

M-OVICARD: Analyzing physical cues for grapevine moth oviposition for the development of a Decision Support System

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The European grapevine moths (GVM) *Lobesia botrana* (Denis & Schiffermüller) and *Eupoecilia ambiguella* (Hubner) (Lepidoptera: Tortricidae) are polyphagous insects, which can cause severe economic losses in European viticulture.

Female grapevine moths are attracted by the host plant to lay eggs on flower buds and grapes at different phenological stages. Beside the direct damage on grapes by feeding, the hatched larvae injure fruits and thus promote infections of pathogenic fungi such as *Botrytis cinerea*, which can lead to a decrease of wine quality.

Besides mating disruption, the only control opportunity consists of insecticide treatments. Most of the modern insecticides against GVM have to be applied around larvae hatching from the eggs.

For effective applications, it would be necessary to conduct egg monitoring in vineyards. Usually this is a laborious and time consuming task for winegrowers. As a result, the application occurs prophylactically which is not in compliance to integrated pest management. Hence the aim of this project is to develop a monitoring tool, which offers the opportunity to determine the timing and necessity of grape berry moth control. Ideally, the tool should be as attractive or even more than the

grape itself and deliver, in reference to the number of eggs, a correlation with pest infestation.

To create a “Moth Oviposition Card” (M-OVICARD), it is necessary to identify the parameter influencing the egg laying process. Basically, olfactory cues, released from host plants, guide the females to oviposition substrates from the distance. Once they reach the plant, volatiles in combination with contact and/or visual stimuli lead to induction of the egg laying process.

The construction of the “M-OVICARD” is made possible by a cumulative work of two facilities of the JKI-Institute for Fruit Crops and Viticulture. The location in Dossenheim consecrates on the identification of the attractive substances whereas in Siebeldingen the corresponding bioassays are carried out.

Primarily, the bioassays are structured according to dual-choice tests. An analysis on volatiles acting over distance is conducted in small tents in the greenhouse. Visual, olfactory and contact-chemosensory plant cues of grapes and suitable surfaces as well are analyzed in small cages under controlled conditions in the climatic chamber. Quantification is primarily based on the number of eggs laid.