

Ladybirds and biological control in Belgium, with a special focus on *Harmonia axyridis*



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Instituut voor Natuurbehoud

1. List of participants

- Benoît Adam (HORPI Systems) horpi.systems@planetinternet.be
- Tim Adriaens (IN) Tim.adriaens@instnat.be
- Olivier Beck (IBGE-BIM) obe@ibgebim.be
- Etienne Branquart (BBPF) E.Branquart@mrw.wallonie.be
- Anne Franklin (RBINS) Anne.Franklin@naturalsciences.be
- Marius Gilbert (ULB) mgilbert@ulb.ac.be
- Jean-Claude Grégoire (ULB) jcgregoi@ulb.ac.be
- Louis Hautier (ULB-CRAGx) hautier@cra.wallonie.be
- Fabrice Henry (HORPI Systems) horpi.systems@planetinternet.be
- Dirk Maes (IN) Dirk.Maes@instnat.be
- Jeroen Mentens jeroenmentens@yahoo.com
- Pierrette Nyssen pierrette.nyssen@caramail.com
- Frédéric Piel (ULB) [fpiegel@ulb.ac.be](mailto:fpiel@ulb.ac.be)
- Gilles San Martin (ULB) gsanmartin@tiscalinet.be
- Elke Van den Broeke (AMINAL Natuur) elke.vandenbroeke@lin.vlaanderen.be
- Aline Van der Werf (SPO) Vdwe@belspo.be
- Jan Vermeulen (BIOBEST) jan.vermeulen@biobest.be
- Ann Verstraete (SPF-FOD) Ann.Verstraete@health.fgov.be

2. Programme

Session 1- Ladybirds & biological control

- 09h20 - General introduction
E. Branquart, BBPF
- 09h30 - The potential of native insect predators for biological pest control
Patrick De Clercq (RUG)
- 09h50 - Use and marketing of *Adalia bipunctata* to control aphid populations
Fabrice Henry & Benoît Adam (Horpi)
- 10h10 - Discussion

Session 2 - Harmonia axyridis, a new invasive species in Belgium ?

- 11h00 - Trends and distribution of *Harmonia axyridis* in Belgium
Tim Adriaens (IN)
- 11h20 - Intraguild predation of *Adalia bipunctata* by *Harmonia axyridis*
Louis Hautier (ULB)
- 11h40 - Ladybirds in urban environment
Gilles San Martin (ULB)
- 12h00 - Discussion

Round-table discussion

- 14h00 - Legal aspects linked to the introduction/sale of biocontrol agents
Introduced by P. De Clercq
- 15h00 - Towards a quantitative ladybird survey in Belgium ?
Introduced by E. Branquart
- 15h30 - Organisation of an international workshop ?

3. General overview

The Asian multi-coloured ladybird *Harmonia axyridis* has been introduced in Belgian greenhouses and gardens in the 90ies to control aphid populations. First observations of feral populations have been observed near Ghent in 2001. Since then, this species has rapidly colonised the Belgian territory and is now present in the whole country (data: Coccinula Workgroup). Observations in the field show that this species co-occurs with other aphidophagous species and locally reaches very high densities. It is already one of the dominant ladybird species on different tree species in the vicinity of Brussels. Moreover, laboratory and semi-field experiments demonstrated that this species has a high potential for intraguild predation on native ladybird species.

Advantages and drawbacks of the use of native aphid predators to replace *Harmonia axyridis* in biocontrol strategies were discussed. Participants agreed that biological control can be a viable and safe pest control method, provided that the use of exotic agents is subjected to regulation from the authorities and more attention is given to native alternatives.

4. Key points of the round table discussion

- **Legal issues.** The participants stress the lack of a regulation tool for the release of biocontrol agents in Belgium. A legal framework and a risk assessment procedure must be developed at the federal level, together with pesticide and GMO regulations (SPF-FOD).

The risk assessment procedure should be based on the technical guidelines developed by OECD-ERBIC. A close co-operation should be strengthened between Belgium and the European and Mediterranean Plant Protection Organisation (EPPO) in charge of (1) the harmonisation of phytosanitary regulations and all other areas of official plant protection action in Europe, (2) the development of an international strategy against the introduction and spread of pests that damage cultivated and wild plants and (3) the promotion of the use of modern, safe, and effective pest control methods.

Representatives from private companies are not in favour of a very long risk assessment procedure to avoid high registration costs and to keep the price for distributing biocontrol agents as low as possible.

It is decided to inform CCIEP members about the problem raised by *Harmonia axyridis* and the introduction of other exotic biocontrol agents in Belgium, including invasive risks and potential impact on the environment as well as on native fauna. Stakeholders should be involved in the process.

- **Research issues.** The participants to the meeting agree to collaborate for the development of future research projects. Several scientific works should be developed as soon as possible, including the study of (1) the ecological preference and life-history traits of *Harmonia axyridis*, (2) the potential competition and intraguild interactions with other aphidophaga, (3) the impact on the populations of native aphidophaga in semi-natural ecosystems, (4) efficient techniques to reduce harmful impact of overwintering aggregations and (5) the use of native predators and parasitoids as a sustainable alternative to control aphid populations. Research peculiarities from Belgian laboratories and institutes already involved in the monitoring and the study of *Harmonia axyridis* are detailed in Annex 1.

The proposition to organise an international meeting in Belgium is not retained. It is rather suggested to foster the organisation of a specific session within an international entomological event such as 'Aphidophaga' or the *European Congress of Entomology*. Note that the next Aphidophaga meeting will be organised between 6-10 September 2004 in Czech Republic (see <http://www.aphidophaga.org/>).

It is also suggested to organise a meeting in Belgium to raise public awareness and inform stakeholders about the environmental risks linked to the use of exotic species in biological control. Target audience should be agriculture and nature administrations, gardeners, etc.

1. Laboratory of Agrozoology, Department of Crop Protection, Ghent University (Prof. Patrick De Clercq)

The general objective of the research performed by the Laboratory of Agrozoology, Department of Crop Protection, Ghent University, is to investigate the biology of beneficial arthropods and assess their potential for use in integrated pest management (IPM). Previous and current research programmes have focused on the integrated control of economically important pests in agricultural crops, with emphasis on field and greenhouse vegetable crops. The major interest of the research unit has gone out to the use of natural enemies (with emphasis on predatory insects and mites) in IPM-programmes. Research has mainly concentrated on the bio-ecology of predatory insects (Heteroptera: Pentatomidae, Anthocoridae, Miridae; Coleoptera: Coccinellidae) and mites (Mesostigmata: Phytoseiidae), their predation capacity and functional responses, their laboratory production and quality and their compatibility with conventional and novel insecticides. Attention has also been given to possible non-target effects of biological control agents; in this respect, efforts have been made to find native alternatives for exotic predators that are commercialized for biocontrol and pose potential risks for native fauna.

Research at the Laboratory of Agrozoology has been funded by various national (IWT, FWO, BOF-UG...) and international (European Commission, Eureka) bodies. The expertise of the group has resulted in over 50 papers in international journals on biological and integrated control since 1998.

Prof. Patrick De Clercq's international leadership in the mass production and use of biocontrol agents is reflected by his co-chairmanship of the Global Working Group on Arthropod Mass Rearing and Quality Control (www.amrqc.org) of the International Organisation for Biological Control of Noxious Animals and Plants (IOBC) and his function of liaison officer between IOBC and the biocontrol industry represented by the International Biocontrol Manufacturers Association (IBMA) and the Association of Natural Biocontrol Producers (ANBP).

2. Laboratory of biological control and spatial ecology, ULB (Prof JC Grégoire)

The laboratory has been active in the field of pest ecology, behaviour and management during the last thirty years, particularly with forest and urban insects and their natural enemies (the bark beetles *Dendroctonus micans* and *Ips typographus* on spruce, the ambrosia beetles *Trypodendron* spp., and *Xylosandrus germanus* on beech, the Douglas fir seed parasite, *Megastigmus spermotrophus*, the urban scales *Pulvinaria* spp. and the leaf-mining moth *Cameraria ohridella* ...). During the last ten years, the group has also developed an expertise in spatial ecology, using GIS, spatial statistics, landscape analysis and remote sensing. One long-lasting concern is the spread of invasive species. Recent significant papers in this field deal with the modelling of *Dendroctonus micans*' spread in the United Kingdom, and of *Cameraria ohridella*'s spread in Europe.

During the last two years, the group has been involved in behavioural studies of intra-guild predation by *Harmonia axyridis*. During the same period, a closely associated group at ULB, the Laboratory of Eco-Ethology (Prof. Jean-Christophe de Biseau), has and still is, been actively working on population censuses of lady beetles in the Region of Brussels.

The laboratory is equipped for field studies and for laboratory work (flight windtunnel, quarantine facility, air-conditioned rearing rooms). It is also fully equipped (hardware and software) for spatial analyses (e.g. Arc-Info, ArcView, PCI, Fragstat, Idrisi, Surfer), and has developed some analytic tools on its own. The laboratory has carried out research projects in Belgium, France, the United Kingdom, Bosnia-Herzegovina and China, with funding from different sources (Région Wallonne, Région Bruxelloise, FNRS, Communauté française, Ministère de l'Agriculture et de la pêche (F), British Forestry Commission, EU). More than 30 papers in international journals have been generated by these research activities (including e.g. *Behavioural Ecology and Sociobiology*, *Canadian Journal of Forest Research*, *Ecological Entomology*, *Journal of Animal Ecology*, *Journal of Chemical Ecology*, *Landscape Ecology*).

Prof. J.-C. Grégoire is deputy co-ordinator of Division 7 (Forest Health) of IUFRO (International Union of Forestry Research Organizations) and Chair of IUFRO Working Party S7.03.05 (*Integrated Control of Scolytid Bark Beetles*).

3. Laboratory of eco-toxicology, Agricultural Research Centre of Gembloux

ANNEX 2 – SPF-FOD follow up

Geachte Mr. Branquart,

Betreft : Ladybirds and biological control in Belgium, with a special focus on Harmonia axyridis.

Ik heb de standpunten van de vergadering aan Mr. Fontier meegedeeld. Wij zijn verder geïnteresseerd voor deelname aan volgende vergaderingen. We erkennen het nut van een wetgeving voor biologische bestrijding op nationaal vlak, maar gelet op de huidige werkdruk van onze afdeling behoort het opstellen van een dergelijke wetgeving op dit ogenblik niet tot onze prioritaire doelstellingen.

met vriendelijke groeten,

Ann Verstraete

FOD Volksgezondheid, Veiligheid van de Voedselketen en Leefmilieu
DG Dier, Plant en Voeding
Arcadengebouw - 5de verdieping
Pachecolaan 19, bus 5
1010 Brussel
Tel : 02/210.50.87
Fax : 02/210.51.15