

Effects of Pruning on Pest Insect Pear Psylla in European Pear Trees

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Introduction:

Pear Psylla is a small flying (Hemiptera) insect (fig 1&2) that is attracted to the soft vegetation in European Pear trees for feeding and breeding.

Psylla can cause damage to the tree via feeding, secreting 'honeydew' (fig 4). Honeydew can attract pathogens such as fungi and insect. It also causes russetting, cosmetic damage to fruit. In severe cases feeding damage can cause 'Psylla Shock'/tree death due to the toxic compounds in Psylla saliva

It is hypothesized that removing soft vegetation from the tree which Pear Psylla feeds on pest populations will decrease.

If there is significant correlation between pruning and reduced insect pressure, with the style of management being affordable and accessible to farmers, it would result in much less need for pesticide use in commercial pear growing operations.



Figure 4 Pear Psylla Feeding Damage and Honeydew Excretion

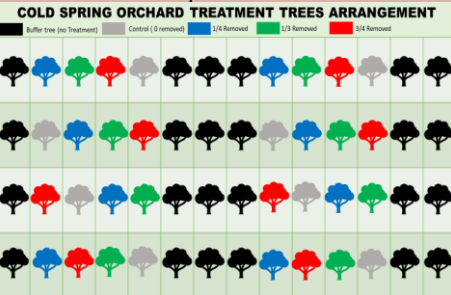


Figure 5 Map of CSO Treatment Trees

Methods:

The experiment was conducted May to August 2022, at Cold Spring Orchard- Belchertown and Bashista Orchard Southampton MA.

At each orchard there were 24 treatment trees in total, split into groups of four. Each group of four had one of every treatment type in randomized order. Each block of four had at least two 'buffer' trees in-between to lessen the effect of pear psylla migration (fig 5).

The treatment types were- one fourth, one third, three fourths, and no (control) vertical shoots pruned. Pruning took place in late May/early June (fig 3).

Post pruning, each location was surveyed two times, with every treatment tree collecting adult pear psylla on clear sticky cards and having 5 shoots and 5 spurs visually inspected for eggs, nymphs, and adults.

Additionally, data regarding risk factors such as fireblight infection, and data regarding economic viability of this style of management were recorded around the same time period as pruning efforts.

Discussion:

While the hypothesis wasn't overwhelmingly supported the trends in the first Cold Spring sampling date warrant more research on this management practice.

Many factors could have affected the results, including 2022 being a drought year- affecting the growth of plants and insects, differences in orchards- geographic, ecological, and management differences, and a lack of proper understanding of pear psylla biology and behavior. In future studies it is recommended to have buffer tree between each treatment tree to prevent adult pear psylla from flying between them, And to prune twice during the summer to stop shoots from growing back. Lastly it would be recommended to research a more efficient and effective manner of sampling for pear psylla which currently a timely strenuous process.



Figure 1 Pear Psylla Nymph



Figure 2 Pear Psylla Adult



Figure 3 Me Pruning a Tree

Results:

Overall data was too inconclusive to outright support the hypothesis

Cold Spring Orchard sampling showed some significant results in favor of pruning as treatment -Eggs on shoots 6/10/22 (fig 7) -Nymphs on Spurs 6/10/22 -Nymphs on Shoots 6/10/22 -Eggs on Spurs 7/8/22 (fig 6)

Bashista Orchard only showed one category with significant results -Adults on Cards 7/22/22 (fig 8)

All Other categories showed no significant relation between treatment types. And no categories showed significant differences in treatment types against the hypothesis.

It was found that for three workers pruning, it would take about 9 minutes per tree. Therefore for 12 trees, the average number in a row, it would take 1.8 hours. Paying minimum wage, it would cost \$85.50

Figure 6

Cold Spring Orchard 6/10/22
Average Pear Psylla Counts Across All Categories

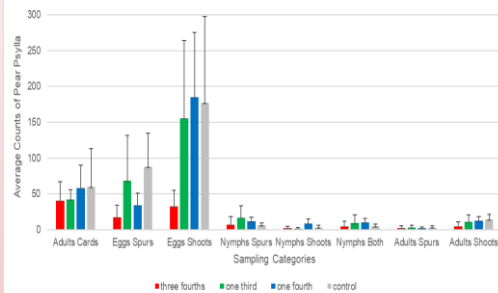


Figure 7

CSO 6/10/22
Eggs on Shoots

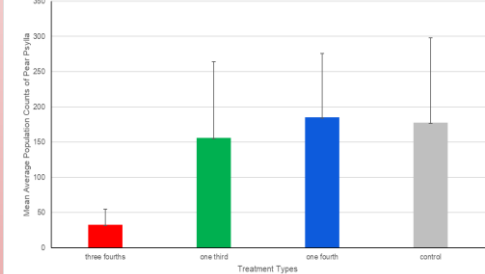


Figure 8

Bashista 7/22/22
Adults on Cards

