

Thresholds and Monitoring

Biased Sampling for Conspere Stink Bug Using a Cut Fruit Technique in Bartlett Pears

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Abstract: A cut fruit technique used to monitor codling moth and oriental fruit moth oviposition in mating disrupted pear orchards has been found to be helpful in monitoring levels of consperse stink bug (CSB). Infestation in a 11.2 ha Bartlett orchard in the Upper Sacramento Valley of California was followed on orchard interior and perimeter cut fruit clusters at 55-13 days before harvest (DBH) in 2002. Adult CSB infestation in the cut fruit clusters was up to 3.3% at 41-13 DBH with treatment at 28 DBH. Levels of CSB were monitored at 58-9 DBH in 2003. In addition, adult and/ or injury presence in cut fruit vs random uncut fruit clusters in one sample area were compared during the 30-9 DBH period. CSB was found only in the cut fruit clusters, and combined injury + adult presence was about four times higher in cut fruit than in uncut fruit clusters. Adult CSB infestation reached 10% in the cut fruit clusters at 30-9 DBH, with the highest numbers in the perimeter samples. This knowledge, and the lateness of the infestation, resulted in a perimeter spot treatment for CSB at 20 DBH in 2003.

Introduction

Conspere stink bug can cause significant phantom injury to Bartlett pears in the 4-6 weeks prior to harvest in the Upper Sacramento Valley. Although this injury becomes more visible during harvest, the necessity for treatment often needs determination at least a month before harvest in order to accommodate the preharvest interval of the least expensive and disruptive chemical control materials. A cut fruit technique used to monitor codling moth and oriental fruit moth oviposition in mating disrupted orchards has been found to be also helpful in monitoring CSB presence (1).

Methods

The same cut fruit clusters installed weekly to monitor codling moth and oriental fruit oviposition were inspected for stink bug presence. One fruit in a cluster of at least two was cut weekly one week prior to examination. The area of the cut surface increased weekly with the size of the fruit. Effort was made to maintain the area at a constant 15-20% of the total fruit surface. All cut fruit were at eye level on the east sides of trees. Clusters were inspected in interior and perimeter locations, on separate trees usually 5 trees distant from other cut fruit clusters.

Sixty cut fruit clusters (1.8/ha at interior and 3.6/ha at perimeter locations) were inspected weekly at 55-13 DBH in 2002. Insect presence and/or injury presence was determined visually and by examining 5 new cuts on the original cut fruit. In 2003 seventy cut fruit clusters (1.8/ha at interior and 4.5/ha at perimeter locations) were inspected weekly at 58-9 DBH. In a perimeter area where CSB had been a problem in the past, insect presence and/or injury presence in 30 cut

fruit clusters vs 125 random uncut fruit clusters were compared weekly in the 30-9 DBH period. In the random clusters, one fruit was chosen for injury determination by cutting.

Results and Discussion

Adult CSB infestation in the cut fruit clusters reached 3.3% at 34 DBH in 2002, with treatment at 28 DBH. CSB infestation developed later in the season in 2003 with 1.4% of cut fruit clusters infested at 30 DBH. The window of opportunity for utilizing the 28 DBH material was allowed to pass. This ultimately created some anxiety as infestation in the cut fruit clusters reached 10% at 23 DBH. Spot treatments in all perimeter areas and the most infested interior area were applied at 20 DBH (Figure 1).

In the tests comparing CSB levels in cut fruit clusters vs uncut fruit clusters, CSB were not found in 125 uncut clusters/ week, while 5% of 30 cut fruit clusters/ week had CSB during the 30-9 DBH examination period (Table 1). When injury was also considered, CSB and/or injury were present at an approximately 4 times higher level in the cut fruit clusters than in the uncut fruit clusters (Figure 2).

Summary

The ability to detect and monitor the activities of consperse stink bugs in Bartlett pears was enhanced by examining weekly cut fruit clusters in the two month period before harvest.

References Cited

1. Zoller, B.G. and Zoller, A.M. 2002. Seasonal comparison of monitoring techniques for codling moth in mating disrupted pear orchards. Proceedings, 76th Western Orchard Pest and Disease Management Conference. Portland, Oregon, January 9-11.

Table 1. Cluster samples with stink bugs, %, 30-9 DBH, 2003

	N	Mean	se
Cut fruit	4	5.00	2.16
Uncut fruit	4	0.00	0.00

T test, P=0.06

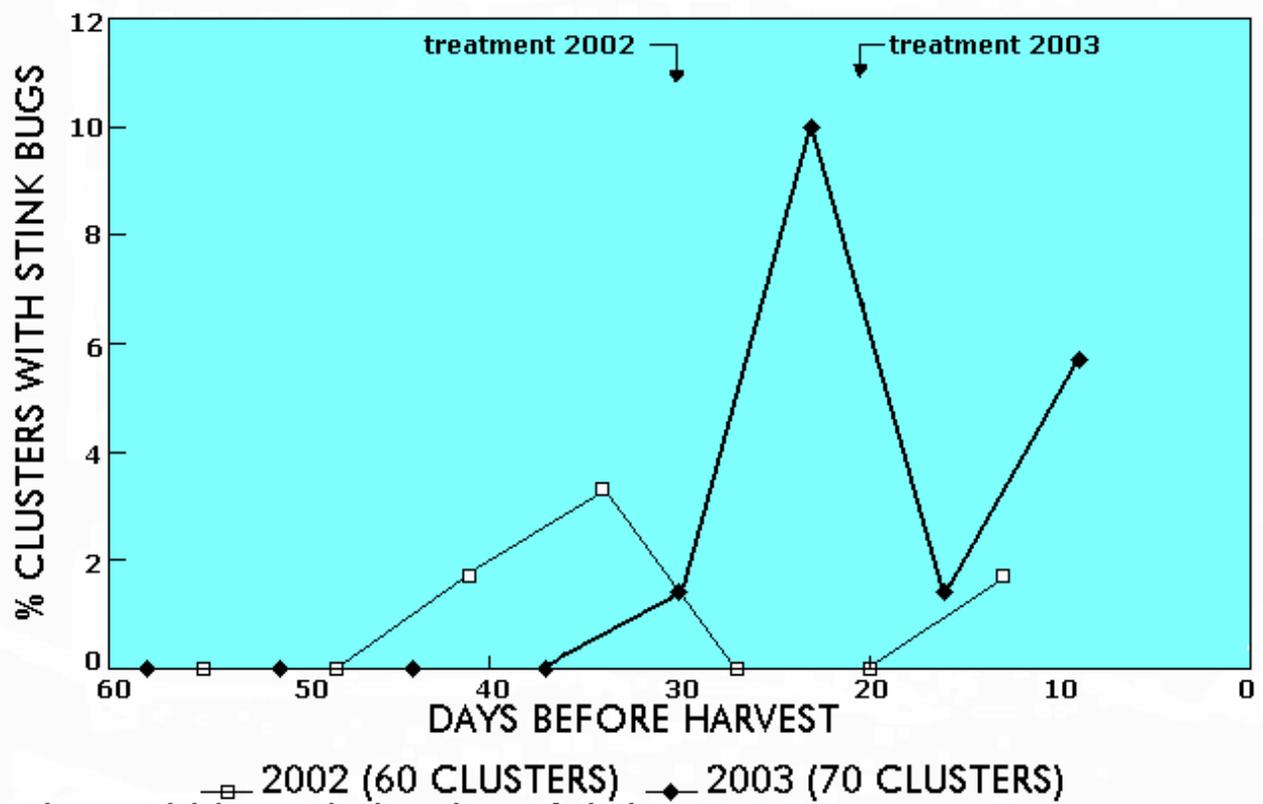


Fig. 1. Stink bug monitoring using cut fruit clusters

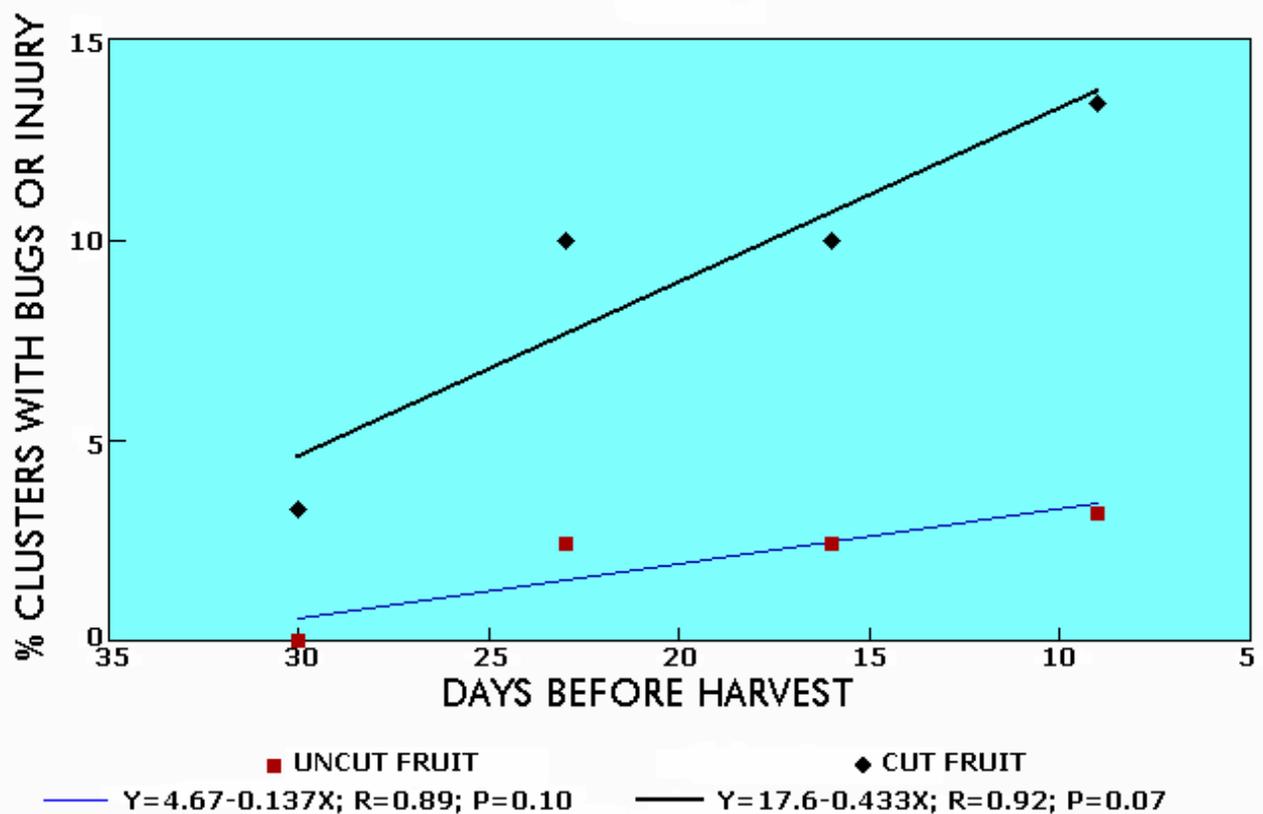


Fig. 2. Stink bugs and/or injury