PRACTICE ABSTRACT

How to control Adoxophyes orana in organic apple production: decision making, mating disruption and direct control measures

Problem

The most significant damage caused by the fruit leaf roller (*A. orana*) occurs in the fall, shortly before harvest, when the overwintering larvae feed on the fruit.

Solution

To regulate heavy infestation by the fruit moth *A. orana*, in organic cultivation, the granulovirus preparation Capex and Bacillus thuringiensis (Bt) preparations are approved.

Benefits

Since the methods often do not produce satisfactory results individually, the regulation of A. orana is carried out by a combination of insect pathogens, especially Bt - preparations, insecticides, confusion, as well as parasitoids as natural enemies.

Applicability box

Theme

Crop production, Horticulture, pome fruit

Keywords

Disease and pest control, Plant protection, biological pest control

Context

All Europe, where *A. orana* is an issue

Application time

Bt and Capex from the appearance of the first larvae; hang out pheromones before first moth flight

Required time

Moths of the first generation fly from the End of may

Equipment

Pheromone, Bt, Granulovirus

Practical recommendation

- The most important representative of the fruit leaf roller is *A. orana* (in Central Europe 2 generations/year)
- Larvae of the overwintering generation cause feeding damage to the fruits, especially in September/ October, which concurrently might serve as an entry gate for secondary infections by different fruit pathogens (fungi).
- In organic cultivation, different pheromones for prevention and Granulovirus & Bt agents for direct control are available to control the pest:
  - **ISOMATE ® CLR MAX TT (pheromone):** Combination dispenser to confuse the codling moth (C. pomonella) and fruit leaf roller (A. orana)
  - **Bacillus thuringensis:** Bt is a toxin-producing bacterium; in organic orchards, it is used to regulate free-feeding butterfly caterpillars
  - **Granulovirus (e.g., Capex):** infects the fatty tissue of the larvae so that they remain alive until the last larval stage and also still feed, therefore only limiting the damage by the subsequent generation; advantageous, however, is that due to the long life of the larvae, most parasitoids can fully develop in the larvae. The virus has a long-term effect because, after capex treatment, the granulovirus persists in the plants for a long time
  - **Parasitoids:** Parasitoids depend on nectar and pollen for their egg maturation; at sites with a high incidence of A. orana, the emergence of parasitoids can be promoted by including flowering plants.

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Picture 1: Larvae of the fruit leaf roller *A. orana* on the leaf, Picture 2: Teleutaea striata Grav. (parasitoid of the Ichneumonidae family), Picture 3: Flowering supply in orchards, Picture 4: Fruit damage caused by *A. orana*: larvae of the fruit leaf roller and snacking on the fruit (Photo 1-4: Christina Adolphi & Anna-Lena Rau, 2019).

Further information

Weblinks

- Regulation of codling moth, Öko-Obstbau, 2020. (DE)
- Influence of other leaf roller moth species and revegetation management, Öko-Obstbau, 2015. (DE)
- Erarbeitung von Bausteinen zur Optimierung der Regulierung der Apfelsägewespe, der Rotbeinigen Baumwanze und von Schalenwicklern und optimale Integration in die Gesamtstrategie zur Insektenregulierung im Ökologischen Kernobstanbau. orgprints.org. (DE)

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