The Role of Bioprotection in the Transition to Regenerative Agriculture

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International Biocontrol Manufacturers Association

Part of the Federation of Biocontrol industries Bioprotection Global

**Small Association**
Local associations around Europe – members represent us where no local Association

**SMEs dominate**
In Europe 71 SMEs and 76 micro SMEs

**Global with European Focus**
165 member companies in Europe
Global members learn how to access Europe. 90 more members worldwide

**25 years old**
Established in 1995 – 25th anniversary

**Global reach**
Part of Bioprotection Global IBMA Kenya and 20% of members from outside Europe
Annual Biocontrol Industry Meeting
EU COM present
Bioprotection

**MACROBIALS 01**
Beneficial insects and mites that control other insects and mites

**MICROBIALS 03**
Micro-organisms that outcompete or control pests and diseases

**NATURAL SUBSTANCES 02**
Botanical extracts and minerals

**SEMIOCHEMICALS 04**
Insect pheromones and plant kairomones that affect the behaviour of specific insects or plants
Biocontrol Technologies: More details on Macrobials, Microbials, Natural Substances and Semiochemicals

IBMA Product categories within the scope of “Bioprotection” currently include:

» **Semiochemicals** are substances emitted by plants, animals and other organisms used for intra-species and/or inter-species communication and have a target-specific and non-toxic mode of action.

» **Microbials** are based on microorganisms, including but not limited to bacteria, fungi, protozoans, viruses, viroids, mycoplasmas, and may include entire microorganisms, living and dead cells, any associated microbial metabolites, fermentation materials and cell-fragments.

» **Natural substances** consist of one or more components that originate from nature, including but not limited to: plants, algae/microalgae, animals, minerals, bacteria, fungi, protozoans, viruses, viroids and mycoplasmas. They can either be sourced from nature or are nature identical if synthetised. This definition excludes semiochemicals and microbials.

» **Invertebrate Biocontrol Agents** (also called macrobials) are natural enemies such as insect, mite and nematode species providing control of pest populations through predation or parasitism.

Currently IBMA does not include, within the scope of “Bioprotection”, any technology for which there is no regulatory pathway or policy decision. Once policy decisions have been published, the technologies will be considered for inclusion.
## 2018 Worldwide Biocontrol Market Sizes

*Source: IHS Markit et Dunham Trimmer – Biocontrol LATAM - 2019*

<table>
<thead>
<tr>
<th>Region</th>
<th>Biocontrol Technologies Market (in Euro Bns) 2018</th>
<th>Annual Growth Rate 2014-2018</th>
</tr>
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<tbody>
<tr>
<td>USA/Canada</td>
<td>1.1</td>
<td>16%</td>
</tr>
<tr>
<td>Europe</td>
<td>0.9</td>
<td>23%</td>
</tr>
<tr>
<td>South America</td>
<td>0.6</td>
<td>32%</td>
</tr>
<tr>
<td>Asia-Pacific</td>
<td>0.4</td>
<td>14%</td>
</tr>
<tr>
<td>Rest of the world</td>
<td>0.6</td>
<td>19%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3.6</strong></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Cultures</th>
<th>Biocontrol Technologies Market (in Euro Bns)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruits and Vegetables</td>
<td>2.8</td>
<td>76%</td>
</tr>
<tr>
<td>Arable Crops</td>
<td>0.35</td>
<td>10%</td>
</tr>
<tr>
<td>Seeds Treatments</td>
<td>0.25</td>
<td>8%</td>
</tr>
<tr>
<td>Other (public and green spaces)</td>
<td>0.2</td>
<td>6%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3.6</strong></td>
<td><strong>100%</strong></td>
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Biocontrol industry Market Research in EU in 2020 has indicated a European market size of 1bn Euro in 2019.
Bioprotection: Essential Innovation within the Green Deal

• **From ‘Farm to Fork’: designing a fair, healthy and environmentally-friendly food system:** “The EU needs to develop innovative ways to protect harvests from pests and diseases and to consider the potential role of new innovative techniques to improve the sustainability of the food system, while ensuring that they are safe."

• **A zero pollution ambition for a toxic-free environment:** “To ensure a toxic-free environment, the Commission will present a chemicals strategy for sustainability. This will both help to protect citizens and the environment better against hazardous chemicals and encourage innovation for the development of safe and sustainable alternatives”

"This is Europe’s man on the moon moment,...Our goal is to reconcile the economy with our planet, to reconcile the way we produce, the way we consume with our planet and to make it work with our people." **Ursula von der Leyen, the European Commission President when presenting the EU Green Deal Communication**
New Green Deal Policies support Bioprotection

Action plans

Farm to Fork
Alternatives to conventional pesticides
Facilitate placing on market of PPP containing biological active substances
Revision of Sustainable Use Directive to ... enhance Integrated Pest Management

Biodiversity
Biodiversity loss results in reduced crop yields
Set national values for targets for Biodiversity and Farm to Fork using CAP instruments

REFIT
1107/2009 Effectively manages risk
BUT
Accelerate the placing on the market of low risk alternatives
Converging Technologies are Creating New Solutions

- Remote sensing
- Sampling
- Controlled release of BCA

- New Biocontrol technologies
- Microbiomes
- Interactions between the two

Information Technology

- Artificial Intelligence
- Pattern recognition

Cognitive Sciences

- New formulations
- Model of action

Formulation Technology

Biocontrol Technologies
The Transition to Regenerative Agriculture

From Forum for the Future – Growing Our Future Report

**CURRENT AGRICULTURE SYSTEM**

- Profit maximization for a small number of powerful players over the short term

**REGENERATIVE AGRICULTURE SYSTEM**

- Putting more back into the environment and society than it takes out

**Shared goals**

- **PRODUCTIVE**
  - Restores ecosystems services at the landscape level (soil health, water quality, biodiversity)

- **Viable**
  - Localize and diversify production systems

- **Profitable**
  - Maximize nutrition and public health

- **Food Safety**
  - Resilient: conditions to allow system participants to thrive and adapt

- **Connection between consumers and production**

- **Equitable distribution of value**

**CURRENT AGRICULTURE SYSTEM**

- Extractive
- Economies of scale and intensive, specialized production
- Maximize calories produced
- Externalizes environmental impacts
- Competitive price reduction for consumers
- Maximize profit for power holders in supply chains
Bioprotection is an enabler for regenerative agriculture

For regenerative agriculture we need systemic change

For sustainable agriculture and maintaining biodiversity, bioprotection and biocontrol technologies need to be at the heart of the pest and disease control programme

It is not business as usual – it is a biology first approach and agroecological approach
How to Incentivise Switch to Bioprotection

And mandate IPM within the SUD revision so bioprotection targets are set within National Action Plans

**Incentives**
Farming businesses need incentives to change. Use CAP EcoScheme to reward change and mitigate the risk of change.

**Farmer to farmer networks**
Farmers listen to farmers. Peer to peer learning within rural communities and regions

**Training advisers and farmers**
How to use bioprotection and how to make successful IPM programmes

**Multi-stakeholder best practice sharing**
Farmer research for farmers led by farmers with support from multiple stakeholders – researchers, advisers, industry.

**Enabling Regulation to Speed Up Market Access**
Farmers need products to control pests and diseases. Bioprotection products are available but are stuck in the inappropriate regulatory system unable to reach market.
Enabling Regulation for Bioprotection is part of the Solution

01 Bioprotection does not work in the same way as chemical pesticides
Bioprotectants are not the same as pesticides – they generally work by suppression, triggering plant defences, or outcompeting the pest or disease

02 Pesticide legislation is written for chemicals
1107/2009 is designed with chemicals in mind

03 Bioprotectants promote resilience.
Bioprotection enhances nature’s biological buffering and over time their impact increases as they facilitate the natural processes in soil and above ground

04 Systemic Change
Farming with a biological mindset is different to farming with a pesticide mindset. Systemic change requires a paradigm shift to actively promote bioprotectants

05 Active facilitation and promotion of bioprotection
Today bioprotectants are buried in pesticide legislation. This is hampering market access for bioprotection

Bioprotection Specific Regulation
We want a new bioprotection specific regulation to accelerate market access for bioprotectants. This is necessary for the transformative ambition of the Farm to Fork Strategy
Bioprotection – New Regulation Principles

Precautionary
Precautionary at farm level – safety to farmers, the environment and the public

Safe Use
Where safe use demonstrated on one crop and no MRL they could be used on all crops

Proportionality
Inherently low risk of bioprotectants merits a reduced evaluation and minimal re-evaluation process

Right to know
A bioprotection specific regulation can give consumers more information on the origin of their food and boost their confidence
The SUD review can help the agricultural transition

SUD is a great tool – it describes Integrated Pest Management within the biology first context

Legally binding Action Plans
National Action Plans have not delivered.
Voluntary approach needs replacing with legally binding action plans.

Integrated Pest Management is rewarded
Reward IPM in CAP through Ecoschemes in the National Strategic Plans

Include Targets in SUD
Create National Targets for bioprotection uptake within the new National Action Plans
Vines in Franciacorta Italy

60% of vines in region under organic production
What has been the impact so far?

*Mimising residues and land contamination*

Triggers for change are multiple – in this case the societal change and limiting risk to workers and the environment was a key driver for change as was the achievement of national certification, highlighting the importance of standards.

*Change happens field by field, farm by farm*

 Started with small pilot on one plot and by 2000 the farm was organic and in 2001 has organic certification. Now over 60% of the Franciacorta region vine area is organic

*Joint working Farmers, Researchers Univ of Milan, local agronomists and municipality*

It began a social project providing work for people with mental health difficulties who were located nearly.

Technology transfer involved multiple stakeholders within the community
Rice in Albufera of Valencia

15,300 ha of rice surrounding 3,000 ha of freshwater lagoon using mating disruption
What has been the impact so far?

*Chilo suppressalis*  control through mating disruption

16,000 ha under mating disruption

Since 2006 the pest is fully controlled by mating disruption in the whole area (approx. 16,000 ha) avoiding of the use of approx. 50,000 L of synthetic insecticides each year.

Joint working with extension service, farmers and industry

The use of mating disruptions allows the coexistence of an important economic activity (such as the rice cultivation) in an area which as been declared a natural reserve and that is, additionally, a touristic site in the region.

Biodiversity increased

The switch to biocontrol allowed to significantly decrease pollution and reliance on chemical pesticides, increasing biodiversity enabling resilient rice cropping systems.

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**Evolution of insecticide use**

- Liters of insecticides
- Ha with MD

**Evolution of nesting aquatic birds**

- Total number pairs species in UICN Red List
- Total number pairs 10 species of special interest
Maize in Italy, France and Germany

400,000 ha of maize under parasitic wasp control
What has been the impact so far?

*Ostrinia nubilalis* is controlled by *Trichogramma brassicae*

400,000 ha of maize grown under bioprotection

Since 2000 Trichogramma used to parasitise European corn borer but exponential increase in use due to use of drones to apply capsules.

**Efficacy to match synthetics**

Over 80% of eggs are parasitized achieving similar levels of control and yield increase as synthetic pesticides

**Development of new application techniques**

Innovation nexus – drone application with change in format of parasitic wasp eggs provided the ability of the technique to compete economically
Conclusion: What is needed to accelerate Bioprotection Role in Regenerative Agriculture

Transition takes time – it is urgent – start now

**Enabling regulation**
Products must reach the market - use the SUD to push bioprotection but a new biological specific regulation is needed to enable the transition

**Incentives – National Strategic Plans**
Use the CAP EcoScheme to reward and mitigate the risks for farmers making change

**Targets – National Action Plans**
Make the SUD legally binding and include a target for bioprotection

**Farmer to Farmer Networks**
Sfarmers learn from farmers and advises and are part of the rural community

**Training and Advice**
Advisers must understand biocontrol and be able to advise biocontrol
What can the Research Community do to accelerate the agricultural transition?

Provide evidence of the wider benefits of bioprotection

For regenerative agriculture we need systemic change
- Wider benefits of existing products eg biodiversity, soil health
- Look beyond efficacy at wider benefits for new products – biodiversity, carbon cycling, microbiome health

All at field level
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Thank you

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