

Risk Assessment posed by imported plants/Organisms

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Outline

- Introduction
- Quarantine measures for prevention
- Quarantine measures during intentional introduction of alien species
- Eradication, containment and control
- Research and monitoring of alien invasive species
- Regional and international cooperation
- Capacity building
- Education and public awareness
- Conclusion

Introduction Contd..

- Kenya has experienced a number of invasions,
 - Larger grain borer (*Prostephanus truncatus*)
 - Water hyacinth (*Eichhornia crassipes*) and
 - *Prosopis* spp.
 - 34 different species have invaded Kenya (Farrell, Kibata and Sutherland, 1995; Lyons, 2000; Kibata, G.N., pers. comm.). T
- Few of these species are under control, hence the concern.
- Various management strategies and activities have been used

Quarantine measures to prevent introductions

- Strict and specified conditions for importation of organisms
- Assessment of Pest/Weed risk of potential including invasiveness.
- Plant quarantine regulations/restrictions
 - Control of import and export of plant materials.
 - Legal authority is provided to allow for treatment or destruction of risky introductions.
 - Inspections are carried out at the entry points (i.e. international airport, sea ports and borders)
 - The border control points

Quarantine measures during intentional introduction - Research

- The Kenya Standing Technical Committee on Imports and Exports - approves importation of restricted
- Bio-control agents. An appropriate risk analysis is carried
 - A comprehensive dossier on the intended introduction is submitted for evaluation
 - Authorization of an introduction is accompanied by conditions such as for containment requirements, monitoring procedures, preparation of mitigation plans.

Eradication, containment and control

- Containment and control have been undertaken to mitigate adverse effects.
- Water hyacinth control options
 - Mechanical removal
 - Use of biocontrol agents.
- Enforcement of domestic quarantine
 - E.g for larger grain borer
- Monitoring in susceptible areas to detect invasion and hence put in place appropriate control measures

Research and monitoring of alien invasive species

- National research institutes such as the Kenya Agricultural Research Institute and Kenya Forestry Research Institute.
- Information generated on the larger grain borer, the water hyacinth and *Prosopis* spp.
- Studies include the biology and ecology of the invasive species, history and associated impacts on the ecosystem and socio-economic impacts.
- KEPHIS has worked closely with the research institutions to determine the status of invasive species and develop management options.

Regional and international cooperation

- Need for a regional approach
 - Examples include the water hyacinth, which has affected Kenya, Tanzania and Uganda, and the larger grain borer, which has severely affected Kenya and Tanzania
- Kenya is a contracting party to the IPPC whose purpose is to secure a common and effective action to prevent the spread and introduction of pests of plants and to promote appropriate measures for their control.

Capacity building

- Staff have been trained on effective implement phytosanitary measures including pest/weed risk analysis and identification of pests of quarantine importance.
- Strengthening phytosanitary activities within KEPHIS including:
 - Strengthening border control
 - Setting up laboratory facilities at the major entry points to ensure quick identification of intercepted species

Education and public awareness

- KEPHIS has striven to raise public awareness on phytosanitary issues and invasive species.
- Procedures on plant import requirement have been Published in the media
- Development and maintenance of a Web site (www.kephis.org), with valuable information
- Putting public alerts on the trade of water hyacinth in the press
- Holding public seminars at entry points
- Participation in shows, exhibitions
- Preparation and distribution of pamphlets, brochures, annual reports

Species	Year of arrival	Impact on native plants, animals and ecosystems
1. Arthropods		
Larger grain borer <i>Prostephanus truncatus</i>	1983	Pest of stored maize and cassava
Serpentine leafminer <i>Liriomyza trifolii</i> (Burgess)	1976	Pest of many horticultural crops
Western flower thrips <i>Frankliniella occidentalis</i> (Pergande)	1989	Pest of many flower crops, pulses and horticultural crops
Cypress aphid <i>Cinara cupressivora</i>	1991	Cypress trees decimated
Russian aphid <i>Diuraphis noxia</i>	1995	Barley and wheat production reduced

Micro-organisms

Crown gall <i>Agrobacterium tumefaciens</i>	1995	Reduced production in roses
Black Sigatoka <i>Mycosphaerella fijiensis</i>	1988	Reduced banana production
Panama disease <i>Fusarium</i> <i>oxysporum f. sp. cubense</i>	1952	Reduced banana production
Cassava mosaic disease ACMV (UgV) (<i>Begomovirus</i>)	1994	Reduced cassava production
Maize streak disease (MSV) (<i>Geminivirus</i>)	1936	Reduced maize production
Fruit and leaf spot <i>Phaeoramularia angolensis</i>	1972	Reduced citrus production

Plants

Water hyacinth <i>Eichhornia crassipes</i>	1989	Serious
Water fern <i>Salvinia molesta</i>	1984	Serious
<i>Prosopis</i> spp.	1983	Serious
Wild garlic <i>Allium vineale</i>	1993	NA
Prickly pear <i>Opuntia</i> spp.	1940s - 50s	Out-competes native plants, precludes grazing and browsing near it
Mexican marigold <i>Tagetes minuta</i>	Unknown	Minimal
Lantana <i>Lantana camara</i>	1950s	Out-competes other vegetation
Morning glory <i>Ipomoea</i> spp.	1960s	Grows over and out- competes other plants
Eucalypt <i>Eucalyptus</i> spp.	1939 - 45	Minimal, though some evidence it retards recruitment of native species

Conclusion

- Relationship between invasive alien species and quarantine pests
- Phytosanitary system must address both
- Issue of import permits is a window for official introduction
- Border control of imports and other pathways
- Precautionary principle and
- Pest/Weed risk analysis: Identifying species or pathways that pose an environmental risk
- Phytosanitary measures
- More specific standards

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