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The use and exchange of *Biological Control Agents* for food and agriculture

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IBMA

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International Biocontrol Manufacturers Association (IBMA)

- Worldwide association of Producers (and distributors) of Biological Control Agents
- Since 1995
- 180 members

- 4 divisions:
  - **Invertebrate Biological Control Agents (IBCA's)**
  - Microbials
  - Semiochemicals
  - Natural & Biochemical Products

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Biological Control

The use of an organism (natural enemy: parasite, predator or pathogen)
to reduce the population density of another organism (pest, disease)

- Safe alternative for chemical pest control
- Common practice in agriculture since 1920 (citrus)
- In greenhouse industry since 1967 (vegetables)
- Cornerstone of Integrated Pest Management (IPM) systems
- Increasing importance for assuring production of safe food
  - Market driven
  - Also low income countries

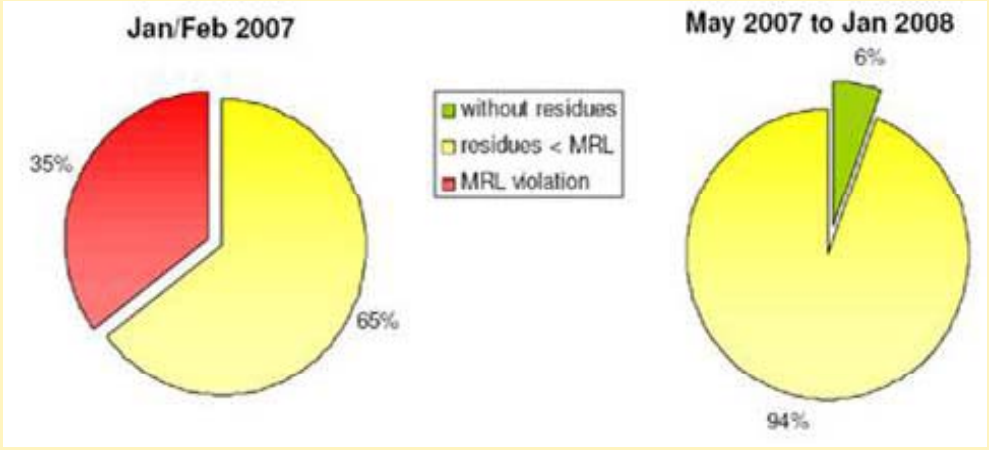


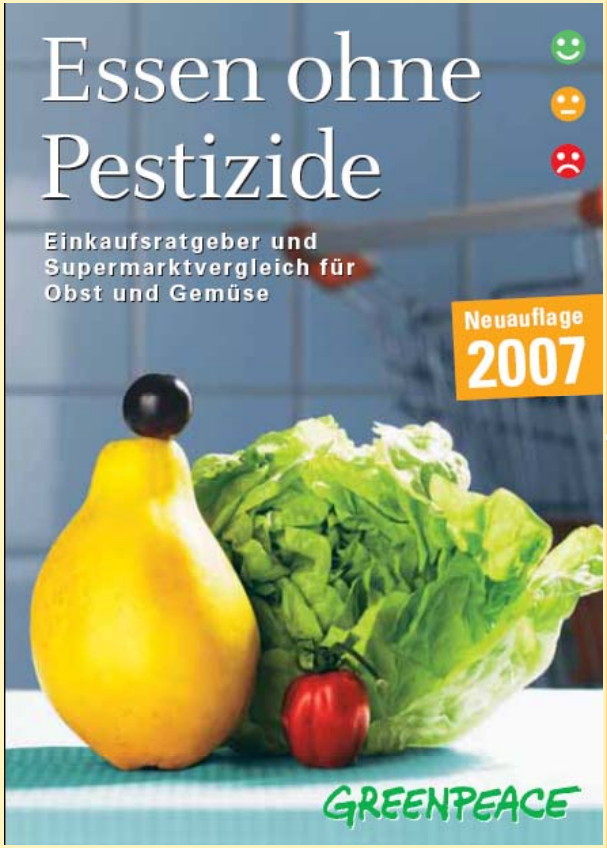
Biocontrol increasingly important

Market drivers:

- food safety,
- pesticide resistance,
- yield and quality increase,
- reduction of available pesticides

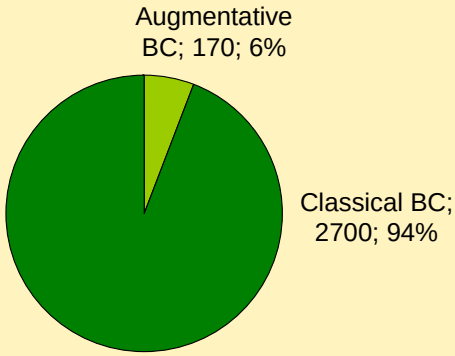
- Example: green revolution in Spain:





Types of uses

- Classical biological control
  - Introduction of BC organism in an area with the aim to reproduce and spread (outdoor)
  - Public institutes
- Augmentative biological control
  - Introduction of BC organisms not aimed to establish, only for duration of crop cycle (greenhouses and some outdoor crops)
  - Private industry

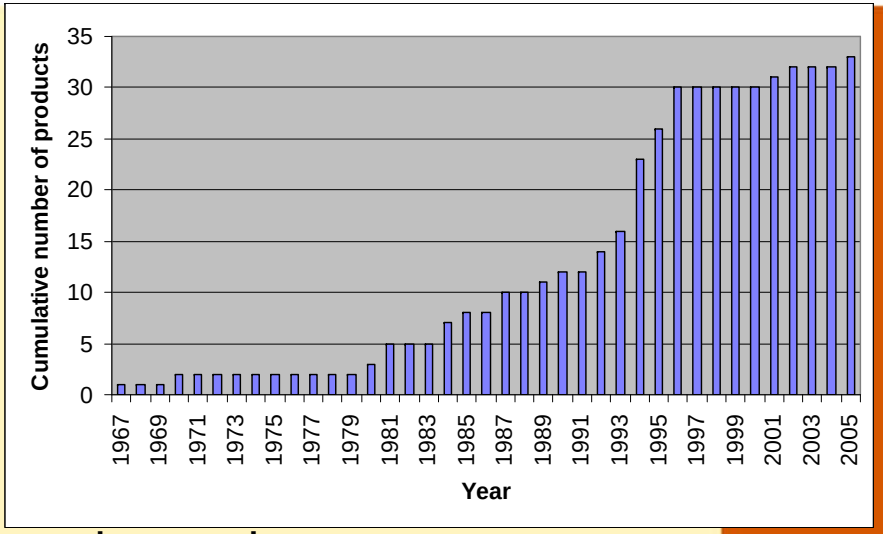


Process of product development

- Field survey in different source countries of pest
- Collection and export of specimen (insects live very short!)
- Identification of specimen
- Set up lab culture
- Research on biological parameters
- Evaluation of candidate -> go/ no-go
- Risk assessment – IPPC phytosanitary requirements
- Field research
- Evaluation of candidate -> go/ no-go
- Development of an economically feasible mass-rearing system
- Development of product

Total process:
5-10 years,
€ 2 – 8 million
Decreasing success ratio

Degree of development



Classical BC:

- Field crops, low value
- 7000 introductions, 2700 species

Augmentative BC:

- Mainly greenhouse vegetables, ornamentals growing
- 25 species > 90% market
- Small sector: 50 producers, 90% less than 20 employees
- Low income: ±150 million € (225 million US$)

  (Pesticides: 25 billion €, insecticides: 6,25 billion €)
- Low profitability:0-5%, total < 15 millionUS$
- No modifications, no IPR's

Holders and users

Classical BC

- Research by (inter)national research institutes
- Research paid by government or development agency
- Development of rearing by research institutes or centralised institutes (cooperations)
- Releases made in public domain, no profit

Augmentative BC

- Research by local research institutes or private companies
- Research paid by private company
- Development of rearing and product by private companies (or cooperations)
- Sales to growers (profits)
- Organisms unprotected by IPR’s

Types of genetic diversity

Wild or improved?

- **No genetic modification or improvement**
- **Inter-specific, sometimes specific strains**

Native or exotic?

- **Tendency towards native species**
  - Result of CBD
  - Increasing regulation: ISPM 3
- **Increasing need for exotics**.
  - Increasing introduction of alien crops and pests, threatening existing IPM programs
  - Native species not always sufficient
  - Rapid solution required
  - Smooth access for research important

Global exchange

Number and frequency of exchanges

- Highest number of exchanges in early stage
- Organisms collected in situ
- Export of preserved specimen for taxonomic purposes
- Export of live specimen once before or after basic research
- Only small proportion becomes product

- Often multiple source countries
- ‘Accidential’ introductions
- Importance of cross-border exchange will increase in future

Direction of flows

- High-income countries both provider and user
- Low-income countries more provider than user

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Modalities for exchange

- Living material -> practical constraints
- Exchange via networks between scientists
- Established customary practices: sharing results, joint publications

- Increasing national regulation: export permits, export rules

- No IPR's: Genetic resources free for use

Other issues for exchange of BC agents

Sanitary and environmental impact legislations: ISPM 3:

- Import and release increasingly regulated
- Certification
- Risk Assessment
- Costs for research increased
- Time for developing product increased
- Secondary effect: regulation of courier services

Summary Biological Control

- **Resources not continually extracted** from Nature. Organism remains available in its natural environment to all possible users.
- **No Intellectual Property Rights** on natural enemies.
  - No patents on natural enemies:
  - Anybody can start mass-rearing the same organism for the same purpose.
- **The results of research become immediately public knowledge**
- **Societal benefits for all**
  - Assuring production of safe and healthy food
  - Minimising pesticide impact on environment and people
- **Monetary benefits for industry are low**

Key Concerns

1. Access is limited

- Threat for existing biocontrol programs in case of a new *exotic invasive pest*

2. Costs of access too high:

- Permitting process might be more costly than the total benefits.
- No IPR's on beneficial insects and mites. Copying by other producers.

3. Administrative burden of sharing benefits based on profit too high

- Many different contracts with small market share

ABS for Biological Control

- Collaboration with local research institutes for collecting, basic research (already in place)
- In case an effective beneficial insects or mite has been found, make the knowledge and organisms available to the farmers and researchers of the country of origin (already in place)
- Facilitate collecting of beneficial insects and mites for biological control:
  - Easy access and fast permitting procedures
- Exempt beneficial insects and mites from Monetary Benefit Sharing, on the condition that they are not patented.

Statement

If we share our pests, then we should also share the biological control agents against these pests.

References

- *Submission of views on the terms of references by IOBC, ICIPE and IBMA at the Windhoek, Namibia meeting in December 2008. See minutes p. 109.*
- *Position paper IBMA Invertebrates 2009*
- *Cock et al., 2009. Background study paper 47 FAO*
- *Cock et al., 2010. Do new Access and Benefit Sharing procedures under the Convention on Biological Diversity threaten the future of Biological Control. BioControl 55(2):199-218*

- *www.ibma-global.com*

Thank you