



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

Johannes Hausmann, Meike Brandes, Udo Heimbach, Bernd Ulber

Dropleg technique in oilseed rape

Advantages:

- Reduced exposure for honey bees and other pollinators
- Reduced residues of active ingredients in honey and pollen
- Efficacy against *Sclerotinia* stem rot is comparable with conventional spraying technique

(Wallner 2015)

(Dicke 2016, Haberlah-Korr 2016, Terhardt *et al.* 2016)

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

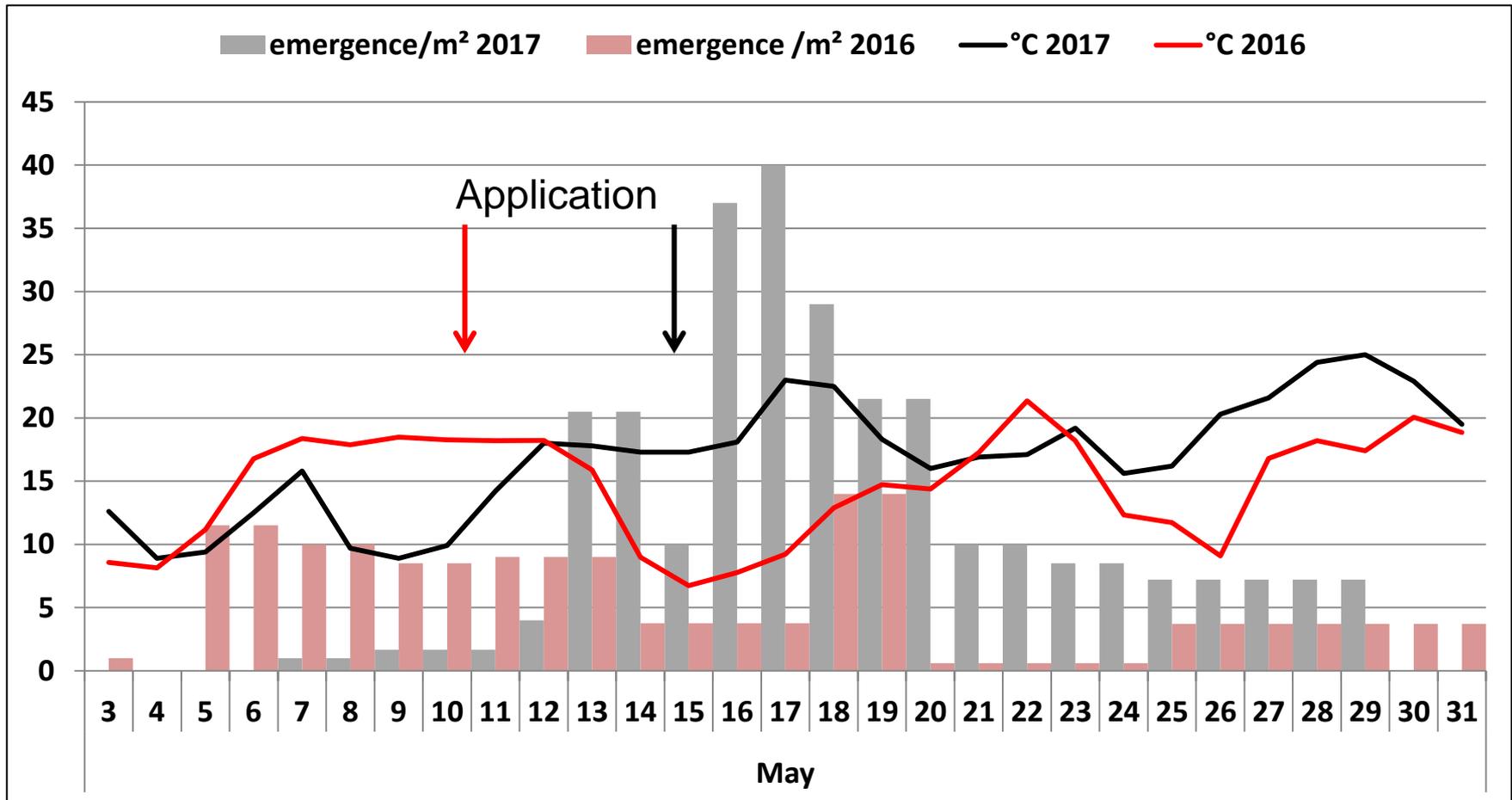
- Field trials near Braunschweig from 2015-2017
- Block design, plot size 240 m², four replicates
- Application at full flowering BBCH 65-67

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)

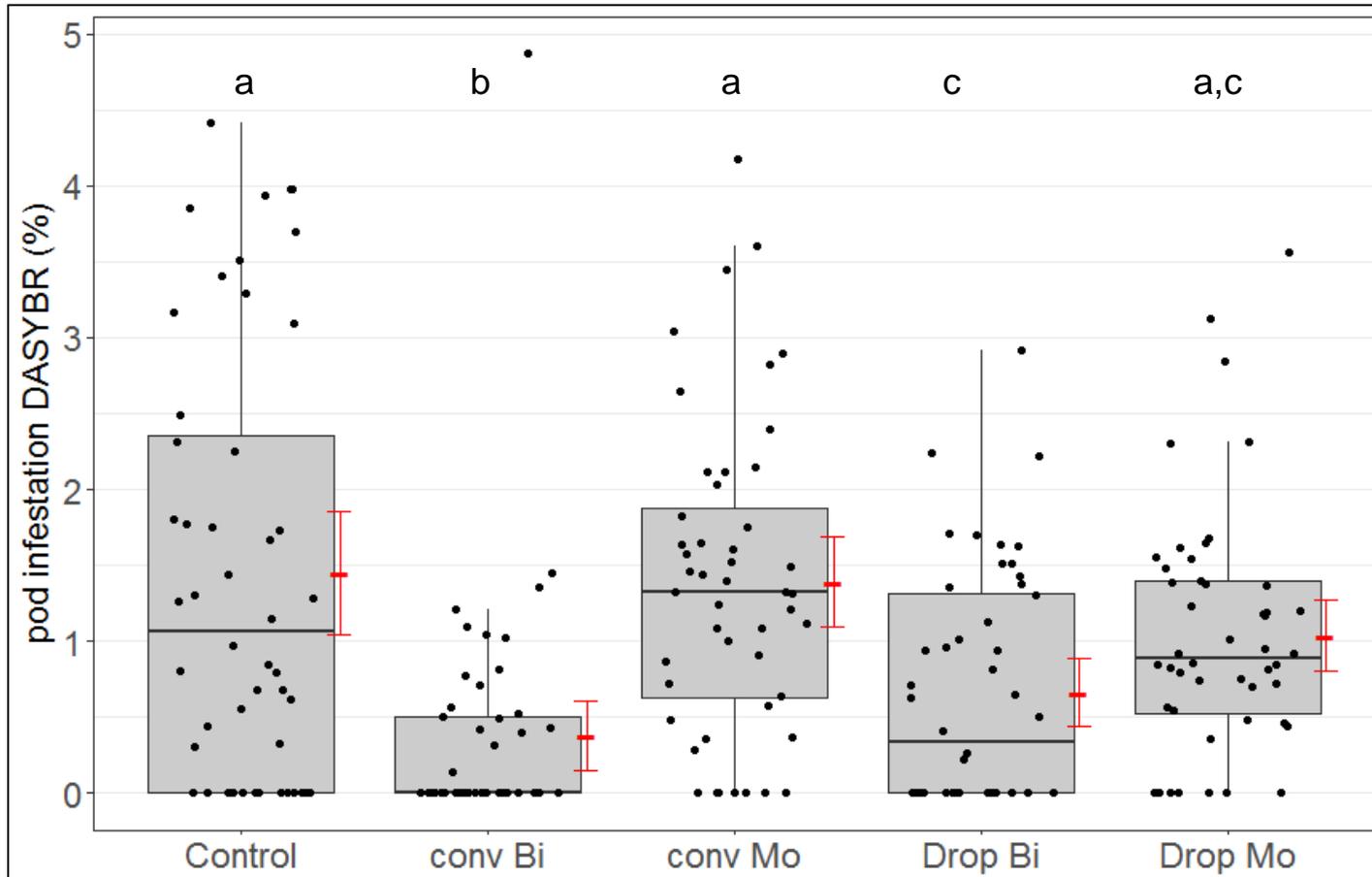
- Assessment of OSR pests:
 - water trays at soil level
 - photoelectors
 - pod examination



Daily emergence rate of *D. brassicae*



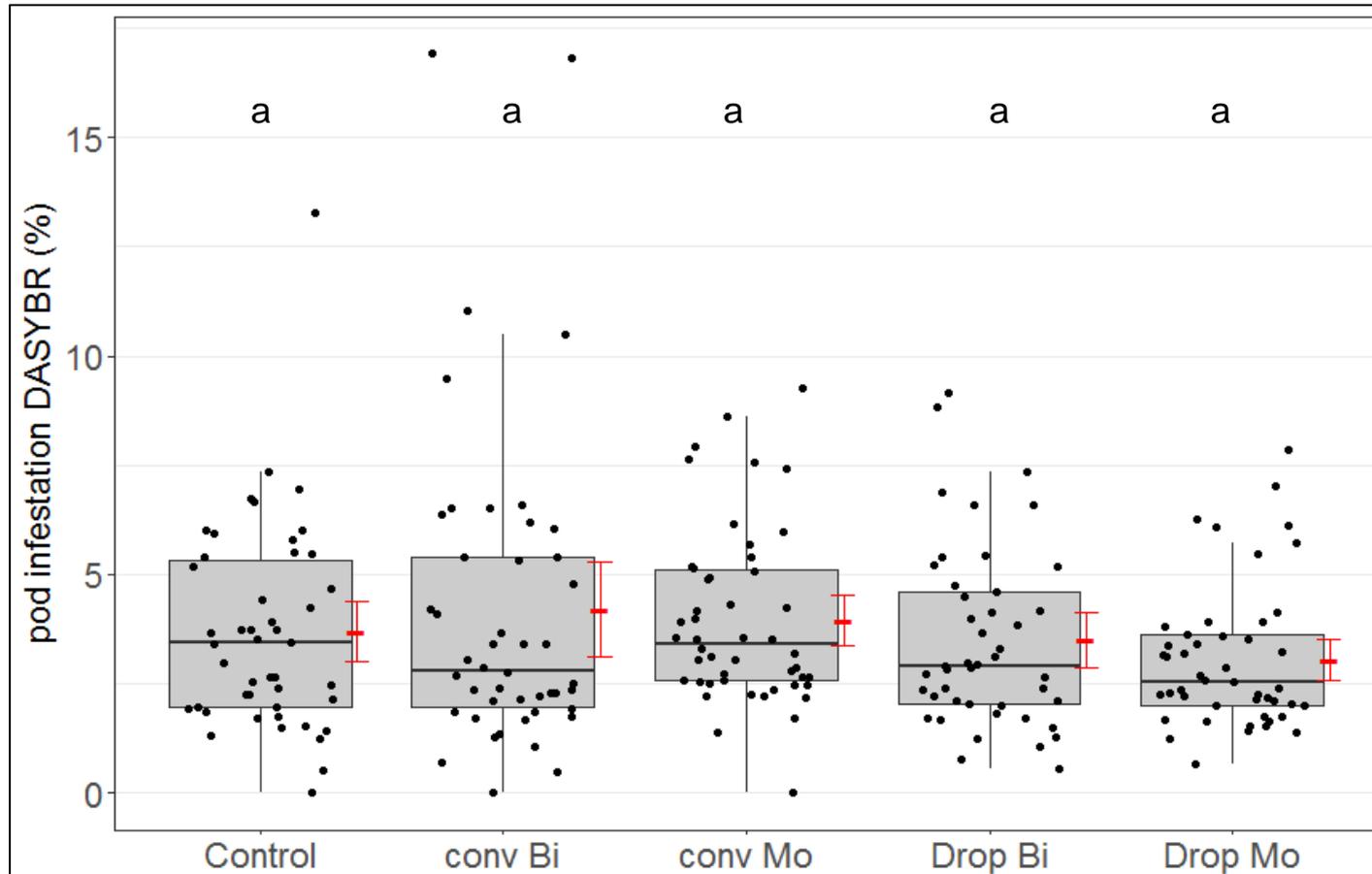
Pod infestation by first generation of *D. brassicae* 2017



- **conv Bi** = conventional application Biscaya (thiacloprid)
- **conv Mo** = conventional application Mospilan (acetamiprid)
- **Drop Bi** = dropleg application Biscaya
- **Drop Mo** = dropleg application Mospilan

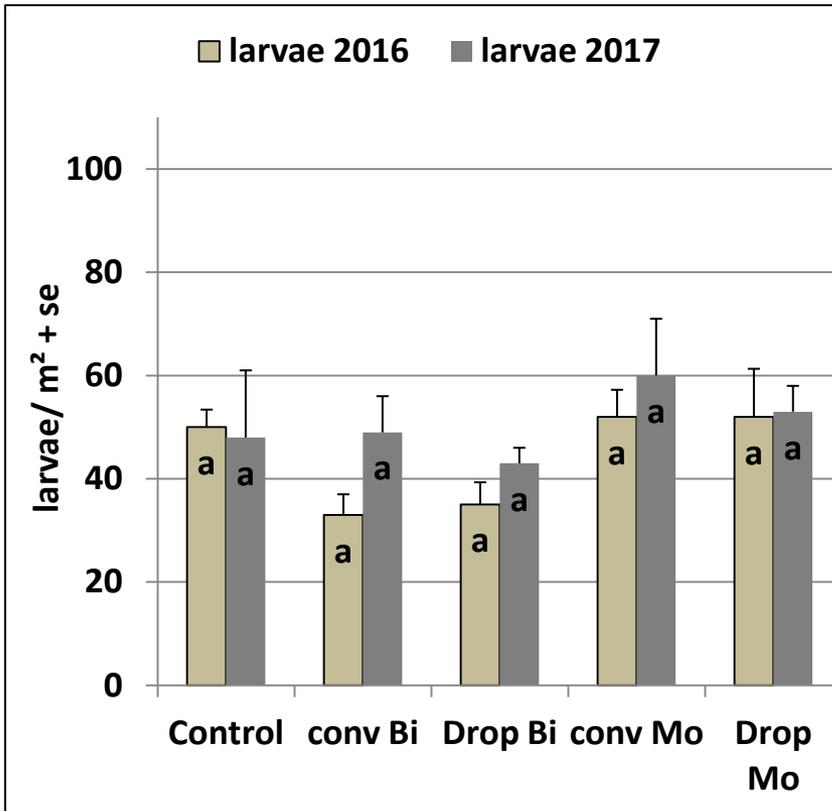
Jittered boxplot of pod infestation by *D. brassicae* at 01.06.2017 (BBCH 75). Mean ± confidence interval (red). Number of plants assessed n = 48.

Pod infestation by second generation of *D. brassicae* 2017

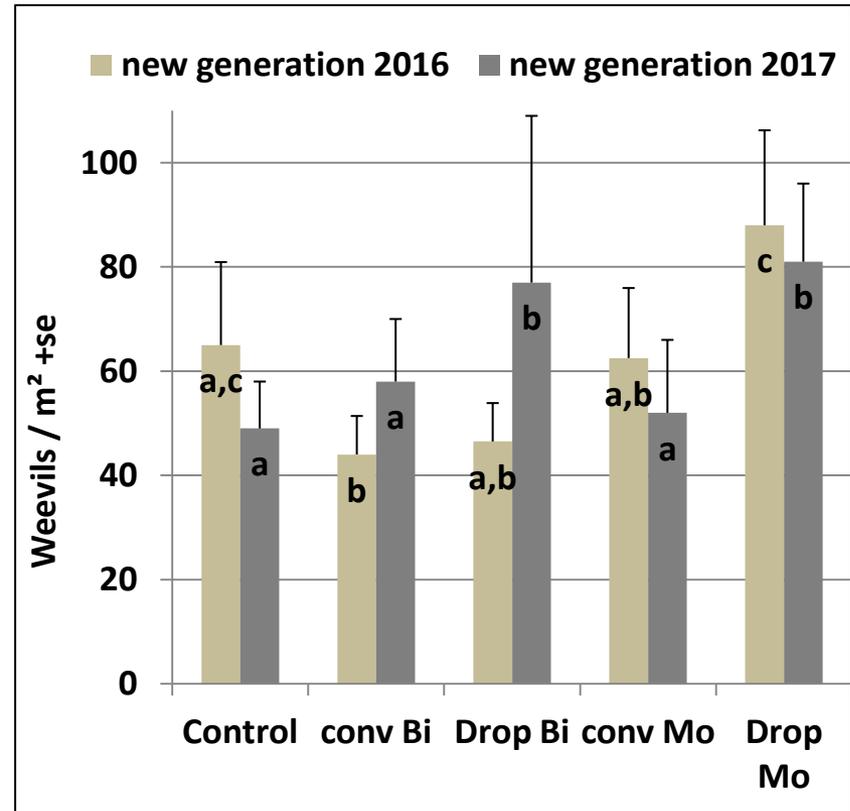


Jittered boxplot of pod infestation of *D. brassicae* at 21.06.2017 (BBCH 78-80). Mean \pm confidence intervall (red). Number of assessed plants $n = 48$.

Abundance of larvae and new generation of *C. obstrictus*

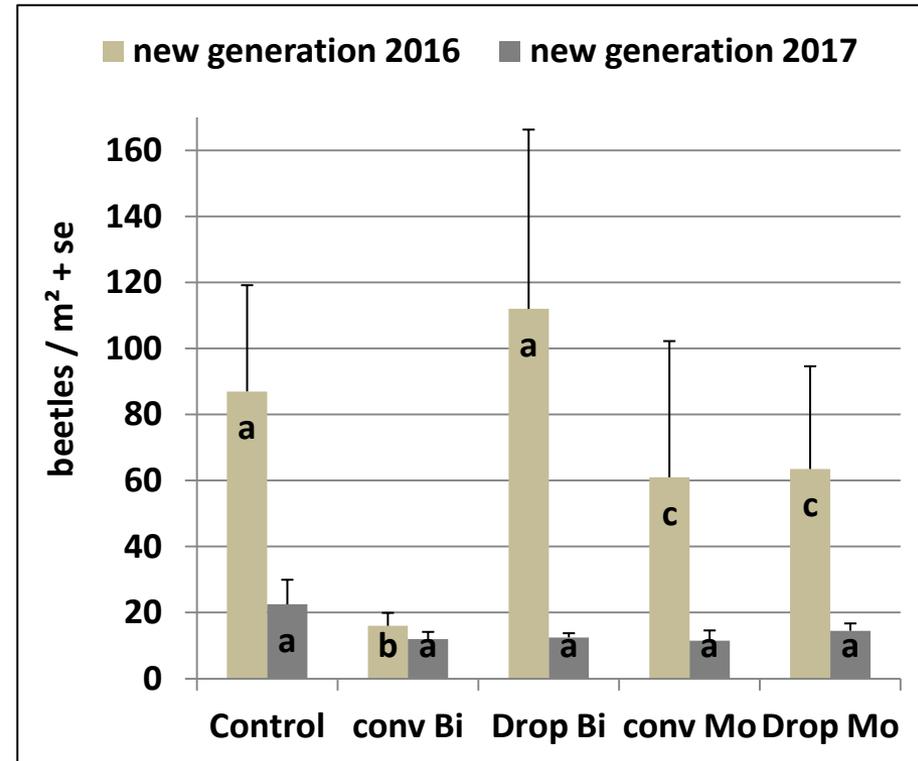
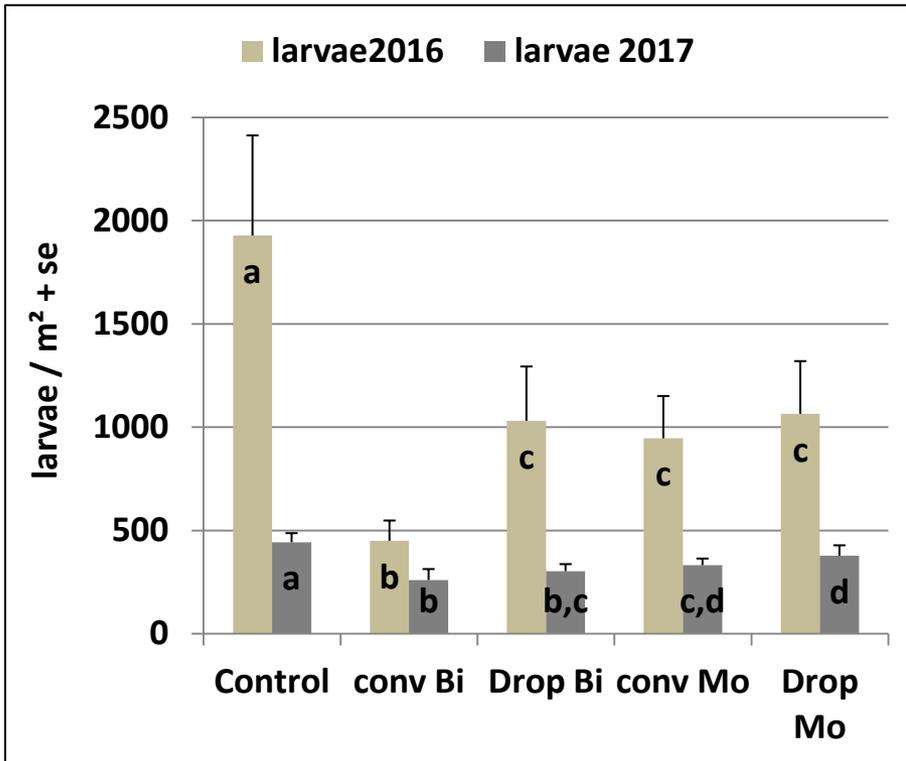


Larvae / m² + se of *C. obstrictus* trapped in water trays, n = 24. Glm, p ≤ 0.05.



Sum of new generation of *C. obstrictus* per m² + se trapped with photoelectors, n = 8. Glm, p ≤ 0.05.

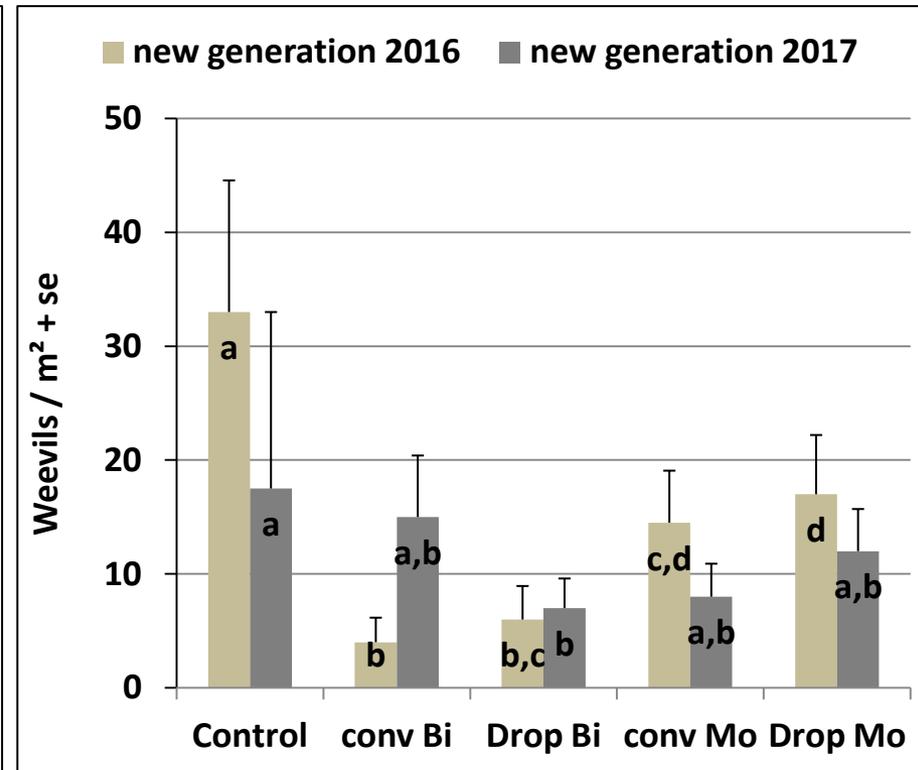
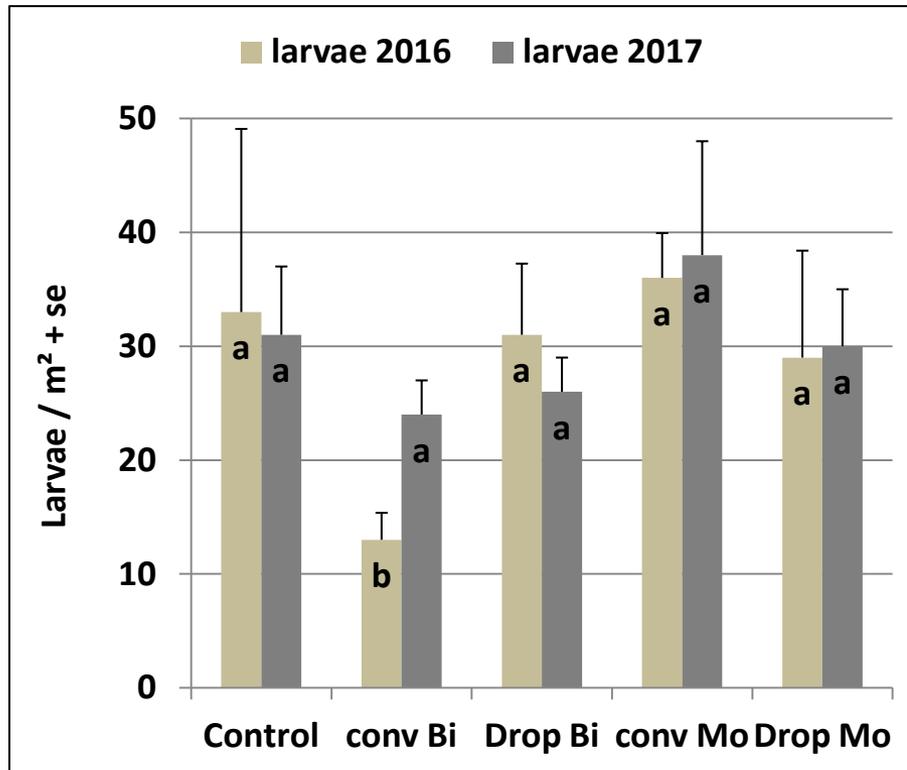
Abundance of larvae and new generation of *B. aeneus*



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 photoelectors, n = 8. Glm, p ≤ 0.05.

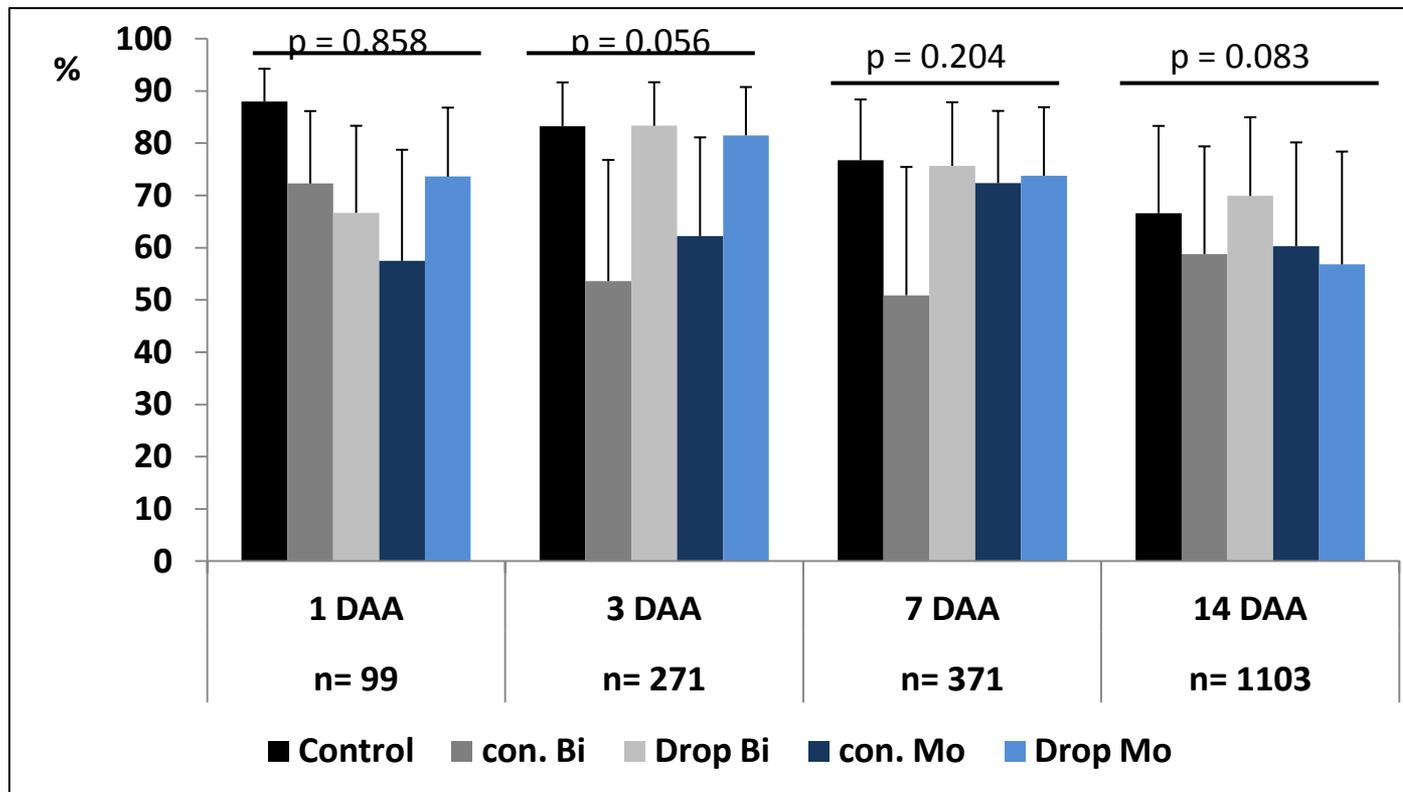
Abundance of larvae and new generation weevils of *C. pallidactylus*



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 photoelectors, n = 8. Glm, p ≤ 0.05.

Parasitism of Pollen beetle larvae by *Tersilochus heterocerus* 2017

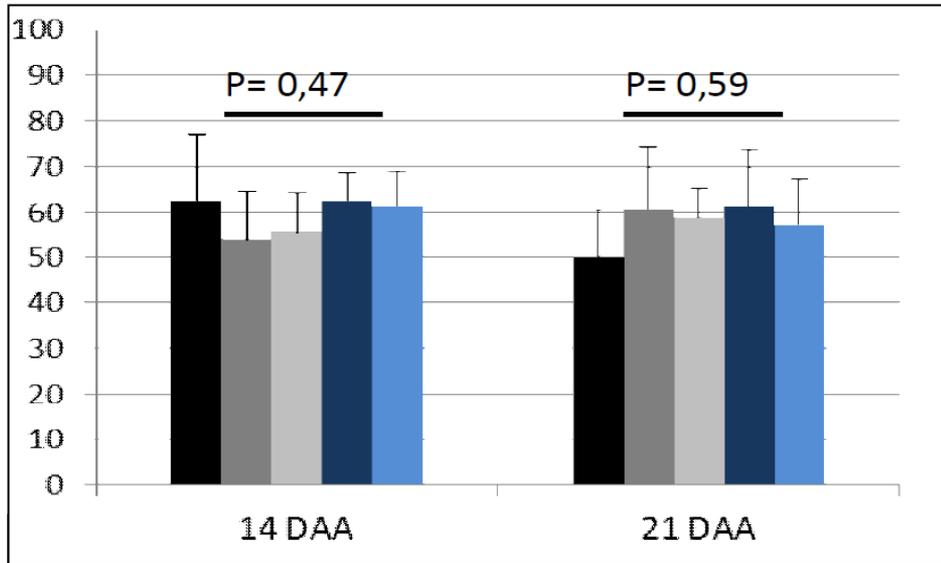


Application: 15.05.2017 (BBCH 65-67)

Larvae were dissected and eggs of *T. heterocerus* were counted.

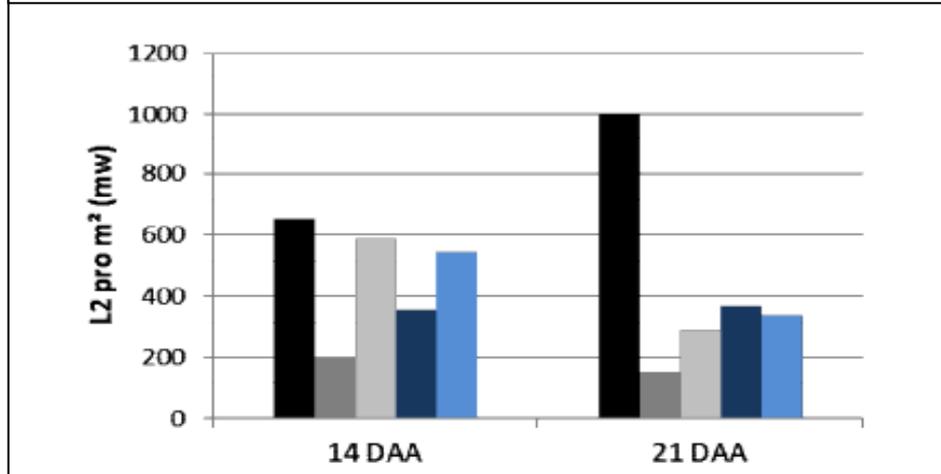
Parasitism of Pollen beetle larvae by *T. heterocerus* 2016

Parasitism rate (mean +sd) %



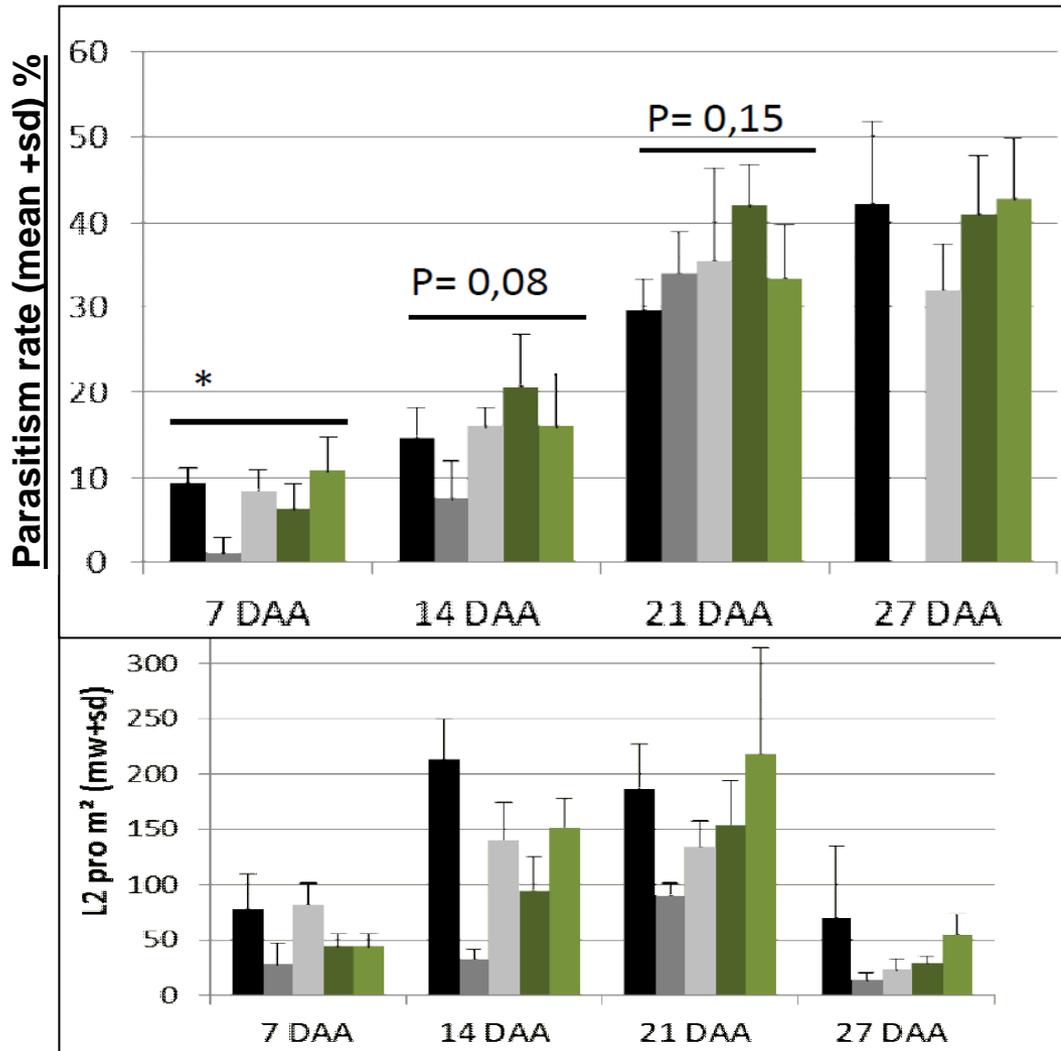
Application: 10.05.2016 (BBCH 65)

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: ≤ 100

27 DAA: only few larvae

7 DAA:

Control > Biscaya

P < 0,01

Biscaya Dropleg > Biscaya,

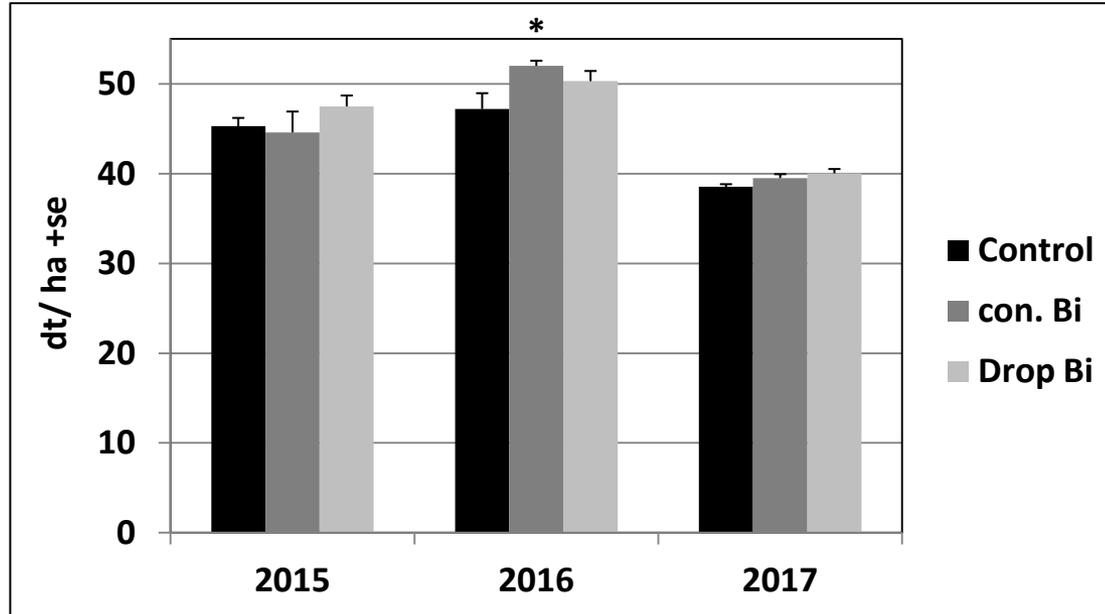
P = 0,02

Mavrik Dropleg > Biscaya,

P < 0,01

- Control
- conv Bi
- Drop Bi
- conv Mavrik (tau-fluvalinate)
- Drop Mavrik (tau-fluvalinate)

OSR yields from 2015-2017



Average yield + se in Wendhausen from 2015 - 2017

-> only in 2016 a significant effect of conventional Biscaya

-> no difference between application techniques

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!

Thanks to:

- Dominik Feistkorn JKI-A
- Rapool for financial support
- Lechler

