1st Delta MVCD-Oxitec Public Educational Webinar, April 26th 2022
An Introduction to Oxitec in California: A Project Based on Strong Partnerships with Local Governments, Communities, and Experts
Introductions – Panelists With You Today

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Delta MVCD-Oxitec Public Educational Webinar Series

Introduction to our Webinar Series

Delta MVCD and Oxitec are hosting a series of public educational webinars to share information with residents of Tulare County and provide forums to answer questions.

- Webinars are open to everyone.
- Webinars are recorded and made available for everyone after the event.
- All questions relating to the webinar topic(s) will be answered (some in batches if questions are similar).
- If time runs out, we will accept questions in writing via info@oxitec.com.
- Questions and answers will be published in writing after the event with external or related online resources/references.
Delta MVCD & Oxitec Public Educational Webinars

Welcome to Webinar #1!

Today’s Agenda:

• Why Now? Why California?
• Oxitec and Self-limiting Mosquito Technology
• Project Plans
• Your Questions, Answered

Documentation, resources, references, and other information are available at oxitec.com/california
Why Now, Why California?

Invasive *Aedes aegypti*, pyrethroid resistance, and challenges unique to *Aedes aegypti*

- Potential risk of local dengue, Zika, chikungunya, and yellow fever transmission.
- **2013:** *Ae. aegypti* detected in Fresno, Madera, and San Mateo Counties.
- **2014:** *Ae. aegypti* persisted in those 3 counties and were also detected in Kern, Tulare, Los Angeles, and San Diego Counties.
- **2015:** Detected in Imperial and Orange Counties.
- Inherent challenges to *Ae. aegypti* control. Cryptic harborages, oviposition & larval sites, daytime behavior.
- **Insecticide resistance:** Need more tools in our toolbox.
Disease Transmission in California?

No locally acquired cases of Dengue or Zika have been detected, but the risk of transmission increases with the spread of Aedes aegypti.

- Viral diseases transmitted by Aedes aegypti present a threat to public health in California.
- With travel-acquired cases in California, it's important that local MCDs have the tools to control this invasive species before it starts transmitting these diseases within the state.
- Aedes aegypti is the #1 reason the public calls Delta MVCD to complain.
Ten Districts in California Wanted To Work With Us

These mosquito control districts spanned the state!

- Each expressed an interest to participate on our pilot projects.
- We included their names in our EUP amendment to the EPA.
- Some counties/districts have had abundant populations of *Aedes aegypti* since 2013-2014.
- Others detected this invasive pest as recently as 2020.
Invasive *Aedes aegypti* is becoming increasingly common in Tulare County.

**2018-2021 average number Ae. aegypti caught per week**

- 4 year average 2018-2021
Delta MVCD has strong public support for measures to fight *Aedes aegypti*.

- 2021: Property tax assessment: 16,000 surveys.
- "Would you support a ballot measure increasing the district's biennial assessment by $12.50 to fight the invasive *Aedes aegypti* mosquito?"
- 57% voted "Yes."
- The citizens of Delta MVCD are interested in innovative mosquito control technologies.
Oxitec and Self-limiting Mosquito Technology
We’re forging a new category of safe, sustainable, chemical-free, highly effective biological pest control solutions.
World-Leading Innovation to Empower Communities

- 250+ Oxitec personnel globally
- 15+ Nationalities represented
- 30+ PhDs in Oxitec's R&D team
- 10+ Languages spoken
- 3 World-Class R&D Facilities (two UK, one Brazil; one more in development in Brazil)

Broad and Cross-cutting Expertise

- Genetics & Biotechnology
- Pest Biology
- Field Validation
- Scalable Production
- Product Development
- Modelling
- Intellectual Property
- Project Management
- Quality Assurance
- Regulatory Affairs
- Digital Systems
- Communications & Engagement
Oxitec’s Friendly™ Science – Safe, Biological, Effective

Friendly™ pests carry two introduced genes that deliver unparalleled pest management performance

- **Self-limiting gene**
- **Marker gene**

Friendly™ males are released to mate with pest females

- **Safe and non-toxic**
  - Harmless predators and other species

- **Male-only releases**
  - Males do not harm people or crops

- **Targeted suppression**
  - Without harming biodiversity

- **Traceable in the field**
  - Marker detectable with special filters

- **Self-limiting in environment**
  - Gene cannot persist beyond a few generations

- **Dilutes insecticide resistance**
  - Natural, safe genes help to protect other tools

**Scientifically Proven**
- 100+ peer-reviewed publications
- Globally respected leader in arthropod biotechnology

**Unmatched Effectiveness**
- Best-in-class vector suppression in city-wide and farm-scale deployments
- Repeated success in field pilot demonstrations in multiple countries

**Multiple Biosafety Approvals**
- Deployments and pilot demonstrations conducted under approvals in the Americas, Africa, Europe, Asia and Australia
- Two products de-regulated in Brazil
OXITEC’s proven vector control results are combined with exceptionally high public support in a range of markets.

Support for "Aedes Do Bem" 92%
- Fully support the ‘Aedes do Bem’ project

“Aedes Do Bem” Should Continue 93%
- Would like the ‘Aedes do Bem’ project to continue

“Aedes Do Bem” For Other Neighborhoods 94%
- Would like to see the project extended to other neighborhoods

Public survey of 1,000 people carried out in September 2019 in the city of Indaiatuba

DECADE OF DEVELOPMENT AND PROOF-POINTS

Support: 96%
- Grand Cayman 2009-10
- Juazeiro, Bahia 2010-2013
- Jacobina, Bahia 2014
- Nuevo Chorrillo, Panama 2014

Oppose: 92%
- Piracicaba, São Paulo 2015-2019

Neutral: 93%

No View: 96%

SUCCESSFUL 4-YEAR PILOT

PREPARING FOR COMMERCIAL LAUNCH

2021-22 INITIAL BR LAUNCH

2021

US OX5034 Market Launch In BR

2020-21

Scaled-up OX5034 Product Trial In Florida 2021

2020-21

1st OX5034 Adult Pilot Indaiatuba, Brazil 2018-2019

2020-21

1st OX5034 Product Trial Indaiatuba, Brazil 2019-2020

2020-21

Upgrade to 2nd Generation Platform in 2018

Support For "Aedes Do Bem”
- 96%

Oppose: 96%

Neutral: 92%

No View: 93%

”Aedes Do Bem” Should Continue
- 93%

Yes: 93%

No: 6%

”Aedes Do Bem” For Other Neighborhoods
- 94%

Yes: 94%

No: 6%

”Aedes Do Bem” Should Continue
- 93%

Yes: 93%

No: 6%
Oxitec’s Products Are Designed for Use by a Diverse Range of Stakeholders and Communities
Example: a public survey of 2,000 people carried out in March 2021 in the city of Indaiatuba highlights that:

97% Would like the Friendly™ project to continue

97% Would like to see the project expanded
World-Class Partners, Collaborators and Regulatory Record

Select Partners and Underwriters

Select Current and Historical Collaborators

Positive Regulatory Approvals and Opinions
10+ Years of Successful Regulatory Decisions

- **USA**: Ox5034 field pilots 2021-2022
- **CAYMAN**: Ox513A field pilots 2016-2018
- **MEXICO**: Mosquito contained pilots 2010
- **PANAMA**: Ox513A contained pilots 2014
- **BRAZIL**: Ox513A commercial biosafety approval 2021
- **AUSTRALIA**: Medfly contained pilots
- **Greece**: Olive fly contained pilots
- **INDIA**: Ox513A contained pilots 2015-2017
- **FRANCE** & THE NETHERLANDS: Ox513A positive technical opinions
- **UK**: Global R&D HQ
- **USDA, FDA, EPA**: CTNBio, National Conservation Council, National Biosafety Committee
- **Greece**: National Office of Sanitary Security of Food Products
- **France & Netherlands**: High Council for Biotechnology (HCB) (FR), National Institute of Public Health and the Environment (RIVM) (NL)

**Key**
- Public health field pilots
- Public health contained pilots
- Agriculture field pilots
- Agriculture contained pilots

**Countries and Pilot Programs**
- **USA**: Diamondback moth and pink bollworm field pilots 2006-2017
- **UK**: Medfly field pilots 2016
- **Greece**: Olive fly contained pilots 2014
- **FRANCE** & THE NETHERLANDS: Ox513A positive technical opinions
- **USA**: Ox5034 field pilots 2021-2022
- **CAYMAN**: Ox513A field pilots 2016-2018
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Overview of EPA’s Scientific Assessment and Approval

Key Elements:
- 14-month in-depth process
- Exhaustive scientific review
- Risk assessment
- Multi-agency support
- Public comment & responses

By the Numbers:
- 70+ documents submitted
- 25 commissioned studies
- 4,500+ pages, including 2,500+ pages of scientific peer-reviewed literature

Data Requirements Fulfilled by Oxitec (partial list)

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- Protein Stability
- Arbovirus Screening
- Introgression Analysis
- Complete SOPs
- Analytical Methodologies
EPA Conclusion: Oxitec Mosquitoes are Safe for Humans, Wildlife, and the Environment

Independently validated: no effects on endangered species or critical habitat, whether direct or indirect.

SAFE FOR:
- Fish
- Birds
- Mammals
- Plants
- Invertebrates
- Other aquatic animals

For example, third-party independent labs found that freshwater fish and invertebrates consuming a diet of 70% OX5034 mosquito larvae fared no differently to fish and invertebrates fed 70% non-Oxitec mosquito larvae.

‘OX5034 male mosquitoes do not bite people or wildlife’
Success: Florida Keys 2021 Hits the Mark!

Key Performance Outcomes

- Oxitec’s self-limiting gene maintains effectiveness in the field
- Dose rates are suitable for use
- Oxitec males performed excellently
- Box dosing established effective overflooding against invasive species
- Oxitec males mated successfully
- Oxitec progeny accessed cryptic breeding sites (this is good)
- No females released

Biotech firm announces results from first US trial of genetically modified mosquitoes

Source: Nature, News, 18 April 2022
Our Joint Team

Oxitec and Delta MVCD:

• A complementary mix of experience, technical expertise, and local knowledge.

• Working hand-in-hand to carry out this project together with local communities.

• Transparency, inclusiveness, and equity are fundamental to success.
Public Engagement

Over the coming weeks and months we will be listening to the community:
Field Project Designs and Data Collection

1. Regulatory Pilots
   Small | high statistical power | protocol approved by regulators | biology/efficacy measured

2. Demonstration Pilots
   Larger pilot to demonstrate area-wide suppression | designed w/ regulator | compared with control

3. Operational Deployment
   Deployed as vector control tool to suppress vector population over an area
Regulatory Pilots Planned

Project B: Small Neighborhood Study
- Release point
- Ovitrap
- Adult trap
- Anticipated area of effect

Project D: Household Study
- Release point
- Ovitrap
- Single home
- Property border
- Anticipated area of effect

Project E: Mark Release Recapture
- Release point
- Ovitrap
- Adult trap
- Anticipated area of effect
This project is currently under review at California’s Department of Pesticide Regulation (DPR).

Next Steps

- Oxitec and Delta MVCD will share information about the planned project
- Community engagement will take place over the coming weeks and months
- Pre-release monitoring of *Aedes aegypti* may be initiated at potential project sites
- California’s regulators will continue their review of the Research Authorization application
Any and all questions on this evening’s topics are welcome!

(If we run out of time tonight, email info@oxitec.com and we will attempt to answer your question if it isn’t included in the growing FAQ or post-event summary we publish online at oxitec.com/california and deltamvcd.org)
THANK YOU!

A summary of this event, as well as more Q&As, resources, facts, and background materials will be made available at oxitec.com/california