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IMPACT OF PARTIAL RESISTANCE IN MANGO TO *XANTHOMONAS* SP. PV. *MANGIFERAEINDICAE* ON THE TEMPORAL AND SPATIAL DEVELOPMENT OF BACTERIAL BLACK SPOT DISEASE

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Background and objectives

Mango Bacterial Black Spot (MBBS) is a potentially destructive disease in many tropical and subtropical areas of Asia, Eastern Africa and Oceania (2). Control is attempted through IPM techniques mainly consisting of prophylactic measures and copper sprays. A limited number of mango cultivars with desirable agronomic traits are partially resistant to *Xanthomonas* sp. pv. *mangiferaeindicae* (*Xm*), the causal agent of MBBS. No quantitative epidemiology data is available on this pathosystem. Our objectives were to (i) describe the temporal and spatial development of MBBS in an area conducive to epidemics and (ii) evaluate the impact of partial resistance on disease development.

Materials and methods

Experimental design consisted of one plot (approx. 250 trees) of cultivar Haden (highly susceptible) and one of cv. Heidi (partially resistant) (1), and was monitored for 2.5 years after establishment. A first set of plots was established in Oct. 1998 in Saint Pierre (Réunion Island) CIRAD experimental station and a second set was established in December 2001. Disease incidence and severity were determined. Temporal analyses were performed by nonlinear regression analysis. Logistic, Gompertz and probit link function models were used. Akaike information criterion was used to retain the most appropriate model. We compared the experiments through the model parameters using likelihood ratio test. Spatial autocorrelation analyses were performed to explore spatial data structure (3).

Results and discussion

All trees remained disease-free until the occurrence of a tropical storm. Disease incidence exceeded 0.95 in all plots. Gompertz was the most appropriate model for describing the temporal increase of incidence. Rates of disease increase (r_G) were not statistically different on the susceptible and partially resistant cvs. However, disease severity on the susceptible cv. was up to 100 times higher. Furthermore, lab experiments indicated that *Xm* population sizes in one month-old lesions on the partially resistant cv. were approx. 100 times less than on the susceptible cv. No aggregation was detected early in the epidemics. Aggregated patterns were detected after 5-7 months and 17-20 months on the susceptible and partially resistant cv., respectively. In contrast with the susceptible cv., the size of core clusters for the plots established with the partially resistant cv. did not increase over time. No directionality of spatial patterns was observed on the susceptible cv.

Analyses based on *Xm in planta* growth and spatial MBBS patterns could be helpful for evaluating partial resistance to *Xm* in promising material from breeding programs.

References

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