



# Use of EPN in Belgium

Jozef Coosemans  
Labo Phytopathology, KULeuven,  
De Croylaan 42, 3001 Leuven-Heverlee Belgium  
[Jef.Coosemans@biw.kuleuven.be](mailto:Jef.Coosemans@biw.kuleuven.be)

# Research

- Research on EPN is mainly concentrated in two groups
- Department of Crop Protection, Agricultural Research Center, Burg. Van Gansberghelaan 96, B-9820 Merelbeke in close cooperation with the Department of Crop protection, Laboratory of Agrozoology, Ghent University, Coupure Links 653, B-9000 Gent, under supervision of Prof. M. Moens
- Laboratory of Phytopathology and Crop Protection, KULeuven, de Croylaan 42, B-3001 Heverlee (Prof. J. Coosemans).

# Education and Use

- At both universities, the courses on Pest-management include lectures on EPN's, while at the Post graduate International Nematology Course ( Univ. Genth), there is a specialized course on EPN's.
- Biobest, Westerlo is the main distributor of EPN's, who brings EPN's to the market as part of their bio control organisms

- Overview of the main research topics during the last 5 years (2001-2006) at KULeuven and UGent/Ilvo, Merelbeke

# Research at KULeuven

- Research focuses on the natural occurrence of EPN, in the aim of better understanding the natural habitat e.g. host insects, vegetation and soil conditions to learn about most successful application conditions.

- In a recent survey of EPN around roots of weeds, aside *H.bacteriophora*, *Rhabditis* spp. *Diplogaster* spp. and *Diploscapter* spp. were found, indicating even a wider potential of insect pathogenic nematodes.

- Research was carried out to understand the possible use of EPN's to control leaf feeding and storage insects, in particular to control the leaf feeding insects *Spodoptera frugiperda* and *Schistocerca gregaria* and the storage insect *Leucophaea maderae*.

## Control of leaf feeding insects

- The largest potential for efficient control is associated with a methylcellulose solution, as a carrier for the IJs. The sticky substance creates partial immobilization, establishing preservation of their energy supplies and assuring longer survival

- Successful control of *Thaumetopoea processionea* was achieved by spaying methylcellulose containing *Steinernema feltiae* on the silky nests of the caterpillars.
- Additional research is carried out at the Dept. Biosystems, K.U.Leuven on the survival of EPN's during machine spray application and incorporating EPN's in the soil.

# Research at UGent

- At the Agricultural Research Station Merelbeke, Univ. Gent.
- Research concentrated on the susceptibility of the cabbage root maggot *Delia radicum*, to *Steinernema* spp. and *Heterorhabditis* spp. during different seasons of the year; The dynamics of the attachment to and penetration into the host were monitored at different temperatures.

- Attention was given to the control of *Hoplia philantus*.
- The interaction between the entomopathogenic fungus *Metarhizium anisopliae* CLO 53 and the entomopathogenic nematodes *Heterorhabditis megidis* and *Steinernema glaseri* against third-instar *Hoplia philanthus*.

**The pathogenicity of the symbiotic bacteria  
*Photorhabdus luminescens*, *Xenorhabdus bovienii*,  
 and *Xenorhabdus poinarii***

- The filtrates of *P. luminescens* and *X. bovienii* caused 100% mortality after 24 h to *H. philanthus* and *G. mellonella*. The *X. poinarii* filtrate was least toxic to both insect species. In both trials, *H. megidis* and *S. glaseri* caused more than 80% mortality of *H. philanthus* larvae infesting potted perennial ryegrass 42 days after application of 2.5-7.5 billion nematodes/ha.

# Symbiosis

- Mutual effects between the symbiotic bacteria and entomopathogenic fungi were investigated in vitro. An isolate of *Steinernema glaseri* from Belgium was found as a natural pathogen of *Hoplia philanthus*.

# Surveys

- Surveys of EPN's in Vietnam yielded several Heterorhabditis isolates. A new species, e.g. *H. baujardi* n.sp. was described : analysis of the ITS1 sequence of rDNA revealed substantial differences with other ITS1 Heterorhabditis sequences.

# Trends in commercial use

- Data supplied by Biobest Belgium.
- Period 2003-2006  
 Heterorhabditis + 20%, Steinernema +10%,  
 Phasmarhabditis -20%. The main application is  
 against Otiorrhynchus ( with Heterorhabditis)  
 and in lower quantity Steinernema spp. against  
 sciaridae.
- This company underlines the necessity for  
 additional research on EPN's to control Hoplia  
 and Melolontha larvae.

# Thank you for your attention