CropLife
AFRICA MIDDLE EAST

New Trends in Crop Protection

Biopesticides

Stella Simiyu, Director Regulatory Affairs at CropLife Africa Middle East

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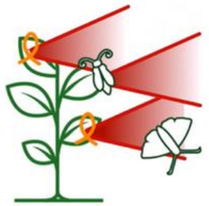
1 What are Biopesticides?

1 What are Biopesticides?

Biopesticides: are active substances derived from nature, either naturally occurring or synthesized with identical structure and function to their naturally occurring counterparts.

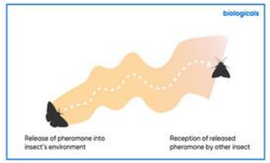
1. Semiochemicals

Are chemicals produced by plants and animals. They modify the behavior of insects rather than killing them.



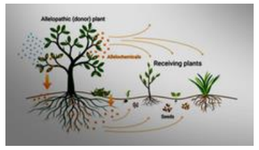
1.1. Pheromones

Compounds that are emitted by an organism that affect members within the same species.



1.2. Allelochemicals

Compounds that are emitted by an organism that affect other species.



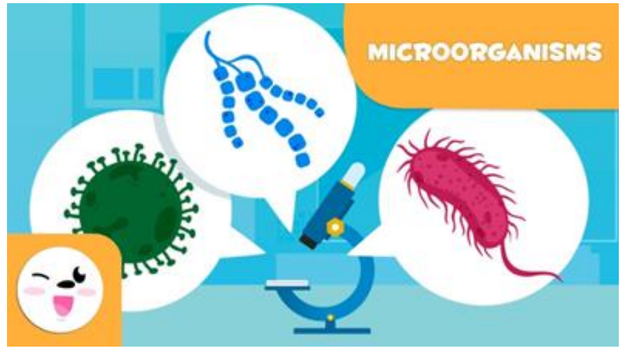
2. Biochemicals

- Plants, microbial and animal extracts
- RNA
- Peptides and proteins
- Fermentation material
- Metabolites from micro-organisms (purified).

3. Micro-organisms

Include bacteria such as:

- Bacillus thuringiensis,
- Algae
- Protozoa
- Viruses
- Fungi



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4. Macro-organisms (beneficial insects)

They are natural enemies of pests and environmentally friendly.

Such as:

- Ladybugs
- Predatory mites
- Parasitic wasps (trichogramma)
- Predatory Bugs (macrolophus pygmaeus)

Macrolophus pygmaeus:
Identification, images, feeding behaviour, aphid biological control

Pretty carnivore:
A ladybug eating aphids on plant stem.

A beneficial wasp, Aleiodeslaphygmae, parasitizing a fall armyworm caterpillar pest

Phytoseiulus persimilis
Mite Predator

Trichogramma

2 The Benefits of Biopesticides

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The Benefits of Biopesticides:

Human and Environmental Health

Consumer Safety:

Safer toxicological profile, targeting specific pests and reducing the risk to humans and wildlife.

Crop Safety:

Biopesticides leave no residues on treated crops, which is beneficial for farmers exporting to markets with stringent regulations.

Resistance Management:

Novel Modes of Action with a unique mode of action that differs from conventional pesticides.

Health Environment:

Biopesticides are non-persistent in nature, enhance nutrient acquisition, improve soil health and promoting beneficial microbial communities.

Low Toxicity to Non-Target Organisms:

They are highly specific to the target pest, reducing the likelihood of impacting wildlife.

Biopesticides have a safer toxicological profile to humans, mammals, and wildlife.

Biopesticides are specific in target organisms, so theydo not have negative effect on non-target organisms.

Biopesticides improve soil health and providing an expected reduced contamination in environmental compartments (soil, water, sediment, air).

Biopesticides break down quickly in the environment, reducing the risk of long-term ecological damage.

Biopesticides have a natural degradation or pathway to balance their concentrations or populations in soil and environmental compartments

Integrated Pest Management (IPM)

Biopesticides work synergistically

with chemical conventional pesticides, extending application timings, allowing longer intervals and providing effective resistance strategies to farmers.

IPM

practices including biopesticides allow farmers to adapt strategies based on local conditions and crop types.

Reduced Residue Levels:

Using biopesticides alongside conventional pesticides reduces residue levels in crops, thereby enhancing consumer safety. This reduction in residues helps farmers meet the stringent requirements of demanding markets, facilitating the sale of their goods.

Tailored Crop Protection:

IPM practices enable customized strategies based on soil type, climate, and pest/disease pressure.

Economically Viable Yields:

Biopesticides help achieve viable crop yields when integrated into IPM programs.

Reduced Reliance on Chemicals:

They significantly reduce the need for chemical pesticides.

A solution for Residue Management

Biopesticides contribute to reduced chemical residue levels in treated crops.

Biopesticides help achieve viable crop yields when integrated into IPM programs.

Biopesticides can reduce the number and/or the quantity of conventional pesticides used, allowing longer intervals, and providing flexible programs to farmers.

Added value supporting marketability of agricultural products ensuring cleaner and safer agricultural produce.

Support for Export:

This residue-free nature supports farmers in exporting their products to international markets with stringent residue regulations.

3 What are the challenges to Biopesticides' uses?

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What are the Challenges to Biopesticides' uses?

Regulatory Challenges

- **Absence of a dedicated regulatory framework** for Biopesticides in AME.
- Lack of a **harmonised definition** for Biopesticides.
- The **absence of specific data requirements** for Biopesticides technologies.
- **Long registration processes:** Authorities may not be fully acquainted with the profiles of these novel technologies, which could result in requests for inapplicable or unavailable data.
- **Need for a dedicated team of experts** for evaluating Biopesticides by authorities.
- **Inadequate post-registration monitoring and extension services**: More extension and surveillance officers, enhanced capacities to enable feedback and support farmers respectively.

Longer Registration Periods to offer Benefits

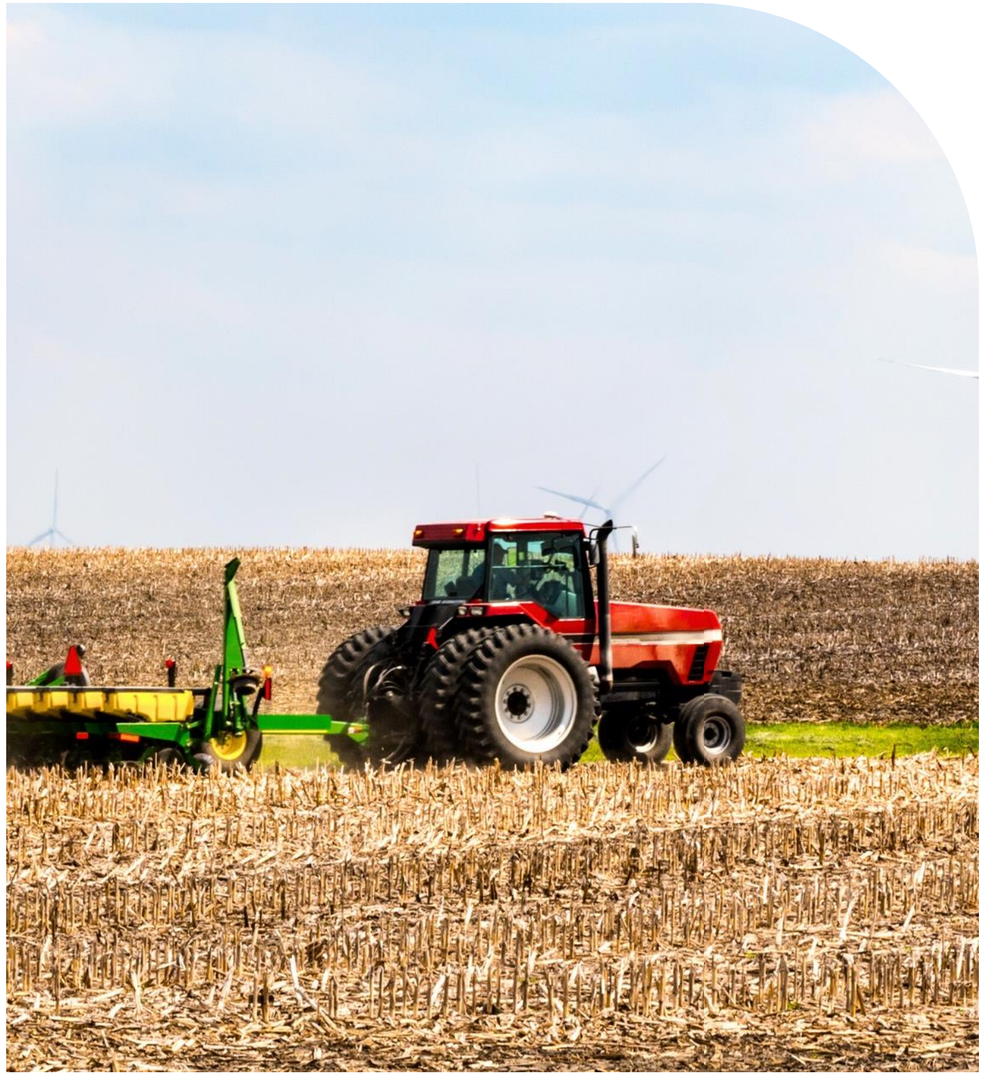
Reduced Administrative Burden:	Less frequent renewal applications save time and resources for regulatory authorities and industry.
Cost Savings:	Companies save on re-registration costs, allowing better resource allocation for establishing Biopesticides.
Market Stability:	Longer registration validity periods provide greater market stability and predictability, encouraging investment and innovation in the development of new Biopesticides. With fewer administrative hurdles, the industry can focus more on research and development, fostering innovation.
Encourages Innovation:	Fewer administrative hurdles enable more focus on research and development.
Consistency in Agriculture:	Farmers and professionals' benefit from reliable access to Biopesticides without interruptions.
Alignment with Global Standards:	Harmonizing validity periods with other regions facilitates international trade and cooperation.

Farmers' Challenges

- **Delayed or long-lasting effects:** Biopesticides may have slow effects on pests or diseases and might require shorter intervals between applications.
- **Narrow pest control spectrum:** Due to high specificity.
- **Stage-dependent effectiveness:** Biopesticides may be ineffective in controlling disease-transmitting insect pests, depending on the infestation stage.
- **Insufficient extension services:** number of trained extension officers to support adoption
- **Train and r**aise awareness on usage conditions, novel modes of action, and benefits.
- **Specific application considerations:** Factors like temperature at the time of application to facilitate microorganism establishment.
- **Storage requirements:** High product usage rates necessitate larger storage areas and specific conditions (temperature, humidity).
- **Inconsistent field performance:** to understand the differences due to climatic and regional variations and to implement mitigation measurements.

Industry’s Challenges

- **Lack of Harmonised Definition and Data Requirements:** creates regulatory uncertainty and hinders innovation.
- **Lack of fast-track procedures to support registration** delays, innovations reaching farmers.
- **Increased Storage Space and Transportation Conditions:** due to larger volumes of biopesticides, sensitivity to temperature and humidity poses logistical challenges for producers and distributors.
- **High Production and Transportation Costs** often impact competitiveness.



4 CLAME's Efforts

CLAME's Solutions

Accelerating and Fast-Tracking/Streamlined Registration Processes and Implementation of Best Practices in Stewardship for Food security and safety

Supporting improved regulatory processes for biological products:

- Reduced data packages,
- Implementation of mutual recognition mechanisms
- Harmonisation of guidelines
- fast-track processes and regulatory reviews etc

Enhanced capacity and knowledge among regulatory officials:

- Creating linkages and platforms for support in dossier evaluation for biopesticides.
- Development of eLearning materials and supporting access to knowledge and resources biopesticides.

Increasing number of biopesticide products registered in countries by CL members

- Tracking progress in the biopesticides sector
- Supporting efforts into technology packages with the use of biopesticides at the end of the crop season

Training farmers in the HOW and WHEN to use biopesticides within IPM programmes

Training other stakeholders in understanding MRLs & trade using CL e-learning tools -

5 Recommendations

5 Recommendations

Public Awareness

Highlight the benefits of biopesticides in IPM programs

Farmer Support & Training

- Field Demonstrations
- Feedback mechanisms for farmers
- Engagement with End User: Farmer, Extension, distributors, advisors

Collaboration, Alliances & Partnerships

Government, industry, farmers and other value chain actors on latest developments

Registration Processes

- Shorter Registration Timelines
- Longer registration validity
- Implement Low-Risk status and reduced data requirements

Policy Facilitation

- Streamlined registration & dedicated regulatory frameworks
- BioPPP definition linked to data requirements & procedures.

Harmonisation

Efforts towards harmonisation:

- Existing global guidelines, standards
- Regional guidelines
- Mutual recognition

6 Summary and Conclusions

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Summary & Conclusions

- **Absence of a dedicated regulatory framework and a harmonised definition for BioPPPs** hinders the establishment of the use of novel BioPPPs in the region.
- **Address Data requirements specific to different BioPPPs:** In most cases, the same data requirements scheme used for conventional chemical pesticides is applied to evaluate BioPPPs.
- **Address long registration processes:** Authorities apply the same criteria in 2, leading to inapplicable or unavailable data requests (chemical mindset).
- **Consideration of Longer validity periods for BioPPPs:** (Biological Plant Protection Products) can offer several benefits, e.g., reduced Administrative Burden, cost saving, market stability, encouraging innovation, and alignment with Global Standards and demands, among others.
- **Need for dedicated teams of experts** for evaluating BioPPPs by authorities.
- **Strengthen extension services:** More extension officers are needed, and they should be well-trained in biopesticide technology to provide support and advice to farmers.
- Enhance **understanding of the nature of BioPPPs**, e.g., shorter shelf life due to the sensitivity to temperature and humidity; which influence field efficacy - due to climatic/regional variations in conditions, etc.


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