

## **Climate and Potential Yield Losses to Fungal Plant Pathogens**

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Plant diseases are major causes of crop yield losses and exert a financial burden via expenditure on disease control. The magnitude of these burdens varies with biological, environmental and management factors, but this variation is poorly understood. Here we model the effects of weather on potential yield losses due to fungal plant pathogens using experimental trials of fungicide-treated and untreated cereal crops in the UK, and project future potential yield loss under climate change. We find that potential yield loss varies between 10 and 20 % of fungicide-treated yields depending on crop, and increases under warmer winter and wetter spring conditions. Potential yield loss will increase for winter wheat and winter barley under climate change, while declining for spring crops due to drier summers. Mean potential yield loss is comparable to the effects of varietal variation but less than the effect of adverse weather. Analysis of yield differences between fungicide-treated and untreated crops provides a new way to understand climate change responses of plant disease, which complements modelling of infection risk by specific pathogens.