

Effects of Temperature, Free Moisture Duration and Inoculum Concentration on Infection of Sweet Cherry by *Pseudomonas syringae* pv. *syringae*

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The effects of temperature, free moisture duration and inoculum concentration on infection caused by *Pseudomonas syringae* pv. *syringae* (*Pss*), on sweet cherry (*Prunus avium*) were investigated. Epiphytic populations of *Pss* are an important source of inoculum for bacterial canker and it has been demonstrated that a cyclic pattern exists during the year, from undetectable during the warm and dry periods to large populations following cool and wet periods. The effects of temperature and inoculum concentration on the infection caused by *Pss* on immature fruits and 1-yr-old twigs were significant ($P < 0.001$). Fruit and twig infection increased linearly in proportion to the logarithm of *Pss* when bacterial concentrations were higher than 10^3 cfu ml⁻¹ and temperatures were between 5 and 20°C. Regardless of the inoculum concentration and the free moisture duration, fruit and twig infection was either absent or low at 5°C but it increased linearly as temperature increased from 5 to 20°C. Growth rate *in vitro* was very slow (0.03–0.04 cfu h⁻¹) at 5°C and fast (0.21–0.23 cfu h⁻¹) at 20°C. Therefore, it is possible that multiplication of the epiphytic populations may be significantly reduced in the field with air temperatures below 5°C. A significant ($P < 0.001$) effect of free moisture was obtained only when a low inoculum concentration (10^3 cfu ml⁻¹) was used, and a significant linear response between free moisture and disease incidence was obtained only at 10°C. An apparent threshold population of *Pss* higher than 10^3 cfu ml⁻¹ was needed to infect immature fruits and 1-yr-old twigs of sweet cherry.

KEY WORDS: Bacterial canker; epiphytic bacteria; pear blossom blast; sour cherry; stone fruits; sweet cherry.

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