From local to large spatial scales : analyses of environmental factors that influence bacteria canker disease severity in kiwifruit orchards in France

Christelle Lacroix[1], Marie-Lisa Brachet[2], Samuel Soubeyrand[3], Cindy E. Morris[1]

[1]INRA, UR 407 Pathologie Végétale, Centre de Recherche PACA, Montfavet, France
[2]CTIFL, Centre de Lanxade, Prigonrieux, France
[3]INRA, UR 546 Biostatistiques et processus spatiaux, Centre de Recherche PACA, Avignon, France

Within-field characteristics (e.g. host susceptibility and crop practices) often determine plant disease severity, but symptom intensity also can be controlled by processes at larger spatial scales. The most recent and economically important disease caused by *Pseudomonas syringae* strains is kiwifruit bacteria canker disease, which alters plant health through leaf necrotic spots, bud necrosis, wood exudates and canker[1]. One of the main control method is based on copper compounds[2]. However, the intensity of symptoms induced by *P. syringae* strains varies greatly with environmental conditions and remains hardly predictable[3]. Dissemination of *P. syringae* occur over local to long distances, as bacteria cells can be uplifted by wind, reach cloud height and be deposited with precipitation[4]. Hence, symptoms intensity could also be controlled by larger scales processes, from landscape characteristics immediately around fields to among-orchards connectivity through trajectories of air masses associated with precipitation. To assess the role of these factors on disease severity, a two-year field survey of symptoms has been conducted in 49 kiwifruit orchards from two production basins in France. Co-variables associated with crop practices (e.g. chemical inputs, planting density) and soil properties (e.g. soil pH) within orchards were recorded, as well as with the local context (e.g. number of health status of kiwifruit crops) in a one km² radius around orchards. Backward trajectories of air masses associated with rain precipitation on kiwifruit orchards will be calculated using HYSPLIT (Hybrid Single Particle Lagrangian Integrated Trajectory Model)[5], and atmospheric connectivity network among orchards will be determined based on the most probable trajectories of aerial dissemination. The joint analysis of processes at various spatial scales will yield important insights on factors that influence the intensity of bacteria canker disease symptoms in kiwifruit orchards.

Références éventuelles en Arial, 8, minuscule, normal

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