Diversity of BM for Autocidal control / SIT

(Sterile insect technique)

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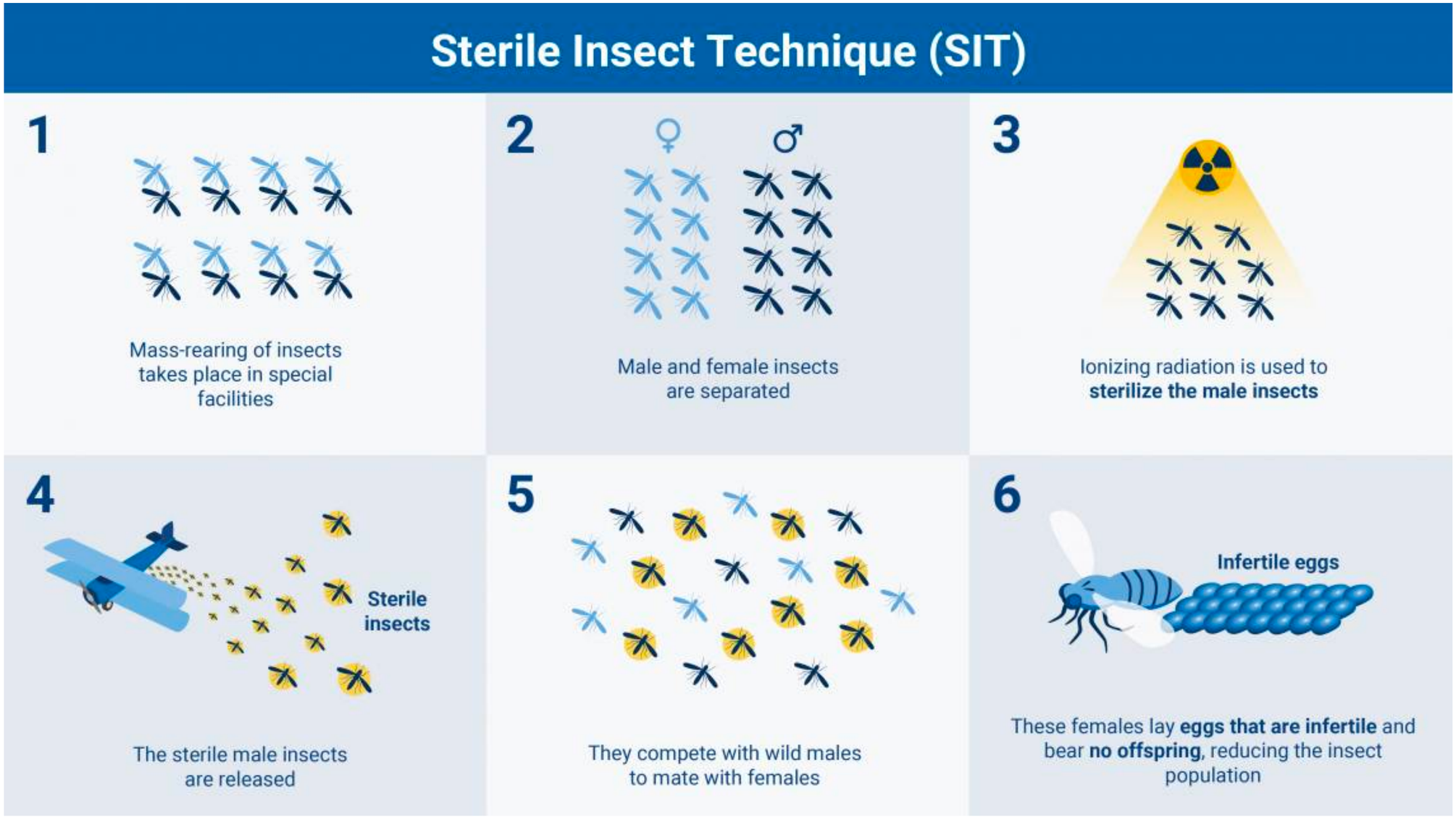
Basic principle of SIT



Benefits of SIT

- **Specific control** of a pest population
- **No risk of resistance**
- **Reduction of crop damages / disease transmission**
- **Ecological & health benefits** : less pesticides use
- **Compatible with many BC tools**
- **Awareness** : multi-stakeholder involvement (incl. public**)**
- **Cooperative action**

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Example : Suppression of codling moth in Canada

- 2900 ha
- <0.2% fruit damage
- 94% pest reduction
- 96% reduction of pesticides
- Improvement of rural-urban relationships
- Opening of new markets
- Cost/benefits: 1 / 2.50

https://www.oksir.org/

Requires mass-rearing facilities

Some very large facilities and programs exporting sterile flies

El Pino, Guatemala
Production capacity 2500M flies/week

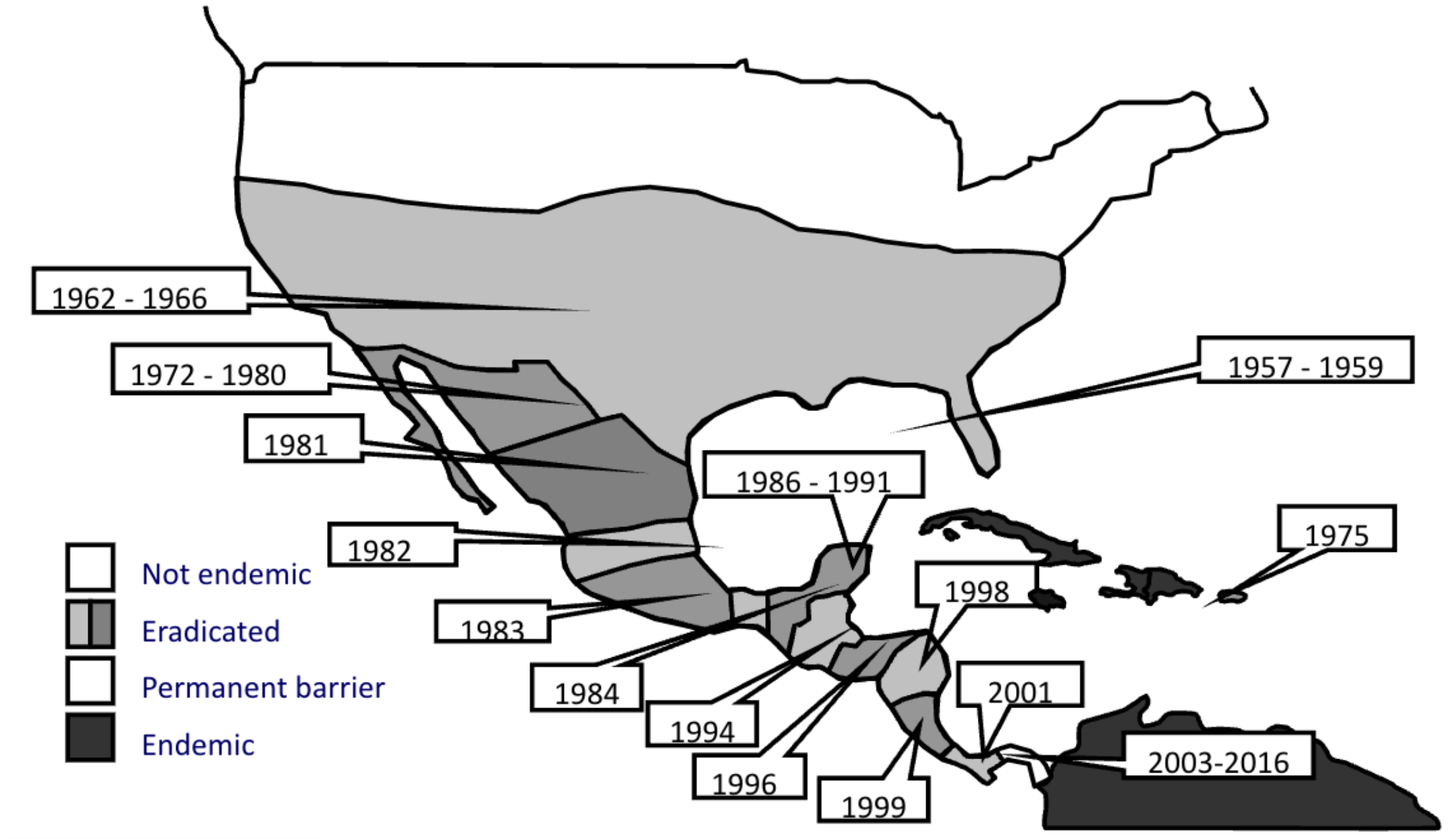
Mexico
1000M/week

Objectives of use

- **Suppression** (reduction pest pop under economic/health risk threshold
- **Prevention** (avoid invasion)
- **Containment** (stop invasion)
- **Eradication**

Different Business Models to build

Example:
Progressive Eradication of Screwworm (C. hominivorax) using SIT from North America to Panama



Over 50 year campaign

Cost >US $1 billion

Yearly benefit ca. US $1,5 billion

Example:
C. capitata containment in Guatemala and Anastrepha spp. control in Mexico

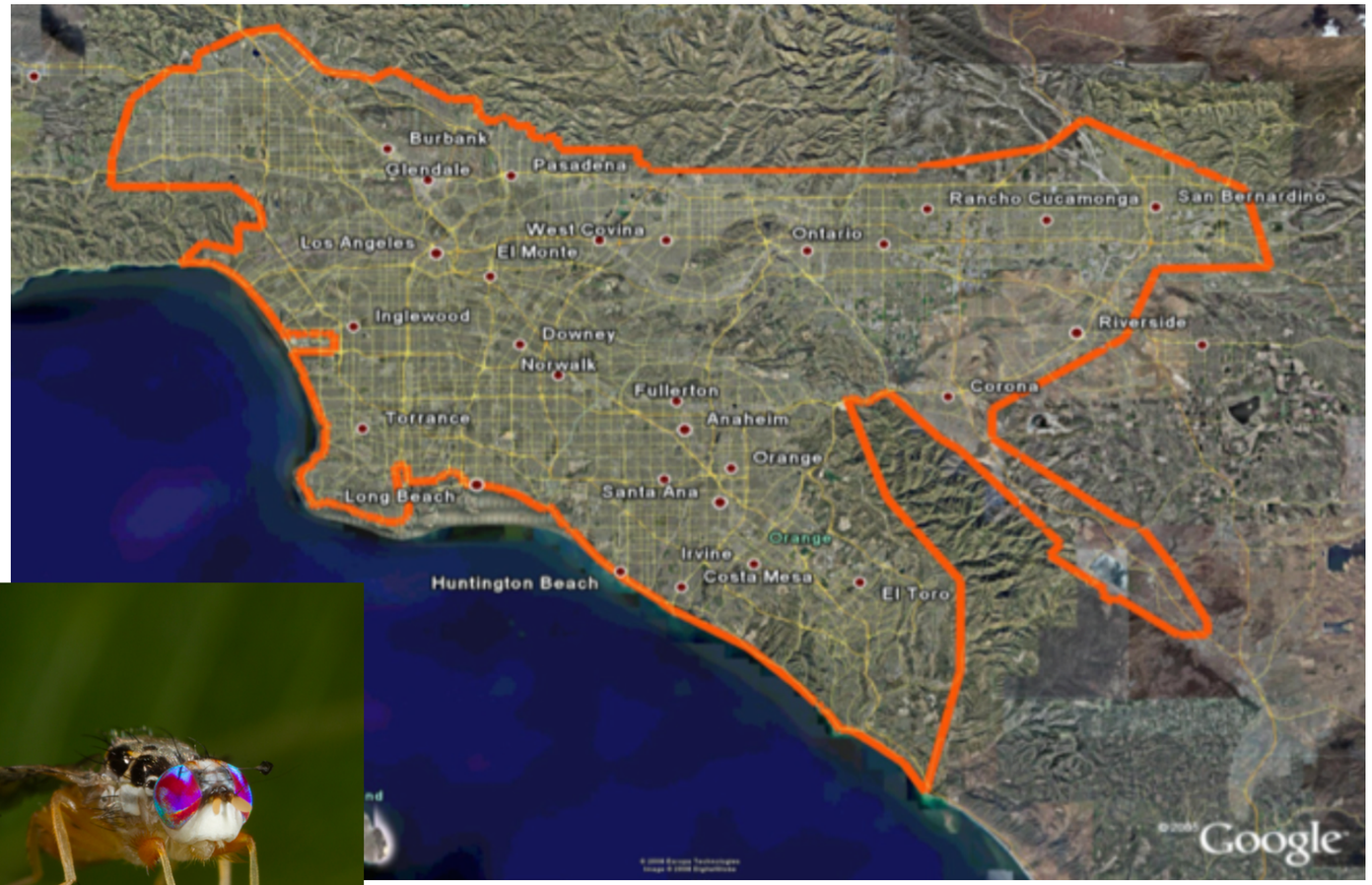
For Mexico

Revenue ca. US $1.3 billion/yr

Vs. cost 0,15billion/yr

Economic return of ca USD 112 for 1$

Example:
Successful Preventive SIT Release Programme
Los Angeles Basin, California



Since 1994
ca 25000 ha

Cost 16 million US$/year
"minimal when compared to the costs of eradication efforts and also serves to limit quarantines imposed upon U.S. growers and industry, thus enhancing global trade efforts"
No pesticides are utilized

Infestation cost for California's economy estimated
USD 1300–1900 million /year

A majority of agricultural programs involving public support

*non exhaustive list

Government (national/regional) involvement (27)

- Argentina (2 entities, agri)
- Australia (3 entities, agri)
- Brazil (1 entity, agri)
- Burkina Faso (1 entity, tse-tse)
- Canada (1 entity, agri)
- Chile (1 entity, agri)
- Costa Rica (1 entity, agri)
- Ethiopia (1 entity, tse-tse)
- Guatemala (1 entity, agri)
- Japan (1 entity, agri)
- Kenya (1 entity, tse-tse)
- Mauritius (1 entity, agri)
- Morroco (1 entity, agri)
- Mexico (2 entities, agri)
- Panama (1 entity, screw-worm)
- Peru (1 entity, agri)
- Spain (1 entity, agri)
- Tanzania (1 entity, tse-tse)
- Thailand (1 entity, agri)
- USA (4 entities, agri)

Private or PPP SIT programs (9)

- Canada (1 entity, agri)
- China (2 entities, mosquitoes)
- Israel (1 entity, agri)
- The Netherland (1 entity, agri)
- Slovakia (1 entity, tse-tse)
- South Africa (3 entities, agri)

14 pest species controlled by SIT
12 on the way to upscaling
14 in R&D phase

Emerging programs by private sector (5)

- UK (agri)
- Israel (2 entities, mosquitoes)
- France (mosquitoes)
- Italy (mosquitoes)

Emerging programs with some involvement of the Public sector (8)

- Brazil (1 entity, mosquitoes)
- Cuba (1 entity, mosquitoes)
- Indonesia (1 entity, mosquitoes)
- Mauritius (1 entity, mosquitoes)
- Singapour (1 entity, mosquitoes)
- Spain (1 entity, mosquitoes)
- USA (2 entities, mosquitoes)

Particularities of SIT that may impact the BM

Efficiency on a large-scale →
- **territory**
- local actors
- **integrated** strategy (incl. prophylaxy)
- progressive area-wide deployment

Innundative releases of insects →
- **factory**
- communication
- **community engagement**
- regulation for releases

Weekly/continuous releases of insects →
- **logistics**
- quality control
- timely **feedback from field** efficiency
- distribution network

More than a product --> a service involving several local actors

Perspective from transforming research output into a business

Terratis

Initial ressources needed

- Need to protect against mosquito nuisance and health risks
- Challenge : upscaling/industrialising the production and release processes
- Financial support opportunities as an innovative Greentech company
- Within the Social Economy (health, societal and environmental impacts)
- Communication and community engagement plans with local authorities
- Regulatory framework adapted to a commercial entity

The importance of building the BM knowing the ecosystem

Opportunities for a successful BM

- Terratis as a technological partner within the mosquito control ecosystem
- With local technical and commercial partners on the territories
- Expansion of production units on different territories (Regions of France)
- Further development to respond to agricultural needs

Speakers

Luc Brodeur Jocelyn Leclair	La mouche rose, Canada	**Cooperation between researchers and onion growers association** to develop the production of sterile onion fly in Quebec
Martin Wohlfarter	Ex Entomon, South Africa	**Initiative from a grower association** to develop SIT against codling moth : Failure case study
Jair Virginio	Moscamed, Brazil	**Non-profit Social Organization** providing SIT against medlfies and developing SIT against mosquito disease vectors