



# *BIOCONTROL ON LOCUSTS IN AFRICA*



**NOVACRID<sup>®</sup>**

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# INTRODUCTION



## Mains stakes of the locust crisis:

- Locusts and grasshoppers regularly decimate crops in many parts of Africa and Asia. Locusts, in particular, are responsible for invading in swarms of millions – leaving behind ravaged fields and putting livelihoods and food security at severe risk
- During periods of remission, migratory locusts occur in arid and semi-arid areas of South America, Africa, the Near East, South West Asia, and the steppes of Central Asia
- During invasion, they can affect 20% of the submerged land and threaten the livelihoods of 1/10 of the world's population
- The large use of chemicals, which may be unsafe for human beings, livestock, fauna, flora, and bees (Carcinogenic, pollinating insects population impacts)
- Response is often late creating some obsoletes stocks after the crisis

# CABI : KEY FIGURES



## OUR MISSION

To improve people's lives worldwide by providing information and applying expertise to solve problems in agriculture and the environment.

**50**  
Member  
countries

**480**  
Staff

**21**  
Locations

**9 million +**  
Records in CAB  
Abstracts



# ÉLÉPHANT VERT : KEY FIGURES



9

LOCATIONS

36

COUNTRIES WITH  
COMMERCIAL PRESENCE

11

PRODUCTION SITES  
including 5 in France

5

R&D SITES

950

COLLABORATORS

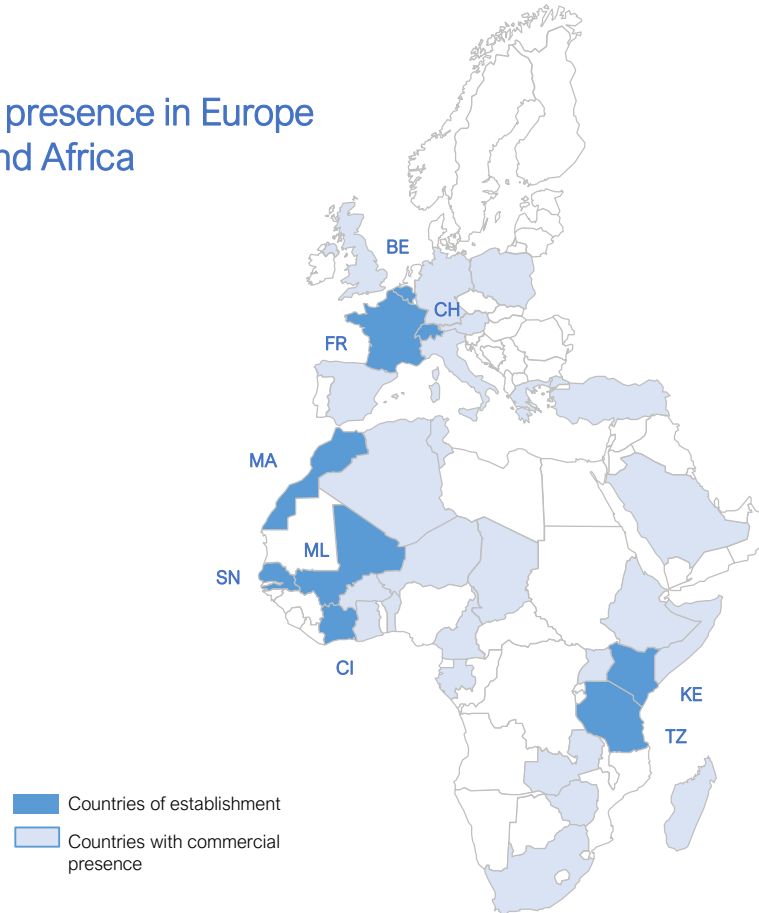
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SALES FORCE

## OUR MISSION

To quickly and efficiently create, promote and distribute innovative, efficient and accessible biosolutions for farmers.

A presence in Europe  
and Africa

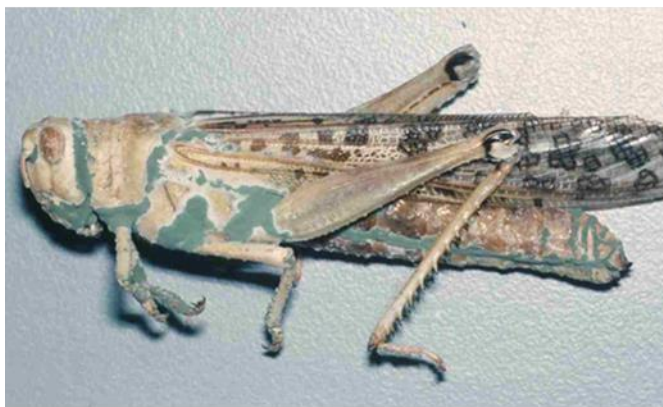


# BACK GROUND ON THE TECHNOLOGY: THE LUBILOSA PROJECT

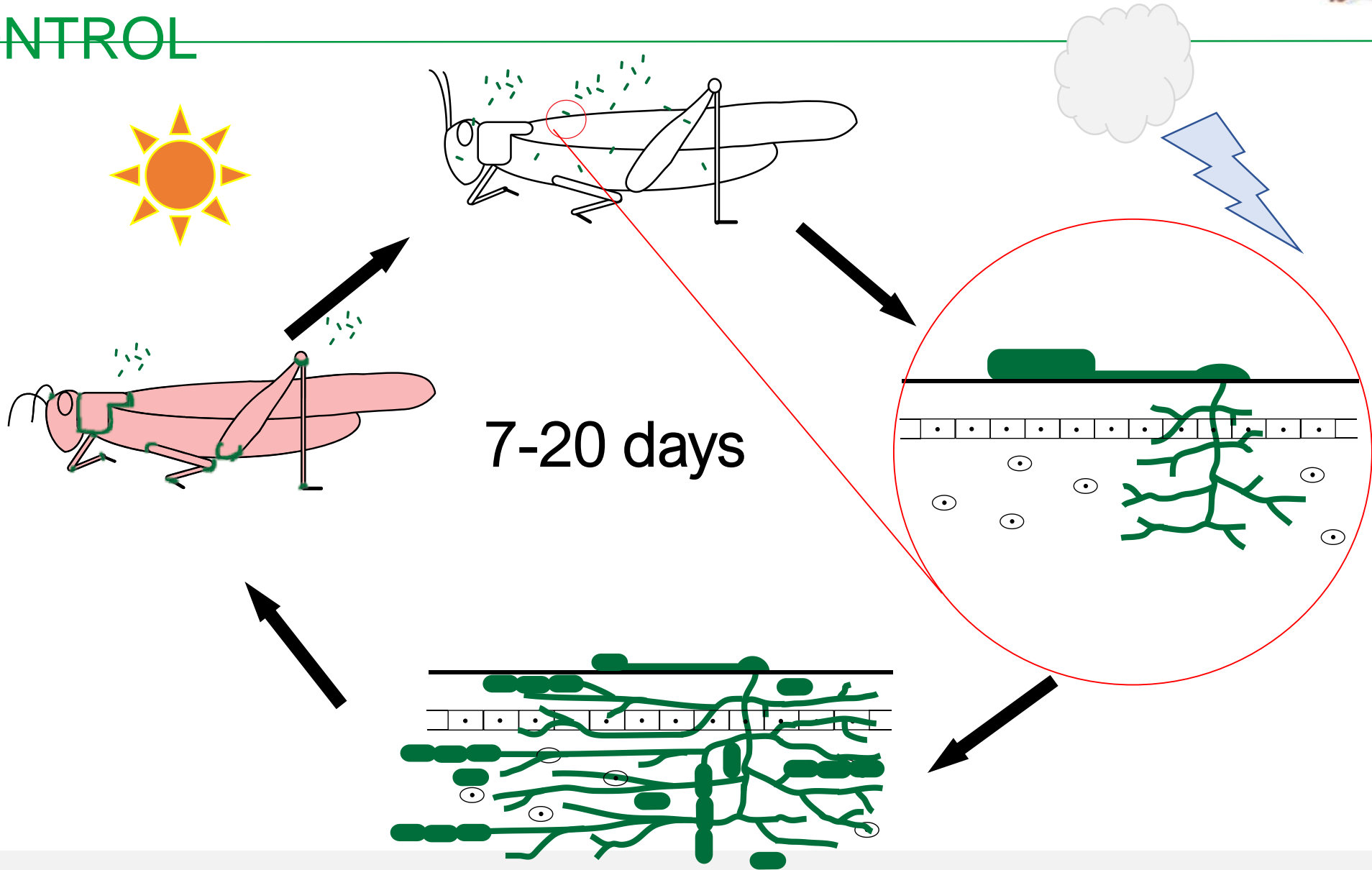


## Lutte Biologique contre les Locustes et les Sauteriaux

- 13 year research programme to develop a biological alternative to chemical control of locusts
- Identified an isolate, *Metarhizium acridum* – went through all the necessary steps to develop the commercial biopesticide Green Muscle
- Donors: CIDA, DFID, DGIS, SDC, USAID
- Cost: £10.2 million
- Four phases:
  - 1 - Found isolates and developed oil formulations concept
  - 2 - Oil formulations tested in field trails and setting up MP unit in IITA, Benin
  - 3 – Field trails on 6 different locust/grasshopper species, ecotoxicology and mass production, commercialisation
  - 4 – Promotion activities



# METARHIZIUM ACRIDIDUM SP, AN ALTERNATIVE TO THE CHEMICALS FOR THE DESERT LOCUST CONTROL





# GREEN MUSCLE® & NOVACRID®

## NATURAL SOLUTIONS AGAINST LOCUST



- Based on the active substance *Metarhizium acridum* EVCH077 and IMI 330189 strains
- The 2 products are specific to locusts and grasshoppers
- Novacrid® and Green Muscle® are produced by Eléphant Vert in Morocco





# GREEN MUSCLE® & NOVACRID®

## NATURAL SOLUTIONS AGAINST LOCUST



- Effective alternative to chemicals for controlling locusts and grasshoppers, tested on:
  - Desert Locust
  - Red Locust
  - Italian locust
  - Moroccan locust
  - Migratory locust
  - Sahelian tree locust
  - Variegated grasshopper
  - African rice grasshopper
  - Senegalese grasshopper

- Low dose (12.5 to 50 g / ha) in mixture with 1 or 2 L/ha of oil
- ULV application, Ground or Aerial
- Persistence effect up to 6 weeks
- No danger to humans and the environment (fauna, flora and livestock)



# REASON TO BELIEVE



- *EV Metarhizium acridum strains* are safe for human beings, fauna and flora:
  - **Green Muscle® & Novacrid®** were the subject of numerous studies as oral and dermal acute toxicity, intravenous and peritoneal toxicity, eye and skin irritation, allergic sensitization, and mutagenicity by accredited laboratories.
  - This package of studies constitutes the TOX file submitted at the registration evaluation
  
- **Largely tested on the grounds:**
  - bio efficacy trials were conducted by ELEPHANT VERT in collaboration with Locust Research Institutes from several countries, especially from Morocco (CNLA), Algeria, Senegal (DPV), Niger (DPV), Mauritania, Tanzania, Ethiopia, Kazakhstan and Uzbekistan.

# REASON TO BELIEVE

TRIAL # AGAINST DESERT LOCUST IN MOROCCO (2018)



## Trial conditions

2 plots of 1 ha each  
Mortality followed up in a cage (semi-natural conditions and semi-controlled)

Began : April 2018

3 repetitions (10 instars/cage)

Novacrid<sup>®</sup> 1 rate

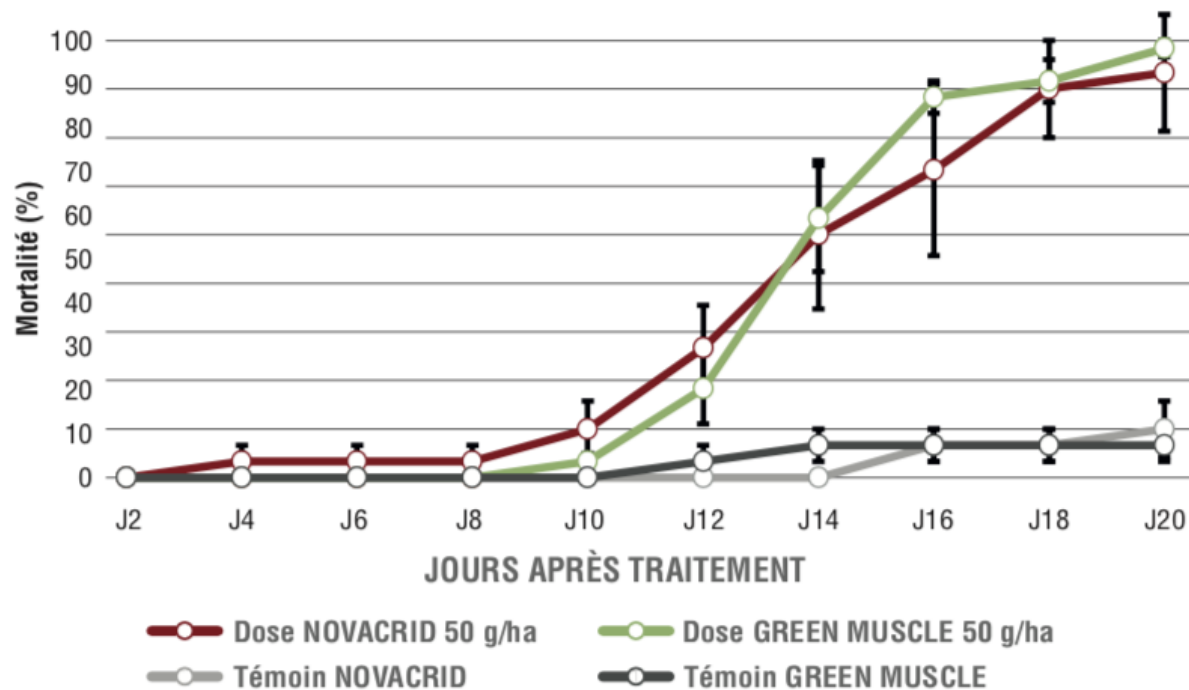
Green Muscle 1 rate

Mixture : 2L/ha

1 application

Centre National de la  
Lutte Antiacridienne

## Essai comparatif des effets de Novacrid<sup>®</sup> et Green Muscle à 50 g/ha au Maroc





# REASON TO BELIEVE

TRIAL # AGAINST DESERT LOCUST IN NIGER (2017)

## Trial conditions

3 plots : 50 ha

August 2017

Novacrid<sup>®</sup> : 50g /ha

Fenical 400 : 1 dose

Mixture : 2 L/ha

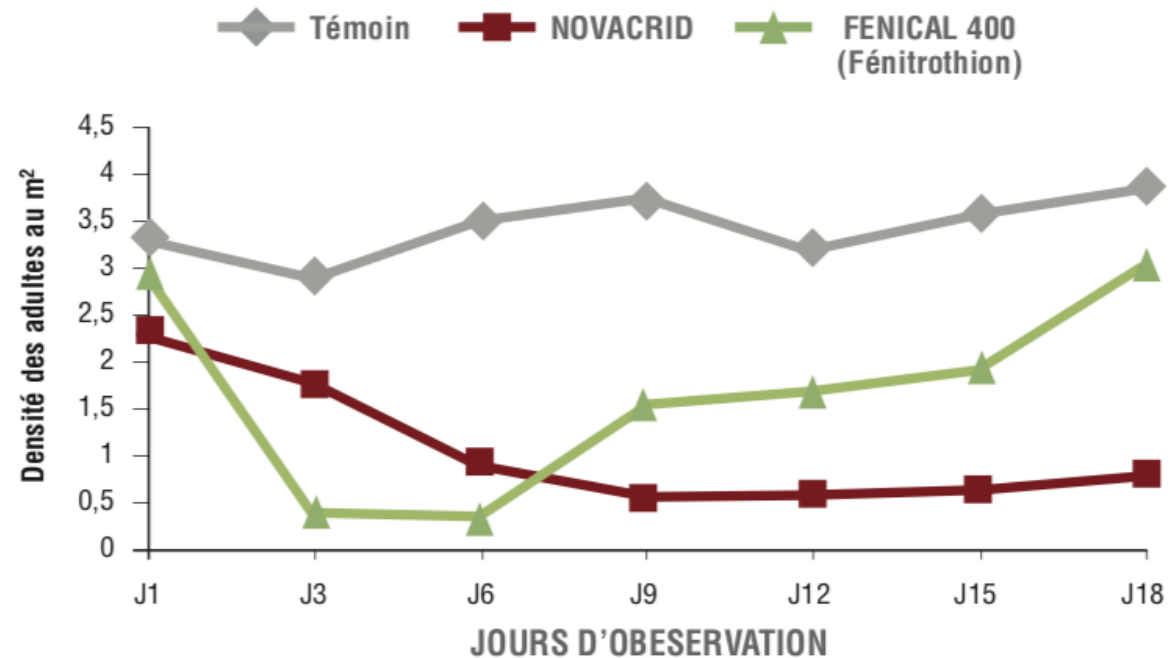
1 application

Direction Générale de la Protection des  
Végétaux du Niger



Avec Bing  
© Wikipedia

## Essai Niger (2017) - Évolution des densités des sauteriaux (adultes) après application Novacrid<sup>®</sup> et Feni 400 UL



## Trial results

Novacrid<sup>®</sup> (50 g/ha application allows a 80% control of the grasshoppers population within 2 to 3 weeks after treatment. The conventional product does not prevent from re-infestation

# REASON TO BELIEVE

TRIAL # AGAINST DESERT LOCUST IN SENEGAL (2017)

## Trial results

3 plots (randomised): 20 à 50 ha

August 2017

40 to 80 countings (1m<sup>2</sup>)

Novacrid<sup>®</sup> : 12,5g /ha

Novacrid<sup>®</sup> : 25g /ha

Mixture : 2 L/ha

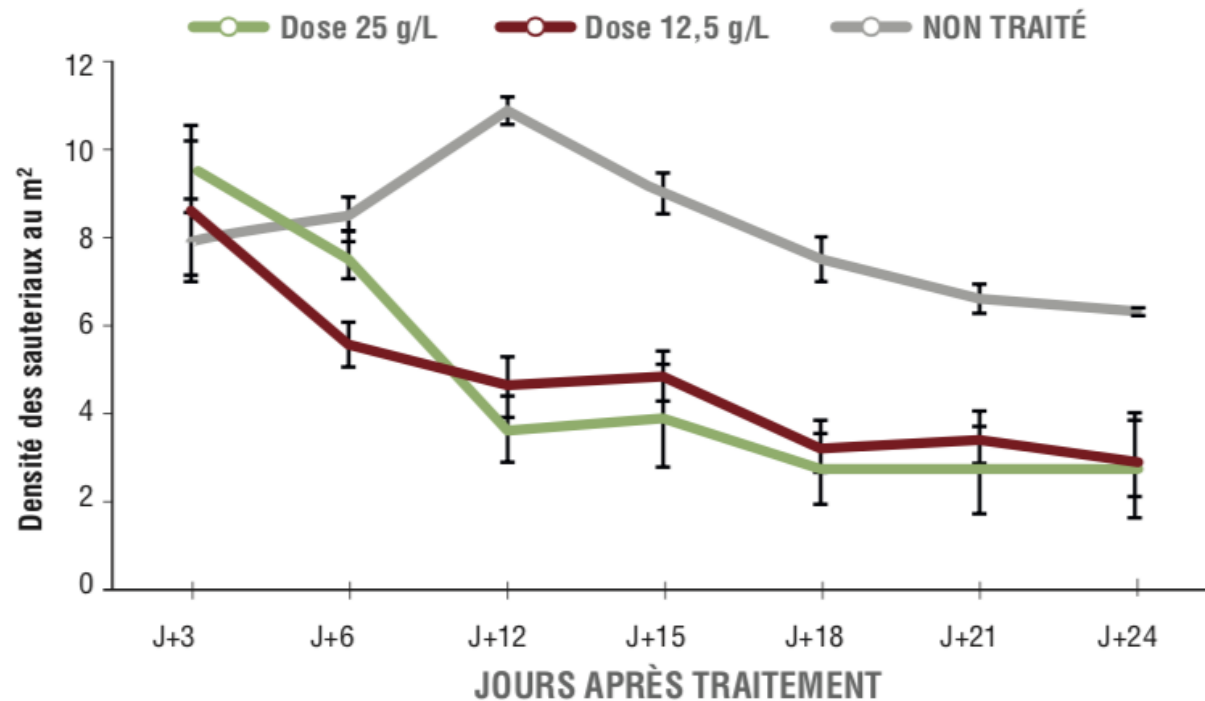
1 application

DPV : Direction de la protection des plantes



Avec Bing  
© Microsoft

## Essai Novacrid<sup>®</sup> au Sénégal (2017) Évolution des densités de sauteriaux sur le terrain



## Trial results

12 days after Novacrid<sup>®</sup> treatment, density of living grasshopper reduced by half for both rates of 25 g/ha or 12,5 g/ha. 19 days after treatment, 100% of the grasshoppers are dead.

# REASON TO BELIEVE



- **EV *Metarhizium acridum* solutions registrations**
  - Registered in Kazakhstan, Uzbekistan, West Africa (CSP), Madagascar
  - Obtained provisional sales authorizations in Kenya, Ethiopia, Somalia
  - Under registration in Morocco, Algeria, Saudi Arabia, Oman
  - Has been registered & needs to be renew in Sudan, South Africa, Mozambique, Zambia, Malawi, Zimbabwe, Tanzania and Yemen
- Approved and recommended by FAO and has been used in large scale in Madagascar (60 000 ha) and Tanzania (10 000 ha)
- Currently use to control the outbreak in East Africa (Somalia spraying on going on 80 000 ha)

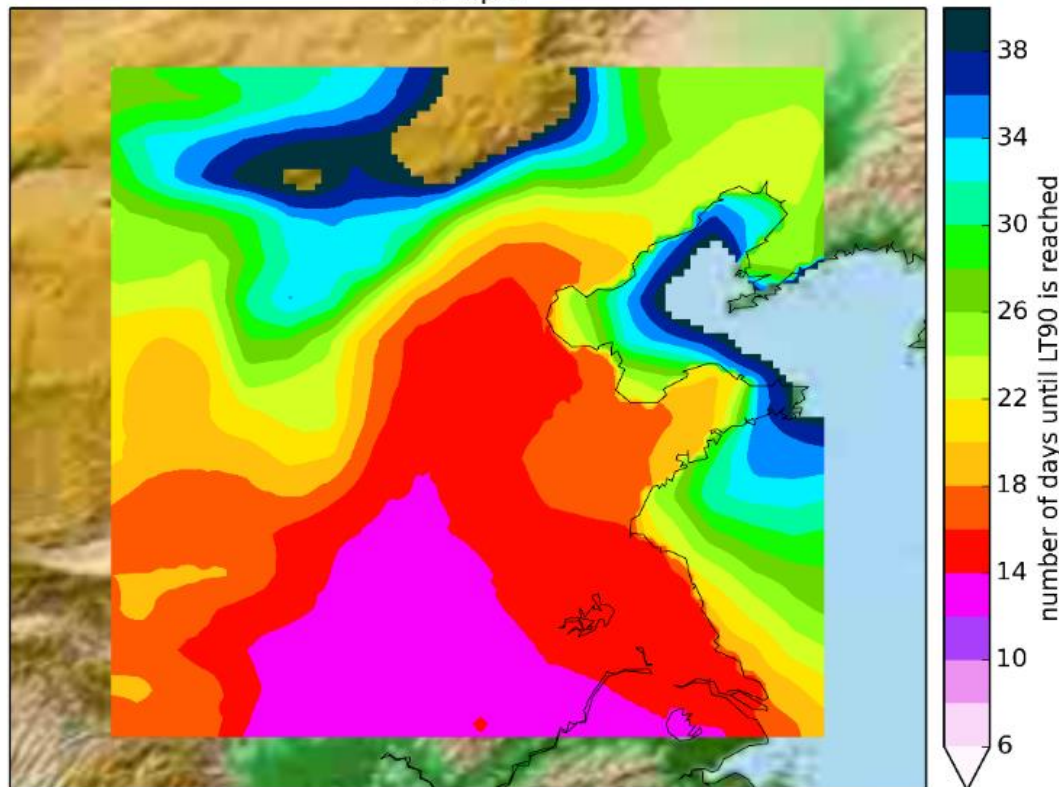


# BIOSUCCESS - PREDICTIVE MAPS



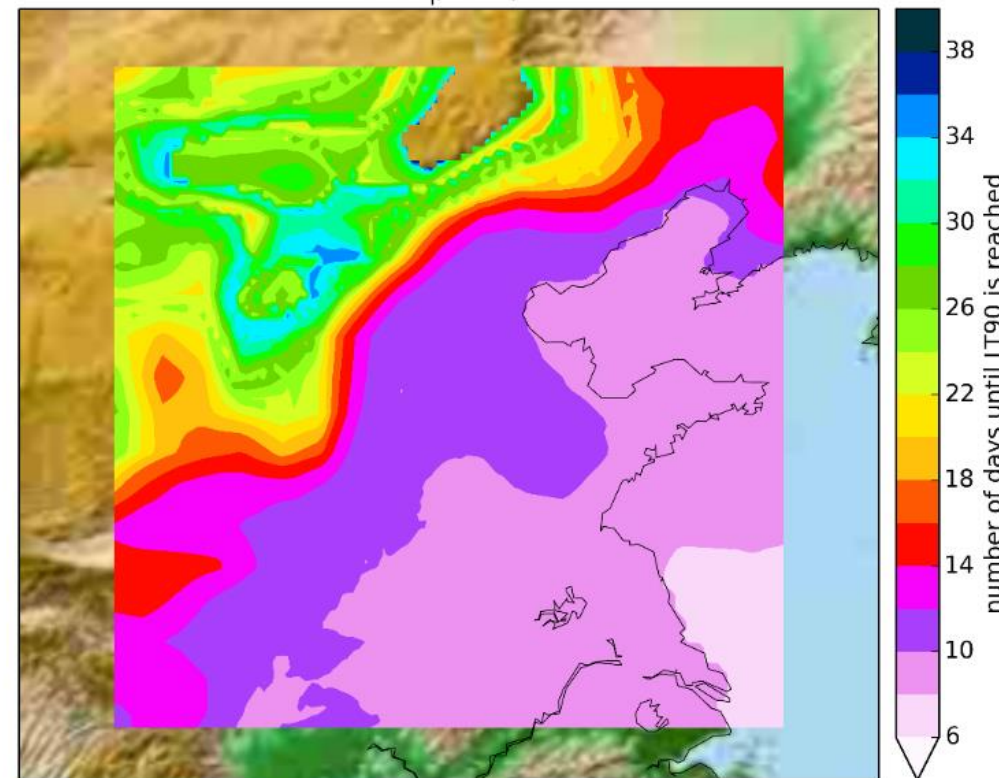
15<sup>th</sup> April

15 April



15<sup>th</sup> September

15 September



# CONCLUSION & CONCERNS FOR FURTHER DEPLOYMENT



- MTZ products have proved with some thousand hectare treated in East, Southern and West Africa that they are a consistent alternative to the Agrochemicals
  
- The need to increase the prevention policies :
  - Some existing survey organisations who need to be supported by the Donors when the States can't make it
  - Most of the time, funding come when the outbreaks are already there and out of control
  - The need of emergency stocks to address the hopper bands populations in the hotspots, preventing from the Outbreak
  
- Biocontrol has poor perception in general by the local authorities, the need to inform the stakeholders on the:
  - the agrochemicals negative impact
  - the existing alternative natural solutions

# THANK YOU FOR YOUR ATTENTION

[www.cabi.org](http://www.cabi.org)

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