JKI

Julius Kühn-Institut

Bundesforschungsinstitut für Kulturpflanzen
Federal Research Centre for Cultivated Plants

Organic Control of Oilseed Rape Pests through Natural Pesticides and Mixed Cultivation with Turnip Rape (*Brassica rapa*)

**Ludwig, Tobias
Jansen, Eva
Trost, Benjamin
Mayer, Julia
Kühne, Stefan
Böhm, Herwart**

Facts about organic oilseed rape

- **Acreage in Germany about 2300 ha (2008)**
- **Increasing demand on organic oilseed rape**
- **Profitable crop (ca. 50 Euro/dt)**
- **Reasons for the low acreage???**
- **Weed control**
- **Manure management**
- **Animal pests (stem weevil, pollen beetle), sometimes total loss of yield**

Experimental stations

Experimental station Dahnsdorf

Overview about the experimental design in Dahnsdorf

➤ preventive measure

**comparison
rape / turnip rape (9 : 1) in mixed
cropping with
rape in single cropping system**

➤ direct measure

**application from natural based
pesticides to control the
stem weevils and the pollen beetles**

Variants of pesticide treatments Dahnsdorf

2009

variant 1: untreated control

variant 2: 8 l ha⁻¹ pyrethrum

**variant 3: 8 l ha⁻¹ pyrethrum
0,2 l ha⁻¹ spinosad**

**variant 4: 8 l ha⁻¹ pyrethrum
12 kg ha⁻¹ diatomeen earth &
12 l ha⁻¹ sunflower-oil**

to control the stem weevils (3rd april)

to control the stem weevils (3rd april)

to control the pollen beetles (14th april)

to control the stem weevils (3rd april)

to control the pollen beetles (14th april)

2010

variant 1: untreated control

variant 2: 0,2 l ha⁻¹ spinosad

**variant 3: 0,2 l ha⁻¹ spinosad
0,2 l ha⁻¹ spinosad**

**variant 4: 0,2 l ha⁻¹ spinosad
12 kg ha⁻¹ rock powder**

to control the stem weevils (25th march)

to control the stem weevils (25th march)

to control the pollen beetles (23rd april)

to control the stem weevils (25th march)

to control the pollen beetles (14th april)

Stem weevils per main shoot -

(*Ceutorhynchus napi*, *C. pallidactylus*, *Psylliodes chrysocephala*)

influence of crop- and treatment variant

average number of stem weevils (rape: n = 80; t. rape: n = 40 (2009), n = 80 (2010))

Degree of efficiency of the treatment variant against the stem weevils

2009

	<u>t. rape</u>	<u>rape mix.</u>	<u>rape sing.</u>
variant 2	+27 %	-25 %	-26 %
variant 3	+23 %	- 6 %	-53 %
variant 4	+14 %	+43 %	-89 %

Var. 2 8 l ha⁻¹ pyrethrum

Var. 3 8 l ha⁻¹ pyrethrum
(0,2 l ha⁻¹ spinosad
to control the pollen beetle)

Var. 4 8 l ha⁻¹ pyrethrum
(12 l ha⁻¹ sunflower-oil &
12 kg ha⁻¹ diatomeen earth
to control the pollen beetle)

2010

	<u>t. rape</u>	<u>rape mix.</u>	<u>rape sing.</u>
variant 2	-23 %	-16 %	+30 %
variant 3	-16 %	+ 9 %	+ 2 %
variant 4	+ 4 %	-14 %	+23 %

Var. 2 0,2 l ha⁻¹ spinosad

Var. 3 0,2 l ha⁻¹ spinosad
(0,2 l ha⁻¹ spinosad
to control the pollen beetle)

Var. 4 0,2 l ha⁻¹ spinosad
(12 kg ha⁻¹ rock powder
to control the pollen beetle)

Pollen beetle infestation over time as function of crop- and treatment variant; 2009

Average number of pollen beetles / main raceme (rape n = 200; t. rape n = 40)

rape	BBCH	52-53	57	57	60-61	63-64
t. rape	BBCH	52-53	57	57	62-63	63-64

Pollen beetle infestation over time as function of crop- and treatment variant; 2010

Average number of pollen beetles / main raceme (rape n = 200; t. rape n = 200)

rape	BBCH	50	51	51-53	53-55	55-57	57	57-59
------	------	----	----	-------	-------	-------	----	-------

rape	BBCH	50	51	51	53-55	53-55	55	57	55-57
t. rape	BBCH	51-53	55	55-57	57-59	57-59	59-61	61-65	61-65

Degree of efficiency of the treatment variant against the stem weevils

2009

<u>t. rape</u>	+1 d	+6 d	+8 d
variant 3	+60 %	+55 %	-75 %
variant 4	+19 %	+21 %	+13 %
<u>rape mix.</u>	+1 d	+6 d	+8 d
variant 3	+69 %	+67 %	0 %
variant 4	+13 %	-33 %	+60 %
<u>rape single</u>	+1 d	+6 d	+8 d
variant 3	+73 %	+78 %	-29 %
variant 4	+14 %	-11 %	-29 %

**Var. 3 0,2 l ha⁻¹ spinosad
(8 l ha⁻¹ pyrethrum to control
the stem weevils)**

**Var. 4 12 l ha⁻¹ sunflower-oil &
12 kg ha⁻¹ diatomeen earth
(8 l ha⁻¹ pyrethrum to control
the stem weevils)**

2010

<u>t. rape</u>	+1 d	+3 d	+5 d
variant 3	+32 %	+35 %	+36 %
variant 4	- 5 %	+ 8 %	-11 %
<u>rape mix.</u>	+1 d	+3 d	+5 d
variant 3	+47 %	+56 %	+69 %
variant 4	- 6 %	+ 8 %	-19 %
<u>rape single</u>	+1 d	+3 d	+5 d
variant 3	+50 %	+54 %	+67 %
variant 4	- 5 %	- 6 %	-17 %

**Var. 3 0,2 l ha⁻¹ spinosad
(0,2 l ha⁻¹ spinosad to control
the stem weevils)**

**Var. 4 12 kg ha⁻¹ rock powder
(0,2 l ha⁻¹ spinosad to control
the stem weevils)**

Spring 2009

Spring 2010

Abstract

- The Mixed cropping system with t. rape causes
 - ... independent from the variety (rape/t. rape),
an increasing infestation of the rape crop with stem weevils,
 - ... dependent from the variety (rape/t. rape),
(growth advance from t. rape!), a decreasing infestation
of the rape crop with pollen beetles.
- Pyrethrum and spinosad were not able to control the stem weevils.
- Spinosad causes a decrease of pollen beetle infestation.
- Rock powder, diatomeen earth & sunflower-oil causes: only a less
decrease of pollen beetle infestation.
- The treatments were not economically efficient

Thank you for your attention!