A PARTNER FOR TROPICAL CROPS

BIOCONTROL

BY CIRAD

Solutions in the South for invasive pests in the North

11 multidisciplinary research units

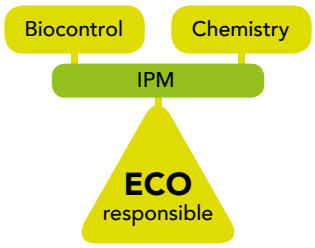
300 researchers throughout the world

IPM methods

Platforms in partnership
A unique international cooperation system

BIOCONTROL
BY CIRAD

Tomorrow, in both the South and the North, our expertise will make all the difference



As close to the field as possible

In a context of globalisation, climate change and increasing trade that fosters the migration of diseases and pests, our expertise in tropical areas is a key asset in inventing new modes of agricultural production at the global level.

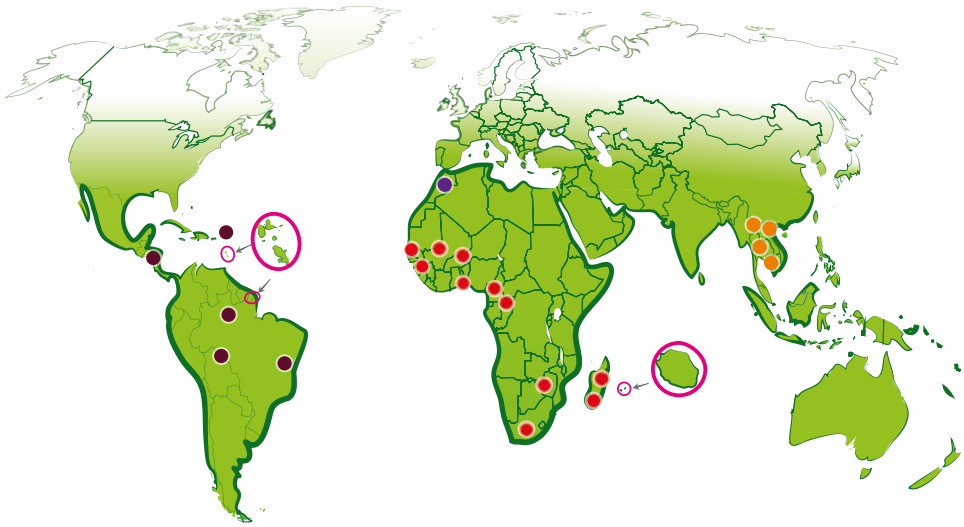
Our approach > A methodology adapted to the field reality for our partners, according to an eco-responsible approach : maximising the use of biocontrol by limiting the use of synthetic chemical products to ensure the sustainability of agricultural production systems.

© Cirad, Eric Penot

© Cirad, Fabrice Le Bellec

A reliable partner for your internationalisation

A global network of partners



“PROTE
cro
FEED
peo

A scientific evaluation

From research on the identification of new biocontrol agents to the certification of plant protection products, CIRAD works with its public and private partners to ensure certified evaluation of your biocontrol solutions.

A unique collaborative system

Our presence in the countries of the South, through our “platforms in partnership”, is highly innovative : it is based on a co-construction process with shared scientific goals uniting all stakeholders.

A single reference in tropical supply chains

Market garden crops • Bananas • Pineapples • Rice • Cacao • Millet • Rubber • Eucalyptus • Citrus fruits • Oil palm • Sugarcane • Coffee • Sorghum • Cotton • Other Fruits, vegetables and cereals

Action The big census

With the **Knomana** project (Knowledge management on pesticide plants in Africa), a network of 70 people has been mobilised to identify plants with biocontrol potential found in 11 African countries. These plants are already used traditionally, and an in-depth study will help to define :

- USES
- MODES OF ACTION
- PEST TARGETING
- NON-TARGET ORGANISMS

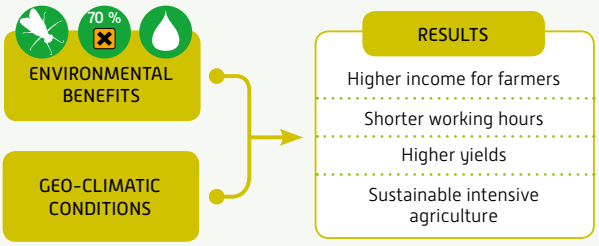
Innovation Brocap® coffee berry borer trap

Combining efficiency, yield and profitability.

- **EFFICIENCY** 10 000 capture/trap/d
- **TARGETING** 70 % =coffee berry borers
- **YIELD** +10% +16% coffee
- **PROFITABILITY** = +€ Cumulative years

Solutions Through simple tools with multiple benefits

The **BioNetAgro** project is in its second phase of development and innovation transfer. A new insect net to improve ecosystem performances of market garden crops subject to difficult farming conditions.



Synergies are being studied with the use of biopesticides such as entomopathogenic fungi that find the microclimate suitable for maximum efficiency. Training and funding for farmers are an essential part of this project. The company Microfinanza is involved in the process.

Co-construction expressed through control of the sugarcane stem borer in Reunion

Colonisation and adaptation of the pest to new high yielding sugarcane varieties.

Economic study among farmers. Release strategies and optimisation in collaboration with InVivo (Biotop France) - Preliminary tests with producers.

Study on optimising the solution in view of reducing costs for industrial production. Outreach experiment.

1855 Introduction of the borer to Reunion via Mauritius

1994 Study of losses associated with the pest

2000 **Selection of trichogramma (parasitic female) and association with indigenous ants.**

1998 Raising European funds. Support from the Conseil Général de la Réunion (General Council of Reunion). Collaboration.
Technical support CIRAD-FDGDON*-INRA company eRcane

2004 Cold storage tests for industrial development. Support from the Ministry of Agriculture. CASDAR financing.

2002-2003 Successful field trials. Training for planters in biocontrol and preservation of natural enemies with support from the Chamber of Agriculture FDGDON*.

ImpresS® **Impact study before transfer for prod. Indust.: measuring efficiency, identifying unintended effects and avenues for optimisation.**

2009-2010 Successful field trials.

POSITIVE RESULTS

- +15 to +26% productivity, depending on infestation level in plots treated.
- 11 weeks of storage (flexible production, better labour management, reduced costs).
- Genetic drift controlled through storage.

ONGOING OPTIMISATION

- Quality of production : Grouping development stages during storage.
- Increase in trichogramma population : bacterial symbiote to produce 100% females.
- Flexibility/management of releases : Early awakening possible ?
- Risk of superparasitism to be monitored.

*Fédération Départementale de Défense contre les Organismes Nuisibles (Departmental Federation of Defence against Harmful Organisms)

cirad
AGRICULTURAL RESEARCH FOR DEVELOPMENT

The French agricultural research and international cooperation organization working for the sustainable development of tropical and Mediterranean regions.

To take full advantage of the cross-cutting expertise of our research units, tell us about your problem !

BIOCONTROL BY CIRAD

A well-organised approach

- You express your needs
- We identify the obstacles
- We propose a research and development pathway
- We study the funding possibilities
- We conduct the R&D activities in partnership
- We share the results
- We transfer the solutions

A range of services and funding solutions adapted to each project

Research collaboration
Example > **Identifying an emerging pest and its epidemiology**
€ Cifre, CIR, UE-H2020

Knowledge integration
Example > **Developing an optimal biocontrol solution in the context of an integrated control process**
€ FUI, Région, Feder, BPI

Transfer and training courses
Example > **Transfer of final research results (licensing) for industrialisation**
€ Licences

Cirad is a member of

biocontrôle · ÉCOPHYTO Réduire et améliorer l'utilisation des phytos · VEGEPOLYS · Céréales Vallée · IAR Le pôle de la bioéconomie · AGRI SUD-OUEST INNOVATION

Cirad is founding member of MUSE Montpellier Université d'Excellence

11 research units to follow

- Agap
- Aïda
- BGPI
- CBGP
- Eco&Sols
- GECO
- HortSys
- Pvbmt
- LSTM
- Bioagresseurs
- QualiSud

CONTACT
Olivier COUILLEROT
olivier.couillerot@cirad.fr
+33 (4) 67 59 38 43

Working together for Tomorrow's Agriculture

Éditions MIMOSA - 04 67 99 49 49 - 12/2018