

**POST-HARVEST CONTROL OF MINT ROOT BORER IN FURROW IRRIGATED
MINT USING CORAGEN[®], MOCAP, AND LORSBAN, IN WESTERN IDAHO**

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INTRODUCTION

Coragen insecticide is still relatively new to the mint industry and it is unknown if the rate of Coragen used affects the amount of Mint Root Borer control in furrow irrigated mint. Mocap has also been registered relatively recently. Last years' trials showed Mocap to be very effective in controlling Mint Root Borer larvae at the lowest labeled rate. It was decided to test Mocap again at the lowest rate and a rate lower than the label lists. In addition, Lorsban was surprisingly effective in last year's trials. Coragen may become the standard insecticide for Mint Root Borer control if Lorsban's uses are limited or eliminated, so Coragen should be thoroughly tested.

OBJECTIVE

Test the efficacy of Coragen and Mocap at different rates, for post-harvest control of Mint Root Borers in furrow irrigated mint.

MATERIALS AND METHODS

Two identical trials (Experiments 3 and 4) were established in production, furrow irrigated peppermint fields. Experiment 3 was located near Wilder, Idaho; Experiment 4 was near Greenleaf, Idaho. Plots were arranged in a randomized block design. Plots of 18'x 20' were replicated six times. The Coragen and Lorsban treatments were broadcast applied with a CO₂ powered backpack sprayer in 20 GPA of water. No surfactant or adjuvant was added to any treatment. The granular Mocap was weighed out and hand sprinkled on each plot.

Experiment 3 was swathed around August 24 and Experiment 4 was swathed around August 13. All the treatments were applied on August 30 and August 20 for Experiments 3 and 4,

respectively. For Experiment 3, the field was corrugated and irrigated about four days after the treatments were applied. Experiment 4 was corrugated before the treatments were applied. For Experiment 4, the furrow irrigation was started as the treatments were applied. The furrow irrigation on Experiment 4 had the water running down every sixth furrow, so the whole plot was not irrigated on the day the treatments were applied. The rows of mint were approximately 33 inches wide. With only one in six furrows being irrigated, little of the plot area was wet when the treatments were applied. These areas that were irrigated as the treatments were applied were not sampled.

There was a light rain event on September 22. The exact amount of rain is unknown but it is estimated to be between 0.1 or less of an inch. The Nampa Agri-met station reported 0.02 inch on Sept. 22.

The corrugation of both experiments was done with a double disk. This implement threw very little soil on top of the row. The soil was dry at the application time of both experiments. In Experiment 3, at the time the treatments were applied, it was observed, that there was an unusual amount of dead leaves from this year's crop, on the soil surface. In addition, there were also many dead stems from previous crops, on the soil surface. It was speculated that this layer of dead plant material might intercept the Coragen or Lorsban from reaching the soil surface.

Experiment 4 had little dead leaf material on the soil or old stems compared to Experiment 3. Experiment 4 did have approximately half of the plot area randomly infested with field bindweed. It is unknown if the bindweed had any effect on the MRB populations.

Evaluation of the MRB control was done by digging eight, 0.75 ft² soil samples in each plot. The soil was shaken off the mint rhizomes and sifted through a 0.25" screen. The rhizomes were placed in Berlese funnels until dry and the total number of MRB larvae was combined with that found from soil sifting. The application rates, dates and results are listed in Table 1.

Experiment 3 was sampled approximately 45 days after the treatments were applied, while Experiment 4 was sampled approximately 55 days after treating. Both experiments were sampled starting on October 15 and sampling was completed by October 20.

RESULTS AND DISCUSSION

Both experiments had lower MRB levels than expected. In Experiment 3, the MRB populations decreased due to natural causes between the end of August and the October 15 sampling date. The low MRB populations make it difficult to determine differences in the amount of control that a treatment may have caused.

Experiment 3 had no significant differences between the untreated check and either Coragen treatment (Table 1). Both Mocap treatments and the Chlorpyrifos treatment did have a significantly lower MRB level than the untreated check, but were not significantly different from

each other. It is speculated that the heavy layer of dead plant material may have reduced the effectiveness of the Coragen. It is unclear how much, if any of the Coragen that contacts the soil is taken up by the mint roots. It is also unclear how, much if any, of the Coragen that comes in contact with any green plant material, enters the mint rhizomes and controls the MRB larvae.

Experiment 4 had no significant differences between any treatment and the untreated check. In Experiment 4, both Mocap treatments and the Chlorpyrifos treatment did have numerically lower MRB levels than the untreated or Coragen treatments, but the differences were not significant.

Experiment 4 also had less fresh organic material on the surface of the soil yet; the Coragen results were no more positive than in Experiment 3.

Table 1. Application rates and levels of Mint Root Borer control from Coragen, granular Mocap and Chlorpyrifos (Lorsban), applied to furrow-irrigated peppermint, post-harvest in the Wilder Idaho area (Experiment 3) and Greenleaf Idaho area (Experiment 4).

Trmt. #	Treatments	Rate/acre (product)	Mean number of live MRB larvae sq. ft.	
			Exp. 3	Exp. 4
1	Untreated check		1.4 b	2.9
2	Coragen 18.4% ai	3.5 fl oz	0.7 ab	2.4
3	Coragen 18.4% ai	5 fl oz	0.9 ab	2.6
4	Mocap 15G	15 lb/a	0.3 a	1.3
5	Mocap 15G	20 lb/a	0.4 a	1.5
6	Lorsban 4E	64 fl oz	0.4 a	1.6
	LSD		0.73	NS

Experiment 3: Coefficient of Variation=92.9%,
 Experiment 4: Coefficient of Variation=84.4%
 Sample means were compared with Fisher's Protected LSD (p=0.05).
 Means with the same letter are not significantly different (Petersen 1985).

CONCLUSIONS

Coragen applied after harvest, appeared to provide little to no MRB control for either rate in either experiment, compared to the untreated check. There was no significant difference in the amount of control between either rate of Coragen.

Both rates of Mocap and the Chlorpyrifos provided significant control of the MRB larvae, in only one of the two experiments. There was no significant difference in the amount of control between the 20 lb/ac and the 15 lb/ac rate of Mocap.

Mocap and Chlorpyrifos again provided overall better results than the Coragen treatments in both experiments but Mocap and Chlopyrifos did not perform as well in 2012 as they did in 2011.

The high amount of fresh organic material in Experiment 3 did not seem to affect the Coragens' control of the MRB larvae when compared to Experiment 4 that had much less organic material.

The low levels of MRB larvae in both of these experiments, partly clouds the results and makes it difficult to be confident in any conclusions drawn from these 2012 experiments.

Further research should be conducted to determine why Coragen has failed to be as effective in these experiments, as it has been previously.