

2. Implementation

AREAWIDE CONTROL OF CODLING MOTH USING THE PARAMOUNT AEROSOL PHEROMONE DISPENSER® (SHOREY "PUFFER") IN LAKE COUNTY, CALIFORNIA 1996-2000

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The Paramount Aerosol Pheromone Dispenser®, originally developed by Dr. Harry Shorey as the "puffer", was utilized to dispense codling moth (CM) (*Cydia pomonella*) pheromone in pear orchards on an areawide basis in Kelseyville, Lake County, California from 1996 to 2000. It was also utilized on 360 acres of pears in Potter Valley, Mendocino County in 1999, without any use of organophosphate (OP). Initial acreage in Lake County was 160 (five orchards), increasing to 500 in 1999 (16 orchards) and 820 in 2000 (37 orchards). Initial application rate was 1.6 units per acre, which decreased to 1.3 in 1999 and 1.1 in 2000. Units were placed approximately 21.7 meters (65') apart around the perimeter with deference to upwind and high-pressure locations. A lesser number of units were also placed across the upwind interior of the area to ensure coverage. Data was collected from each orchard and included trap catches (1 mg. low, 1 mg. high, and 10 mg. high traps), egg samples prior to each potential cover spray window and damage counts for each generation (tree, bin, and post-harvest). Data from puffer treated blocks was compared to that from a standard OP treated block and several untreated control sites upwind of the pheromone treated area.

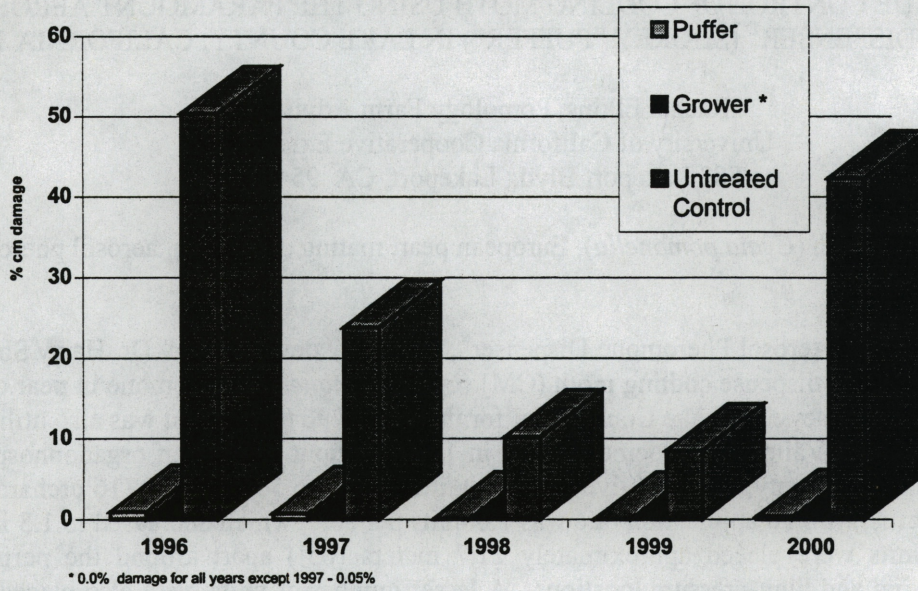
Data from 1996-2000 shows that the puffer successfully controlled CM in treated orchards compared to untreated controls and compared favorably with control using several applications of OP's. Overall damage in 2000 (a high pressure CM season) in the 37 puffer treated blocks was 0.15% versus 0.1% in the OP treated control and 47.9% in untreated controls. Virtually all damage occurred in first year, upwind blocks and mainly in rows bordered by either a) large open pace or vineyard, b) less effective mating disruption programs, or c) in close proximity to backyard apple trees. Damage also occurred in proximity to a previously untreated control site that had built up a high population, and along riparian corridors. Damage was reduced ten-fold in second year orchards and was zero in fifth year orchards, despite a complete lack of OP sprays for several years (Figure 1).

Oblique-banded leafroller has been the major secondary pest. Damage is most severe in orchards lacking a pre-bloom chlorpyrifos (Lorsban®) application. BT applied once or twice during the season has assisted in reducing final damage. Other secondary pests, such as stink bugs and San Jose scale, are very localized and have failed to thus far increase appreciably. Early-season thrips damage is noticeable some years, though not economic. Pear psylla and spider mite damage was minimal in long-term puffer treated blocks in 2000, eliminating the need for a post-harvest treatment.

Data from 1996-2000 shows that CM damage decreases the longer an orchard is under disruption. No second to fifth year blocks were treated with an OP for CM in 2000, while first year blocks were treated from 0-3 times, depending on CM pressure. This contrasts with the initial project years (1996-1998) when two to three OP treatments were applied (Figure 2).

Results from 1996-2000 have led to increased interest in the puffer system. The projected areawide project acreage will increase to 1,360 acres in 2001.

**Figure 1. Average 2nd Generation CM Damage
Pre-harvest Tree Fruit Sample, Kelseyville, Lake County
1996 - 2000**



**Figure 2. EFFECT OF TIME IN PUFFER PROJECT ON 2ND GENERATION CM DAMAGE
Pre-harvest Fruit Sample %/2000 Fruit
Kelseyville, Lake County
1996-2000**

