Integrate Control for *Aedes aegypti* Population Suppression

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Sterile Insect Technique (SIT)

Birth Control Method:
- Mass rearing
- Sex separation
- Sterilization (irradiation)
- Packing, transport, release
- Sterile matings
  
= no offspring

1. MALE STERILISATION

2. RELEASE

3. POPULATION SUPPRESSION

The Wolbachia suppression approach (IIT/SIT)

uninfected

infected

Population Suppression
### SIT X IIT/SIT

<table>
<thead>
<tr>
<th>SIT</th>
<th>IIT/SIT</th>
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</thead>
<tbody>
<tr>
<td>• Male sterilization</td>
<td>• Male incompatibility</td>
</tr>
<tr>
<td>• 70 Gy</td>
<td>• Female sterilization</td>
</tr>
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<td></td>
<td>• 28 – 30 Gy</td>
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#### Open Field Release of OX513A Aedes *aegypti* Transgenic line evaluation

![Projeto Aedes Transgênico](image)
Repressive of Insects carrying a Dominant Lethal gene (RIDL) – From OXITEC Biotech (UK)

Antidote (Tetra)

tetO Minimal promoter

dead

tTA

Thomas et al. 2000 Science 287: 2474-6

Local and National Community Engagement

Pre-Release

Local Leaders

Release

Local and National Authorities

Public Consultant

Site Selection

CTNBio Approval

Post-Release
**Aedes aegypti Production (UPAT)**

**COLONY**
4 to 6 million eggs/week

**Males for releases**
1.5 million/week

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**Itaberaba – Field site**

![Field site map with control and area A and B](image_url)
Pupa transportation (LEMI)

C25

BOD 16°C ON

180,000 per container

Arriving at LEMI
Emergency, Monitoring and Information Lab

Preparation for release

Project Phase 2 – Jacobina - Bahia
How to implement Transgenic mosquitoes in Integrate Control Programs?

- Egg distribution is easy
- Hatch centers – no larvae sorter
  - no tetracycline needs
  - after release no offspring
Improving transgenic lines  
*Aedes aegypti* and *Aedes albopictus*

- Producing GSS (Genetic Sexing Strain)
- Producing Sterile male strain (no Larvae)
- Use of tetracycline only in colonies
Improving transgenic lines *Aedes aegypti* and *Aedes albopictus*

- Producing GSS (Genetic Sexing Strain)
- Producing Sterile male strain (no Larvae) ✔
- Use of tetracycline only in colonies ✔

Sterile Conditional Construct (SCC)

- 60% Homozygous
- 80% Reduction

![Graph showing percentage of Taxa de eclosão (%) for different strains.](image)
Production for Release

- Mechanical Control
- Remove breeding sites
- Education:
  - Community Engagement
  - and Responsibility
- Population Suppression
- SIT
- Bti
- Larvicides
- Fishes
- Autodissemination
  - Pyriproxyfen
- Chemicals
- Adulticides
- SCC

2016
2017
Capacity: 12 million males for release

Moscamed Brasil
UPAT

Universidade de São Paulo
LEMI

INCT - EM
PRONEX/DECIT