

## MODELLING AND CONTROLLING FUNGUS *HEMILEIA VASTATRIX*, A COFFEE PEST

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Coffee is the second most important commodity behind oil in the international trade. However its production is affected by several diseases. The coffee leaf rust, a cryptogamic disease caused by the fungus *Hemileia vastatrix*, is the most serious leaf disease known to date. It causes damages that induce severe yield losses (up to 50%). Its control mainly relies on cultural practices and fungicides, which have limited efficiency and harmful ecological impact.

Our goal is to estimate the damages caused by *H. vastatrix* and to control the disease. We formulate and study a spatio-temporal model for the propagation of *H. vastatrix* on a coffee tree. The model takes into account the logistic growth of young branches, the seasonal production of flowers or berries and the diffusion of urediniospores. We then introduce an integrate chemical and physical controls. Numerical simulations are performed using non-standard methods for partial differential equations to illustrate and validate theoretical results.