

Xanthomonas fragariae Kennedy and King 1962



Fig. 1. Upper leaf symptoms (a), bacterial oozing b), and lower leaf symptoms caused by *Xanthomonas fragariae* (c). Photo credits A. Young.

Common name: Angular Leaf Spot (ALS)

Causal agent: *Xanthomonas fragariae*

Classification: K: Bacteria; P: Proteobacteria; C: Gammaproteobacteria; O: Xanthomonadales; F: Xanthomonadaceae; G: Xanthomonas.

Xanthomonas fragariae (Fig. 1) is an exotic bacterial pathogen of strawberry. It is normally distributed in North America, South America and Europe, where it causes significant yield losses via destruction of the leaves and occasionally flowers of the plant.

Host Range:

Like most *Xanthomonas* strains, *X. fragariae* is very host specific. Its only known host is strawberry, with attempted inoculations onto other members of the Rosaceae all proving fruitless.

Impact:

Given its normal distribution in cooler climates, it is not surprising that the effects of infection are most apparent when conditions are cool and wet. When prevalent, yield losses to ALS can be severe. Like many other bacterial diseases of foliage, *X. fragariae* is favoured by overhead irrigation. It is classified under category 3 as a Quarantine Threat under the Emergency Plant Pest Response Deed.

Over the past 40 years there have been several incursions and border detections in Australia and New Zealand, all linked with the importation of latently infected planting material. Previous incursions have been successfully eradicated, owing perhaps to the absence of alternate hosts and limited dispersal means of *X. fragariae*, as well as early detection.

Key Distinguishing Features:

The foliar symptoms of ALS are immediately distinguishable from any other disease. If plants exhibit ALS symptoms, and bacterial ooze is confirmed, it is unlikely that it could be any other disease.

X. fragariae is a fastidious bacterium and takes nearly a week to appear on culture medium. As there are usually many potential contaminants on strawberry leaves, the best way to isolate *X. fragariae* is to conduct a dilution series on water-eluted ooze. This should yield cultures of numerically-superior but growth-rate inferior, whitish round colonies that eventually turn yellow, characteristic of faster-growing xanthomonads.

A currently undescribed *Xanthomonas* species is often cultured, but is not pathogenic.

Control:

The best form of control is eradication, which has been successful in the past. Copper sprays can be used to mitigate against losses to ALS, but is not as important as the use of disease-free planting material and good phytosanitation techniques.

Further Reading:

- Young *et al.* (2010) *Australasian Plant Pathology* (submitted).
- Kennedy & King (1962) *Phytopathology* **52**, 873-875.
- McGechen & Fahy (1976) *Australian Plant Pathology* **5**, 57-59.
- Gillings *et al.* (1998) *Australian Plant Pathology* **27**, 97-103.

Key Contacts: Anthony Young, Agri-Sciences, DEEDI, Indooroopilly, soon Boggo Rd. anthony.young@deedi.qld.gov.au