

# Ash Leafcurl Aphid (*Prociphilus fraxinifolii* Riley): Field Studies in the Okanagan Valley, British Columbia

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*Fraxinus pennsylvanica*, commonly known as green ash, is a tree native to moist bottomlands and stream beds. It transplants and grows well in a great variety of environmental and soil conditions, making it a popular ornamental tree widely planted along streets, in lawns, parks and golf courses.

In July 1994, leaf curling damage was observed in downtown Penticton and in the City tree nursery. Between 1995 and 1999, the intensity of damage increased and was also noticed in city parks and in commercial nurseries. Inspection of damaged leaves revealed a woolly type aphid, *Prociphilus fraxinifolii* (Homoptera: Pemphigidae). There were few published descriptions of this insect.

This presentation is a summary of our work between 1999 and 2001 to research the local life cycle of the aphid; evaluate the potential for biological control; and identify effective timing and products for chemical control.

## Life cycle

✓ *P. fraxinifolii* is a dark greenish aphid that is characteristic of woolly aphids. It is often covered in flocculent white waxy hairs produced by waxy plates on the dorsal side of the abdomen.

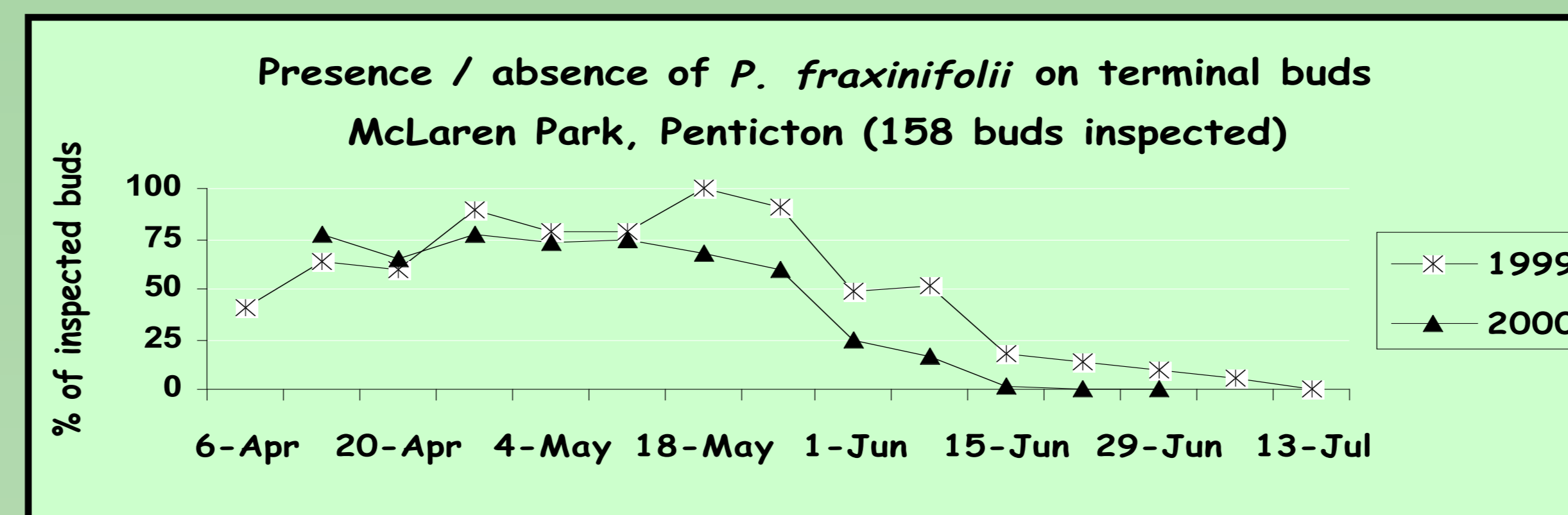
✓ Overwintering is reported to occur as eggs in bark crevices. We found no eggs in repeated microscope dissections of swelling buds. First nymphs are "fundatrices" wingless females and appear in late March in Penticton, at the time of bud swell of the host tree.



✓ Feeding on the phloem sap of the host plant causes the infected leaves to curl, twist and sometimes gall. This leaf curl damage impacts the aesthetic appearance of mature trees in public areas and stunts growth of young trees in nursery production.

✓ Fundatrices females give live birth to wingless aphids. Young nymphs have a variety of body colour, becoming blue to black when mature. Four to six weeks after first emergence, winged aphids are noted in the colony.

✓ During the month of June, winged aphids move to a secondary host. There are reports of *Prociphilus americanus* spending the summer on the roots of fir trees (*Abies* sp.). In the Okanagan, winged adults return to *Fraxinus* trees during the month of October, where they congregate on the trunk.

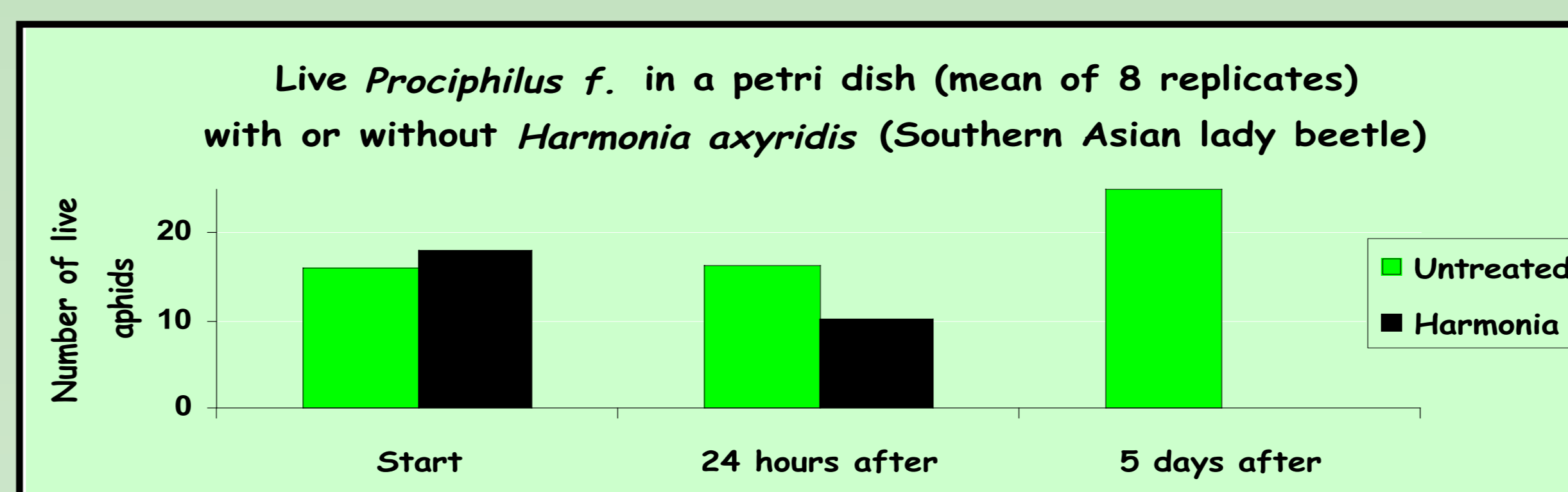


## Field studies

✓ To verify local life cycle, terminal buds were marked on a number of trees at two parks in Penticton and examined weekly from April to July for presence / absence of *P. fraxinifolii* and predator insects.

✓ Efficacy trials were conducted with five low-impact pesticides at different timing of plant development. The only pesticides then registered in Canada for control of aphids on green ash were acephate (Orthene) and ethion (Ethion), both broad-spectrum organo-phosphate products. Acetamiprid (Assail) was registered in 2003.

✓ Laboratory feeding trials were set-up in a replicated, controlled design. Different predators were introduced in a closed petri dish containing *Fraxinus* leaves infected with *P. fraxinifolii*. Number of aphids were counted under a microscope before and after treatment.



## Suggested Management Program

**Survey susceptible trees early in the season.**

First nymphs emerge at the very beginning of bud swell.  
Look for small blue-colored aphids at the base of leaf buds.

**Tolerate some damage.**

The first flush of leaves may become distorted and curled.  
The aphids leave in June and subsequent growth is good quality.



**Monitor for presence of beneficial insects.**

Lady beetles, syrphids and lacewings are seen feeding on this aphid.  
However, predator insects appear after leaf damage as occurred.  
A parasitic wasp completely destroys colonies during the summer.

**Use pesticides that preserve beneficials.**

Dormant oil is very effective when applied before bud swell.  
Insecticidal soap, Pirimor and Assail are very effective.  
Best spray window is at full bloom, a stage easy to miss on *Fraxinus*.