



Are there alternative insecticidal products after the ban of neonicotinoid seed treatment?

N. Conrad, M. Brandes & U. Heimbach

Background



Ban of neonicotinoids for seed treatment in winter oilseed rape in the EU in 2013

- higher importance of autumn insect pests
- chemical control of PSYCH relies on synthetic pyrethroids but **resistance to pyrethroids complicates control**
- knowledge gap because of many years good control of insect pests of young plants by neonicotinoid seed treatments
- changed crop production systems may need new thresholds



Aim of the study



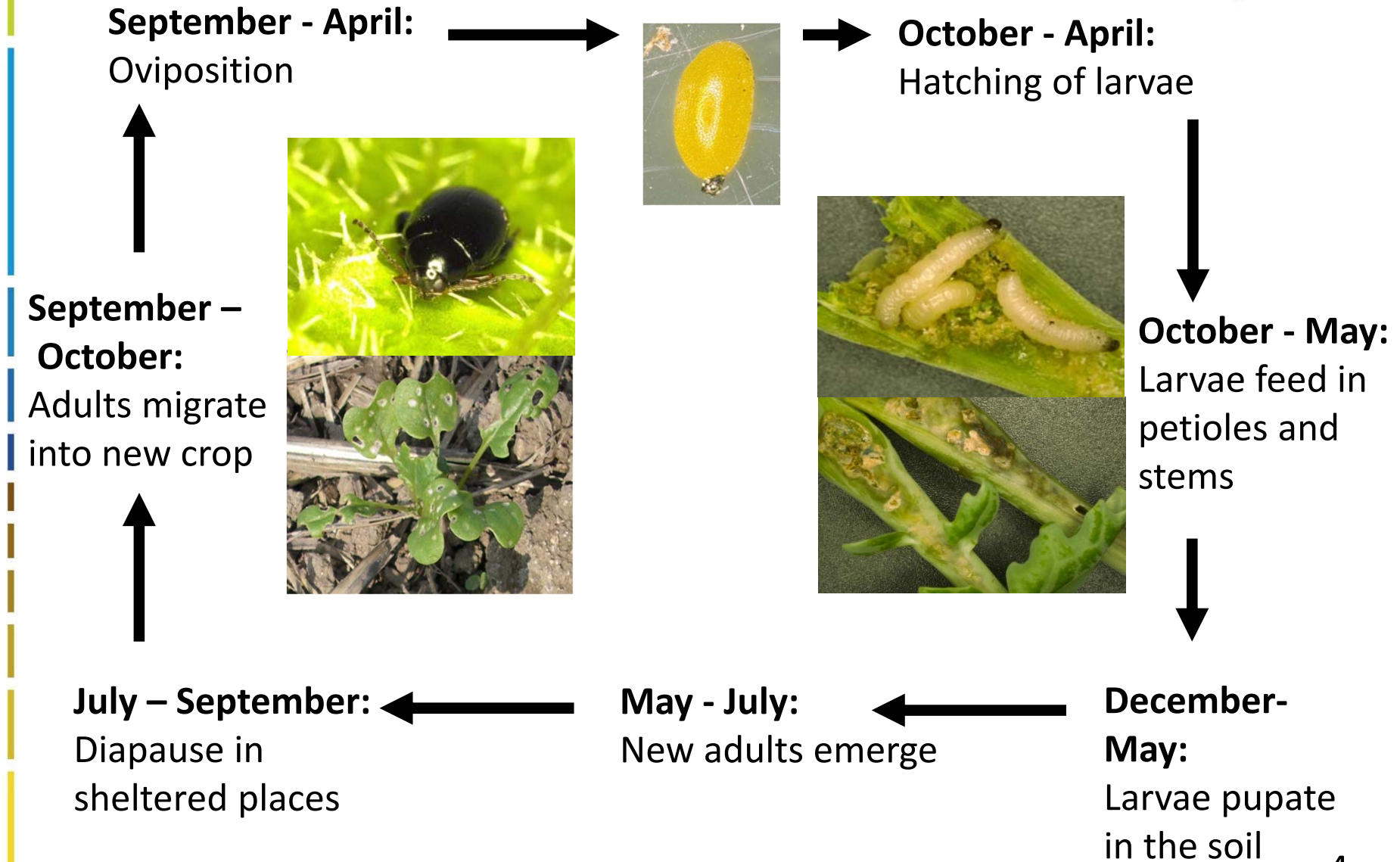
PhD project started in autumn 2015:

- Research on biology and population dynamics
- Figure out threshold values for PSYICH
- Damage potential

→ Are there alternative control options for autumn pests of oilseed rape? (presented today)



Phenology of Cabbage stem flea beetle *P. chrysocephala*



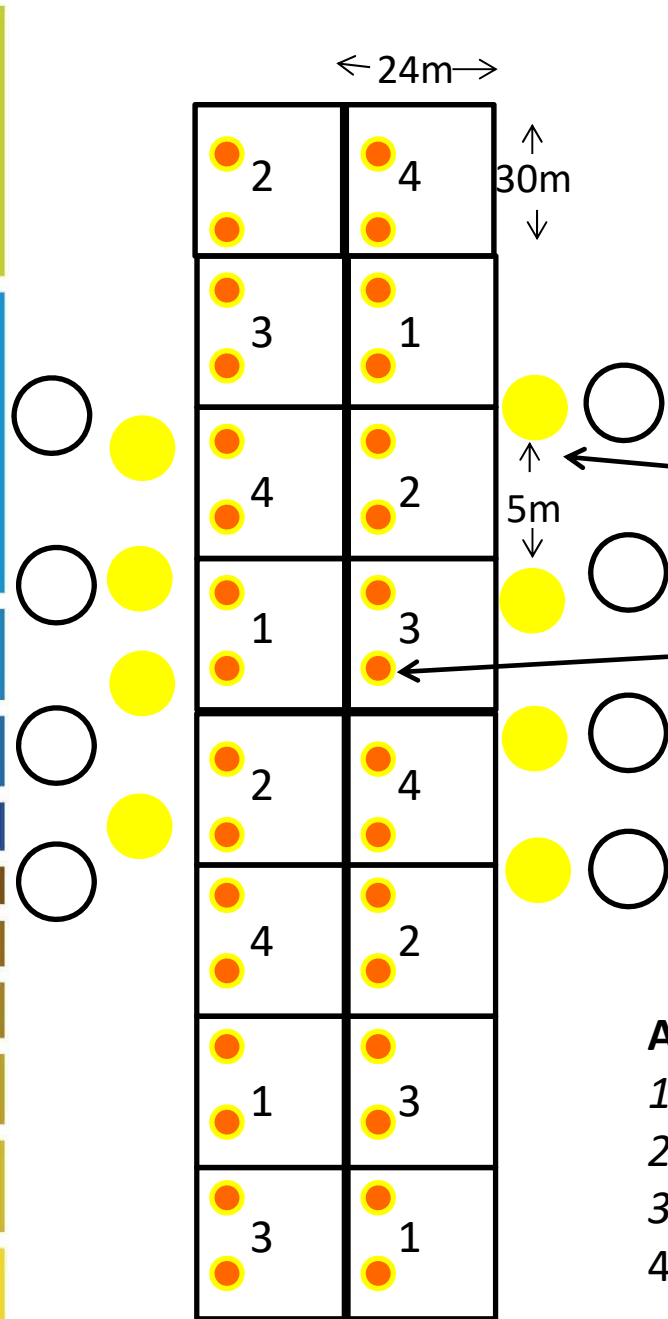
Materials and methods



Product	Active ingredient	Application
control	-	-
Karate Zeon (2015 + 2016)	lambda-cyhalothrin 7.5 g /ha. sprayed	Foliar appl. 12.10.2015 (1 st year) 30.09.2016 (2 nd year)
Elado (2015 + 2016)	clothianidin + beta- cyfluthrin. 10 + 2 g ai / kg	Seed treatment
Fortenza Force (2015)	cyantraniliprole + tefluthrin. 39 + 25 g ai / 1.000.000 seeds	Seed treatment
Lumiposa (2016)	cyantraniliprole. 50 g ai / 1.000.000 seeds	Seed treatment

All treatments with same fungicide (TMTD & DMM) seed treatment and of the same batch of seeds

Materials and methods



Photoelector to estimate the number of beetle **in autumn**

Yellow water trap to detect the beetle activity **in autumn**

Photoelector to determine the number of emerging young beetles **in summer**

- | |
|------------------------------|
| 1. control |
| 2. Karate Zeon |
| 3. Elado |
| 4. Fortenza Force / Lumiposa |

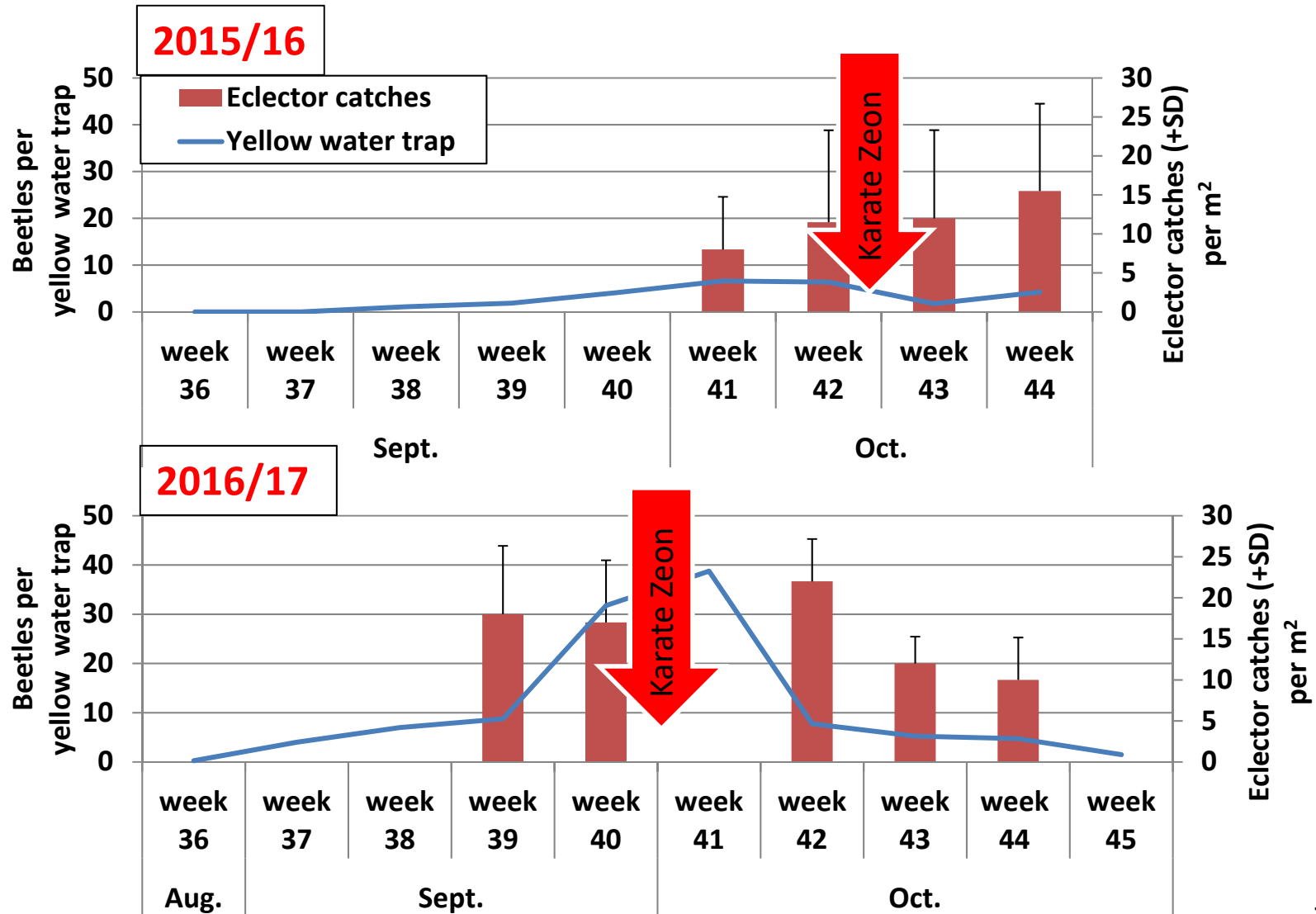
Assessed insect pests:

1. *P. chrysocephala* (feeding damage; number of larvae)
2. *D. radicum* (root damage)
3. *M. persicae*
4. TuYV infection rates



Eclector and yellow water trap

Autumn yellow water trap catches and beetle density per m²

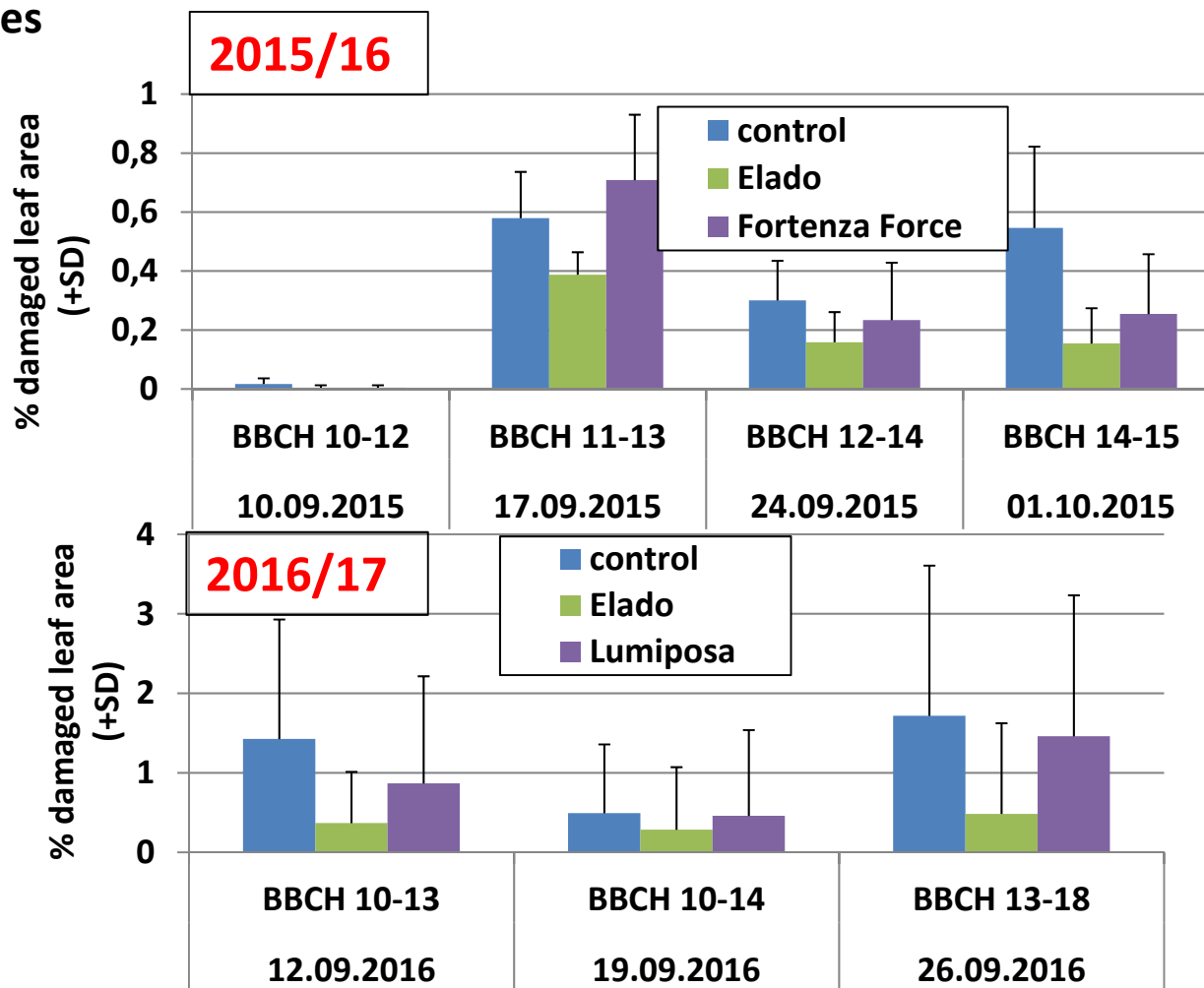




Feeding damage of PSYICH

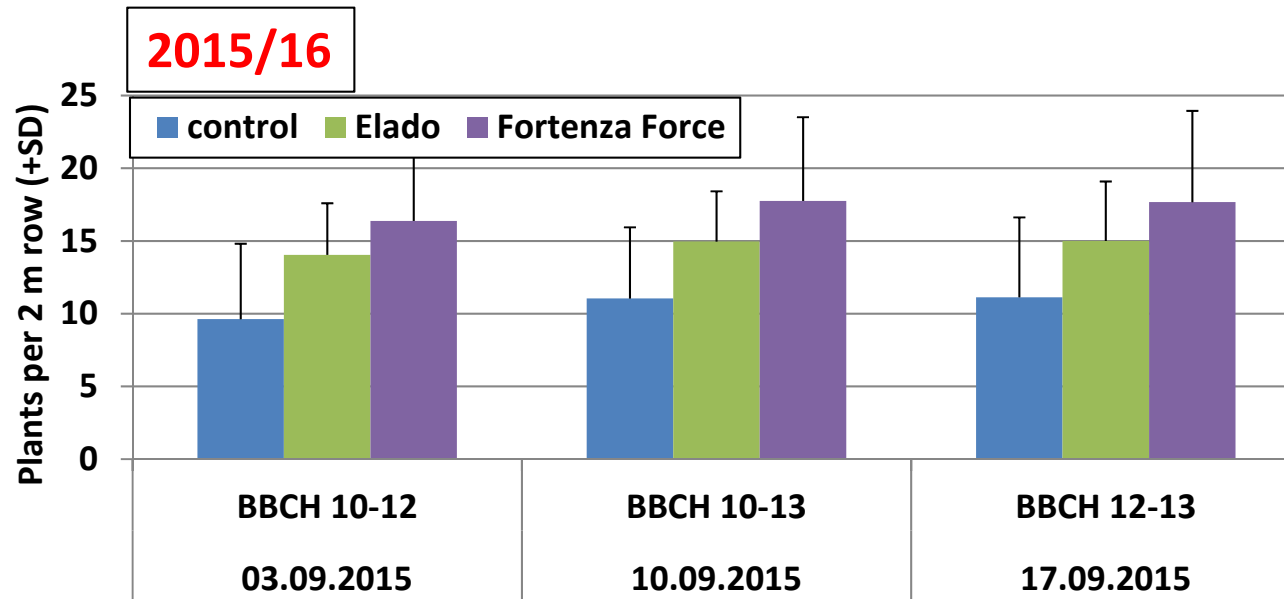


Shot-holes

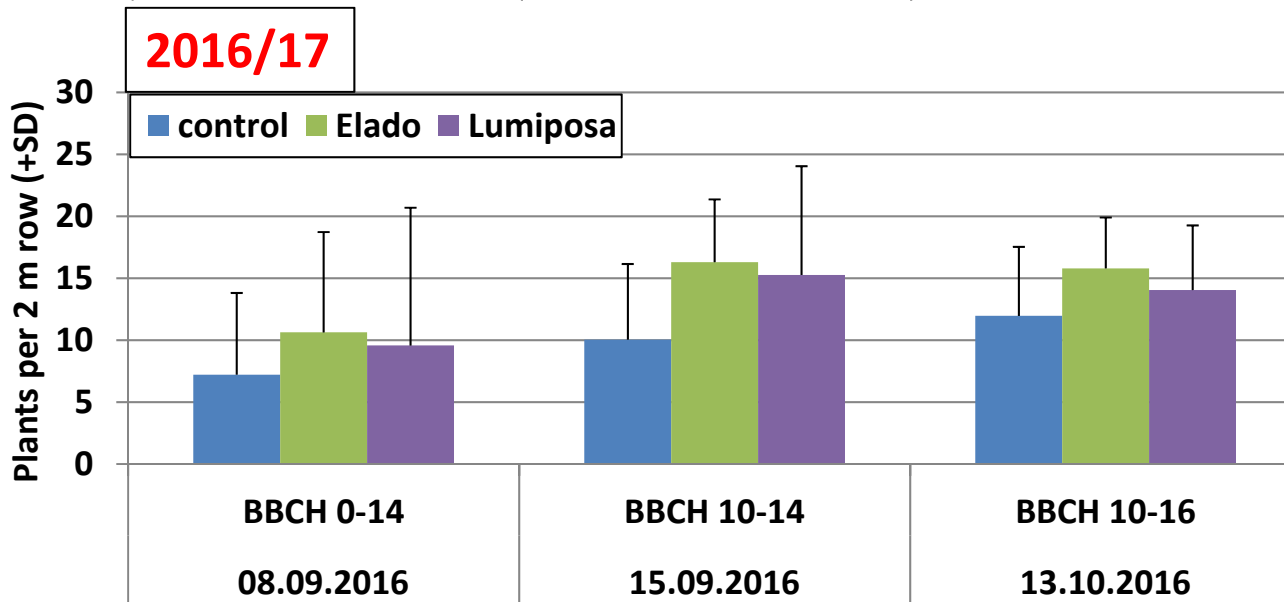


A low level of feeding damage in both years!

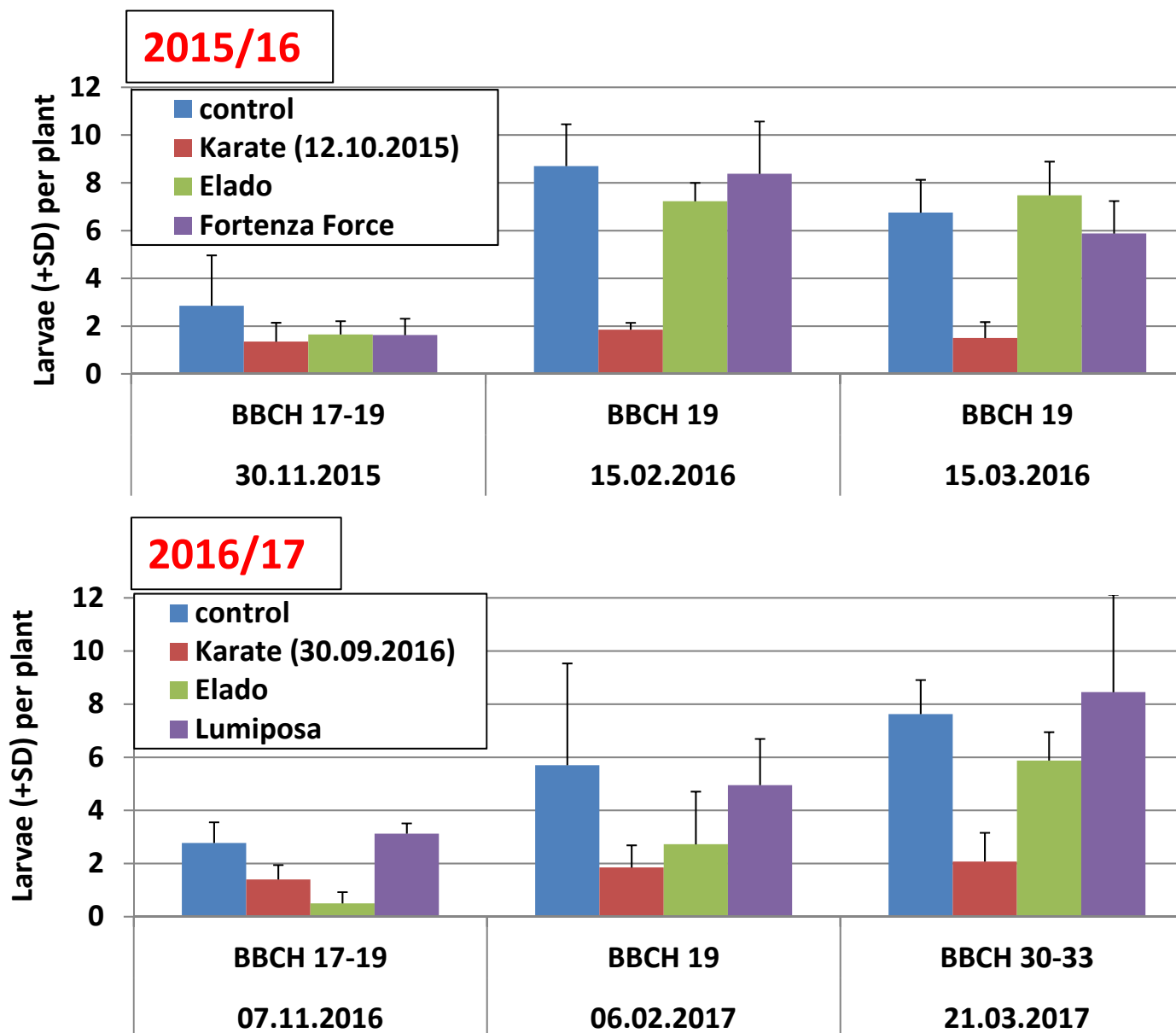
No. of emerged plants per 2 m row



Higher numbers of emerged plants in Elado and Lumiposa/Fortenza plots



No. of PSYCH larvae per plant



No. of larvae in both years significantly lower in **Karate Zeon** plots

Elado with clear effects only in 2nd year

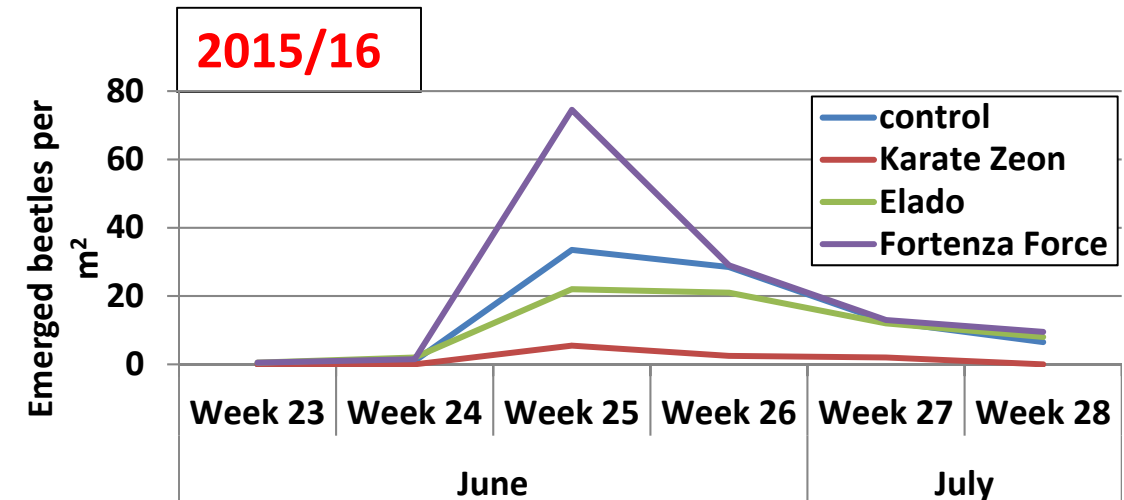
No effects visible for **Fortenza/Lumiposa**

Cumulative daily degrees

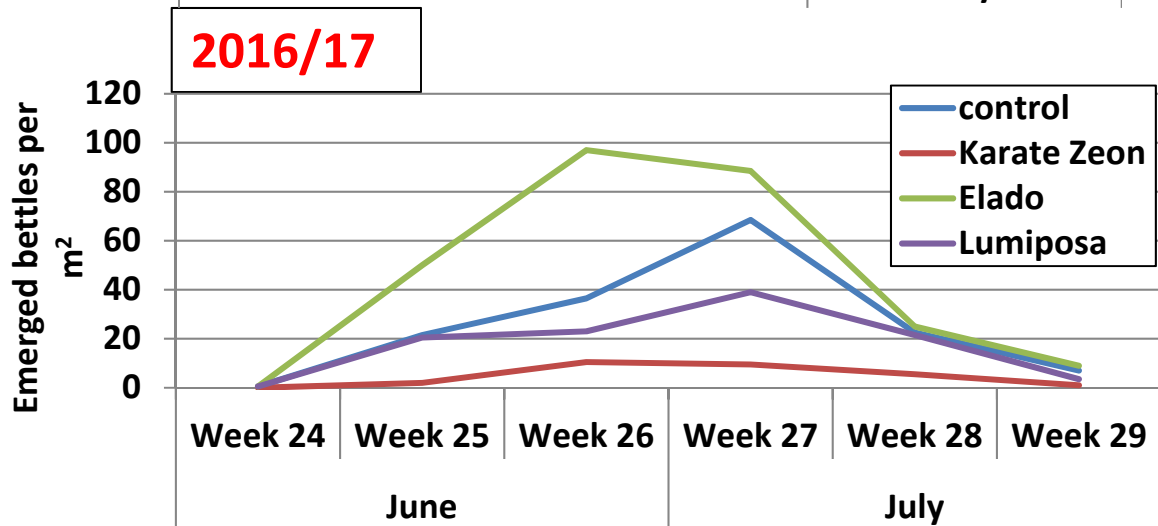


Month	2015-2016	2016-2017	Difference
September	422.5	586.6	-164.1
October	287.8	323.6	-35.8
November	273.8	163.6	110.2
December	270.7	141.7	129.0
January	96.1	43.8	52.3
Sum	1350.9	1259.3	91.6

No. of emerged beetles per m²



Eclector



No. of emerged beetles per m²



2015/16

Treatment	Mean number of emerged beetles / m ²	SD
control	82	± 41
Karate Zeon	10	± 8
Elado	65	± 46
Fortenza Force	128	± 60

2016/17

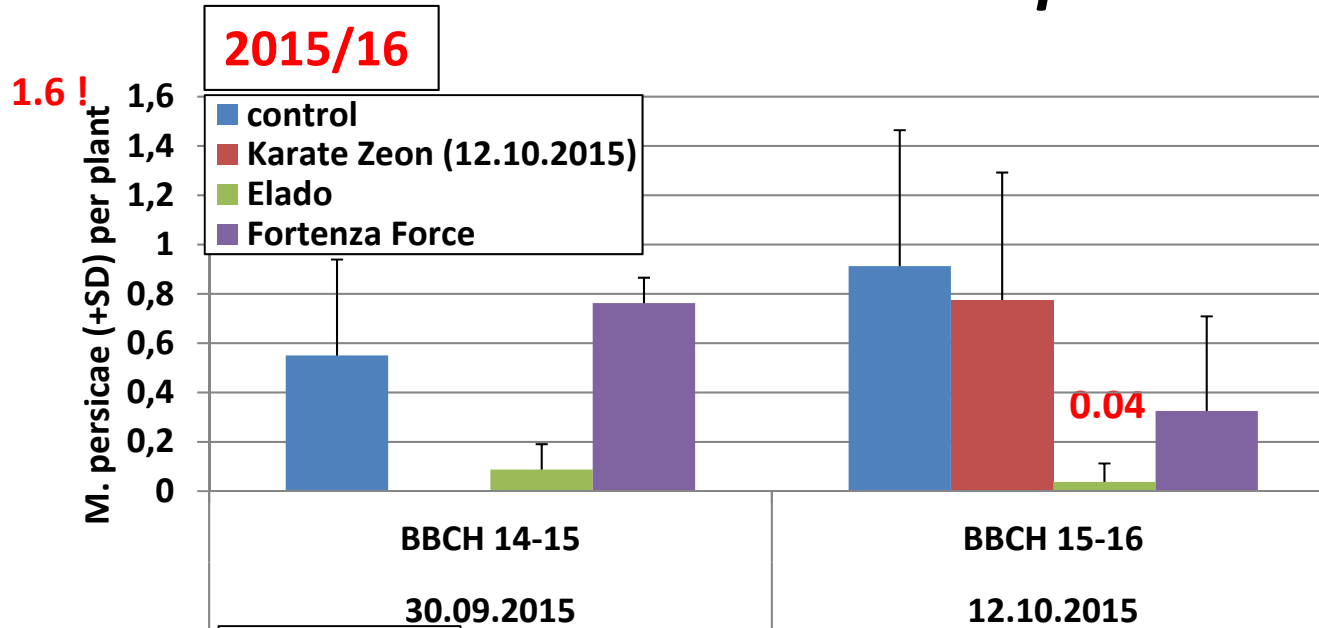
Treatment	Mean number of emerged beetles / m ²	SD
control	156	± 40
Karate Zeon	28	± 24
Elado	272	± 104
Lumiposa	108	± 44



Eclector

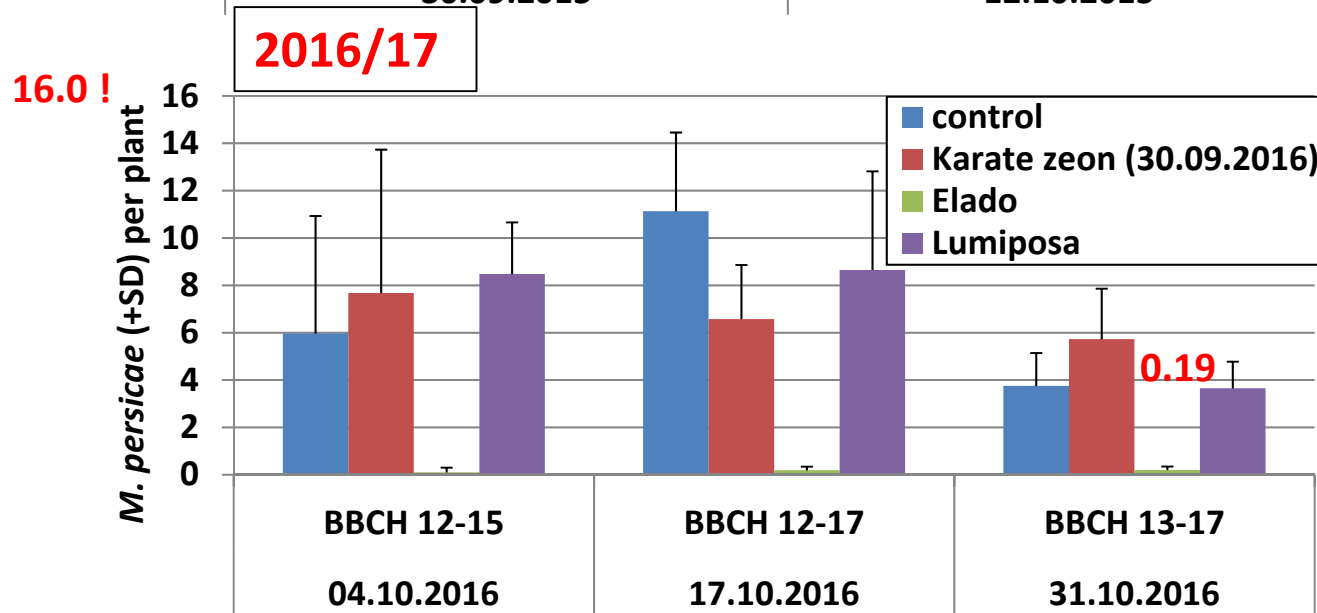
Reduced No. of emerged beetles in Karate plots

Infestation of *M. persicae*



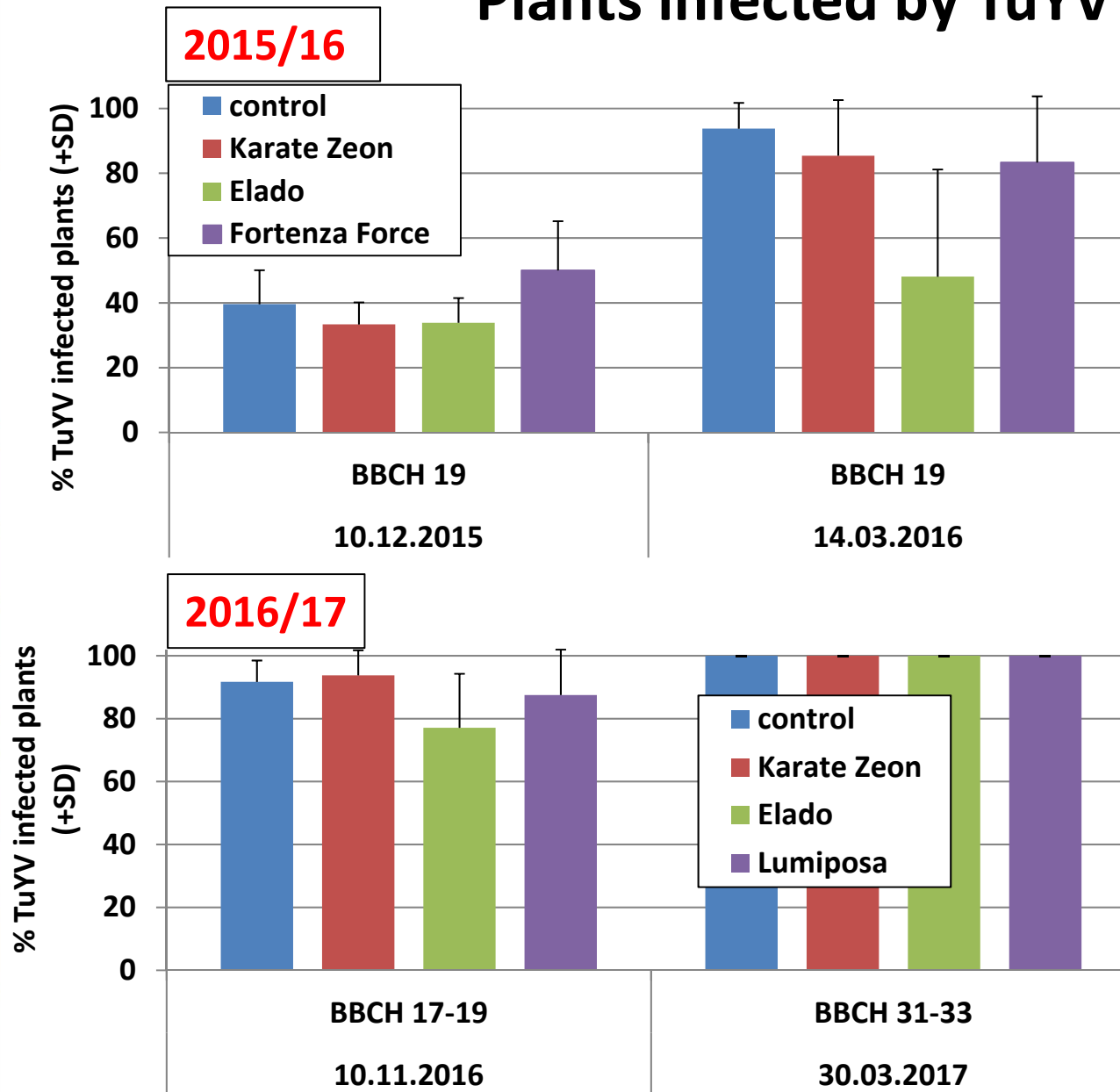
M. persicae

Reduced No. of aphids in Elado plots



No influence of Karate Zeon and Lumiposa/Fortenza on No. of aphids

Plants infected by TuYV



Virus symptoms

Effects of Elado only at low levels of aphid infestation

No effects of Karate and Lumiposa/Fortenza

No differences between quantitative Virus-titer!!

Yield



No clear difference between treatments because of high variability, but Elado in both years better!!

Treatment	Yield	std	Difference (kg) to control	% of control
2015/16				
Control	2557	156	-	-
Karate Zeon	2581	265	24	100
Elado	2720	147	162	106
Fortenza Force	2517	187	-39	98
2016/17				
Control	2420	239	-	-
Karate Zeon	2437	308	17	100
Elado	2623	181	203	107
Lumiposa	2478	460	57	94

Summary



Low leaf feeding damage of PYSICH in both years but more emerged plants in ELADO and Lumiposa/Fortenza.

Low infestations with cabbage root fly (< 30% damaged root area at single plant level) in both years

Application of Karate Zeon significantly decreased the No. of flea beetle larvae in both years. Effects of Elado seed treatment visible only at early migration in 2016/17

No influence of cyantraniliprol products on PSYICH observed

No. of aphids, especially *M. persicae*, reduced by Clothianidin. *TuYV* infestation only slightly reduced, but depending on infestation levels

All insecticide treatments had no clear influence on yield in both years, but Elado in both years better

Thank you!!!



The work was funded by the Union for Promoting Oil and Protein Plants e. V. (UFOP)

