# Improved knowledge on key epidemiological parameters to optimize management strategies against sharka

Sylvie Dallot, Gaël Thébaud

# Improved knowledge on key epidemiological parameters to optimize management strategies against sharka

**DALLOT Sylvie and THEBAUD Gaël**

PHIM Plant Health Institute, INRAE, Univ Montpellier, CIRAD, Institut Agro, IRD, Montpellier, France

Sharka is a major viral disease of stone fruits (*Prunus*) worldwide, reducing both fruit quality and yield. Caused by *Plum pox virus* (PPV, family *Potyviridae*, genus *Potyvirus*), the disease is spread over long distances by the propagation and transport of infected plant material and locally by aphids in a nonpersistent manner. Depending on the agricultural and epidemiological context, various management strategies (i.e., eradication, containment or resilience) have been implemented in different regions of the world.

Apart from strategies to breed resistant, hypersensitive or tolerant cultivars that are not yet available for all *Prunus* species, prophylaxis, surveillance and tree removals remain the only options to mitigate the impact of sharka and to prevent the spread of new PPV variants. The design of sustainable management strategies, especially in the context of the recent European downregulation of PPV, requires a good understanding of the factors driving virus evolution and disease dynamics, from the tree to the landscape scales.

To gain insights into the processes and parameters underlying epidemic dynamics, we use complementary approaches including experiments under controlled conditions, field surveys, and parameter estimations from disease surveillance databases. We work on key epidemiological parameters acting at the scale of the tree (e.g., interactions between PPV strains and *Prunus* species, duration of the latent period, aphid transmission rates) or at the landscape scale (aphid dispersal function). These parameters are integrated in a modelling framework to simulate epidemics in different types of landscapes and to identify the most effective sharka management strategies.

Key words: sharka, surveillance, management, epidemiological parameters, modeling