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Plant disease risk, management and policy formulation

A Rural Economy and Land Use research project investigating how integrating natural and social science perspectives and improving stakeholder engagement can enhance our management of plant diseases.

Potato late blight on a leaf; photo courtesy of the Food and Environment Research Agency

Policy and Practice Notes

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The Rural Economy and Land Use Programme is a UK-wide research programme carrying out interdisciplinary research on the multiple challenges facing rural areas. It is funded by the Economic and Social Research Council, the Biotechnology and Biological Sciences Research Council and the Natural Environment Research Council, with additional funding from the Scottish Government and the Department for Environment, Food and Rural Affairs.

We rely on plants for many ecosystem services. They underpin our food production and security, and provide habitat for wildlife and amenities for people. Whilst growers are often able to manage existing pests and pathogens on commercial crops, increased volume and diversity of trade are resulting in many new potential threats to the health of our plants, both cultivated and wild. There are international methodologies for pest risk analysis but currently these are based primarily on technical assessments. An integrated approach, using not just a good technical analysis, but also taking into account social and economic parameters, would enhance policy making for plant disease management. Better engagement with stakeholders will be needed to achieve this.

Why are plant diseases a problem?

Plant diseases can cause widespread damage to both crops and native flora, threatening food security and biodiversity.

Identifying and responding to these threats is difficult because:

— Although endemic diseases are often well described and understood, new, unfamiliar pests and pathogens may be brought in on plants and plant produce through commercial trade or personal imports.
— These non-indigenous organisms may be previously unknown to science or have little impact in their regions of origin, but in a new ecosystem some may cause serious damage.
— In some cases climate change may alter their impact so that an organism previously regarded as harmless poses a threat.
— We may lack information about their biology, and effective control/eradication methods may not have been developed.
— New organisms may not be detected for some time, or the end users may not recognise their potential impact.

How do we assess the risks associated with different plant diseases?

There is an internationally agreed system of plant health regulation:

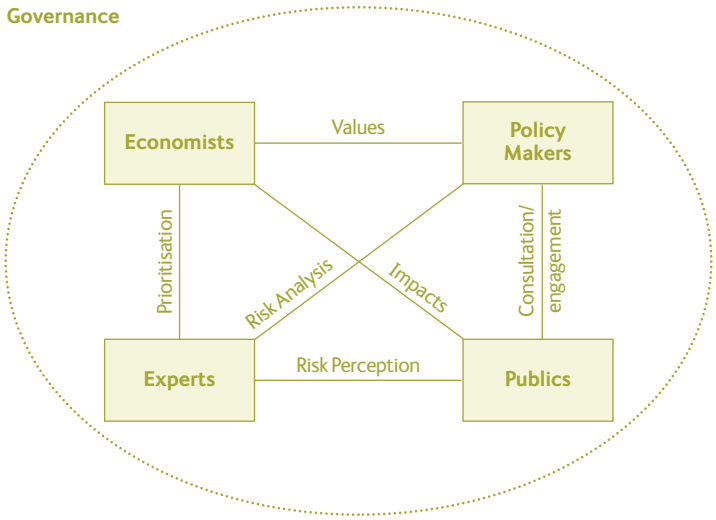
— It is designed to prevent the spread of serious plant pests and pathogens whilst still facilitating competitive international trade in plants and their products.
— A technically orientated pest risk analysis process provides the evidence base.
— There are international guidelines on the content and the methodology of the risk assessment, management and communication involved.

What are the potential weaknesses of this system?

The system has several areas of potential weakness:

— The emphasis on technical data and the lack of wider interdisciplinary inputs can lead to an incomplete understanding of the supply chain, and reduce the effectiveness of proposed approaches to disease mitigation.
— There is no transparent and strategic framework for involving the broader community of stakeholders in the process of risk assessment and disease governance.
— The lack of stakeholder involvement may weaken disease mitigation because evidence suggests that where stakeholders are effectively involved they are more likely to accept responsibility for implementing such measures.

This governance model embraces both the key players who may need to interact (represented by the nodes) and the potential interactions/tensions between them (shown on the axes between the nodes)



What additional sources of evidence should we use?

Sources should include more than just technical assessments from a limited number of scientists. Involving relevant stakeholders can mean that important information is included that might otherwise be missed.

It is important to bear in mind that:

— Local knowledge (which may often be qualitative rather than quantitative) can provide important contextual information about how diseases are arriving and spreading, and whether proposed mitigation methods will work.

— Social and political risks associated with disease management methods can lead to the undermining of effective action.

— A thorough analysis of socio-economic drivers and impacts may help prevent the adoption of behaviours that increase risks and/or limit remedies.

— Stakeholders' own approach to risk may be based on subjective and emotional judgements as well as technical analysis.

Who are the stakeholders and how are they connected?

International trade in plants and plant produce can involve extended and complex supply chains.

We must:

— Find a way of identifying and involving stakeholders with the whole range of political, economic, social and environmental perspectives.

— Identify public stakeholders, growers, transport companies, wholesale importers and distributors, retailers and end users, including, for example, local authorities and non-governmental organisations, as well as individual members of the public.

— Remember that expert stakeholders should include social as well as natural scientists and those outside Government, as well as risk assessors in government agencies.

— Integrate a broad perspective of costs and benefits into economic assessments, not simply restrict these to government expenditure.

— Note that relevant policy makers are not just those who have direct responsibilities for plant health, but also include officials with connected interests such as pesticide regulators and conservation authorities.

What are the implications for decision makers?

The research has some important messages for how policy is formulated:

— Stakeholder communities vary substantially in relation to different plants and plant products. Policy makers need to undertake effective mapping of stakeholders in order to identify all the relevant parties and their interests/influence.

— There needs to be an interdisciplinary approach that produces integrated, holistic models of risk assessment and disease management, based on both professional and relevant lay knowledge.

— Disease management programmes need to be more flexible in terms of solutions and have the ability to change as new data emerge. Different circumstances may require very different solutions, including non-regulatory ones such as insurance or public education.

— More consideration should be given to precautionary rather than reactive regulatory action.

— There are useful lessons that policymakers in animal and plant disease could share across their disciplines if the process became more joined up.

Further information

The research has been carried out at the universities of Warwick and Gloucester, Harper Adams University College, Imperial College London and the Central Science Laboratory.

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Project Website: http://www.harper-adams.ac.uk/groups/crops/relu/

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