



**Fact Sheet:**

**Psa, non-New Zealand biovars**

*Pseudomonas syringae pv. actinidiae*

Different outbreaks of Psa have been caused by five related, but genetically distinct lineages of *Pseudomonas syringae* and it is likely that many more exist in wild kiwifruit populations. Psa1 (Japan, Italy) and Psa2 (Korea), are of particular concern as these strains are more virulent against Hayward cultivars than the Psa-V strain currently in NZ. New genetic material of any strain is a concern due to the potential of horizontal gene transfer and the impact new strains may have on new or existing kiwifruit cultivars.

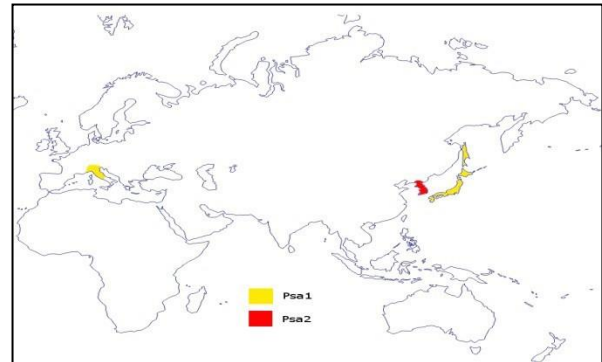
Biovar	Countries	Virulence
1	Japan Italy	High virulence, especially to Hayward cultivars
2	Korea	High virulence, especially to Hayward cultivars
3 (Psa-V)	Italy, Chile, China, NZ, France, Portugal, Japan, Korea	High virulence, especially Hort16A cultivar. Less virulent on Hayward than Psa1 & Psa 2
4 (Psa-LV)	NZ Australia	Low virulence
5	Japan	Low virulence

New strains of Psa are also expected to evolve within New Zealand of which the characteristics and virulence to new and existing kiwifruit cultivars are unknown. Good biosecurity practices are vital to prevent the spread of any new strains between orchards and growing regions.

**Distribution and climate range**

Psa is a bacterium that is thought to have existed in kiwifruit for thousands of years. It is most active between 10 to 20°C and is limited at temperatures above 25°C. There is no evidence to suggest the various strains respond to a different temperature or climatic range.

Virulent strains not found in NZ are currently restricted to Japan, Italy and Korea.



Distribution of non-NZ Psa biovars, Psa1 shown in yellow, Psa2 shown in red.

**Signs and symptoms**

Psa can be recognised visually by its characteristic symptoms (leaf halos, red exudate, cane die back) and verified through PCR analysis. PCR tests are available for non-NZ biovars and any symptomatic material in New Zealand that returns a non-detected result for Psa-V (Psa3) is also tested for Psa1 and Psa2.



Symptoms of Psa1 on Hayward in Japan

**Control**

Control measures are well documented and pertinent to each growing region but based on consistent principles of limiting spread and keeping inoculum loads low.

**What should you do if you think you have seen this pest?**

Phone MPI on 0800 80 99 66 or KVH on 0800 665 825.

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