

New approaches to control the cherry fruit fly *Rhagoletis cerasi* in organic cherry production

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Objectives: The cherry fruit fly (*Rhagoletis cerasi*) is one of the key-pests in organic sweet cherry production. Until now, in Swiss organic production the cherry fruit flies are mainly controlled by using Rebell traps (yellow trap) and Israeli Fructect traps (combination of visual and food-bait attractants). The disadvantage of these methods is, besides the partly insufficient efficacy, that the installation of the traps is very labour-intensive. For this reason different new approaches to control the cherry fruit fly were tested under field conditions in the northwestern part of Switzerland.

Hypothesis: (1) the application of "Audienz" (Spinosad) prevents an oviposition of the cherry fruit fly and the addition of Neem increases the ovicidal effect; (2) food-baits containing insecticides and applied on the tree trunk poison feeding flies; (3) baits containing insecticide in Rebell traps (without glue) act as a sort of "attract & kill".

Methods: The different methods were tested in 11 field trials. (1) *Insecticide trials:* Spinosad (formulation "Audienz", 0.02%) was twice applied on the trees at the period when cherries turn from green to yellow. This treatment was compared with an untreated control and with the combination of "Audienz" (0.02%) and Neem (0.3%). (2) *Bait trials:* after the first appearance of the fruit flies the bait formulation "Spinosad GF 120" was applied with a brush to the trunk and the branches three times in a 7-10 days interval. (3) *Attract & kill:* the Spinosad bait "Spinosad GF120" was used as "attract & kill" in unglued Fructect traps (trap system with a yellow panel and a red spherical container). The original Israeli bait of the Fructect trap mixed with pyrethrine was tested the same way. (1 - 3) The infestation with larvae of the cherry fruit fly at the harvest was determined by using the salty-water method.

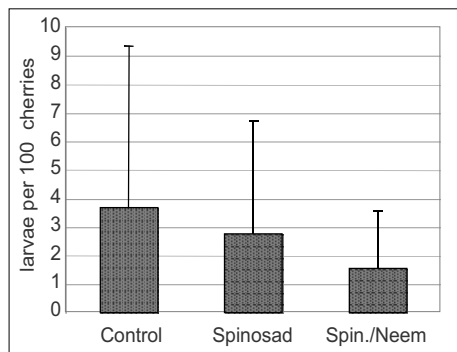


Fig.1: Number of Larvae per 100 cherries, determined by using the salty-water-method, pooled over 2 orchards, Dunnett's Test with $\alpha=0.05$ no significant differences

Results/Discussion: (1) *Insecticide trials:* the results of this trial are given in Figure 1. Fruits of the untreated control had an average infestation of 3.6 larvae per 100 cherries, in cherries treated with Spinosad 2.75 larvae and the treatment Spinosad/Neem 1.5 larvae were found. However, these differences were not significant. Thus, Spinosad (formulation "Audienz") does not show a sufficient effect on the cherry fruit fly. The ovicidal effect of Neem as described by GEIPEL (2001), could not be definitely proven.

(2) *Bait trial*: the use of the bait formulation “Spinosad GF 120” had no sufficient effect. Results are shown in Figure 2. A direct comparison with an untreated control was not possible, because the control trees were situated outside the orchard in order to stay uninfluenced by the bait. Nevertheless, infestation levels up to 19% (depending on the cherry variety; average 4.28%) in the treated areas can not be tolerated. (3) *Attract & Kill*: this trial, too, did not give convincing results. We observed infestation levels up to 15% (depending on the variety; average 4.6%) in the orchards with Spinosad bait as well as the orchards with the Israeli bait mixed with pyrethrine. A direct comparison with an untreated control is not possible for the same reasons given above. The results are shown in Figure 3.

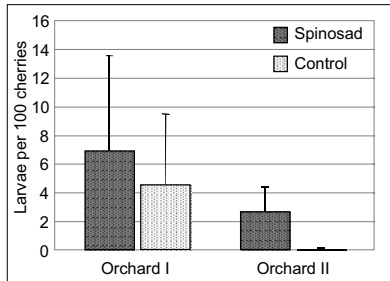


Fig.2: Mean number of Larvae per 100 cherries in 2 orchards in northwestern Switzerland; determined by using the salty –water method

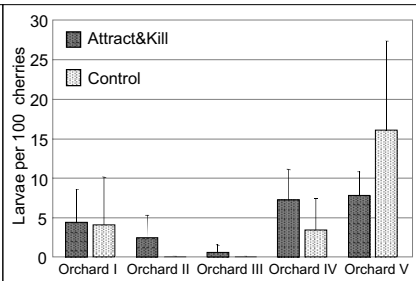


Fig.3: Mean number of Larvae per 100 cherries; determined by using the salty –water method; Orchard I & II: Spinosad bait; Orchard III – V: Israeli bait + pyrethrine

Further results: In a further trial the attractiveness of the different baits (original Israeli bait; “Spinosad GF 120”; “Nulure” 1:10; “Nulure” 1:3; empty trap) was compared. Due to the inhomogeneous distribution of the fruit flies in the orchard, the results did not show significant differences but, by tendency the Israeli bait trapped more fruit flies (average of 7.25 flies per trap), compared to the other bait stations (“Nulure” 1:10: 5.5 flies; “Nulure” 1:3: 4 flies; Spinosad: 4.25 flies; empty: 2.75 flies).

Summary: (1) Spinosad (formulation “Audienz”) does not show a sufficient effect on the cherry fruit fly. The addition of Neem does not significantly increase the efficacy. (2) All food-baits seem to be very suitable for cherry fruit flies and should be tested in laboratory under standardised conditions. (3) The method “attract & kill” with Fructect traps does not work. Different kinds of bait stations should be tested.

Literature: GEIPEL, K. (2001): Versuchsbericht zum 2. Jahr des Projektes: Bekämpfung der Kirschenfliege *Rhagoletis cerasi* L., Bayerische Landesanstalt für Bodenkultur und Pflanzenbau, S. 32