Innovation Shaping the Future of Agriculture and Safe Trade

Learnings from Pesticide Management in Asia and the Pacific

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Advancing innovation in agriculture for a sustainable future

As a global advocate for the plant science industry, CropLife International champions innovative technologies that enable farmers to sustainably increase productivity while managing the critical challenges facing our climate and the environment.

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Our Member Companies

syngenta

FMC

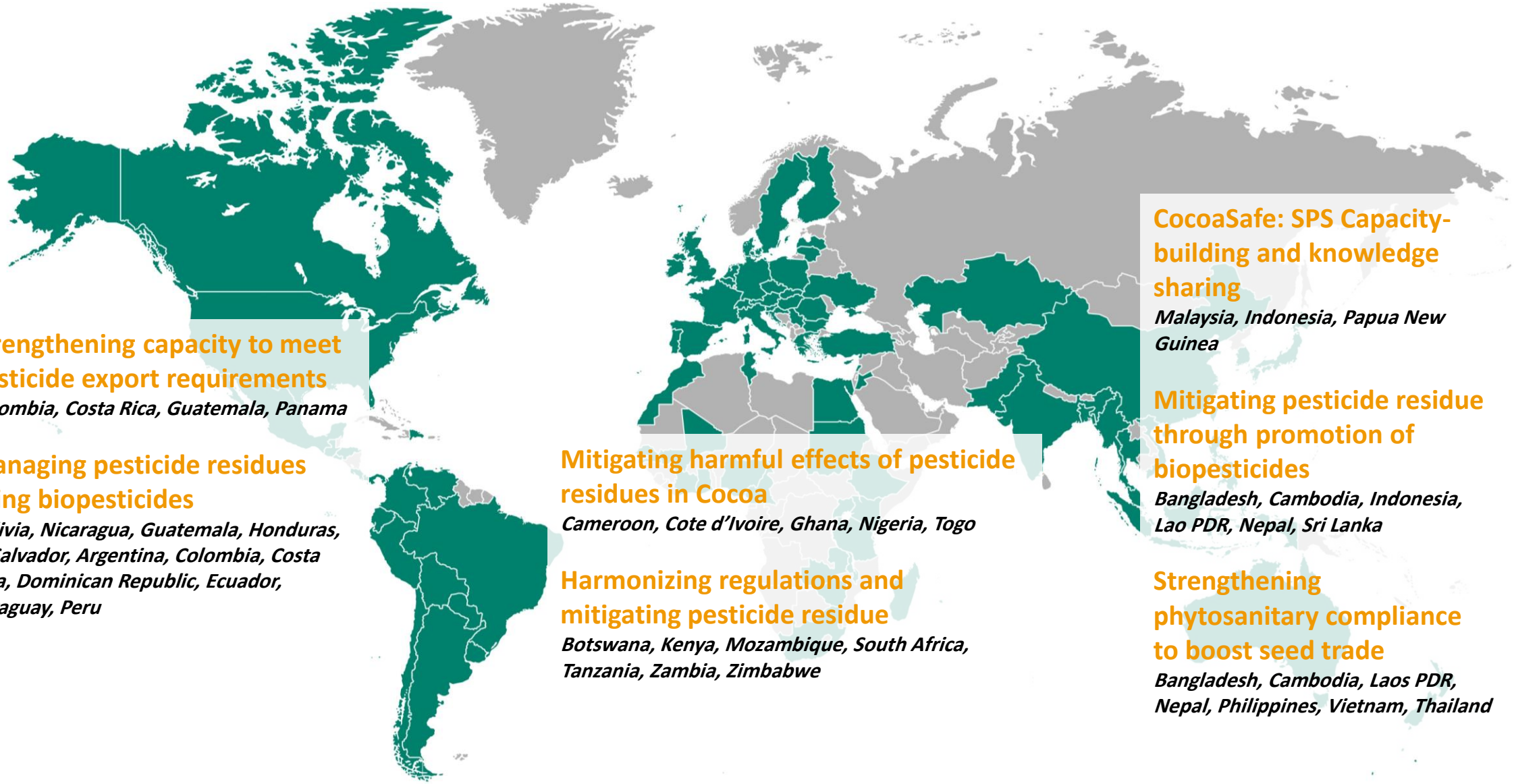
SUMITOMO CHEMICAL

BASF
We create chemistry

BAYER

CORTEVA™
agriscience

Our partnership with STDF



Strengthening capacity to meet pesticide export requirements
Colombia, Costa Rica, Guatemala, Panama

Managing pesticide residues using biopesticides
Bolivia, Nicaragua, Guatemala, Honduras, El Salvador, Argentina, Colombia, Costa Rica, Dominican Republic, Ecuador, Paraguay, Peru

Mitigating harmful effects of pesticide residues in Cocoa
Cameroon, Cote d'Ivoire, Ghana, Nigeria, Togo

Harmonizing regulations and mitigating pesticide residue
Botswana, Kenya, Mozambique, South Africa, Tanzania, Zambia, Zimbabwe

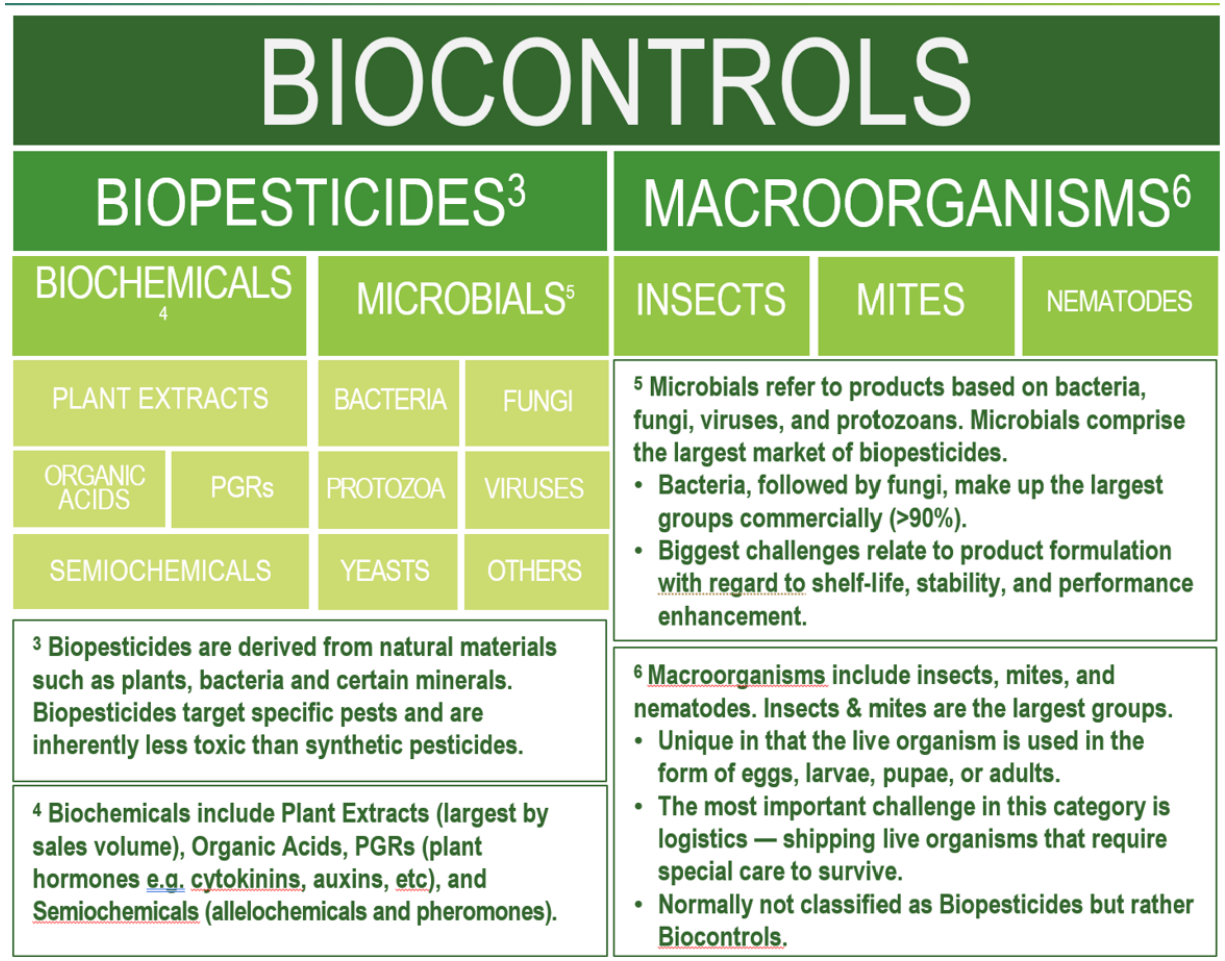
CocoaSafe: SPS Capacity-building and knowledge sharing
Malaysia, Indonesia, Papua New Guinea

Mitigating pesticide residue through promotion of biopesticides
Bangladesh, Cambodia, Indonesia, Lao PDR, Nepal, Sri Lanka

Strengthening phytosanitary compliance to boost seed trade
Bangladesh, Cambodia, Laos PDR, Nepal, Philippines, Vietnam, Thailand

Ag Biologicals Sector

In addition to the 600-odd synthetic crop protection active ingredients, there are around 300 biopesticide active substances and organisms (Phillips McDougall analysis).

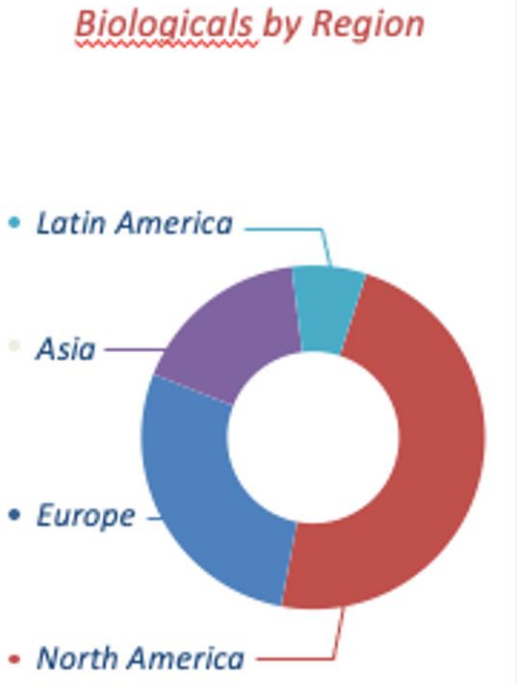


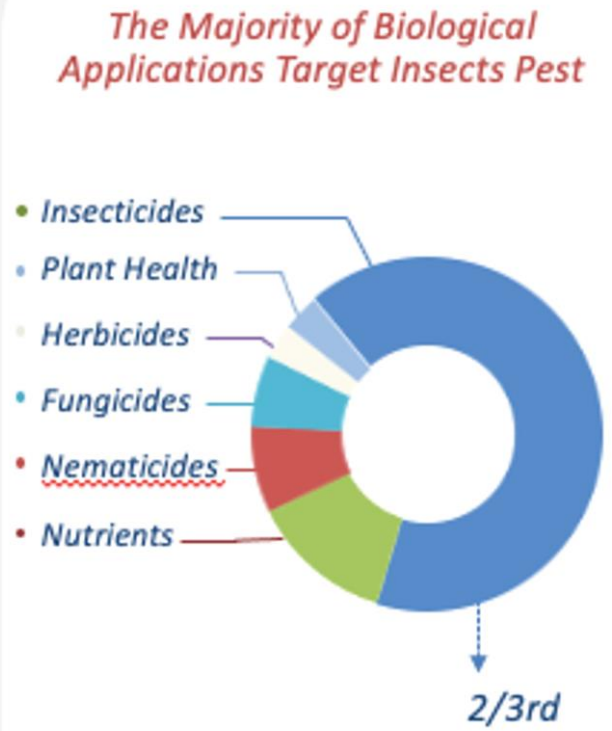
Benefits

- Reduce crop residue levels to enhance food safety and soil health
- Specific to target organisms and minimize off-target risks
- Introduce diverse modes of action to control pests when integrated with conventional pesticides
- Increasing advances in R&D has strengthened the efficacy of biopesticides

Growing use of biologicals

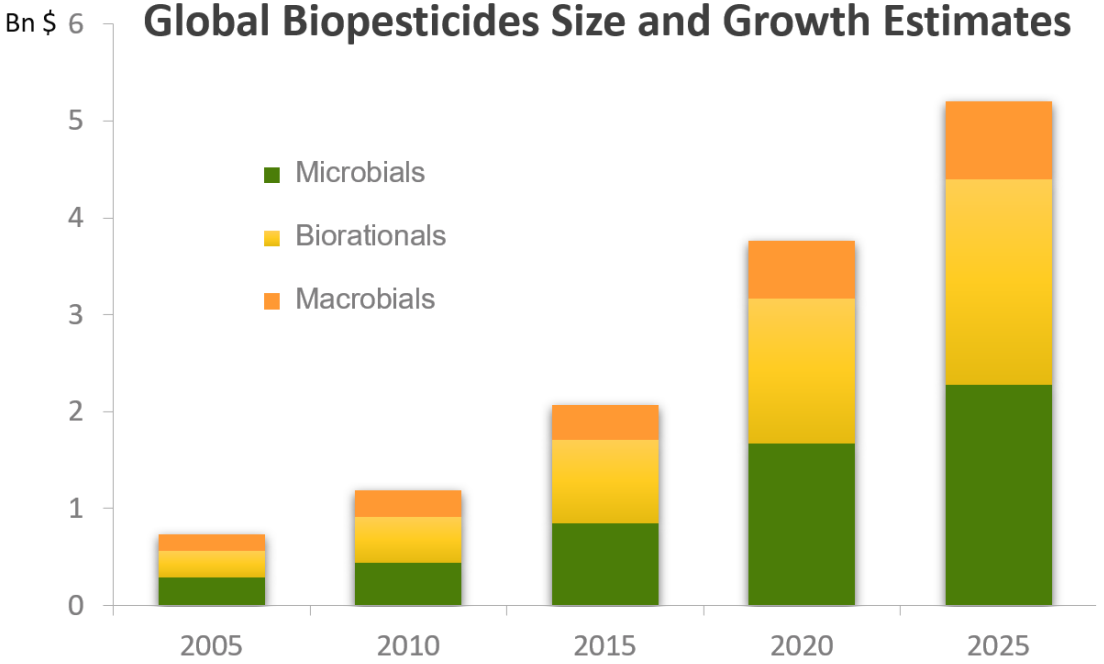
Global Ag Biologicals Industry Primarily Focused on Targeting Insect Pest and Disease Control





Source: Marrone Bio Innovations (MBI)

Global Biopesticides Size and Growth Estimates



Source: Frost & Sullivan, Nov. 2009; BCC Research Survey 2010; CPL Business Consultants 2010

- **Average Market Growth (2005-2025): > 10 % Biologics, Chemicals < 3% CAGR**
- **Biologics Market (2010-2020): 1.2 – 3.7 bn. US$**

Source: Marrone Bio Innovations (MBI)

Integrated Pest Management (IPM)

The demand is driven by farmers' demand for a more diverse toolbox that include biological and synthetic pesticides to deal with pest threats.

IPM "**combines** biological, chemical, physical and crop specific (cultural) management strategies and practices to maximize crop yield resilience and minimize risks posed by pesticides to human health and the environment."

Benefits of IPM

- Increase pest control effectiveness
- Reduce risk to human health and environment
- Delay pest resistance
- Increase cost-effectiveness

Challenges for biologicals adoption in ASEAN

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Regulation

Regulations that encourage market access and ensure effective use

Field adoption

Awareness and incentive for sustainable use

Continued innovation

Improvements on efficacy and practical use, and integrated use

Regulatory challenges

- **Regulatory Frameworks Based on Chemical Pesticides**: Many regulatory agencies assess biopesticides using criteria designed for chemical pesticides, such as the 70% efficacy threshold, which may not be appropriate for biocontrol products aimed at IPM
- **Lengthy Registration Process**: Registering biopesticides often requires extensive data on efficacy and safety, which can be time-consuming and expensive.
- **Limited Capacity**: Many regulatory bodies lack technical knowledge to evaluate the diverse range of biopesticides, including microbial pesticides, plant extracts, and semiochemicals.
- **Lack of Harmonized Testing Protocols and Assessment methodologies**: Each ASEAN Member State has different requirements for efficacy and safety assessment, leading to duplicative efforts, increased costs, and delays in product registration.

CropLife's efforts

- Regulatory capacity-building
- ASEAN biopesticides regulatory harmonization

Inaugural biological regulatory capacity-building workshop in Vietnam (2023)

Field adoption challenges

Awareness and knowledge

- Lack of knowledge to apply biopesticides particularly in an IPM – where there is no one size fits all approach

Farmer incentive

- The lack of seeing tangible benefits lead to the lack of incentives for adoption.
- Farmers are resistant to change due to the perceived lower efficacy of biopesticides

CropLife's efforts

- Training on IPM
- Training of extension workers to enhance farmer outreach
- Engaging exporter groups
- Data generation (e.g. resistance monitoring to develop IPM)

Developing Sustainable Rice Platform (SRP) as a national and commercial standard to enhance adoption

Continued innovation

Product innovation

- Improving efficacy
- Improving affordability and practical use (shelf life, storage conditions, large-scale production/ application)
- Localized trials and solutions

Innovative practices

- IPM
- Complementary technologies

No one size fits all solution

Based on data from Africa, FAW was estimated to cause annual maize **production losses of 21%-53%** in the absence of pest management (value at risk of over **$13.3 billion).**

Option	Effectiveness	Status in Africa
Synthetic Pesticides: Numerous pesticides including WHO Class lll (slightly hazardous) and U (unlikely to present acute hazard).	Effective but risk of resistance development if no rotation	Widespread use but **farmers need to be trained** on responsible and effective use
Virus-based biopesticide: A commercial product is available in Brazil, and recently US	Effective and does not affect non-target organisms but **slow-acting**	Not clear if virus is already present in Africa
Botanicals: Neem (Azadirachta indica), seed cake and leaf extracts etc.	Not clear if used commercially, **time consuming** to prepare and long-term use require sustainable production of the botanicals	Farmers are trying locally available botanicals
Rearing and release of predators: Doru luteipes (earwig), Orius insidiosus (pirate bug)	Brazil has observed effectiveness	In Africa, mainly used in high value crops. **Cost might be prohibitive** for low value crops
Cultural Methods e.g. plant early, use early maturing varieties, intercropping, remove weeds	Unlikely to provide adequate control alone, but contribute to reducing populations and damage	Being recommended in several countries. Some positive observations.
Pheromones to mass-trap males or disrupt their mate-finding	Effective in trials, but **little evidence of successful commercial use**. More effective when used on large scale	Pheromone blend has been **optimised in Zambia**

Extracted from: "Executive summary: Fall Armyworm Status Impacts and control options in Africa: Preliminary Evidence Note", CABI, April 2017

Complementing technologies

The shift towards more preventive control of desert locusts to avoid emergency actions relying on chemical pesticides requires advanced monitoring capabilities.

FAO concluded:

"Going forward, ***biopesticides have an important role to play in strategies that monitor such risky weather events and start preventive treatment in the early stages of an outbreak.***

This would go a long way to avoiding the kinds of large-scale crises the Horn of Africa is experiencing today and safeguard the food security of millions of people."

The importance of public-private partnerships

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Governments

Farmers

Private sector/ Research


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Thank you