The severity of kiwi (Actinidia deliciosa) bacterial canker disease under conditions of nitrogen and water stresses

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Crop plants are often under multiple biotic and abiotic pressures. *Pseudomonas syringae* pv. *actinidiae* (Psa, phylogroup 1) strains cause one of the most recent and economically important disease caused by strains of the *P. syringae* species complex. The global epidemic has resulted in the destruction of thousands of kiwifruit hectares worldwide and to significant yield losses. Bacterial canker of kiwifruit affects tree health through different types of leaf and wood tissue alterations, which can lead to tree health decline and death. There is no entirely efficient mean to cure these perennial plants from Psa infections. Producers have to manage plant health in the presence of the disease over long periods of time, and rely mainly on prophylactic methods including, the disinfection of tools, the surveillance of symptoms, and pruning of symptomatic canes. However, symptoms expression is highly variable across time and environmental conditions, and remains hardly predictable. Hence, disease management in kiwifruit orchards remains difficult due to gaps of information on the effects of abiotic factors on disease severity. While the effects of individual stresses on plant development have largely been investigated, the effects of combined stresses on plant health are still little understood. In this project, we have analyzed the effects of different abiotic factors (e.g. relative humidity, temperature, water and nutrient deficiency), alone or in combination, on the severity of symptoms of kiwifruit bacteria canker disease and on plant health. The experiments have been performed in controlled conditions, where abiotic stresses were applied after Psa inoculations to kiwifruit plants as an approach to field situations where producers have to manage crop health with established plant diseases. The knowledge derived from these data will reinforce a corpus of knowledge for a better management and preservation of plant health when faced with multiple abiotic and biotic stresses.