



Results of the Q-collect project

Peter Bonants
Q-collect project coordinator

www.q-collect.eu



*EPPO-TESTA Workshop
Angers, FR, 2015-12-2*



Introduction

- Expanding globalisation of trade in plant material,
- Climate change,
- EU expansion creating new borders and pathways,
- Increasing regulation harmful organisms,
- Decline in the resources supporting plant health activities on national and european level,
- Reference material needed for ID/DET methods.

Introduction

- Collections EU dispersed, widespread and of very variable quality. (NPPO's, mandated diagnostic laboratories, Universities, Research Institutes, Natural History Musea, other),
- Own collections related to their specific work and scope,
- Connected to a single specialist,
- Need to improve the infrastructure supporting phytosanitary important collections,
- MIRRI (Microbial Resource Research Infrastructure) project started in 2013.



Q-collect

- Title: Coordination and Collaboration between reference collections of plant pests and diseases for EU Plant Health Policy
- Grant agreement no: 612712
- EU Budget: 500,000 €



Partners in Q-collect

- 1: DLO (NL)
- 2: DEFRA (UK)
- 3: ILVO (B)
- 4: UGent (B)
- 5: UNIBO (I)
- 6: KNAW-CBS (NL)
- 7: EVD-ACW (CH)
- 8: ANSES (F)
- 9: INRA (F)
- 10: Naturalis (NL)
- 11: DSMZ (D)
- 12: AGES (AU)
- 13: EPPO (F)
- 14: FGU VNIKR (RU)
- 15: JKI (D)
- 16: NVWA (NL)



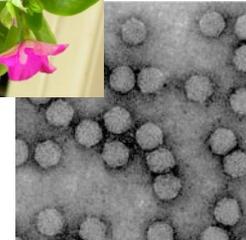
(Dpt) WP leaders

WP	Title	WP-leader	deputy WP leader
1	Coordination	Peter Bonants (DLO)	
2	Inventory	Jean-Claude Streito (INRA)	Francoise Petter (EPPO)
3	Quality Standards	John Elphinstone (Fera)	Marianne van der Blom (NVWA)
4	Access	Perrine Portier (INRA)	Pascal Gentit (Anses)
5	Info-portal	Vincent Robert (CBS)	Francoise Petter (EPPO)
6	Network Reference	Sylvia Blümel (Ages)	Paul de Vos (UGent)
7	Dissemination	Francoise Petter (EPPO)	Peter Bonants (DLO)



Organisms included

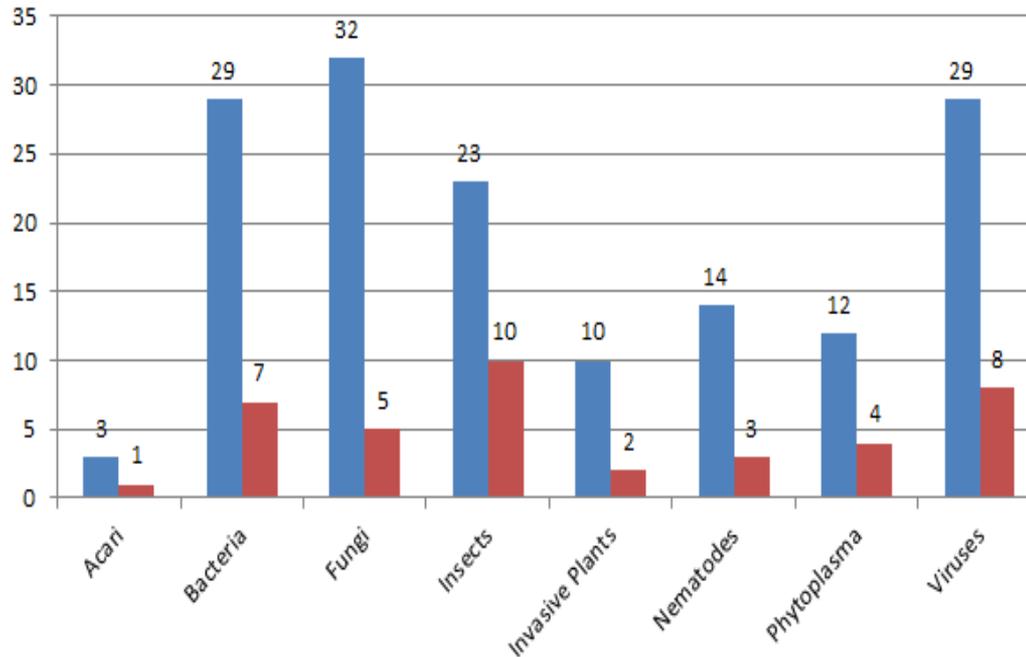
- Fungi
- Bacteria
- Invasive plants
- Nematodes
- Arthropods
- Phytoplasmas
- Viruses & Viroids



Aims

- Inventory of existing phytosanitary important collections within Europe and their content (WP2)
- Development guidelines for quality standards (WP3)
- Development guidelines to improve the accessibility of these collections (WP4)
- Development an info-portal on the web (WP5)
- Design and build a network of reference collections (WP6)
- Dissemination of the results to stakeholders (WP7)

Collection that have no catalogue (paper, database, online or website).



No catalogue

- Acari : 33%
- Bacteria : 24%
- Fungi : 16%
- Insects : 44%
- Invasive plants : 20%
- Nematodes : 21%
- Phytoplasma : 33%
- Viruses : 28%

Collections with a website address

- Acari: 1 (Q-bank)
- Bacteria: 5
- Fungi: 7
- Insects: 1 (Q-bank)
- Invasive plants: 1
- Nematodes: 1
- Phytoplasma: 0
- Viruses: 1
- Total: 15**

Findings

The percentage of collections that have neither a catalogue nor a list of their holdings is high (up to 44% for insects).

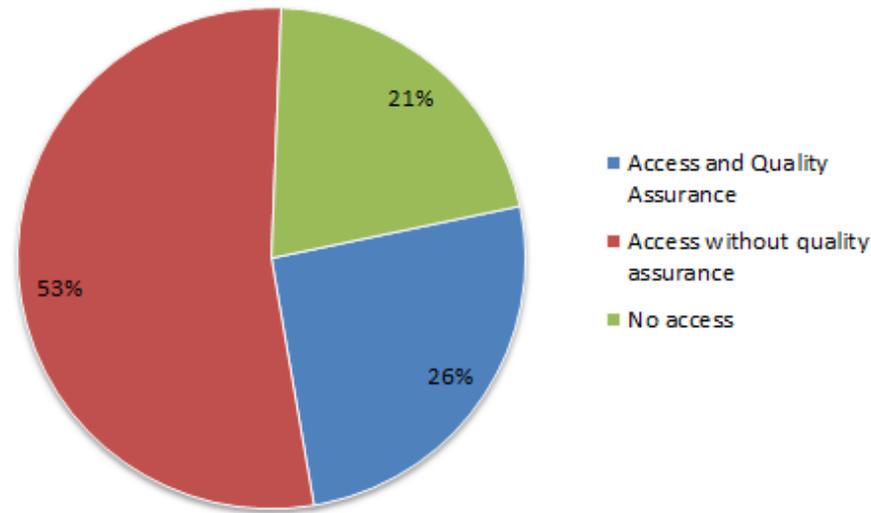
Number of catalogues on line and collections with a website address is low.

This is an important gap to ensure an easy access to biological material.



Information on the collection(s)

Access and quality assurance



Findings

More than half of the collections sharing material has no quality assurance system. In such cases exchange of material is assumed to be based on trust, there is no formalized process, which excludes in principle the use of such material in a formalized framework (such as use in the framework of official diagnostics performed under accreditation).

This is an important gap.

Minimum quality standards

- Specific quality requirements vary according to:
 - Type of organism or reference material
 - Whether maintained as live organisms, fixed specimens or other material.
- Minimum quality standards agreed through consultation amongst experts associated with reference collections of quarantine organisms
 - viruses, phytoplasmas, bacteria, fungi and oomycetes, nematodes, insects and invasive plants.
- Minimum quality standards for:
 - Information required on accession
 - Data storage and maintenance
 - Authentication
 - Identification methods
 - Storage and conservation
 - Production of reference materials
 - Access to reference materials



Minimum quality standards

Issues	Information to be held / Standard operating procedures and competences required	Viruses/viroids	Phytoplasmas	Bacteria	Fungi/oomycetes	Nematodes	Insects/mites	Invasive Plants
Data to be stored on each accession	Specimen full scientific name	Required	Required	Required	Required	Required	Required	Required
	Geographic source of specimen (at least to country of origin)	Required	Required	Required	Required	Required	Required	Required
	Host plant or other source/substrate from which it was collected	Required	Required	Required	Required	Recommended	Recommended	Recommended
	Date (at least year) of sampling (where available)	Required	Required	Required	Required	Required	Required	Required
	Sampler/collector	Recommended	Recommended	Recommended	Recommended	Recommended	Recommended	Recommended
	Original specimen number or name given by collector (where available)	Recommended	Recommended	Recommended	Recommended	Recommended	Recommended	Recommended
	Unique accession number in the collection	Required	Required	Required	Required	Required	Required	Required
	Date of deposit in collection	Required	Required	Required	Required	Required	Required	Required
	Preservation conditions and date preserved	Recommended	Recommended	Recommended	Recommended	Recommended	Recommended	Recommended
	Reference to accession numbers for duplicates in other collections (where available)	Optional	Optional	Optional	Optional	Optional	Optional	Optional
	History from sampling to deposit in collection (if available)	Optional	Optional	Optional	Optional	Not applicable	Not applicable	Not applicable
	Traceable history of persons making identification	Optional	Optional	Optional	Optional	Optional	Optional	Optional
	Depositor (where known)	Required	Required	Required	Required	Required	Required	Required
	Current quarantine status in EU	Required	Required	Required	Required	Required	Required	Required
	Species Type (reference strain) strain (yes or no)	Required	Required	Required	Required	Required	Required	Required
	Authorities of scientific name	Not applicable	Not applicable	Recommended	Recommended	Recommended	Recommended	Recommended
	Links or references to sequence data from the accession	Optional	Optional	Optional	Optional	Optional	Optional	Optional
	Date of last viability test	Recommended	Not applicable	Recommended	Recommended	Recommended	Not applicable	Not applicable
	Date of last authenticity check/purity test	Recommended	Recommended	Recommended	Recommended	Not applicable	Not applicable	Not applicable
	Date of last pathogenicity test	Not applicable	Not applicable	Optional	Optional	Optional	Optional	Optional
	Traceable history of all quality control checks and persons involved	Recommended	Recommended	Recommended	Recommended	Recommended	Recommended	Recommended
	Images of the accession	Not required	Not required	Not required	Optional	Optional	Optional	Optional
	Literature references to use of the accession as reference material	Optional	Optional	Optional	Optional	Optional	Optional	Optional
Morphological/morphometric data	Optional	Not applicable	Optional	Optional	Optional	Optional	Optional	
Expected reactions when used as reference material in specific diagnostic tests	Recommended	Recommended	Recommended	Recommended	Recommended	Not applicable	Not applicable	
Data storage procedures	Database maintenance procedures	Required	Required	Required	Required	Required	Required	
	Data back-up process procedures	Required	Required	Required	Required	Required	Required	
	Sharing procedures for selected data (e.g. via website or paper inventory/catalogue)	Required	Required	Required	Required	Required	Required	
Identification methods	Sources and use of identification keys (where used)	Not applicable	Recommended	Recommended	Recommended	Recommended	Recommended	
	Classical morphological descriptions (where used)	Recommended	Not applicable	Recommended	Recommended	Recommended	Recommended	
	Morphometric analysis of specimens (where used)	Recommended	Not applicable	Recommended	Recommended	Recommended	Recommended	
	Other phenotyping methods (examples)	Recommended	Not applicable	Recommended	Not applicable	Not applicable	Not applicable	
	DNA/RNA sequencing/barcoding methods (where available)	Recommended	Recommended	Recommended	Recommended	Recommended	Recommended	
	Other identification methods (examples)	Recommended	Not applicable	Recommended	Not applicable	Recommended	Not applicable	
Updating taxonomy	Sources of approved taxa (examples)	Required	Required	Required	Required	Required	Required	
Current quarantine status	Sources of current lists of quarantine organisms and invasive plants	Recommended	Recommended	Recommended	Recommended	Recommended	Recommended	
Contact details	Contact details for persons responsible for the collection	Required	Required	Required	Required	Required	Required	
Labelling	Unique number assignment/barcode labelling	Required	Required	Required	Required	Required	Required	
Storage facilities	Containment/isolation measures	Required	Required	Required	Required	Required	Not applicable	
Purity	Measures to avoid cross-contamination or mixing	Required	Not applicable	Required	Required	Required	Required	
Chain of accession	Record keeping for movement of accessions in and out of the collection	Required	Required	Required	Required	Required	Required	
Comparison with original accession	Methods to check batch to batch variation	Required	Required	Required	Required	Optional	Not applicable	
Viability	Assessment of quality after storage/exchange	Recommended	Recommended	Recommended	Recommended	Recommended	Not applicable	
Pathogenicity	Viability tests and frequency of assessment	Not applicable	Not applicable	Recommended	Recommended	Optional	Not applicable	
Storage facilities	Pathogenicity tests and frequency of assessment	Not applicable	Not applicable	Optional	Optional	Not applicable	Not applicable	
Protection from loss	Location and maintenance of stores	Required	Required	Required	Required	Required	Required	
Conservation	Duplication of collections	Optional	Optional	Recommended	Recommended	Optional	Optional	
	Validated conservation methods	Required	Required	Required	Required	Required	Required	
	Determination of long term stability	Required	Required	Required	Required	Required	Required	
Containment	Determination of short term stability (e.g. for transport)	Required	Required	Required	Required	Required	Not applicable	
	Biosecurity for live quarantine organisms	Required	Required	Required	Required	Required	Not applicable	
Preparation of reference materials	Production methods	Required	Required	Required	Required	Required	Required	
	Analysis of uniformity	Required	Required	Required	Required	Required	Required	
	Determination of confidence limits for supply of reference materials with specific quality or quantity requirements	Not applicable	Not applicable	Required	Required	Not applicable	Not applicable	
	Instructions for end users	Required	Required	Required	Required	Required	Required	
Public access to specimens	Ordering procedures	Required	Required	Required	Required	Required	Required	
	Packing and transportation procedures	Required	Required	Required	Required	Required	Required	
	Customer communications and feedback	Required	Required	Required	Required	Required	Required	
	Customer data	Recommended	Recommended	Recommended	Recommended	Recommended	Recommended	
	Non-conformance procedures	Required	Required	Required	Required	Required	Required	
Legal aspects	Adherence to local plant health licensing requirements	Required	Required	Required	Required	Required	Required	
	Adherence to international quarantine regulations	Required	Required	Required	Required	Required	Required	



Users



Questionnaire
for users
DL4.2

WP4 Access



Results describing
the different
general cases
DL4.3

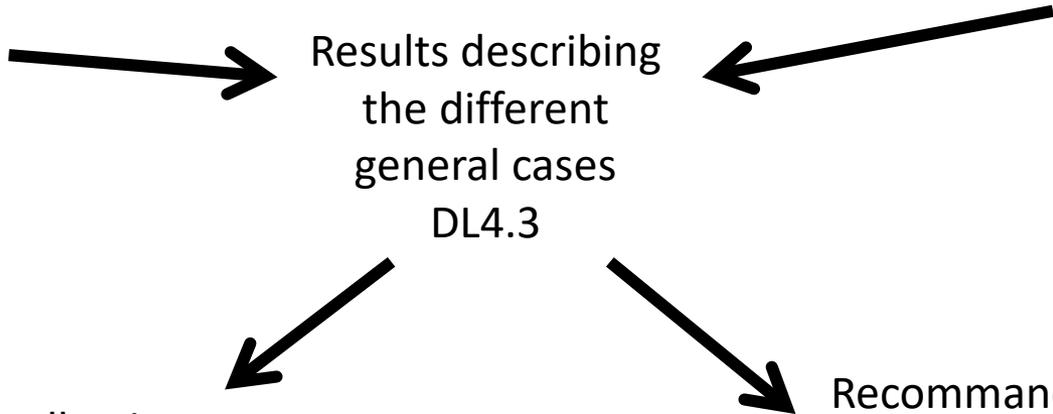
Quarantine collections



Questions for
collections
(with WP2
questionnaire)
DL4.1

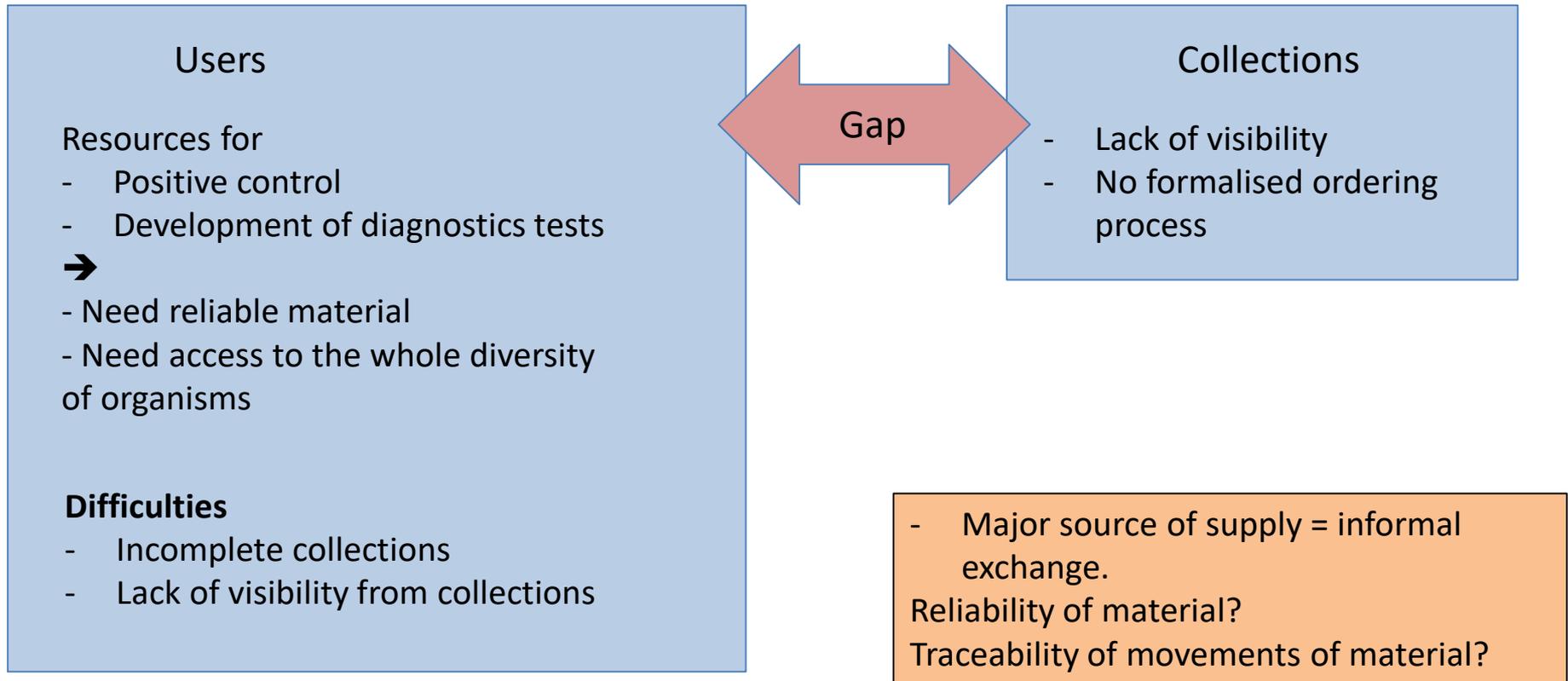
Guidelines for collections to
improve access to resources
DL4.4 (Joined to DL6.2)

Recommendations for info-
portal and tools developed
by WP5 and WP7
DL4.5



Analysis of results from both questionnaires – Major conclusions

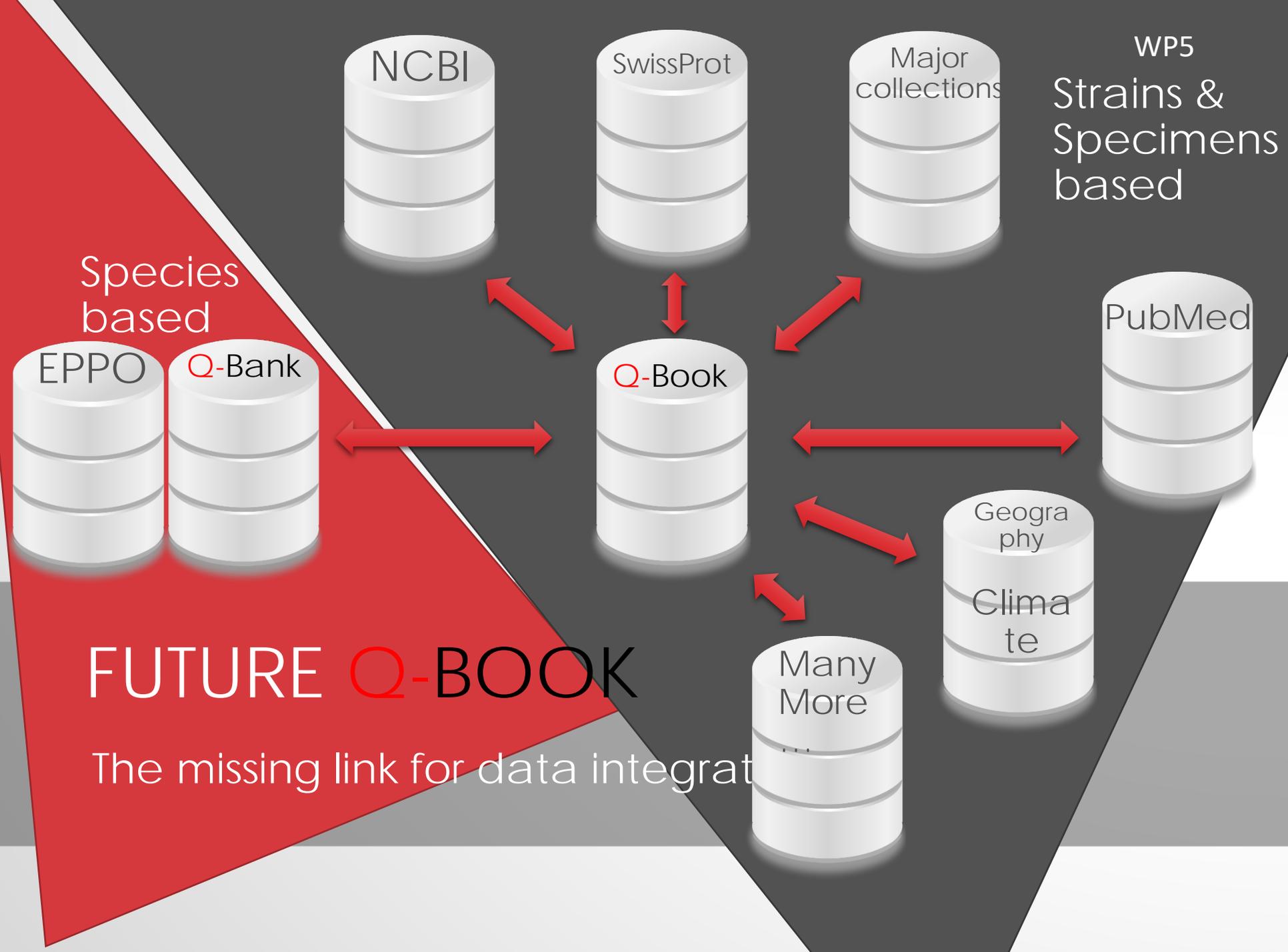
No real specificity between type of users, type of uses, and type of organisms



COLLECTIONS ISLANDS

Disconnected databases

Only 1/10000 strains in scientific publications are in collections



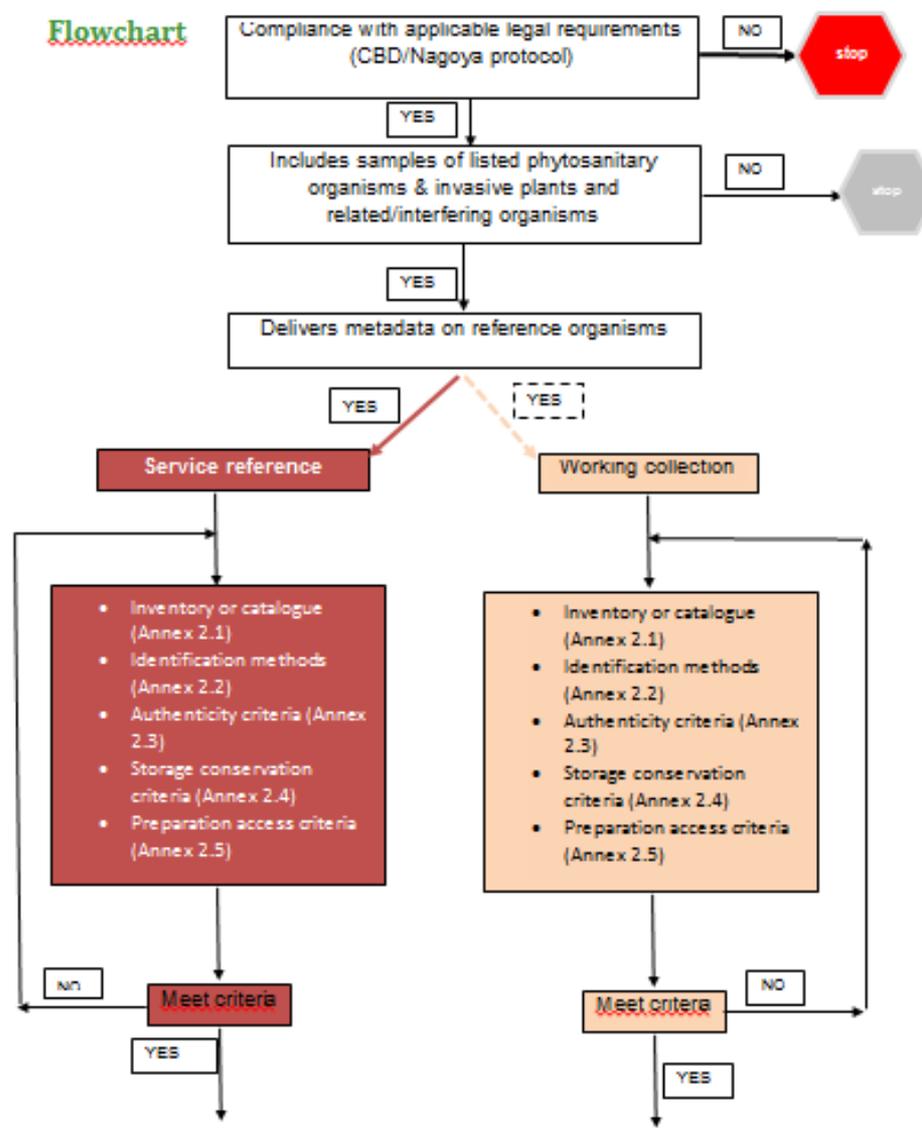
Issues	Information to be held	Viruses/viroids		Phytoplasmas		Bacteria		Fungi/oomycetes		Insects/mites		Nematodes		Invasive Plants	
		in service reference	in working	in service reference	in working	in service reference	in working	in service reference	in working	in service reference	in working	in service reference	in working	in service reference	in working
Data to be stored on each accession	Specimen/culture scientific name	Information to be held													
	Geographic source of specimen (at least to country of origin)	Viruses/viroids		Phytoplasmas		Bacteria		Fungi/oomycetes		Insects/mites		Nematodes		Invasive Plants	
Date of deposit in collection	Specimen/culture scientific name	in service reference collection	in working collection	in service reference collection	in working collection	in service reference collection	in working collection	in service reference collection	in working collection	in service reference collection	in working collection	in service reference collection	in working collection	in service reference collection	in working collection
	Geographic source of specimen (at least to country or region of origin)	required ¹	required	required	required										
Reference to accession numbers for deposit reference collections	geographic place of isolation of specimen (especially import consignments)	required	required ³	required	required ³	required	required ³	required	required ³	required	required ³	required	required ³	required	required ³
	Host plant, host plant part, host plant material, substrate or other source (e.g. commodity) from which it was collected	required	required ³	required	required ³	required	required ³	required	required ³	required	required ³	required	required ³	required	required ³
A) e.g. liquid nitrogen, -80 C, freeze drying, under oil, insect mounting, slide preparations	Date (at least year) of sampling	required	required ³	required	required ³	required	required ³	required	required ³	required	required ³	required	required ³	required	required ³
	Species type (yes or no)	required	required ³	required	required ³	required	required ³	required	required ³	required	required ³	required	required ³	required	required ³
B) These criteria or data are part of the quality assurance system and might be provided upon request, but might not be necessarily visible in the catalogue	Original specimen/culture number or name given by collector	required	required ³	required	required ³	required	required ³	required	required ³	required	required ³	required	required ³	required	required ³
	Links or references to sequence data from the accession	required	optional	required	optional	required	optional	required	optional	required	optional	required	optional	required	optional
Date of last viability test ^B	Date of last purity test ^B	3) required for working collections linked to plant health reference collections													
		n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Date of last pathogenicity test ^B	These criteria or data are part of the quality assurance system and might be provided upon request, but might not be necessarily visible in the catalogue	optional	optional	optional	optional	optional	optional	optional	optional	optional	optional	optional	optional	optional	optional
		n.a.	n.a.	optional	optional										
Data	Data back-up process	required	optional	optional	optional	optional	optional	required	optional	required	optional	required	optional	required	optional
	Accessibility and visibility of selected data (e.g. via website or paper inventory/catalogue)	required	optional	required	optional	required	optional	required	optional	required	optional	required	optional	required	optional
Access to data	Contact details for persons responsible for the collection	required	required	required	required	required	required	required	required	required	required	required	required	required	required

A) e.g. liquid nitrogen, -80 C, freeze drying, agar cultures, under oil, insect mounting, slide preparations etc
 B) These criteria or data are part of the quality assurance system and might be provided upon request, but might not be necessarily visible in the catalogue
 1) for older accessions (to be specified) optional

3) required for working collections linked to plant health reference collections



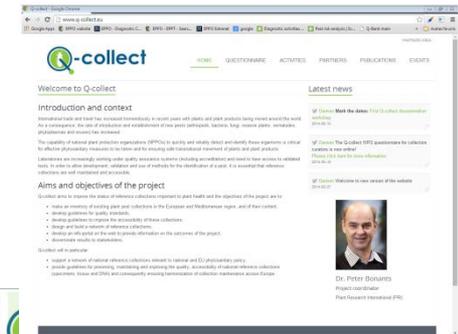
Flowchart



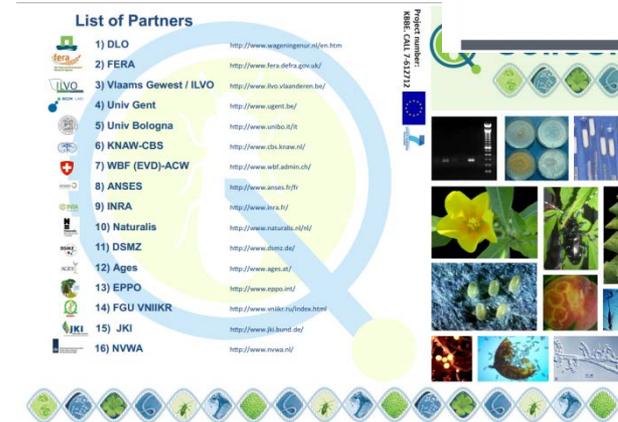
Q-collect Network



- WP7: Dissemination
 - Website: www.q-collect.eu



- Flyer

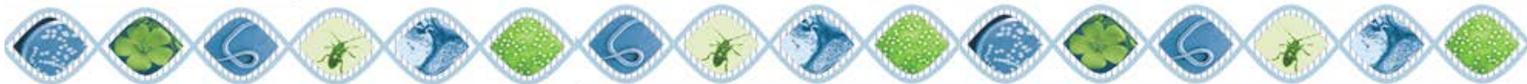


- EPPO standards on quality control
- Two workshops (Kleinmachnow and Rome)
- http://archives.eppo.int/MEETINGS/2015_conferences/q_collect_workshop.htm



Conclusions

- Inventory on phytosanitary collections
- Gaps identified and recommendations
- Guidelines for application of quality standards,
- Guidelines for access to specimens
- Guidelines for design and building a network of reference collections
- An info-portal with relevant information on phytosanitary important collections
- Dissemination to stakeholders



Recommendations

- *A: Priority to making/maintaining inventories*
- *B: Establish a long term sustainable online platform*
- *C: Improvement of Quality systems for collections*
- *D: Establish networks for collections*
- *E: Establish a common policy for reference material*
- *F: Nagoya Protocol*



Acknowledgements

- All Partners of Q-collect
- EU commission for funding
- EPPO for organisation of 2 symposiums
- JKI and CRA-PAV for hosting the 2 symposiums

- Thank you very much for your attention

