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Black leaf streak disease (BLSD), caused by the airborne ascomycete *Pseudocercospora fiji*ensis, is the main constraint of banana production for export, due to its impact on leaves, fruit ripening and marketable yield. In countries growing susceptible cultivars, the disease is managed by frequent aerial applications of fungicides (about 50 per year in Costa Rica). Alternative strategies are crucial to reduce the negative impact of chemicals on the environment, but experiments to develop such strategies are difficult to implement at the scale of a production basin (e.g. several hundred hectares). Therefore, modelling is a key approach to identify innovative scenarios to reduce the use of pesticides while maintaining efficient control of the disease.

In this study, we assess the performance of different spatiotemporal strategies to reduce pesticide use. These strategies, chosen with banana producers, are either directly based on fungicide applications (reduction of application frequency, spatial coverage or dose), or based on the deployment of resistant cultivars (increase in spatial coverage, resistance efficiency, choice of target pathogen traits). To test these strategies, we adapted the mathematical spatially-explicit model *landsepi* to simulate BLSD epidemics in a real agricultural landscape from Costa Rica. Using this model, we plan to compare the yield and epidemiological control provided by the simulated control strategies in a real 300-ha banana production basin. More than 11,000 simulations are currently running and will help identify the most promising strategies to test in the field.

Keywords: black leaf streak, fungicide application, mathematical model, resistance deployment, simulation modelling