

Thresholds and Monitoring

SEASONAL OVIPOSITION PREFERENCE OF CODLING MOTH BETWEEN CUT AND INTACT FRUIT OF BARTLETT AND BOSCH PEAR CULTIVARS

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Abstract: Oviposition was monitored weekly comparing intact and cut fruit cluster samples in an orchard with adjacent Bartlett and Bosc cultivars in the Sacramento Valley. In six weekly samples prior to May 23 (965 degree days, 53 days before first Bartlett harvest), oviposition was slightly more frequent in the intact fruit clusters compared with the cut fruit clusters. Beginning May 23 through July 18 (2461 degree days, 3 days after first Bartlett harvest), cut fruit clusters became much preferred oviposition sites over intact fruit clusters. Intact Bosc were preferred over Bartlett in the late season also.

Introduction

Oviposition detection in random fruit clusters can be used to monitor codling moth in pears but may require inspection of hundreds of clusters to detect low populations in commercial orchards. Oviposition detection was increased 20-80 times in cut Bartlett pear fruit cluster samples compared with intact fruit at 0-28 days before harvest in 2000 (Zoller, 2001). This oviposition preference of codling moth for cut fruit of Bartlett and Bosc pears was studied during the entire season in 2001.

Methods

Comparisons between Bartlett and Bosc were made using 10 wounded clusters on trees adjacent in an orchard planted with alternating trees of the two cultivars. These wounded samples were compared with random intact cluster samples. Five hundred intact clusters were counted, or the number of clusters was counted to first egg detection, whichever came first.

A solid Bartlett-planted end of the orchard bordering untreated Hartley and Ashley walnuts was used for comparison of oviposition in wounded and intact Bartlett clusters. Samples were taken at the border, using 10 wounded clusters and 100 intact clusters (or the number of intact clusters was counted to first egg detection, whichever came last).

One fruit in a cluster of at least two fruit was wounded by cutting one week prior to observing for oviposition. The clusters were at eye level on the east sides of trees.

In the case of cut fruit cluster samples, the area of the cut surface and its depth increased with the weekly size of the fruit (but without reaching the core area). It is estimated, very approximately, as follows (Table 1).

Table 1.

Date	4/18	5/16	6/13	7/11
Days before harvest	-88	-60	-32	-4
Fruit diameter, cm	2	3	4.5	6.5
Cut diameter, cm	1.3	2	3	4.5
Cut area, % of total	20	15	15	15
Cut depth, cm maximum	0.3	0.6	1.2	2.4

The orchard was commercially managed with mating disruption and organophosphate sprays, but has had a high codling moth population over the years.

Results and Discussion

In six weekly samples prior to May 23 (965 degree days, 53 days before first Bartlett harvest), oviposition did not occur in the cut fruit clusters. Beginning May 23 through July 18 (2461 degree days, 3 days after first Bartlett harvest) cut fruit clusters became much preferred oviposition sites over intact fruit clusters. Intact Bosc were preferred over intact Bartlett in the late season also (Table 2).

Table 2.

Ratio		Early season		Late season		P
% Oviposition		Mean	se	Mean	se	t-test
Cut: Intact	Bosc: Bosc	0	0	9.48	4.39	0.10
Cut: Intact	Bart: Bart	0	0	71.44	33.69	0.11
Cut: Intact	Bosc: Bart	0	0	75.44	22.52	0.02
Intact: Intact	Bosc: Bart	2.33	1.31	19.00	6.79	0.06

Egg detection increases in the cut fruit samples generally matched those measured in year 2000 studies at 0-28 days before harvest. However, the decline in relative detection with time before harvest noted in the cut fruit samples compared with the intact ones in year 2000 was not seen in this year 2001 study (Figure 1). This perhaps is due to the 2001 effort to increase the cut area each week compared with efforts to maintain the cut area at a constant diameter in the previous year's study in 2000.

References Cited

Zoller, B.G., 2001. Proceedings, 75th annual Western Orchard Pest and Disease Management Conference.

FIGURE 1

CODLING MOTH EGGS

SACRAMENTO VALLEY 2001

