



Global outlook on the future of IPM (and pesticides)

Contents

- Member Countries another platform
- CABI and Plantwise one platform for insights
- Unintentional Acute Pesticide Poisoning in the Caribbean
- Barriers and facilitators to biopesticide uptake – Systematic Review
- Pesticide Risk Reduction consultation – initial findings

Our member countries



Afghanistan



Anguilla



Australia



Bahamas



Bangladesh



Barbados



Bermuda



Botswana



British Virgin Islands



Burundi



Canada



Chile



China



Colombia



Cote d'Ivoire



DPR Korea



Ethiopia



Gambia



Ghana



Grenada



Guyana



India



Jamaica



Kenya



Malawi



Malaysia



Mauritius



Montserrat



Myanmar



Nigeria



Pakistan



Papua New Guinea



Philippines



Rwanda



Sierra Leone



Solomon Islands



South Africa



Sri Lanka



St Helena*



Switzerland



Tanzania



The Netherlands



Trinidad & Tobago



Uganda



United Kingdom



Vietnam



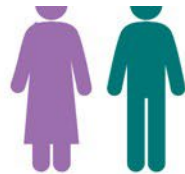
Zambia



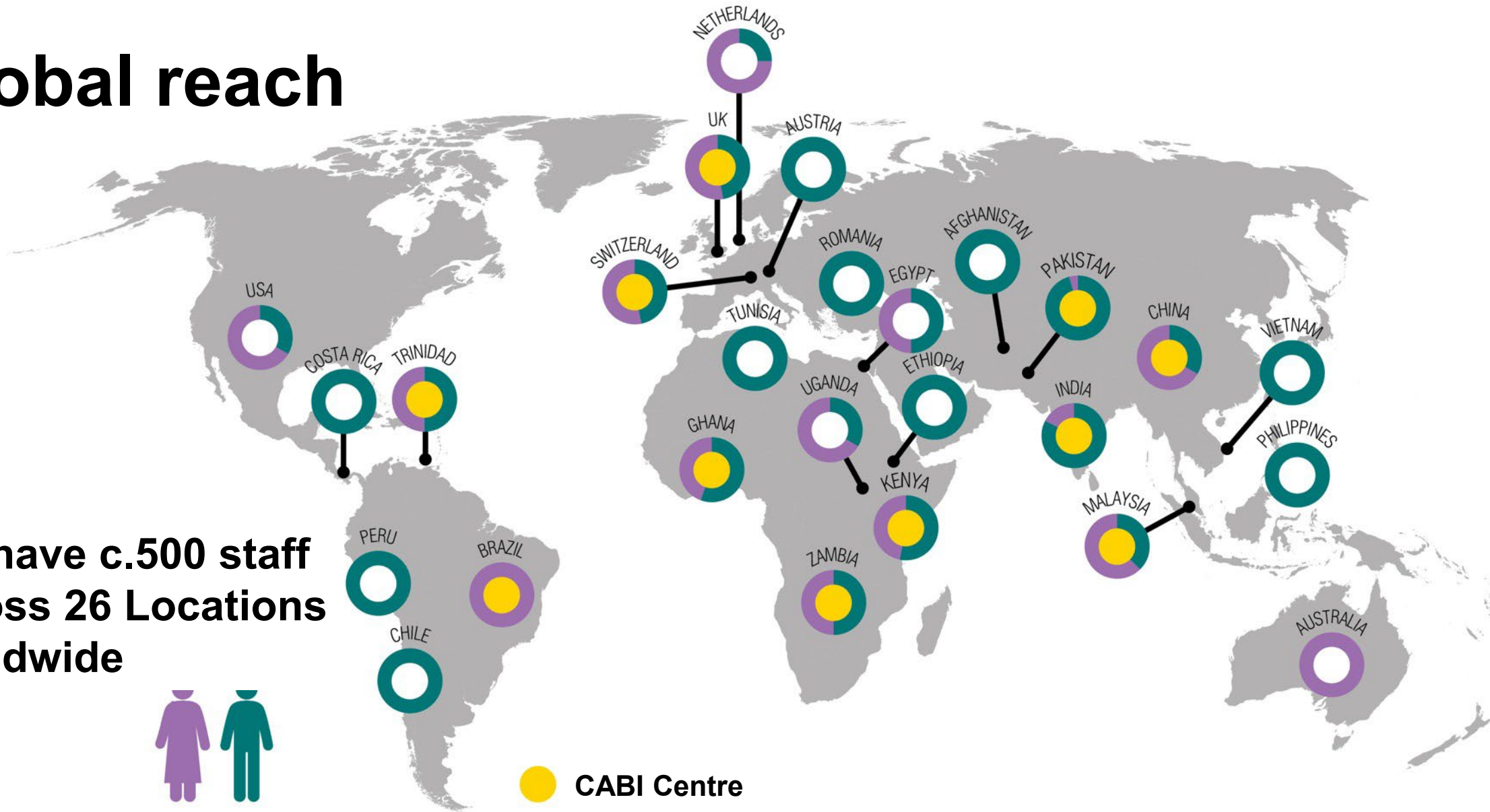
Zimbabwe

Global reach

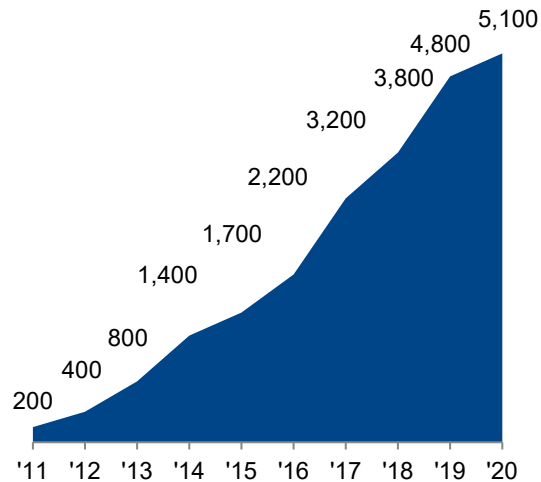
**We have c.500 staff
across 26 Locations
worldwide**



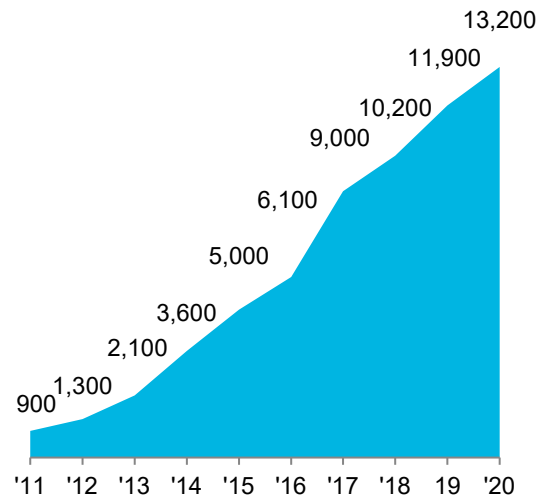
 **CABI Centre**



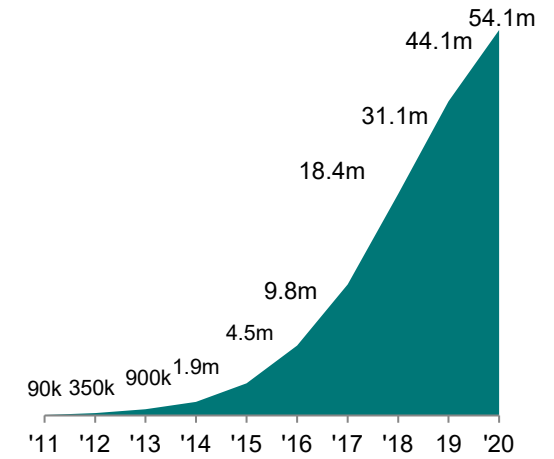
Plantwise – Ten Years of Impact



> 5,000
plant clinics established



> 13,000
plant doctors trained



> 54 million
farmers reached

Sustainable crop production with PlantwisePlus

PlantwisePlus aims to reach **75 million smallholder farmers** in low and lower-middle-income countries, providing them with access to the knowledge and skills they need to improve their production practices.

This will be achieved by supporting countries to **predict, prevent, and prepare** for plant health threats in the face of a changing climate.

This ensures that smallholder farmers reduce their crop losses and **produce** more and safer food through sustainable crop production practices.



Impact pathways



Pest preparedness

Coordinating and strengthening systems for detection and response to pest outbreaks



Pesticide risk reduction

Increasing awareness of, access to, and use of affordable integrated pest management solutions



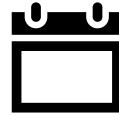
Farmer advisory

Enhancing knowledge and uptake of integrated pest management practices through responsive digital advisory tools

PlantwisePlus countries, 2025



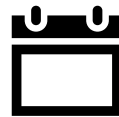
Regional Consultation Meetings 2025



Asia-Pacific

February 2025

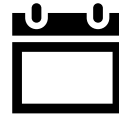
Kuala Lumpur, Malaysia



Europe

May 2025

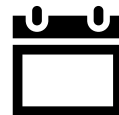
The Hague, Netherlands



Africa

June 2025

Nairobi, Kenya



Americas and Caribbean

September 2025

Port of Spain, Trinidad & Tobago

**Thanks to all
involved for
participation
and support**

Farmers in Trinidad



Trinidad vegetable farmers and UAPP

(presentation by Prof Duraisamy Saravanakumar)

Survey data from 208 farmers

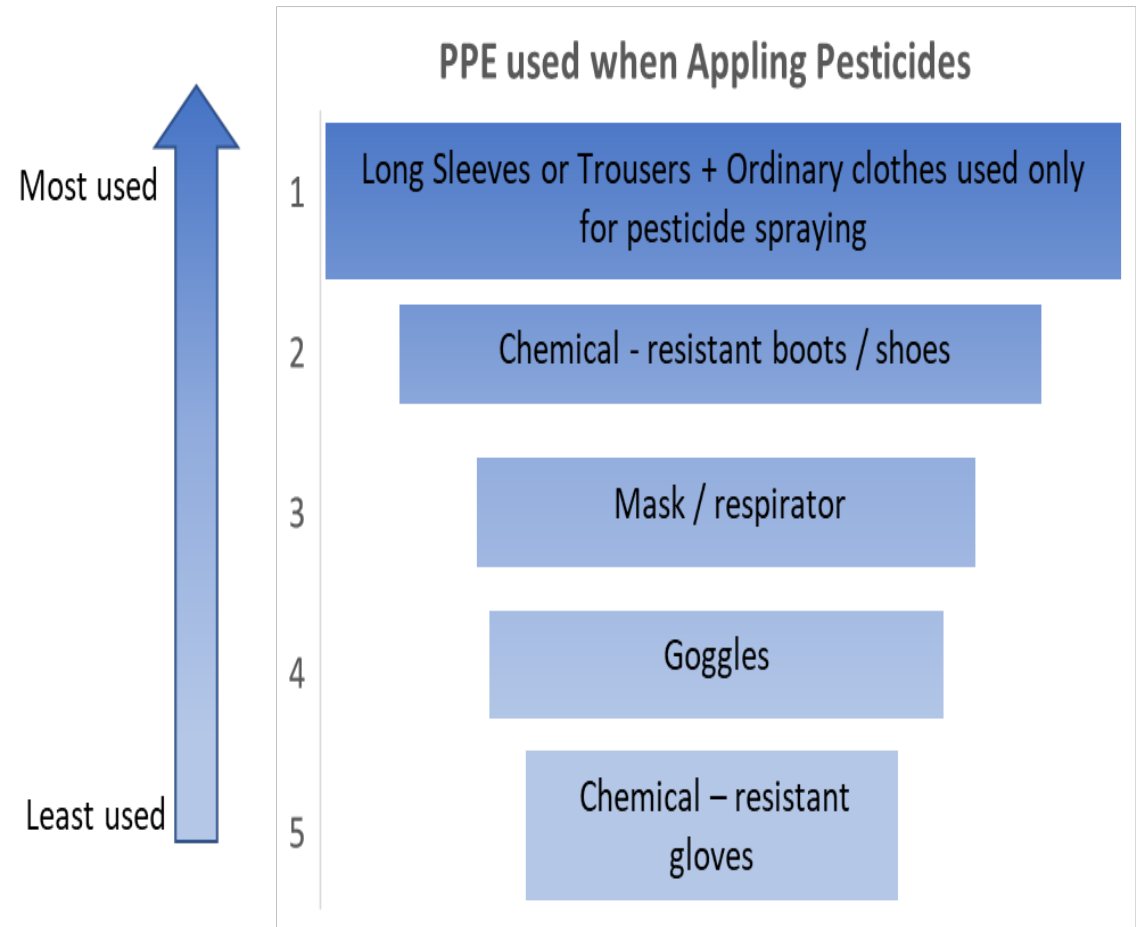
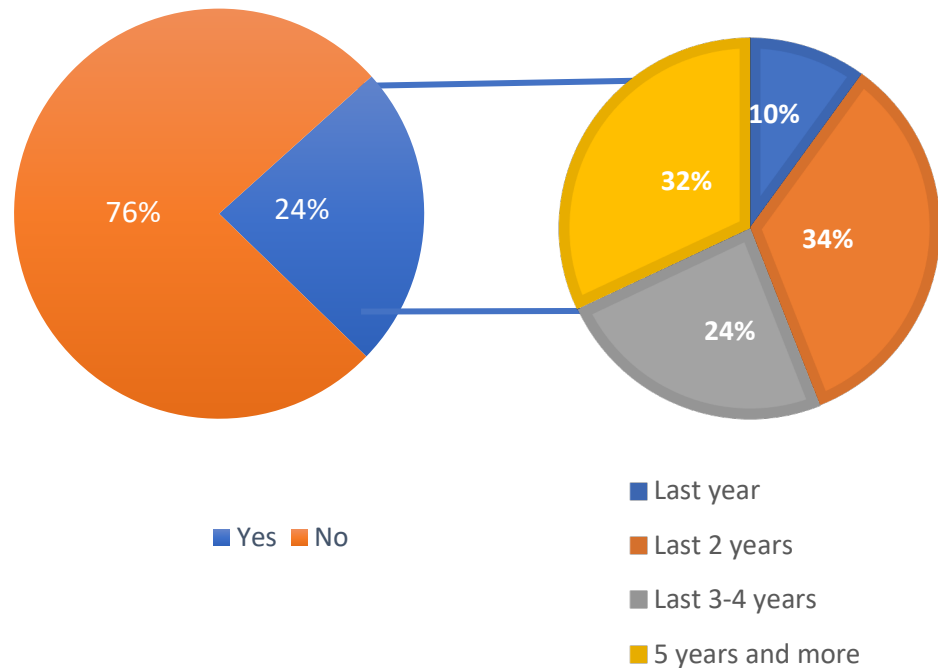
91% had less than 5ha

65% were older than 40

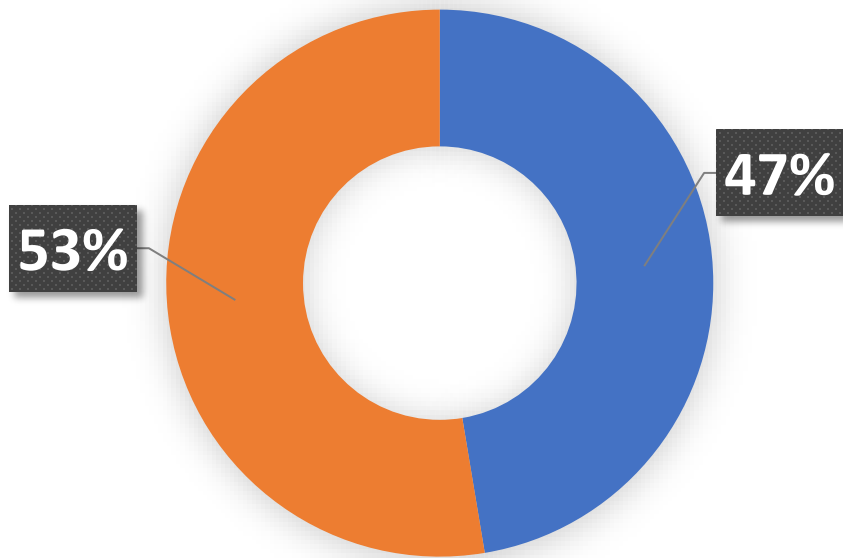
83% male

Robinson, Dwight E., et al. "Assessment of unintentional acute pesticide poisoning among smallholder vegetable farmers in Trinidad and Jamaica." *Frontiers in Public Health* 12 (2024): 1470276.

Farmers PPE training and type of PPE used

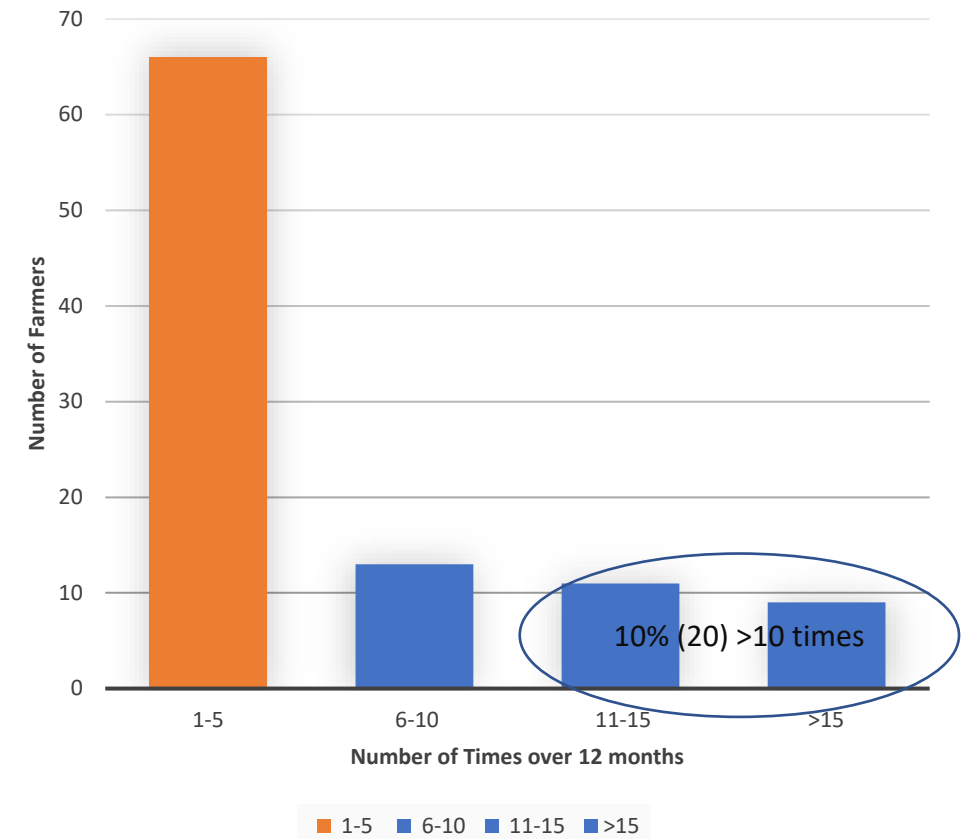


Farmers felt unwell over past 12 months within 24 hrs after application



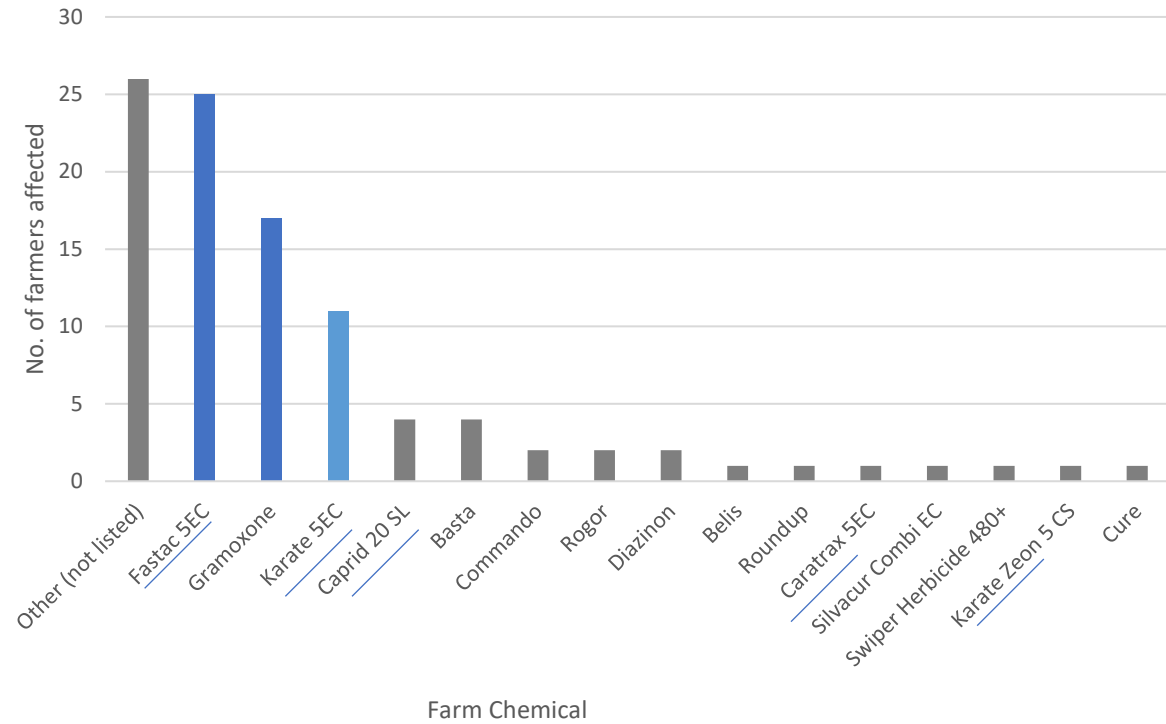
■ Yes ■ No

Times have Farmer felt unwell within 24 hours of using pesticides over 12 months (N=99)

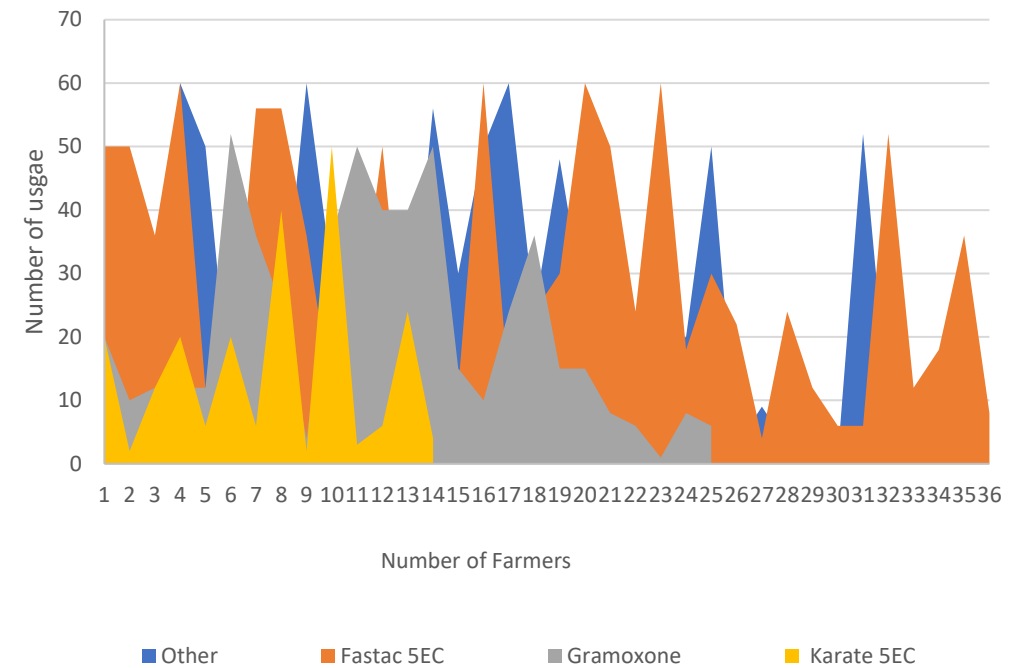


Pesticides reported with health impact

Pesticides used in the last 12 months which affected health

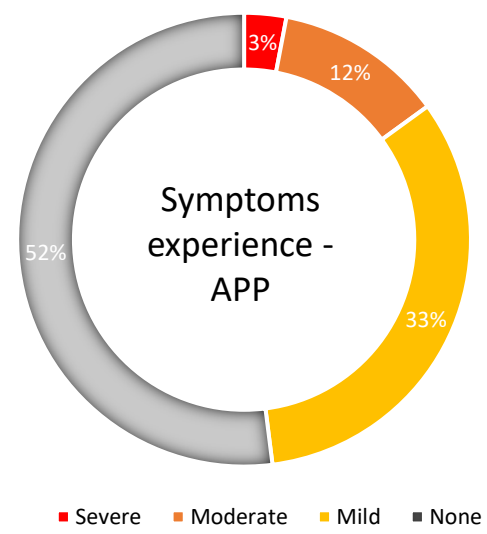
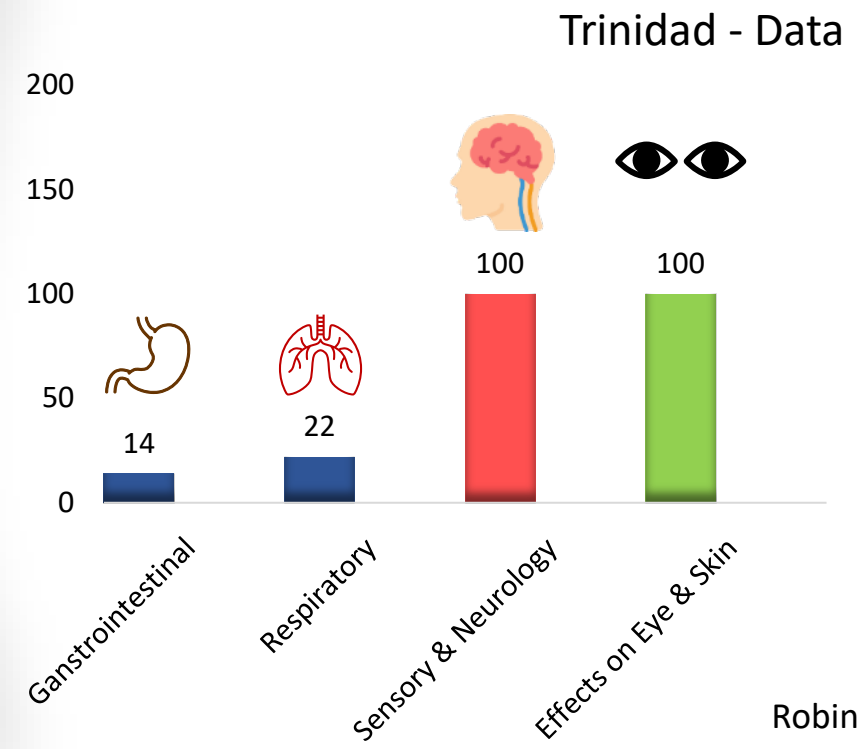
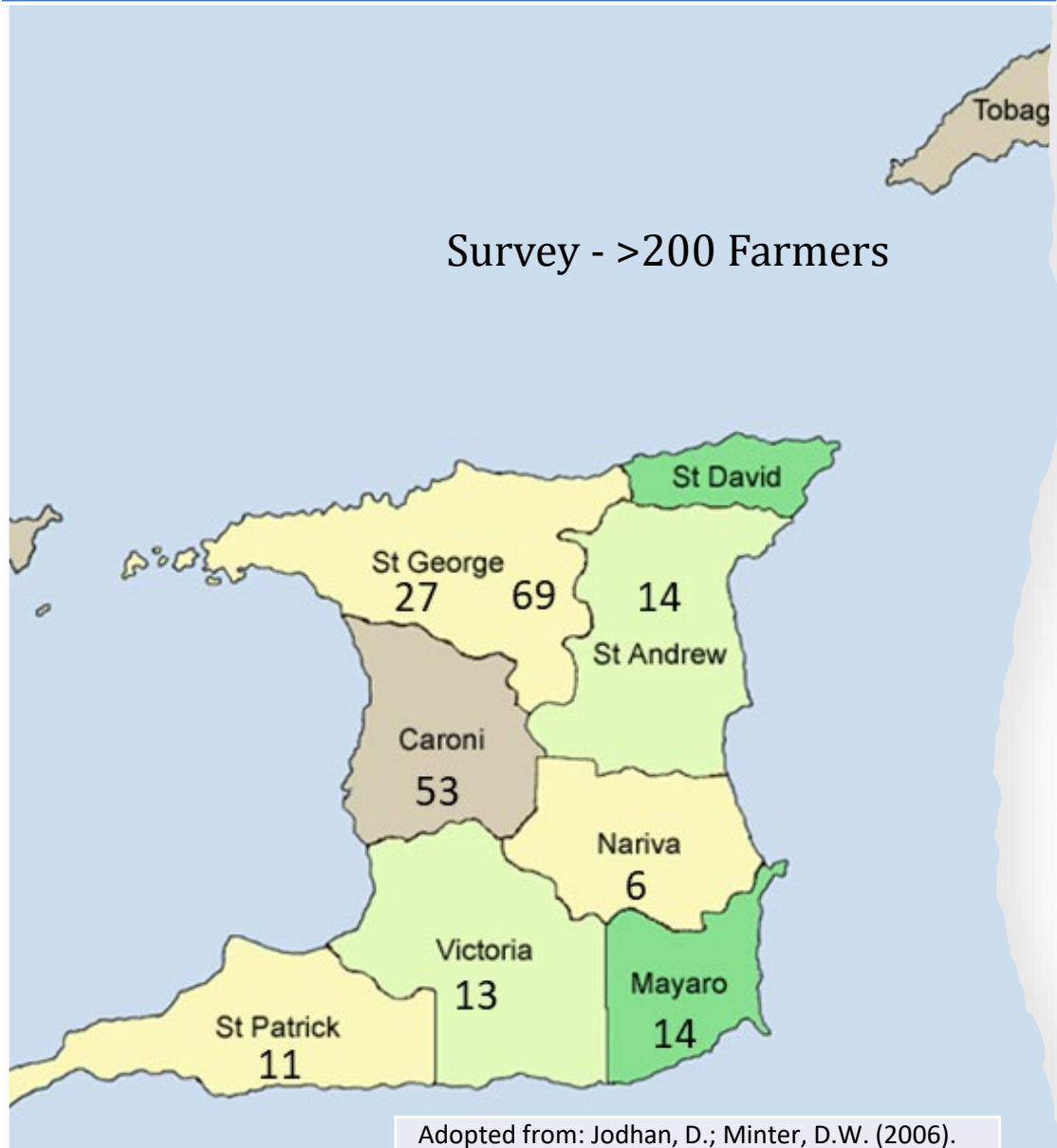


Times of application over 12 months time



*Supertak (Alpha Cypermethrin), Agrinet (Methomyl), Ethrine-Plus (Ethion & Cypermethrin)

Symptoms associated with HHPs

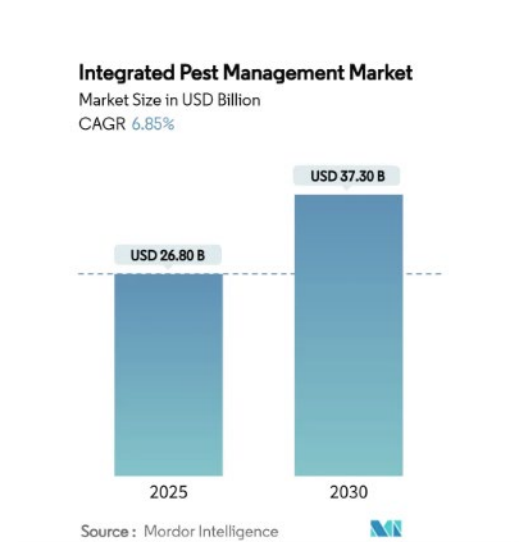
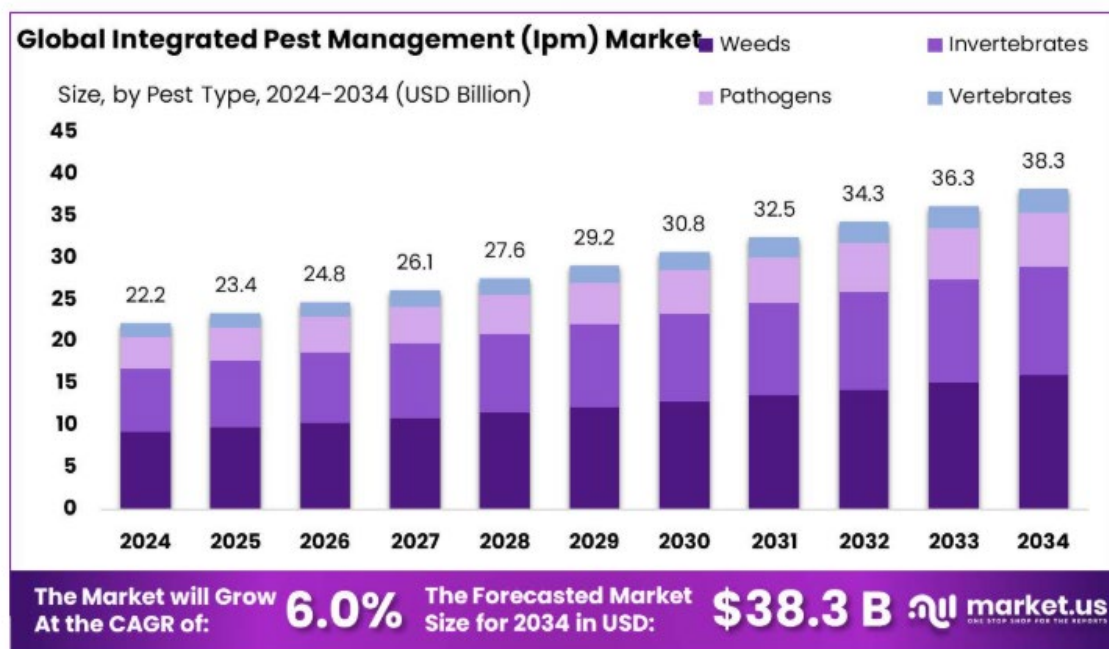


Reports of pesticide incidents in Trinidad from the surveying of 208 participants



This report assisted the regulatory authorities to make decision to **DE-REGISTER** some of the HHPs!!!

Global IPM market is growing fast



Market Overview

Study Period	2020 - 2030
Market Size (2025)	USD 26.80 Billion
Market Size (2030)	USD 37.30 Billion
Growth Rate (2025 - 2030)	6.85% CAGR
Fastest Growing Market	Asia Pacific
Largest Market	North America
Market Concentration	Medium

Major Players

*Disclaimer: Major Players sorted in no particular order

Biologicals share growing by 8-11% and expected to double in less than 10 years (DataIntelto)





Global Barriers and Facilitators to the Uptake of Biopesticides

Joint CABI and FAO evidence synthesis

Robert Malek, Kris Wyckhuys, Neal Haddaway, Dirk Babendreier, Melanie Bateman, Lukas Wyrwal,
Qingpo Yang, Ivy Saunyama, Sini Savilaakso, Gu Baogen, Ulrich Kuhlmann

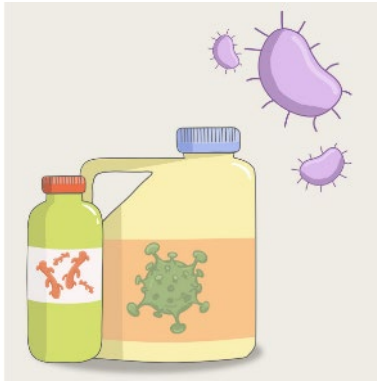
WIP



Evidence synthesis overview

- **Research questions:**
 - What research exists on **barriers** and **facilitators** to biopesticide uptake?
 - What are the **barriers** and **facilitators** to biopesticide uptake and where do they occur along the stages of the uptake pipeline?
 - How do they vary by biopesticide type (e.g. microbial, macrobial), literature type and geography?
- **Timeframe:** 2016 – present; in line with the publication of the FAO guidelines for the registration of microbial, botanical and semiochemical pest control agents ([FAO and WHO 2017](#))

Types of biopesticides included in our study:



**Microbials
and their
extracts**



**Macrobials
(augmentative
biocontrol)**

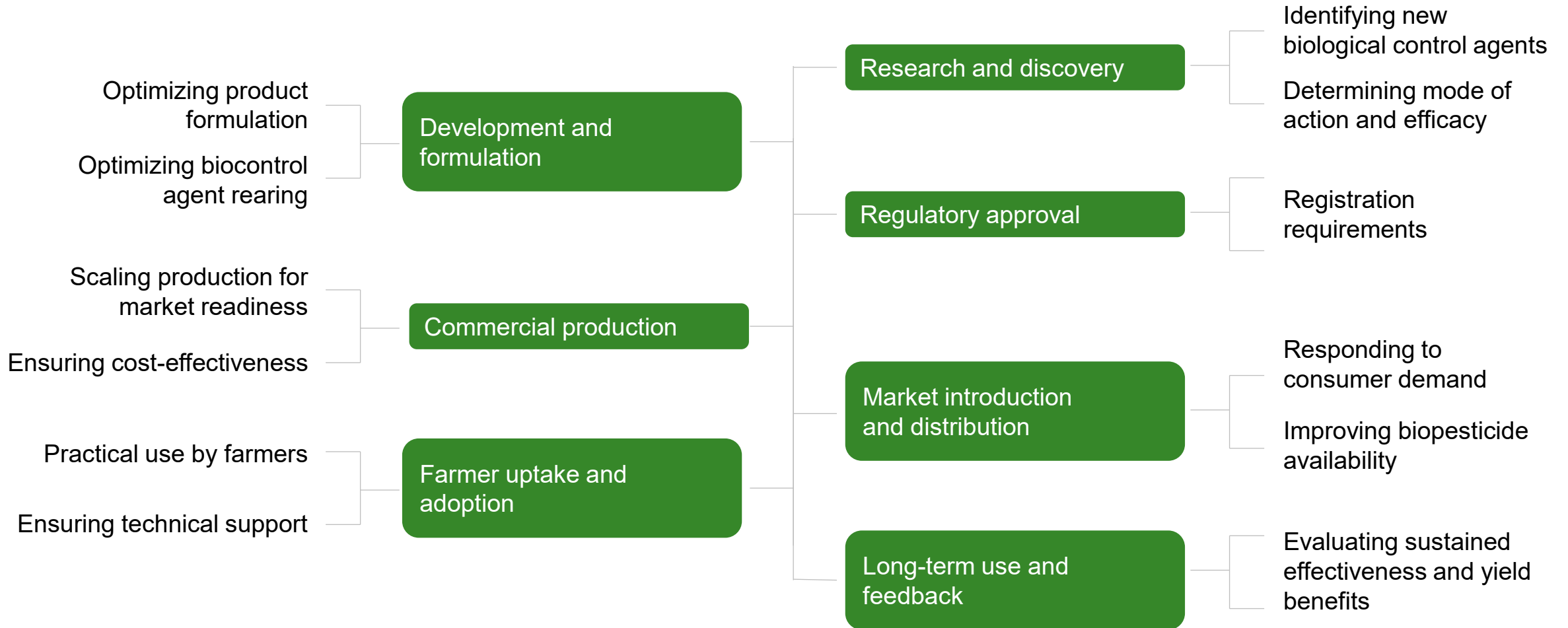


Semiochemicals



**Botanicals and
other natural
substances**

Biopesticide production and uptake pipeline

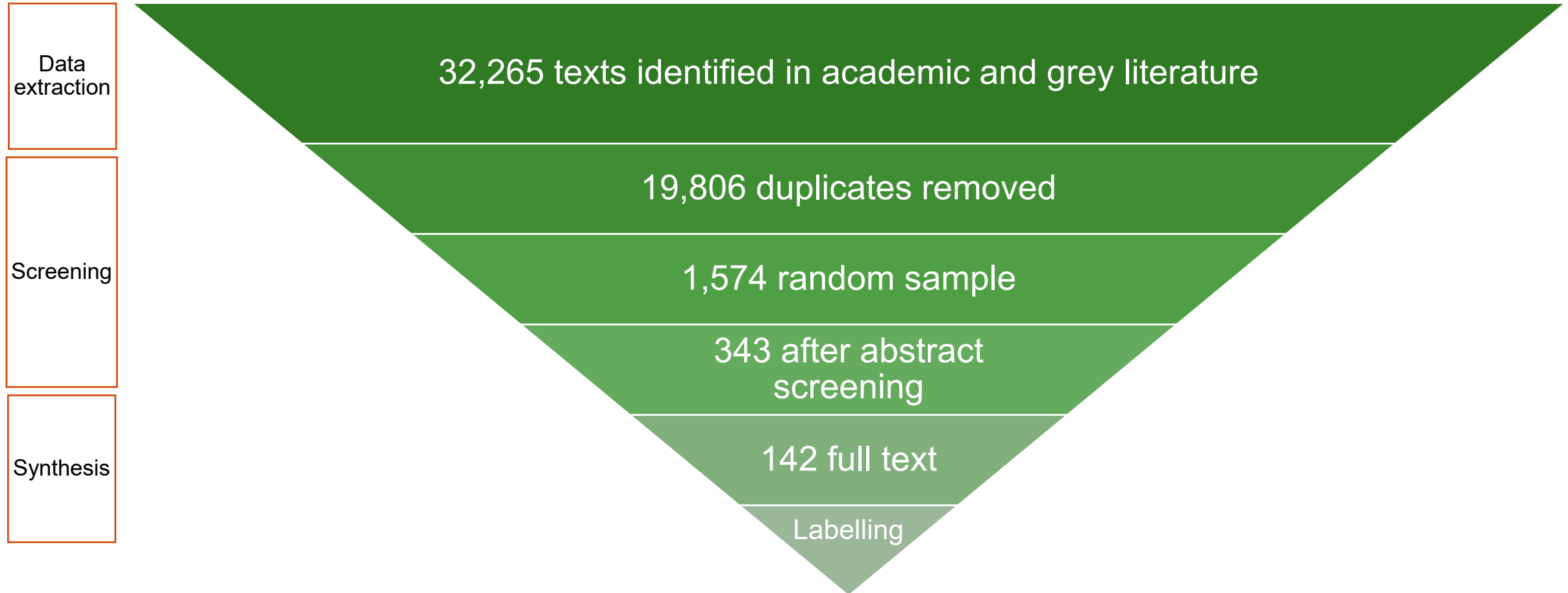




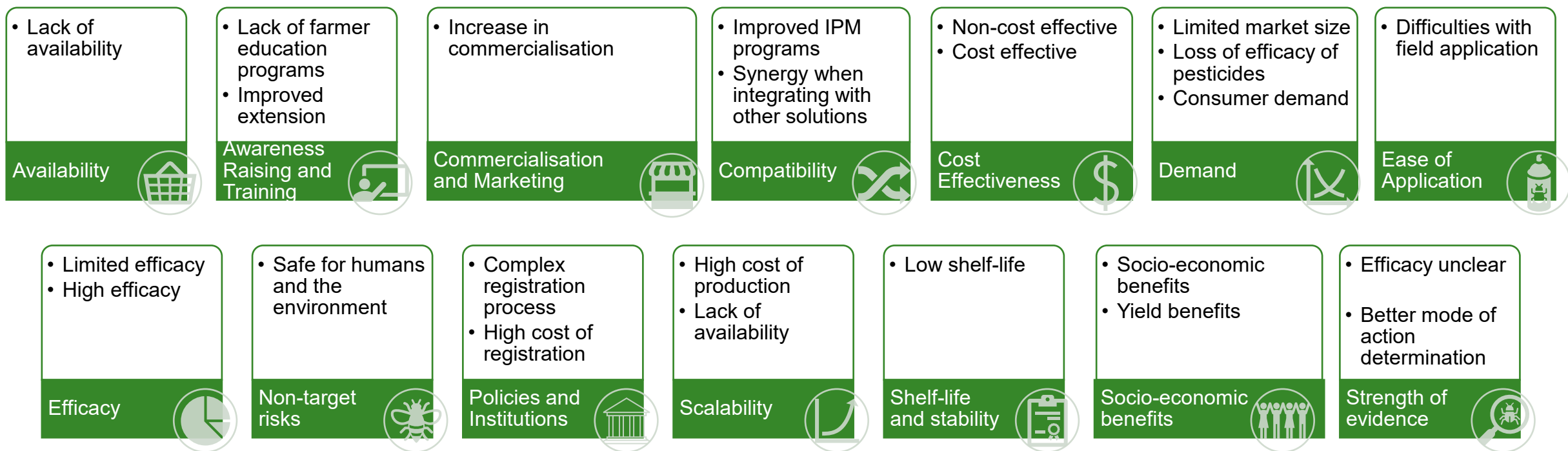
Approach: Data extraction

- Define search string (biopesticides, barriers, facilitators, timeline etc.)
- Search **academic databases** (e.g. CAB Abstracts, Scopus, Web of Science) and **grey literature websites** (FAO, CABI, IBMA, UNEP, ICGEB, OECD, APAARI, STDF)
- English language publications

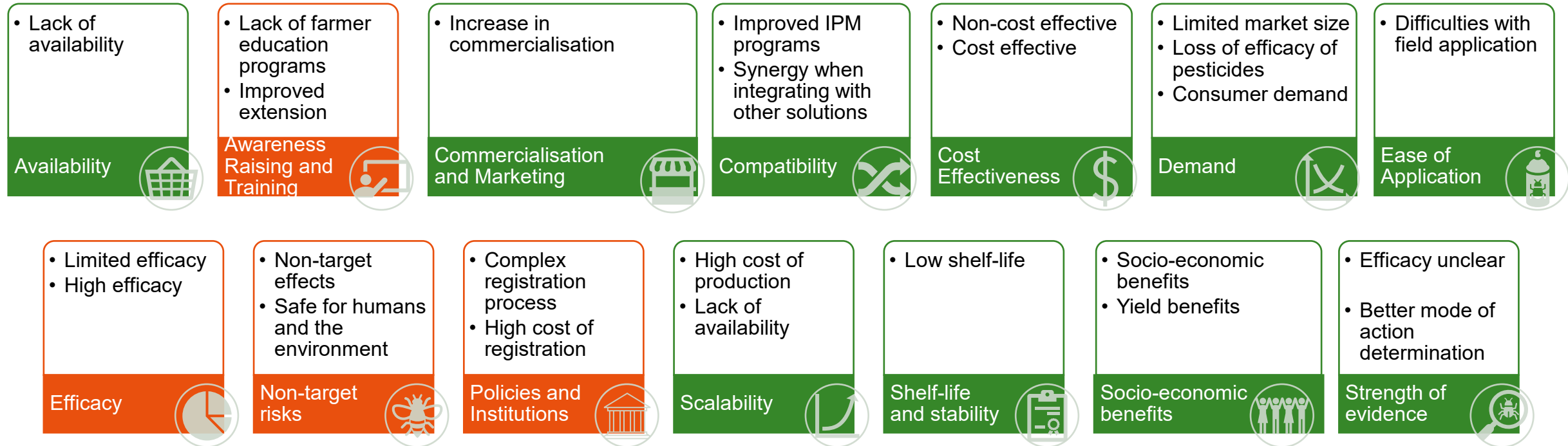
Screening



Results: Thematic classification



Results: Thematic classification



Prominent barriers and facilitators

- Lack of farmer education programs (26%)
- Lack of technical support (10%)
- Improved training and extension (24%)
- Improved farmer education programs (13%)

Awareness
Raising and
Training



- Limited efficacy (22%)
- High efficacy (39%)

Efficacy



- Non-target effects (6%)
- Safe for humans and the environment (91%)

Non-target risks



- Complex registration process (15%)
- High cost of registration (9%)
- Lack of regulatory guidelines (7%)
- Policy support and incentives (18%)

Policies and
Institutions



Take home messages

- The interplay of **barriers** and **facilitators**, shapes the biopesticide landscape and forms a **dynamic system** rather than a set of isolated challenges and opportunities
- The most prominent **facilitator** referred to biopesticides' “**Safety for humans and the environment**”. Capitalizing on that through “**Policies and institutions**” may tip the scales of adoption
- This **evidence map** allows stakeholders to prioritize certain key barriers depending on the **geographical** and **institutional** perspective



Consulting and building partnerships

- 1.5 days of each regional consultation dedicated to **Pesticide Risk Reduction**
- These sessions created **significant engagement**
- **64 experts** in pesticide risk reduction, from **31 countries**
- Aims were to understand key issues from a country level, regional and global perspective
- We are using this feedback to build a **robust, useful and measurable offering** to assist countries in reducing pesticide risk



The 64 Pesticide Risk Reduction experts included representatives from

17 Global organisations

10 Regional bodies

7 University researchers

6 Regulatory authorities

6 Government research organisations

4 Private sector organisations

Plus, expert representatives from the ministries of agriculture, extension, farmers associations, funding agencies, government bodies and industry boards



THE UNIVERSITY
of EDINBURGH



Pesticides Control Authority





PRR – Immediate feedback from the regional consultations



Support the development and implementation of policies and regulations: **Issues**

Highly Hazardous Pesticides – definition, evidence of harm

Government priorities – plant health is often low in priority

Regulatory issues:

- Lack of dedicated pathway for lower risk product approval
- Regional harmonisation – Maximum Residue Levels, biopesticide regulation
- Multiple ministries
- Long approval times
- Lack of resource / trained personnel

Enforcement, compliance and understanding of new regulations associated with biopesticides



Support the development and implementation of policies and regulations:

Action Areas

- Highly Hazardous Pesticides
- Separate biopesticide regulations
- Regional harmonisation of regulations
- Increasing drive to implement low risk Integrated Pest Management based approaches
- International frameworks, conventions, national strategies
- Progress differs country to country
- Facilitate trade and adherence to international standards
- Multi-stakeholder representation



Collaborate on research and development of innovative IPM solutions: **Issues**

- Limited financial and technical resources
- Impacts of Highly Hazardous Pesticides
- Consistency of performance and efficacy of bioprotection products
- Limited evidence of efficacy and profitability for lower risk products
- Data supporting product efficacy
- Bioprotection is not a silver bullet
- Holistic approaches required
- Indigenous approaches to be considered



Collaborate on research and development of innovative IPM solutions: Action areas

- Evidence to waive requirements in chemical regulatory pathways
- Evidence for policy
- Early warning and early intervention
- Public – private partnerships, multi stakeholder collaborations
- Address technology gaps through research
- Develop more lower risk plant protection products
- Demonstrate efficacy, economic benefit, biodiversity benefits
- Demonstrate integration with Integrated Pest Management approaches
- Communication and training is essential



Support value chain actors to transition to lower-risk production practices: Issues

- Significant pest/disease pressure
- Pesticide poisonings
- Personal Protective Equipment (PPE)
- Few economic incentives for farmers to reduce pesticide use
- Maximum Residue Levels for market access versus phytosanitary regulations
- Shrinking toolbox of active ingredients
- Lack of access to existing solutions for growers
- Changing behaviour of growers is challenging
- Local markets are not as incentivised to reduce hazardous pesticide use



Support value chain actors to transition to lower-risk production practices:

Action areas

- Trade, health, certification schemes and consumer demand are key
- Communicate evidence of success of lower risk approaches
- Context specific extension methods
- Work with local agro-dealers and extension workers
- Explore financial mechanisms to derisk transition in practices
- Improved pathway of communication between regulators and farmers



CABI's approach to pesticide risk reduction

CABI aligns with the FAO Guidance on Pest and Pesticide Management Policy Development (FAO, 2010), working across three steps:

- 1. Reducing reliance on pesticides.** Determine what levels of pesticide use are actually needed. Make optimum use of non-chemical pest management and eliminate unjustified pesticide use.
- 2. Selecting pesticides with the lowest risk.** If use of pesticides is deemed necessary, select products with the lowest risk to human health and the environment from the available registered products that are effective against the pest or disease.
- 3. Ensuring proper use of the selected products** for approved applications and in compliance with international standards.



CABI's approach to pesticide risk reduction

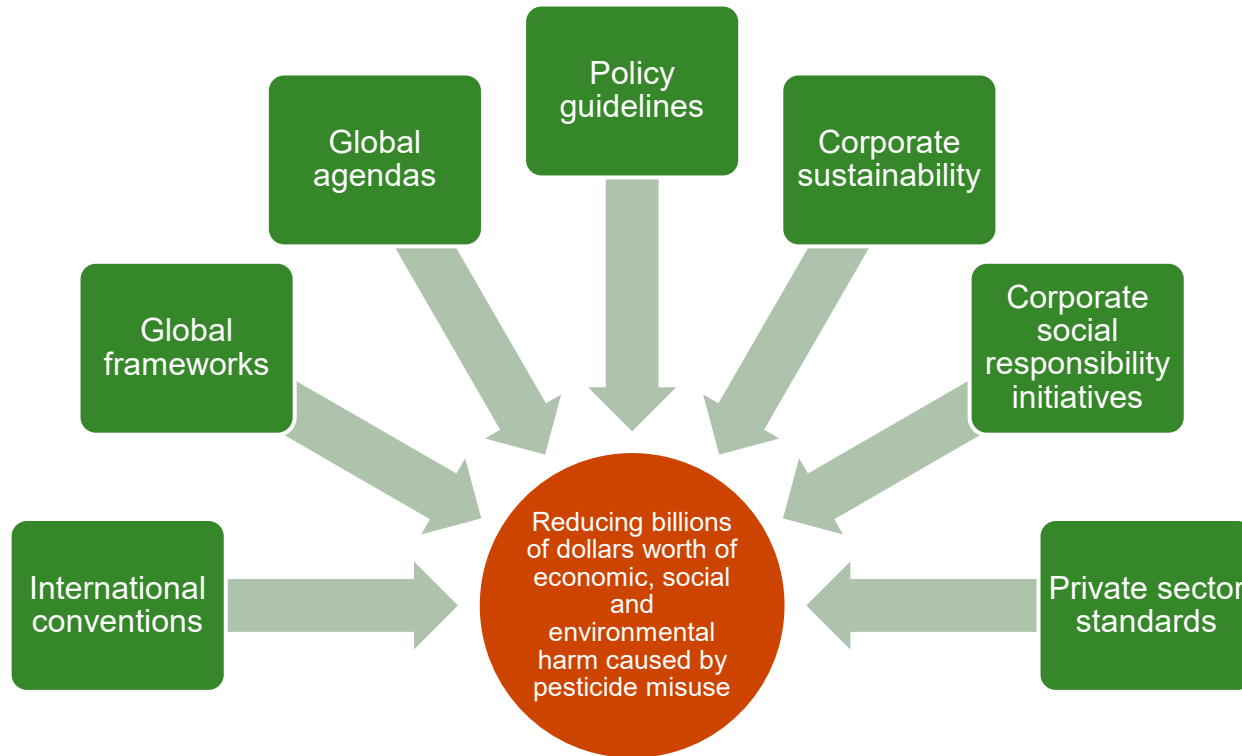
Through working with Member Countries and other stakeholders we will:

- Support the development and implementation of **policies and regulations**
- Collaborate on **research and development** of innovative IPM solutions
- **Support value chain actors** to transition to lower-risk production practices

By applying **Integrated Pest Management (IPM)** practices we will:

- Encompass **diverse, safer practices** to manage pests
- Encourage **judicious and carefully managed** use of appropriate chemicals
- **Reduce the risks** posed by hazardous chemical pesticides

Partnerships are essential

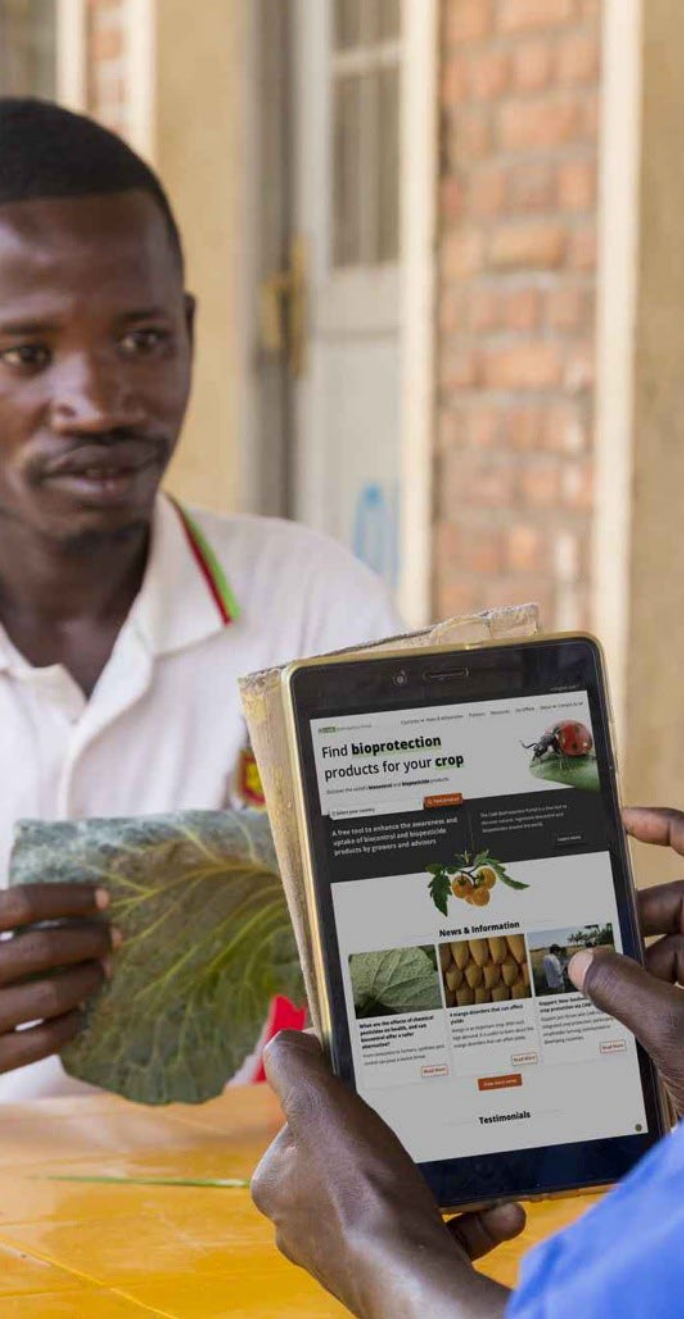


Multiple global initiatives include targets and goals to reduce the harm caused by pesticides; however, much work to do

100s of public and private sector organisations worldwide are working towards reducing the environmental and health risks associated with pesticides

Collaboration is key to meeting these international targets

We recognise that the barriers faced, and progress made around pesticide risk reduction vary substantially between countries; therefore, **collaboration between CABI and its Member Countries is vital**



The CABI BioProtection Portal

The world's largest open access tool for bioprotection – helping growers and advisors find biopesticide solutions and supporting more sustainable, regenerative agricultural practices.

Features:

- A search engine to look up authorised biological products by country, crop and/or pest
- A resources area with information on biological pest control, pest and crop guides, IPM guidance, success stories etc.

50
Countries



940+
Crops covered



4000+
Products



2200+
Pests covered



CABI BioProtection Portal Wins Gold Stevie Award: Sustainability Initiative of the Year in Europe

This recognition highlights **the Portal's impact as a global resource empowering farmers with safe, sustainable pest management solutions** and advancing agricultural transformation.

Winning this award affirms the Portal's leadership in **tackling global sustainability challenges** and strengthens its position as a **trusted partner in promoting bioprotection** and environmentally responsible farming.

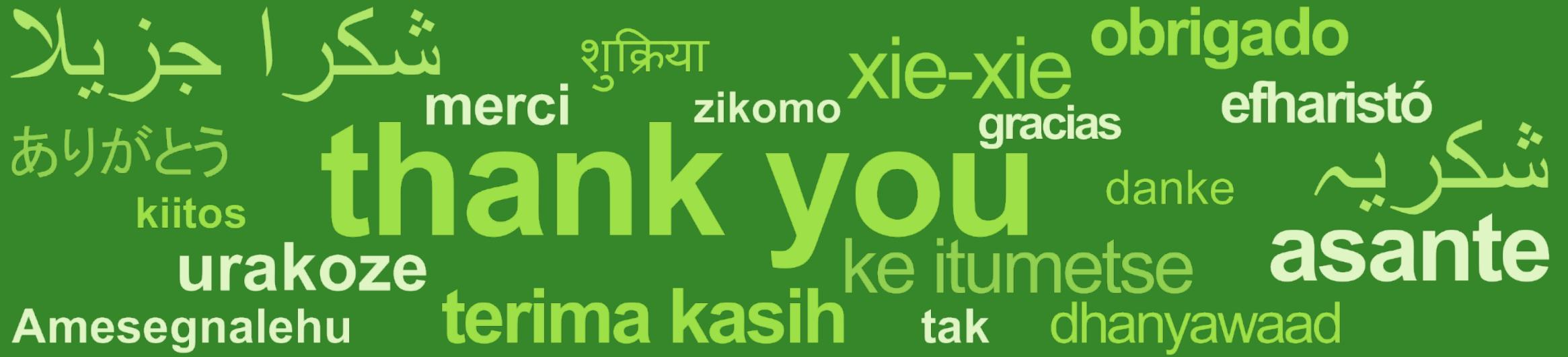
The **Stevie Awards** are among the world's premier business honours, recognising excellence and innovation across industries, with over 12,000 entries annually from more than 70 countries.



The future

- IPM-friendly policy increases
- Shift away from HHP globally
- Increased demand for sustainability evidence
- Ever increasing integration
- Growing importance of data
- Gene editing opening the door to new strategies?





CABI as an international intergovernmental not-for-profit organization, gratefully acknowledges the generous support received from our many donors, sponsors and partners. In particular we thank our Member Countries for their vital financial and strategic contributions.