Brief Report

# The Significance of Secondary Bloom to Fire Blight Development on Bartlett Pears in Eastern Washington

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**ABSTRACT**

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During a 2–4 yr period, fire blight infections were recorded and removed from trees in two Yakima Valley Bartlett pear orchards. Except for the second year of the study, when disease incidence was extremely low, 69.4–96.0% of the fire blight infections originated in secondary blossoms.

Fire blight literature is replete with reference to the importance of blossom infections by *Erwinia amylovora* (Burr.) Winsl. et al (3,5–9). In contrast, there are no quantitative data on the significance of secondary (rat-tail) bloom on pear (*Pyrus communis* L.) to the number of infections throughout the growing season. Over the past 20–25 yr in central Washington, fire blight has seldom been found before mid-June even though the primary blossom period is generally mid- to late April. As in southern Ontario (1,4), the temperature during bloom in central Washington is generally too cool for fire blight infection to occur. On the basis of grower experience, for many years pathologists have recommended the removal of secondary blossoms as a fire blight control practice (2). Therefore, studies were conducted to determine the relative importance of secondary blossoms in the development of fire blight infection and the practicality of removing this bloom as a control measure.

## MATERIALS AND METHODS

Two Bartlett pear orchards with recent histories of fire blight were selected for this study. No fire blight control measures were used in the experimental portion of the orchards other than removal of cankers, and new fire blight infections were removed and recorded on a weekly basis during the growing season. Orchard I, located near Sawyer, Washington, was examined for 4 yr, and orchard II, west of Yakima, on the north slope of Ahtanum Ridge, was examined for 3 yr.

The orchards were inspected weekly starting the last week in April. Full bloom ranged from 10 to 20 April over the period of the study. Infections were removed and recorded as they were observed. Those found before 15 May were considered to have developed from infection of a primary blossom or in blossoms that could not be distinguished from primary blossoms.

An auxiliary experimental study was carried out in orchard I during 1978 and 1979. Beginning the last week in April, all blossoms were removed weekly from seven randomly selected trees. Fire blight was recorded and removed on a weekly basis from these trees.

## RESULTS AND DISCUSSION

In 1977, secondary bloom was the origin of 84.8 and 96.0% of the fire blight infections in orchards I and II, respectively. In orchard I, 84.6 and 69.4% of the infections originated in secondary blossoms in 1979 and 1980, respectively. In orchard II in 1979, secondary blossoms were the origin of 92.0% of the infections; the significance of this figure may be questionable, however, as there were few succulent shoots and infection could have occurred later on fruits, after the plot was abandoned.

It is frequently somewhat difficult to separate the beginning of secondary bloom and the end of the regular primary bloom. Thomson et al (9) stated that symptoms could be detected as early as 14 days after blossom infection. Therefore, we considered any infections detected prior to 28 days after full bloom to have occurred in the primary bloom. Even with this conservative approach, more than 75% of the infections originated in secondary bloom.

In the blossom removal study during 1979, 0.9 infections per tree were recorded on the trees that had the blossoms removed, compared with 3.9 infections per tree in the rest of the plot. Each of the infections noted in this study originated in blossoms. Thus, removal of secondary blossoms does decrease the incidence of fire blight. Time and cost studies will be needed to determine whether this is a practical means of control.

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