

FLORIDA COORDINATING COUNCIL ON MOSQUITO CONTROL

MEETING MINUTES SEPTEMBER 15, 2020

Held via GoToMeeting due to Covid-19

MEETING OBJECTIVES

- ✦ To provide subcommittee reports.
- ✦ To provide Agency updates.
- ✦ To receive briefings and updates on current and pending issues: Zika, Dengue, Chikungunya, West Nile Virus, Keystone, and, genetically modified mosquitoes.
- ✦ To consider public comment.
- ✦ To consider Councilmember's comments and issues.
- ✦ To identify needed next steps, assignments, and agenda items for the next meeting.

COUNCIL MEMBERS PRESENT:

Amy Brown, Chair
Carina Blackmore
James Clauson
David Cook
Randy Dominy
Rick Gleeson
Matthew Hodge *for Gregg Walker*
Ken Linthicum
Edgar Lowe
Heath Rauschenberger
Jorge Rey
Keith Singleton

COUNCIL MEMBERS MISSING:

Ed Irby
Mark Yanno

FDACS STAFF PRESENT:

Lisa L. Brown, FCCMC Coordinator
Jessica Ber
Marah Clark
Caitlin Gill
Frieda Lamberg
Bruce Nicely
Lindsey Spears

SUBCOMMITTEE MEMBERS PRESENT:

Ricardo Zambrano, Chair	Subcommittee on Imperiled Species
Michael Hudon	Subcommittee on Imperiled Species
Dan Kline, Chair	Research Selection Subcommittee
Aaron Lloyd	Research Selection Subcommittee
Ruide Xue	Research Selection Subcommittee

MEMBERS OF THE PUBLIC PRESENT:

John Bergquist (presenter)	Anthony Ellis	Roberto Pereira
Phillip Koehler, Ph.D. (presenter)	Joseph Faella	Whitney Qualls
Andrea Leal (presenter)	Sandra Fisher-Grainger	Adriane Rogers
Rebecca Baldwin	Susan Gosselin	Annie Sheldon
Suzanne Bartlett	Julia Halbritter	Cheryl White
Carl Boohene	David Hoel	Graham White
Wade Brennan	Christopher Lesser	"Rick"
Eric Cope	Patrick Linn	"TJ"
Caroline Efstathion	Matt Mizereck	Indian River MCD personnel
	Jackson Mosely	



CALL TO ORDER

Amy Brown, Chair, opened the meeting at approximately 10:13 a.m., and called roll of Council members. A quorum was present.

She reminded those calling in to MUTE their audio devices, and to email Lisa Brown so that she can get the attendee names correct in the minutes.

APPROVAL OF AGENDA AND PRIOR MEETING MINUTES

Chair Brown called for approval of the meeting agenda. Councilmember Rey offered the motion to approve the meeting agenda, which was seconded by Councilmember Cook. Upon a call to vote, the motion was unanimously passed, and the agenda was accepted.

Chair Brown next asked if anyone had questions, comments, or revisions to the May 2020 Meeting Minutes. Councilmember Rey moved to accept the minutes, which was seconded by Councilmember Cook. Upon a call to vote, the May 2020 Minutes were unanimously approved.

REVIEW OF ACTION ITEMS FROM MAY MEETING

Regarding the question by Councilmember Rey on the possibility of increase Mosquito Control presence on Council: the members are set out in section 388.46(2)(a)8 of the Florida Statutes. The Florida Mosquito Control Association nominates mosquito control directors to fill two positions for 4-year terms. While the idea of an increased mosquito control presence on the Council is great, it unfortunately cannot be changed without changing the statute.

The request to have abstracts and contact information of research projects funded posted on FDACS website for the previous year have been completed. Marah Clark and Caitlin Gill are working on getting the 2016-17 fiscal year funded abstracts to post. They can be viewed at

<https://www.fdacs.gov/Business-Services/Mosquito-Control/Mosquito-Control-Reports>

The remaining matters (mosquito control advertising, revisions to the Request for Proposals, and Oxitec) were addressed later in the meeting.

AGENCY UPDATE

Organizational Updates: Chair Brown mentioned the new FCCMC@FDACS.gov email address which Coordinator Lisa Brown will be using in the near future.

COVID-19: All Department services are still open for business though the buildings are closed to the public. A majority of FDACS staff is working remotely due to COVID-19. The FDACS laboratories are still staffed and working. The Bureau of Scientific Evaluation and Technical Assistance (BSETA) building is being used for laboratory staff offices to also allow for social distancing. BSETA's Mosquito Control Outreach personnel are still available via telephone, email, or video chat.

Chair Brown advised that a Staff Assistant has finally been hired under the CoAg Crisis Grant - Lindsey Spears. Ms. Spears will be doing outreach on mosquito population data, entering the data into the Center for Disease Control's web based MosquitoNET application, and other related matter as needed.

Ashley Pierre-Saint, who handled mosquito control outreach in South Florida, left the FDACS in July to take a position with the Department of Health. At the time of the meeting, the

position was frozen. Chair Brown asked that if anyone participating knows of someone with mosquito control experience who would be interested in an OPS Environmental Specialist III to send in a resume to Marah Clark for consideration when the position can be filled.

There were no questions nor any discussion.

Legislative/Rulemaking/Budget Update: Due to COVID-19, there is nothing to update on legislative, rulemaking, and budget matters. Marah Clark is looking in to the possibility of holding pre-rulemaking workshop online at some point, but that is still in preliminary discussion.

SUBCOMMITTEE REPORTS

Due to COVID-19, neither the **Subcommittee on Managed Marshes** nor the **Imperiled Species Subcommittee** have met since the May meeting.

Research Selection: Marah Clark gave the attached PowerPoint presentation [Attachment #1], with Subcommittee Chair Dr. Kline available to answer any questions. Sixteen proposals plus two carried over from the previous fiscal year, were received from five different state universities (UF, UCF, USF, FAMU, FIU). Seven projects were funded, totaling \$508,921⁰⁰.

ISSUE BRIEFINGS AND UPDATES

Arboviral Update: Councilmember Blackmore then gave the arboviral update. She began by explaining the Department of Health is still very busy with Covid-19. She thanked FDACS for assisting with sentinel chicken testing because many of their personnel who normally deal with sentinel chicken testing have been handling Covid-19-related tasks.

As far as arboviruses in Florida, to date, for Eastern Equine Encephalitis (EEE) there has been very little activity this year. To date, there have been seventeen horses and 39 sentinel chickens testing positive, and no human cases.

For West Nile Virus (WNV) activity, there is an outbreak in South Florida with the epicenter in Miami. Five human cases of WNV infection were reported this week in Miami-Dade County. As is often in the case of WNV, the case range is in the elderly population. Dr. Blackmore continued, stating that the unusual thing about the outbreak is that of the sixty-one total cases statewide, thirty-four were asymptomatic positive blood donors.

One case of locally acquired Dengue Fever (DENV) was reported in Key Largo, Monroe County this week. Two mosquito pools tested presumptive positive for DENV this week in Miami-Dade County and will need additional testing at a reference laboratory to confirm the presence of DENV. So far in 2020, there have been positive samples from 56 humans, three mosquito pools, and two presumptive positive mosquito pools have been reported from two counties. This is a cluster that has been going on for some time. She continued, as you know people who travel and have been in multiple places could have been the source of this dengue outbreak. Because of that cluster, she feels like they have linked back to Key Largo and not other exposure sources.

Note: The Florida Department of Health's Florida Arbovirus Surveillance reports may be viewed at <http://www.floridahealth.gov/diseases-and-conditions/mosquito-borne-diseases/surveillance.html>

Oxitec Update: Chair Brown began with an overview of the Oxitec Experimental Use Permit (EUP) process the FDACS' Pesticide Registration Evaluation Committee (PREC) uses for these registrations and the EUP requirements. [Attachment 2]. She began with a brief overview of her background, and a description of the Bureau of Scientific Evaluation and

Technical Assistance (BSETA). Chair Brown then described PREC, its members - human toxicologists, eco toxicologists, soil scientists, geologists, chemists, biologists and entomologists from FDACS, the Florida Department of Health (FDOH), the Florida Department of Environmental Protection (FDEP), and the Florida Fish and Wildlife Conservation Commission (FFWCC) - and the types of registrations it reviews and approves. In summary, the data reviewed by PREC supported the Oxitec EUP application with no objection from the participating affected state agencies. FDACS then approved Oxitec's request for an EUP on the state level.

Next, Chair Brown introduced Andrea Leal, the Executive Director of the Florida Keys Mosquito Control District (FKMCD), to give the local perspective on the Oxitec approval. Ms. Leal started out by thanking the numerous people that have weighed in on this project, both at the federal and state levels, stating that it was entire teams of scientists really going over a lot of data and information, and that she appreciates everybody's time commitment.

Ms. Leal referred to Dr. Blackmore's arbovirus update and the local outbreak of Dengue Fever in the Keys. The FKMCD Board voted to move forward with what they termed an "Investigations Agreement" with Oxitec. Four commissioners in favor with one against. The results of a local referendum in 2016 was just under 60% in favor of the project with 40% against, so there is local support. She explained that for a project like Oxitec, they do not normally hear from those supporting the project, but they do hear very loudly from those that are opposed. Despite that, she explained that there is great support from our mosquito control board, great support from other governmental boards, and she feels that our stakeholders are very much behind this project.

Ms. Leal went on to explain that they have started a Keys-wide public information campaign, with monthly webinars focused on the technology itself, and answering public questions. The FKMCD is coming up with a very robust community plan, which will most likely involve going door to door throughout all of the keys, giving people information, and answering any questions. As the project goes forward, the FKMCD plans to be as open and transparent as possible by answering any questions and making sure people have the information. She said they are not looking at starting the Oxitec trials until 2021 to give time to pinpoint where they want to do the releases. At that time, not only will there be regulatory oversight but also an external advisory panel which will include local, state, and federal stakeholders to ensure that everyone knows what's going on and see what the results can be.

There were no questions and no discussion. Several attendees thanked Ms. Leal for the work that FKMCD has been doing to move the Oxitec project to this point.

Chair Brown then called for a five-minute break. Upon the return, she asked Marah Clark to give the CoAg Update.

CoAg Update: Ms. Clark explained that this is a grant from the Centers for Disease Control focused on hurricane crisis response. Florida applied for this grant in 2018 and was awarded approximately Six Million Dollars to cover five or six different projects over an approximate two-year period.

The main project is to improve mosquito control capacity through operational expenses and programs. FDACS submitted requests for funding which were recently received.

Operational Expense project: ends at the end of December. Participating programs have had a year and a half to utilize funds.

Community Clean Up for hurricane mitigation: also ending in December. Participating programs received \$15,000 each.

Novel Mosquito Control Techniques project: two programs funded, UF/USDA/Anastasia Mosquito Control partnership and Lee County Mosquito Control District. Lee County has been conducting releases of sterile mosquitoes.

FDACS Program Capacity Improvement project: funding allowed us to hire an OPS position to begin entering data into the CDC Arbonet Application.

Insecticide Resistance project through FMEL: Dr. Buckner is conducting testing on major disease vector mosquitoes in the state. Results for *Culex* mosquitoes is becoming very important. There are pockets mosquitoes resistant to pesticides. Working to move some funding around to fund project beyond December.

Chair Brown then introduced John Bergquist, Assistant Chief of the Bureau of Inspection and Incident Response (BIIR) at FDACS, to discuss regulation of pest control providers.

Regulation of Pest Control Advertising Mosquito Control: Mr. Bergquist began by explaining that BIIR is comprised of the inspectors who are out in the field conducting inspections on a wide variety of activities, including pesticides and pesticide use. He noted that Chapter 482 of the Florida Statutes, you do not need to be licensed to do mosquito control on your own property - as long as you use the product according to the label. Additionally, it does not apply to mosquito control activities conducted by a local government or district established under Chapter 388 of the Florida Statutes, a special act, or a contractor of the local government or district.

He gave a brief overview of the requirements for obtaining a license to perform mosquito control (pest control) under Chapter 482. *[Attachment 3]*.

In response to a follow-up question, Mr. Bergquist explained that regarding advertising for mosquito control, it cannot be faulty or misleading. However, without a specific example he is not able to give further clarifications. Chair Brown made the point that pest control companies providing mosquito control services are regulated. She suggested that Councilmember Irby be given the information to contact Mr. Bergquist directly with any specific questions.

There were no further questions.

FMEL Research Funding: Councilmember Rey gave an update on research funding at the University of Florida / IFAS Florida Medical Entomology Laboratory (FMEL). As he described at the last meeting, both funded positions have been filled. FMEL used some of the funding left from the prior year's contract to buy lab equipment for Dr. Giordano.

Councilmember Rey addressed the comments ("rumors") made outside FCCMC that FMEL would be keeping funds left over from positions being open during the hiring process. He explained that is patently false, that FMEL is effectively "reimbursed" for all related, documented costs. Any funds not spent are returned to FDACS. He thanked Marah Clark, Stephanie Young, Amy Brown, and Lisa Brown, for their successful efforts in getting the prior year's contract to charge back expenses from August 2019 though the contract was not in place until later.

Councilmember Rey then pointed out that FMEL is currently in a bit of a pickle since it has not yet received the contract for funding for the **current** year which began in August. He has concerns that if it is not in place soon FMEL could be in the red by the end of the year without the contract and funding. Councilmember Rey did not want to be put in the position of having to shut down the project or be in the red without the funding. Luckily, the matter was resolved during the meeting by Marah Clark and remotely by Stephanie Young.

Request for Proposal Revisions: Chair Brown then called upon Marah Clark to discuss handling of revisions to the Request For Proposal (RFP) document sent to the research institutions as part of the FCCMC mosquito research grants *[Attachment 4]*.

Ms. Clark explained that the changes are to take it from a basically generic document to one that is more specific to the principal investigators, giving them the overall process of where the funding priorities are ranked, how the process works, what needs to be done, and finally,

what needs to be submitted. She explained that she and Caitlin Gill worked with the comments and questions received by councilmembers, and they presented the changes.

At the end of the presentation, Chair Brown asked if the Council would like to move forward with voting on the changes at this meeting. Members agreed that it should be voted. Chair Brown thanked Marah Clark and Caitlin Gill for their lengthy work on revising the document and ask for a motion to approve the revisions to the RFP document. Councilmember Gleeson so moved, with Councilmember Linthicum seconding. Upon a call to vote, the revisions were unanimously approved. Chair Brown then said that the RFP document will now be referred to as the **"Florida Coordinating Council on Mosquito Control Research Proposal Review and Selection Process for Principal Investigators."**

Marah Clark then brought up the pending, similar document for the reviewers, and asked if the Council would like to review the document before it goes to the review subcommittee. Councilmember Rey said that it would be a good idea to do so before it goes to the subcommittee. Ms. Clark then said she would do a process similar to the RFP document revisions and provide the draft to the councilmembers to review prior to the January 2020 meeting, so it can be voted on at that time.

Research Prioritization review of priorities: Next, Chair Brown discussed the Research Prioritization Exercise which will be voted upon at the January 2021 meeting. The prior years' results were provided to the Council before and after the meeting *[Attachment 5]*.

Chair Brown said that Coordinator Lisa Brown will be resending the prior years to the members after the meeting. Chair Brown requested that the members review the priorities from last year once Lisa Brown sends them, and if there are any proposed changes or new priorities anyone wishes to be considered, to please email Lisa Brown. Lisa Brown will compile and have Marah Clark review to see if the suggestions already fit within a current category or would need to be a separate category.

If proposed revisions/additions cause a change to the priorities list, Lisa Brown will schedule another virtual meeting in late October or early November to vote whether to include them in the priorities for the 2021-2022 grant funding.

If there are no changes proposed, or after voting upon any changes, Lisa Brown will send the priorities out to the members for their ranking. The totals will be tallied and voted upon at the January 2021 meeting to be included in the **Florida Coordinating Council on Mosquito Control Research Proposal Review and Selection Process for Principal Investigators** sent out in February 2021.

Chair Brown asked if there was a need for another break – there was not – so the meeting continued.

Target and Non-Target Effects Of Insecticide Mixtures For Use In Operational Mosquito Control: Chair Brown then introduced Dr. Phillip Koehler, Professor Emeritus of the University of Florida in the Department of Entomology and Nematology, who specializes in urban entomology. Dr. Koehler gave an overview of his FDACS/FCCMC funded, completed research on Target and Non-Target Effects Of Insecticide Mixtures For Use In Operational Mosquito Control *[Attachment 6]*.

COUNCILMEMBER COMMENTS, ISSUES AND OTHER MATTERS

Councilmember Linthicum briefly commented on Councilmember Blackmore's arbovirus update, pointing out that in spite of the very low importation of dengue, an outbreak occurring in the Florida Keys is of great significance.

There were no issues brought up by council members.

GENERAL PUBLIC COMMENTS

There were no public comments.

FUTURE MEETINGS

The location for the January 2021 meeting was discussed. Chair Brown felt that another virtual meeting would be in order, suggesting January 12 and 19th as possible dates. January 5th would be too soon after the New Years' Holiday. There was minimal discussion, so Chair Brown called for a motion to hold the next scheduled meeting virtually on January 19, 2021. Councilmember Linthicum so moved and was seconded by Councilmember Dominy. Upon a call to vote, the date of January 19, 2021, was unanimously approved.

Chair Brown then mentioned holding the May 2021 meeting at Beach Mosquito Control District in the event that in-person meeting will be viable at that time.

REVIEW OF THE MEETING'S ACTION ITEMS

Chair Brown reviewed the meeting's action items:

- o Revisions to the Process Document for Reviewers (M. Clark/C. Gil)
- o Stats on costs per priority submitted for funding (C. Gill)
- o Send Research Priorities to members ASAP for review and any revisions (L. Brown)

ADJOURNMENT

With no further business to discuss, Chair Brown then called for a motion to adjourn, which was made by Councilmember Dominy and seconded by Councilmember Singleton. Upon a call to vote, it was approved unanimously.

The meeting was adjourned at 12:41 pm.

ATTACHMENTS

- 01 Research Selection overview
- 02 Oxitec Experimental Use Permit (EUP) process
- 03 Requirements for obtaining a license to perform mosquito/pest control under Chapter 482
- 04 Request For Proposal (RFP) document revisions
- 05 Prior Research Prioritization Results
- 06 Target and Non-Target Effects Of Insecticide Mixtures For Use In Operational Mosquito Control

FCCMC MISSION STATEMENT

The mission of the Florida Coordinating Council on Mosquito Control is to provide assistance and recommendations to the Commissioner of Agriculture and the Florida Legislature in all matters related to public health pest control in the State of Florida. Areas of interest and concern would include providing guidance to, and enhancing communication between, the Department of Agriculture and Consumer Services and other appropriate agencies and interests; providing guidance to mosquito control programs and other arthropod control-related agencies to reduce duplication of efforts; maximizing efficient use of existing resources; implementing best management practices and available technology; evaluating arthropod control methods that both protect the public health and the State's natural environment; and to set priorities for research funded through Department grants.

Attachment 1

2020-2021 Research Grants	
# of Proposals	18** (2 carried over)
\$ Range of proposals submitted	\$61,641 - 181,684
# Funded	7** (2 carried over)
\$ Range of proposals funded	\$61,641 - 90,451
Total \$ amount funded	\$508,921
# Not funded	11
# of Universities/Colleges	5
Representation of Universities/College	UF, UCF, USF, FIU, FAMU

Priorities of ALL Submitted proposals n=16	# of Proposals	Priority Rank
Disease- Surveillance/Control/Risk Prediction	8	3
Pesticide- Efficacy/ Resistance	6	2
Mosquito Ecology/Biology/Population Dynamics	6	5
Domestic Mosquito Control	6	7
Pesticide- Non-target effects: chronic or acute	5	1
Emerging Pathogens	5	4a
Mosquito Surveillance	4	4c
Environmental Residue Monitoring	1	4b
Application - Larvicides	1	8a
Non-Pesticide Control / Products	1	8b
Public Education/Risk Communication	1	10
Pesticide- New Products	0	6
Application- adulticide	0	9
Storm water	0	11b
Attractants/ Repellents	0	11a
Application- Residual Vegetative Barriers	0	12

Highest Priority
Second Priority
Third Priority
Mid Range Priorities (4-7)
Lowest Priorities (8-12)

Priorities of Funded Proposals n=5	# of Proposals	Priority Rank
Pesticide- Non-target effects: chronic or acute	4	1
Pesticide- Efficacy/ Resistance	2	2
Mosquito Ecology/Biology/Population Dynamics	2	5
Mosquito Surveillance/Trapping Systems	2	4c
Disease- Surveillance/Control/Risk Prediction	1	3
Emerging Pathogens	1	4a
Domestic Mosquito Control	1	7
Non-Pesticide Control / Products	1	8b
Environmental Residue Monitoring	0	4b
Pesticide- New Products	0	6
Application - Larvicides	0	8a
Application- adulticide	0	9
Public Education/Risk Communication	0	10
Application- Residual Vegetative Barriers	0	12
Attractants/ Repellents	0	11a
Storm water	0	11b

Highest Priority
Second Priority
Third Priority
Mid Range Priorities (4-7)
Lowest Priorities (8-12)

Oxitec Experimental Use Permit Update

FCCMC meeting
September 15, 2020

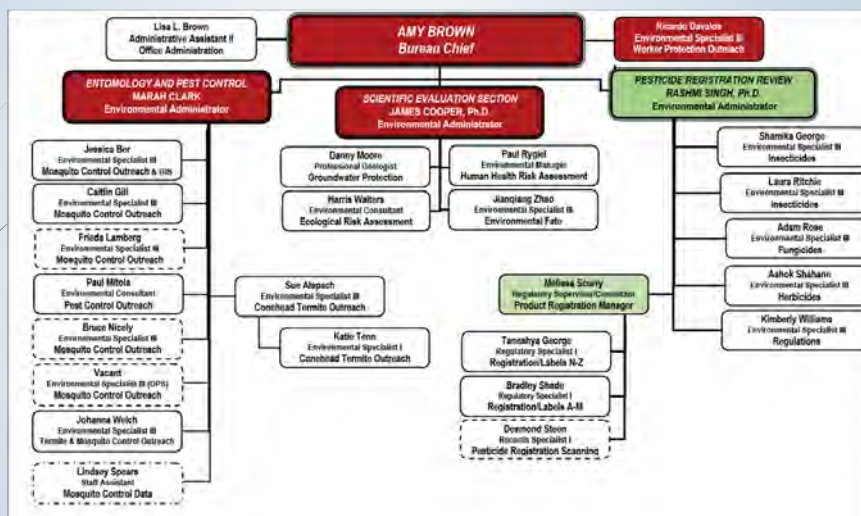
Amy N. Brown, Chief

Scientific Evaluation and Technical Assistance

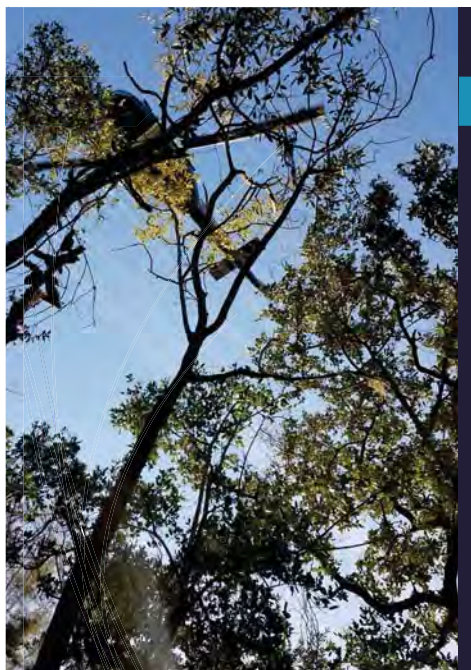


Florida Department of Agriculture and Consumer Services

Bureau of Scientific Evaluation and Technical Assistance



Dr. Rashmi Singh is the Chair of the Pesticide Registration Evaluation Committee (PREC)



Pesticide Registration Review Section

Coordinates Reviews of Special Registrations:

- New Active Ingredients (NAI)
- Significant New Uses (SNU)
- Special Local Needs (Sect. 24c or SLN)
- Experimental Use Permits (EUP)
- Emergency Exemptions (Sect. 18)

Experimental Use Permit (EUP) Overview

- FDACS is the State Lead Agency for pesticide review, registration, use, applicator licensing and enforcement.
- Applicants often provide preliminary presentations of proposed experimental research to the FDACS to get input on experimental designs, logistics, scientific concerns and potential public feedback.
- After the Environmental Protection Agency's (EPA) review and issuance of an approved Federal EUP, Florida is one of only a few states that does a scientific review before the pesticide product can be used experimentally in Florida.
- EPA issued a federal EUP for the release of OX5034 *Aedes aegypti* mosquitoes containing Tetracycline Trans-Activator Variant (tTAV-OX5034) protein and the genetic material (from vector pOX5034) necessary to produce the protein *in vivo*. The EUP purpose is to evaluate efficacy of release of adult and eggs of OX5034 *Aedes aegypti* mosquitoes against wild *Aedes aegypti* mosquitoes within Monroe County, Florida and Harris County, Texas.
- Permittees holding an approved Federal EUP must make application for and be granted a State EUP before initiating any shipment or use of the pesticide product in the state under the experimental program.
- Oxitec then submitted their application to FDACS for a State EUP once the Federal EUP was granted.
- Florida's review process uses scientists from FDOH, FDEP, FFWCC, and FDACS. These scientists form the Florida's Pesticide Registration Evaluation Committee (PREC).
- Pesticide products used under an EUP and not registered in the state for other uses shall not be sold or distributed other than through authorized participants and may only be used at an application site of an authorized cooperator in accordance with the terms and conditions of listed in the EUP.

Florida EUPs may be issued to...

- Any person for shipment and use of limited amounts of a pesticide for gathering data in support of registration under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Section 3 (*Federal EUP) or Section 24(c) (State EUP).
- A public or private agricultural research agency or educational institution may obtain a permit for experimental purposes within the state not directly intended to result in the registration of a pesticide product.

***Permittees holding a valid Federal EUP must make application for and be granted a State EUP.**

EUP Requirements

1. Verification of registration request and fee payment. The EUP registration fee is \$200.00 biennially.
2. Name and address of the applicant.
3. Confidential Statement of Formulation (CSF) for unregistered pesticide products.
4. Proposed EUP label and federal label if registered.
5. Names and addresses of all participants and cooperators available at the time of application to whom the pesticide will be delivered for experimental use in Florida;
6. Tolerances for the pesticide in food, feed, or potable water if established, or exemptions from tolerances, if the pesticide is to be used on food, feed, or aquatic sites. If tolerances have not been established or exemptions from tolerances not granted, permittees must certify that treated food or feed products will be destroyed or fed only to experimental animals.
7. Current safety data sheets (SDSs) including a statement of emergency treatment.

EUP Requirements

8. Summary of data to include:
 - a. Physical/chemical properties, including water solubility, partition coefficient (KOC, KOW), vapor pressure and specific gravity;
 - b. Toxicity, including toxicity to fish and wildlife where pertinent;
 - c. Environmental fate and residue analytical methodology (complete or rudimentary).
9. The purpose or objectives of the proposed experimental program to include:
 - a. Type of data to be collected and purpose of such data collection;
 - b. Target pests;
 - c. Sites, method of application, application rates and total amount of pesticide to be applied;
 - d. Number of acres, or structural sites, or animals to be treated;
 - e. Period during which the tests will be conducted.
10. The intended method of storage or disposal of excess pesticide. In the case of a non state registered pesticide product used under an EUP, a statement to the effect that the permittee will collect for storage or disposal, in accordance with Title 40 CFR, Part 172 subpart B, all excess pesticide from participants and cooperators at the termination of experimental use or expiration of the EUP.

Pesticide Registration Evaluation Committee (PREC)

- Chapter 487.041(5), Florida Statutes states in part that FDACS "shall seek the review and comment of other appropriate agencies."
- Established by FDACS in 1984 to implement review responsibilities and obtain input from involved FDACS staff and affected state agencies.
- Overseen by the Bureau of Scientific Evaluation and Technical Assistance, Pesticide Registration Review Section.
- Evaluates all new active ingredients and special registrations (e.g. SLNs, EUPs); meets monthly to discuss their reviews of new registration requests

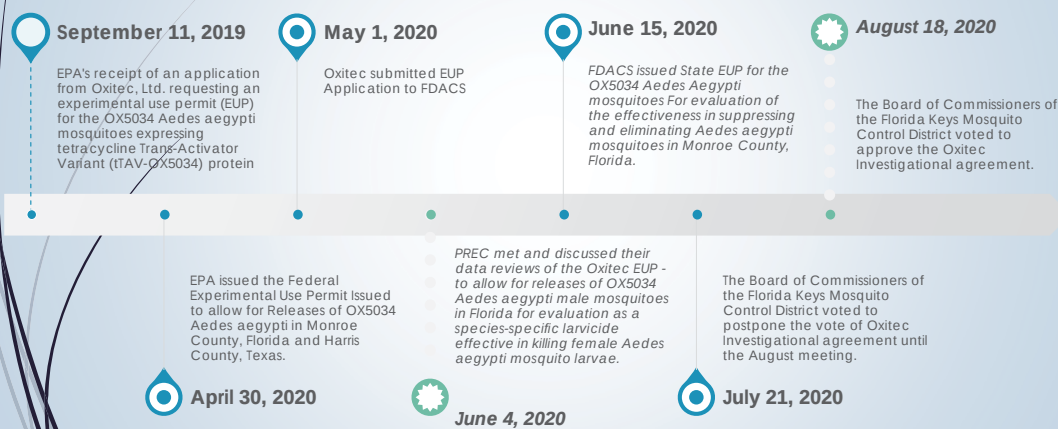
Pesticide Registration Evaluation Committee (PREC)

- Scientists represent agencies, including FDACS, the Florida Department of Health (FDOH), Florida Department of Environmental Protection (FDEP), and the Florida Fish and Wildlife Conservation Commission (FFWCC).
- FDACS scientists includes human toxicologist, ecotoxicologist, soil scientist, geologist, chemist and entomologist.
- FDACS PREC members also include:
 - Bureau of Inspection and Incident Response
 - Bureau of Agricultural Environmental Laboratories
 - Bureau of Food Safety Laboratories
- PREC's review evaluates a product's effects specific to Florida's unique climate, geology, plant communities, wildlife, and pest pressures.

Oxitec EUP Summary

- The product is a species-specific larvicide effective in killing female *Aedes aegypti* mosquito larvae. This EUP will allow the release of only genetically engineered OX5034 *Aedes aegypti* male mosquitoes (AAM) containing a protein that will inhibit the survival of their female offspring when they mate with wild female *Aedes aegypti* mosquitos. Basically the female needs a tetracycline diet to survive.
- The male offspring will survive to become fully functional adults with the same genetic modification, providing multi-generational effectiveness that could lead to a reduction in *Aedes aegypti* mosquito populations in the release areas.
- The data reviewed by PREC supported the EUP application for OX5034 AAM with no objection from the participating affected agencies.
- PREC concluded that the experimental application of the product is unlikely to cause any adverse effects to humans, non-target organisms, or the environment.
- FDACS approved Oxitec's request for an EUP after an extensive evaluation of the best available science to field-test the use of the OX5034 AAM.
- The EUP limits the application of the OX5034 AAM to 3,120 acres in Monroe County, Florida. It also stipulates that mosquitoes are not to be released within 500 meters of commercial citrus growing areas or sewage treatment plants where environmental oxytetracycline may be present.
- EPA documents, including the human health and environmental risk assessment can be found at <https://www.regulations.gov/docket?D=EPA-HQ-OPP-2019-0274>

EUP timeline



Thank You!

- <https://www.fdacs.gov/Business-Services/Pesticide-Product-Registration>
- (850) 617-7940 – Main Line
- rts@FDACS.gov
- Amy.Brown@FDACS.gov

MOSQUITO CONTROL

388

482

487

AND BEYOND



CHAPTER 388

MOSQUITO CONTROL

IT IS WHAT YOU DO AND WILL NOT BE
DISCUSSING BUT IN GENERAL TERMS
GOVERNMENT CONDUCTED WIDE AREA
CONTROL FOR THE PUBLIC



CHAPTER 482

► "Structural Pest Control Act."

482.211 Exemptions.--This chapter does not apply to:

(1) Pest control, except for fumigation, performed by a person upon her or his own individual residential property.

(7) Mosquito control activities conducted by a local government or district established under chapter 388 or by special act or by a contractor of the local government or district.

So if you are not doing mosquito control on your residential property or are a district it defaults to having to be licensed under 482 if the area of treatment is covered by 482.

To conduct mosquito control on residential/commercial property have to be a licensee (company).

Licensee" means a person, partnership, firm, corporation, or other business entity having a license issued by the department for engaging in the business of pest control at a particular business location.

To get a license you have to have someone who is the certified operator in charge for the business license in the appropriate category.

(5) "Certified operator in charge" means a certified operator:

- (a) Whose primary occupation is the pest control business;
- (b) Who is employed full time by a licensee; and
- (c) Whose principal duty is the personal supervision of the licensee's operation in a category or categories of pest control in which the operator is certified.

To become certified you have to meet the requirements to sit for and pass closed book exam in one of the two categories that is recognized to conduct mosquito control.

"Category" means a distinct branch or phase of pest control for which a pest control operator's certificate may be issued such as: fumigation, general household pest control, termites and other wood-destroying organisms pest control, lawn and ornamental pest control, and such a combination or division of such branches of pest control as the department may by rule establish.

To conduct mosquito control have to have either GHP or L&O certification to endorse the business.

Who can make pesticide application for the pest control company?

Any ID card holder who has received training in L&O and/or GHP category by the company.

What type of pesticide can be used?

Any that are allowed by label direction including RUPs and are registered in the state.

What type of application equipment can be used?

Any unless prohibit by label directions except a thermal-aerosol fogger which only a certified operator who is certified in the category of general household pest control, or an authorized employee of a licensee under the supervision of such an operator, may use a machine in general household pest control.

Must pre and/or post application surveillance be done?

No, preventive treatments are referenced and allowed in 482.

Are applications records required to be maintained?

Only for RUP applications.

Can pest control companies install and maintain misting systems?

Yes, companies without a pest control license can install misting systems but can not put any pesticide through or maintain them.

Does labelling for some specific pesticides (wide area ULV) used for mosquito control prohibit pest control companies from using them?

Maybe.

“For use only by federal, state, tribal or local government officials responsible for public health or vector control or by persons certified in the appropriate category or otherwise authorized by the state or tribal lead pesticide regulatory agency to perform adult mosquito control applications, or by persons under their direct supervision”.

Or maybe not.



CHAPTER 487

PESTICIDE REGULATION AND
SAFETY

Areas that mosquito control could occur that are regulated by 487

Pastures

Golf Courses

Parks

Cemeteries

Athletic Fields

Really any area not covered by 482 where an individual want to control mosquitos some determinations are made on a case by case bases.

Licensing and/or certification requirements?

None unless a RUP is used, all commercial applicators (for hire) are encouraged to get commercial license.

No record keeping unless RUP used.

No surveillance required.

No training for uncertified applicator unless RUP used.

Mosquito control would not fall under the WPS requirement.

FLORIDA COORDINATING COUNCIL ON
MOSQUITO CONTROL
RESEARCH PROPOSAL REVIEW AND
SELECTION PROCESS FOR PRINCIPAL INVESTIGATORS

Revised
September 15, 2020

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Introduction

This document provides established procedures and guidance to the Florida Coordinating Council on Mosquito Control's (FCCMC), Research Selection Subcommittee (RSS) when reviewing proposals for mosquito control research submitted by Florida public universities and colleges. In addition, this document also provides guidelines for prospective researchers on how to format proposals for consideration and funding. This document was initially created when the FCCMC appointed a subcommittee of its members to respond to the need for a transparent process by which research into practical methods of mosquito control would be evaluated.

The members of the initial group that successfully created the procedures utilized for this purpose are as follows: Ed Fussell; Thomas Loyless; Dr. John Mulrennan; Michael J. Page; Dr. John Smith; and Dr. Walter Tabachnick. The initial work was approved and adopted by the FCCMC on May 2, 2005.

In 2013, the Florida Legislature amended Chapter 388.261, Florida Statutes, thereby providing the Florida Department of Agriculture and Consumer Services (FDACS) authority to distribute mosquito control funding provided through legislative appropriations from the State's Solid Waste Trust Fund. This section of the law was further amended to include a provision which would provide a portion of the funds appropriated by the legislature for mosquito control and which specifically supported research into practical methods of mosquito control for the benefit of all Florida mosquito control programs. **In doing so, the legislature also opened the door to all Florida public universities and colleges to compete for funding that would benefit public health mosquito control operations statewide.** The resulting legislation prompted a review of the procedures delineated in this document. A review was initiated during the September 2014 meeting of the FCCMC. The procedures herein have been revised and approved by the FCCMC Subcommittee on Research Proposal Evaluation on February 10, 2015 and then again on January 20, 2016. The most recent updates and revisions were approved by the Council on September 15, 2020.

Purpose

The primary purpose of this document is to detail the outline and proper format for individuals submitting research proposals for review. In addition, this document provides an overview of the peer review process based on guidelines with established criteria that will select the highest quality research in practical methods of public health mosquito control in identified areas of concern in Florida.

Guidelines for Proposal Submission

All proposals submitted by principal investigators (PI) for consideration must adhere to the following format for proposals.

- Research proposals will be submitted electronically via email in .PDF format.
- Word limits on sections and page limitations are provided as maximum allowed for each section. Limitations do not apply to tables or figures.
- Proposal submission must be made in accordance with the deadline established in the *Proposal Process Timeline* on page 5.

Failure to adhere to this format will result in the return of the proposal with no review or consideration for funding during that review cycle.

Proposal Format

COVER PAGE

Title
Name of PI
Names of Co-PIs
Institutional Affiliations of PI and Co-PIs
Contact information of PI and Co-PIs
Mailing address
Email address
Phone number

RESEARCH TOPIC PRIORITIES

List of priorities being met by the proposed research
Brief overview of how research addresses proposed priorities (350 words)

ABSTRACT (maximum 350 words)

Provide an overview of the entire project

INTRODUCTION (maximum 1200 words)

State the objectives clearly.
State hypotheses that will be tested if appropriate.
State the importance to Florida mosquito control.
Provide background information with references on the magnitude of the problem and relevant other research that bears on the problem.
Provide references of preliminary or related work bearing on the problem previously done by the investigators demonstrating expertise and ability to accomplish the proposed research.

PLAN OF RESEARCH (maximum 2000 words)

State the plan of research.
Provide materials and methods to be used.
Provide how data will be analyzed and the statistical approaches if appropriate.
Justify how the objectives will be met using the plan.
Summarize any potential pitfalls and how these will be addressed.

LITERATURE CITED (maximum 2 pages)

COST ANALYSIS (maximum 1 page)

Budget for projects must fit the *FDACS Example Cost Analysis Form* on page 10 below. If submitting a multi-year project, include an additional column assigning cost for each cost element for each year.

RESOURCES (maximum 1 page)

Briefly describe organizational structure, available equipment, collaborations, space, etc. already in place in the parent institution that will be available for use in the project.

CVs OF PI AND CO-PIs (maximum 1 page each)

Name

Position title

Affiliation

Highest degree (degree, date awarded, institution)

Current and pending extramural support

Other projects linked (if any) to current proposal

Provide title, role, dates, total cost and objectives.

Previous Publications (give career total of peer reviewed publications)

List 5 most recent publications relevant to the proposal.

Previous FDACS funding and resulting publications

List previous FDACS funding (as PI or Co-PI) during the last 5 years and include all peer reviewed publications resulting from each project.

LETTER(S) OF COLLABORATION

Must be on collaborating organization's letterhead.

Request for Proposals Timeline

Procedure Action	Date / Deadline ¹
Request for project proposals (RFP) sent to institutions (hard copy)	February 15 th
Project proposal deadline for submission (email)	April 15 th
FDACS sends proposals for review to RSS Chair (email)	April 16 th
RSS Peer review deadline. Reviews and score sheets sent to FDACS (email)	May 30 th
Contracts issued to PIs awarded funding (dependent on appropriated funds)	July 1 st

¹ Dates listed are proposed target dates for the actions listed.

FCCMC Research Priorities

Research Funding Prioritization Exercise Results

January xx, 20xx

Research Topic	Rank	Total
Application - Adulticides		
Application - Larvicides		
Application - Residual Vegetative Barriers		
Attractants / Repellants		
Disease - Surveillance / Control / Risk Prediction		
Domestic Mosquito Control		
Emerging Pathogens		
Environmental Residue Monitoring		
Mosquito Ecology / Biology / Population Dynamics		
Mosquito Surveillance / Trapping Systems		
Non-Pesticide Control / Products		
Pesticide - Efficacy / Resistance		
Pesticide - New Products		
Pesticide - Non-target effects: chronic or acute		
Public Education / Risk Communication		
Storm water		

FCCMC Research Proposal Review and Selection Process

Initiating Procedures for Proposal Review

- 1) **Initiating the RFP:** FDACS initiates the process by sending a formal letter announcing a Request for Proposals (RFP) to state public universities and colleges in accordance with the timeline established in the *Request Proposals Timeline* on page 5. Guidelines delineated in the *FCCMC Research Proposal Review and Selection Process* document contain instructions to PIs on the format that must be followed for the proposal to be considered for support. In addition, a listing of the research priority areas as determined by FCCMC, FDACS and FMCA is provided with the letter requesting proposal submissions from competing universities and colleges. Principal investigators must provide FDACS with their research proposal via email in .PDF format in accordance with the established timeline.
- 2) **Submit RFP to FDACS:** Refer to letter to researchers submitted along with this document. Researchers must follow guidelines established and listed above.

FCCMC Research Selection Subcommittee Appointment Overview

The membership of the Research Selection Subcommittee (RSS) shall be based on previous scientific expertise in research, service as a peer reviewer on research proposals for other agencies and/or participation in research that has resulted in peer reviewed publications.

- a) Constitute a subcommittee of 6 to 8 members (not including a Chairperson).
- b) Select a Chair person responsible for guiding stimulating discussion, distributing review materials, compiling evaluation scores, communicating with RSS members, but will not act as one of the peer reviewers conducting evaluations or making actual selections of proposals.

Proposal Review Process

- 1) **FDACS Submission to RSS:** FDACS sends all proposals, submitted by the established deadline, to the Chairperson for his/her initial review and dissemination to RSS members.
- 2) **Initial Review by the RSS Chair:** Chair will provide instructions to each reviewer as written guidelines on the criteria to evaluate proposals and a review scoring sheet for each proposal. Subcommittee members must review each proposal independently.
 - a) Chair provides reviewers with a conflict of interest form and requests completed form to be returned from reviewers who will be recused from an evaluation of specific proposals due to a conflict of interest.
 - b) Chair uses a streamlining system for proposals based on FCCMC established priorities (see included *Research Topic Priorities Table*). Chairperson uses abstracts and provided research priorities of the proposals to make **an initial assignment** of each proposal into one of the following three groups:
 - i) **Group 1:** Proposals that address the high priority topics
 - ii) **Group 2:** Proposals that address midrange priority topics
 - iii) **Group 3:** Proposals that address low priority topics
- 3) Once grouped as outlined in Proposal Review Process, Section 2(b), the Chairperson sends all proposals in an email to each RSS member with instructions for conducting reviews with a list of those proposals in Groups 1, 2 and 3.

- a) Reviewers are allowed 7 days after receipt of proposals to review and use proposal abstracts to inform the Chairperson of any proposal in Groups 2 and 3 which they believe should be selected for further review.
 - b) The Chair receives this information and instructs all reviewers to consider for review any of the proposals in Group 2 and 3 that any member has asked to be considered.
 - c) Reviewers must use the provided electronic (Word/fillable PDF) evaluation sheet to assign a priority score, research score, and an overall evaluation score (based on the formula guidelines) for every proposal under consideration for Group 1.
 - d) Each reviewer is required to return completed electronic evaluation sheets for each proposal reviewed, with comments, to the Chair, who compiles the scores for the proposals, including the average for priority score, research score, and overall score for each reviewed proposal, and provides a spreadsheet of all reviewer scores for each of the three evaluation segments in all reviewed proposals so that individual scoring can be viewed.
 - e) The Chair convenes a conference (meeting in person or teleconference) to discuss proposals and scoring.
 - f) Proposal Evaluation: The Chair then evaluates each grant individually in accordance with the criteria listed below:
 - i. Chair points out scores for each grant, focusing on clear consensus and agreements.
 - ii. Chair asks reviewers whose scores are in disagreement with the consensus scores on any reviewed grant to explain their reasons for the scoring.
 - iii. The reviewers discuss the merits of the divergent scores.
 - iv. The reviewers are asked to reconsider their scores based on the discussion.
 - v. The Chair makes any scoring changes according to the reviewer's instructions.
 - vi. The Chair seeks to establish a consensus scoring range for the grant based on the overall scores seeking to have all scores within this range.
 - vii. The group will work to avoid having any proposal receive an overall negative review based on a clearly divergent score on the part of 1 or 2 reviewers.
 - viii. If any reviewer scores a proposal more than 2 or more (unit) scores above or below the average consensus scores of the other reviewers, that reviewer must provide a written justification for their score. For example, if the average score is 1.2 (without the disagreement score), any scores at 3.3 or higher require written justification.
 - ix. After discussion and if there is a failure to arrive at a consensus, a vote is taken with yea's voting to drop the score in contention from the overall scoring of the proposal. Passing the motion requires a super majority of the RSS including a vote by the Chairperson. Defeating the motion requires 3 nay votes.
 - g) All Group 1 proposals along with selected proposals from Group 2 and 3 will be evaluated, scored; and presented in rank order of their overall scoring.
 - h) The RSS will come to consensus on the overall ranking and the associated expenditure of funding. Budgets will be discussed at this point to achieve consensus that the RSS members agree the rankings are the optimal use of the funds.
- 4) **FDACS Review and Acceptance of Proposals Recommended for Funding:** Subsequent to the review process, the Chair will provide FDACS with the recommended proposals for funding, a listing of proposal rankings and a brief synopsis of the overall review process. In addition, the Chair will also provide the scored evaluation sheets that include written comments from each RSS member for each proposal reviewed, completed conflict of interest forms, and any justification of scoring documentation (Section 3(f)(viii) of the *Proposal Review Process*).

- a) FDACS will review the recommendations of the RSS for acceptance, denial or amendment of any of the proposals recommended for funding.
- b) In the event that a proposal requires an amendment or is unacceptable for any reason, FDACS must discuss these changes with the RSS Chair prior to making a final decision on funding. If the recommendations by the RSS are acceptable, no additional action is necessary.

5) Funded/Not Funded/Not Reviewed Notification

The principal investigator for each proposal will receive a short email communication/letter from FDACS indicating whether or not their proposal was chosen for funding by the review committee. Any reviews that the proposal received will be sent to the PI. This decision in no way reflects future priority considerations. **NOTE: To ensure reviewer anonymity, FDACS will eliminate the reviewer's name from reviewers' evaluations, save the evaluation as a .PDF file, and provide the reviews to the principal investigators submitting the proposal.**

- 6) Funding Multiyear Proposals:** Consideration for multiyear proposals will be determined based on the following criteria:
- a) The project is considered by the RSS during their review process (Sections 2 and 3 of the *Proposal Review Process*) using FCCMC established priorities.
 - b) The project is within one of the top 3 priorities assigned by the FCCMC in a funding year.
 - c) The selection of a multiyear project in a particular year automatically encumbers funds for future years.
 - d) Continuance of funding for a multiyear proposal is contingent on annual legislative appropriations.

FDACS Sample Cost Analysis Form

Contractor University name
Proposal Title Project title
Period of Service To be determined upon contract execution

Budget	Total amount funded by the Contractor (i.e., university)	Effort/Time percentage allocated to this project only	Amount allocated to conduct this project by FDACS
Salaries ^{a)}			
Dr. Hollywood, PI	\$85,000	5%	\$4,250
TBD Biologist	\$61,286	14%	\$8,580
Dr. California, Co-PI	\$0	1%	\$0
TBD Graduate Student	\$9,960	100%	\$9,960
TBD Post Doc	\$42,263	8%	\$3,381
Fringe Benefits ^{b)}			
Dr. Hollywood, PI	\$24,310	5%	\$1,216
TBD Biologist	\$17,528	14%	\$2,454
Dr. California, Co-PI	\$0	1%	\$0
TBD Graduate Student	\$1,594	100%	\$1,594
TBD Post Doc	\$12,087	8%	\$967
Equipment ^{c)}			
5 Microscopes	\$0	100%	\$10,000
Travel ^{d)}			
UF - USDA Campus	\$0	100%	\$6000
Miscellaneous ^{e)}			
Lab supplies	\$0	100%	\$15,500
Computer supplies	\$0	100%	\$4,000
Contractual services	\$0	100%	\$7,500
Indirect cost / overhead ^{f)}		100%	\$7,590
TOTAL CONTRACT VALUE			\$83,492

Cost Elements: The proposed budget must be broken down by the following cost elements; salaries, fringe benefits, equipment, travel, miscellaneous and indirect cost/overhead.

- a) Salaries: List each proposed position that will perform the tasks needed to complete this project. For each position, the total salary should be indicated as should the percent of salary requested from this project budget.
- b) Fringe Benefits: List each proposed position that will perform the tasks needed to complete this project. For each position, the total value of fringe benefits should be indicated. Then, indicate the value and percentage of the fringe benefit that is contributed from this contract.
- c) Equipment: List each proposed piece of equipment to be purchased from monies from this contract (i.e., computers, microscopes, etc.).
- d) Travel: List each proposed meeting, travel destinations, etc. the contractor will request reimbursement for as part of this project.
- e) Miscellaneous: List each proposed item the contractor will request reimbursement for (i.e., lab and field supplies, computer supplies, contractual service, etc.).
- f) Indirect Cost/Admin Overhead: These costs have already been negotiated (i.e. 5% or 10%). Refer to your respective finance or fiscal department for your university or college.

FCCMC RESEARCH TOPIC PRIORITIES 2016

Research Funding Prioritization Exercise Results January 20, 2016

Research Topic	Rank	Raw Score
Pesticide- Efficacy/ Resistance	1	62
Emerging Pathogens	2	61
Domestic Mosquito Control	3	60
Disease- Surveillance/Control/Risk Prediction	4	58
Pesticide- Non-target effects: chronic or acute	5	56
Pesticide- New Products	6	54
Application- Larvicides	6	54
Application- Adulticides	8	52
Mosquito Surveillance/ Trapping Systems	9	49
Mosquito Ecology/Biology/ Population Dynamics	10	48
Public Education/ Risk Communication	11	46
Non Pesticide Control/ Products	12	45
Environmental Residue Monitoring	13	43
Storm Water	14	40
Attractants/Repellants	14	40
Application-Residual Vegetative Barriers	16	37

FCCMC RESEARCH TOPIC PRIORITIES 2017

Research Funding Prioritization Exercise Results January 24, 2017

Research Topic	Rank	Raw Score
Domestic Mosquito Control	1	57
Disease- Surveillance/Control/Risk Prediction	2	56
Application- Adulticides	2	56
Pesticide- New Products	2	56
Pesticide- Non-target effects: chronic or acute	5	54
Pesticide- Efficacy/ Resistance	6	52
Mosquito Ecology/Biology/ Population Dynamics	7	50
Non Pesticide Control/ Products	8	49
Mosquito Surveillance/ Trapping Systems	8	49
Application- Larvicides	10	48
Emerging Pathogens	11	47
Application-Residual Vegetative Barriers	12	46
Public Education/ Risk Communication	13	41
Environmental Residue Monitoring	14	40
Attractants/Repellants	14	40
Storm Water	16	35

FCCMC RESEARCH TOPIC PRIORITIES 2018

Research Funding Prioritization Exercise Results

January 16, 2018

Research Topic	Rank	Raw Score
Pesticide - Non-target effects: chronic or acute	1	50
Pesticide - New Products	2	48
Domestic Mosquito Control	3	46
Application - Adulticides	4	45
Disease - Surveillance / Control / Risk Prediction	4	45
Mosquito Ecology / Biology / Population Dynamics	4	45
Emerging Pathogens	7	41
Application - Larvicides	8	38
Pesticide - Efficacy / Resistance	9	37
Mosquito Surveillance / Trapping Systems	10	35
Public Education / Risk Communication	11	34
Non Pesticide Control / Products	12	33
Environmental Residue Monitoring	13	32
Attractants / Repellants	14	27
Storm Water	15	25
Application - Residual Vegetative Barriers	16	24

FLORIDA COORDINATING COUNCIL ON MOSQUITO CONTROL RESEARCH TOPIC PRIORITIES

February 12, 2019

Research Topic	Rank
Pesticide - Non-target effects: chronic or acute	1
Pesticide - New Products	2
Domestic Mosquito Control	3
Application - Adulticides	4
Disease - Surveillance / Control / Risk Prediction	4
Mosquito Ecology / Biology / Population Dynamics	4
Emerging Pathogens	7
Application - Larvicides	8
Pesticide - Efficacy / Resistance	9
Mosquito Surveillance / Trapping Systems	10
Public Education / Risk Communication	11
Non Pesticide Control / Products	12
Environmental Residue Monitoring	13
Attractants / Repellants	14
Storm Water	15
Application - Residual Vegetative Barriers	16

FLORIDA COORDINATING COUNCIL ON MOSQUITO CONTROL

2020 RESEARCH TOPIC PRIORITIZATION RANKING SUMMARY

Ranking Scale (5 highest priority to 1 lowest priority)

5 = Highest priority - Urgent/Critical
4 = High priority
3 = Moderate priority
2 = low priority
1 = lowest priority - Council need not pursue

Research Topic	RANK	TOTAL
Pesticide - Non-target effects: chronic or acute	1	63
Pesticide - Efficacy / Resistance	2	57
Disease - Surveillance / Control / Risk Prediction	3	54
Emerging Pathogens	4	51
Environmental Residue Monitoring	4	51
Mosquito Surveillance / Trapping Systems	4	51
Mosquito Ecology / Biology / Population Dynamics	5	50
Pesticide - New Products	6	49
Domestic Mosquito Control	7	48
Application - Larvicides	8	47
Non Pesticide Control / Products	8	47
Application - Adulticides	9	44
Public Education / Risk Communication	10	40
Attractants / Repellants	11	39
Storm Water	11	39
Application - Residual Vegetative Barriers	12	36

**AS APPROVED
at the
January 14, 2020
FCCMC Meeting**

TARGET AND NON-TARGET EFFECTS OF INSECTICIDE MIXTURES FOR USE IN OPERATIONAL MOSQUITO CONTROL

FDACS-GRANT NO. 026366

Phil Koehler, Emeritus Professor
Roberto Pereira, Research Scientist
and

Bettina Moser, Research Associate

Entomology & Nematology Department

University of Florida

Gainesville, FL 32611

Differential Toxicity of ULV Active Ingredients

ULV Adulticide	_____ times more toxic to mosquitoes than bees ¹
----------------	---

Deltamethrin	18.56
--------------	-------

Bifenthrin	
------------	--

Chlorpyrifos	
--------------	--

Phenothrin	
------------	--

Permethrin	
------------	--

Prallethrin	10.91
-------------	-------

**ULV Adulticides are
~10-2,300 times more
toxic to mosquitoes
than bees**

¹ ug/g of body weight to kill 50% of bees / ug/g of body weight to kill 50% of mosquitoes

Sanchez-Arroyo et al. 2019, 2020 (in review)

Background

- Adulticides
 - Major tool for Integrated Mosquito Management
 - Pyrethroid resistance limits effectiveness
 - Criticized for having a negative impact on non-target organisms, such as honeybees
- Insecticide mixtures
 - Used agriculture and urban pest management
 - Overcome resistance
 - Usually mixtures of pyrethroid + nicotinoid insecticides
- Commercial products may have potential in mosquito management
 - Can they control resistant mosquitoes with minimal impact on honey bees?

ACTIVE INGREDIENT:	
Imidacloprid, 1-[(6-Chloro-3-pyridinyl)methyl]-N-nitro-2-imidazolidinimine.....	21.0%
β- Cyfluthrin, Cyano(4-fluoro-3-phenoxyphenyl)methyl 3-(2,2-dichloroethenyl)-2,2-dimethyl-cyclopropanecarboxylate	10.5%
OTHER INGREDIENTS:	68.5%
TOTAL	100.0%
EPA Reg. No. 432-1483	

Active Ingredients:	
Thiamethoxam (CAS No. 153719-23-4):	11.6%
Lambda-cyhalothrin ¹ (CAS No. 91465-08-6):	3.5%
Other Ingredients:	84.9%
Total:	100.0%

EPA Reg. No. 8033-109-279	EPA Est. No. 279-NY-1
Active Ingredient:	
Acetamiprid.....	By Wt. 5.00 %
Bifenthrin*.....	6.00 %
Other Ingredients:.....	89.00 %
	100.00%

Clothianidin	4.00%
Metofluthrin.....	0.10%
Piperonyl Butoxide*	10.00%
OTHER INGREDIENTS:	85.90%
	100.00%

Objectives

- Determine toxicity of insecticide mixtures on susceptible and resistant *Aedes aegypti* mosquitoes
 - Toxicity to honey bees
- Potential of **barrier treatments** to control susceptible and resistant *Aedes aegypti* mosquitoes
- Potential for **ULV applications** of insecticide mixtures to overcome mosquito pyrethroid-resistance



Materials and Methods

Insecticide Active Ingredients and Classes

- Insecticide Mixtures:

- Serial dilutions applied to filter paper strips

- Mosquitoes

- Susceptible *Aedes aegypti* Orl1952
- Resistant *Aedes aegypti* PR

- Honey bees

- Newly emerged *Apis mellifera* adults

Commercial Insecticide Name	Active Ingredient (A.I.)	A.I. - Class	A.I. (%)
Tandem Labeled for mosquitoes	Thiamethoxam λ -Cyhalothrin	Nicotinoid Pyrethroid	11.60 3.50
Temprid FX Labeled for mosquitoes	Imidacloprid [%], β - Cyfluthrin	Nicotinoid Pyrethroid	21.00 10.50
Transport Mikron Labeled for mosquitoes	Acetamiprid Bifenthrin	Nicotinoid Pyrethroid	5.00 6.00
Crossfire Labeled for bedbugs	Clothianidin Metofluthrin (Piperonyl Butoxide - synergist)	Nicotinoid Pyrethroid Synergist	4.00 0.10 10.00

Toxicity Testing

- Mosquitoes
 - >3-day old adult female susceptible and resistant mosquitoes
 - Placed in 20-mL scintillation vials
 - Insecticide-treated paper strips placed in scintillation vials
- Honeybees
 - 3-10 day-old bees
 - Transferred to 4-ounce jelly jars.
 - Insecticide-treated paper strips placed in jars
- Mortality recorded at 24 h
 - Probit analysis for LC-50 and LC-90



Results: Toxicity Testing

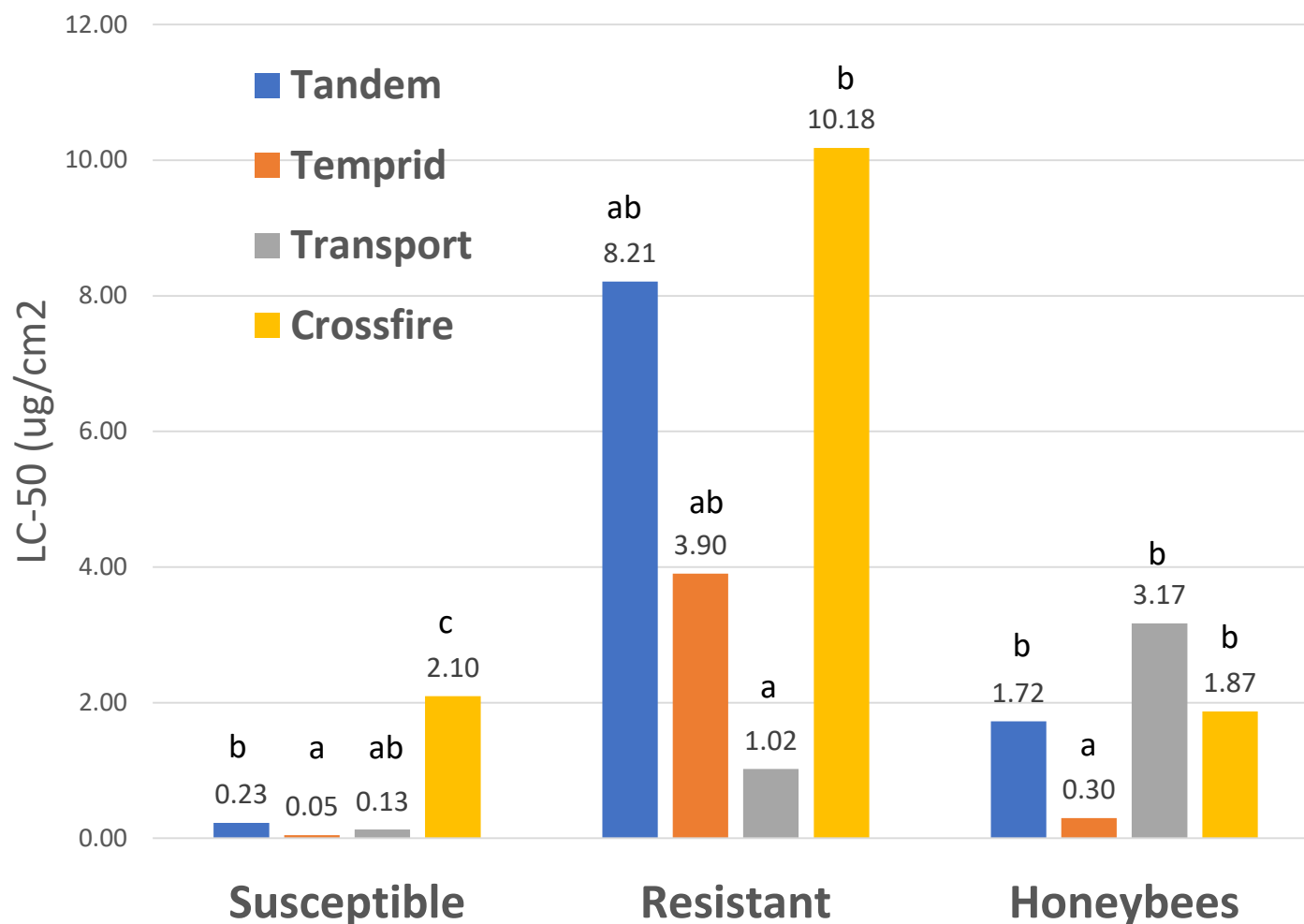
TABLE 5. Acute toxicity of four insecticide mixtures for *Aedes aegypti* ORL1952 (pyrethroid-susceptible), *Aedes aegypti* PR (pyrethroid-resistant), and *Apis mellifera*.

Insecticide	<i>Aedes aegypti</i>		<i>Apis mellifera</i>
	ORL1952 - Susceptible	PR - Resistant	
	LC ₅₀ ± 95% Confidence Limits (µg/cm ²) ^a		
Tandem	0.219 (0.131, 0.382) b	8.211 (0.168, 15.631) ab	1.723 (0.865, 2.655) b
Temprid	0.046 (0.023, 0.102) a	3.903 (1.548, 7.396) ab	0.300 (0.058, 0.653) a
Transport	0.128 (0.079, 0.206) ab	1.022 (0.466, 1.646) a	3.171 (1.481, 11.553) b
Crossfire	2.096 (1.731, 2.483) c	10.180 (5.379, 22.419) b	1.869 (1.055, 3.048) b
	LC ₉₀ ± 95% Confidence Limits (µg/cm ²) ^a		
Tandem	0.663 (0.381, 4.753) a	43.522 (21.585, 16,467.304) a	4.240 (2.739, 12.965) a
Temprid	0.193 (0.092, 5.647) a	22.243 (10.461, 335.423) a	1.082 (0.549, 2273.330) a
Transport	0.341 (0.211, 1.391) a	3.270 (1.934, 23.425) a	12.506 (5.636, 17,421.779) a
Crossfire	2.934 (2.479, 4.781) a	29.416 (15.956, 718.725) a	3.820 (2.548, 34.958) a

^aOf highest active ingredient (a.i.).

*Means followed by the same letter within a CL group for each species/strain are not significantly different

Results: Toxicity Testing



M&M: Field Barrier Treatments

Applied with a Backpack sprayer mounted on an ATV

TABLE 4: Amount of Active Ingredients Applied in Barrier Trials

Insecticide	Dilution ^a	Percent A.I. ^b in Diluted liquid	Product (oz)/ 1000 sqft ^c	A.I. ^d (oz)/ 1000 <i>sqft</i>	A.I. - Class
Tandem	1:115	Thiamethoxam (0.10) λ-Cyhalothrin (0.03)	2.2	0.347	Neonicotinoid Pyrethroid
Temprid FX	1:236	Imidacloprid (0.09) β – Cyfluthrin (0.04)	1.08	0.405	Neonicotinoid Pyrethroid
Transport Mikron	1:106	Acetamiprid (0.05) Bifenthrin (0.06)	2.4	0.291	Neonicotinoid Pyrethroid
Crossfire	1:9	Clothianidin (0.44) Metofluthrin (0.11) PBO ^e (1.11)	26	3.905	Neonicotinoid Pyrethroid Synergist

^a Dilutions based on product labels

^b A.I. = active ingredient

^c All products applied at the rate of 2 gallons /100 sqft

^d Combined a.i.s

^e PB = Piperonyl Butoxide

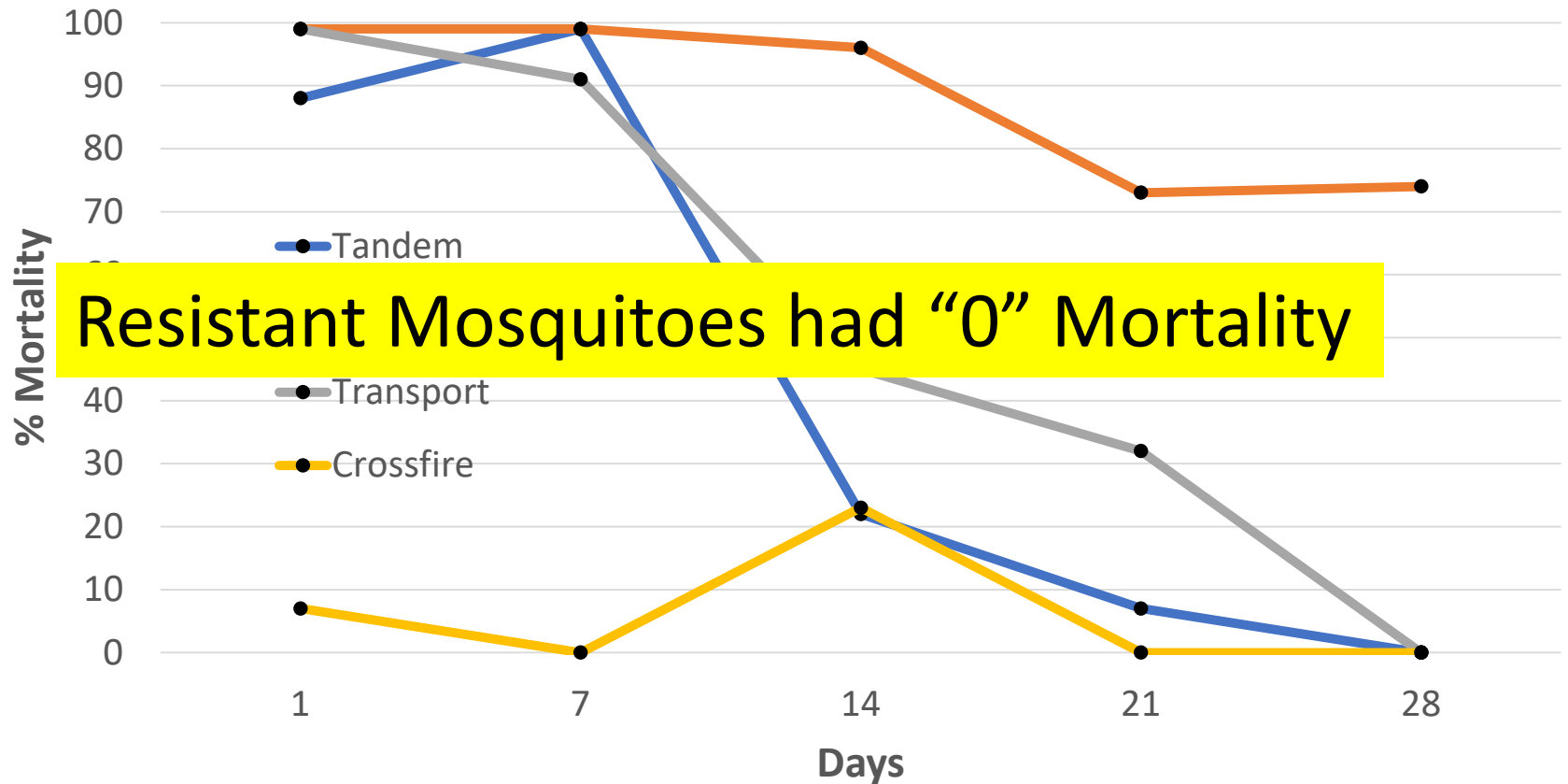
M&M: Field Barrier Treatments

- Bioassay
 - Sprayed plants with dilutions of insecticide mixtures
 - Leaf samples removed from plants
 - Insects placed with leaves
- Mosquitoes
 - >3-day old adult susceptible and resistant mosquitoes
- Bees
 - 3-10 day-old bees

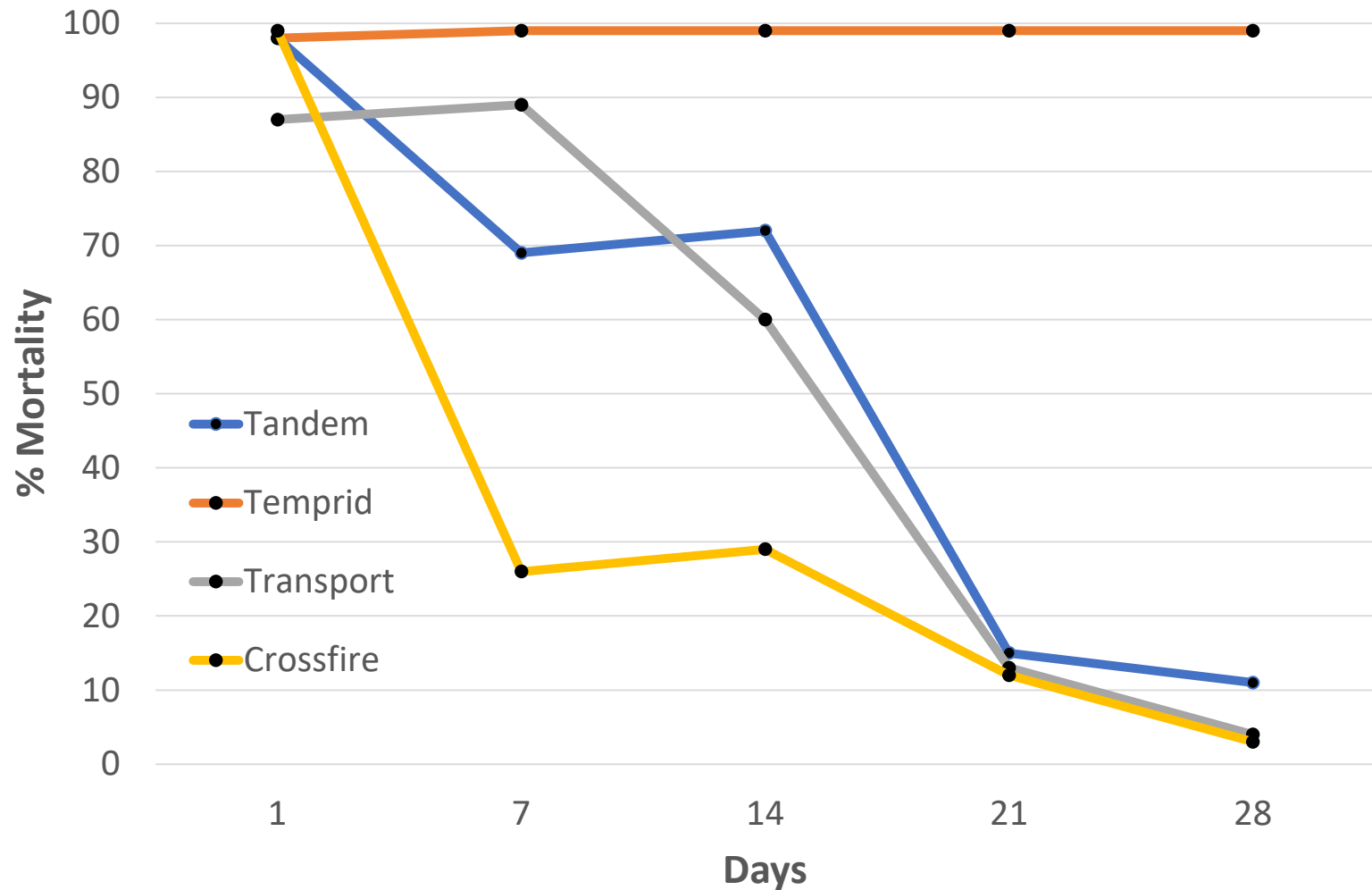


Results: Mosquito Mortality for Barrier Treatments Over Time

Susceptible Mosquito Mortality



Results: Honey Bee Mortality for Barrier Treatments over Time



ULV Treatments

- Mosquitoes
 - Susceptible *Aedes aegypti* Or1952
 - Resistant *Aedes aegypti* PR
- Honey bees
 - Newly emerged *A. mellifera* adults
- Aqueous insecticide dilutions and water (negative control)
 - Caged *Ae. aegypti*, ORL1952 and PR, and *A. mellifera* (from 3 beehives)
 - Curtis Dyna-Fog Hurricane Ultra II (ULV / mister)



ULV Treatments

Insecticide dilutions based on LC90s

TABLE 2: Amount of Active Ingredients Applied in ULV Greenhouse Trials

Insecticide	Dilution	A.I. ^a (%) of Diluted Product	A.I. - Class
Tandem	1:8	Thiamethoxam (1.45) λ-Cyhalothrin (0.44)	Neonicotinoid Pyrethroid
Temprid FX	1:56	Imidacloprid (0.38) β – Cyfluthrin (0.19)	Neonicotinoid Pyrethroid
Transport Mikron	1:8	Acetamiprid (0.63) Bifenthrin (0.75)	Neonicotinoid Pyrethroid
Crossfire	Undiluted	Clothianidin (4.00) Metofluthrin (0.10) PB ^c (10.00)	Neonicotinoid Pyrethroid Synergist

^aA.I. = active ingredient

^bof highest a.i.

^cPB = Piperonyl Butoxide

ULV Treatments Droplet Size Analysis



TABLE 3: Droplet Size Analysis for Diluted insecticides applied using ULV sprayer.

Product	DV 0.1 ($x \pm$ std. dev.) μm	DV 0.5 ($x \pm$ std. dev.) μm	DV0.9 ($x \pm$ std. dev.) μm
<u>CrossFire</u>	34.2 ± 1.74 a	113.9 ± 1.08 a	140.9 ± 3.76 a
<u>Temprid FX</u>	18.7 ± 0.35 b	39.3 ± 0.60 c	116.6 ± 10.11 <u>bc</u>
Tandem	18.2 ± 1.29 b	50.9 ± 4.20 b	131.5 ± 08.30 ab
Mikron	15.3 ± 0.78 c	34.0 ± 1.40 d	105.5 ± 9.06 c

*Means followed by the same letter within a column are not significantly different

**Acknowledgement: Anastacia Mosquito District for droplet size analysis

Results: ULV Treatments

Insecticide	Immediate Mortality (%) (mean $\pm$ SE)		
	<i>Aedes aegypti</i>		<i>Apis mellifera</i>
	ORL1952	PR	
Tandem	100 $\pm$ 0	100 $\pm$ 0	100 $\pm$ 0
Temprid FX	100 $\pm$ 0	100 $\pm$ 0	100 $\pm$ 0
Transport Mikron	100 $\pm$ 0	100 $\pm$ 0	100 $\pm$ 0
Crossfire	100 $\pm$ 0	100 $\pm$ 0	100 $\pm$ 0
Neg. Control	0 $\pm$ 0	0 $\pm$ 0	10 $\pm$ 7.7

Summary

- Toxicity of insecticide mixtures on susceptible and resistant *Aedes aegypti* mosquitoes
 - Susceptible: Temprid = Transport > Tandem > Crossfire
 - Resistant: Transport = Temprid = Tandem > Crossfire
 - Honey bees: Temprid > Tandem = Transport = Crossfire
- Barrier treatments for control of *Aedes aegypti* mosquitoes
 - Effective on susceptible mosquitoes for 7-14 d 
 - No mortality for resistant mosquitoes 
 - High mortality of honey bees for 7-14 d; 28 d for Temprid 
- ULV treatments for control of *Aedes aegypti*
 - 100% mortality of susceptible and resistant mosquitoes and honey bees
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Questions?

