



Summary of the Grow Asia/CABI Webinar series on FAW biological control

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Regional Training Workshop for Farmer Field School facilitators on sustainable management of Fall Armyworm: IPM, Biocontrol and Farmer Field Schools



Implementation of Bio based IPM strategy

- Integration of practices supporting biocontrol strategies
- Conservation: Making environment conducive for BCA
 - Strengthen monitoring, scouting, and surveillance efforts
 - Undertake pest management efforts
- Creating Awareness : Community based action
- Collaboration across the region

Author's personal copy

Journal of Plant Diseases and Protection
<https://doi.org/10.1007/s41348-020-00357-3>



ORIGINAL ARTICLE



Biocontrol-based management of fall armyworm, *Spodoptera frugiperda* (J E Smith) (Lepidoptera: Noctuidae) on Indian Maize

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CABI initiatives for Monitoring and Surveillance

- Surveys conducted in Pakistan under ISPM 6 and 8 with Department of Plant Protection
- Monitoring coupled with molecular characterization: India, Philippines, CISRO Australia
- FAMEWS trainings in Bangladesh, Solar based trapping System and E surveillance
- ASEAN region linked to PW program : Vietnam, Myanmar, Cambodia (PRISE)



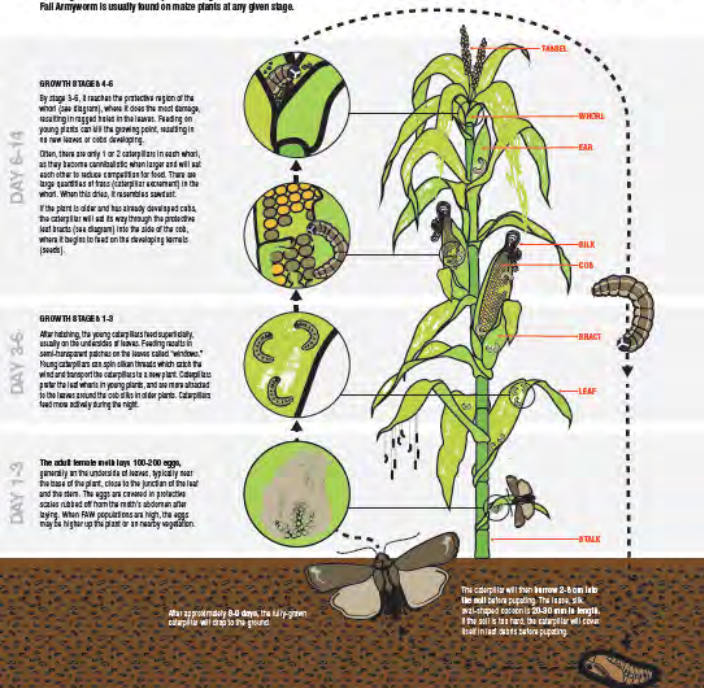
Biological Control Approaches

Fall Armyworm: Life cycle and damage to maize

The Fall Armyworm (FAW) lifecycle includes egg, 6 growth stages of caterpillar development (instars), pupa, and (adult) moth.

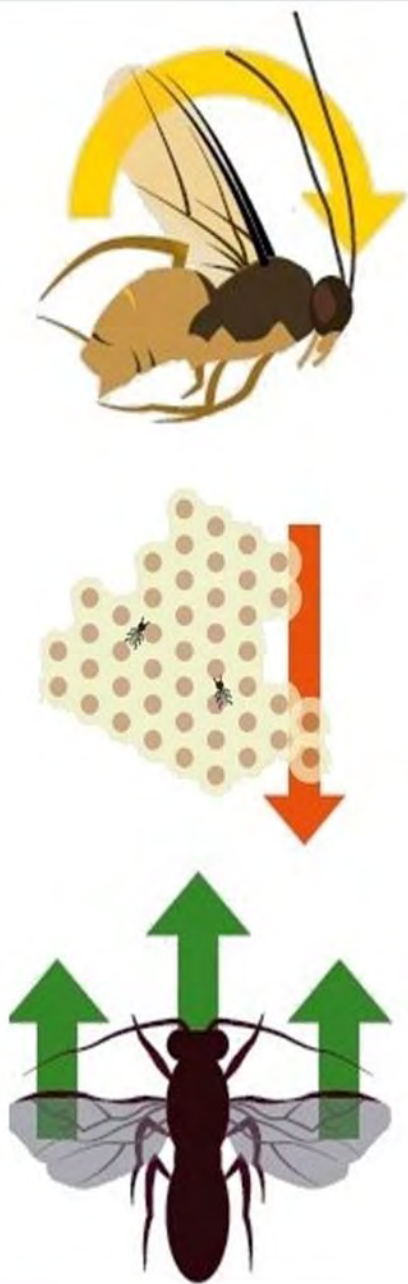
This diagram illustrates the lifecycle, showing where the Fall Armyworm is usually found on maize plants at any given stage.

After approximately 14 days the fully-grown caterpillar will drop to the ground.



- **Conservation:** encouraging natural enemies; habitat management; avoiding killing them
- **Augmentation:** release of large numbers of a natural enemy that is already present
- **Biopesticides:** products based on microbial natural enemies
- **Classical:** introduction of a natural enemy species that is not already present

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Classical biological control

- Collaboration and work
 - in the area of origin of the pest, or
 - in a country that has already introduced the natural enemy
- Introduction of exotic organisms
 - Risk assessments and
 - Quarantine facilities
- No need for repeated releases:
 - No Cost Automatic control has huge benefits

Present Classical Biological Control activities at CABI

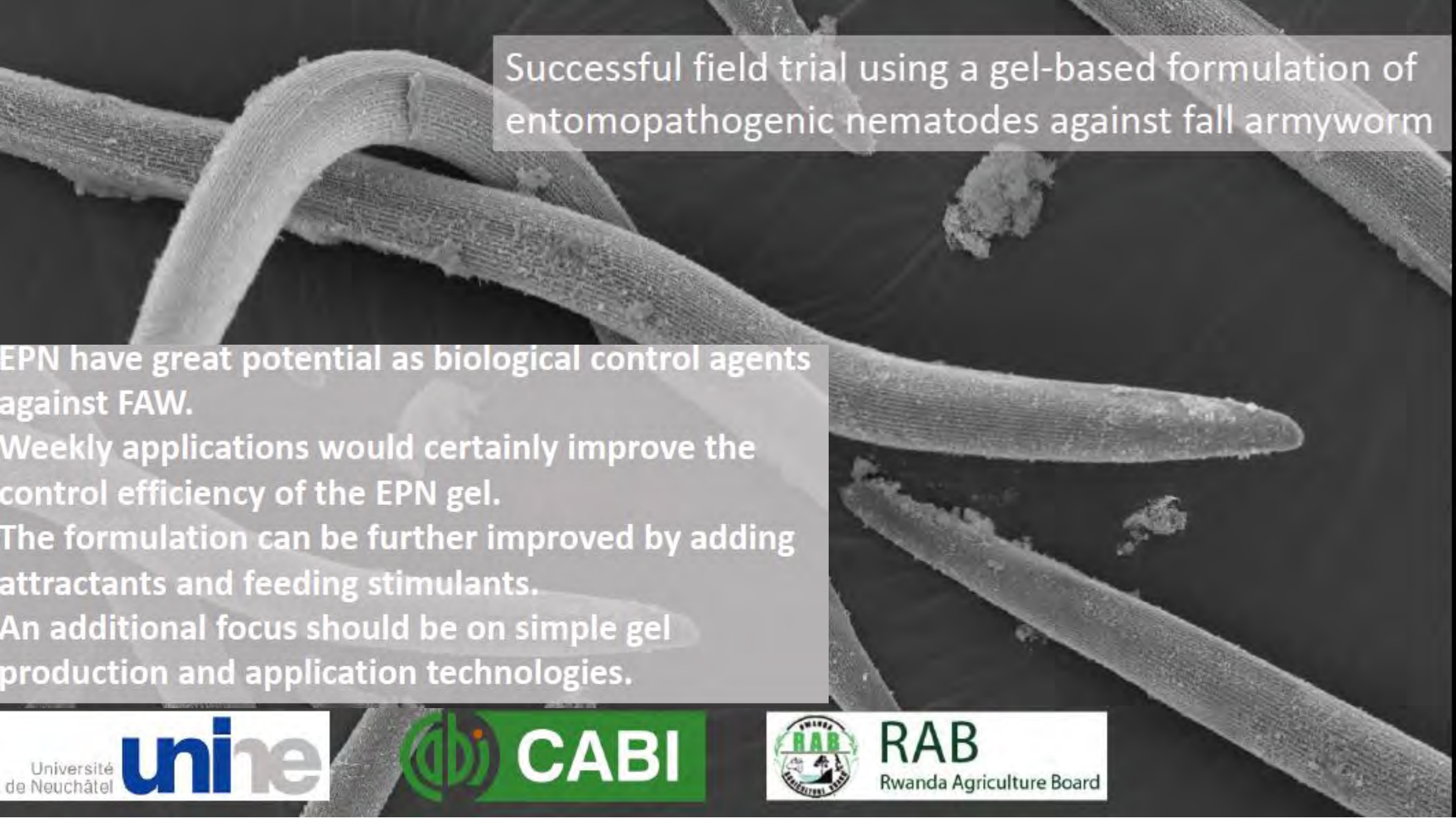
- Two parasitoids under study shipped quarantine facilities in Africa and Asia
- Can take advantage of the on-going projects
- But still need to investigate the specificities of SE Asia
 - Native parasitoids already attacking FAW
 - Potential non target effects on native species
 - Climate matching
 - Regulations and quarantine facilities



Chelonus insularis



Eiphosoma laphygmae



Successful field trial using a gel-based formulation of entomopathogenic nematodes against fall armyworm

EPN have great potential as biological control agents against FAW.

Weekly applications would certainly improve the control efficiency of the EPN gel.

The formulation can be further improved by adding attractants and feeding stimulants.

An additional focus should be on simple gel production and application technologies.



FAW MANAGEMENT: Fostering Agricultural Revitalization in Myanmar (FARM)

- **Farmer Practice:** Chemical pesticides of indiscriminately used by farmers heavy losses >90% spray frequency 8 times on 3 months
- **PARTICIPATORY LEARNING PLOT APPROACH :** biopesticide *Bacillus thuringiensis* (Bt) var aizawai, pheromone trap, physical removal of egg masses and larvae etc;
- **YIELD BENEFIT:** IPM yield -3000 marketable ears/0.9 ha with marginal higher net revenue of USD 300 (450,000 MMK) VS conventional farmer practices -2000 ears harvested for a revenue of USD 200 (300,000 MMK).
- **REDUCED SPRAYS WITH 'HARD' PESTICIDES:** Reduced frequency of 'hard' pesticide spray (2x with emamectin benzoate; and increased use of 'soft' biopesticide with 4x with Bt);



Current status on uptake of BCA

CABI conducted a study which found:

- Big awareness campaigns needed
 - Farmers don't realize the risks of conventional pesticides
 - Farmers aren't aware of biologicals
 - Biologicals treated as conventional pesticides
 - Farmer education on use needed
- Biologicals aren't available in the market
- Farmers aren't advised to use biologicals

BioControl (2018) 63:117–132
<https://doi.org/10.1007/s10526-017-9823-y>



A baseline study using Plantwise information to assess the contribution of extension services to the uptake of augmentative biological control in selected low- to lower-middle- income countries

Julien Dougoud · Matthew J. W. Cock · Steve Edgington · Ulrich Kuhlmann

Research Article

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Why don't smallholder farmers in Kenya use more biopesticides?

Kate L Constantine,^{a*} Monica K Kansime,^{b*} Idah Mugambi,^b Winnie Nunda,^b Duncan Chacha,^b Harrison Rware,^b Fernadis Makale,^b Joseph Mulema,^b Julien Lamontagne-Godwin,^a Frances Williams,^b Steve Edgington^a and Roger Day^b



CABI plantwise



Food and Agriculture
Organization of the
United Nations

বাংলাদেশে ফল আর্মিওয়ার্ম (*Spodoptera frugiperda*)-এর তদারকি, পূর্ব সতর্কীকরণ এ
ব্যবস্থাপনার জন্য নীতিনির্ধারণ পন্থা ও সমন্বিত ব্যবস্থার উপায়সমূহ
কর্মকর্তাদের জন্য প্রশিক্ষকের প্রশিক্ষণ ম্যানুয়াল
প্রথম সংস্করণ



Feasibility : work with smallholder farmers, community based action

- Manuals
- Mass Extension Tools developed
 - Leaflets
 - Posters
 - Video through training workshops
 - Public Service message
 - Community Radio Broadcasts
 - Social Media Campaigns

FALL ARMYWORM research collaboration portal

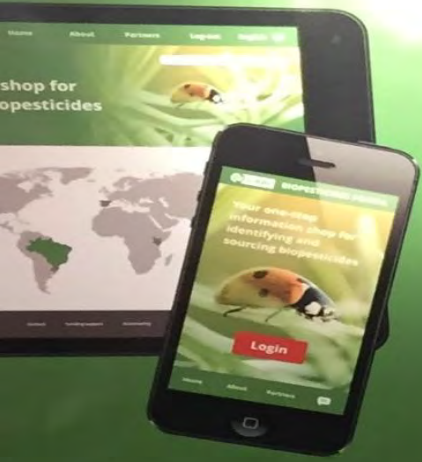
The screenshot shows the 'Crowdsource table' for natural enemies. The page includes a navigation bar with links for HOME, ABOUT, RESEARCH UPDATES, COLLABORATE, CURRENT RESEARCH, MY ACCOUNT, and LOGOUT. Below the navigation bar, there are two main sections: 'Natural Enemies' and 'Crowdsource table For natural enemies'. The 'Crowdsource table' section contains a table with columns for Species, Type, Country Found, Location Found, Source, Submitted By, and Submitted Date. The table lists four entries for the species *Beauveria bassiana*, *Camponotus chlorideus*, and *Camponotus chlorideus*.

Add records of accurately identified natural enemies you know about below. Records do not need a citation to be added. [Click here for more support with contributing to this table](#)

[ADD/EDIT SUBMISSIONS](#)

Species	Type	Country Found	Location Found	Source	Submitted By	Submitted Date
<i>Beauveria bassiana</i>	Pathogen	Kenya		Kornil et al. 2019	publisheddata	2020-10-19
<i>Camponotus chlorideus</i>	Parasitoid	Barbados		Shylesha et al. 2018	publisheddata	2020-10-19
<i>Camponotus chlorideus</i>	Parasitoid	India		Shylesha et al. 2018	publisheddata	2020-10-19
<i>Camponotus</i>	Parasitoid	Brazil	Sao Paulo	Silva et al. 2012	publisheddata	2020-10-19

Crowdsource Tables : aims to b



Biopesticides Portal

one-stop information shop
identifying and sourcing biopesticides



- Increasing awareness and uptake of biopesticides among farmers and advisors
- Current, online information for those who need it



- An international not-for-profit intergovernmental organisation, owned by 49 member countries
- Tackling global issues such as food safety through research and international development
- A leading global publisher of agricultural and environmental information



Information portal for biopesticide products



Your free one-stop shop for identifying, sourcing and applying biopesticides

Farmer/grower

Kenya

Rose

Whitefly

Your Nearest Town

Search





Getting biological control used

Effectiveness/efficacy

- Does it work? Reduction of losses?

Regulatory approval

- Safety?
- International standards, guidelines

Practicalities

- How easy to use?
- Smallholders; gender considerations

Economics

- Is it cost-effective?

Collaboration

- Lots of groups doing related work

<https://faw.researchcollaborationportal.org/>

ありがとう
 merci
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 ke itumetse
 dhanyawaad
 terima kasih
 gracias
 danke
 urakoze
 thank you

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Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development and Cooperation SDC