



## Modelling the Control of an Infectious Disease in the Plant Nursery Trade

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**Niels Bohrs Vej 9, 6700 Esbjerg**

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### Abstract

The ornamental plant trade has been identified as a key introduction pathway for plant pathogens. Establishing effective biosecurity measures to reduce the risk of plant pathogen outbreaks in the live plant trade is therefore important. Management of invasive pathogens has been identified as a weakest link public good, and thus is reliant on the actions of individual private agents. This paper therefore provides an analysis of the impact of the private agents' biosecurity decisions on pathogen prevention and control within the plant trade. We model the impact that an infectious disease has on a plant nursery under a constant pressure of potentially infected input plant materials, like seeds and saplings, where the spread of the disease reduces the value of mature plants. We explore six scenarios to understand the influence of three key bioeconomic parameters; the disease's basic reproductive number, the loss in value of a mature plant from acquiring an infection and the cost-effectiveness of restriction. The results characterise the disease dynamics within the nursery and explore the trade-offs and synergies between the optimal level of efforts on restriction strategies (actions to prevent buying infected inputs), and on removal of infected plants in the nursery. For diseases that can be easily controlled, restriction and removal are substitutable strategies. In contrast, for highly infectious diseases, restriction and removal are often found to be complementary, provided that restriction is cost-effective and the optimal level of removal is non-zero.

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**About the speaker:** *Dr Julia Touza (University of York) is an environmental economist, interested in the ecological-economic analysis of ecosystem management and how to make take better decision when facing environmental human-driven risks. She has held a Marie Curie Research Fellowship at the Ecological Modelling department at the Helmholtz Centre of Environmental Research-UFZ (Germany) and is a Research Associate with the ecoSERVICES Group, Arizona State University (USA).*

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