



BIOLOGICAL CONTROL SUCCESS STORIES

biocontrol technologies and the positive impact
on farmers and society



IBMA
INTERNATIONAL BIOCONTROL
MANUFACTURERS ASSOCIATION



BIOLOGICAL CONTROL SUCCESS STORIES

biocontrol technologies and the positive impact on farmers and society

Biological control is the **safer alternative** to chemical pesticides, bringing **evidence-based environmental, health and climate benefits** for a more sustainable food system. Soil biodiversity and nutrient cycling are enhanced. Healthy ecosystems can be restored. Farmers report **equivalent productivity**. A triple win for nature, **long term food security** and sound economic return for farmers.

Today the EU is on the brink of backing biological control through the Sustainable Use Regulation. Unlocking the potential of biological control means a genuine transition to sustainable farm and food systems. Regulatory clarity, though a definition and targets is essential to the transition. Also important is the **innovation mindset** of farmers, availability of the full range of biological controls, and local support.

The following pages provide a snapshot of biocontrol use in Europe, part of integrated pest management. Farmers have used biological control for over 50 years and manufacturers have persevered and continued to register products despite regulatory hurdles. In Europe it takes 10 years for registration, whereas elsewhere in the world, it can take just two years.

Let's make sure farmers can choose biological control.



For more farmer experiences and biocontrol in action examples beyond the information presented in this document, visit the [IBMA YouTube channel](#), the [IBMA France YouTube channel](#), the [Low impact farming campaign](#) by our partner PAN Europe and www.ibmabiocontrolsuccess.org.

CASE STUDIES OF BIOCONTROL IN ARABLE

Biocontrol is well established as an effective pest and disease control solution in horticulture and speciality crops indoors and outdoors.

In recent years in Europe use in arable is increasing with 1000s of hectares under biocontrol.

- Rice - rice stem borer - Albufera, Spain - 15,300 ha
- Maize - corn borer - Germany, France, Italy, Austria - 500,000 ha
- Maize - wireworm - Germany - 10,000 ha
- Cereals - seed treatment - Germany, Italy, France - 85,000 ha
- Individual arable farm example of transition - 350 ha

These examples show evidence of effective use and uptake by farmers around Europe. What is clear from the success stories, is the importance of key enablers to successfully implement change at farm level. These are: (i) existence of an external trigger (market or regulatory) and/or deep personal motivation and belief from the farmer (ii) product availability (iii) an enabling regulatory system for biocontrol (iv) focus on training and demonstration of success by multiple stakeholders implementing locally on farm and (v) financial incentives for the farmer to try something different (overcoming the perceived risk of change).

In Brazil, where the regulatory system is enabling biocontrol and there is a strong belief among farmers in the potential of biocontrol, IBMA member Koppert covers more than 4,000,000 ha of soybeans with biocontrol. More detail is given on next page.

Specificities of Brazilian regulatory system that enable biocontrol:

- Time to registration - 2 years compared to up to 10 years in Europe.
- Enabling research and regulatory environment for biocontrol increasing product availability - 433 products are available in 2021 versus 107 in 2013.
- Ability to register in one pest and to extend this to other crops without any additional data.
- National Programme for Biobased Agricultural Inputs focusing policies on biocontrol

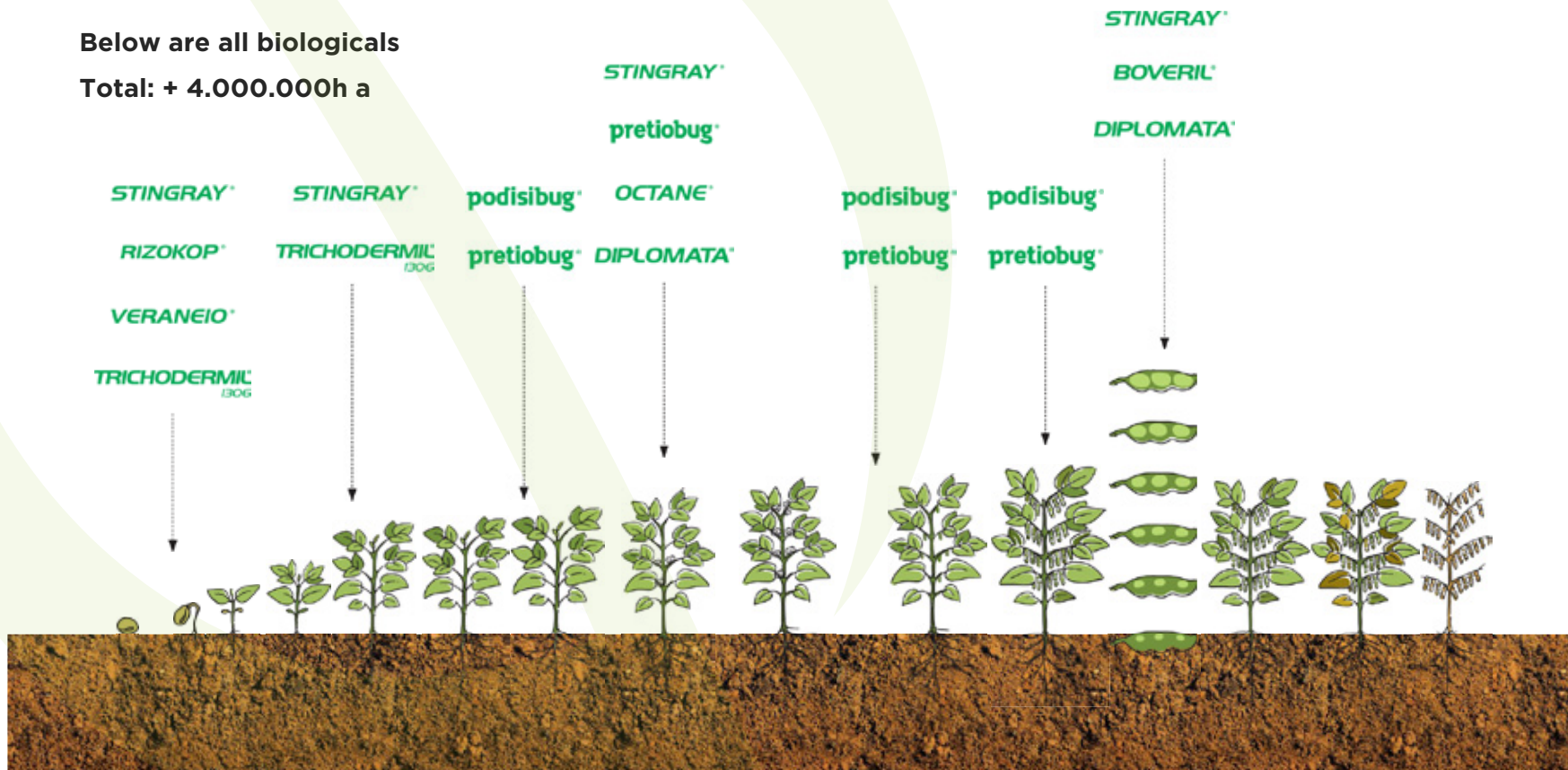
Where multiple biocontrol products are registered, such as in Brazil and in the USA, there is a broader coverage of solutions, which is important for effective pest and disease control since biocontrol products are generally more specific than chemical products.

KOPPART INTEGRATED SYSTEM EXAMPLE - SOYABEAN

Below are all biologicals

Total: + 4.000.000h a

KOPPERT
BIOLOGICAL SYSTEMS



CROP: Arable
COUNTRY: Chartres, France
(wheat, barley, sugar beet, maize, OSR)

BENEFITS OF BIOLOGICAL CONTROL

FARMER SAVINGS

- ↓ Pesticide costs and applications
- ↑↓ For Trichogramma against corn borer in maize - labour costs increase to apply manually but reduced by drone application

Example costs:

Wheat 24€/ha biological,
27€/ha chemical
Oilseed rape 38€/ha biological,
39€/ha chemical

SUSTAINABILITY BENEFITS (inc. carbon savings)

- ↓ Worker exposure
- ↓ Pesticide residue
- ↓ Pesticide resistance
- ↑ Biodiversity
- ↑ Soil health
- ↑ Regenerative land practices
- ↑ System resilience

ENABLERS OF BIOLOGICAL CONTROL

TRANSITION TRIGGER

Personal farmer motivation to use biocontrol
2009 EU Sustainable Use Directive
2018 - new French government certification - High Environmental Value
New requirement for no chemicals next to housing

PRODUCT

Sulphur - powdery mildew on sugar beet
Trichogramma - corn borer in maize
Ferric phosphate - slugs in wheat and barley
Laminarine - septoria and rust in wheat and barley
Bacillus pumillus - sclerotinia in oilseed rape

LOCAL IMPLEMENTATION TEAM

Farmers, manufacturers, regional advisers



RESULT

DURATION OF TRANSITION TO FULL IMPLEMENTATION

1980s using sulphur: Uses new biological product as soon as it is available. **Implementation of each change takes 2-5 years.**
Limitation to uptake is (i) availability of products (ii) lack of experience with biologicals.
The farm referred to in this example is 350ha.

CROP: Rice
COUNTRY: Albufera, Spain

BENEFITS OF BIOLOGICAL CONTROL

FARMER SAVINGS

- ↓ Pesticide applications replaced by one pheromone dispenser
- ↓ Operational costs

SUSTAINABILITY BENEFITS (inc. carbon savings)

- ↑ Biodiversity
- ↑ Water quality
- ↓ Worker exposure
- ↑ Soil health
- ↑ Farmer livelihoods and tourism

RESULT

DURATION OF TRANSITION TO FULL IMPLEMENTATION

1989-2000: Integration - 9000 ha

2000-2006: Fully under pheromones - 16000 ha

ENABLERS OF BIOLOGICAL CONTROL

TRANSITION TRIGGER

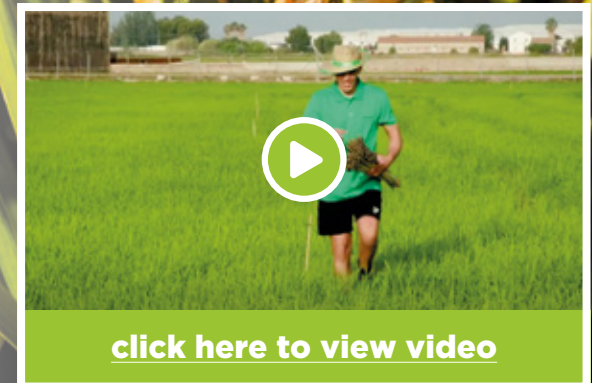
- 1986 - Natural Park creation
- 2000 - Tourism decision to extend area
- Subsidy from region to switch

PRODUCT

Chilo suppressalis - sex pheromone for control of rice stem borer by mating disruption

LOCAL IMPLEMENTATION TEAM

Farmers, manufacturers, regional government, local advisers, University of Valencia



[click here to view video](#)

CROP: Pepper
COUNTRY: Almeria, Spain

BENEFITS OF BIOLOGICAL CONTROL

FARMER SAVINGS

- ↓ Pesticide applications and use
- ↑ Crop monitoring costs initially supported by subsidy

SUSTAINABILITY BENEFITS (inc. carbon savings)

- ↓ Worker exposure
- ↑ Worker health
- ↓ Pesticide residue
- ↓ Pesticide resistance

ENABLERS OF BIOLOGICAL CONTROL

TRANSITION TRIGGER

2007 - Refusal of peppers exported from Spain by Germany due to traces of illegal pesticide in 30% of produce

PRODUCT

Amblyseius swirskii - mite for control of whitefly and thrips

LOCAL IMPLEMENTATION TEAM

Farmers, manufacturers, local distributors, government subsidy for biocontrol

RESULT

DURATION OF TRANSITION TO FULL IMPLEMENTATION

2007-2012: complete switch to beneficial insects Ca 11,000 ha



CROP: Vines
COUNTRY: Franciacorta, Italy

BENEFITS OF BIOLOGICAL CONTROL

FARMER SAVINGS

- ↓ Pesticide applications

SUSTAINABILITY BENEFITS (inc. carbon savings)

- ↓ Worker exposure
- ↓ Pesticide residue
- ↑ Biodiversity
- ↓ Historical land contamination reduced
- ↑ Soil health
- ↑ Carbon sequestration

ENABLERS OF BIOLOGICAL CONTROL

TRANSITION TRIGGER

Health of public and workers
Environmental concerns which risk limiting production (Soil health, water quality).
National Organic certification
EU Organic product list

PRODUCT

Pheromones – grape berry moth

LOCAL IMPLEMENTATION TEAM

Farmers, University of Milan, local agronomists, municipality

RESULT

DURATION OF TRANSITION TO FULL IMPLEMENTATION

1998-2001: transition to organic.

Start small pilot on one plot, by 2000 farm was organic and in 2001 had organic certification. In 2001 only one farm in Franciacorta was organic. In 2017 60% of the Franciacorta regional area is organic.



CROP: Potato

COUNTRY: Germany, Austria & Switzerland

METARHIUM CONTROLS WIREWORM IN POTATO CROP

- Potato (*Solanum tuberosum*)/ D,CH, AU, LUX)/Metarhizium brunneum/ larvae of click beetle (*Elateridae*) to control wireworm
- No other organic nor conventional solutions for wireworm control exist in Germany today
- Smart CO₂ emitting granules with entomopathogenic fungus (microbial) attract and kill wireworm

TECHNICAL RESULT

Granules provide efficacy levels of more than 70% in GEP field trials (EPPO guidelines).

ECONOMIC RESULT

Economic surplus of the product application is already given at efficacies of 20%.

BENEFITS OF BIOLOGICAL CONTROL

SUSTAINABILITY BENEFITS

Ecological

- ↑ Biodiversity
- ↓ Pesticide usage
- ↓ Fresh water usage

Social

- ↑ Health and safety of workers
- ↑ Quality, nutritious production

Economical

- ↑ Farmer livelihoods
- ↓ Yield losses
- ↑ Financial viability and income stabilisation



CROP: Apples
COUNTRY: Czech Republic

CYDIA POMONELLA GRANULOSE VIRUS CONTROLS CODLING MOTH IN APPLE

- Apple (*Malus spp.*)/Czech Republic/*Cydia pomonella* Granulovirus (CpGV)/Codling Moth (*Cydia pomonella*)
- Residue-free apple production for use in baby food makes the granuloose virus an indispensable tool

TECHNICAL RESULT

CpGV is highly effective and selective, without non-target effects, nor rapid pest resistance.

ECONOMIC RESULT

Farmer's yield loss is controlled while keeping their high value market segment of baby food.

BENEFITS OF BIOLOGICAL CONTROL

SUSTAINABILITY BENEFITS

Ecological

- ↑ Biodiversity
- ↓ Chemical pesticide reliance
- ↑ Regenerative land use practices
- ↑ Mind shift towards IPM practices (combining with pheromone traps)

Social

- ↑ Health and safety of workers
- ↑ Quality, nutritious production

Economical

- ↑ Farmer livelihoods
- ↓ Yield losses
- ↑ Financial viability and income stabilisation



CROP: Apples & Pears
COUNTRY: Belgium

SEVERAL BIOCONTROL SOLUTIONS AGAINST PEST AND DISEASES IN APPLES & PEARS

- Apple (*Malus spp.*) and pear (*Pyrus spp.*)/pest insects and diseases/ predatory insects and mites, mating disruption, habitat improvement
- In 1988, 3rd generation fruit farmer decides to decrease chemical load of broad-spectrum chemicals in their fruit orchard. 30 years later they **reduced the chemical load by 90% by applying agroecological practices in an IPM scheme**
- Releasing of predatory mites, mating disruption, safeguarding natural enemies by habitat improvement through creating hiding places (hedges, nesting boxes), water purification by reeds

TECHNICAL RESULT

Apple and pear production with 90% reduction of chemicals, increased biodiversity

ECONOMIC RESULT

Better pest control of complete fruit production, at lower cost

BENEFITS OF BIOLOGICAL CONTROL

SUSTAINABILITY BENEFITS

Ecological

- ↑ Biodiversity
- ↑ Resilient fruit cropping systems
- ↓ Chemical pesticide reliance
- ↑ Regenerative land use practices
- ↑ Good animal welfare, providing adequate habitats

Social

- ↑ Good governance cross pollinating the rest of the sector
- ↑ Health and wellbeing of workers and consumers
- ↑ Quality, nutritious production

Economical

- ↑ Farmer livelihoods and value distribution
- ↑ Financial viability



[click here to view video](#)

CROP: Maize
COUNTRY: Germany, Austria, Italy, France

ENABLERS OF BIOLOGICAL CONTROL

TRANSITION TRIGGER

Subsidy from region to switch
Efficacy is 75% and reduces pest to below economic threshold

PRODUCT

Trichogramma brassicae against corn borer

LOCAL IMPLEMENTATION TEAM

Farmers, manufacturers, regional government.

RESULT

1990s-2020: Gradual increase in area now
500,000 ha in France and Germany under with
several companies marketing *Trichogramma*



CROP: Maize
COUNTRY: Germany, Austria

ENABLERS OF BIOLOGICAL CONTROL

TRANSITION TRIGGER

Lack of chemical options – farmers desperate for a solution try it and succeed
Interest in biocontrol

PRODUCT

Metarhizium brunneum to control wireworm

LOCAL IMPLEMENTATION TEAM

Farmers, manufacturers.

RESULT

2017-2020: derogation on **10,000 ha**



CROP: Cereals (wheat, triticale, barley, oats)
COUNTRY: Northern Europe, Germany, Austria, Italy, Switzerland

ENABLERS OF BIOLOGICAL CONTROL

TRANSITION TRIGGER

Push for biological alternatives

PRODUCT

Pseudomonas chlororaphis MA342 - seed treatment against fusarium, tilletia caries, septoria nodorum.

LOCAL IMPLEMENTATION TEAM

Farmers, manufacturers.

RESULT

2021: 85,000 ha

across Italy, France, Germany, Switzerland and Austria.

Additional major use in Scandinavia (EFSA concerns raised on metabolite DDR under review process)





96% of pepper crops in Almeria & Granada use biocontrol against pests

10% of almonds in the USA use biocontrol against pests



ISABELLE PINZAUTI BABRZYNSKI
SENIOR ADVOCACY AND OUTREACH MANAGER
T: +33 (0)497 69 58 42 E: isabelle.pinzauti@ibma-global.org

JENNIFER LEWIS
EXECUTIVE DIRECTOR
T: +44 (0)7711 115764 E: jennifer.lewis@ibma-global.org



80% of Brazilian cotton is grown using biological control



FOR MORE BIOCONTROL IN ACTION VISIT OUR WEBSITE
www.ibmabiocontrolsucces.org

95% of greenhouse crops are biologically controlled in the Netherlands