

Pome Fruits—Biological Control

The Potential of Filbert Hedgerows to Augment Pear Psylla Natural Enemies

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*Keywords:* pear psylla, filbert, pear

This study assessed the potential of filbert hedgerows to augment pear psylla natural enemies in three orchards of differing vegetational setting. The major objective was to determine the role of filbert hedgerows relative to the surrounding vegetation and distance from the orchard perimeter in determining abundance of arthropod generalist predators in pear.

A hedgerow consisted of two small potted filbert trees placed next to each of four adjacent pear trees. Hedgerows were established during early May at three distances from the orchard perimeter (rows 1, 7, and 15). An untreated control plot was located next to the hedgerow-treated plot. To detect effects of distance from the orchard perimeter, both hedgerow-treated and control plots were partitioned into five subplots (rows 1-2, 3-5, 6-8, 10-12 and 14-16). Generalist predators and their pear psylla or filbert aphid prey were sampled at weekly intervals.

At all orchards, predators were more abundant on filbert than pear. Disregarding effects of season or distance from orchard edge, total number of predators was more abundant in the hedgerow-treated than in the untreated control plot in two orchards, but species often responded differently. Effects of distance from orchard perimeter varied according to species, treatment, or host tree. In untreated pears, some predators were less abundant at greater distances from the orchard perimeter, but this trend was not as apparent in the hedgerow-treated pears. On the filbert hedgerows, some predators (e.g., *D. brevis* adults) were more abundant when furthest from the orchard edge.

At each hedgerow, total predators showed seasonal dynamics which resembled but lagged behind those of the filbert aphid. Psylla densities remained low and seasonal trends did not resemble or anticipate those of the predators. Comparisons of predator seasonal dynamics among three host types (filberts, immediately adjacent pear, and pears in neighboring rows) suggest that predators dispersed from filberts mostly to immediately adjacent pears. Preference for and movement among host types can also be inferred for each species from its relative abundance on the host trees at each orchard and sample date.

Although the filbert hedgerows did not substantially augment generalist predators in pear, these preliminary trials generated considerations for future studies. Filbert aphid density rather than vegetational setting or distance from the orchard edge appeared to be the major factor determining predator abundance on filbert hedgerows. Predator movement among the hedgerows and pear trees was also determined, in part, by filbert aphid density. Mid-season predator movement from hedgerows to pear might be enhanced by higher densities of filbert aphids during early season.