

Combined use of insect pathogenic nematodes and fungi against the onion thrips, *Thrips tabaci*, in the field



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Integration of biocontrol strategies into organic vegetable production

Project number 02OE091

Development of control strategies against thrips in organic vegetable production by the use of insect pathogenic fungi and nematodes

supported by the BLE within the framework of the Federal Programme for Organic Agriculture

in co-operation with:

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Aim of the project

To achieve an effective reduction of the pest population, i.e. the onion thrips, *Thrips tabaci*, through the combination of nematodes and fungi, by which both the soil dwelling stages and the adults will be attacked, in order to develop sustainable control solutions.

Way of proceeding

→ Lab- and greenhouse experiments

(1) Comparison of different commercial bio-preparations with respect to their effect

(2) Establishment of dose-response relationships

(3) Optimization of formulation and application

→ **Field trials** in summer 2003 in co-operation with the plant protection services of Nord-Rhein-Westfalen, Rheinland-Pfalz and Baden-Württemberg

Field trials: Onion, variety ,Bristol`

Field site	Schifferstadt	Mainz-Bretzenheim
Date of seeding	27.02.03	31.03.03
Date of harvest	15.07.03	15.07.03
Plot size	19.2 m ² /4 rep`s	22 m ² /4 rep`s
Application	plot sprayer	plot sprayer/watering can
Dates of appl.	11.06./18.06./04.07.	5x (11.06.-09.07.)
Evaluation	20 plants/plot 7/12 d after final appl.	25 plants/plot pre-evaluation/01.07./15.07.
Treatments	Perfekthion (0.6 l/ha) PreFeRal (1 kg/ha)/ Nemagreen/ Nemaplus (1x10 ¹⁰ /ha)/ Mycotal (1 kg/ha)	Perfekthion (0.6 l/ha) Naturalis (1,5 l/ha)/ Nemagreen/ Nemaplus (1x10 ¹⁰ /ha)

Field trials: onion, variety ,Bristol`



Schifferstadt, 3 July 2003



**Mainz-Bretzenheim,
6 June, 1 (u.b.) and
15 July 2003**



Field trials: leek, variety ,Helios`, and chives

Field site	Bonn	Horkheim
Date of seeding	24.03./27.05.03	perennial
Date of harvest	03.09./22.09.03	—
Plot size	20 m ² /4 rep`s	28 m ² /3 rep`s
Application	plot sprayer	backpack sprayer
Dates of appl.	6x (30.06.-07.08.)	6x (11.06.-18.07.)
Evaluation	20 plants/plot 26.06./10.07./28.07./ 11.08./27.08.-03.09.	5x 0.5 m plant rows/plot (+ washing) 09.07./16.07./07.08.
Treatments	Spruzit (0.6 l)/Neudosan (18 l) Mycotal/Nemagreen/ Nemaplus (1x10 ¹⁰ /ha)/ PreFeRal (1 kg/ha)	no chemical standard PreFeRal/ Nemagreen/Nemaplus

Field trials: leek, variety ‚Helios`, and chives



Bonn, 10 July, 27 Aug. (u.b.) and 3 Sept. 2003



Horkheim 3, 16 July, and 7 Aug. 2003

Results: onion

Mainz-Bretzenheim

(pre-evaluation: 22 thrips/plant)

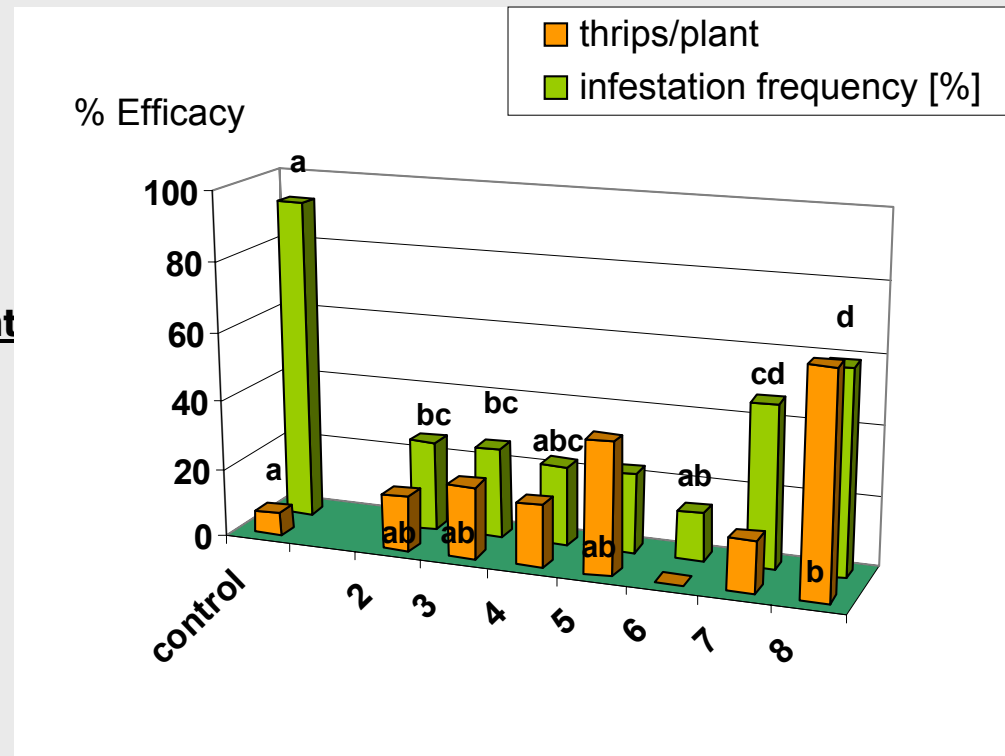
treatment	infestation	thrips/plant
control	67	1.8
Perfekthion	78	3.2
Naturalis	72	1.7
Naturalis +Nemagreen	72	2.1
Naturalis +Nemaplus	70	1.7

Schifferstadt

treatment	infestation	thrips/plant
control	93	6.5
Perfekthion (2)	69	5.5
Nemagreen (4)	71	5.3
Nemaplus (5)	71	4.0
Mycotal (6)	80	7.4
PreFeRal (3)	69	5.2
PreFeRal+H.b. (7)	49	5.5
PreFeRal+S.f. (8)	38	2.4

limited leaf damage.

→ after initial infestation at the onset of the trial, no differences between treatments at the end



Results: leek and chives

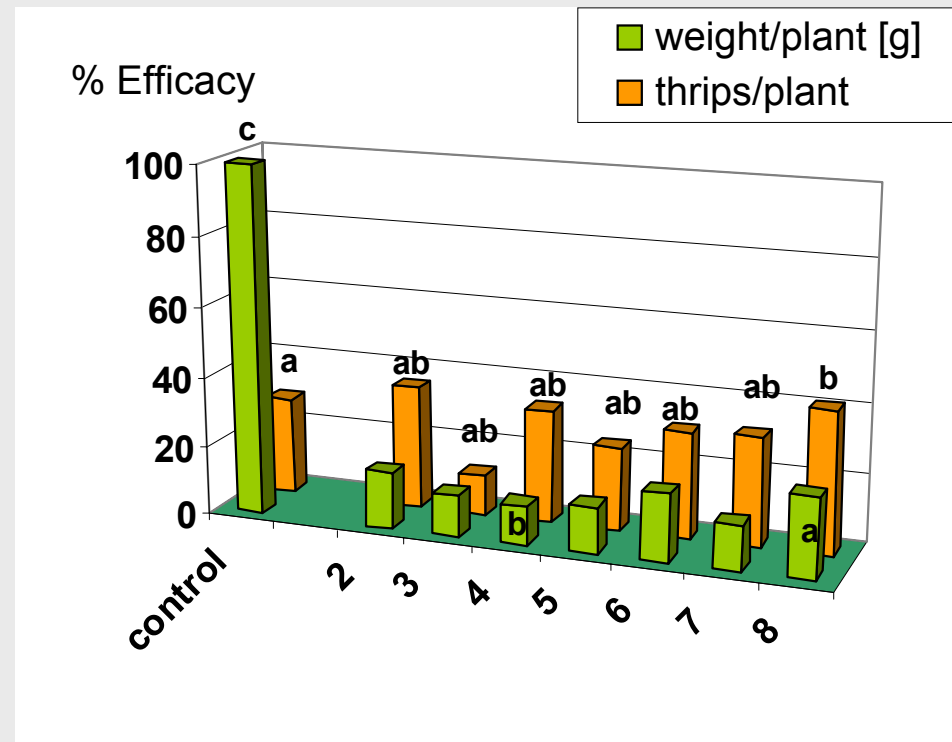
Horkheim

16 thrips/0.5 m at the onset of the trial

On 7 Aug. weed coverage of plots $\geq 72\%$, 3 thrips/0.5 m, no differences between treatments

Bonn

treatment	thrips/plant		weight [g]/ plant
	(11 Aug.)	27 Aug.	
control	(7)	28	345
Spruzit/Neudosan (2)	(4)	29	402
Nemagreen(7)	(5)	19	390
Nemaplus (8)	(5)	16	425
PreFeRal (5)	(6)	21	391
Mycotal (3)	(5)	25	387
Mycotal+H.b. (4)	(4)	19	384
Mycotal+S.f. (6)	(4)	19	412



Conclusions

- These trials show again, that the use of nematodes and fungi, is not necessarily restricted to protected environments, but can be extended to the open field.
- Regarding the extreme weather conditions in summer 2003, the efficacy achieved by the combination of nematodes and fungi, with 60 % in onion and 30 % in leek is a very good result - especially when compared with the chemical control agents (16 und -3 %).

However, the results were either too good or not good enough, as no more money was given for a prolongation of the research.