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**ISOLATION DISTANCE BETWEEN TREATED AND UNTREATED VINEYARD WITH MATING DISRUPTION PHEROMONES AGAINST GRAPE MOTH (*Lobesia botrana*.Schiff.)**

**ISUFI Alban<sup>1\*</sup> and ÇOTA Ejup<sup>2</sup>**

Agricultural University of Tirana, Faculty of Agriculture and Environment, Plant Protection Department, Koder-Kamez, 1029, Tirana, Albania

**ABSTRACT**

Grape moth is key insect pest in Albanian vineyards. Traditionally, some three to four chemical treatments are carried out with conventional insecticides every year. When mating disruption method was applied, no more chemical treatments were carried out. The vineyard farmers are not aware about the significant role that mating disruption plays comparing with conventional treatments. According to our observations, the isolation distance avoids reaching of fertile grape moth coming from untreated vineyard to treated ones. The experiment was carried out in Durres region during 2014-2015. Trials show that in the treated vineyard with disruption pheromones with 10 m distance from untreated the rate of infestation was 18 %. In treated vineyard with mating disruption pheromones, where the distance from untreated was 85 meters the infestation rate was 8,5 %. In treated vineyard with disruption pheromones in 200 meters distance from untreated vineyard, the infestation rate was 3,5 %, whereas in 1500 meters distance from untreated vineyard infestation was 2%. In untreated area (neither chemical insecticides nor disruption pheromones), where the distance was 1000 meters, the infestation rate was 38%. When the isolation distance was 200 meters among treated vineyards with mating disruption pheromones from treated with conventional insecticides results with the lowest infestation rate (3.5%).

**Keywords:** Grape moth, Vineyard, Pheromone, Isolation distance, infestation rate.

**INTRODUCTION**

**MATERIAL AND METHOD**

The goal of field test was to find what is the security distance between treated vineyards with mating disruption pheromones and other variants treated with conventional insecticides. This security distance understand the distance that avoid fertile female come from untreated vineyard to reach vineyard treated with mating disruption pheromones. The fertile female has no need for contact with male adults. Fertile females come in treated vineyard with mating disruption pheromones and lay the eggs on the of grape bunches.

In the four vineyards parcels treated with mating disruption pheromones and in control without treatment are made the field analyses in order to see the infestation from grape moth on the grape cluster. In the control vineyard analyses are made in order to see the infestation potential of grape moth in this zone. For each parcel of vineyard are controlled 100 clusters taken diagonal in five control point. In each control points are controlled 20 grape clusters. The field analyses are made before the harvesting.

The biochemical structure of pheromones with formulation ISONET.L is (*E*)-7-dodecenyl acetate and (*E, E*) - and (*Z, E*)-isomers of 7, 9, 11- dodecatrienyl acetate.). The dispenser of pheromones **Isonet L** in vineyard are hang in flowering time of grape The dispenser are hang every 6-7 meter in second or third wire of the grape row. Dispensers are hang on one row yes, another row no. Are used 500 dispenser per ha. Isonet L is imported from one bio-fabric in Switzerland. The field tests were carried out in five variants as in table 1 bellow.

**Table 1. Variants of field test treated with mating disruption pheromone with formulation (Isonet L) with 500 dispensers/ha**

Variants (V)	Distances of untreated variants from variants treated with mating disruption pheromones (in meter)
V1	10
V2	85
V3	200
V4	1500
V5 Control without treatments neither with pheromones nor insecticides	1000

**This table below is considered to be taken into account for evaluation of infestation rate in our study (after C.Carlos et.al. 2013)**

Generations of <i>L.botrana</i>	Analyzed organs	Threshold
First generattion	Analised 100 cluster	100-200 nets in 100 clusters
Second generattion	Analised 100 grape cluster	1-10 grape clusters

Third generation	Analised 100 grape cluster	1-10 grape clusters
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**Research Findings and Discussion**

**Table 2. Infestation rate of grape clusters from larvae of *Lobesia botrana* during 2014**

Variants	Number of larvae in 20 clusters					Total nr. of larvae/100 cluster
	Control points					
	1	2	3	4	5	
V1	4	6	3	3	3	19
V2	1	1	4	1	3	10
V3	1	0	1	0	1	3
V4	0	1	0	1	0	2
V5	5	7	6	9	5	32

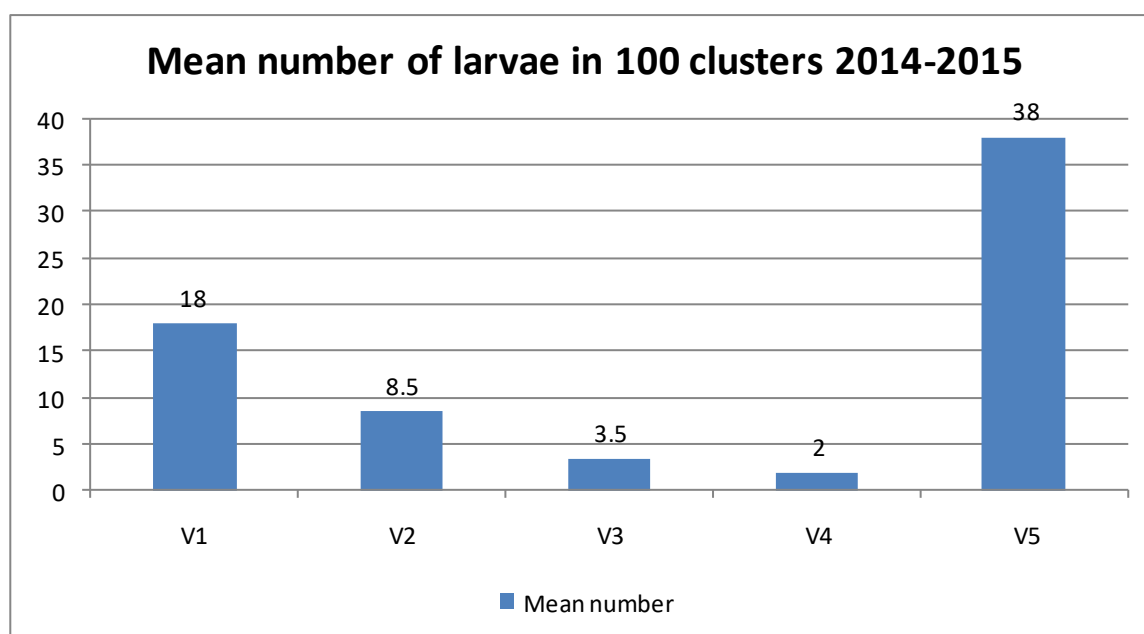
**Table 3. Infestation rate of grape clusters from larvae of *Lobesia botrana* during 2015**

Variants	Number of larvae in 20 clusters					Total nr. of larvae/100 cluster
	Control points					
	1	2	3	4	5	
V1	4	6	3	3	1	17
V2	1	1	4	0	1	7
V3	2	0	2	0	0	4
V4	0	1	0	1	1	2
V5	9	11	13	4	7	44

**Table 4. Number of larvae/100 cluster**

Variants	Number of larvae/100 cluster
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	2014	2015	Total	Mean
V1	19	17	36	18
V2	10	7	17	8.5
V3	3	4	7	3.5
V4	2	2	4	2
V5	32	44	76	38



## RESULTS AND SUGGESTIONS

The field test shows that in the case of using of mating disruption pheromones against grape moth (*Lobesia botrana*) must be respect a distance between vineyard with mating disruption pheromones and vineyard without mating disruption pheromones.

According to our observations, the tolerable distance between treated and untreated vineyard was above 200 meters (Pflanzenschutz, 2007). In this distance the infestation in variant treated with pheromones was 3.5 %. The infestation rate was under the economic threshold, (tolerable infestation of the clusters with larvae). This threshold in Albanian condition is accepted to be 6 % of grape clusters with at least one larva), whereas the distance under 100 meters is not secure. In distance 85 meter between variants with mating disruption pheromones and treated with

conventional insecticides is above economic threshold, or 8.5 % of grape clusters with at least one larva. When the distance was 1500 meters it is fully secure. In this distance infestation rate was only 2 %. In vineyard areas without any treatment, the infestation rate was 32 %, which means that the grape moth is a key pest in the zone where are carried out the field test.

## **CONCLUSIONS**

Based on results, the infestation rate is strongly depended by the isolation distance from treated and untreated area.

So, the appropriate and secure distance results to be 200 m, where the infestation rate was 3.5%.

Based on Albanian condition it was confirmed again that economic threshold by 6% is acceptable and can be used by farmers as an orientated threshold in case of using matting disruption method in organic production of grapes.

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