

# Use of EPN's against *P. horticola* in Denmark - will/can a long term effect be established ?

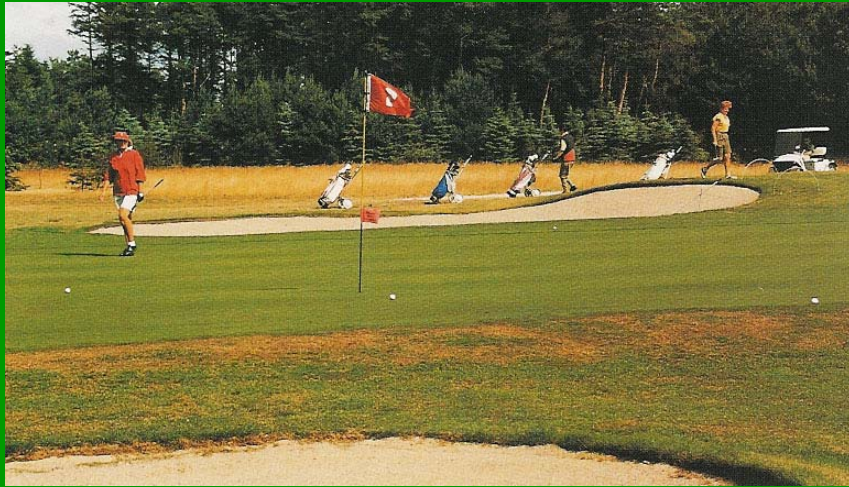
Holger Philipsen, Otto Nielsen  
Hans Peter Ravn  
Ralf-Udo Ehlers



# Hjørring Golf Course



# Symptoms



Wilting grass



Birds activity rooks



# Hole 5, Hjørring Golf Course





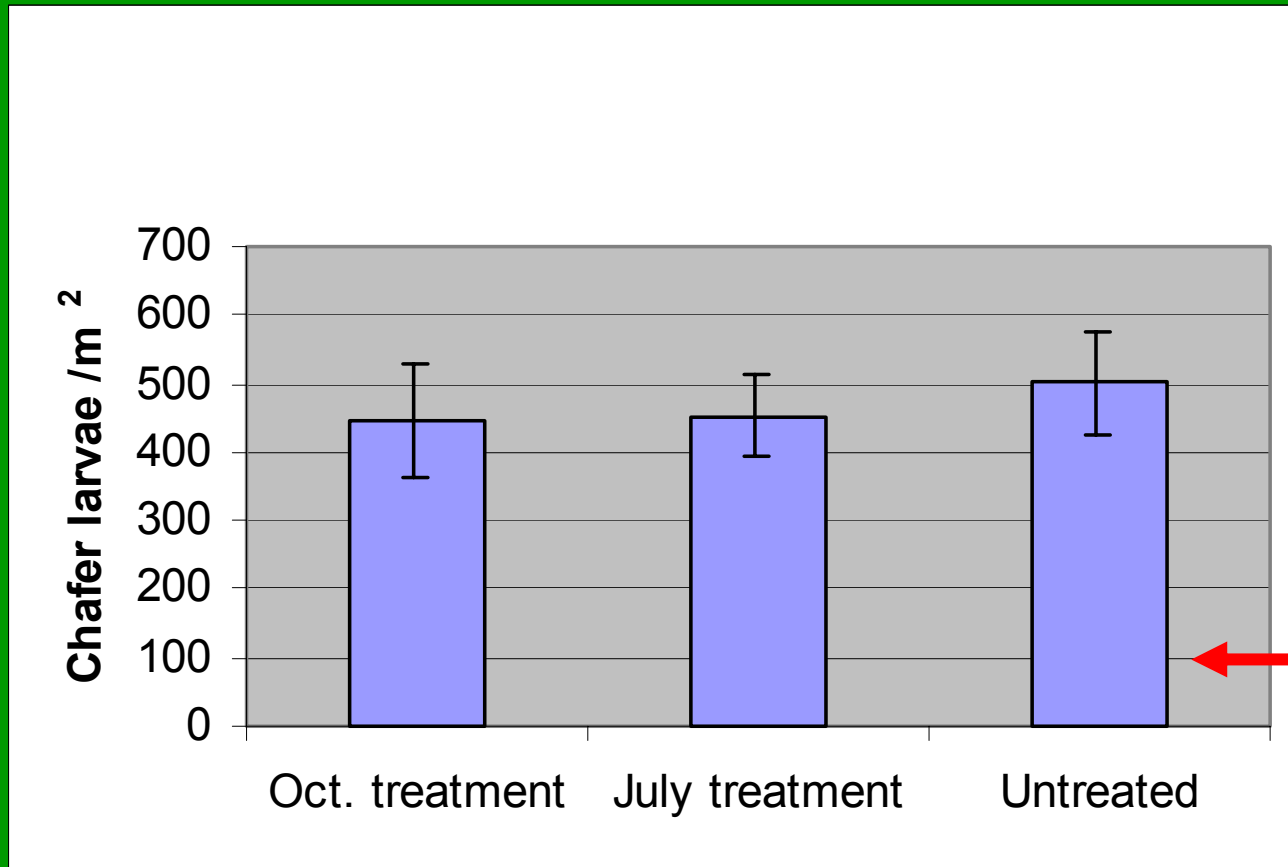
# Give golf course 2003







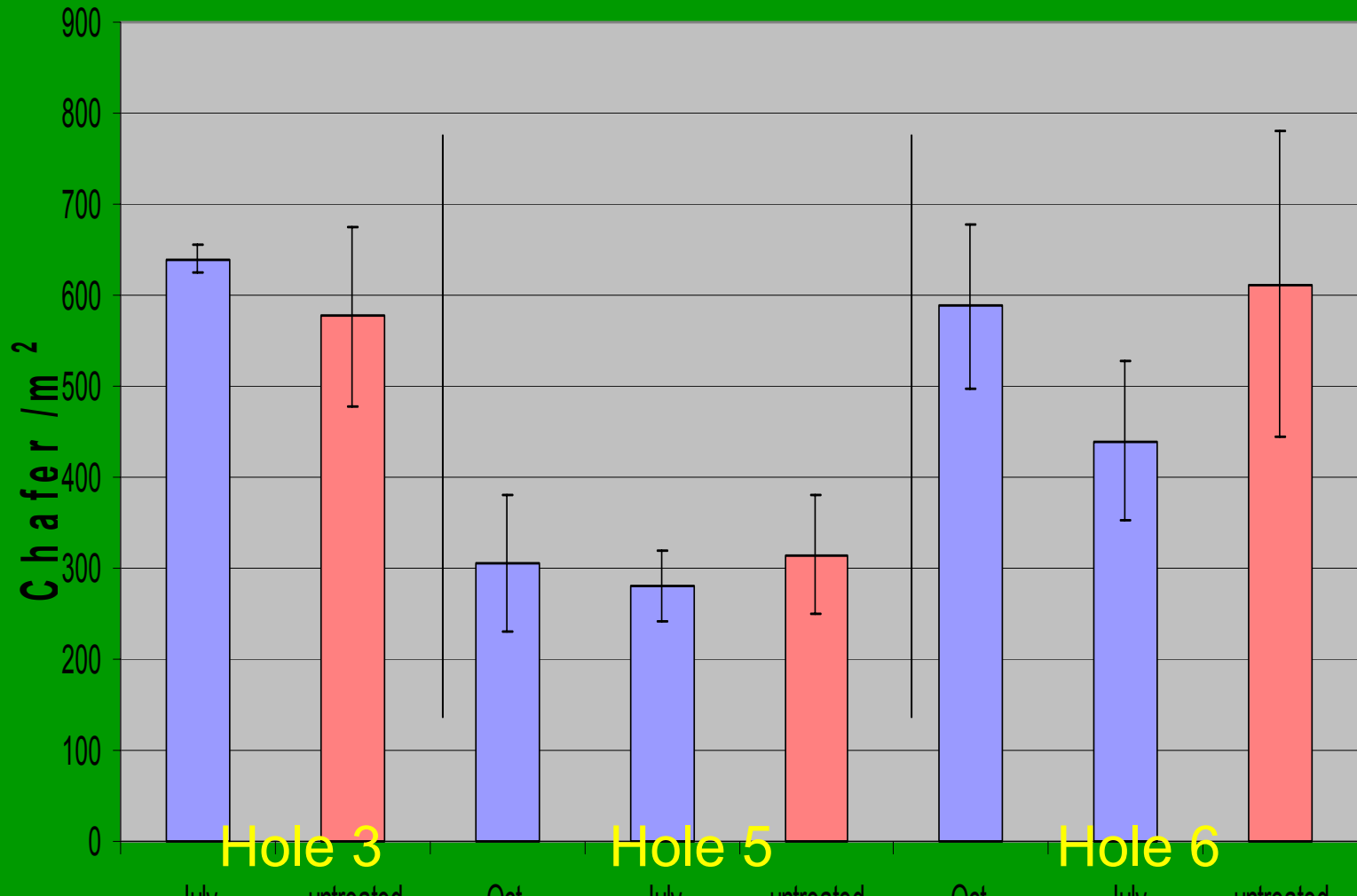
# Control experiments with nematodes, Hjørring, 1999-2000



Application conc. 0,5 Mio. nematodes / m<sup>2</sup>

Evaluated September 2000

# Control experiments with nematodes, Hjørring, 1999-2000





# 2001 Experiment, Hjørring

5 tests strips 6 m wide,  
Application conc. 0,5 Mio. nematodes / m<sup>2</sup>,  
Application 17th August 2001,  
Evaluation 8th Oct. 2001



- Same disappointing results as in 2000:
- No significant effects on the larval density

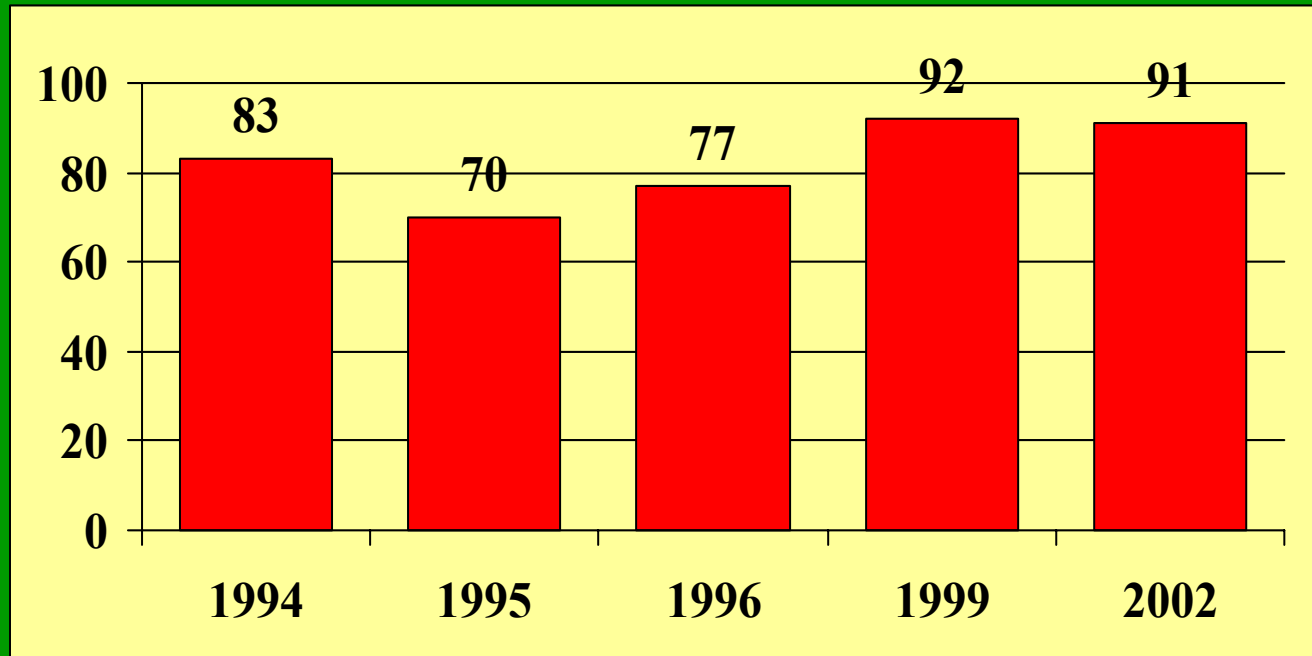
In spite of favourable application conditions: Temperatures <12°C, humid weather under and after application (irrigation)



# Trials from several years by University of Kiel

## - nematode control of Garden chafer

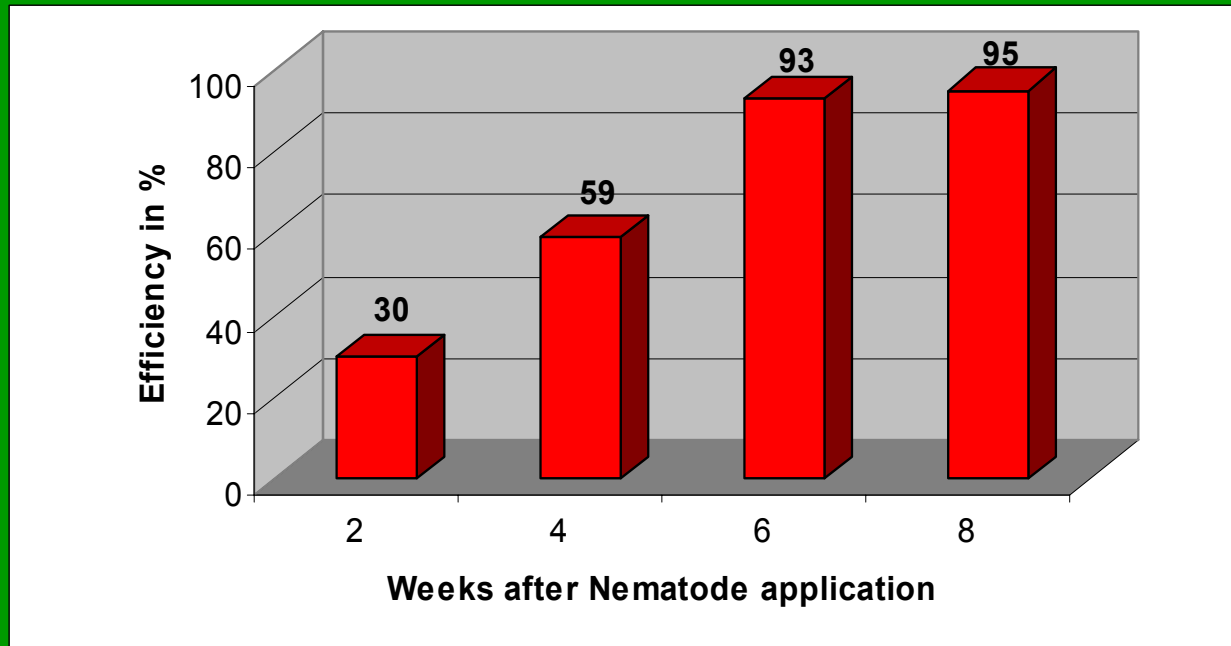
### Efficiency (%)



Data from Ralf-Udo Ehlers



# White grub control experiment - University of Kiel



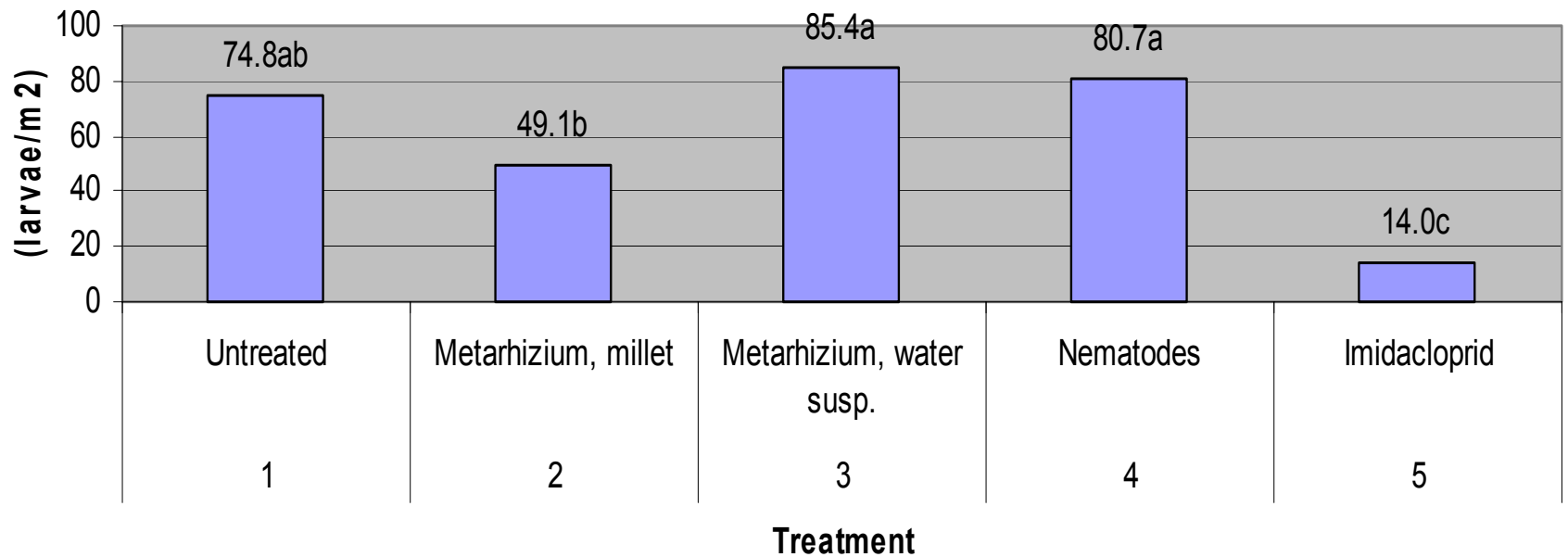
Data from Ralf-Udo Ehlers, Univ. Kiel

**30 tests areas 2 x 2 m,  
Application conc. 0,5 Mio. nematodes / m<sup>2</sup>,  
Application in August 1999**

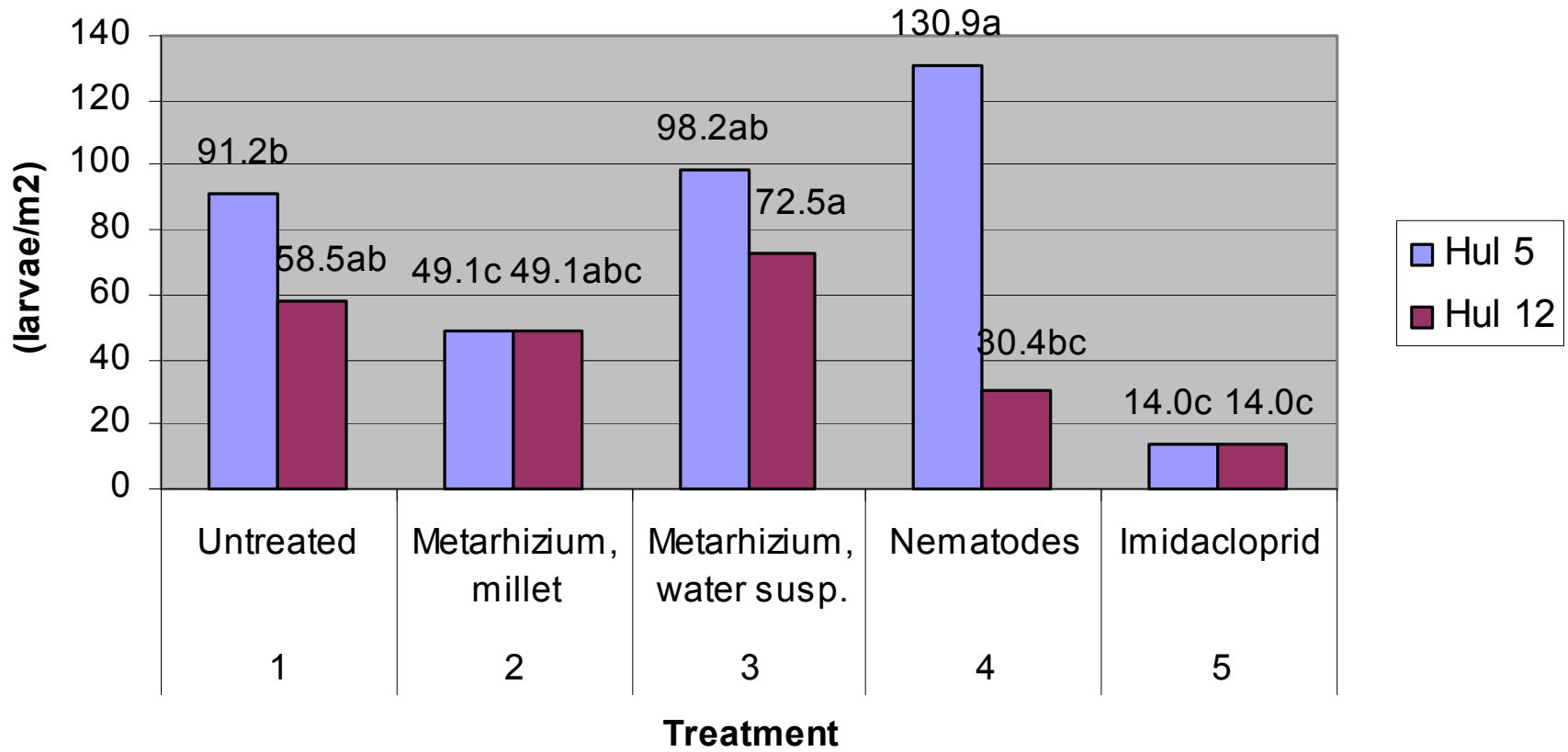
# Give golf course 2003



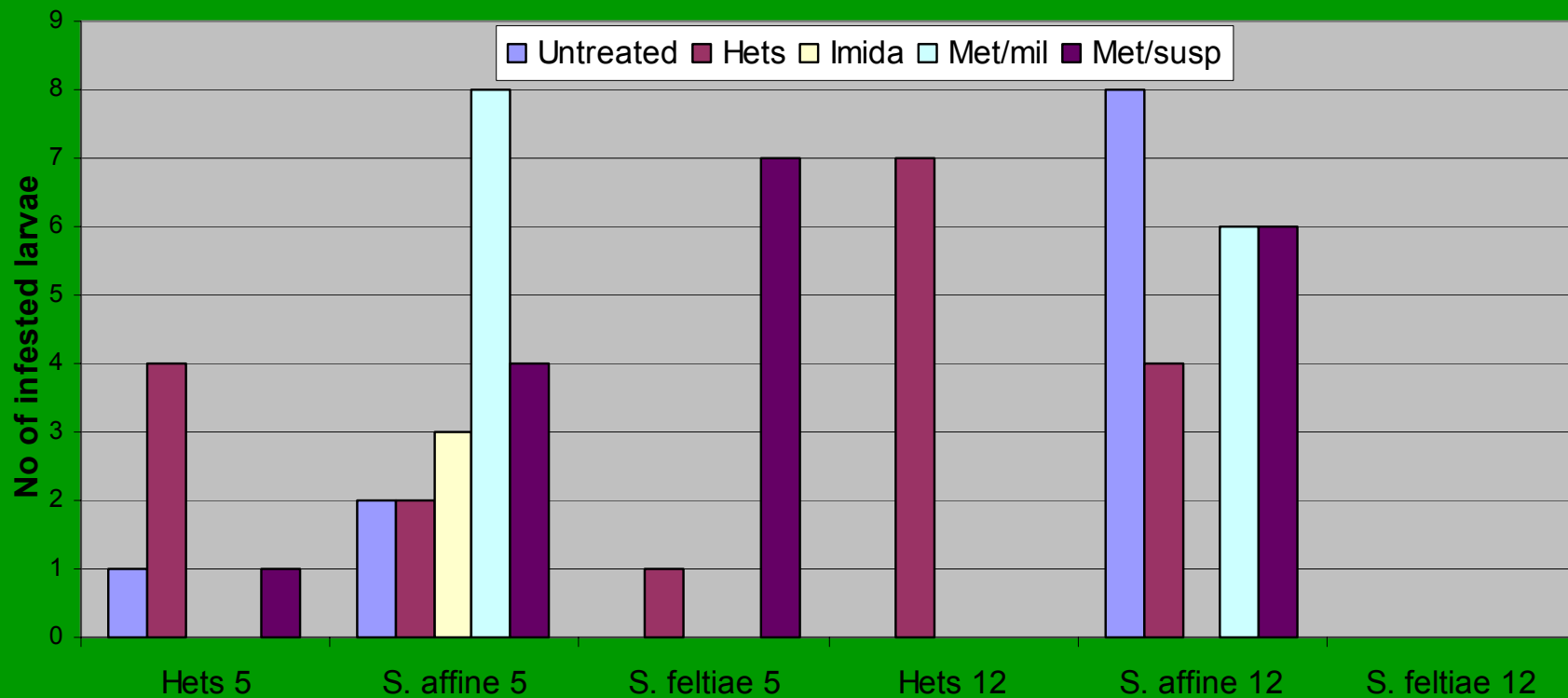
Larval density 2/10-03, mean hole 5 and 12



### Larval density 2/10-03

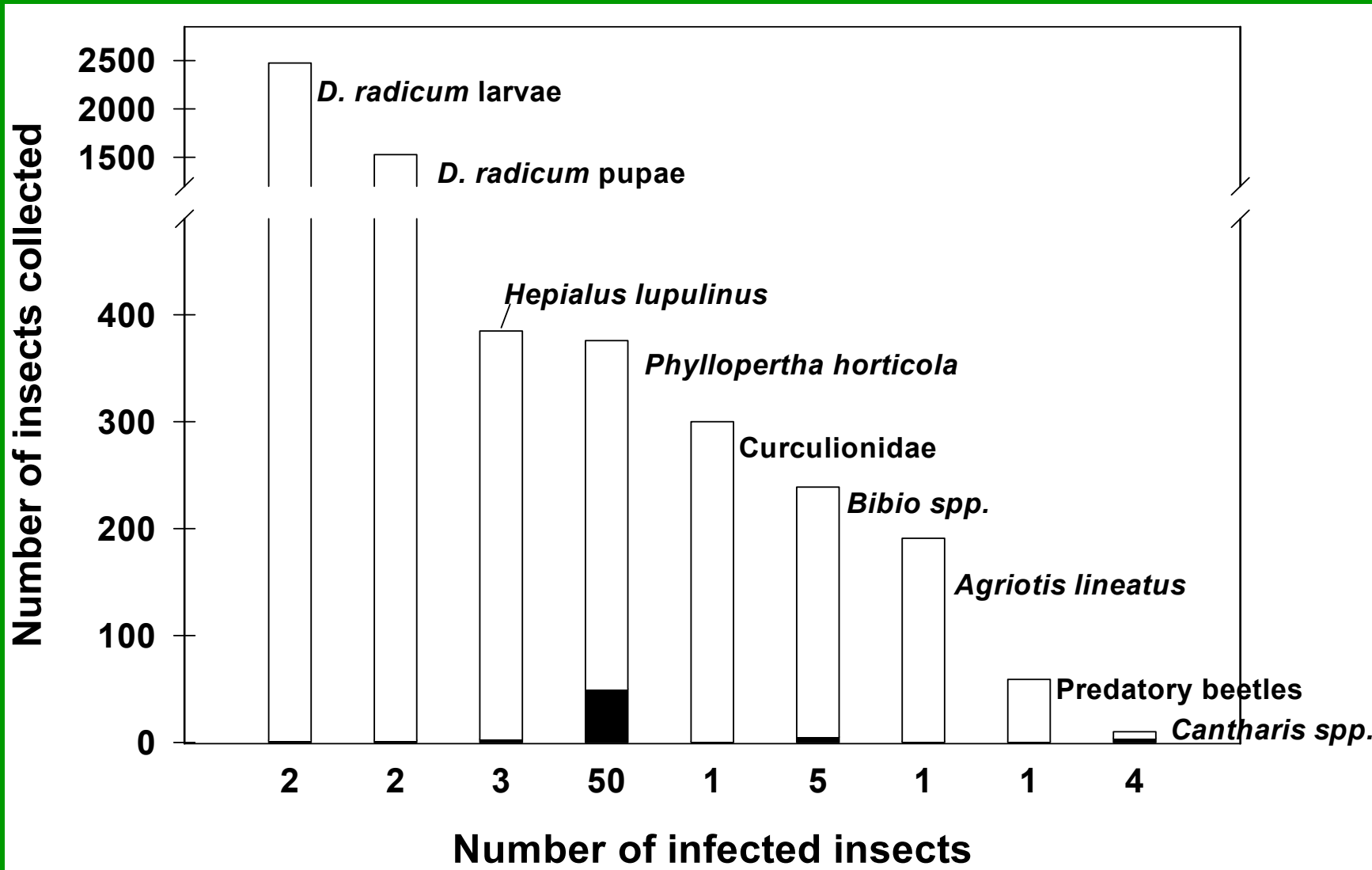


## Baiting experiment - hole 5 and 12



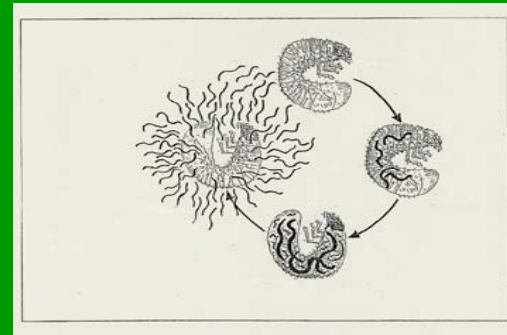
Nematode species	Insect order or family	Insect species	stage(s)
<i>Steinernema feltiae</i>	Curculionidae	Not identified	L
	Diptera	<i>Delia radicum</i>	L <sup>*</sup> , P
	Diptera	<i>Bibio</i> sp.	L
	Elateridae	<i>Agriotes lineatus</i>	L <sup>*</sup>
	Hepialidae	<i>Hepialus lupulinus</i>	L
	Scarabaeidae	<i>Phyllopertha horticola</i>	L
<i>Steinernema affine</i>	Cantharidae	<i>Cantharis</i> sp.	A
	Scarabaeidae	<i>Phyllopertha horticola</i>	L
		<i>Pterostichus nigrita</i>	L
<i>Steinernema intermedium</i>	Cantharidae	<i>Cantharis</i> sp.	P

\**S. feltiae* had been supplied to the plants approximately three month prior to collection of infected insects.



- Long term effects are uncertain. However, nematodes have been found in treated plots in years following application. Most likely they have propagated in Garden chafer larvae.

- Can this situation be established with population levels fluctuating below the damage threshold?



# Acknowledgement



Thanks to:

Danish Golf Federation,  
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Jan Martin, KVL



kov & Landskab

