

# Use of Carpovirusine products against codling moth in organic fruit cultivation to prevent resistance

## Problem

The codling moth is one of the major pests in pome fruit cultivation. However, they are becoming increasingly resistant to commonly used Carpovirusine isolates, with only a few known efficient stems left.

## Solution

The use of Carpovirusine agents must only be part of a wider strategy against the pest and should be used cautiously while infestation pressure is low.

## Benefits

To avoid mass reproduction of codling moths in organic orchards (and to keep population levels sustainably below the economic damage threshold), regulation must be accomplished through a combined strategy of monitoring, pheromone confusion, nematodes, plant hygiene, and the use of granuloviruses.

## Practical recommendation

Carpovirusine is a biological agent based on a specific insect pathogenic virus, the *Cydia pomonella* Granulovirus (CpGV).

- Determine when the flight of *C. pomonella* begins by using Pheromone-Delta traps. A digital forecast model (e.g. Fruitweb) can also (additionally) help to screen flight begin. Flight activity means ongoing egg laying and hatching of the damaging larvae shortly afterwards (usually from the end of May onward).
- Based on these screening results, start treatments with CpGV agents from hatching onwards with sufficient, regular application. If the infestation pressure is medium-high: Use **at least** 100ml CpGV per hectare to avoid resistance building (Antibiotics principle – an insufficient dosage risks resistance building).
- Dosage/application rate can be adapted to infestation pressure, hatching prognosis, weather conditions and tree height, especially for the 2<sup>nd</sup> and 3<sup>rd</sup> generation (the number of possible generations varies in Europe related to climatic conditions. There are between 1 & 3 generations per year).

## Which CpGV-agent to use?

- Madex Max /Carpovirusine Evo2: For farms in which no loss of efficacy was observed yet
- Madex Top: If there is a loss of efficacy of MadexMax or in case of heavy infestation
- ABC V14: In case of **proven** resistance against above Agents (emergency approval in Germany, only available after a positive resistance test done by the JKI-Institute and official approval)

## Applicability box

### Theme

Crop production, Horticulture, Temperate fruits

### Keywords

Plant protection; Pest control, Biological pest control

### Context

Central Europe

### Required time

Immediately

### Period of impact

Spring, summer

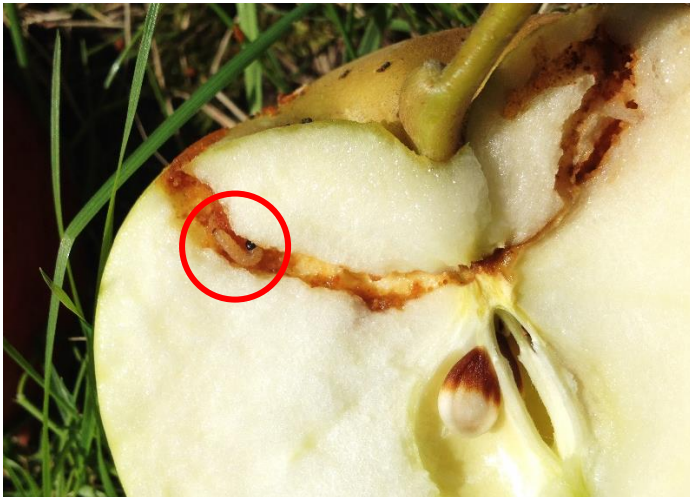
### Equipment

CPGV (*Cydia pomonella* Granulovirus)

### Best in

Pome fruits

- Do not apply MadexTop in an extensive spraying sequence or with a constant low application rate (risk of resistance building)
- In case of high fruit infestation (>1%), consider manually picking out infested fruits as well as application of nematodes in autumn (See Practice Abstract 'Beneficial nematodes against codling moth in organic apple production')



Picture 1 Tunneling codling moth larvae (2016).



Picture 2 Apple with multiple infestations (Photos: C. Adolphi, 2016).

### Weblinks

- Adolphi, C., Oeser, N. 2023. Practice abstract Beneficial nematodes against codling moth in organic apple production. FÖKO. BIOFRUITNET.
- Schluchter, M. et al. 2020. Regulation of codling and cup moths. Öko-Obstbau. (German)
- Fritsch, E. et al. 2007. Codling moth Granulovirus: first evidence of differences in susceptibility of local codling moth populations. (German)
- Weber, R., Heyne, P. 2021. The codling moth, a climate winner. Öko-Obstbau. (German)
- Check the Organic Farm Knowledge platform for more practical recommendations.

### About this practice abstract

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