Integrate Control for *Aedes aegypti* Population Supression

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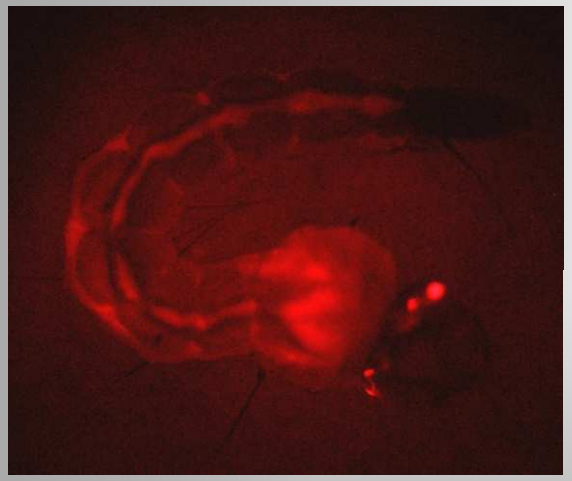
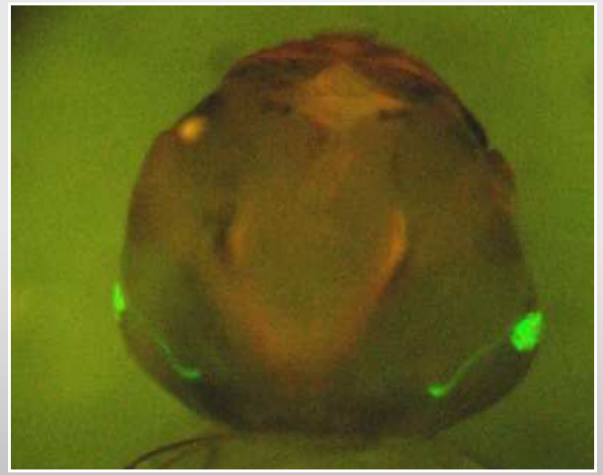
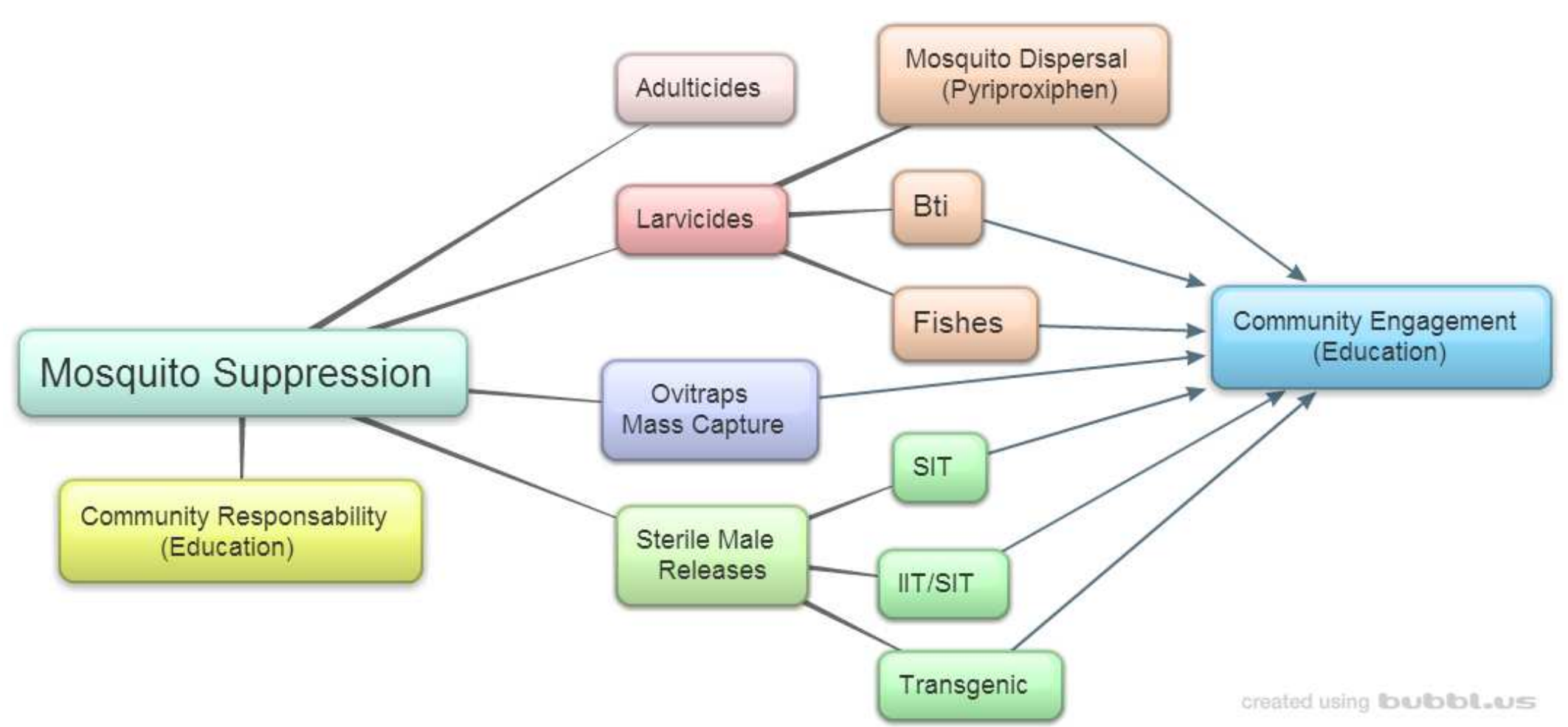


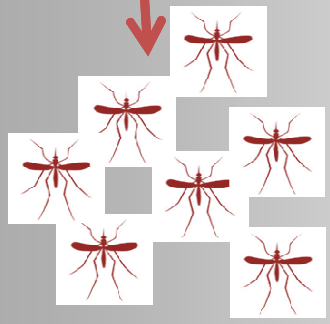



Mosquito Suppression
Adulticides
Mosquito Dispersal (Pyriproxiphen)
Larvicides
Bti
Fishes
Community Engagement (Education)
Ovitraps Mass Capture
Community Responsability (Education)
Sterile Male Releases
SIT
IIT/SIT
Transgenic
created using bubbl.us

Sterile Insect Technique (SIT)

1. MALE STERILISATION

Irradiation



2. RELEASE

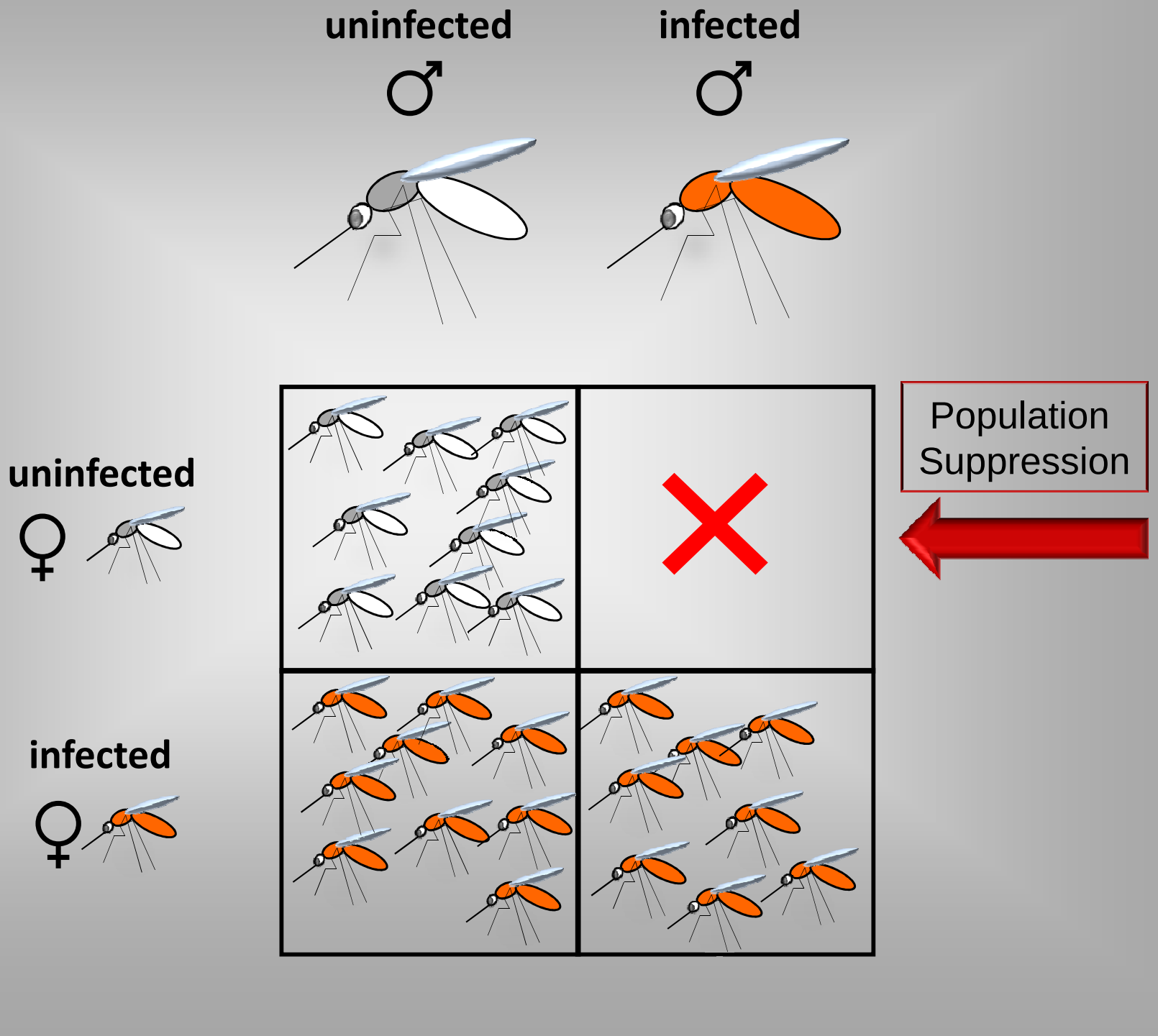
3. POPULATION SUPPRESSION

Birth Control Method:

- Mass rearing
- Sex separation
- Sterilization (irradiation)
- Packing, transport, release
- Sterile matings

= no offspring

The Wolbachia suppression approach (IIT/SIT)



SIT X IIT/SIT

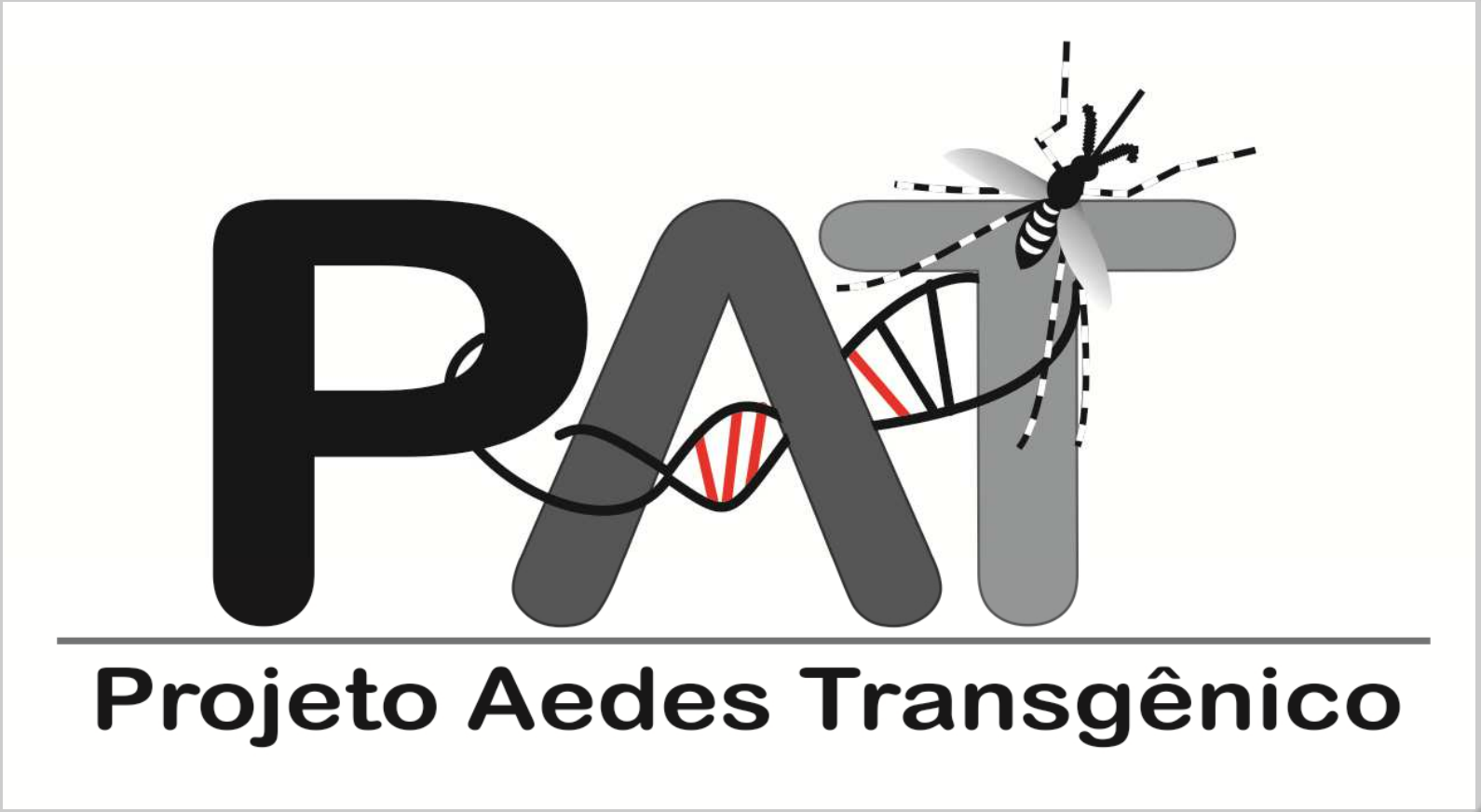
SIT

- Male sterilization
- 70 Gy

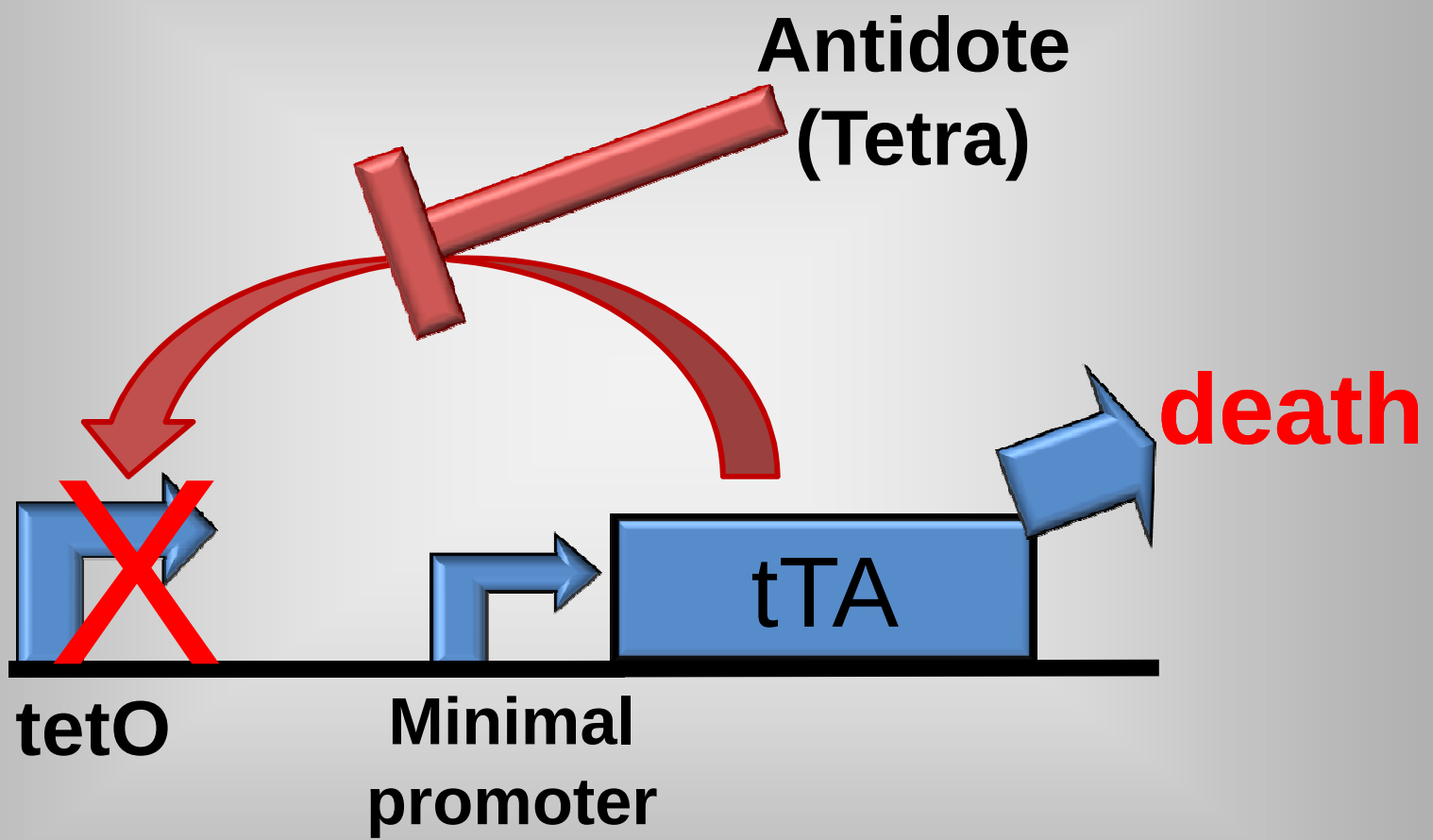
IIT/SIT

- Male incompatibility
- Female sterilization
- 28 – 30 Gy

Open Field Release of OX513A *Aedes aegypti* Transgenic line evaluation

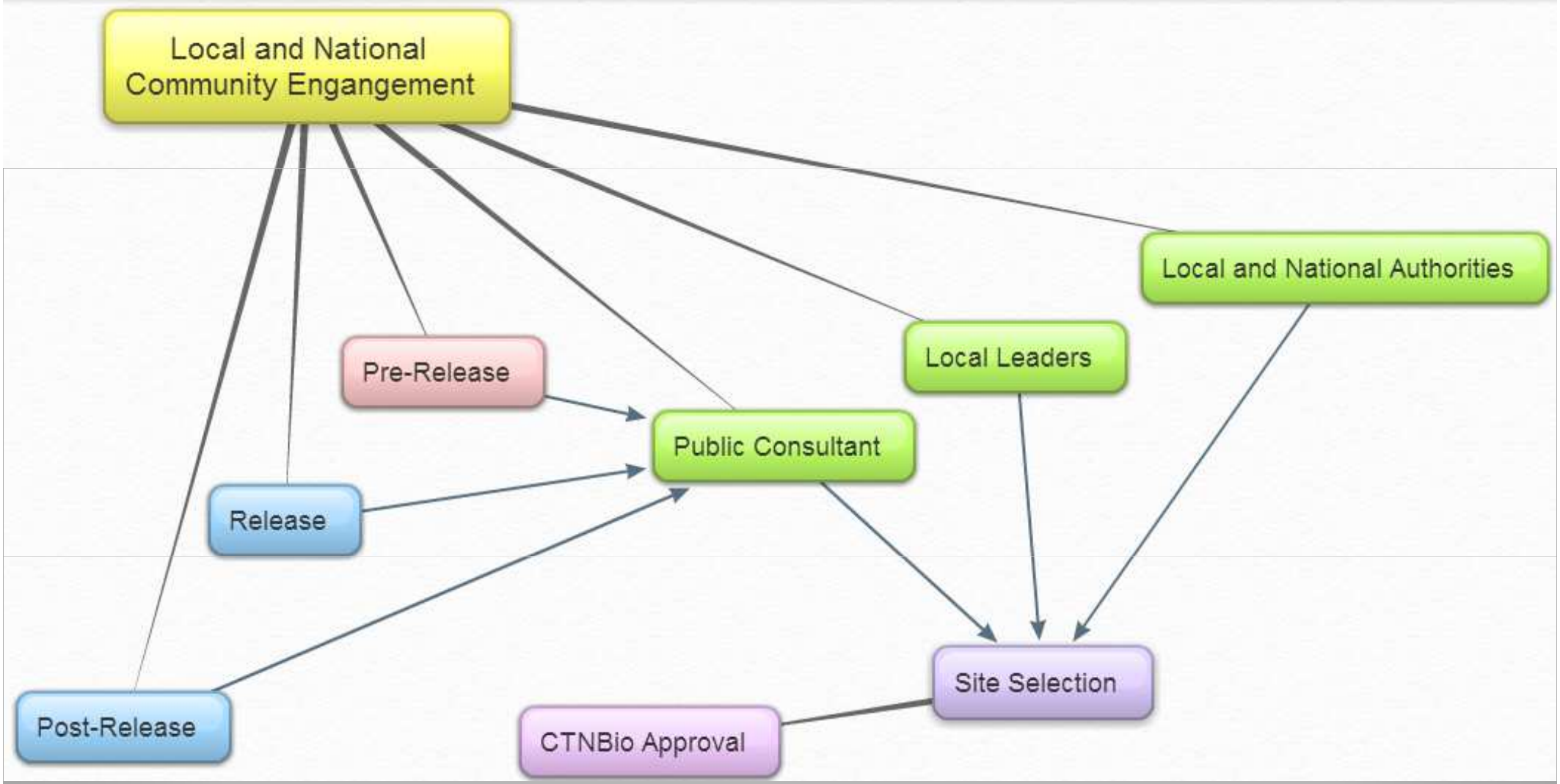


Repressive of **I**nsects carrying a **D**ominant **L**ethal gene (RIDL) – From OXITEC Biotech (UK)



Thomas *et al.* 2000 Science 287: 2474-6

Projeto Aedes Transgênico

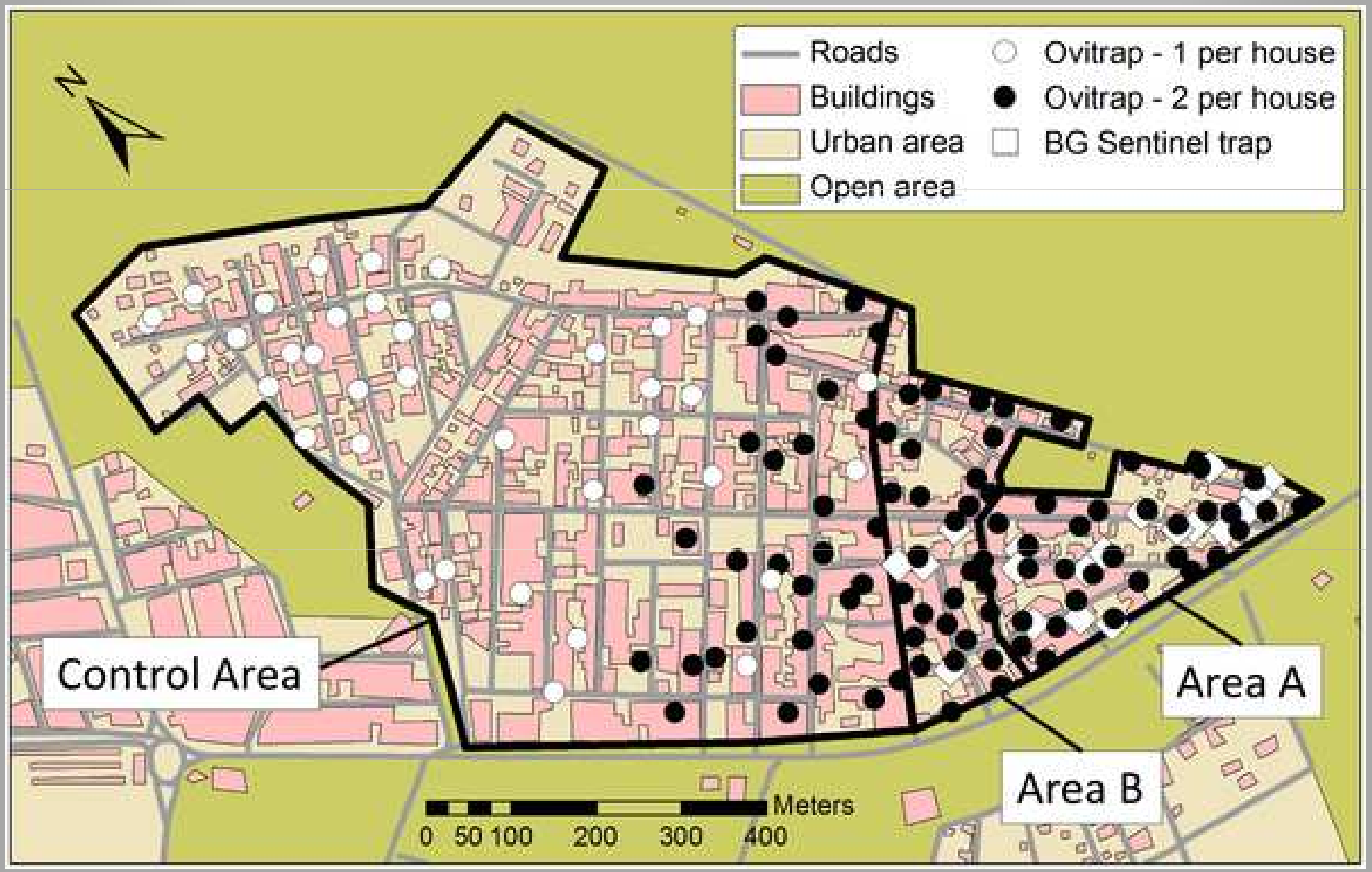


Aedes aegypti Production (UPAT)

COLONY
4 to 6 million eggs/week

Males for releases
1,5 million/week

Itaberaba – Field site



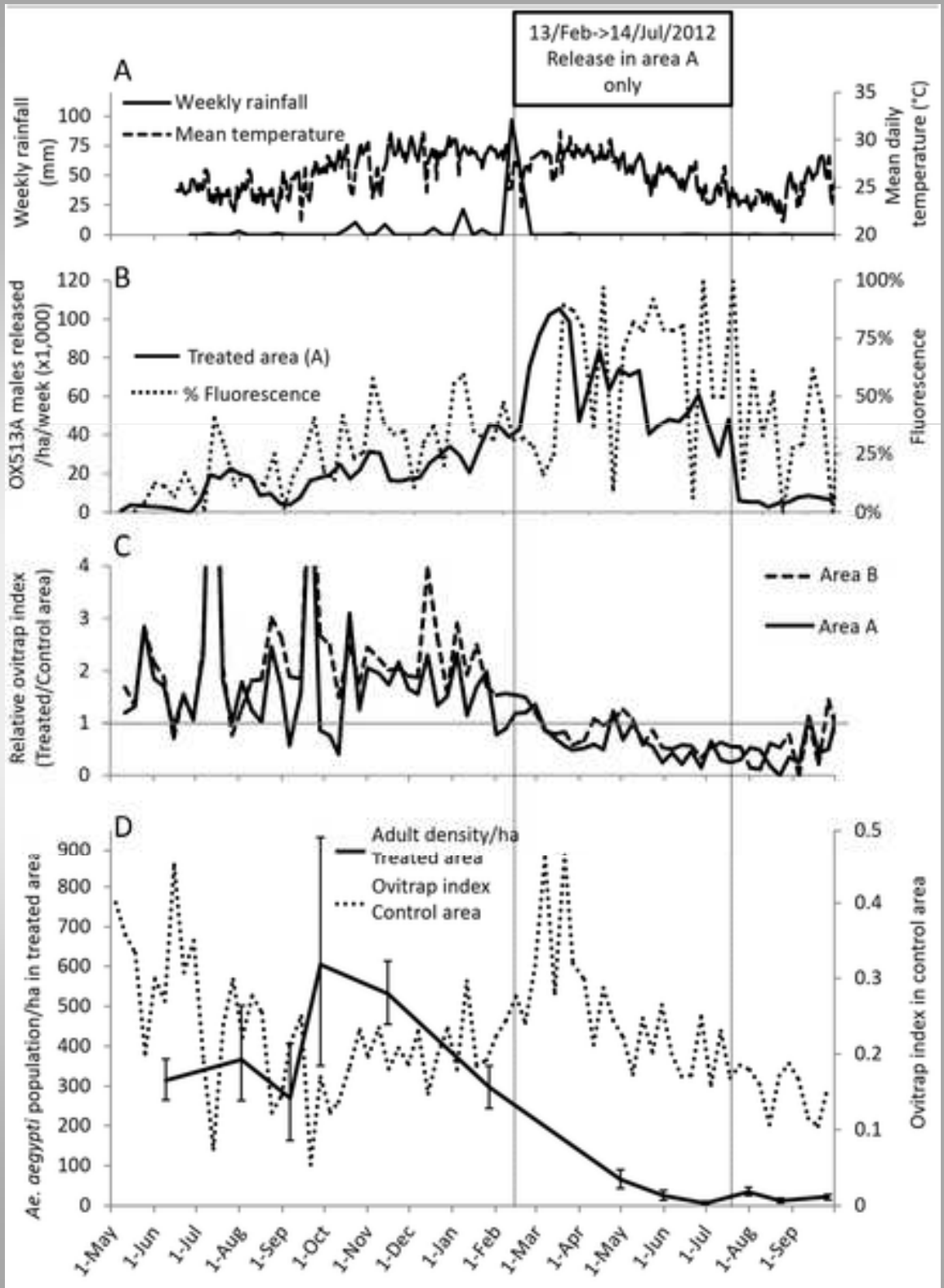
PLOS | NEGLECTED TROPICAL DISEASES

RESEARCH ARTICLE

Suppression of a Field Population of *Aedes aegypti* in Brazil by Sustained Release of Transgenic Male Mosquitoes

Danilo O. Carvalho[1,2☯], Andrew R. McKemey[1☯*], Luiza Garziera[3], Renaud Lacroix[1], Christl A. Donnelly[4], Luke Alphey[1,5,6], Aldo Malavasi[3], Margareth L. Capurro[2,7]

PLOS Neglected Tropical Diseases | DOI:10.1371/journal.pntd.0003864 July 2, 2015



Projeto Aedes Transgênico

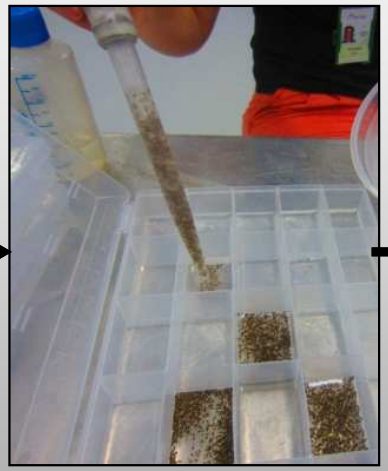
New Project – Jacobina - Bahia

Pupa transportation (LEMI)

C25

BOD 16ºC ON

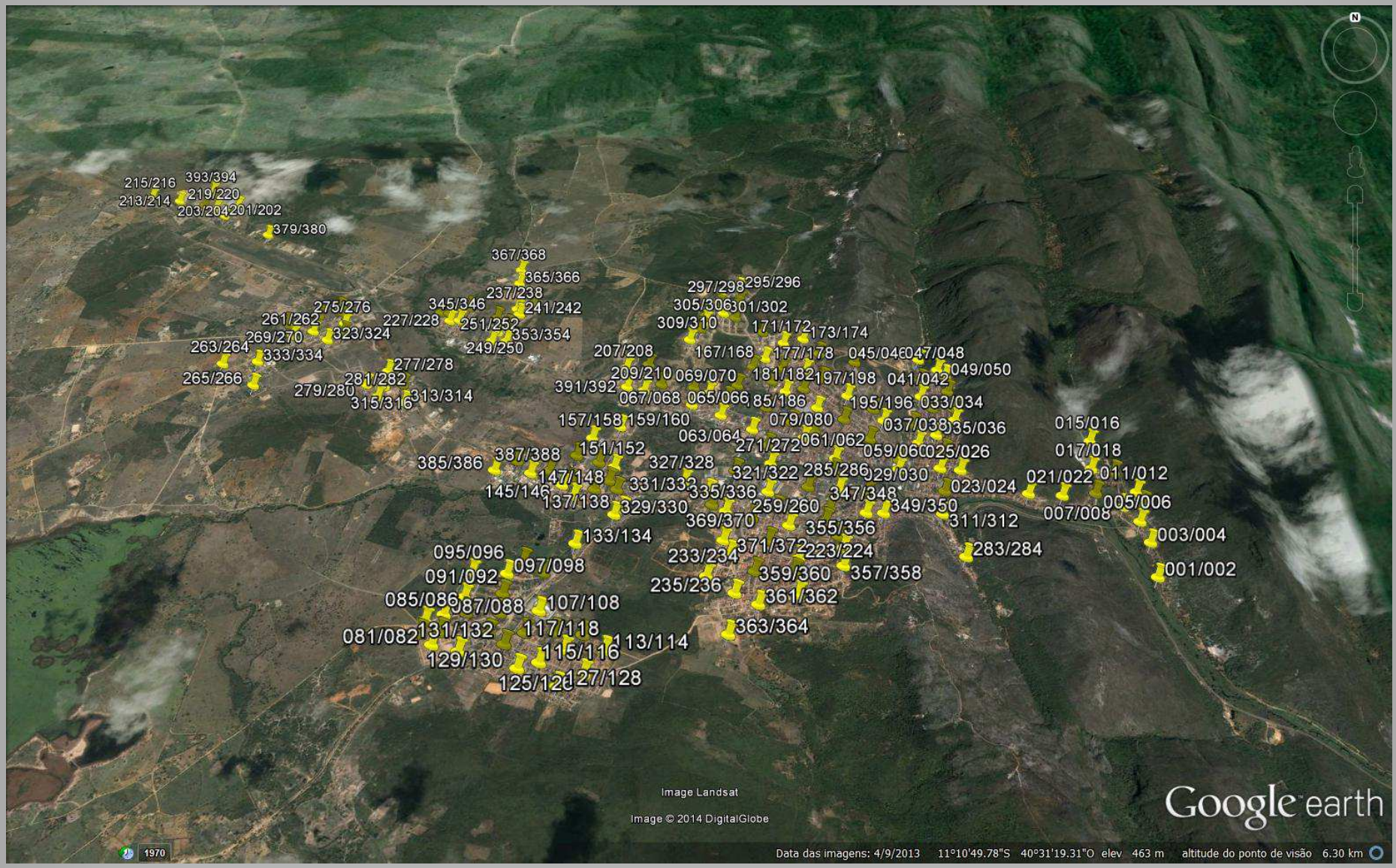
180,000 per container



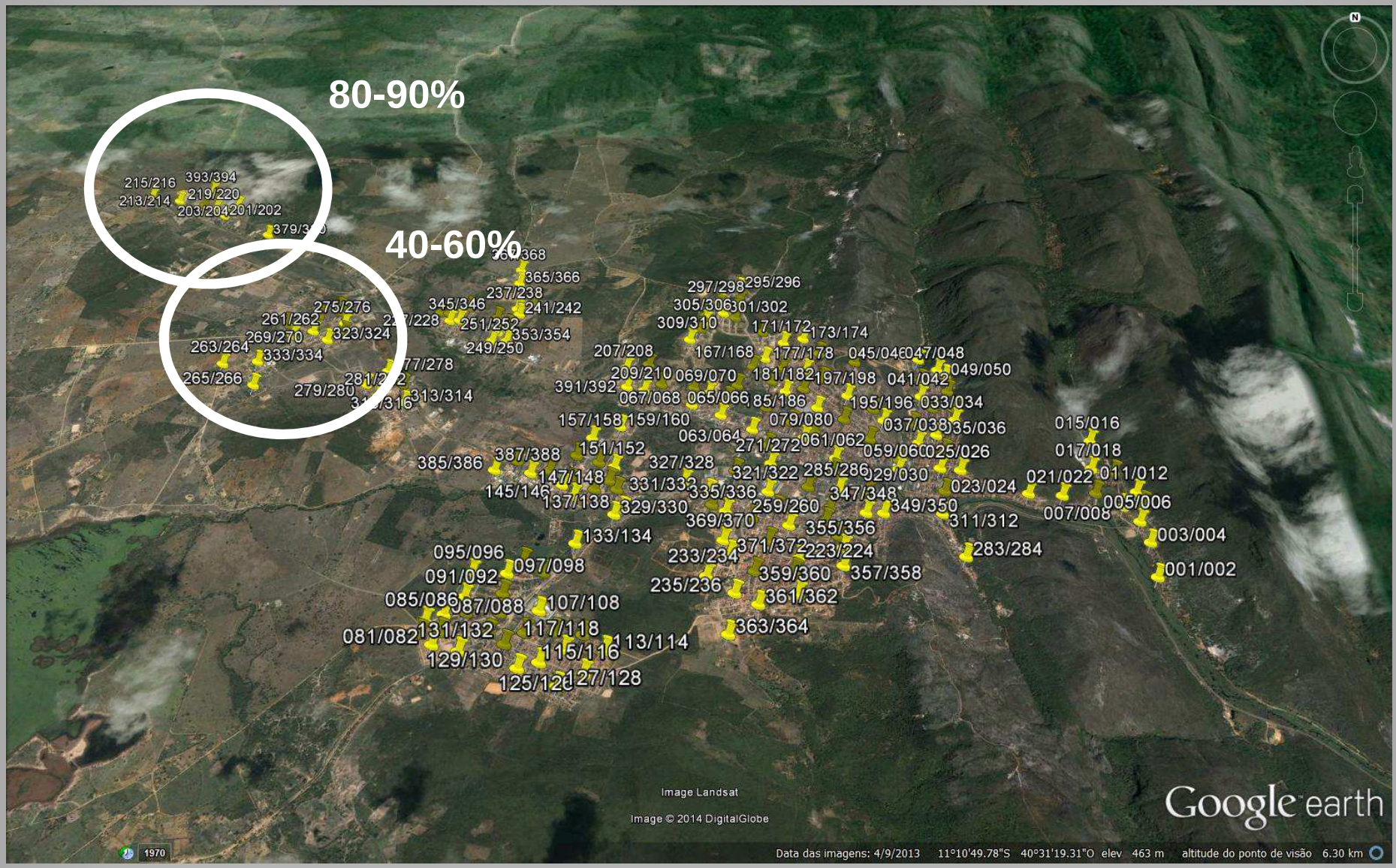
Arriving at LEMI
Emergency , Monitoring and Information Lab

Preparation for release

New Project – Jacobina - Bahia



New Project – 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

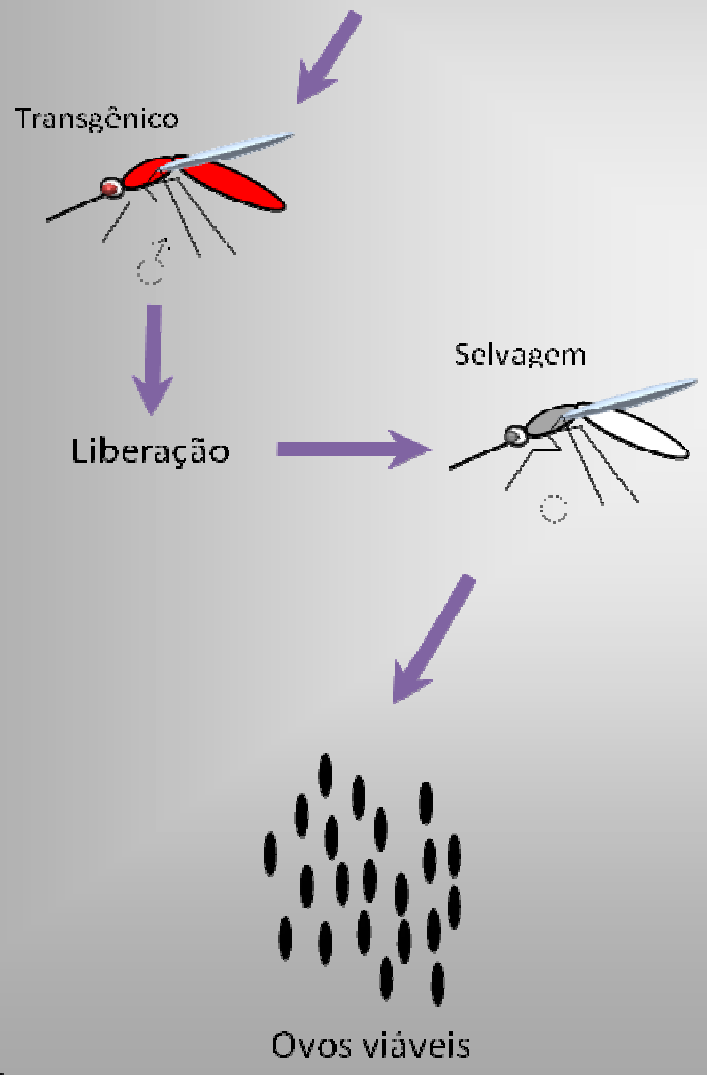
Improving transgenic lines *Aedes aegypti* and *Aedes albopictus*

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

Esterilização Genética Condicional

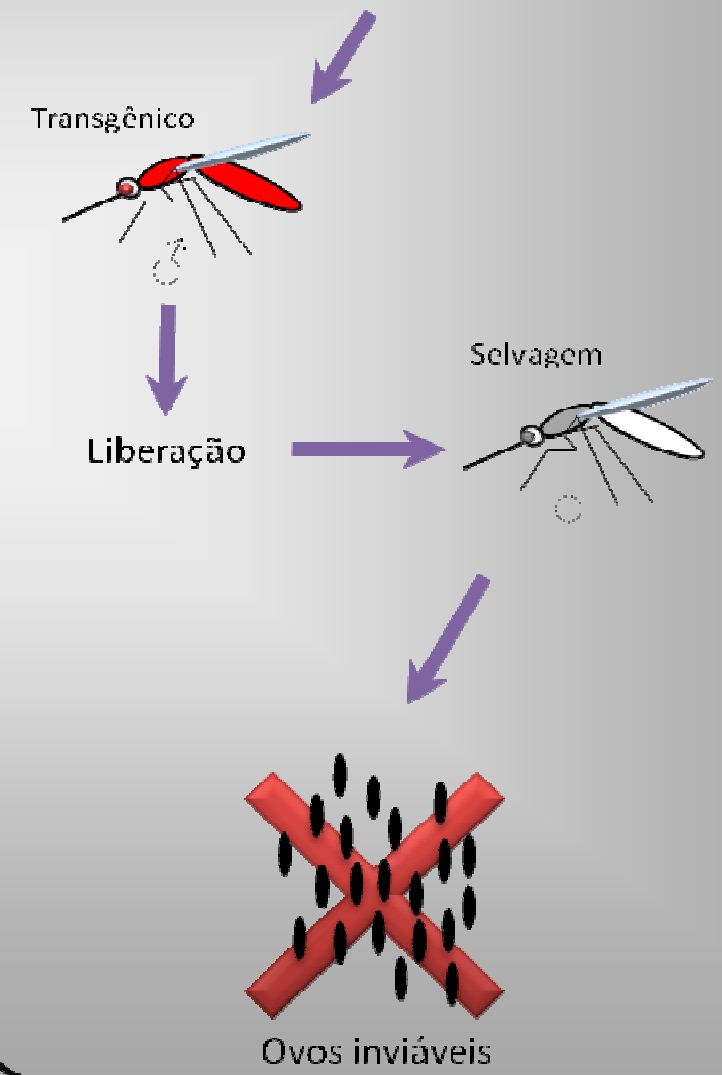
1° condição: Gene desativado

Produção de esperma + Molécula efetora + Antídoto



2° condição: Gene ativado

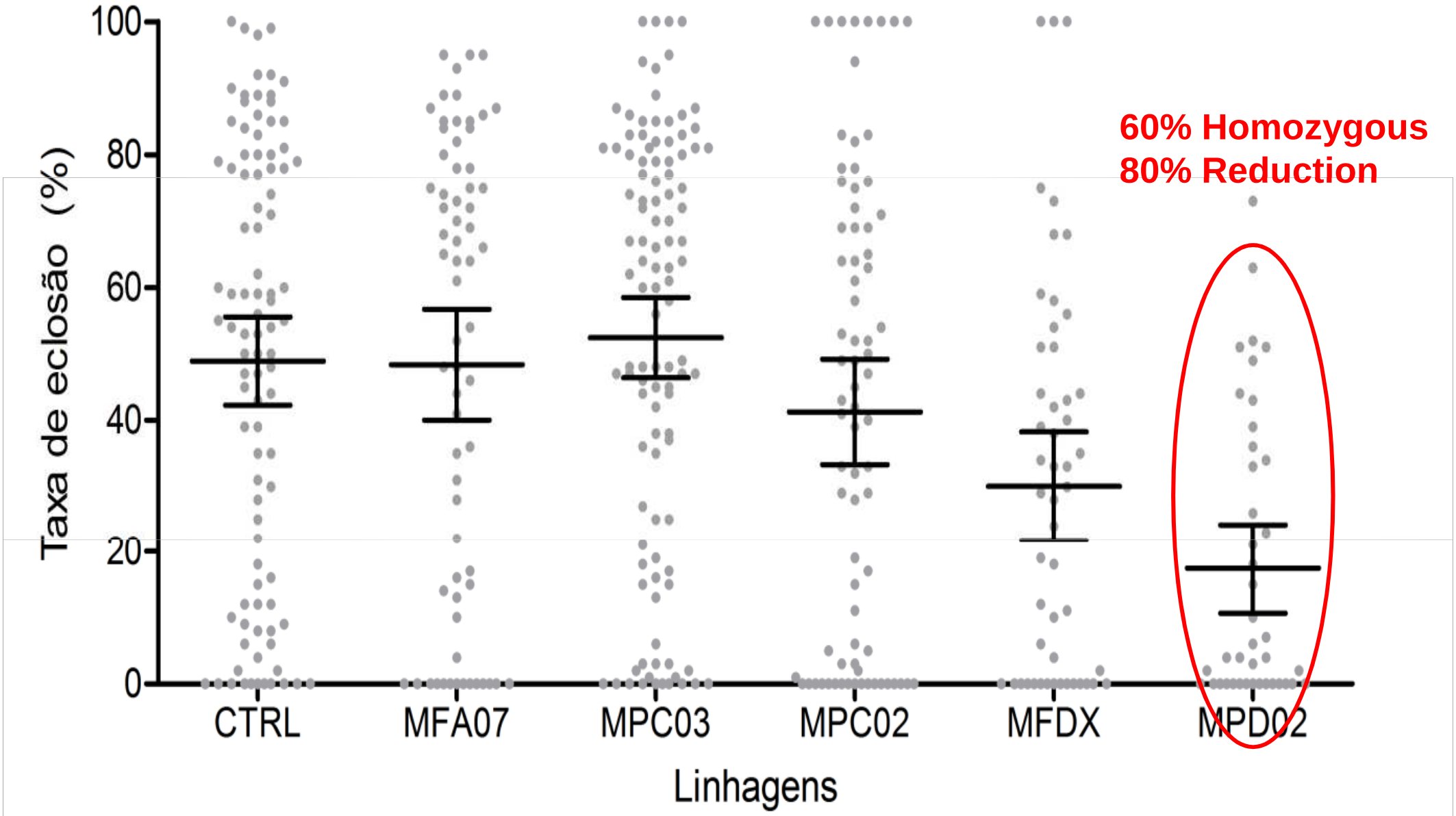
Produção de esperma + Molécula efetora - Antídoto



Sterile Conditional Construct (SCC) Homozygous generation

Strain	Generation					
	F2	F3	F4	F5	F6	F7
MFA07	20%	35%	45%	55%	70%	85%
MPC02	20%	40%	50%	55%	65%	70%
MPC03	25%	45%	60%	70%	75%	90%
MPD02	**20%**	**35%**	**40%**	**55%**	**60%**	- *
MPD01	15%	25%	30%	40%	50%	- *
MFDX	20%	35%	40%	55%	65%	- *

Sterile Conditional Construct (SCC)



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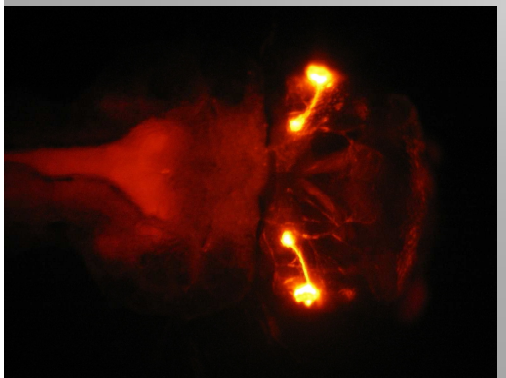
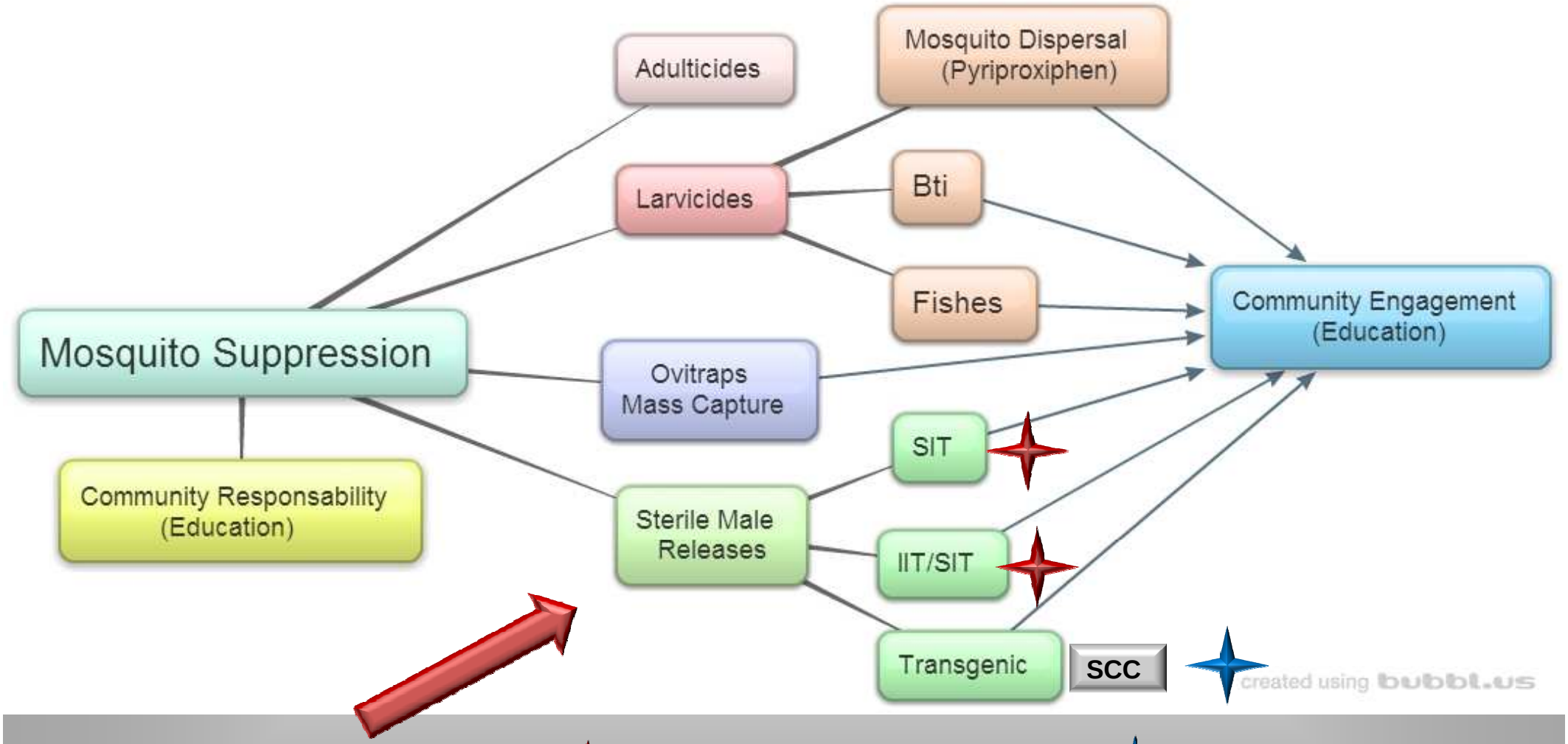


Production for Release



2016 **2017**

Capacity: 12 million males for release

Moscamed Brasil

UPAT

LEMI

Universidade de São Paulo

MOSCAMED BRASIL

Universidade de São Paulo

GOVERNO DA Bahia
TERRA DE TODOS NÓS
Secretaria de Ciência, Tecnologia e Inovação

FAPESP

CNPq
Conselho Nacional de Desenvolvimento Científico e Tecnológico

IAEA
International Atomic Energy Agency

INCT - EM
PRONEX/DECIT