DESCRIPTION:	**Seasonal Comparison of Monitoring Techniques for Codling Moth in Mating Disrupted Pear Orchards**
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Thresholds and Monitoring

SEASONAL COMPARISON OF MONITORING TECHNIQUES FOR CODLING MOTH IN MATING DISRUPTED PEAR ORCHARDS

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Abstract: A season long weekly comparison of monitoring techniques for codling moth was made in a Bartlett orchard undergoing mating disruption in the Sacramento Valley. The methods compared were (1) MEGALURE high pheromone trapping for males, (2) sampling intact fruit clusters for oviposition, and (3) sampling cutfruit clusters for oviposition. Prior to May 23 (965 degree days), 53 days before harvest, one male was present in two of three traps, while all cutfruit cluster samples were negative and intact clusters reached 8% oviposition in a perimeter sample next to untreated walnuts. However, after June 6 (1320 degree days), 39 days before harvest, no male codling moths were trapped while cutfruit cluster samples on the same trees as the moth traps reached 122% oviposition. Intact cluster samples reached 8% oviposition and cutfruit cluster samples reached 220% oviposition levels in perimeter samples next to the untreated walnuts. A similar comparison of codling moth monitoring techniques using cutfruit and 10mg high pheromone traps in 550 acres of mating disrupted pear orchards in a lower population area of Lake County is discussed.

Introduction: Pheromone trap catch is shut down to very low levels in mating disrupted orchards, making the need for additional control difficult to ascertain. Oviposition detection in cutfruit clusters was compared with male catch in 10x high pheromone traps and oviposition in intact fruit clusters in mating disrupted orchards.

Methods: Pheromone traps (1gal ice cream carton style) were positioned in the center of blocks, high in the trees, at 1 trap per 10 acres. They utilized one 10mg Trece lure in the early season and a Trece MEGALURE for 11 weeks, May 2 through July 18-19.

In the Sacramento Valley study, intact fruit clusters were inspected in a border area next to untreated walnuts. One hundred intact clusters were counted, or the number of clusters was counted to first egg detection, whichever came last.

One fruit in a cluster of at least two was cut weekly, one week prior to examination for oviposition. Cutfruit clusters were observed weekly, beginning April 11 in Sacramento Valley studies and May 31 in Lake County tests. The area of the cut surface and its depth increased

with the weekly size of the fruit (but without reaching the core area). Effort was made to maintain the cut area at a constant 15-20% of the total fruit surface.

Block perimeter and interior cutfruit clusters were examined. Perimeter samples were 10 clusters per 35 acres next to untreated walnuts in Sacramento Valley studies and 0.8 per acre in the Lake County tests. The latter samples were usually located on the south or west windward edges unless an abandoned orchard was next to another border. Cutfruit interior samples were on trap trees at usually 3 per trap tree. All cutfruit clusters were located at eye level on the east sides of trees.

Results and Discussion: In the Sacramento Valley studies prior to May 23, one male was present in two of three traps, while all cutfruit cluster samples were negative. Intact clusters reached 8% oviposition next to the untreated walnuts. However, after June 6, no male codling moths were trapped, while cutfruit cluster samples on the same trees reached 122% oviposition. Intact cluster samples reached 8% oviposition and cutfruit clusters reached 220% oviposition in perimeter samples next to the untreated walnuts (Figure 1).

In the Lake County studies, populations were much lower, reaching only 2-3% oviposition in cutfruit in June and July. Weekly pheromone trap catch was very low, 0 to 0.2 moths per average grower trap, even while the cutfruit clusters were indicating some codling moth activity in late June and July (Figure 2). Most of the weekly trap readings were zero, while perimeter cutfruit samples in the same blocks had 3.5% oviposition and 1.7% of cutfruit samples on the same trap trees had oviposition. Where weekly trap readings were 1 moth per week, oviposition in cutfruit samples increased to 10.5% of perimeter samples and 13.7% of interior cutfruit samples on the same trap trees. Frequency of trap readings above 1 per week was too low to allow meaningful comparison with cutfruit data (Figures 3 and 4).

The results were used effectively on a weekly basis to recommend treatments. Perimeter egg findings resulted in spot treatments. Trap tree (interior) egg findings or at least 2 moths per trap per week were used as whole block treatment thresholds. Since there was not one for one correlation of trap catch and egg-finding, it was necessary to use the methods together to identify all areas needing treatment. The cutfruit were more useful than traps in the late season. However, oviposition response to the cutfruit is not present in the early season. Trapping data is thus the only information available prior to cutfruit response development, unless large numbers of intact clusters are inspected for oviposition.

CODLING MOTH MONITORING

KNIGHTS LANDING 2001

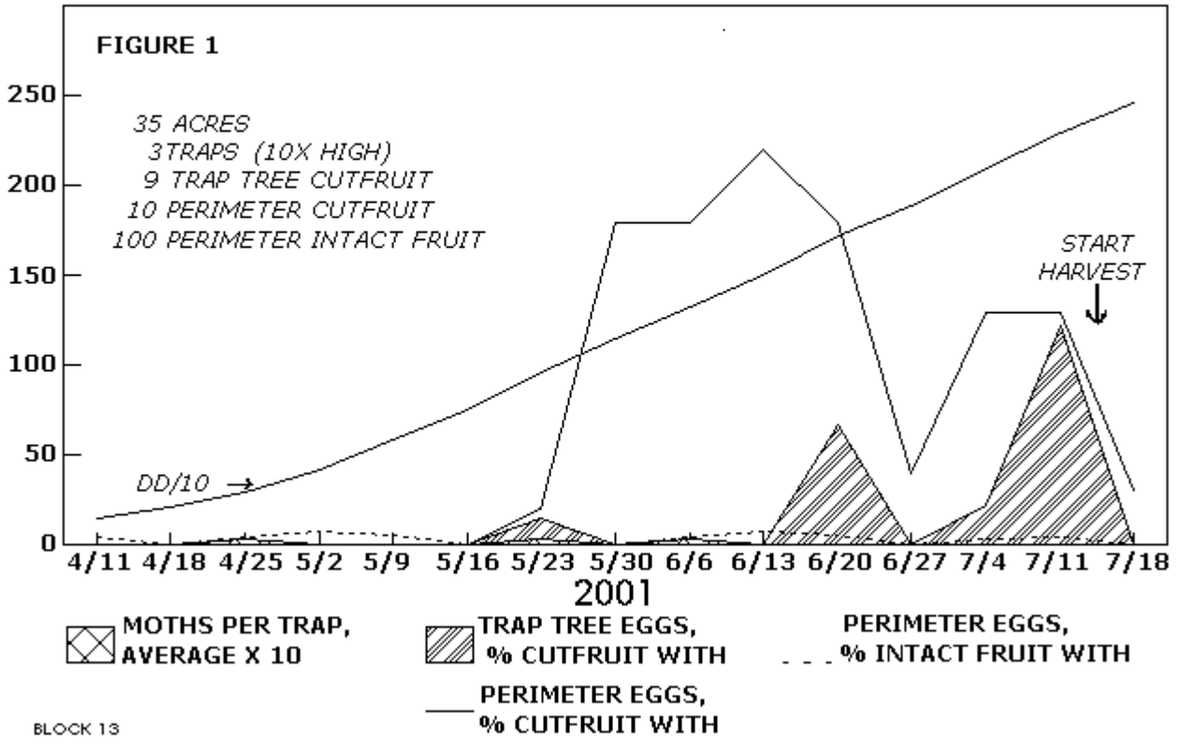
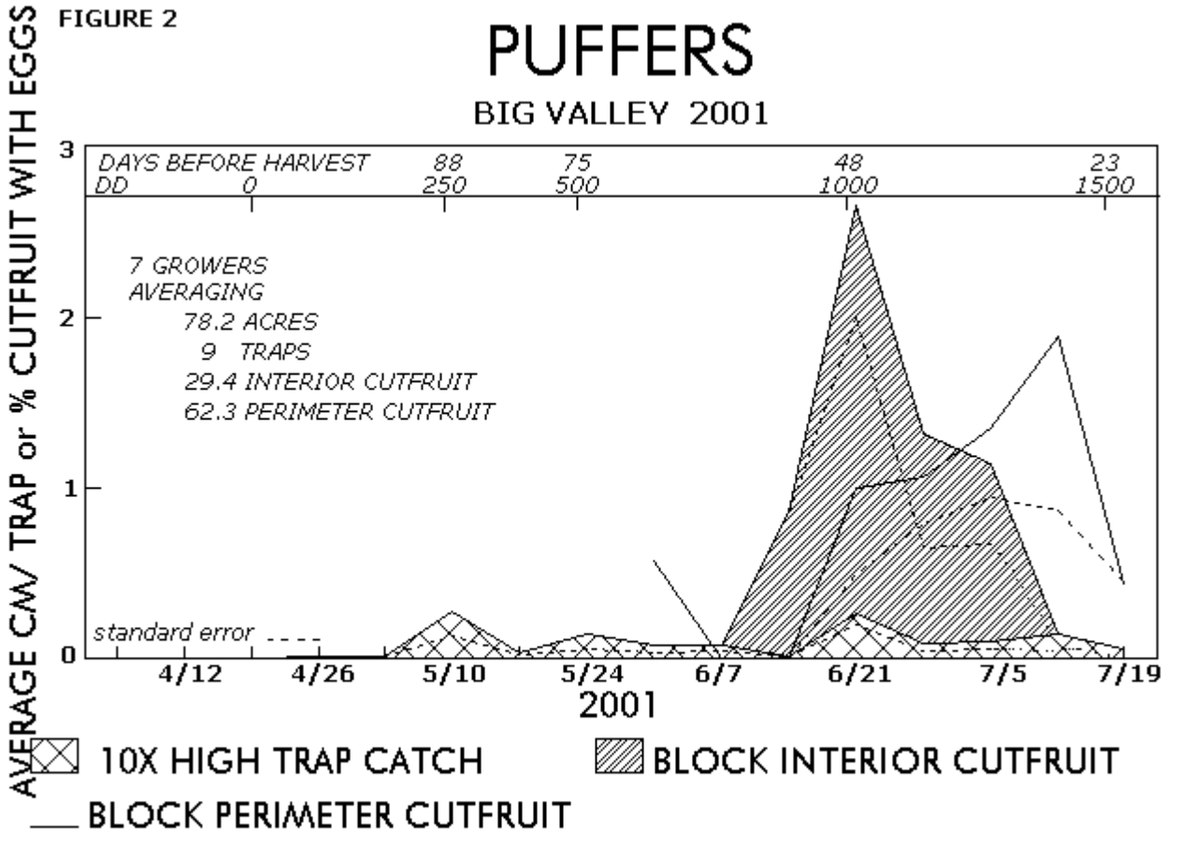


FIGURE 2


PUFFERS
BIG VALLEY 2001
DAYS BEFORE HARVEST
DD
88
250
75
500
48
1000
23
1500
7 GROWERS
AVERAGING
78.2 ACRES
9 TRAPS
29.4 INTERIOR CUTFRUIT
62.3 PERIMETER CUTFRUIT
standard error
AVERAGE CM/ TRAP or % CUTFRUIT WITH EGGS
3
2
1
0
4/12
4/26
5/10
5/24
6/7
6/21
7/5
7/19
2001
10X HIGH TRAP CATCH
BLOCK INTERIOR CUTFRUIT
BLOCK PERIMETER CUTFRUIT

MOTH CATCH vs EGG DETECTION

LAKE PUFFERS, BV 2001

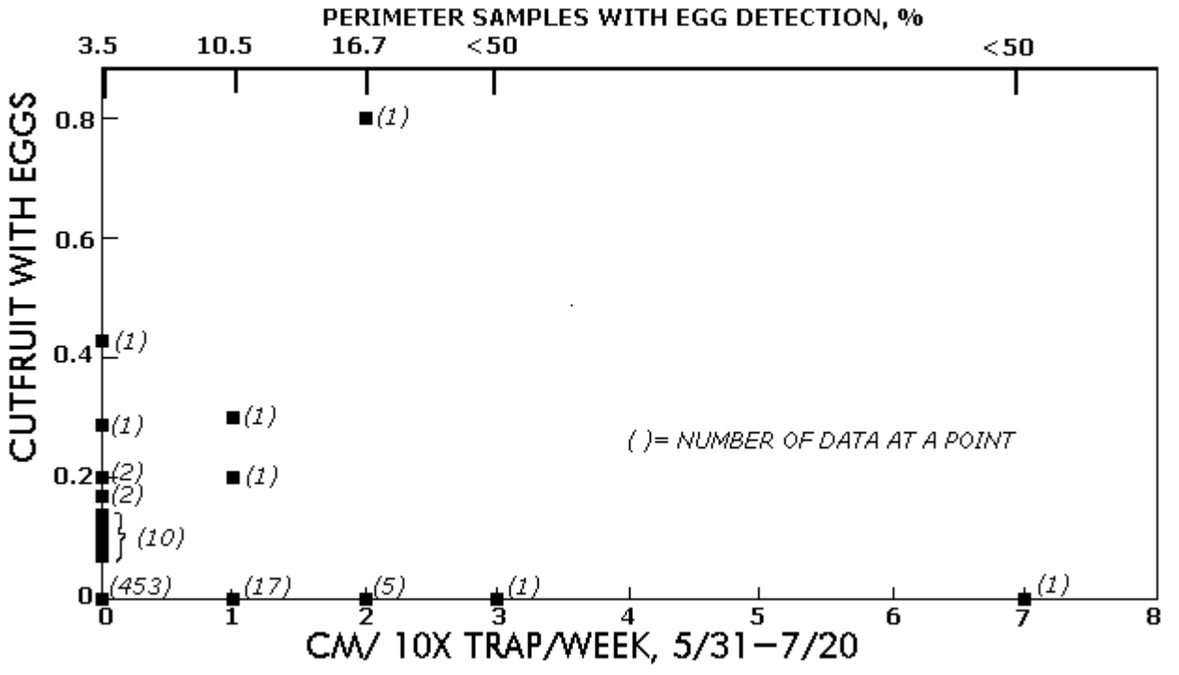


FIGURE 3

MOTH CATCH vs EGG DETECTION

LAKE PUFFERS, BV 2001

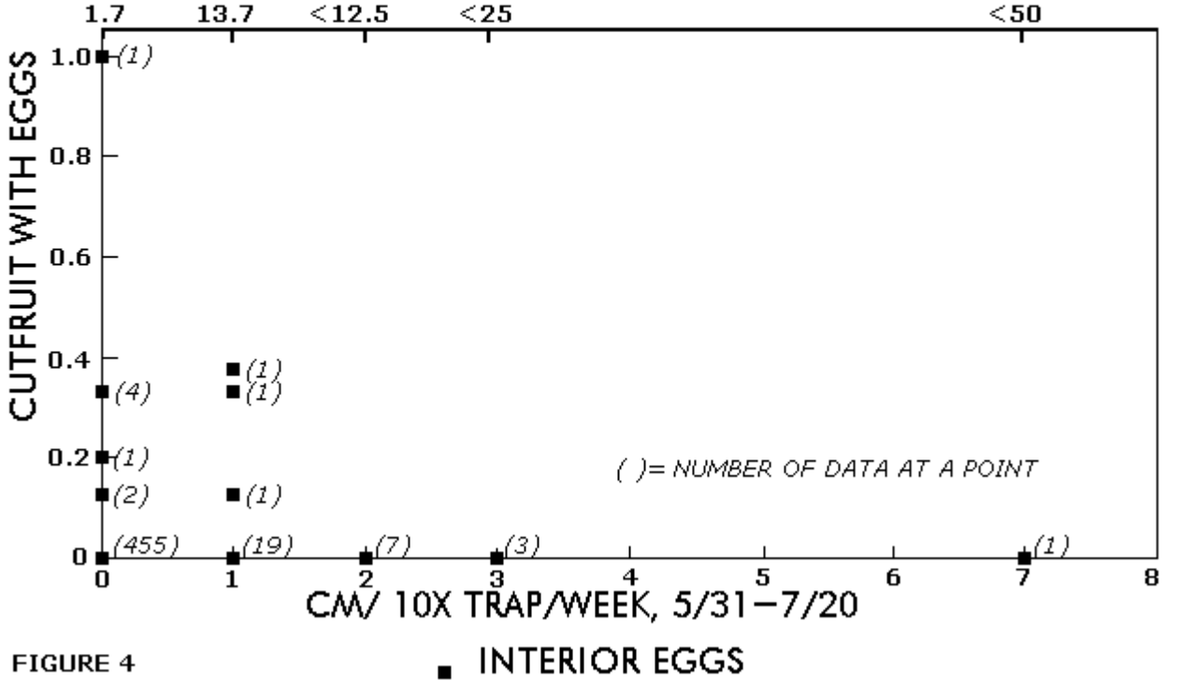


FIGURE 4