

FINAL REPORT OF 2000 LWWC-FUNDED RESEARCH PROJECT
Mating Disruption Strategies for Omnivorous Leafroller Control

Principal Investigator:

Chuck Ingels
UC Cooperative Extension
4145 Branch Center Road
Sacramento, CA 95827-3898
Tel: (916) 875-6913
Fax: (916) 875-6233
E-mail: caingels@ucdavis.edu

Objective

To evaluate existing mating disruption products and develop a reliable and consistent mating disruption system for OLR control in grapes

Summary

(Funding for this project was provided for 2000 only, but this report covers the work that was done in 1999 also.)

In these trials, vineyard blocks were subjected to various pheromone treatments. In 1999, four pheromone treatments were applied in 5-acre blocks. The single CheckMate OLR-F spray treatment effectively shut down trap catches for about six weeks, and the CheckMate membrane dispensers shut down traps for about 8 weeks. Few moths were caught during the entire test period in the paraffin emulsion treatments. Damage to clusters was inconsistent among treatments.

In 2000, pheromone treatments were again compared, but this time using 10- to 15-acre blocks, and identical treatments were used in each of several vineyards. CheckMate OLR-F sprays appeared to last about 4-5 weeks, and Scentry spirals lasted about 14 weeks. Paraffin emulsion at both high and low rates shut down traps for about 13 weeks, or just before the time of Chardonnay harvest. OLR incidence and damage at harvest was again light in both blocks. However, all treatments did reduce OLR incidence and damage compared to the untreated control.

1999

Methods and Materials. This unreplicated trial consisted of four 5-acre pheromone treatments and a large untreated block in a Syrah/Zinfandel vineyard. The treatments used were:

- 1) Consep CheckMate OLR-F spray – 0.65 fl. oz./acre
- 2) Consep CheckMate membrane dispensers – 100/acre
- 3-4) Agrium Confuse-OLR (paraffin emulsion) – 5 and 10 g ai/acre, or every 4.5 and 9 vines respectively
- 5) Untreated control

Treatments were applied June 24 (one time only). Three pheromone-baited traps were placed in each block and monitored weekly. We thoroughly examined 300 clusters per treatment just before harvest.

Results. There were probably 2 generations of OLR during the treatment period (Fig. 1). The single CheckMate flowable treatment effectively shut down trap catches (and presumably mating) for about 6 weeks, and the CheckMate membrane dispensers shut down traps for about 8 weeks. This period was during the hottest months of the season, so trap shutdown may last somewhat longer if applied during the spring. Few moths were caught during the entire test period in the paraffin emulsion treatments.

There were no meaningful differences between treatments in the number of clusters in OLR or bunch rot before harvest (Table 1). This lack of correlation may have been due to the late application date (mating and egg laying probably took place before treatments were applied) or to the small size of the blocks (mated females may have flown into mating disrupted blocks). The CheckMate membrane dispenser block was harvested before we were able to evaluate the clusters.

Table 1. Percent of clusters with OLR (larvae, pupae, or damage) and bunch rot – 1999.

<u>Treatment</u>	<u>OLR</u>	<u>Bunch Rot</u>
Paraffin Emulsion 200 g	10	9
Paraffin Emulsion 400 g	20	17
CheckMate membrane dispenser *		*
CheckMate OLR-F spray	20	7
<u>Untreated control</u>	<u>11</u>	<u>6</u>

* Data not available

2000

(OLR biofix approx. March 24)

Trial 1

Materials and Methods. Two mating disruption products and an untreated control were tested in 10- to 15-acre blocks in each of 4 Chardonnay vineyards (Sutter Home - Delta, Sutter Home - Circle K, Johnson, and Pierson-Lambert vineyards) located on Lambert Rd, west of Interstate 5:

- 1) Consep CheckMate OLR-F spray was sprayed 2 times in all vineyards (April and May), and 3 growers applied it in late June or early July as well, using 30-100 gal. water/acre. (Traps were not removed before spraying.)
- 2) Scentry NoMate spiral dispensers were hung at a density of 130 per acre between April 6 and April 19
- 3) The untreated control was made smaller (2 to 5 acres) in each vineyard in order to reduce the risk of damage to the crop. These untreated blocks were situated upwind but adjacent to treated blocks. There is a fairly constant breeze that blows from the west.

Two pheromone-baited traps and one bait-pan trap were placed in each treated area and were monitored weekly. Lures were changed according to manufacturer specifications. Because the bait-pan traps caught no moths whatsoever, we removed them in July. 200 clusters per treatment were examined for OLR and bunch rot on August 15, 2000, 1 to 2 weeks before harvest.

Results and Discussion. There appeared to be two OLR generations during the season – one peaked in late June and the other peaked in mid-August (Fig. 2). During the summer, CheckMate OLR-F sprays appeared to last about 1 month in each vineyard before moths were caught (Figs. 3-6). At some point in three of the vineyards, trap catches in this treatment increased above untreated treatment. We do not know why this happened, but traps were not removed from the vineyard before spraying, so the traps or the stickem could have been more attractive to moths when the scent wore off the vines. Scentry spirals lasted an average of 14 weeks before substantial moths were caught. Based on the very low trap catches in April and May, it would appear that any pheromone applications made early in the season were unnecessary.

OLR incidence and damage at harvest was very light in all blocks and there were no significant differences between treatments (Table 2). Bunch rot was virtually non-existent in three of the vineyards; only one vineyard had substantial rot.

When larvae or pupae were found, only a few berries were damaged. This damage could cause rot, but with so few OLR present, the risk was minimal. It is possible that insect damage would be worse in later maturing varieties. Also, damage may be worse in years where a substantial population was present the previous season.

Trial 2

Materials and Methods. Confuse-OLR, which is the same paraffin emulsion product used in 1999 and now being developed by Gowan, was tested at two rates in two Chardonnay vineyards. It was applied at a rate of 200 and 400 g/A (5 and 10 g active ingredient) per acre, or one squirt per 4.5 and 9 vines, respectively. These treatments were compared to over 100 acres of untreated vines in their first year of bearing in one vineyard (Schatz), and to BT/sulfur dust in another vineyard (Samra).

Three pheromone-baited traps were used in each treatment. Lures were changed according to manufacturer specifications. 200 clusters per treatment were examined for OLR and bunch rot on August 15, 2000, 1 to 2 weeks before harvest.

Results and Discussion. Trap counts were higher in the Schatz vineyard than the Samra vineyard (Figs. 6-7). In both cases, Confuse-OLR at both 1x and 2x shut down traps for about 3 months, or just before the time of Chardonnay harvest. This duration should be fine for Chardonnay, but may be inadequate for late maturing varieties.

OLR incidence and damage at harvest was again light in both blocks (Table 3). However, both Confuse-OLR treatments appeared to reduce OLR incidence and damage. Bunch rot was present in only one of the vineyards, and the 1x block in this vineyard seemed to be a different clone that was much more susceptible to rot.

Table 2. Percent of clusters with OLR (larvae, pupae, or damage) and bunch rot – Trial #1, means of 4 growers, 2000.

<u>Treatment</u>	<u>OLR</u>	<u>Bunch Rot</u>
Untreated	2.0	14.5
Spirals	0.75	9.5
Flowable	1.5	1.5

Table 3. Percent of clusters with OLR (larvae, pupae, or damage) and bunch rot – Trial #2, means of 2 growers, 2000.

<u>Treatment</u>	<u>OLR</u>	<u>Bunch Rot</u>	
Untreated	5.0	5.0	
Confuse-OLR 200 g		1.0	19.0
Confuse-OLR 400 g		1.5	5.0

Potential Benefits/Impacts on Agriculture

There are many strategies for controlling OLR in vineyards, and there are many mating disruption strategies. In many areas, there is some question as to whether it is necessary to use any control methods, based on these results. Indeed, it was difficult to find growers that treated for OLR at all. However, there are reports of severe infestations in some vineyards in some years, particularly further south in the Central Valley. This trial showed how long the various products

can be expected to last, and the level of control that can be achieved under low to moderate OLR pressure.

Dissemination of Findings

Meeting presentations of OLR pheromone trial results:

November 8, 2000	Lodi-Woodbridge Winegrape Commission Trade Show (attendance 79)
November 15, 2000	UC Grape Pest Mgmt. Workshop, Kearney Ag. Center (attendance 34)
March 20, 2001	Clarksburg Grape Grower Meeting (attendance 90)

Publications:

December 2000	“Omnivorous Leafroller (OLR) Pheromone Disruption Trials”
---------------	---