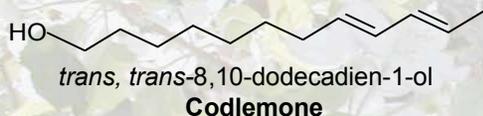


Measuring the Pheromone Release Rate to Disrupt Mating of the Codling Moth

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INTRODUCTION

- ❑ Pheromone dispensers release the sex pheromone (Codlemone) into the air and it is used to disrupt the mating of the codling moth in apple orchards.



Purpose of study:

1. Determine if dispensers are releasing an appropriate amount of codlemone (> .5 mg/day) for season-long mating disruption.
2. Evaluate how reproducible release is among similar dispenser-types.

FIELD SAMPLING

- ❑ Three dispenser-types were collected from an apple orchard in Wenatchee WA after 0, 60, and 90 days.



Checkmate

Isomate C+

Isomate CTT

ANALYTICAL METHOD

1. **VCS:** Each aged dispenser was placed in the Volatile Collection System (VCS) for two hours with air passing over polyurethane foam (PUF) at 10 L/min



2. **PUF EXTRACTION AND ROTO EVAPORATION:** After air sampling, the PUF was ultrasonicated in hexane/ethyl acetate. The solvent was extracted from the PUF by suction filtration. The solvent from each dispenser was evaporated by rotary-evaporator under vacuum.

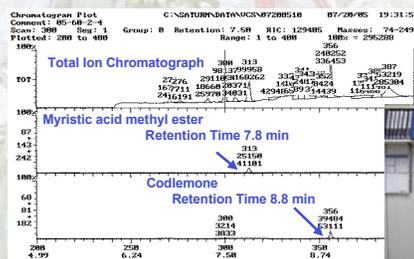


Solvent Extraction



Rotoevaporation

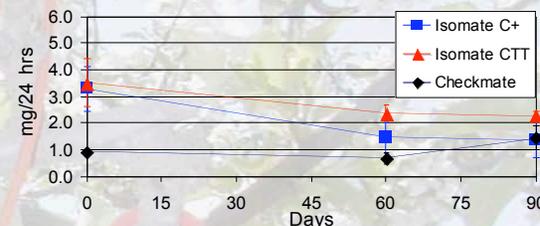
3. **GC/ MS ANALYSIS:** The solvent extracts were transferred to vials and placed on the gas chromatograph (GC). The GC separates the complex mixture and the mass spectrometer (MS) detects and measures each component individually.



RESULTS

- ✓ All dispensers released at least 0.5 mg/day or more throughout the 90 days.
- ✓ Each dispenser had a different amount of pheromone released depending on how long it was aged on the field. However, after 90 days in the field, all of the dispensers released similar amounts of pheromone.

Codlemone Release Rates



PHEROMONE DISPENSER	DAY 0 (mean mg/24 hour ± SD) n = 8	DAY 60 (mean mg/24 hour ± SD) n = 8	DAY 90 (mean mg/24 hour ± SD)
Isomate C+	3.29 ± 0.83	1.46 ± 0.57	1.37 ± 0.66 (n = 4)
Isomate CTT	3.52 ± 0.88	2.37 ± 0.29	2.28 ± 0.18 (n = 4)
Checkmate	0.92 ± 0.06 (n = 4)	0.68 ± 0.20	1.45 ± 0.45 (n = 3)

CONCLUSION

- ✓ At the end all the dispensers were still working well, and the amount of pheromones release through the 90 days was greater than 0.5 mg/day, which is enough to disrupt the mating.
- ✓ Within each dispenser type the release throughout the 90 day period was consistent.

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