

Protecting Sweet Cherries from Bacterial Canker

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Bacterial canker of sweet cherry causes bud mortality, twig cankers, leaf spots, flower and fruit lesions, and severe collapse and death of trees. Disease management hinges on cultural practices – trickle irrigation, good air drainage, proper soil pH, and adequate nutrition. Infections may be associated with cold damage or pruning cuts. *Pseudomonas syringae* pv. *syringae* (Pss) and *P. s.* pv. *morsprunorum* are plant epiphytes, increasing in prevalence during cool, humid weather. Although epiphytic population management relies on leaf drop and late dormant copper sprays, these sprays often fail to effectively control the disease, even in orchards without copper-resistant bacterial populations.

Our objectives were to determine if pruning stubs, copper or phosphorous acid sprays, and pruning date have potential for managing bacterial canker infection. Pruning techniques and bactericides (applied at March and April pruning times) were evaluated in replicate orchard blocks in Geneva and Highland, NY. Stub pruning (avg 20-cm-long x 3.5 cm diam) and inoculation (copper-sensitive Pss at 10⁸ cfu/ml) were done in March, April, May and post-harvest. Canker progression down stubs (severity) was assessed during the growing season.

Stub infections rarely progressed into scaffolds or trunks. Cankers progressed furthest in stubs pruned in March and least when pruning was done post-harvest. Bactericide treatments failed to prevent infections and provided less than 16% reduction in canker severity. Our results indicate the ineffectiveness of bactericides at pruning and the effectiveness of post-harvest, stub pruning to manage cankers. Reducing copper applications in orchards will slow the emergence of copper-resistant bacterial strains and reduce copper build-up in soils.

Pruning stubs lowered the risk of scaffold and trunk invasion, based on observations of 315 trees, none of which developed trunk cankers from inoculated stubs. Copper or phosphorous acid sprays failed to provide protection against bacterial canker invasion into stubs pruned in April: 0% reduction of canker progress down stubs in 2009, < 1.5% in the '09-10 dormant season, and < 16% in 2010. Stubs pruned “after harvest” showed reduced progression of canker into stubs over time (Fig 1A). Pruning “after harvest” (late July - early August) resulted in the lowest extent of canker into stubs, as shown below for Geneva NY in 2009 (Fig 1B) & 2010 (Fig 1C) and Highland NY in 2009 (Fig 1D).

Conclusions

- Copper or phosphorous acid sprays provide minimal to no protection of pruning cuts against Pss infection.
- Pruning stubs may protect against bacterial canker by ‘distancing’ the main trunk and scaffolds from invasion.
- Pruning after harvest appears to reduce bacterial canker infection risk, provided trees are pruned during dry weather conditions.

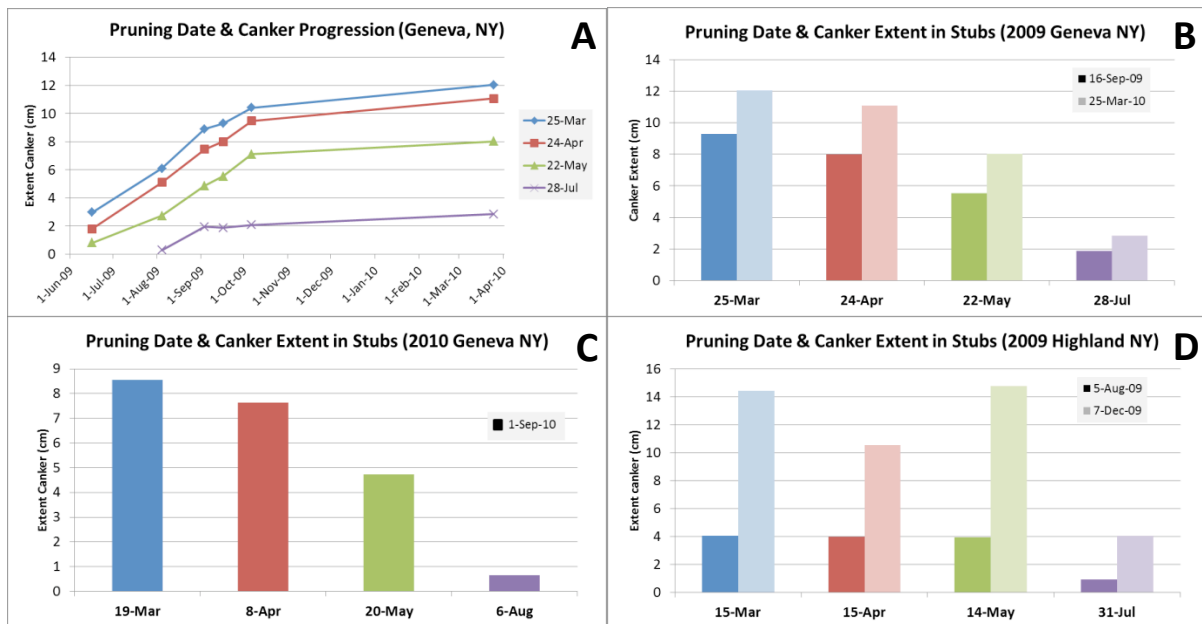


Figure 1. Effect of pruning date on bacterial canker invasion into the pruning stub. (A) Progression of canker into stubs pruned on, either, 25 March, 24 April, 22 May, or 28 July 2009. Rating dates, from June 2009 through April 2010, are given on the x-axis. (B) Extent of canker into stubs pruned on four dates in 2009 (x-axis) and rated on 16 September 2009 and 25 March 2010 in Geneva, NY. (C) Extent of canker into stubs pruned on four dates in 2010 (x-axis) and rated on 1 September 2010 in Geneva, NY. (D) Extent of canker into stubs pruned on four dates in 2009 (x-axis) and rated on 5 August 2009 and 7 December 2009 in Highland, NY.