Using dropleg technique during flowering of oilseed rape to avoid pollinator exposure

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Dropleg technique in oilseed rape

Advantages:

• Reduced exposure for honey bees and other pollinators

• Reduced residues of active ingredients in honey and pollen
  (Wallner 2015)

• Efficacy against Sclerotinia stem rot is comparable with conventional spraying technique

Disadvantages and open questions:

• Additional costs and labour for farmers

• Efficacy against cabbage seed weevil (Ceutorhynchus obstrictus) and pod midge (Dasineura brassicae)?
Material and methods

- Field trials near Braunschweig from 2015-2017
- Block design, plot size 240 m², four replicates
- Application at full flowering BBCH 65-67

08.05.2015
- Biscaya
- Mavrik
- (Thiacloprid 72 g a.i. ha⁻¹)
- (Tau-fluvalinate 48 g a.i. ha⁻¹)

10.05.2016
- Biscaya
- Mospilan
- (Thiacloprid 72 g a.i. ha⁻¹)
- (Acetamiprid 40 g a.i. ha⁻¹)

15.05.2017
- Biscaya
- Mospilan
- (Thiacloprid 72 g a.i. ha⁻¹)
- (Acetamiprid 40 g a.i. ha⁻¹)

- Assessment of OSR pests:
  - water trays at soil level
  - photoeclectors
  - pod examination
Daily emergence rate of *D. brassicae*

![Graph showing daily emergence rate](attachment:image.png)

- **emergence/m² 2017**
- **emergence/m² 2016**
- **°C 2017**
- **°C 2016**

**Application**

May

3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
Pod infestation by first generation of *D. brassicae* 2017

Jittered boxplot of pod infestation by *D. brassicae* at 01.06.2017 (BBCH 75). Mean ± confidence intervall (red). Number of plants assessed n = 48.

- **conv Bi** = conventional application Biscaya (thiacloprid)
- **conv Mo** = conventional application Mospilan (acetamiprid)
- **Drop Bi** = dropleg application Biscaya
- **Drop Mo** = dropleg application Mospilan
Pod infestation by second generation of *D. brassicae* 2017

Jittered boxplot of pod infestation of *D. brassicae* at 21.06.2017 (BBCH 78-80). Mean ± confidence intervall (red). Number of assessed plants n = 48.
Abundance of larvae and new generation of *C. obstrictus*

Larvae / m² + se of *C. obstrictus* trapped in water trays, n = 24. Glm, p ≤ 0.05.

Sum of new generation of *C. obstrictus* per m² + se trapped with photoeclectors, n = 8. Glm, p ≤ 0.05.
Abundance of larvae and new generation of *B. aeneus*

Larvae / m² + se of *B. aeneus* trapped with water trays, n = 24. Glm, p ≤ 0.05.

Sum of new generation of *B. aeneus* per m² + se trapped with photoeclectors, n = 8. Glm, p ≤ 0.05.
Abundance of larvae and new generation weevils of *C. pallidactylus*

Larvae / m² + se of *C. pallidactylus* trapped with water trays, n = 24. Glm, p ≤ 0.05.

Sum of new generation of *C. pallidactylus* per m² + se trapped with photoeclectors, n = 8. Glm, p ≤ 0.05.
Parasitism of Pollen beetle larvae by *Tersilochus heterocerus* 2017

Application: 15.05.2017 (BBCH 65-67)
Larvae were dissected and eggs of *T. heterocerus* were counted.
Parasitism of Pollen beetle larvae by *T. heterocerus* 2016

Application: 10.05.2016 (BBCH 65)

Number of L2 larvae investigated: ≤ 100

- Control
- conv Bi
- Drop Bi
- conv Mo
- Drop Mo
Parasitism of Pollen beetle larvae by *T. heterocerus* 2015

Application: 08.05.2015 (BBCH 65)

Number of L2 larvae investigated: \( \leq 100 \)

27 DAA: only few larvae

**7 DAA:**
- Control > Biscaya \( P < 0.01 \)
- Biscaya Dropleg > Biscaya, \( P = 0.02 \)
- Mavrik Dropleg > Biscaya, \( P < 0.01 \)

Parasitism rate (mean \( \pm \)sd) %

- Control
- conv Bi
- Drop Bi
- conv Mavrik (tau-fluvalinate)
- Drop Mavrik (tau-fluvalinate)
OSR yields from 2015-2017

- only in 2016 a significant effect of conventional Biscaya

- no difference between application techniques

Average yield ± se in Wendhausen from 2015 - 2017
Outlook

• Application during flowering also selects for resistance

• we are still waiting for a year with high pest abundance

• So far no remarkable differences in efficacy between conventional and dropleg spraying technique

• Generally dropleg technique can allow reduced drift values

• It can be an opportunity to keep active ingredients available for application during flowering
Thank you for attention!

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