Developing a partnership model for tree disease resilience

The example of canker stain of plane

Arboricultural Association

50th National Amenity Arboriculture conference

September 2016, Keele University

Lucio Montecchio & Neville Fay

www.treeworks.co.uk

Development of a partnership model

Italian Society of Arboriculture

Milan 2- 5 July 2015, Parc Sempione, Milan,

Lucio Montecchio & Neville Fay

Treework Environmental Practice

What is tree 'health' or 'fitness'?
- a dynamic ecosystem approach

Healthy organism?

One operating within normal species capacity (e.g. for growth, defense and reproduction) functioning in equilibrium **within its evolved ecosystem**

- Individual-based model – absence of 'ill-health'

  Free from harmful biotic or abiotic effects (pathogens or environmental impacts)?

- Ecosystem-based model (individual = networked function of environment)

Dynamic condition – an organism functions within & contributes to sustainable & biodiverse system

-What if disease infection is asymptomatic?
-Assessment typically above ground
-Tree & not soil (is soil diseased)?

The Treework Seminar Series

Innovations in Arboriculture

SEMINAR 20	THE LINEAR FOREST
SEMINAR 16	AVENUES, ALLEYWAYS AND BOULEVARDS
SEMINAR 15	TREES & CLIMATE ADAPTATION
SEMINAR 13	TREES, ROOTS, FUNGI, SOIL (2)
SEMINAR 12	TREES, ROOTS, FUNGI, SOIL (1)
SEMINAR 11	TREES & CLIMATE PROOFING
SEMINAR 9	INTEGRATED TREE ASSESSMENT
SEMINAR 8	TREE RISK MANAGEMENT (2)
SEMINAR 7	TREE MORPHOLOGY (2)
SEMINAR 6	TREE RISK MANAGEMENT (1)
SEMINAR 5	TREE MORPHOLOGY (1)
SEMINAR 4	TREE WIND LOAD SIMULATION
SEMINAR 3	LIFE WITHIN & BENEATH THE TREE
SEMINAR 2	TREE MICRO-ECOLOGY
SEMINAR 1	TREE STATICS AND DYNAMICS

Dutch Elm Disease (*Ophiostoma novo-ulmi*) - the province of experts

Treework Environmental Practice

Collaborative partnership model
Open science with open commerce

- Communicating study of diseases
- Offering high-level training
- Develop competence in pathogen identification
- Early warning alerts & control systems

Move from specialist lab-based service-support
to
partnership-based, knowledge transfer

STUDY WORKSHOP INTERNATIONAL

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P&D & Biosecurity – What do we understand?

Biosecurity

Preventive measures to reduce transmission-risk of infectious *pests* & *diseases* (Koblentz, 2010)

Introduction & Transmission

EU Council Directive on protective measures (biosecurity) against *introduction into* and *spread within* the Community, of organisms harmful to 'plants or plant products' (economic)

How to avoid biosecurity paralysis?

- Experience of DED
- Pathogen virulence + vector transformed threat
- Wrong-footed experts
- Attempted pruning / injecting / spaying
- Sanitary felling
- Local restrictions in movement of infected material
- Left with sense of powerlessness as disease ran its course
- We lost the battle despite knowing the cause
- **Science identified cause – but no effective treatment**
- **Uncalculated economic, ecological, cultural etc... costs**
- **Influenced professional arboriculture**

Chalara ash dieback (*Hymenoscyphus fraxineus*)

In UK – recognised in 2012

Defra - Chalara Management Plan (March 2013)

– ash 5.4% within GB woodland (9% England)


Photo Jonas Barandun


Forestry Commission

- Tree organisations (Gov + NGO) + Public + Press
- **Biosecurity = N*ational security***
- **Cobra** *(Cabinet Office Briefing Room)*
- Tree loss = ecosystem + economic impacts
- Suffolk CC approx £25 million to manage roadside trees
- Scaled up nationally = £billions
- *Tourism, landscape, agriculture, wood production, hydrology, health, well-being*

Lessons from past epidemics & Chalara experience
Dutch Elm Disease, Foot & Mouth

How have things changed?

- Public media-assisted interest in nature has expanded
- Today's expanded tree sector + public alarm + press
- Powerful NGOs and campaigning social media drive public concerns
- Today threat more likely to be taken seriously by Government + tree-scientific communities

Since Chalara....Collaboration & Partnership?

Arboricultural Association
Ancient Tree Forum
Institute of Chartered Foresters
Royal Forestry Society
Woodland Trust
International Society of Arboriculture
London Tree Officers Association
National Association of Tree Officers
Tree Council
Trees & Design Action Group
Forestry Commission
Defra - Tree Health & Plant Biosecurity Expert Taskforce
Defra-FC Biosecurity & Plant Health Action Plan
National Trust
Myerscough University + other colleges
University Forestry Departments
ObservaTree partnership – UK Tree Health Early Warning System (EU)

Biosecurity Policy & Position Statements

Arboricultural ASSOCIATION
trees.org.uk

Position Statement

Biosecurity in Arboriculture & Urban Forestry

LONDON TREE OFFICERS ASSOCIATION

Position Statement

LTOA Managing the threat to London's trees from pests & diseases

Department for Environment Food & Rural Affairs
Institute of Chartered Foresters
Forestry Commission England
n·a·t·o
Trees & Design Action Group
SGD SOCIETY OF GARDEN DESIGNERS
Kew Royal Botanic Gardens
Royal Botanic Garden Edinburgh

ANCIENT TREE FORUM

KEEP IT CLEAN
Don't give pests and diseases an easy ride

Academic institutions & practitioner partnership model

- Open source access to data and scientific papers
- Train the Trainers
- Innovate commercial potential for biosecurity collaboration – (example of CSP)
- Build experience and confidence in the tree sector
- Accessible, high-impact university-supported workshops for practitioners
- Develop knowledge on disease expression, including false symptoms
- Short, sharp specialist training – a model to deliver practical competence in disease identification.
- Development of best practice to assess disease risk and control disease introduction
- Understand biosecurity principles & application to specific disease

Case for open-source knowledge & Science

Open access (OA) journals

Journals available to readers *without financial, legal, or technical barriers*
(other than those inseparable from gaining access to the internet itself)

Start own open-access peer-reviewed journals?

- International Association for Media and Communication Research
- *Directory of Open Access Journals (DOAJ)*
- *International Free and Open Source Software Law Review*
- *International Journal of U- and E- Services, Science and Technology*
- *Technology Innovation Management Review*
- *SciTechnology – International Publisher of Science, Technology & Medicine*

Biosecurity & British Standards

British Standard (BS8545: 2014)
Trees: from nursery independence in the landscape - Recommendations

Para 8.6 *Biosecurity*

- Biosecurity is an important consideration, and appropriate measures should be taken to minimize the introduction and spread of harmful organisms (*Signpost to FC website*)

British Standard (BS3998:2010)
Treework –Recommendations

Para 4.3 Avoiding transmission of pests and pathogens

- Extreme caution...to prevent introduction of pests & pathogens into UK on tools & equipment *previously used abroad*.
- Avoid transmission of pests and pathogens from tree to tree and from site to site. (*Signpost to Plant Health Service & Forestry Commission*)

7 Key Biosecurity – how serious are we?
CSP Action Points

1. **Enforceable contingency protocols to be followed in event of outbreak**
2. **Biosecurity protocols** key to reducing CSP introduction risk & spread in UK. Protocols to be common working practice, disseminated across sector, including tree nurseries.
3. **Awareness of clonal imports**: Nursery trade to be aware of danger of clonal imports branded as 'resistant' or 'tolerant'. Recommended such unacceptable biosecurity risk - importation ban
4. **Quarantine of imported nursery stock**: Imported plane trees to be grown on by importing nursery for 12 months before being sold on. Any symptomatic stock to be reported FC.
5. **Maintaining & extending monitoring programmes** already underway for *C. platani* (e.g. London) to be maintained and rolled out nationally. CSP disease awareness initiatives to alert key symptoms should be core sector objective.
6. ***Standard practice for all arboricultural contractors,* sector training & certification**: E.g FC *Keep It Clean* campaign - sector drive to adopt biosecurity protocols for controlling pathogens as - not subject to voluntary uptake.
7. **Regular updating of certification of bio-security competence: *a pre-requisite to obtain work within the industry*** *and a condition of insurance*.

A European study experience

Treework Environmental Practice

Hot-house learning, intense competence training

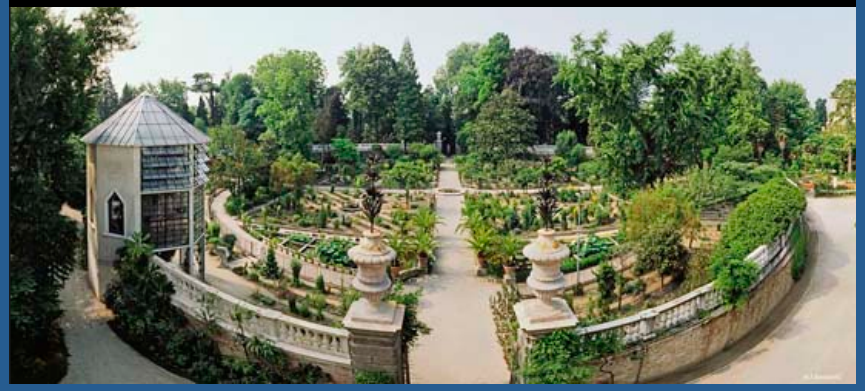
A Soil Study Weekend

on

Trees, soil, disease & resilience

May 2017

Orto Botanico, University of Padova



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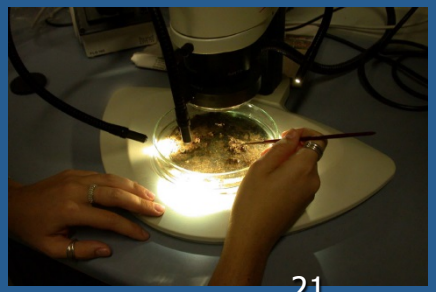
Ecology & dynamics of the mycorhizosphere

- Prof Concheri ..... *Soil & nutrition*
- Prof Squartini ..... *Soil microflora & microfauna*
- Dr. Dal Maso ..... *Root parasites & mutualists*



Founded 1545 for study of medicine as open-air medicinal plant laboratory (now Unesco Heritage Site)

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