

An Overview of Plant Disease Diagnostics and Kenya's Capacity/Needs

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Plant pathology largely deals with diseases caused by biotic agents, generally referred to as pathogens.

- Agents may be microscopic (very small) or macroscopic (fairly large & easy to see).

- ***Main groups of pathogens***

1. Fungi & oomycetes
2. Bacteria
3. Viruses
4. Nematodes

Others

Parasitic plants

Rickettsiae

Phytoplasmas

Spots

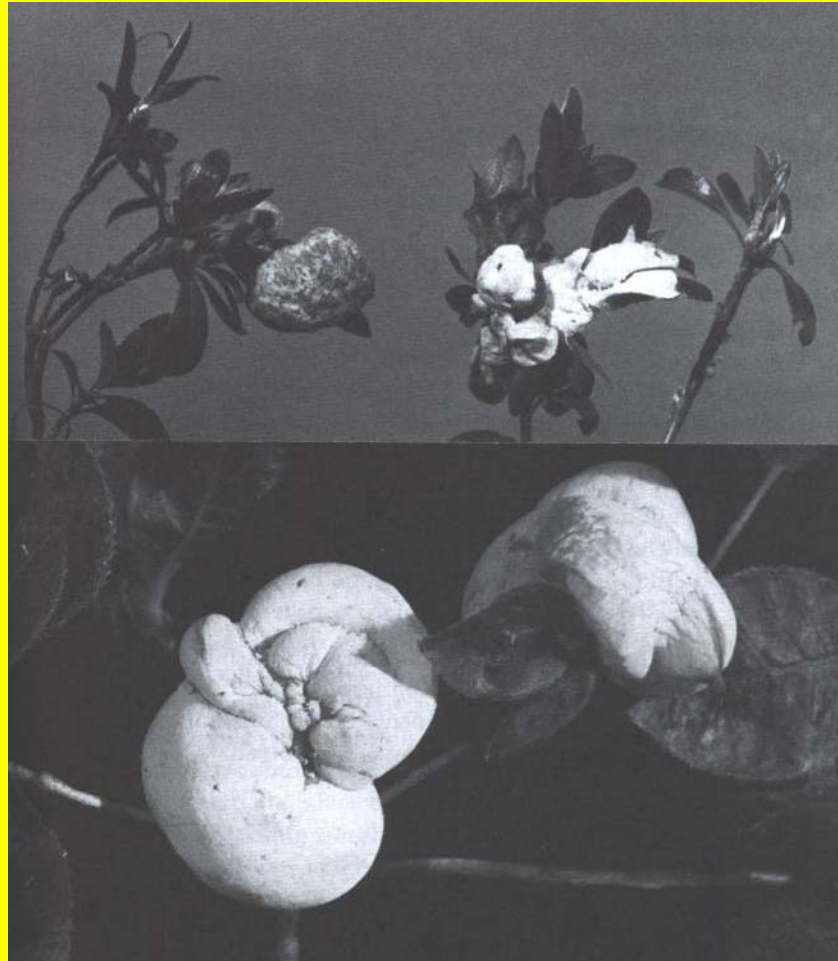




Wilts



Galling – nematodes, fungal



Some virus symptoms



Leaf deformation/retardation



Tissue necrosis



Vein necrosis



Mosaic, vein chlorosis



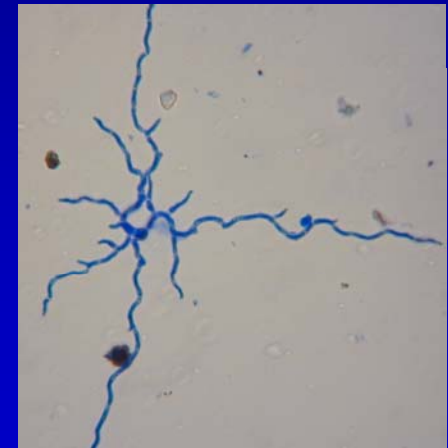


Pathogen vectors



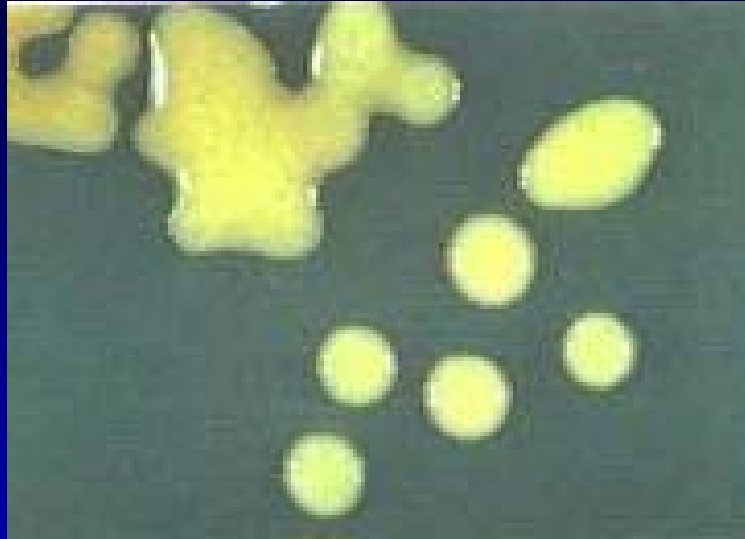


Fungal organisms



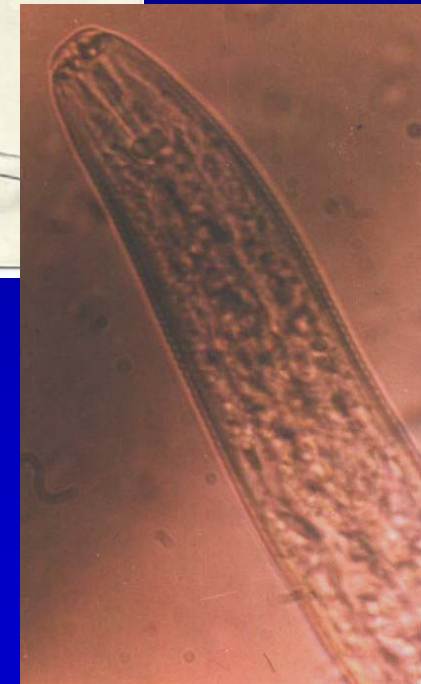


Bacterial organisms





Nematodes





Requirements in plant disease diagnostics

1. Equipment & apparatus
2. Infrastructure & utilities
3. Human resources
4. Operations funds
5. Policy environment



Equipment and apparatus

- Autoclave
- Oven
- Laminar flow cabinet/chamber
- Microscopes
- Glassware & plastic ware
- Spirit lamps/gas burners
- Dissecting tools
- Incubator
- Water distiller
- Blender
- Volumetric apparatus
- Refrigerator
- Freezer
- Weighing balance
- Hot plate/magnetic stirrer
- Trans-illuminator
- Vortex mixer
- Fume cabinet
- Thermocycler
- Electrophoresis equipment
- Sequencer
- Computer
- Imaging equipment
- Lyophilizer

Infrastructure & Utilities



- Laboratory space with fixed/immovable facilities
- Water
- Electricity
- Information facilities
 - Guide keys, reference publications, databases
- Communication systems
 - telephone, email, internet
- Transport
- Storage/preservation facilities – Herbaria/culture collections



Human resources

- Trained diagnosticians/taxonomists
- Technical support staff
- Non-technical staff
- Service managers/co-ordinators
- Outreach/Public liaison staff



Operations funds

Funds to:

- Purchase reagents, chemicals and other supplies
- Pay for utilities
- Maintain/replace/upgrade equipment
- Pay for services, including staff remuneration
- Establish and maintain linkages

Policy Environment



- Structured operations of diagnostic services
- Support in the bridging of existing gaps in human resources, operational funds, equipment maintenance, replacement, upgrade and procurement
- Support in the establishment and maintenance of linkages
- Support to knowledge enhancement and research

Analysis of Kenya's capacity & needs



Stumbling blocks / hindrance	Self-sufficiency level (%)
Staff (taxonomists, parataxonomists/support staff, personnel in information management & electronic databases, etc)	30
Physical infrastructure (labs, storage space & retrieval infrastructure)	10
Equipment & apparatus (microscopes, computers, field equipment, molecular biology equipment, etc)	20
Basic taxonomic literature and library facilities (guide books, taxonomic keys, electronic databases, etc)	16
Institutional running costs (laboratory supplies, operations, overheads)	20
Plant pathology herbarium and culture collections	Insignificant

Source: Siboe, Mukiana & Masinde, 2007



Thanks

Diagnostics
demand
succession
planning



Getting others
interested??