Black Leaf Streak Disease (BLSD) is the most severe foliar disease of banana and plantain. BLSD is caused by Pseudocercospora fijiensis, an ascomycete fungus which produces wind-borne spores responsible for its spatial dispersal. In order to evaluate the BLSD long-distance dispersal and to better understand the effect of environmental factors on its invasive spatial spread, a spatiotemporal study was set up during the recent BLSD invasion in the Martinique island (FWI). Disease detection was carried out from September 2010 to May 2012 and sampling squares were defined from a regular spatial grid built over the island. In this paper, we consider a stochastic model of spatio-temporal propagation of BLSD in an heterogeneous landscape and we present mathematical and computational results for this continuous-time model. Statistical inference of parameters is carried out from presence-absence data using a Bayesian framework based on a data augmentation method with respect to square first colonization times. Parameter posterior distribution calculations made possible the evaluation of the BLSD long-distance dispersal and land-cover influence on the disease propagation. Our results enabled the reenactment of the invasion.
References

A Spatio-temporal Stochastic Model for an Emerging Plant Disease Spread in a Heterogeneous Landscape


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Index Terms

Computer Science

Applied Sciences

Keywords

Stochastic process, Likelihood, MCMC, Bayesian inference, Data augmentation, BLSD