SCI Funding Agri-Innovation
22 March 2011
Breaking through

goals

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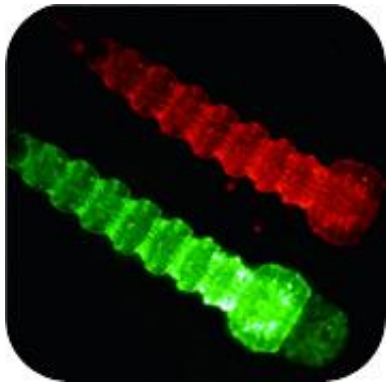
HEALTHY PEOPLE HEALTHY ENVIRONMENT



Combat insect borne diseases

Improve crop yields

through the reduction of the insect population causing disease or damaging crops

genetic approach that is safe, sustainable, economic and applicable to many insect species worldwide

background

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- **Company**
  - Founded in 2002
  - Oxford University spin out
- **Financial**
  - Oxford Capital
  - East Hill Management
  - Wellcome Trust
  - Gates Grand Challenges
- **Collaborations**
  - Institute Pasteur
  - Malaysian Ministry of Health
  - United States Dept Agriculture
  - Moscamed Brazil
  - SIPPE China

WORLD ECONOMIC FORUM
Technology Pioneer 2008

BBSRC
INNOVATOR OF THE YEAR 2009

dengue fever

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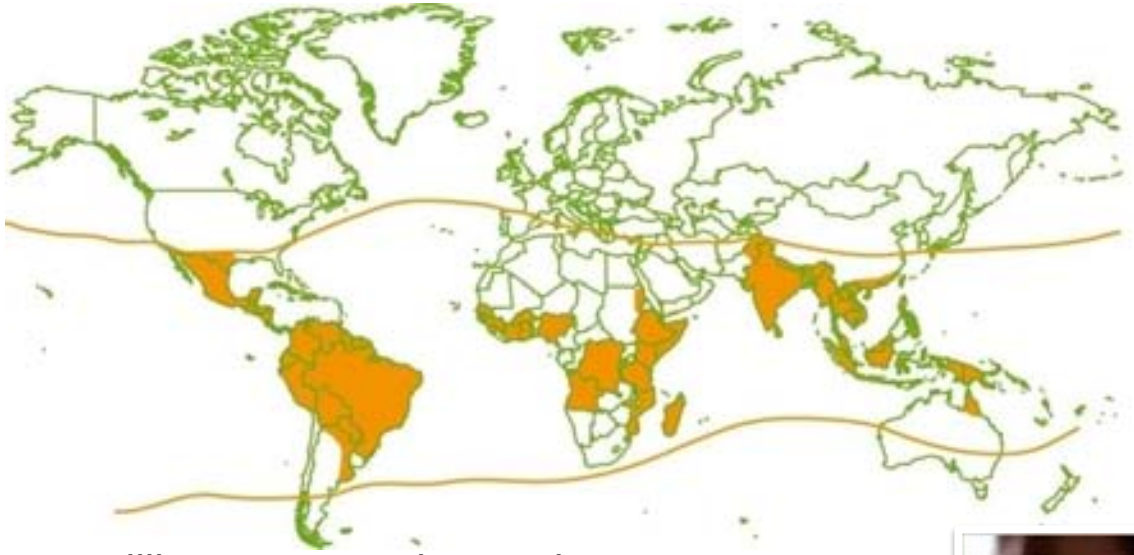
Dengue is a global unmet health challenge



$5 Bn burden of cost

Dengue fever risk areas

Worldwide distribution of dengue fever
Source: National Travel Health Network and Centre
www.nathnac.org, adapted from WHO

- 50 -100 million cases pa, increasing
- One main vector worldwide; *Aedes aegypti*
- Invasive species in most countries
- Symptoms – joint/muscle pain 'Breakbone fever'
- Severe form Dengue Haemorrhagic Fever (DHF)
- No medication or vaccine
- Same vector – Chikungunya and Yellow Fever

global threat from Dengue

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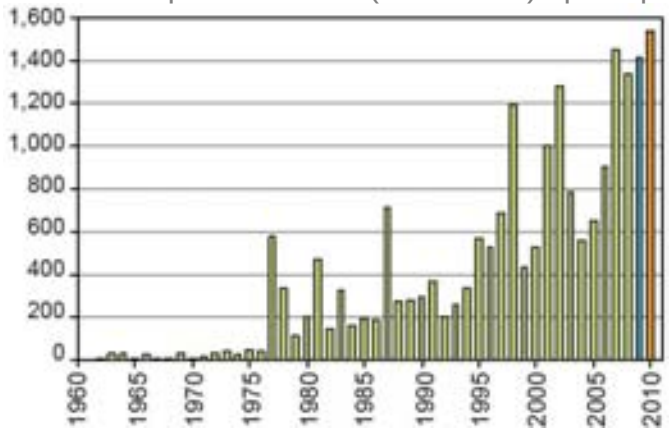
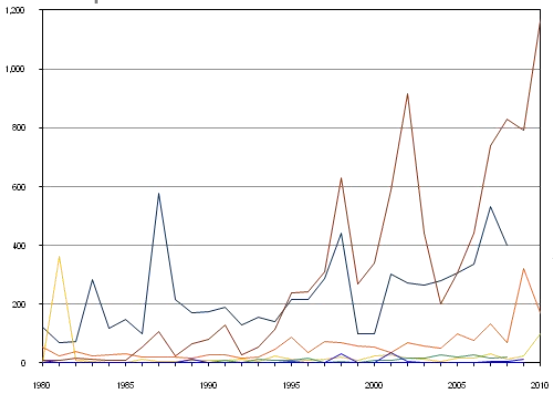
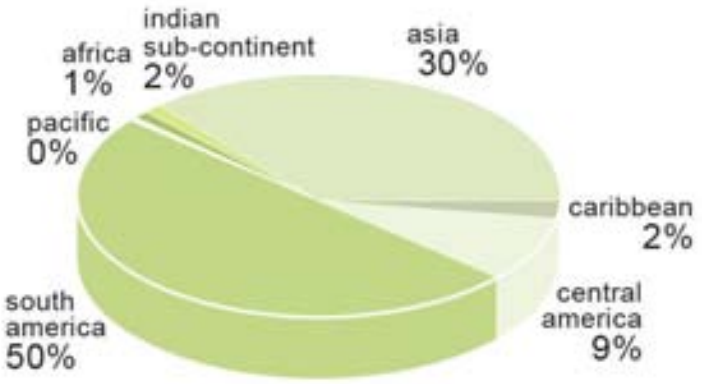
- **The rise of Dengue**
  - WHO reported cases (thousands)– principally DHF



- **Notified cases over time by region**
  - WHO reported cases



- **Geographic profile**
  - WHO reported cases – 2007



- **Geographic progression**

current control methods

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Any water containing vessel is an ideal breeding ground for *Aedes aegypti*

Current control methods need to be applied direct to breeding sites or to the adult mosquito
(NB *Aedes aegypti* bite during the day making bednets ineffective)

Reaching all breeding sites with chemicals is an impossible task – current control methods are failing

RIDL®

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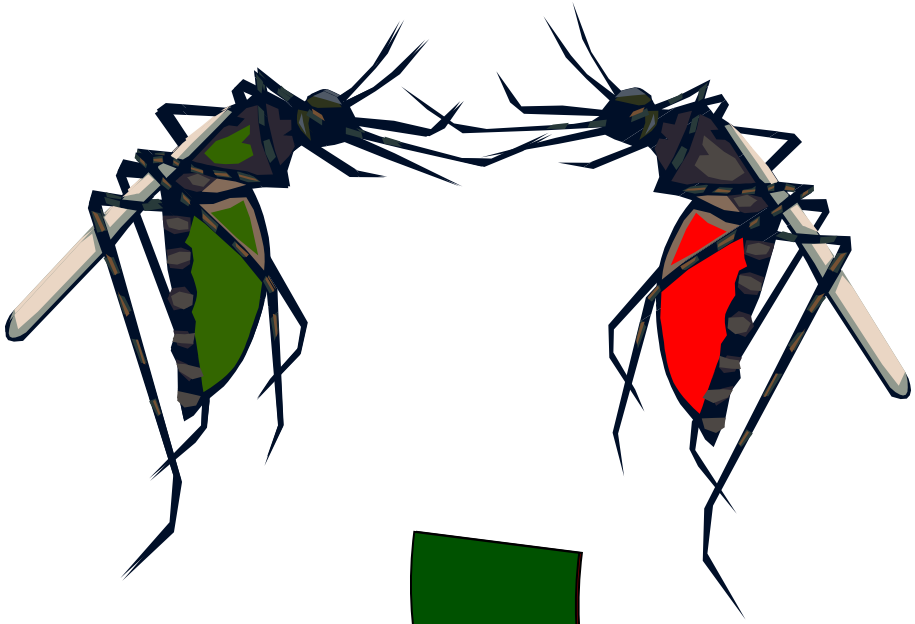
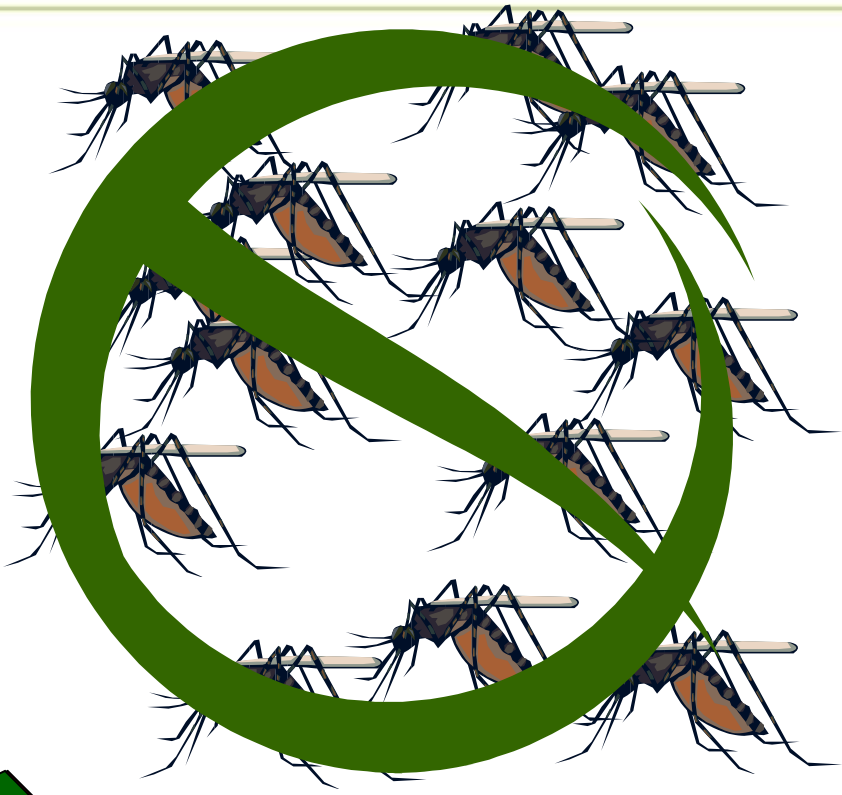
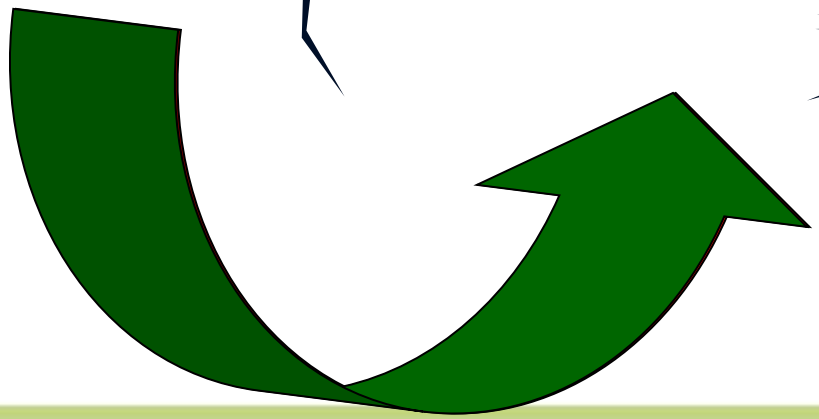




RIDL®



Breaking the life cycle

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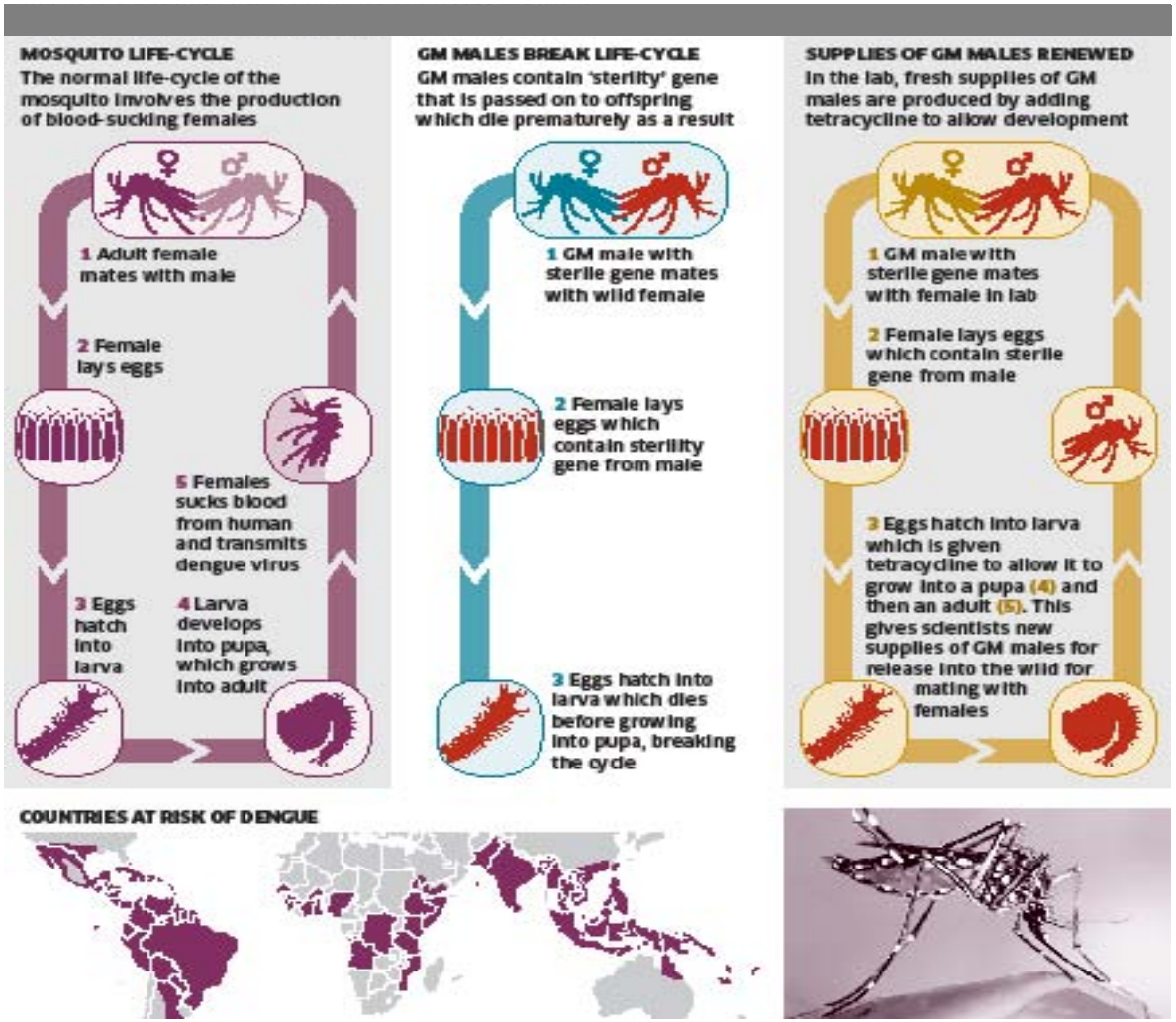

Rob Brooks
The Independent
27th Jan 2011

benefits of Oxitec's approach

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- Reduction in mosquito population below the level required to transmit disease
- Long term control solution
- Species specific
- Self limiting strategy, controllable
- Can be part of an IPM approach
- Cost effective
- Sustainable
  - APHIS (USDA) determined approach is not merely acceptable but is 'environmentally preferable' to all available alternatives.

development trials

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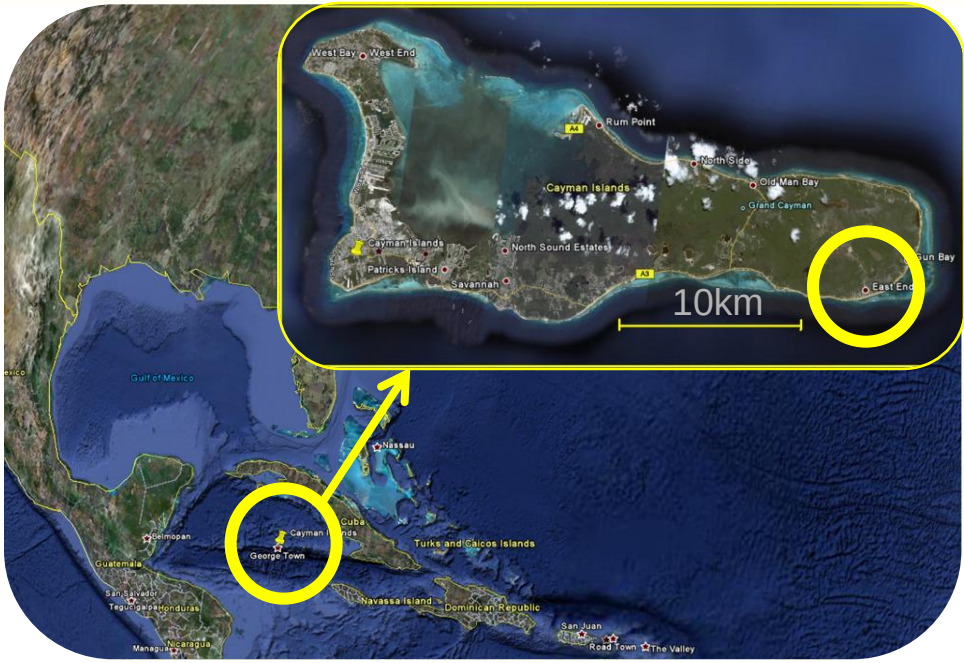
- **Research and Development**
  - transformation
  - laboratory scale evaluation
  - strain selection
- **In-country evaluation**
  - permit to import
  - contained trials
  - several countries
- **Open field release**
  - first open release Grand Cayman 2009
    - mating of RIDL males to local females
    - excellent mating competitiveness
    - provided data for suppression trial 2010



sterile insect techniques

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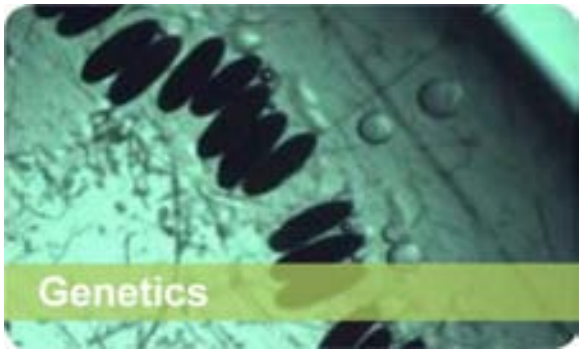
- **Benefits**
  - proven approach
  - long history
- **Challenges**
  - high capital expenditure
  - Bio-safety
  - mixed sex release
  - damaging to fitness
  - species limited



- **Benefits**
  - low capital
  - applicable to local area control
  - many species
  - minimal fitness penalty
  - male only release
  - ‘built in’ monitoring
- **Challenges**
  - innovative

supply chain

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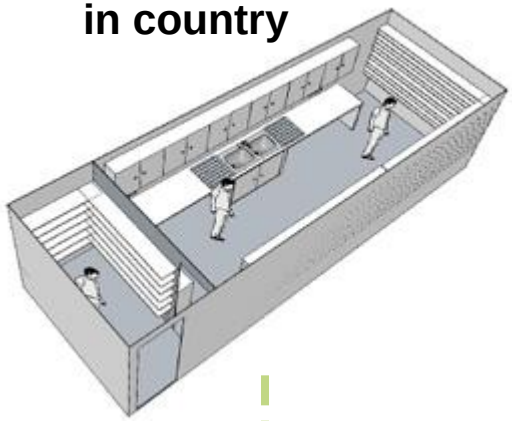
- **Filter Colony (UK)**
  - Hybrid strain
  - Quality control
  - Fitness
  - Genetic diversity
  - Longevity

- **Eggs**

- **Rearing cabin / factory in country**



- **Sex-sort pupae**
  - Males only

- **Release by vehicle /hand**

Channels

- Govt or municipality vector programmes
- Private sector, hotels, corporates
- Consumers

RIDL strains in agriculture

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- species specific insect control
- local or area-wide control programmes
- compatible with other forms of insect control (IPM)
- male only release
- genetic marker for monitoring

agriculture

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- Fruit Fly RIDL strains
  - *Ceratitis capitata* Medfly
  - *Anastrepha ludens* Mexican Fruit Fly
  - *Bactrocera oleae* Olive Fly
- Moth strains
  - *Pectinophora gossypiella* Pink Bollworm
  - *Plutella xylostella* Diamondback moth
  - *Tuta absoluta* Tomato leaf miner (R&D)

Public engagement

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Oxitec highlights

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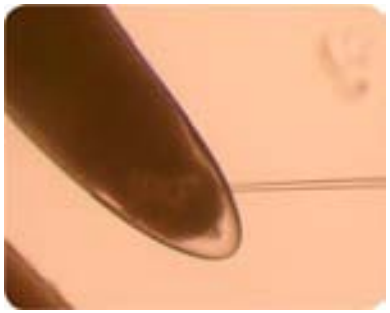
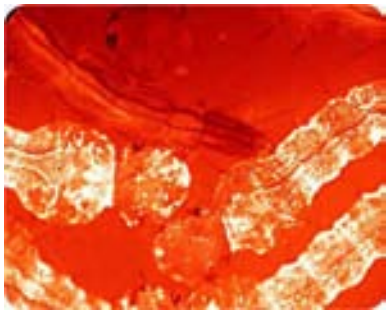
- Ground breaking technology to control insects
  - $5 billion burden of cost in dengue fever
  - agricultural portfolio developed
- Unique and effective products
  - ability to deploy in vector control, agriculture and other markets
  - broad IP portfolio
- Environmentally safe and sustainable
  - regulatory approvals
- Partnerships for commercialisation and production
  - agriculture
  - vector control



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Thank you!