SDC A+FS Network

# Science for Food

A series of light & informal events on science in food systems

# WELCOME !

04.03.2026

# What's on the menu ?

1. Opening address
2. **Pesticide Risk Reduction in the CABI PlantwisePlus programme** – Wade Jenner, Centre Director of CABI Switzerland
3. Break-out – informal meeting
4. News & events
5. **Biological control of the Fall Army Worm for enhanced food security in Africa** – Ted Turlings, Professor emeritus at the University of Neuchatel

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# Pesticide Risk Reduction in the CABI PlantwisePlus programme

**Wade Jenner**, Centre Director
CABI Switzerland

# Pesticide risk reduction in the CABI PlantwisePlus Programme

"Science on our plate" webinar

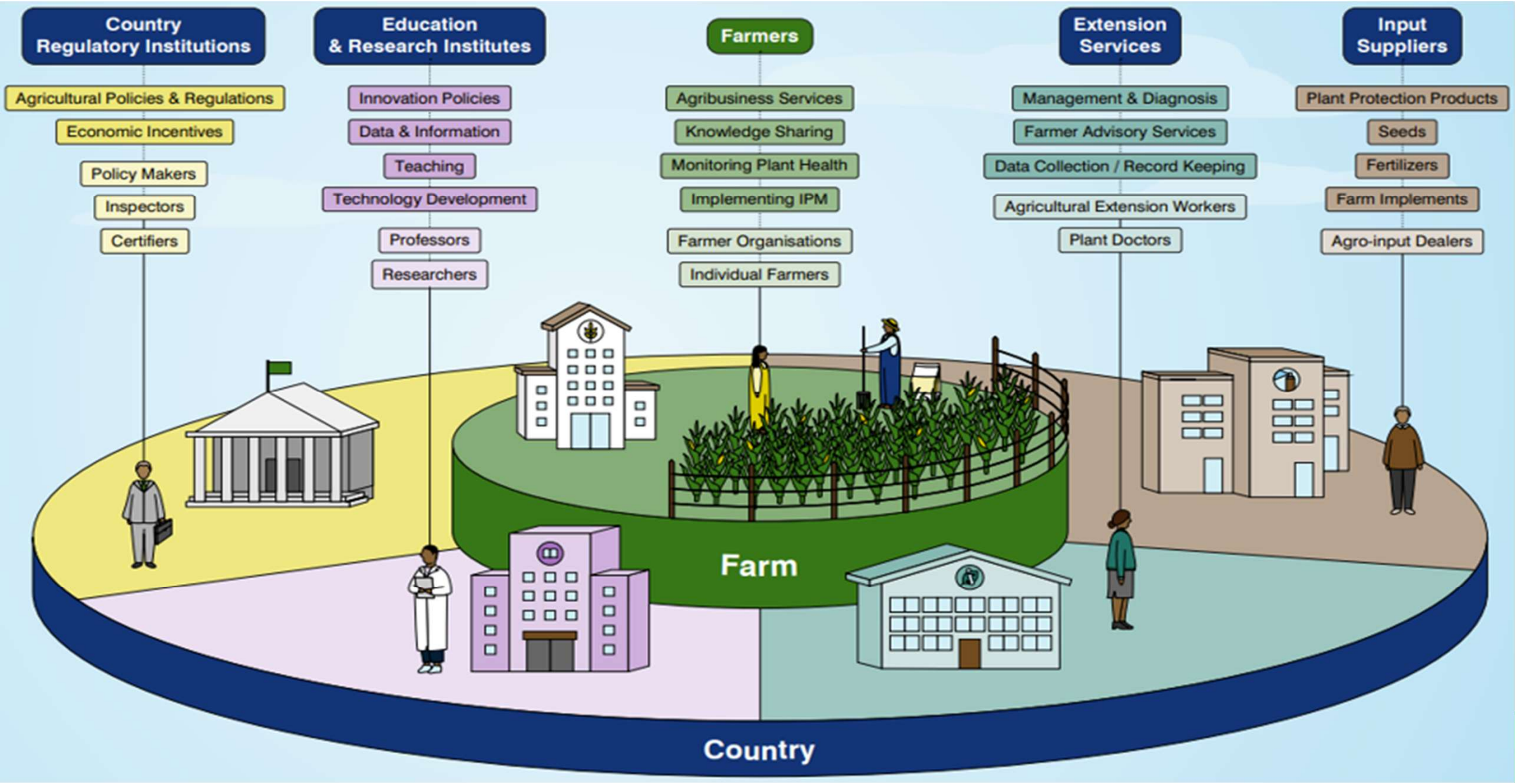
Dr Wade Jenner
Centre Director, CABI Switzerland

4th March 2026

KNOWLEDGE FOR LIFE

CABI

# What is a plant health system?




# Integrated pest management

An environmentally-sensitive approach to managing pests through careful decision-making:

**Prevention**

- Always the best medicine!

**Monitoring and action thresholds**

- Pest identification; Taking action only when needed

**Direct control**

- Preference given to "green" approaches before resorting to chemical pesticides

# Integrated pest management

An integrated approach using complementary tactics to improve plant protection and reduce dependence on pesticides:

**Cultural**

- Crop rotation, pest-resistant varieties, pest-free planting material

**Mechanical**

- Physical removal, trapping, covering

**Biological**

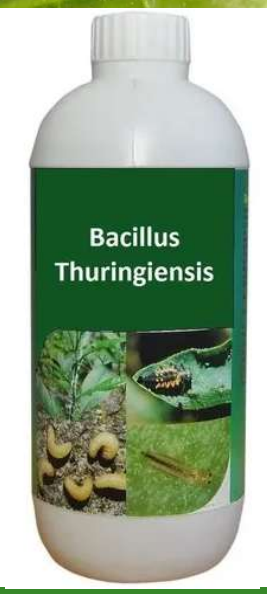
- Use of natural enemies and biological products

**Chemical**

- Application of synthetic products

# Chemical versus biological pest management

| Chemical pesticides | Biologicals |
|---|---|
| **Pros**<br>• Widely available and well-known<br>• Relatively cheap to use<br>• Fast-acting | **Pros**<br>• Safer for humans and the environment<br>• Little to no toxic residues<br>• Easily compatible with IPM approaches<br>• Sustainable<br>• Resistance development is slow |
| **Cons**<br>• Health risk for farmers/consumers<br>• Harmful to biodiversity and the environment<br>• Market access barriers<br>• Pesticide resistance | **Cons**<br>• Not yet widely available<br>• Poorly understood<br>• Often slower-acting<br>• Living biological products have stricter storage requirements |




# Biological Control

**Conservation biocontrol**

- Crop management practices that maintain/increase populations of existing biocontrol agents, e.g., through providing shelter and more nectar plants

**Augmentative biocontrol**

- The use of beneficial organisms (biopesticides and biocontrol products/agents) by farmers, often using commercially available species and requiring repeated application

**Classical biocontrol**

- The government-authorised introduction of a non-native natural enemy to control a non-native invasive pest. The biocontrol agent establishes and self-replicates, permanently regulating the pest.

# Augmentative biocontrol in PlantwisePlus

**Problem**

Tomatoes are commonly a heavily sprayed crop, partly driven by infestation by various insect pests.

**Solution**

Mass production of natural enemies (tiny parasitic wasps) by local partners as an alternative to insecticides.

- Three provincial governments in Pakistan are setting up production facilities to serve local farmers.
- Trained agricultural officers promote the biocontrol solution and uptake by farmers is strong, with preliminary reports indicating improved yields alongside reduced pesticide use.
- Two of the provinces are planning to replicate the model in additional districts.

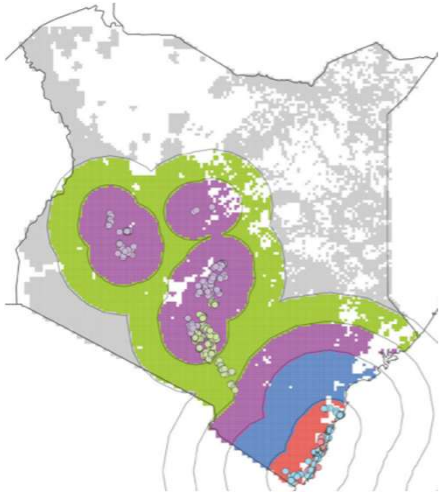
# Classical biocontrol in PlantwisePlus

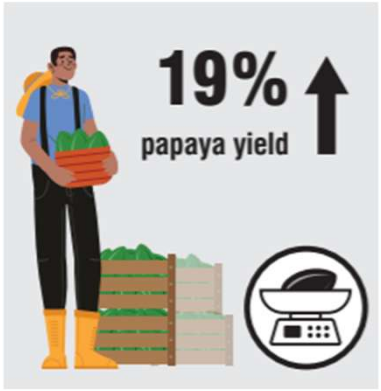
**Problem**

Papaya mealybug – Invasive pest causing devastating losses, primarily on papaya, in Kenya and beyond.

**Solution**

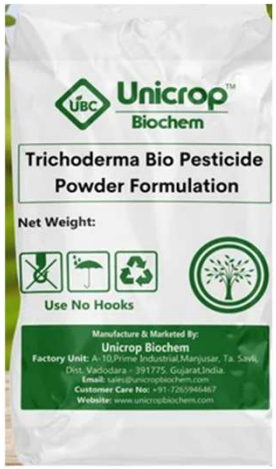
A co-evolved natural enemy (tiny parasitic wasp), released by CABI in partnership with national authorities (KALRO, KEPHIS).






# Bioprotection products

**Living organisms and nature-based compounds used to control pest populations**




**Macrobials**

- Invertebrates (e.g., insects, nematodes, mites)
- Parasitise and/or feed on pests

**Microbials**

- Microorganisms (e.g., bacteria, fungi, viruses)
- Kill pests or outcompete and prevent diseases

**Natural substances**

- Natural chemicals obtained from plants, animals, and microorganisms (e.g., azadirachtin, thyme oil)
- Have antimicrobial, insecticidal or pest repellent activity

**Semiochemicals**

- Message-bearing compounds (e.g., pheromones)
- Change and disrupt a pest's normal behaviour

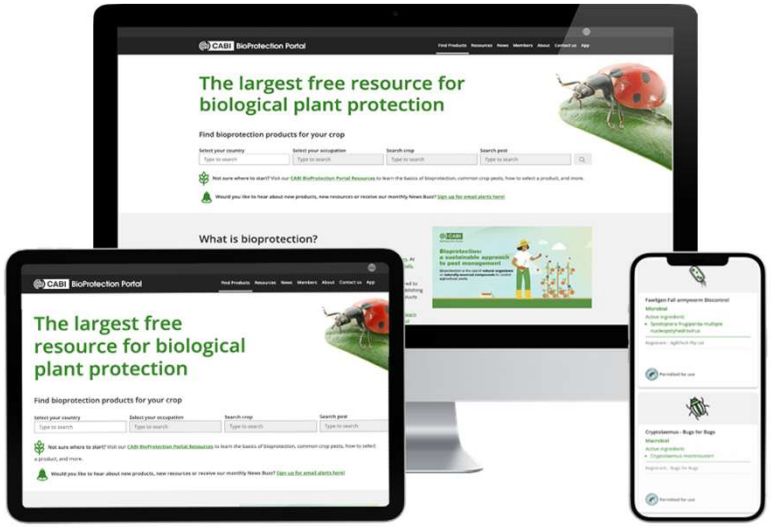
# The CABI BioProtection Portal

Database of registered biological controls and biopesticides, **searchable by crop and pest**

Helps users **identify, source, and apply** bioprotection products

**Educational area with information** on biological control and IPM via e-learning, blogs, resources, success stories and courses

**Open access, web-based, multi-lingual**




**7,000+**
**Products**

**9,000+**
**Pests**

**2,900+**
**Crops**

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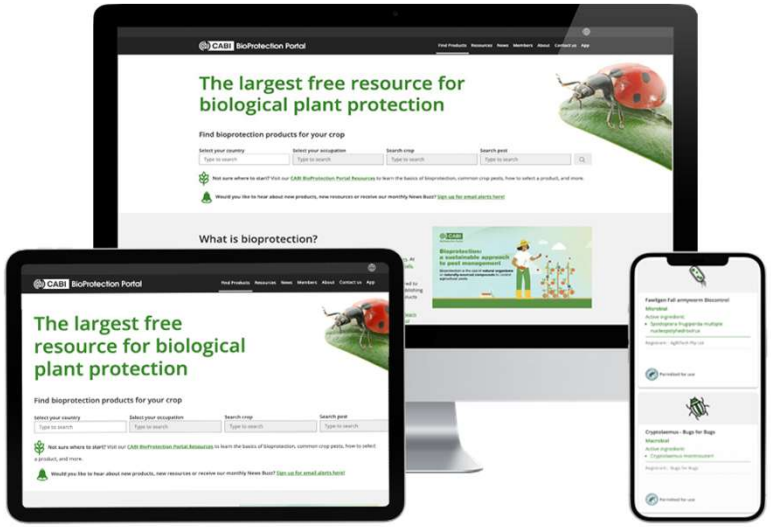



**>3.2 million**
Visits since 2020

**>248k**
Searches

**>347k**
Product views


CABI is an international intergovernmental organisation, and we gratefully acknowledge the core financial support from our member countries (and lead agencies) including:

UKaid from the British people

Ministry of Agriculture and Rural Affairs, People's Republic of China

Australian Government Australian Centre for International Agricultural Research

Agriculture and Agri-Food Canada

Ministry of Foreign Affairs of the Netherlands

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development and Cooperation SDC

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# WHAT'S NEW?

# Malawi Marks Agricultural First with Early-Maturing Vegetable Pigeonpea to Boost Food & Nutrition Security

Feb.2026

→ More information

ICRISAT
INTERNATIONAL CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID TROPICS

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# Impacts of large-scale food fortification on the cost of nutrient-adequate diets

Nov.2025

→ More information

# Gender and the adoption of biofortified crop varieties in LMICs

Jan.2026

→ More information

# IFPRI and Farm Radio International collaborate to give a voice to the most vulnerable farmers

Feb.2026

→ More information

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CGIAR

FARM RADIO INTERNATIONAL

1) Tiny Precision Agriculture

2) AI-Powered Advisory Tools

3) Mobile Insurance

# Three Smallholder Farm Innovations to watch out for in 2026

Feb.2026

→ More information

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# Biological control of the Fall Army Worm for enhanced food security in Africa

**Ted Turlings**, Professor emeritus
University of Neuchatel

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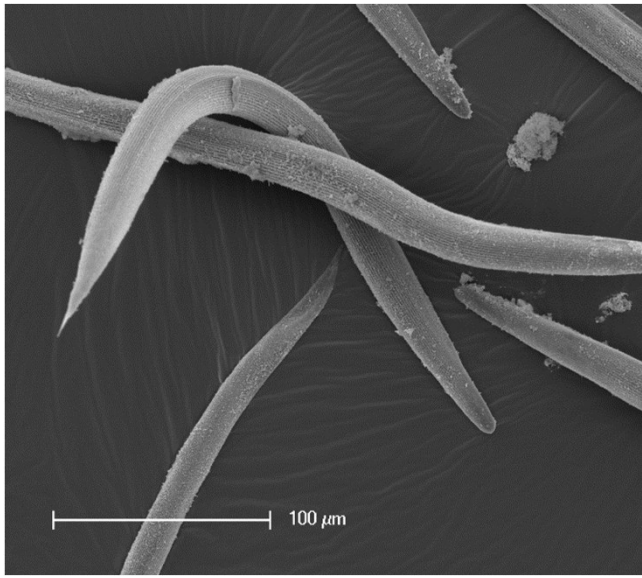
# Biological control of the fall armyworm with entomopathogenic nematodes for enhanced food security in Africa



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fall armyworm

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# The problem:

## The invasion of the fall armyworm *Spodoptera frugiperda* causes major crop losses in Africa and…

up to 50% yield losses
representing US$ 2-6 billions per year

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# The problem:
# … has resulted in tremendous increase in pesticide use

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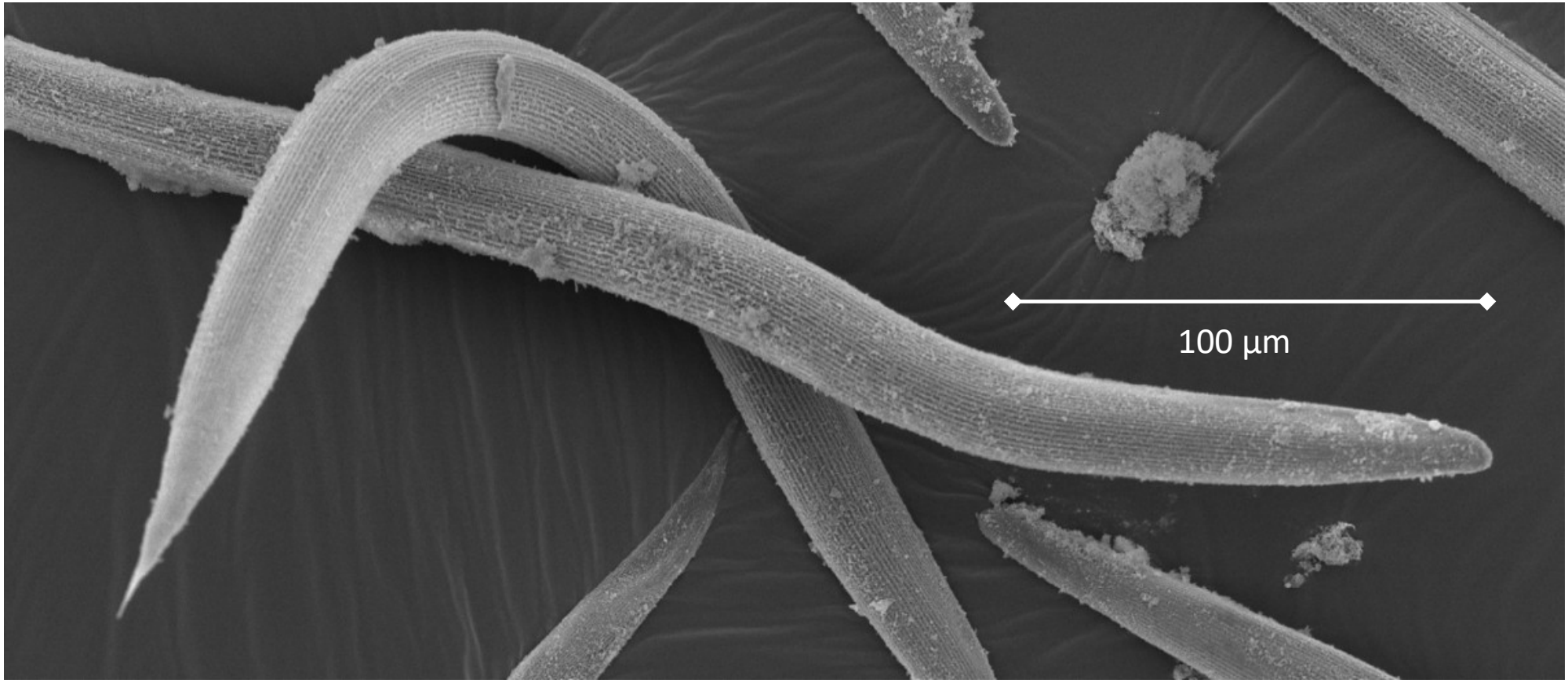
# Our proposed solution: Biocontrol with entomopathogenic nematodes (EPN)




tiny insect-killing beneficial worms, not to be confused with plant-parasitic nematodes (pest)

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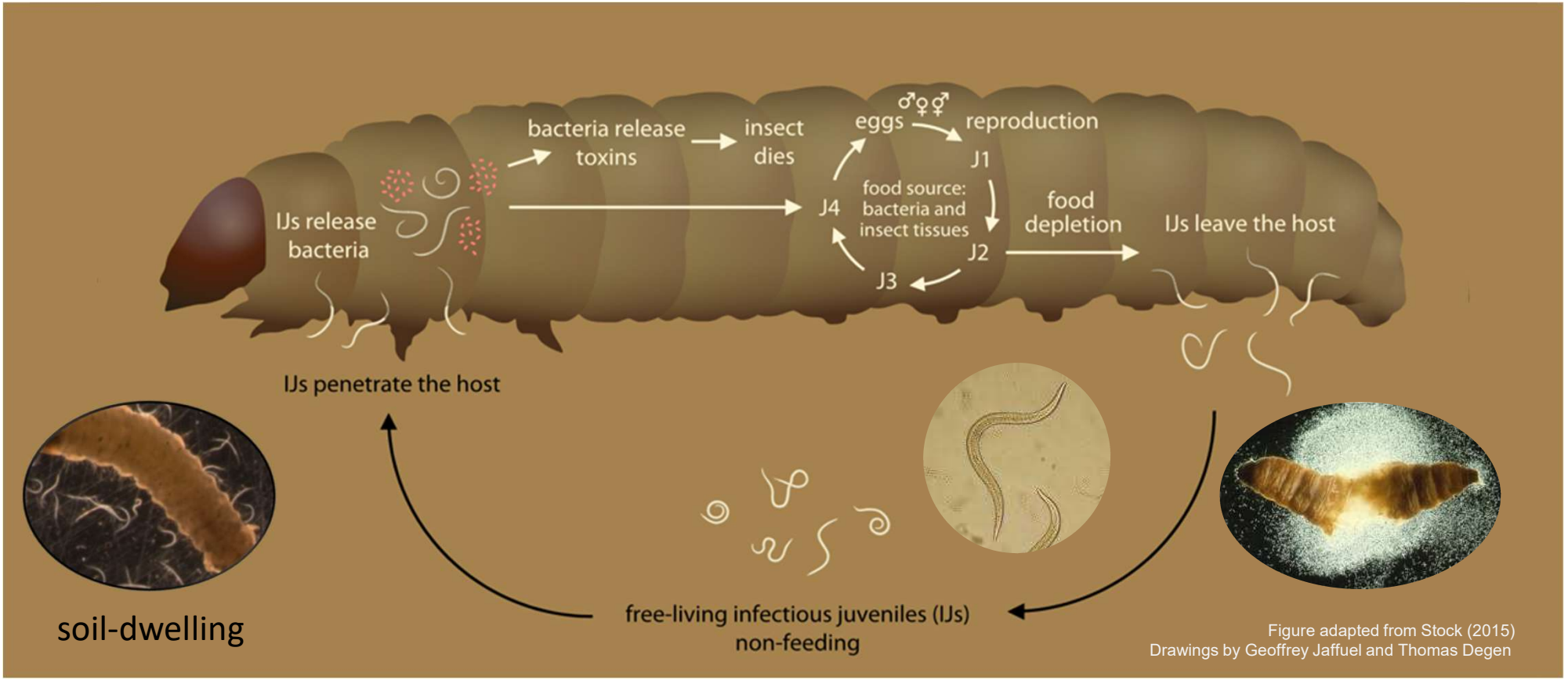
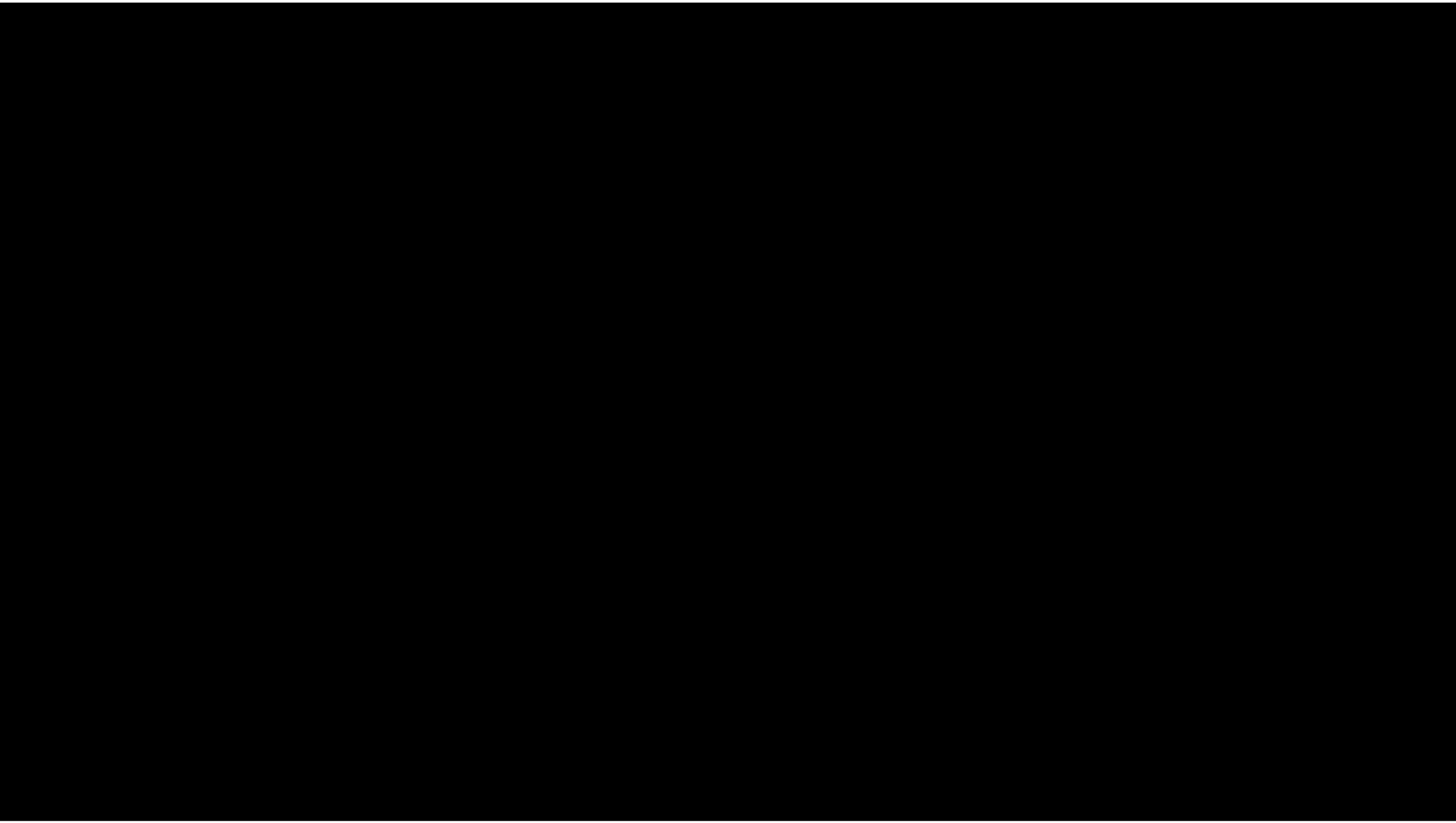
# Entomopathogenic nematodes




- can be isolated locally
- can be mass produced
- safe for farmers and environment



# Biological control of the fall armyworm with entomopathogenic nematodes for enhanced food security in Africa

PIs

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*Baldwyn Torto*

*Beatrice Murriithi*

*Solveig Haukeland*

*Jack Adundo*

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*Ted Turlings*

*Constance Muholo*

*Catherine Gacheri*

*Stefan Toepfer*

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Université de Neuchâtel
Institut de biologie

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Environmentally intelligent farming

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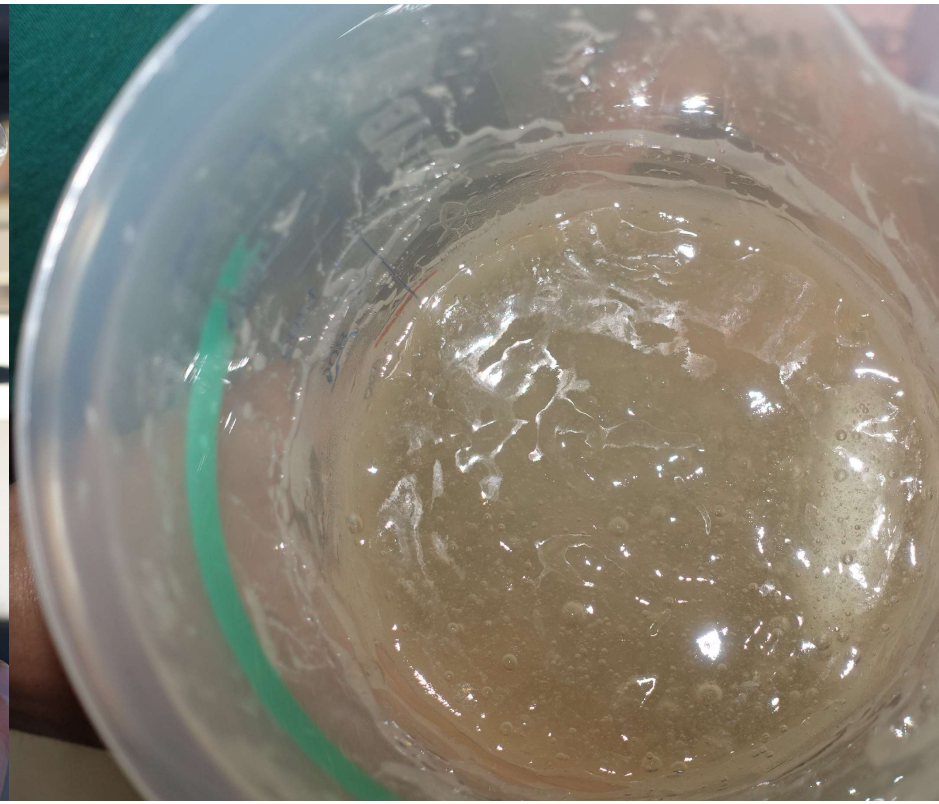
# Novel formulation of EPN against FAW as innovation



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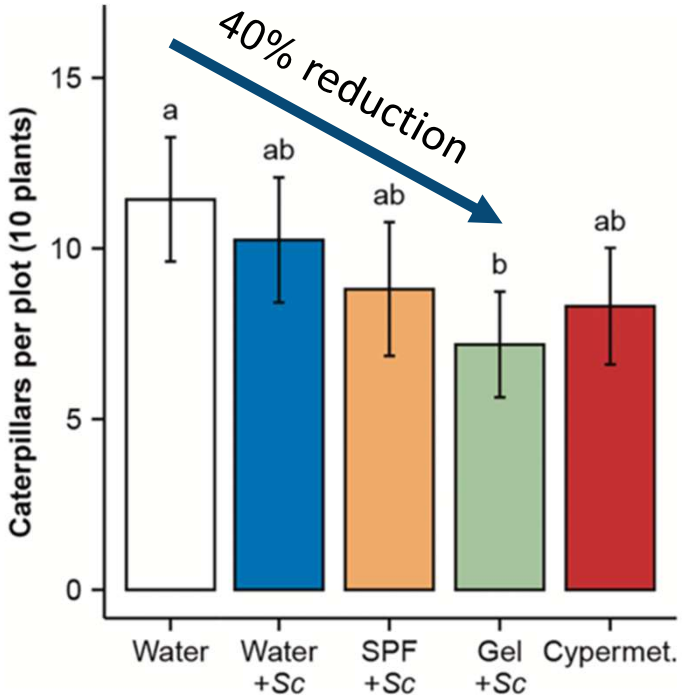
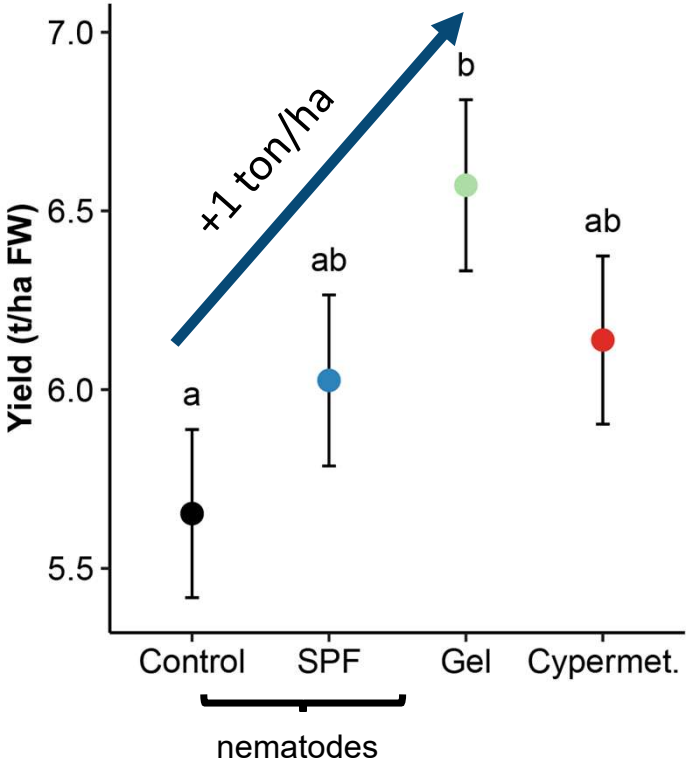
# The proposed solution: Field trials – results

**Infestation (single application)**




**Yield (repeated applications)**




→ EPN (Sc) can be as effective as cypermethrin

Fallet, P., D. Bazagwira, L. Ruzzante, G. Ingabire, S. Levivier, C. Bustos-Segura, J. Kajuga, S. Toepfer, and T.C .J. Turlings (2024). Entomopathogenic nematodes as an effective and sustainable alternative to control the fall armyworm in Africa. ***PNAS Nexus*** 3 (4) 122

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Work package 1

Development and optimization of the gel-based EPN formulation

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Work package 2

Field testing and proof-of-concept

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Work package 3

Mass production and capacity building of farmers

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Work package 4

Communication, farmer engagement, out-scaling and impact assessment

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Development and **optimization of the gel-based EPN formulation**

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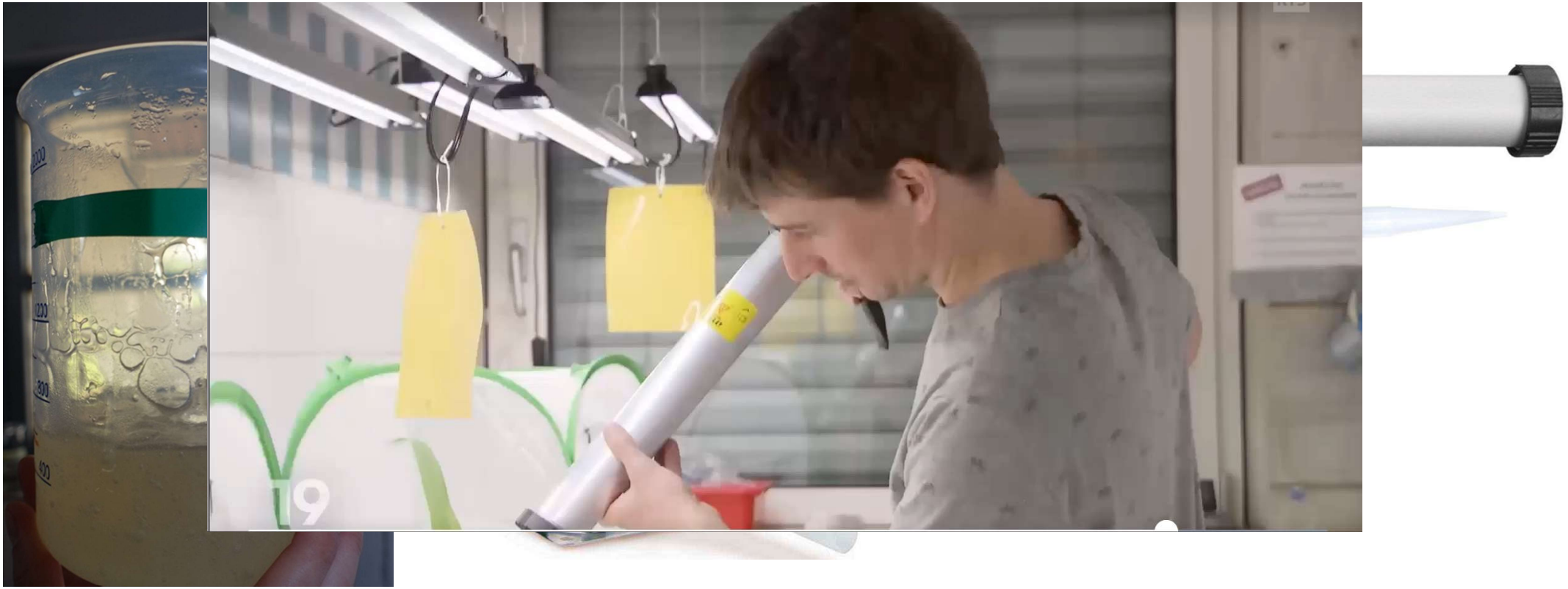
# What we did so far:
# Optimized application method



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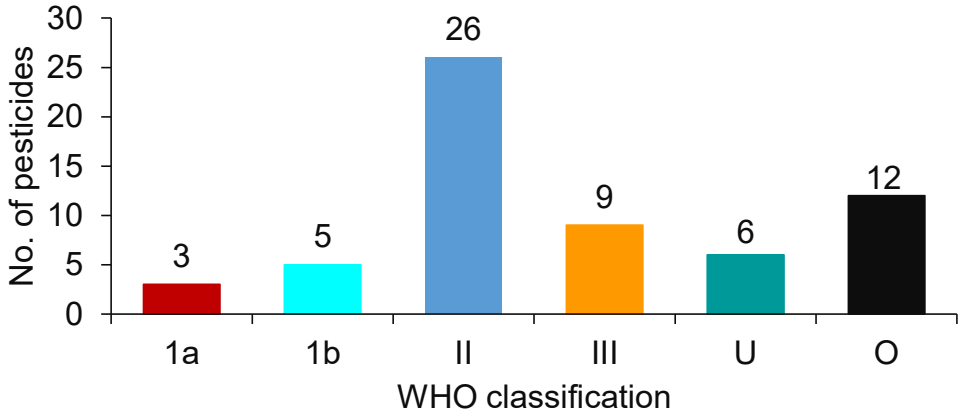
# What we did so far:

## Entomological baseline survey among African farmers to determine the impact of FAW on maize production and pesticide use

**Demographics of farmers surveyed**

| Gender | No. of farmers |
|---|---|
| Male | 92 |
| Female | 115 |
| Youth | 42 |
| Total | **249** |

Pesticide residues detected in soils from five maize-growing counties in Kenya




The WHO classification of the pesticides based on the level of toxicity: Ia = Extremely hazardous; Ib = Highly hazardous; II =Moderately hazardous; III = Slightly hazardous; U = Unlikely to present acute hazard in normal use; O = Obsolete as pesticide, not classified

Total of 61 pesticides detected in Embu, Kilifi, Makueni, Nakuru and Nyeri counties

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# What we did so far: improvements to gel formulation

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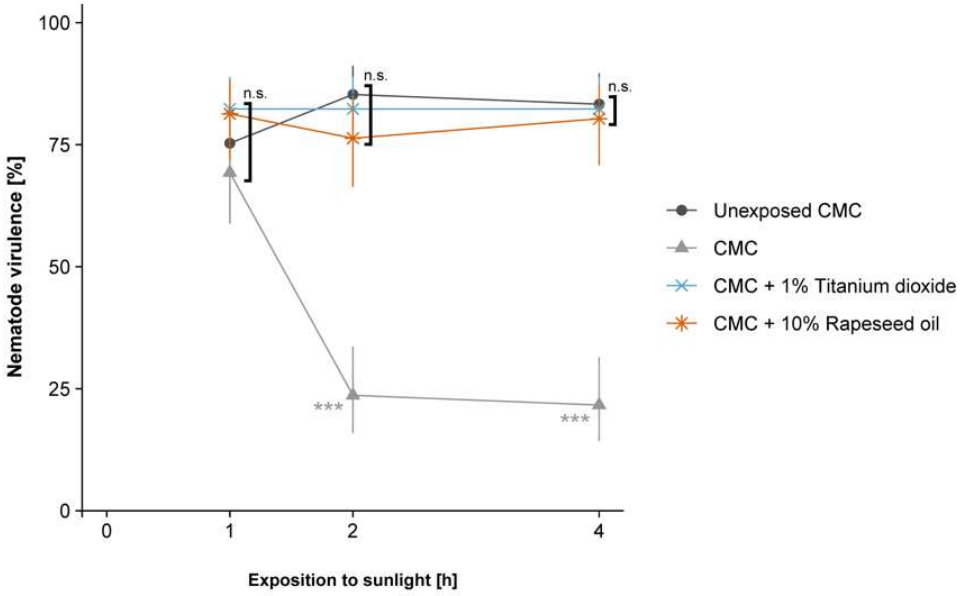
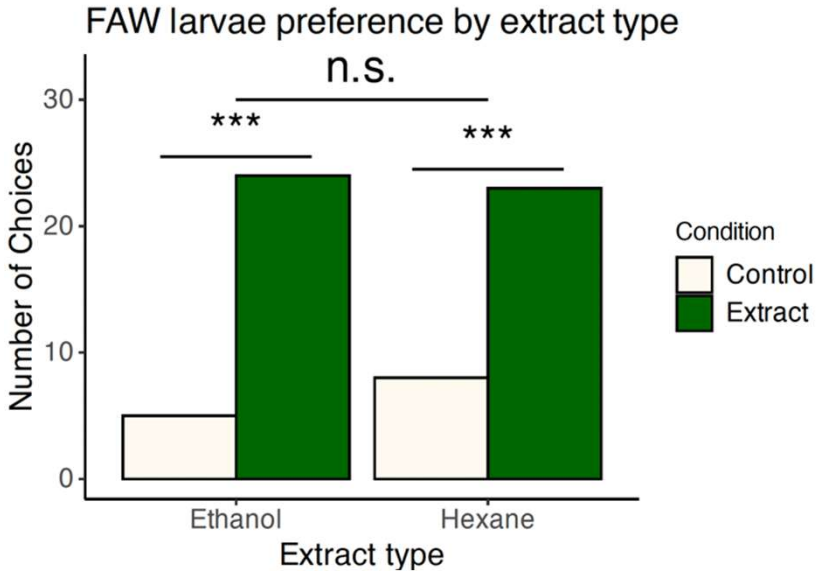



Nematodes in CMC gel remain virulent much longer when titanium dioxide or rapeseed oil are added as UV protectants.




FAW larvae are attracted to gel with *Desmodium* leaf extracts

We will also add a potent repellent emitted from the frass (feces) of fall armyworm.

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# Next steps:

## Further engagement with Kenyan farmers and involve them in the research

- Creating awareness on the new EPN-formulation as a biocontrol option for the FAW
- Mobilizing farmers for the uptake of the EPN-formulated biocontrol option

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# Next steps:
# Extensive field testing with Kenyan and Rwandan farmers

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# Next steps: out-scaling and impact assessment

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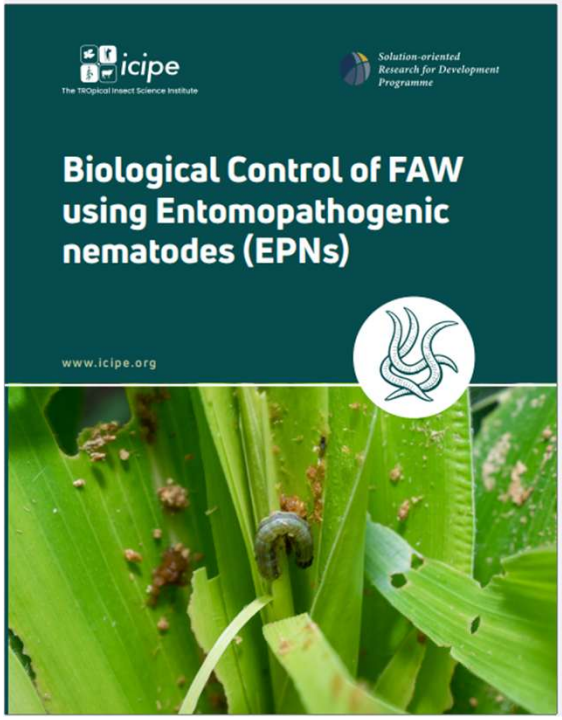
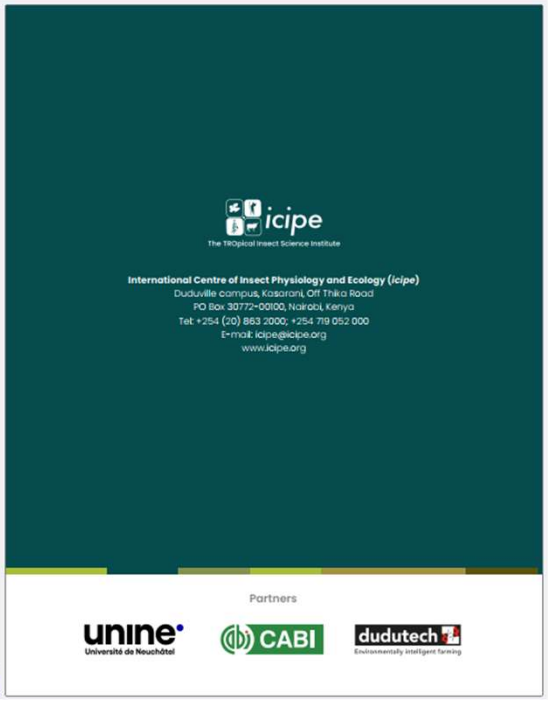
# Brochure: SOR4D project





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# Thank you for your attention!

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# ANNOUNCEMENTS

- Presentations soon available on our website : https://www.sdc-foodsystems.ch/en/thoughts-for-food
- Upcoming events :


AFS network

**Making the case for resilience in development**

Wed, Mar 11, 9:30 AM

Online


AFS network

**Gestion holistique : l'expérience d'ACF**

Thu, Mar 26, 10:00 AM

Zoom


AFS network

**Thoughts for Food - n°3 / 2026**

Wed, May 6, 9:00 AM

Zoom

Don't hesitate to share news, topics and ideas with us!

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**Thank you!**
**Stay well, and stay connected!**