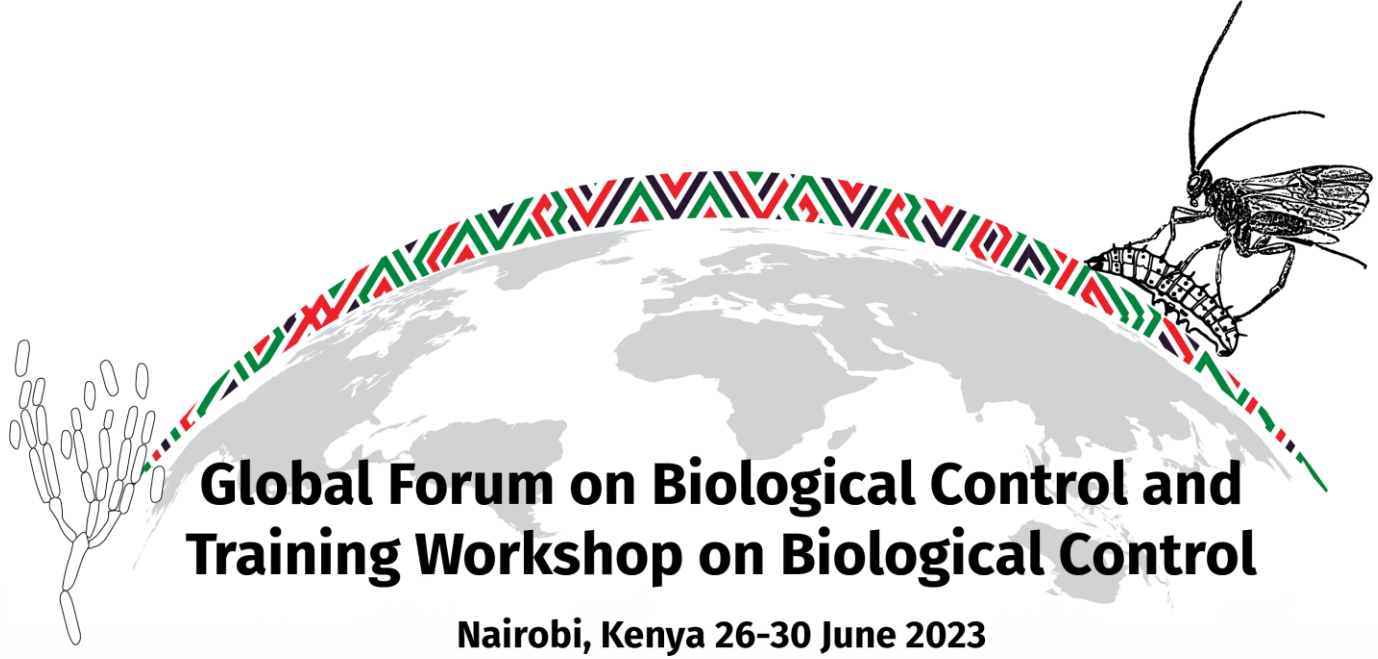


Global Forum on Biological Control and Training Workshop on Biological Control

Nairobi, Kenya 26-30 June 2023

Biocontrol R&D in Africa

Thomas Dubois, Head Plant Health, *icipe*

Co-organized by

Food and Agriculture Organization of the United Nations

icipe

Supported by

EUROPEAN UNION

USAID FROM THE AMERICAN PEOPLE

german cooperation DEUTSCHE ZUSAMMENARBEIT

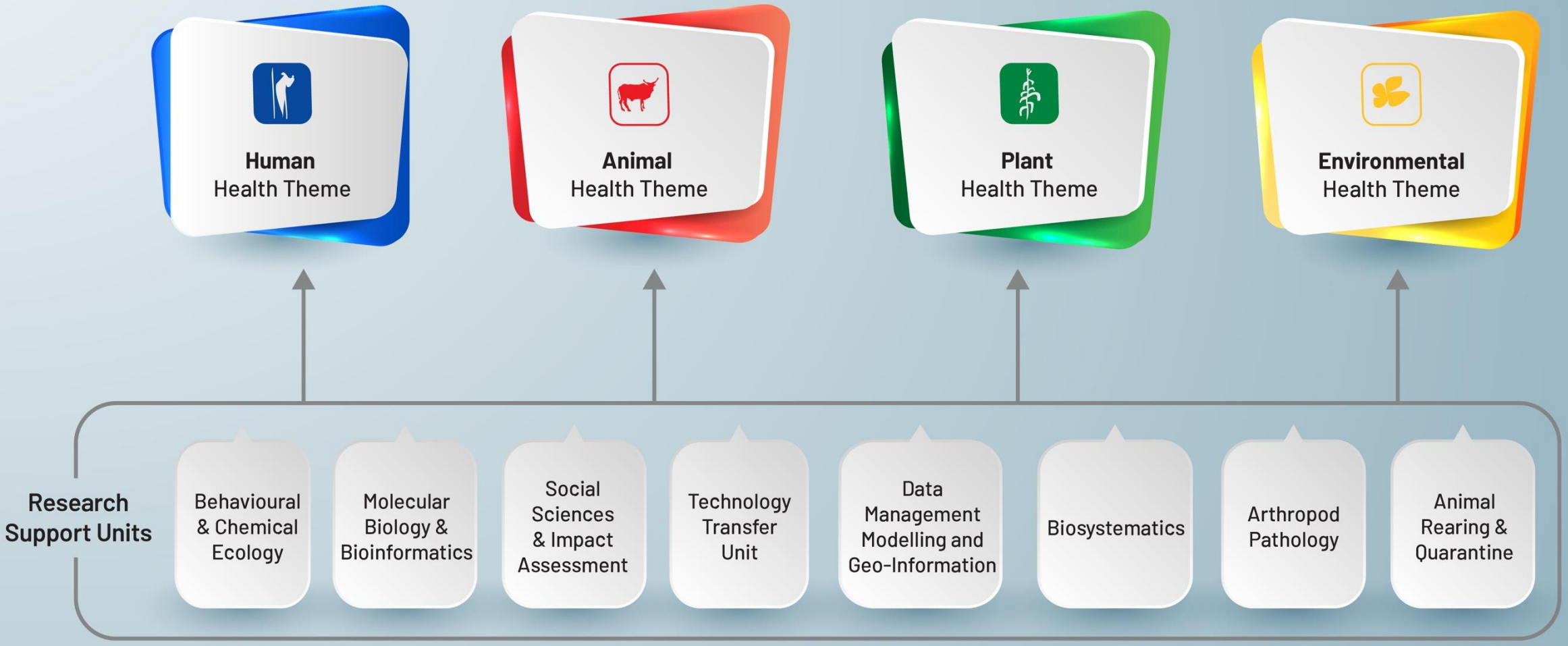
Implemented by

giz

icipe

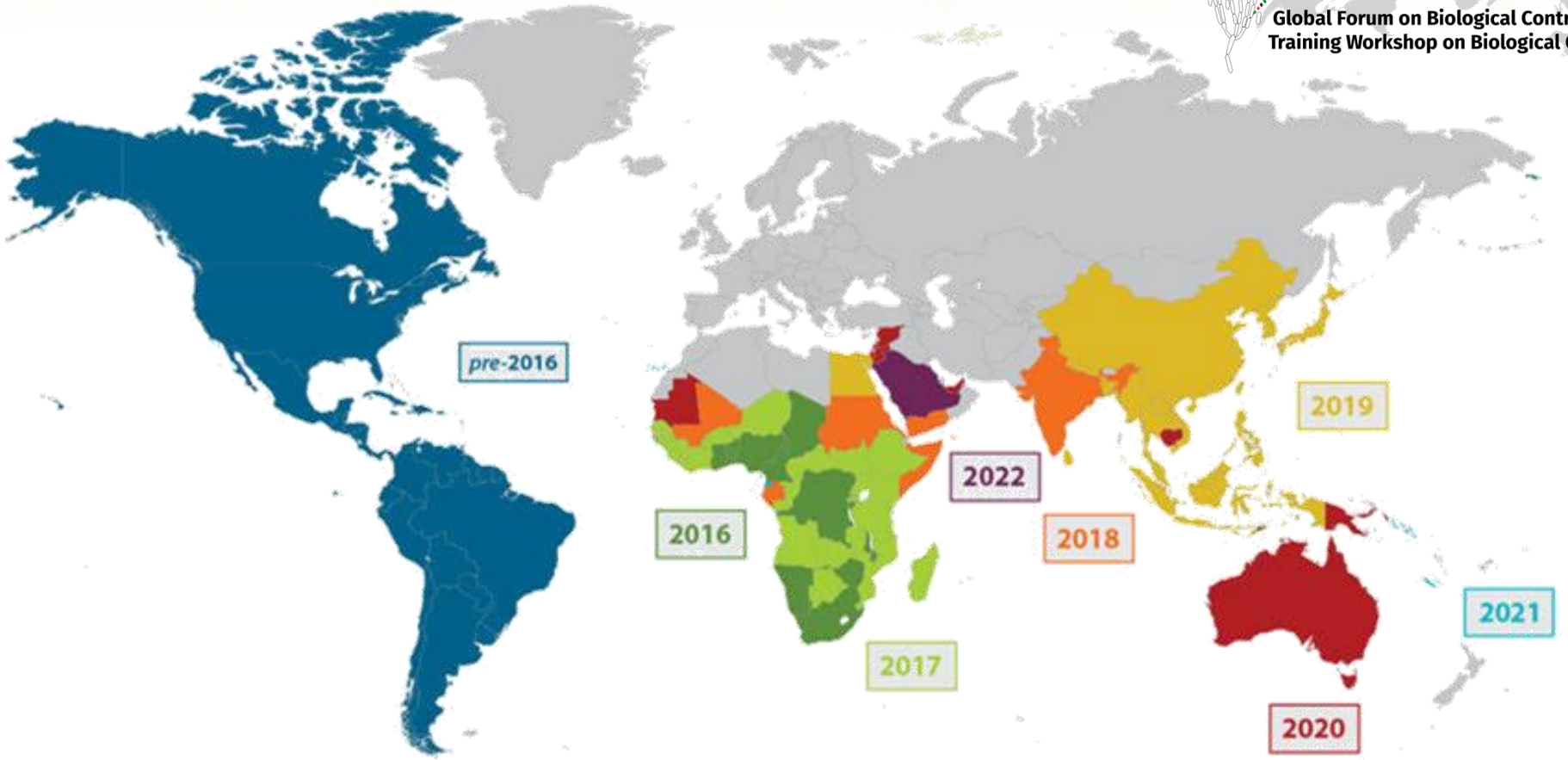
- **African centre of excellence**
  For R&D of insects
- **Intergovernmental organization**
  Charter signed by 13 countries on 1971
- **571 staff (> 40 nationalities)**
- **>300 partners**
- **150-180 MSc and PhD students**

icipe


Human
Health Theme
Animal
Health Theme
Plant
Health Theme
Environmental
Health Theme
Research
Support Units
Behavioural & Chemical Ecology
Molecular Biology & Bioinformatics
Social Sciences & Impact Assessment
Technology Transfer Unit
Data Management Modelling and Geo-Information
Biosystematics
Arthropod Pathology
Animal Rearing & Quarantine

global invasion of the fall armyworm

1 female



average yield loss to maize: 10.4 – 45%
economic impact : million US$ 1.1 – 4.7 billion USD

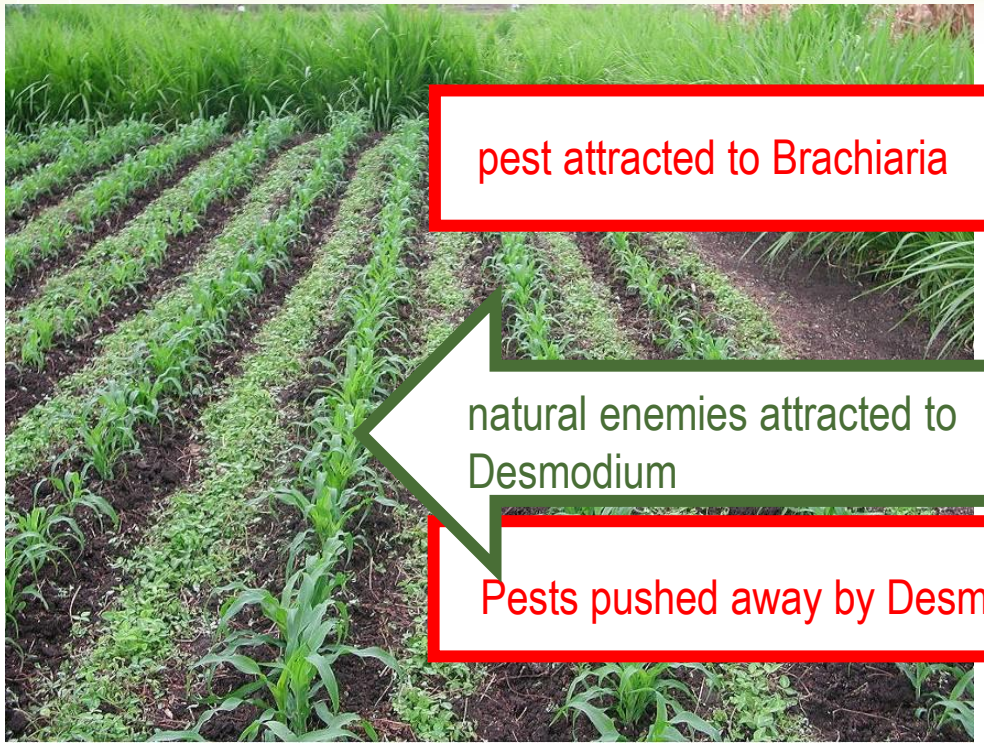
FAO
CABI 2018

1 female

100,000,000,000,000,000 moths

our immediate reaction:

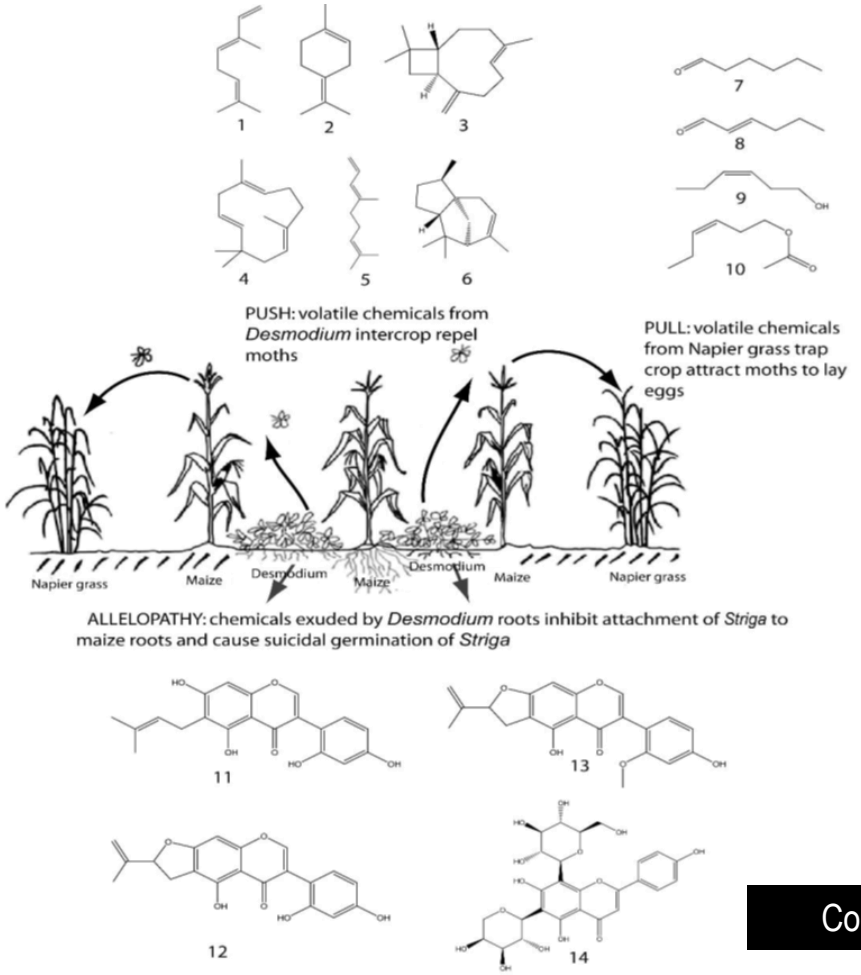
push-pull technology



pest attracted to Brachiaria

natural enemies attracted to Desmodium

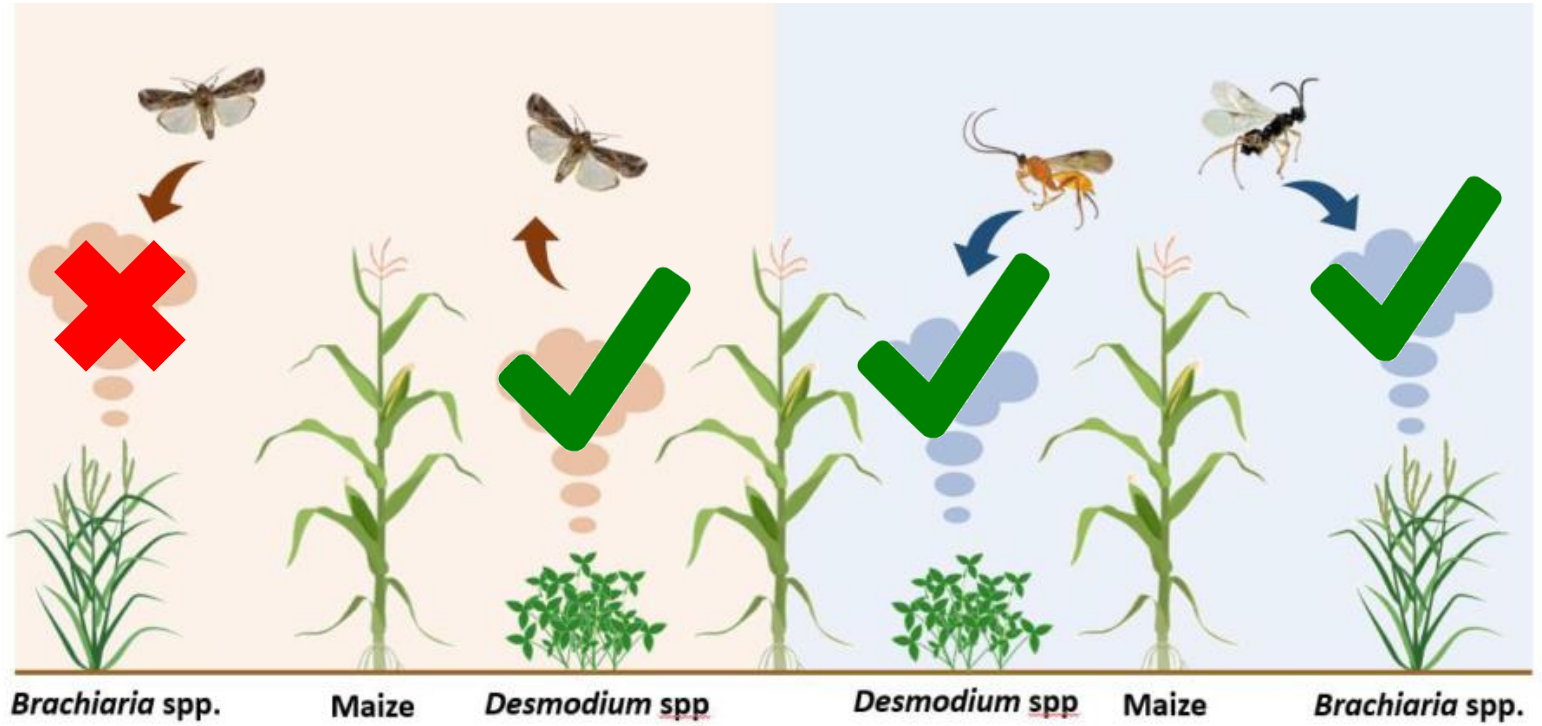
Pests pushed away by Desmodium



Cook et al 2017

CONSERVATION

push-pull technology against fall armyworm



Sobhy et al 2022

CONSERVATION

parasitoids

>150 fall armyworm parasitoid species documented from the Americas

Africa: ‘new associations’:

AUGMENTATION

CONSERVATION

Cotesia icipe

Chelonus curvimaculatus

Charops ater

Palexorista zonata

Coccygidium luteum

Trichogramma chilonis

Telonomus remus

Molina-Ochoa et al 2003
Sisay et al 2018
Kenis et al 2019

parasitoids for augmentation

mass production for augmentative releases:

AUGMENTATION

CONSERVATION

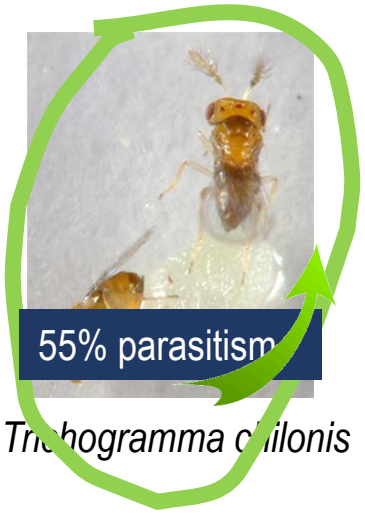
Cotesia icipe

Chelonus curvimaculatus

Charops ater

Palexorista zonata

Coccygidium luteum



Trichogramma chilonis

Telonomus remus

Molina-Ochoa et al 2003
Sisay et al 2018
Kenis et al 2019

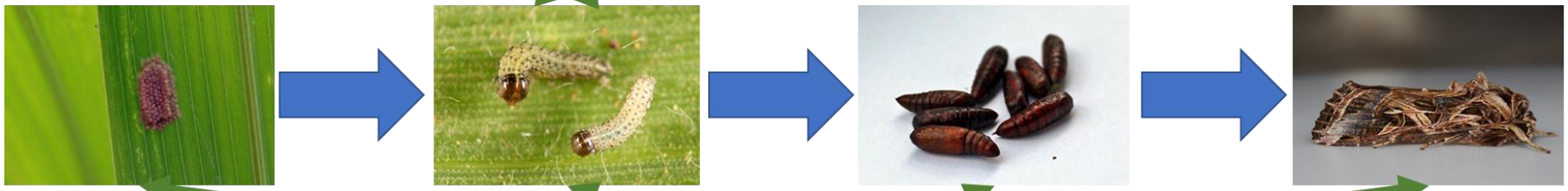
microbes against fall armyworm

AUGMENTATION

CONSERVATION

insect viral diseases: **Baculoviruses**

insect bacterial diseases: ***Bacillus thuringiensis***



insect fungal diseases: ***Metarhizium anisopliae, Beauveria bassiana***

biopesticides

AUGMENTATION

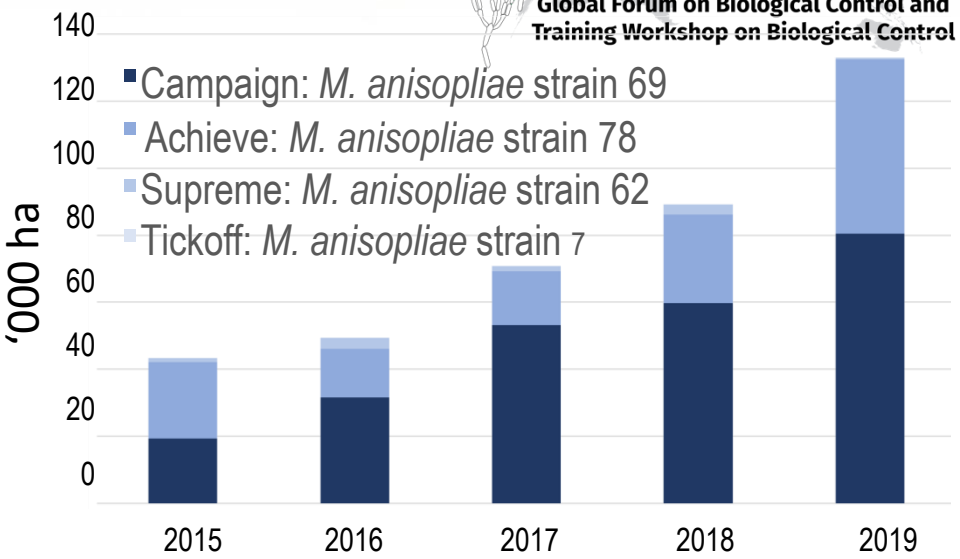
CONSERVATION

Mazao Campaign

Mazao Achieve

Mazao Supreme

Mazao Tickoff



Biopesticide Research and Product Development in Africa for Sustainable Agriculture and Food Security – Experiences From the International Centre of Insect Physiology and Ecology (*icipe*)

Komivi Senyo Akutse, Sevgan Subramanian, Nguya Kalemba Maniania, Thomas Dubois and Sunday Ekesi*

International Center of Insect Physiology and Ecology (icipe), Nairobi, Kenya

frontiers in Sustainable Food Systems

biopesticides against fall armyworm

AUGMENTATION

CONSERVATION

Mazao Campaign

Mazao Achieve

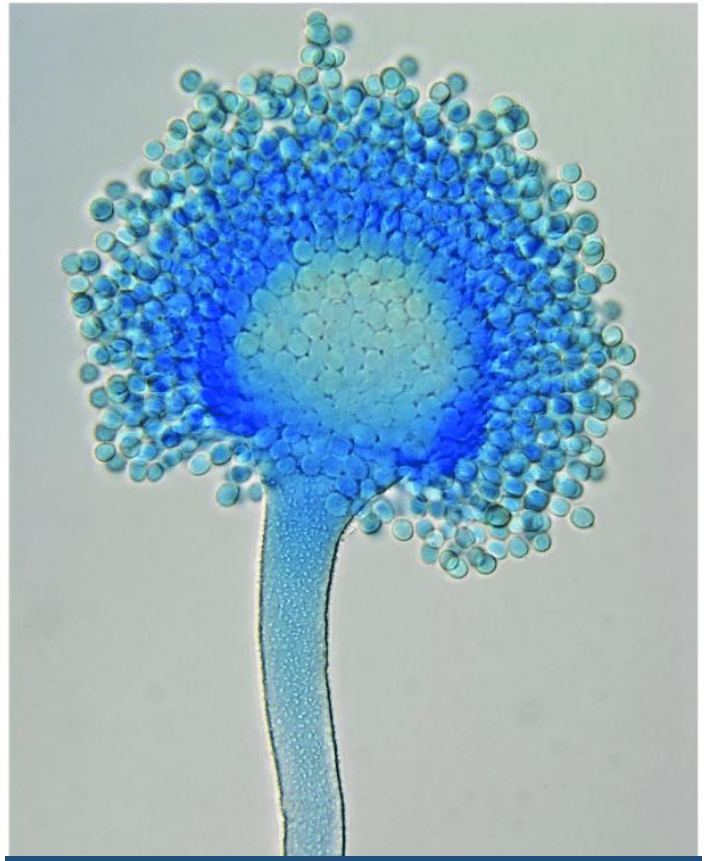
Mazao Supreme

Mazao Tickoff

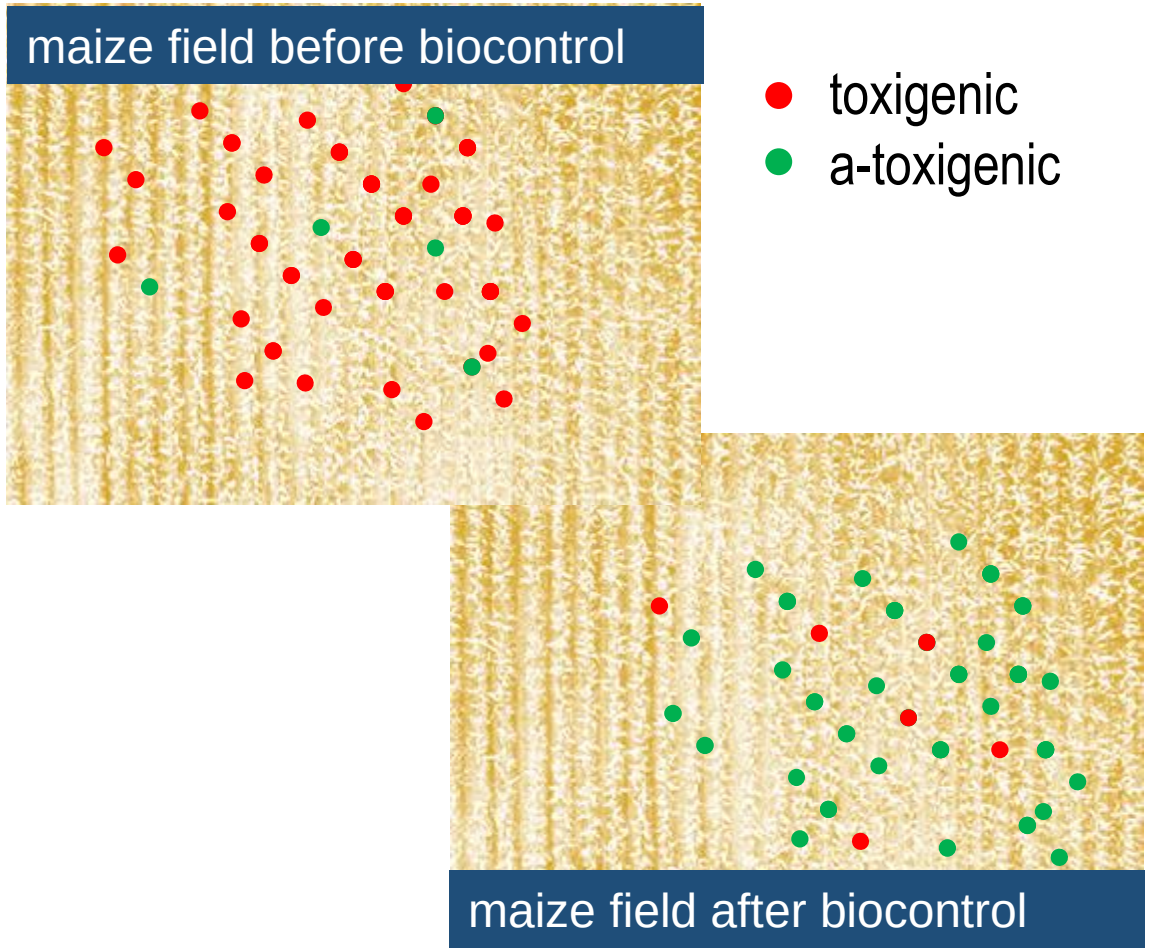
biopesticides against aflatoxin

AUGMENTATION

CONSERVATION



Aspergillus flavus



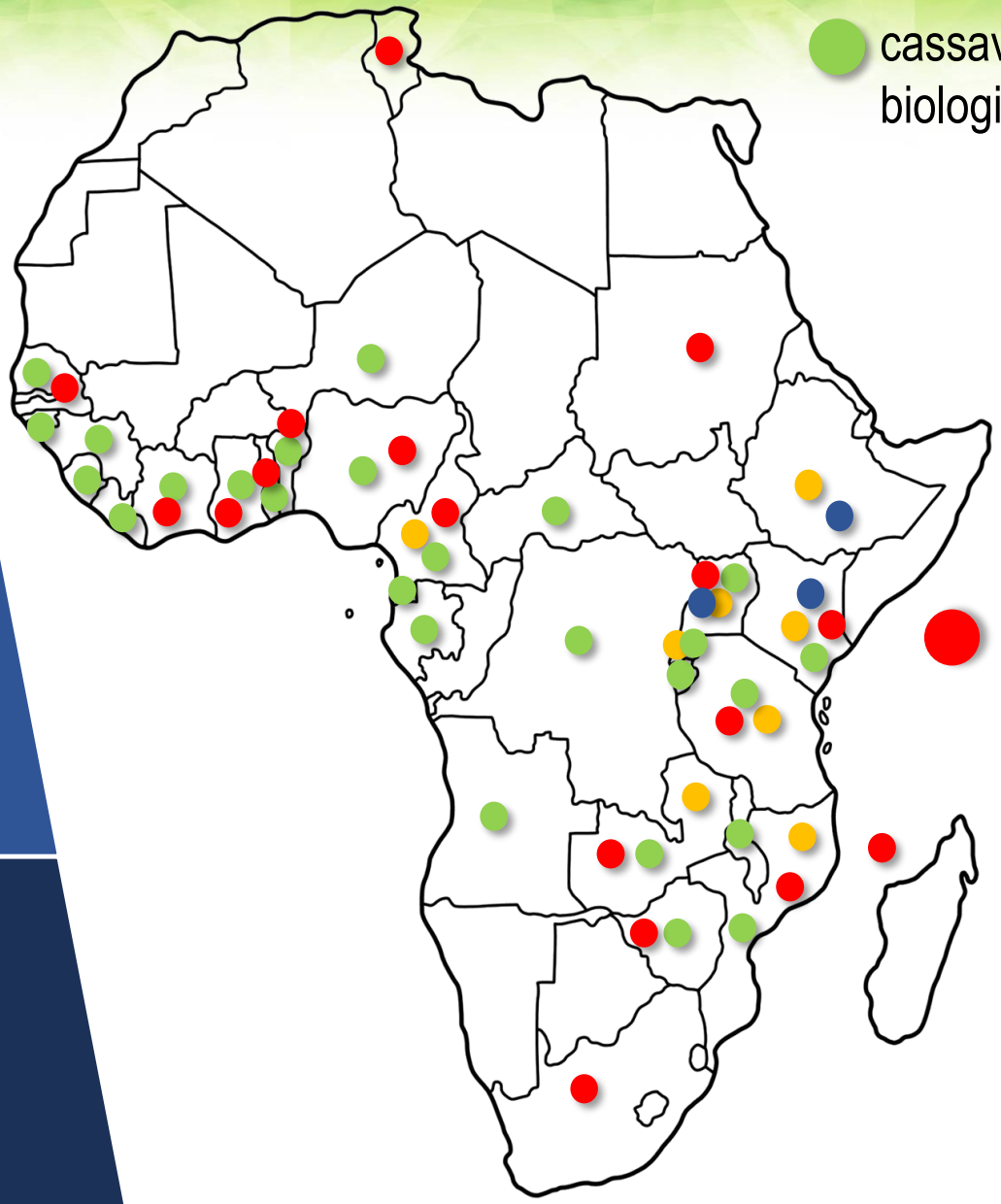
Aflasafe

Bandyopadhyay et al 2022

CLASSICAL

AUGMENTATION

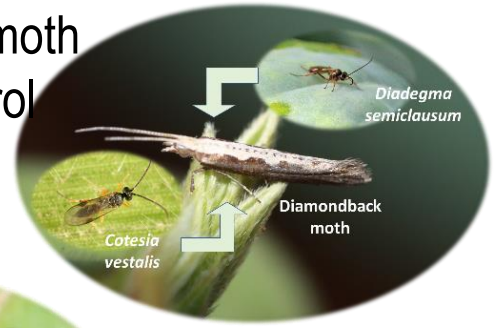
CONSERVATION



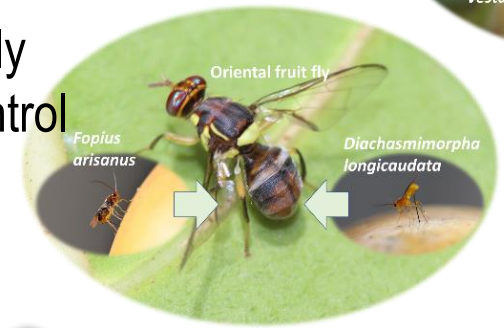
cassava mealybug biological control

Global Forum on Biological Control and Training Workshop on Biological Control

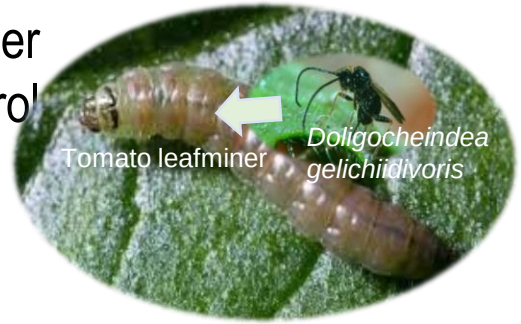
diamondback moth biological control



oriental fruit fly biological control



tomato leafminer biological control



Food and Agriculture Organization of the United Nations

icipe

parasitoids for classical biological control

CLASSICAL

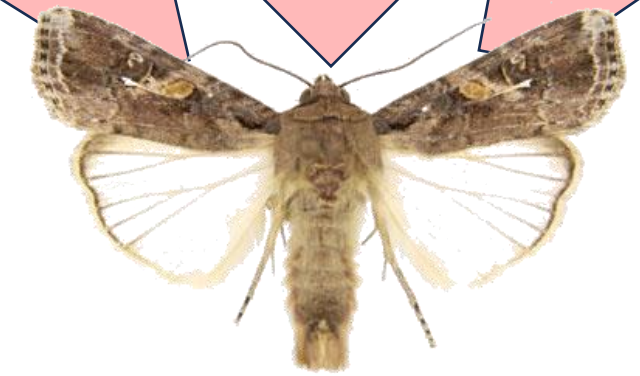
AUGMENTATION

CONSERVATION

Telonomus remus

Chelonus insularis

Cotesia marginiventris



	legislative cost	research cost	farmers' costs
conservation biological control	low	high	low
augmentative biological control	high	high	high
classical biological control	very high	very high	nihil

	legislative cost	research cost	farmers' costs
conservation biological control	low	high	low
classical biological control	high	very high	nihil
augmentative biological control	high	high	high

Thank you

Co-organized by

Food and Agriculture Organization of the United Nations

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Implemented by

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Donor Acknowledgement

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