Why aren't more growers using codling moth mating disruption?

- Walnut acreage treated with MD stands at about 15,000 acres
- Represents <8% of the acreage annually facing pressure from CM

Aerosol dispensers for mating disruption
THE FACTS

- Best suited to large blocks (>40 acres)
- Few to no mechanical failures (<1%)
- Monitor with COMBO traps (hung high)
- Supplemental sprays important
- Orchard edges may need extra attention
- Trap suppression possible in nearby orchards
- Population decline & damage control achievable in 2-3 years if follow program

CheckMate® Puffer®

Isomate® CM Mist

Why aren't more growers using codling moth mating disruption?

Answer #1:

It costs too much, especially if I still have to spray for codling moth.

FACT: Need for supplemental CM sprays is reduced or eliminated over time

- Year 1 - Puffers + supplemental sprays to reduce population and control damage

- Year 2 – Continued population reduction; reduce/eliminate sprays or use softer materials according to “Combo” trap catches and in-season damage

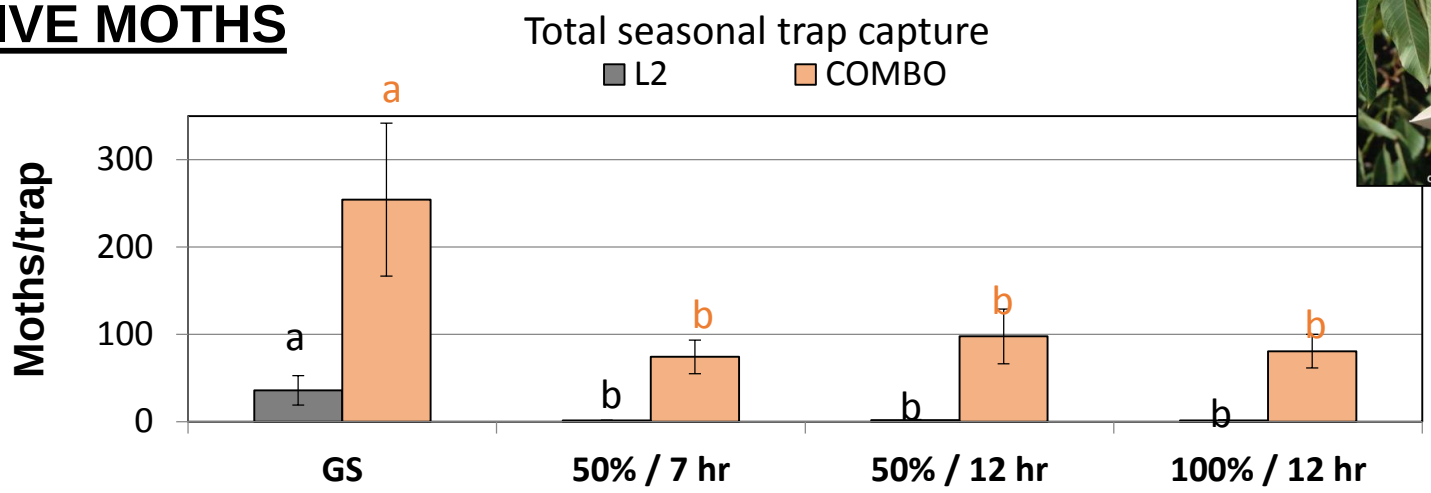
- Year 3-5 – With above, need for CM sprays eliminated over time

FACT: Good control can be achieved with less pheromone in the can and emitters running as little as 7 hours per night.

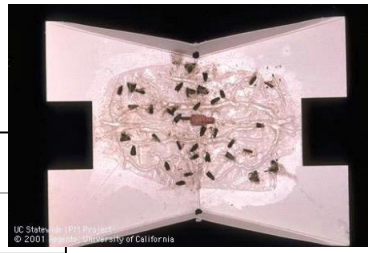
Both aerosol dispenser companies plan to market a "reduced rate" product for walnuts.

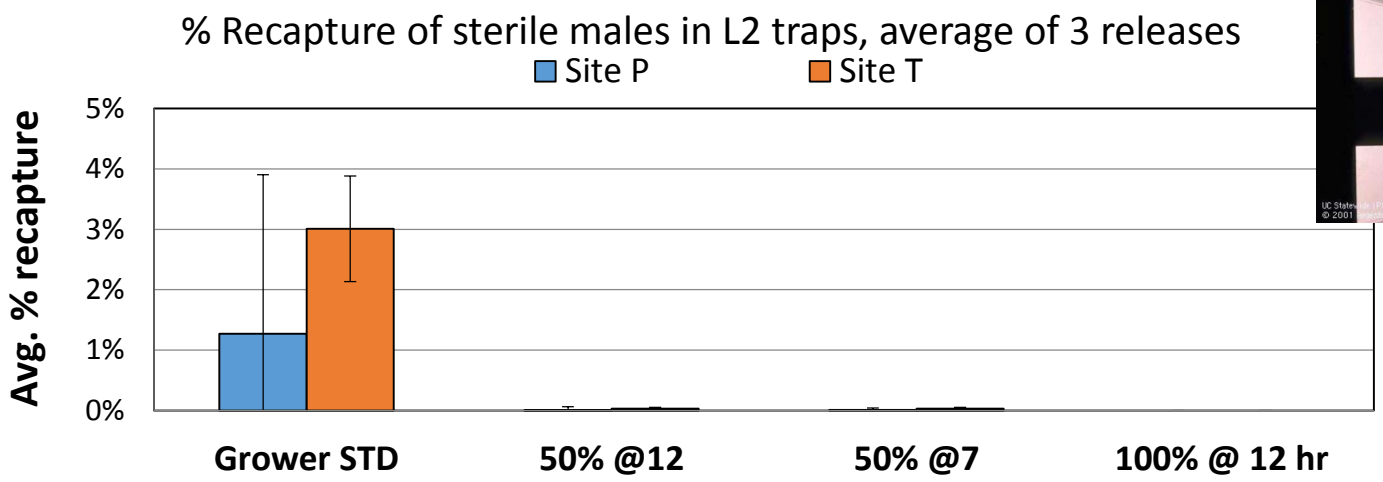
2013: Trap capture suppression with “reduced rate” aerosol dispensers

NATIVE MOTHS



STERILE MALES





Columns for the same lure with the same letter are not statistically different (Fisher's Protected LSD, *P*=0.05)

2014 Tests: What is the optimum aerosol dispenser density?

Currently based on:

- Keeping the cost below some maximum
- Extrapolation based on plume studies

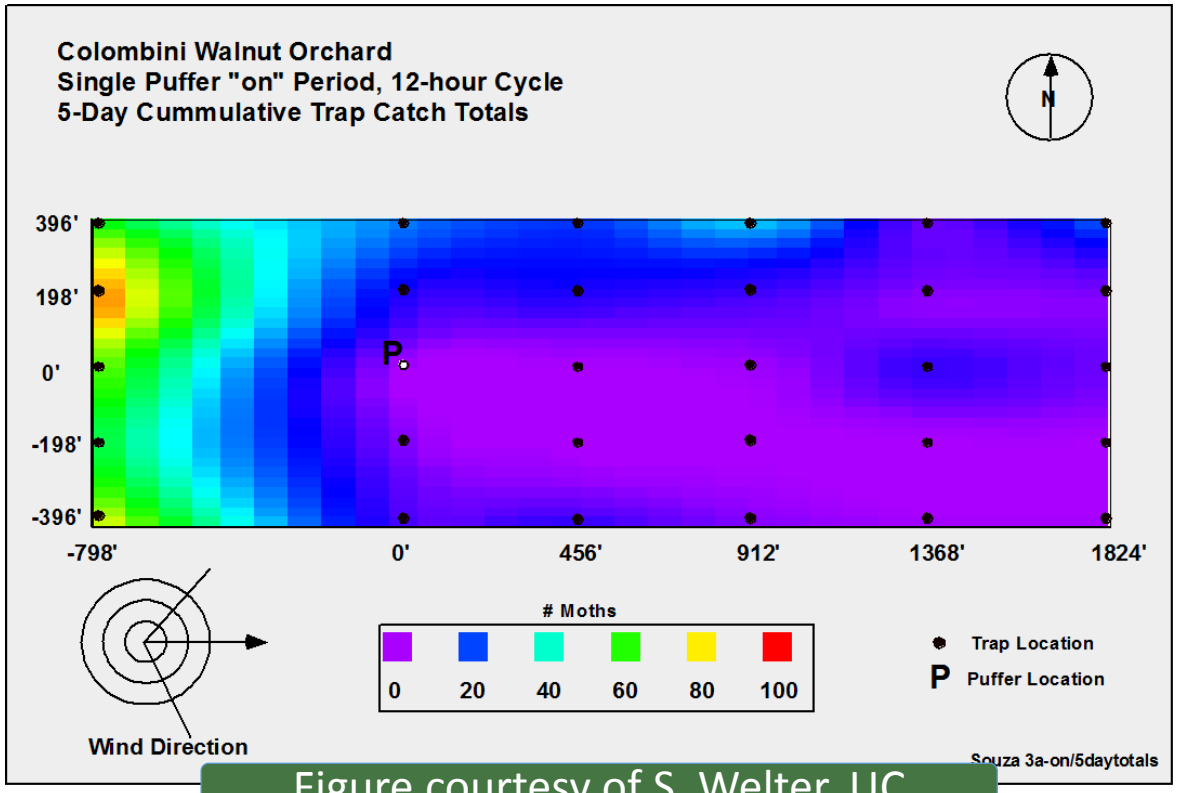
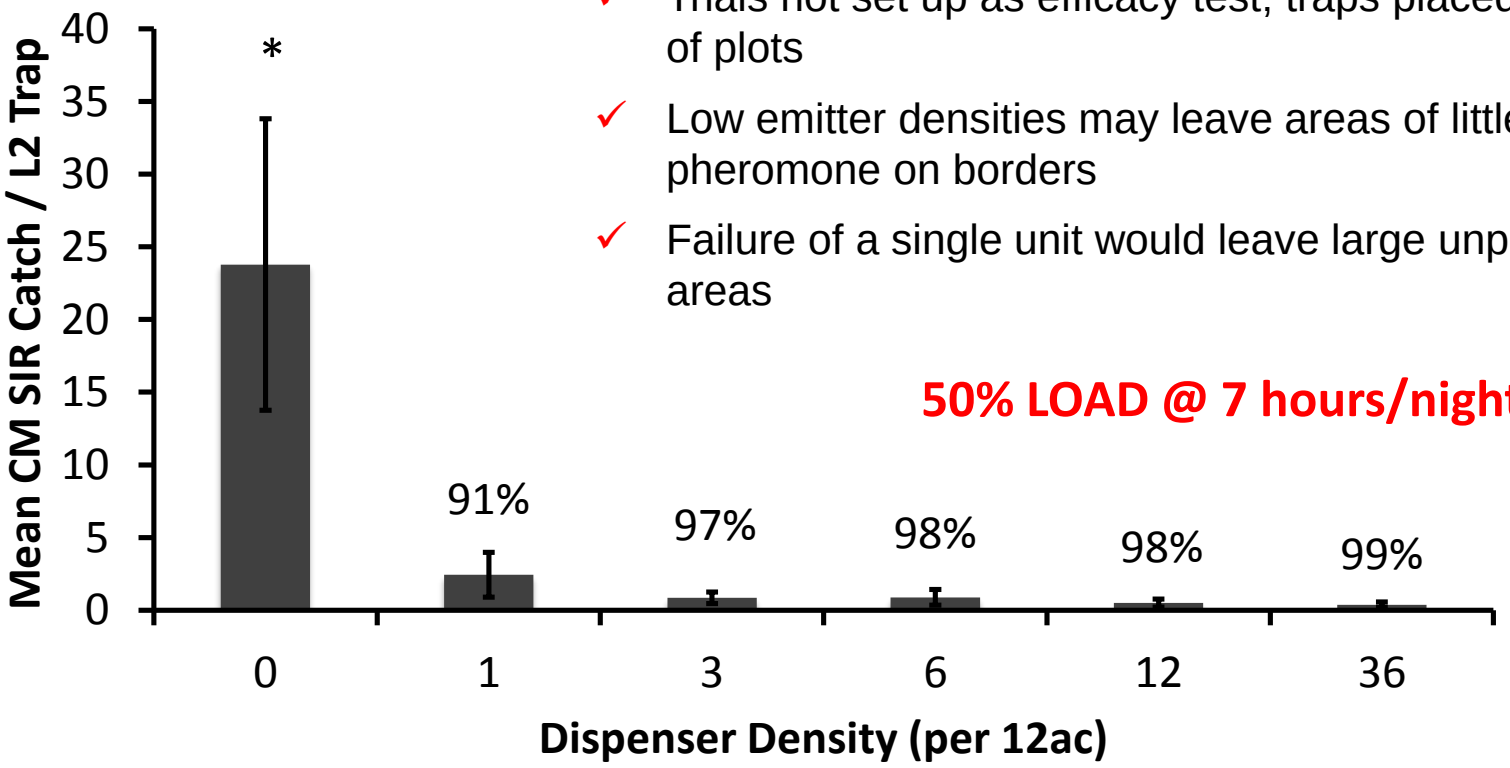


Figure courtesy of S. Welter, UC

2014 Tests: What is the optimum aerosol dispenser density?

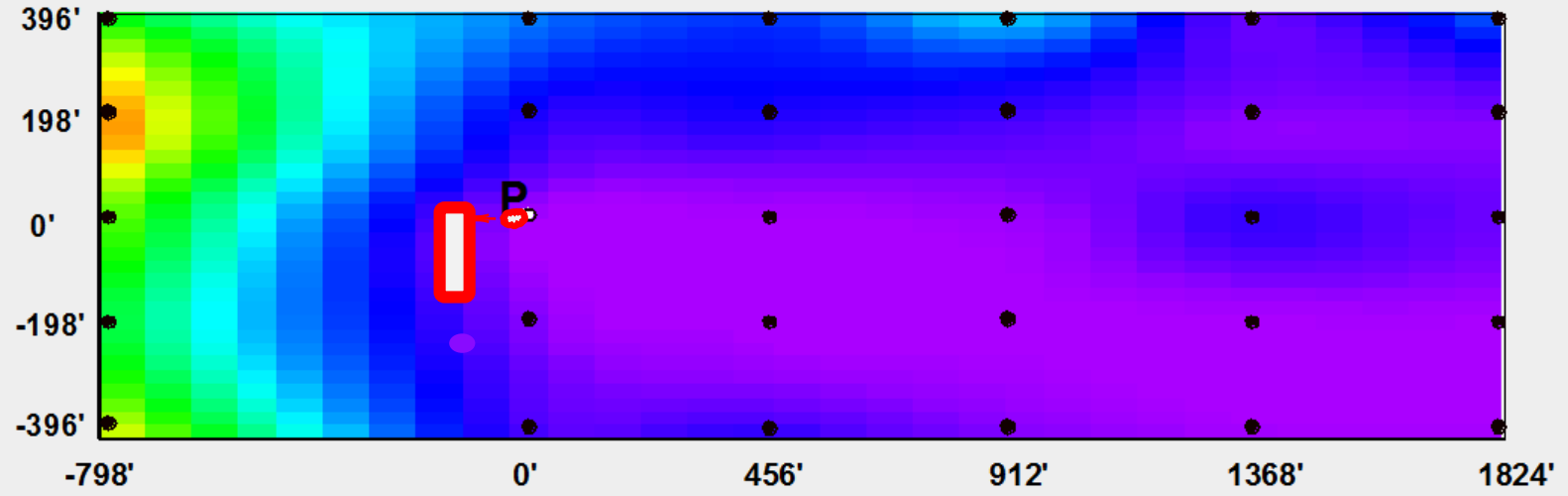
- Good suppression of CM using emitters that release substantially less pheromone
- Very low densities provide high level of disruption
  - ✓ *97% at 1 per 4 acres*
- We support the current recommendation of around 1 per 2 acres
  - ✓ Trials not set up as efficacy test; traps placed in interior of plots
  - ✓ Low emitter densities may leave areas of little or no pheromone on borders
  - ✓ Failure of a single unit would leave large unprotected areas



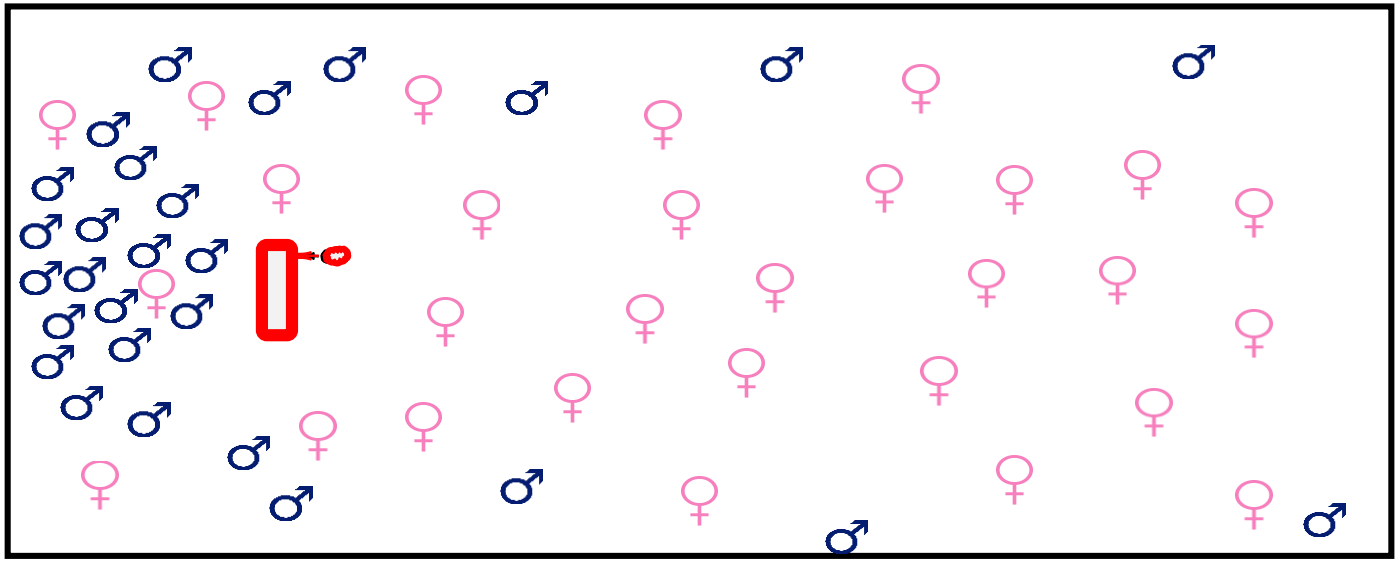
50% LOAD @ 7 hours/night

2014 Tests: Mechanism of aerosol dispenser disruption

Low trap catch interpreted as huge plume and males deactivated downwind



More likely, males move upwind towards the emitter, bypassing traps and females



Why aren't more growers using codling moth mating disruption?

Answer #2a:

I have to spray anyway for WHF, aphids, etc., so I may as well throw in a CM material.

FACT: This may occasionally work, but in most instances, CM spray timing and materials are different than those for other pests.

Why aren't more growers using codling moth mating disruption?

Answer #2b:
WHF will go out of control if I stop spraying for codling moth.

FACT 1: There may be other explanations for an increase in WHF.

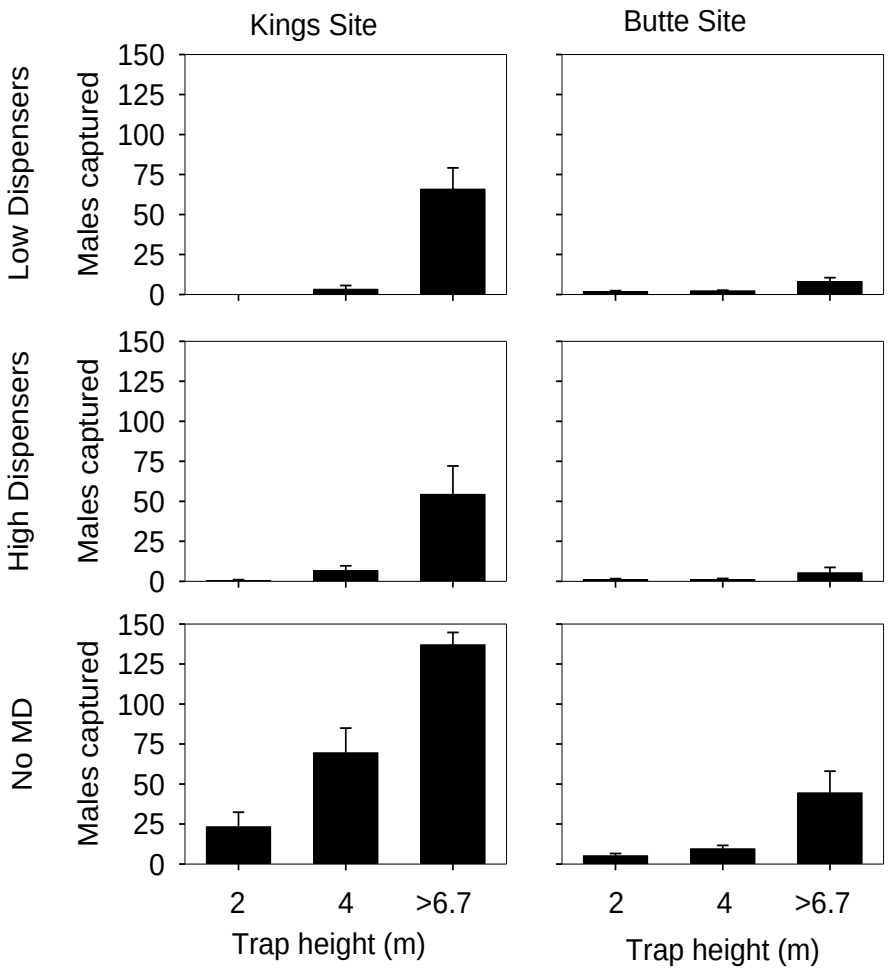
FACT 2: We no longer have broad spectrum and long residual materials that will kill both pests.

Why aren't more growers using codling moth mating disruption?

Answer #3:

I've heard that it doesn't work well in tall orchards.

FACT: In controlled tests, hanging dispensers <u>high</u> in tall trees did not improve performance over hanging them at mid-canopy height.



Why aren't more growers using codling moth mating disruption?

Answer #4:

Codling moth is being controlled just fine with insecticides.

FACTS:

Historic failure of insecticide-based programs to be sustainable

Resistance development

Compounds lost due to regulation

Newer insecticides lack the broad-spectrum activity that older materials had

Toxicity to natural enemies, leading to secondary pests

Mite flaring in walnuts ?

Why aren't more growers using codling moth mating disruption?

Answer #5:

I don't know how to tell if I am getting into trouble and need to spray.

ONGOING WORK:

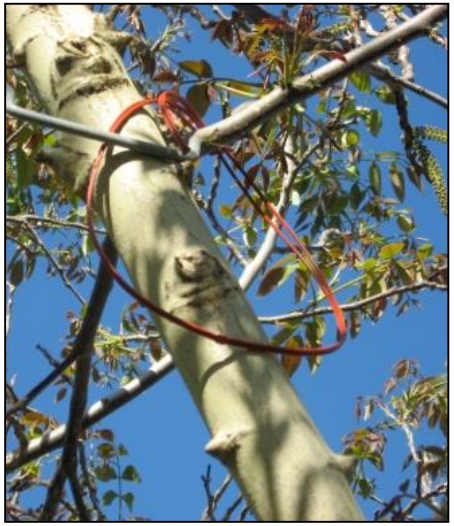
Pheromone-based solutions to CM in orchards too small for aerosol dispensers

"Meso" emitters continue to look promising

CM-DA Meso still under trial

New CM + NOW product

Isomate® CM-Ring



Trece CideTrak ® CMDA Meso

DEEP BARK CANKER

Brenneria rubrifaciens

SHALLOW BARK CANKER

Brenneria nigrifluens