CHAPTER 1

NEW APPROACHES TO THE ECONOMICS OF PLANT HEALTH

General introduction

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INTRODUCTION

The protection of plant health and natural habitats is an important issue in many countries all over the world. Although the probability of a catastrophe due to introduction and spread of new plant diseases is generally very low, the economic and environmental impacts can be extremely large if a pest does occur (Knowler and Barbier 2000). OTA (1993) estimated the cumulative damage costs from alien species in the USA to be about $100 billion, for a selected group of pests over 85 years; for all introduced pests (some 50,000 species), the costs were estimated at $123 billion per year (Pimentel et al. 1999). Moreover, the probability of introducing non-indigenous organisms is rising due to: (1) increase in world trade; (2) population mobility and tourism; (3) increase in information, communication, technology and wealth in developed countries creating a demand for exotic plant material; (4) habitat fragmentation that may increase vulnerability; and (5) a general tendency towards the globalisation of the world economy (Shogren 2000).

In most countries, national plant health services have been assigned the task of safeguarding the national plant health situation. Under EU legislation, national plant health services are required to inhibit the introduction and spread of organisms harmful to plants or plant products (Plant Protection Service 2004). A distinction is made between harmful organisms not known to occur in the EU (A1 organisms), harmful organisms known to occur in the EU (A2 organisms), and harmful organisms that are not known in certain protected areas (B organisms). The plant health situation in particular is more generally affected by actions of all those actors

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involved in activities related to plant production and trade. The risk of a pest occurring has to be considered as an endogenous variable, influenced by economic activities that *create* risk and by economic activities that *reduce* risk. Examples of the former are international trade in plants and plant materials, production of crops, tourism and more general transport of goods and people (see, e.g. Dalmazzone 2000). Examples of activities aimed at reducing phytosanitary risks are: activities related to eradication, containment, prevention and monitoring of pests and diseases.

Phytosanitary policy worldwide is placed in the context of the WTO agreement on *Sanitary and Phytosanitary Measures* (SPS agreement); for alien species, policy is placed in the context of the Convention on Biological Diversity (CBD). Among others, the SPS agreement requires a scientific underpinning for trade-restricting measures based on the international standards, guidelines and recommendations developed under the auspices of the Secretariat of the IPPC. An example of such a standard is the standard for pest risk analysis in ISPM-11 (FAO 2003). More generally, governments worldwide are under increasing pressure of stakeholders from business and society. Stakeholders from business demand a rationalisation of phytosanitary policy in order to avoid unjustified trade restrictions and increase the efficiency of the plant production system. Stakeholders from society want to increase the scope of phytosanitary policy from the protection of the economic plant production system to the natural ecosystem.

SCOPE OF THE BOOK

Substantial methodological advances still have to be made regarding the economic modelling of harmful organisms as referred to in the SPS. The underlying book presents a number of methodological advancements on modelling and measuring the economic and environmental risk of harmful organisms. The book contains twelve papers that were presented at the Frontis Workshop on the Economics of Plant Health that was organised in Wageningen from 4 to 6 June 2005.

The book begins in Part I with two papers that aim at measuring the costs and benefits of phytosanitary measures in Finland and the UK, respectively. This is followed in Part II by a number of studies that evaluate the risks and economic effects of quarantine measures using spatially explicit bio-economic models. The studies in this part provide applications to Potato Brown Rot in the Netherlands and Asiatic Citrus Canker in the US. Next, Part III presents three novel attempts to model inspection policy regimes in the Netherlands and the US. The general problem addressed in these papers is: how to allocate scarce resources available for inspection of imported plants and plant materials so as to minimize the risks of pest incursion. Part IV presents two studies providing general frameworks for analysing the environmental and economic risks of pests and invasive species. The two chapters have a broad scope as they address the risks for the economic and ecological systems from harmful organisms and invasive species. Finally, Part V of the book demonstrates the usefulness of *Contingent Valuation Method* and *Multicriteria Analysis* in modelling the (non-monetary) impacts of plant health

policies on the environment and society at large. These tools are useful in measuring impacts of plant health policies on natural habitats, landscapes and society at large.

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