OXITEC

HEALTHY PEOPLE HEALTHY ENVIRONMENT

Oxitec ABIM Lucerne

October 2010
Hadyn Parry

Background

- Financial
  - Wellcome Trust
  - Grand Challenges
  - Investors
- Collaborations
  - Institute Pasteur
  - Malaysian Ministry of Health
  - USDA

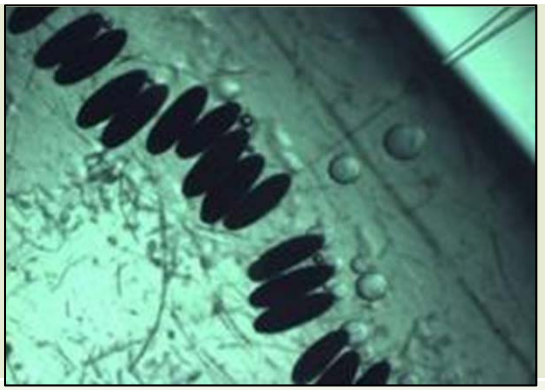
Bill and Melinda Gates Foundation

Grand Challenges in Global Health

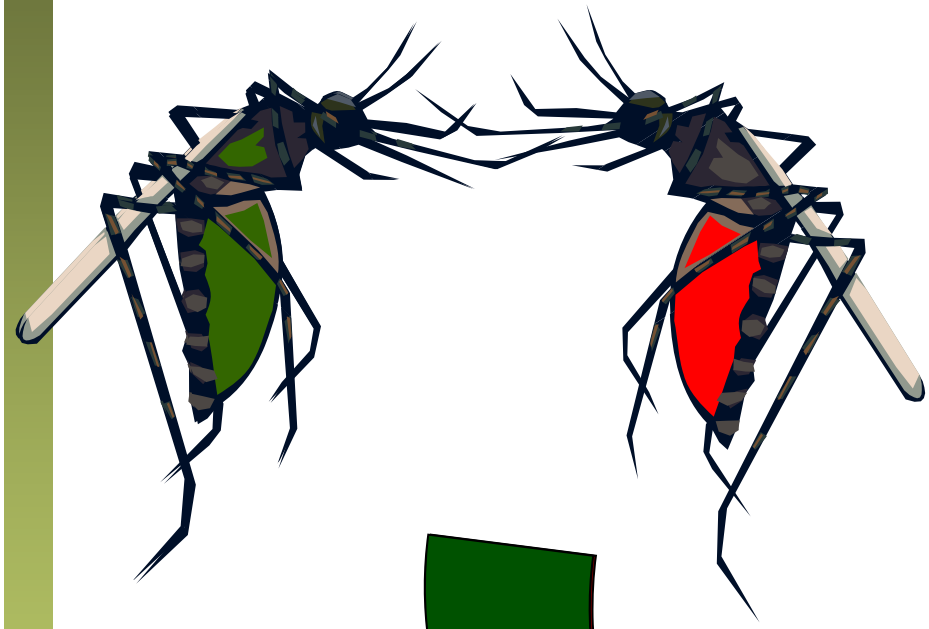
BBSRC INNOVATOR OF THE YEAR 2009

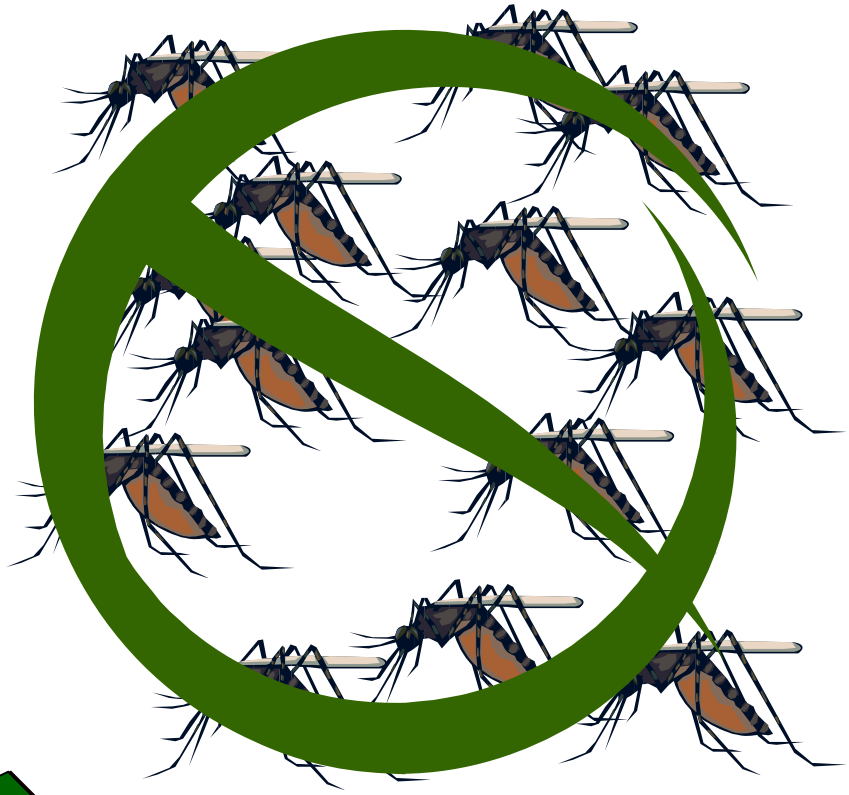
WORLD ECONOMIC FORUM Technology Pioneer 2008

Sterile Insect Techniques

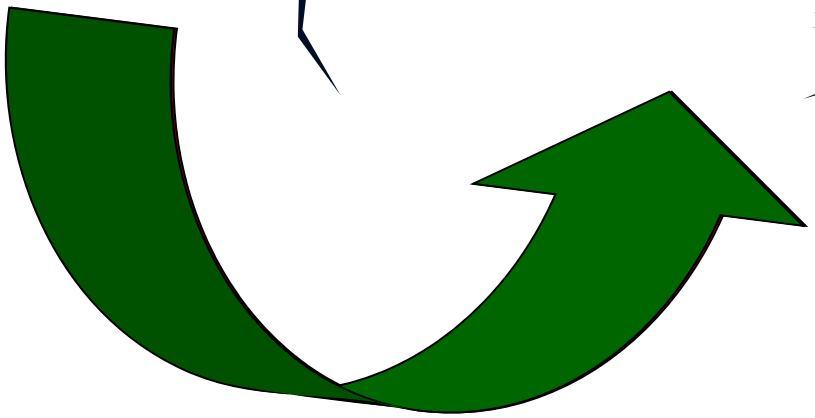
Radiation	Genetics
	
Benefits**:* proven approach long history ***Challenges: high capital expenditure Bio-safety mixed sex release damaging to fitness species limited	***Benefits**:* low capital applicable to local area control many species minimal fitness penalty Male-only release 'built in' monitoring ***Challenges*:** novelty regulatory

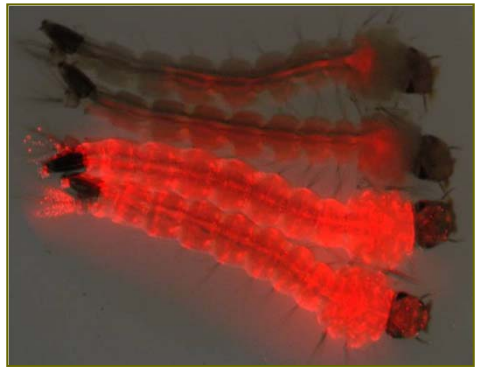
RIDL®





RIDL®



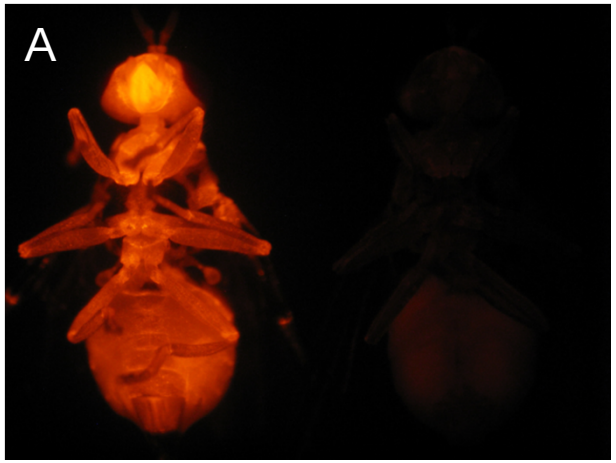


Benefits of Oxitec's approach

- reduction in target population
  - seasonal control
  - long term control (elimination)
- integration with other IPM /IVC approaches
- species specific
- self limiting strategy, controllable
- cost effective
- sustainable
  - APHIS (USDA) determined approach is not merely acceptable but is *environmentally preferable to all available alternatives.*

RIDL strains in olive fly (*Bactrocera oleae*)

- Olive fly RIDL female lethal strains:
  - Male only release
  - With or without irradiation
  - Bio-safety containment
  - Genetic marker



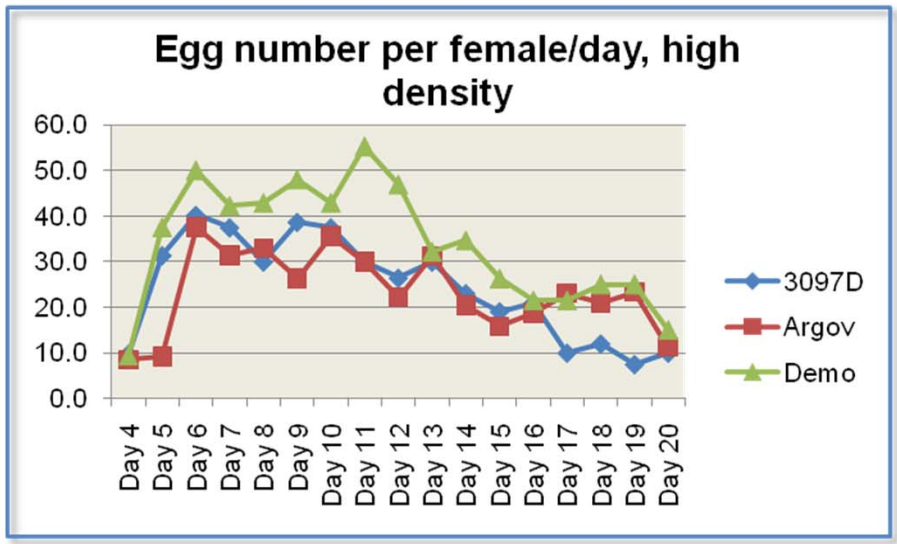
OX3097D WT

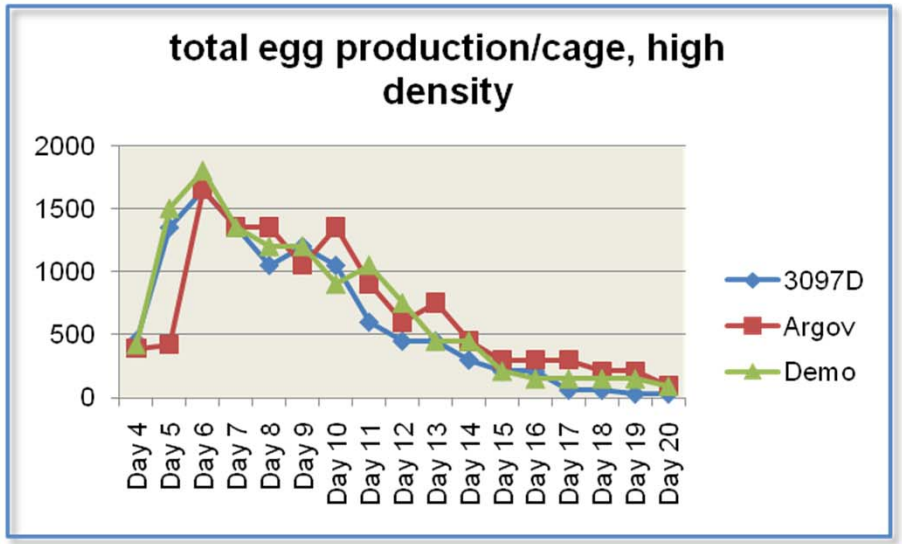
Red Filter

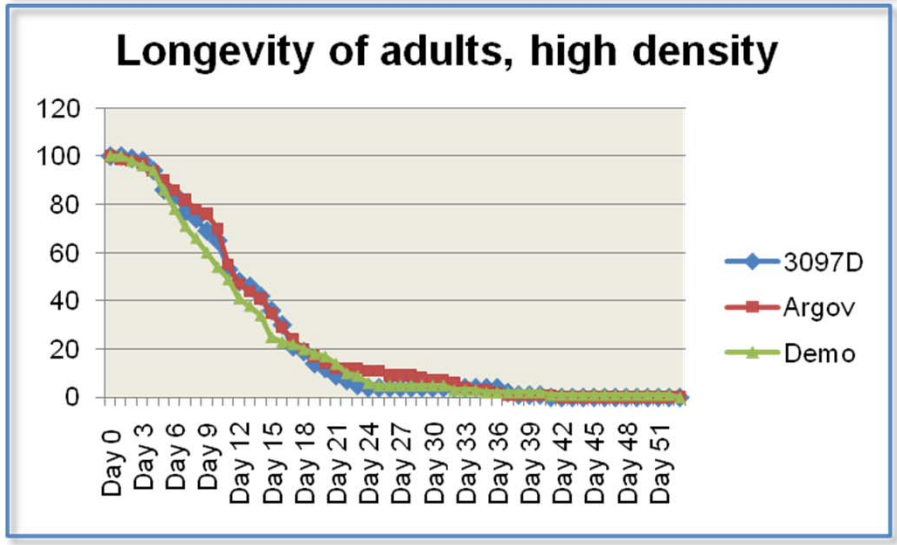
OX3097D WT

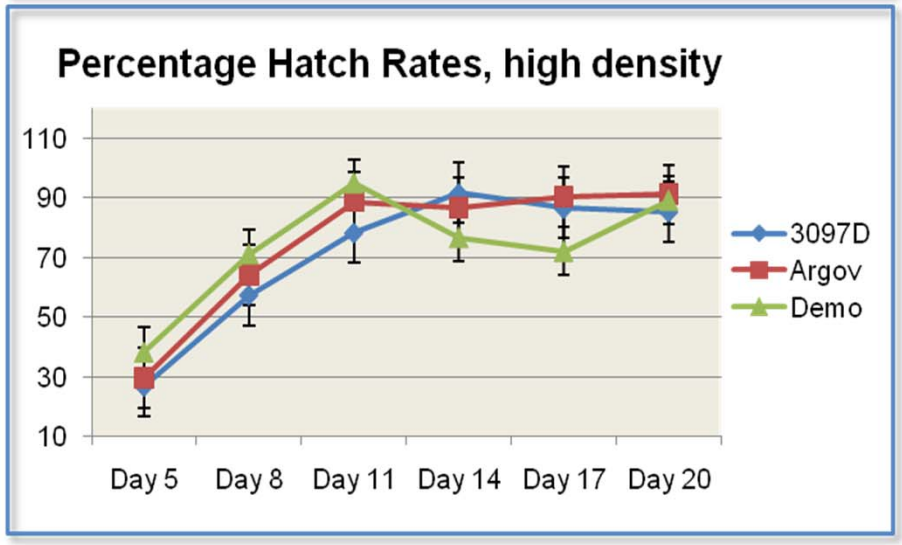
Bright Field

Olive fly: fecundity, production, hatch rate and longevity









Diamondback moth, *Plutella xylostella*

- The most significant pest of crucifers
- $1Bn cost of control worldwide
- IAEA-funded sterile insect technique trials:
  - "*male only releases should be considered for DBM, no efficient technique is currently available to separate large numbers of male and female pupae*"[1]
- Homozygous RIDL strains developed
  - Females die in absence of dietary supplement
  - Male-only releases
  - Currently in development
- Field trials expected 2011

[1]Nguyen Thi & Nguyen Thanh 2001 *Florida Entomologist* 84(2): 199-208

Tomato leafminer, *Tuta absoluta*

- Devastating European tomatoes
  - €95m losses in Spain, 2009
- Female-lethal strains currently in development
  - Allow for male-only release
  - Applicable in greenhouses, open field and packing houses

Agriculture and Public health

- RIDL easily transferred between species

- Fruit Fly RIDL strains developed
  - *Ceratitis capitata* Medfly
  - *Anastrepha ludens* Mexican Fruit Fly
  - *Bactrocera oleae* Olive Fly
- Moth strains
  - *Pectinophora gossypiella* Pink Bollworm
  - *Plutella xylostella* Diamondback moth
- Mosquito strains
  - *Aedes aegypti*
  - *Aedes albopictus*

Mexican Fruit Fly

Pink bollworm in cotton

Diamondback moth

Aedes aegypti (female flightless) press Feb 2010

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