Including the costs of plant disease into risk analyses related to food security

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Abstract

A simple way of looking at the costs of plant diseases is to think that 'If disease wasn't there we'd have higher yield, and spend less money on fungicides'.

One way of calculating the costs of disease is to include the quantitative crop loss added with the costs of fungicide, wheel track damage, labour, fuel and machinery, CO2 emissions, poorer quality and storability and effects related to all people and processes involved in the refinement of products (Haverkort *et al*., 2008). The crop losses can be estimated with a number of methods and the choice of method will strongly affect the outcome. A common way of estimating crop loss quantitatively is to measure the difference in yield between a disease free plot, obtained by intense fungicide treatment, and an untreated plot. For both of these sets of calculations, however, one needs to define what is a loss and what is a normal yield, since this varies between production system intensity, geographic location, and attitudes to the use of pesticides. It is also useful to classify the different diseases that may affect a particular production system. If one classifies them as chronic, acute or emerging (Savary *et al*. 2011), society may be able to deal with the ones that chronically affect the system, with less preparedness for acute diseases, and often no awareness of the emerging ones. Thus, one may estimate the costs of the chronic diseases, but the other categories may not have appeared on the production 'radar'. Clues about these costs could come from other disease typologies, such as those based on their epidemiological characteristics, or dispersal modes.