Managing data challenges for evidence-based policy making.

Willem Roelofs
willem.roelofs@defra.gsi.gov.uk

Date: Wednesday 2nd April
Policy Landscape

• PH is one of Defra’s four strategic objectives:
  – grow the rural economy
  – improve the environment
  – safeguard plant health
  – safeguard animal health

• Cross-cutting
  – Natural Science
  – Social Science
  – Economics
  – Modelling / Statistics
Taskforce Key Recommendations:

A. National Context
- Develop a prioritised UK Plant Health Risk Register.
- Appoint a Chief Plant Health Officer to own the UK Plant Health Risk Register and to provide strategic and tactical leadership for managing those risks.
- Develop and implement procedures for preparedness and contingency planning to predict, monitor, and control the spread of pests and pathogens.
- Review, simplify, and strengthen governance and legislation.

B. International Context
- Improve the use of epidemiological intelligence from EU/other regions and work to improve the EU regulations concerned with tree health and plant biosecurity.
- Strengthen biosecurity to reduce risks at the border and within the UK.

C. Capabilities and Communication
- Develop a modern, user-friendly system to provide quick and intelligent access to information about tree health and plant biosecurity.
- Address key skills shortages.
Evidence

• Evidence: information used to support decisions in developing, implementing and evaluating policy, operations and services.

• Aspiration:
  – Ensure all PH activity is informed by robust evidence
  – Interdisciplinary
  – Proactively share evidence across government, industry and the public and at EU & global levels.
  – Undertake R&D that is policy driven
  – Work collaboratively (coordination, cooperation)
  – Evaluation of activities
Obtaining Evidence

• Observational Evidence

  Data Capture
  (government surveillance for known and new threats and observations reported by citizens, volunteer networks and NGOs)

  1\textsuperscript{st} Processing
  (diagnostics, data storage, processing & management)

  2\textsuperscript{nd} Processing
  (epidemiology, modelling, statistics, performance indicators, risk analysis, impact assessments, research)

  Observations translated into information

  Informed Gov, Response
  (policy formulation, evaluation and emergency response)

  Observational evidence flow

• Targeted R&D
Use of Evidence

• Task Force
  – Risk Register / Horizon Scanning
    • Prioritisation
  – Contingency Planning
  – Epidemiological Intelligence
    • Modelling Spread
  – Develop systems for quick & intelligent access to information

• PRA

• Policy Options:
  – Assess impact in design stage
  – Evaluation
Risk Register

• **Aim:**
  - To **identify** the greatest plant health threats to UK crops, trees, gardens and ecosystems
  - To provide a framework for decision making on **priorities** for actions

• **Ratings (unmitigated and mitigated) for:**
  - \( L \) = Likelihood of the risk arising
  - \( I \) = Impact on the host plants if it does
  - \( V \) = Value of the host plants in the UK

• **Overall risk rating =** \( L \times I \times V \) (on a 1-125 scale)

on a 1-5 scale
Contingency Planning

• Allows us to carry out a rapid response to an outbreak or prevent outbreaks
  – Use case studies for contingency planning

• **Predict & monitor** the spread of pests and pathogens to inform control strategies:
  – Eradication
  – Containment
  – Slow spread & manage impacts
  – Adaptation
  – Increase Resistance (plant level) & Resilience (landscape level)
Epidemiological Intelligence

Data Requirements
- Host
- Pest/Pathogen
- Environment

Where do we get data from?
- Pest/Pathogen
  - What can we learn from previous outbreaks?
  - What can we learn from outbreaks elsewhere?
- Host:
  - What / Where are they?
- Environment:
  - How do weather conditions affect impact?
Develop Systems

• Existing Systems:
  – CABI Bioscience
  – EPPO PQR
  – Fera PHIW
  – …

• Gaps:
  – Single portal for PH Information?
  – Data sharing (epidemiology)
  – Citizen Science
  – Host distributions
Horizon Scanning

• How to predict next (unknown) pest
  – Analysis of known threats
    • Pathways
    • Host species
    • Taxa
  – Sentinel Plant Networks
    • Host identification
  – Analyse Trade patterns
  – Monitoring Media
    • ProMed / MediSys
  – Use stakeholders
PRA

• Entry
  – Where is it now?
  – What are current hosts?
  – What are pathways?

• Establishment
  – Can it survive (hosts, climate)

• Spread
  – How fast? How far? To what hosts?

• Impact
  – Economic, Social, Environmental?
Evaluation

- Evidence needed
  - to help develop control strategies before a pest or disease arrives
  - to monitor the success of these strategies once the pest or disease has established
Strategies for Obtaining Evidence

• National R&D
  – Sharing outcomes?
  – Co-planning / Aligning R&D programmes

• Multinational / International R&D
  – Benefits:
    • Leveraging funds
    • Expertise and opportunities
  – Disadvantages
    • Effort and admin
    • Less control?
    • Less relevant?
Data Sharing

• Opportunities
  – More value out of existing data
  – Development of new approaches
  – Examples:
    • Anoplophora outbreak in Kent
    • Chalara - Fraxback

• Barriers
  – Lack of recognition
  – Cost
  – Compatibility of systems
Managing Uncertainty

• Uncertainty caused by limited information on:
  – Pest/Pathogen
  – Effectiveness of control strategies
  – Impacts

• Risks of not managing uncertainty:
  – Impact on policy decisions and control strategies

• Future R&D

• Essential to assess impact of uncertainty (quantitatively or qualitatively)
  – Quantitative: Stochastic Modelling
  – Qualitative: Expert Judgement / Uncertainty Tables
Examples

- **PRA**
  - Use of BBNs instead of conventional scoring systems

- **Spread**
Conclusions

• Evidence is essential for safeguarding plant health
  – Many activities in PH depend on access to data
    • Access to many types of data still limited
  – We need to
    • Obtain access to different types of data
    • Better engagement between data users and data collectors
    • Build better systems for easy access
    • Share data to obtain the most benefit from existing data sets

• We need to understand strengths / weaknesses of evidence
  – Uncertainty Analysis
    • Inform policy decisions
    • Prioritise evidence gathering