegans*

*Colletotrichum cocodes*

*Colletotrichum truncatum*

*Diaporthe phaseolorum var. caulivora*

*Diaporthe phaseolorum var. sojae*

*Glomerella cinguilata*

*Peronospora trifoliorum*

*Peronospora mashurica*

**Insects**

*Diabrotica virgifera*

*Popillia japonica*

*Trogoderma granarium*

**Nematodes**

*Heterodera glycine*

1. **SUNFLOWER**

**Bacteria**

*Pseudomonas syringae pv. helianthi*

*Pseudomonas cichorii*

**Viruses**

Tobacco ringspot virus

**Fungi and Oomycetes**

*Alternaria helianthi*

*Plasmopara halstedii*

*Sclerotia sclerotiorum*

*Verticillium albo-atrum*

*Verticillium dahlia*

**Insects**

*Diabrotica virgifera*

*Prostephanus truncates*

*Trogoderma granarium*

1. **SEED POTATO**

**Bacteria (and phytoplasmas)**

*Clavibacter michiganensis*

*Clavibacter michiganensis subsp michiganensis*

*Clavibacter michiganensis ssp. sepedonicus*

*Candidatus Liberibacter solanacearum*

*Dickeya spp*

*Pectobacterium carotovorum var atrosepticum*

*Pectobacterium carotovorum var carotovora*

*Potato stolbur MLO*

*Potato witches’broom phytoplasma*

*Ralstonia solanearum*

*Streptomyces scabies*

**Viruses**

Andean potato Latent vitus

Andean potato mottle comovirus

Beet curly top hybrigeminivirus

Potato A potyvirus

Potato black ringspot nepovirus

Potato deforming mosaic virus

Potato leaf-roll luteovirus

Potato M carlavirus

Potato mop-top furovirus

Potato S carlavirus

Potato spindle tuber viroid

Potato T trichovirus

Potato Y potyvirus (all three strains)

Potato yellow dwarf nucleorhabdovirus

Potato yellow vein virus

Potato yellowing alfamovirus

Tobacco rattle tobravirus

Tobacco ringspot nepovirus

Tobacco streak virus

Tomato black ring nepovirus

**Fungi and Oomycetes**

*Alternaria solani*

*Colletotrichum capsici*

*Helminthosporium solani*

*Phoma exigua var. foveata*

*Phytophthora infestans*

*Phytophthora infestans mating type 2*

*Phytophthora erythroseptica var. erythroseptica*

*Polyscytalum pustulans*

*Rhizoctonia solani*

*Spongospora subterranea*

*Synchytrium endobioticum*

*Thecaphora solani*

*Ulocladium atrum*

*Verticilium albo-atrum*

*Verticillium dahlia*

**Insects**

*Agrotis exclamationis*

*Anthonomus eugenii*

*Bothynoderes punctiventris*

*Diabrotica balteata*

*Diabrotica speciosa*

*Diabrotica undecimpunctata howardi*

*Diaprepes abbreviatus*

*Heliothis armigera*

*Hydraecia micace*

*Leptinotarsa decemlineata*

*Macrosiphum solani*

*Peliococcus perfidiosus*

*Phthorimaea operculella*

*Spodoptera littoralis*

*Tecia solanivora*

*Tetraneura nigriabdominalis*

**Nematodes**

*Belonolaimus longicaudatus*

*Ditylenchus destructor*

*Ditylenchus dipsaci*

*Globodera pallida*

*Globodera rostochiensis*

*Nacobbus aberrans*

*Radopholus similis*

**ANNEXURE D**

**Summary of mitigation options used forcommon quarantine pests of maize in the tripartite region**

1. Maize Chlorotic mottle virus (MNLD)
   1. Country of production free from - RSA, Kenya, Malawi, Zimbabwe & Zambia
   2. Test ELISA/ PCR – consignment free from – RSA, Kenya, Malawi & Zambia
   3. Seed certification 1% tolerance (field) and 0% (consignment) - Kenya
   4. Production site free from virus (tested field and consignment) - Malawi & Zambia
2. Sugarcane mosaic virus (MLND)
   1. Country of production free from - RSA, Uganda, Kenya, Malawi, Zimbabwe & Zambia
   2. Testing post-harvest ELISA/ PCR – consignment free from - RSA, Kenya, Malawi & Zambia
3. *Claviceps gigantea*
   1. Consignment free & treated fungicide – Zambia
4. *Cochliobolus heterostrophus*
   1. Country free from - RSA
   2. Consignment free / testing – RSA
5. *Peronosclerospora maydis*
   1. *Country free from- RSA, Zimbabwe, Zambia)*
   2. *Seed moisture below 13% & Fungicide treatment- RSA, (Zimbabwe seed for plant)*
   3. *PFA of production - Zimbabwe*
6. *Peronosclerospora phillipinensis*
   1. Country free from – RSA, Zimbabwe, Zambia
   2. Seed moisture below 13% & Fungicide treatment- RSA, Zambia (Zimbabwe seed for plant)
   3. PFA of production - Zimbabwe
7. *Peronosclerospora sacchari*
   1. Country free from – SA, Zimbabwe, Zambia, Kenya
   2. Seed moisture below 13% & Fungicide treatment – RSA, Kenya, Zambia (Zimbabwe seed for plant)
   3. PFA of production – Zimbabwe, Kenya
8. *Puccinia sorghi*
   1. RNQP free from in production area - Zimbabwe
9. *Sclerophthora macrospora*
   1. Country free from / PFA – Zambia
   2. RNQP free from in production area – Zimbabwe
   3. Tested and consignment free from – ZAMBIA
10. *Ustilago zeae*
    1. Country free – Eswatini, Kenya, Malawi
    2. PFA – Eswatini, (Malawi -Seed)
    3. Testing seed - Eswatini
    4. Consignment treat fungicide - Malawi
11. *Prostephanus truncates*
    1. Country freedom – RSA, Mozambique
    2. Consignment treatment - fumigation – RSA , Zimbabwe
    3. PFA – Eswatini
    4. Processed / milled – Eswatini
    5. Consignment free from live insects and quality tolerance – Zimbabwe
12. *Trogoderma granarium*
    1. Country free – Kenya, RSA, Zimbabwe
    2. Seed - treatment insecticide/ grain fumigation – Kenya
    3. Consignment fumigation – RSA, Zimbabwe