

FLORIDA COORDINATING COUNCIL ON MOSQUITO CONTROL

MEETING MINUTES

JANUARY 19, 2021

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.
- ✦ 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
Ken Linthicum
Heath Rauschenberger
Jorge Rey
Keith Singleton
Scott Schermerhorn
Gregg Walker
Mark Yanno

COUNCIL MEMBERS MISSING:

Ed Irby

FDACS STAFF PRESENT:

Lisa L. Brown, FCCMC Coordinator
Kelly Friend, Director AES
Courtney Frazier, Asst. Director AES
Jessica Ber
Marah Clark
Kimisha Davis
Caitlin Gill
Frieda Lamberg
Bruce Nicely

SUBCOMMITTEE MEMBERS PRESENT:

Ricardo Zambrano, Chair	Subcommittee on Imperiled Species
Ron Brockmeyer, Co-Chair	Subcommittee on Managed Marshes
Ed Foley, Co-Chair	Subcommittee on Managed Marshes
Dan Kline, Chair	Research Selection Subcommittee
Alden Estep**	Research Selection Subcommittee
Peter Jiang**	Research Selection Subcommittee
Ruide Xue**	Research Selection Subcommittee

**** - PRESENTER**



Florida Department of Agriculture and Consumer Services

MEMBERS OF THE PUBLIC PRESENT:

Eva Buckner**	Muhammad Farooq	Estelle martin	Adriane Rogers
Vindhya Aryaprema	Sandra Fisher-Grainger	Richard McDowell	Victor Soto
Sue Bartlett	Mary Geesey	Masami McLemore	TJ
Chris Borden	Scott R Henson	Montgomery, Ronald	Miranda Tressler
Richard Christoff	Christopher Lesser	Andrea Morrison	Graham White
Glen Paul Edson	Jonathan Linder	Douglas O'Connor	[Waiting for name]
Caroline Efstathion	Keira Lucas	Steven Peper	
Joseph Faella	Timothy Machardy	Whitney Qualls	

** - PRESENTER

CALL TO ORDER

Amy Brown, Chair, opened the meeting at approximately 10:03 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.

Ms. Brown then introduced Scott Schermerhorn, the Director of Charlotte County Mosquito and Aquatic Weed Control, as the newest member of the Council representing mosquito control. Mr. Schermerhorn has replaced Mark Latham on the council.

Ms. Brown then advised that Dr. Ed Lowe's appointment to the Council expired and he declined to be reappointed. She asked that the Department is seeking recommendations for someone to represent Florida Environmental groups to replace Dr. Lowe on the Council. If anyone has a recommendation, please let Marah Clark and Lisa Brown know, and they will assist them with the requirements/procedures.

APPROVAL OF AGENDA AND PRIOR MEETING MINUTES

Chair Brown called for approval of the meeting agenda. Councilmember Dominy offered the motion to approve the meeting agenda, which was seconded by Councilmember Singleton. 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 September 2020 Meeting Minutes. Councilmember Gleeson moved to accept the minutes, which was seconded by Councilmember Rey. Upon a call to vote, the September 2020 Minutes were unanimously approved.

REVIEW OF ACTION ITEMS FROM PRIOR MEETING

Chair Brown then reviewed the status of the action items from the September 2020 meeting: a) the revisions to the Process Document for Reviewers will be discussed later in the meeting; b) the breakdown of costs per priority for the research selection proposals will be discussed later in the meeting; and, Lisa Brown sent the prior years research priorities to the members after the September meeting.

AGENCY UPDATE

Organizational Updates: Chair Brown reminded everyone of the FCCMC@FDACS.gov email address being used for Council business. Coordinator Lisa Brown can still be reached via her direct email.

Personnel: Chair Brown advised that the Staff Assistant hired in the fall resigned to take a full-time position outside the agency. However, Kimisha Davis was just hired to fill the position and started Friday, January 15! Ms. Davis will be working for Marah Clark doing outreach

regarding mosquito population data, entering mosquito population data into the Centers for Disease Control and Prevention's (CDC) web based MosquitoNET application, among other things. Welcome aboard, Kimisha!

The department is still on hold to replace the Environmental Specialist III who handled mosquito control outreach in South Florida. Chair Brown again asked that if anyone knows of someone with mosquito control experience who would be interested in this OPS Environmental Specialist III to send in a resume to Marah Clark for consideration when the position can be filled.

Legislative/Rulemaking/Budget Update: There were no updates at this time. Chair Brown then asked Marah to report about an EPA Pesticide Program Update regarding an ongoing investigation regarding per- and poly-fluoro-alkyl substances (PFO/PFAS) that was released Thursday, January 14, 2020. These banned substances recently were detected in a commonly used mosquito adulticide. The EPA has determined that the fluorinated HDPE containers are the source and not the pesticide or its manufacturing process.

Councilmember Carina Blackmore stated that FDOH has been involved with PFO/PFAS because of their use around fire stations and fire cleaning facilities. The current issue could be a big deal with regards from a communications level depending on the volume of the pesticide use. She asked if it is all containers or specific containers? Ms. Clark responded that the EPA is still investigating and there is limited information at this time and that it was a 30-gallon fluorinated HDPE container

Councilmember Randy Dominy issue will encompass pesticides in Ag departments, but DEP and similar entities because PFAS crosses all boundaries. The EPA put out the notice to be ahead of it. They will be having ongoing discussions. Not unique to mosquito control because it is directly related to a process centered around the containers.

FDACS AES Division Director Kelly Friend stated that the first product was Anvil 10+10 but will be a broader issue because it does involve the containers. FDACS is compiling questions from state mosquito control programs, ag industries, and partnering agencies to submit to the EPA as a unified front.

SUBCOMMITTEE REPORTS

Chair Brown reminded the Council that Doug Carlson, Chair of the **Subcommittee on Managed Marshes** retired in December 2020. Ron Brockmeyer and Ed Foley have volunteered and are the new Co-Chairs. They briefly stated that they are going to keep things going and will get back to us at the next meeting with their progress.

Neither the **Research Selection Subcommittee** nor the **Imperiled Species Subcommittee** met since the last FCCMC meeting.

Ricardo Zambrano, Imperiled Species Subcommittee Chair, let the Council know that Michael Dunn of the Indian River Mosquito Control District retired, leaving a vacancy on the subcommittee. He asked that if anybody interested in joining email him directly. Once he has a candidate, he will bring it before the Council to vote.

Mr. Zambrano then gave some brief updates on imperiled species issues:

- North Florida Conservation Coordinator/Technician has been hired to assist with the Florida Natural Areas Inventory.
- Research Technician hired in the Florida Keys to help lead our population surveys and population structure project for the imperiled sawgrass skipper (funded by USFWS).
- Research Technician has been hired to lead a new Urban Corridor project funded by the Florida Wildflower Foundation.
- Research Technician has been hired to lead out pesticide/monarch trails as part of our UF Funded Wildlife-Safe Certified Plant project. Funding is being sought to continue this project beyond 2022.

- The National Park Service will provide \$51,997 for FY 2021 to help support our Schaus' swallowtail conservation and reintroduction efforts.
- A range wide population structure analysis of the frosted elfin butterfly as part of the USFWS candidate evaluation (funded at ~\$90K by USFWS), joining researchers from Oklahoma and Dartmouth.

There was a brief discussion on whether the Council is required to vote on subcommittee chairs, or just subcommittee members. It was decided that it is not.

Councilmember Clauson then requested that the Council recognize Doug Carlson for over 30 years as the chair of SOMM. Chair Brown said that she would work with the Department to do so.

ISSUE BRIEFINGS AND UPDATES

Arboviral Update: Councilmember Blackmore then gave the arboviral update. In 2020 there was one West Nile Virus outbreak with 50 human cases, primarily based out of South Florida/Miami-Dade County (36 asymptomatic blood donors and 14 illnesses). There was an outbreak of Dengue Fever primarily located in the Florida Keys with Key Largo the epicenter. There were 71 **locally acquired** human cases with seven mosquito pools testing positive.

Councilmember Blackmore then said she needed to mention COVID-19 and the financial constraints that it has brought to the Department of Health (DOH). DOH is going to have look very closely at the finances of our public health laboratory, which includes our sentinel chicken testing. At this time, no decisions have been made, but she does not know if DOH will have funding to sustain that program. Councilmember Blackmore feels that would be a worst-case scenario, but the cost of the sentinel chicken testing program is definitely something that needs to be reviewed. COVID-19 has strained the finances of Florida public health laboratories.

Marah Clark added that the loss of the sentinel chicken surveillance program would have a major impact on the state. The Council and mosquito control programs should begin thinking of ways to find funding to maintain it.

There were no further discussions.

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>

CoAg Update: Ms. Clark explained the department is in the last six months of the Centers for Disease Control CoAg grant focused on hurricane crisis response. The CoAg grant has been very helpful for many of the smaller mosquito control programs (programs) helping them to improve capacity for post-disaster response. Many of the programs used the funding to clean up ditches and areas where container waste would have held water. She is working with DOH and the Department of Environmental Protection regarding tire waste and a possible amnesty project if a timely Memorandum of Agreement cannot be executed by mid-February.

Ms. Clark continued, advising that there are two programs with SIT that are continuing forward and to the end of June and have had some success and releases of sterile males. She is looking forward to seeing if they've been able to get any effective control by this method. Ms. Clark reiterated that Kimisha Davis has been hired to work with the programs to get their surveillance data and enter it into the CDC's Mosquito Net.

Finally, she explained that a large portion of the funding has gone to Doctor Buckner and her work on insecticide resistance in the state. She advised that Dr. Buckner will be discussing her research later in the meeting.

Cm Walker then let Ms. Clark know that he was not aware of any conflicts in getting a MOA with the DEP. He offered that he and Councilmember Singleton to help to get the agreement in place.

Chair Brown then had Ms. Clark and Caitlin Gill continue with the Revisions to the Process Document for Reviewers.

Revisions to the Process Document for Reviewers: Ms. Clark welcomed Ms. Gill and reminded the Council that it approved the changes to the research grant proposal process at the prior meeting. This similar document for those reviewing the grant proposals was provided to the members prior to this meeting to allow for approval for the upcoming research selection process (*See Attachment 1*). She requested comments, questions or revisions.

There were none directed towards the document itself, however, Cm Rey raised the issue of doing due diligence on conflict of interest before the review committee members are selected and approved. Discussion ensued, including the possibility of a “term limits” and/or a rotating schedule for subcommittee members. Three years was suggested as a minimum term. The chair could also be rotational.

It was confirmed that currently RSS members who may have a connection or interest in a proposed project recuse themselves from that review. Dr. Kline, subcommittee chair, reviews all the proposals and recommendations, and then Ms. Gill does a follow-up review to also check for potential conflicts of interest. Ms. Clark reminded the Council that it must vote to approve subcommittee members. Ms. Clark commented that currently there is a good representation of mosquito control programs and research institutions on the subcommittee and suggested that should remain as a requirement. The public records/committee membership requirements should also be taken into consideration when selecting subcommittee members.

Ms. Clark, Ms. Gill, and Dr. Kline will work include this in the draft **Process Document for Reviewers** and have it available for the May meeting and it place by the 2022-2023 grant cycle. She requests that the subcommittee use the draft document for the 2021-2022 review.

Costs Per Priority Submitted For Funding: Chair Brown introduced Caitlin Gill to go over the costs per priority submitted for funding (*See Attachment 2*). She advised that it is often not possible to break out by a single one of the Council's priorities as research projects actually cover more than one priority. This is actually good as more issues are being touched upon for the amount of funding used. The new process document approved at the prior meeting - *the Florida Coordinating Council on Mosquito Control Research Proposal Review and Selection Process for Principal Investigators* - should make it easier to show which priorities are being targeted in the future.

Chair Brown then called for a brief break before the remaining presentations.

Displacement of *Aedes albopictus* by *Aedes aegypti* in Gainesville: Upon return, Chair Brown introduced Dr. Peter Jiang, Director of the City of Gainesville's mosquito control program. He discussed the displacement of *aedes albopictus* by *aedes agypti* in urban Gainesville (*See Attachment 3*). At the end of his presentation, Councilmember Blackmore asked if he had data on the how more urbanized the area has become. Dr. Jiang stated that the downtown area is “pretty urbanized.” Ms. Clark said she had seen something similar in extreme urban, older areas, due to the increased resistance in those mosquitos. A brief discussion ensued regarding increased resistance and the displacement.

FMEL Insecticide Resistance: Chair Brown then introduced Dr. Eva Buckner of the Florida Medical Entomology Laboratory. Dr. Buckner discussed domestic mosquitoes in Florida and insecticide resistance in those domestic arbovirus vectors (*See Attachment 4*). Her research Illustrates that resistance in mosquitoes can vary by population and insecticide and species, and the need for population level insecticide resistance testing being done by her lab. She stated that many human-borne illnesses could have been prevented if there were insecticide resistance data, and insecticide recommendations were made to the mosquito programs before local virus transmission started. Discussions ensued regarding site collection locations, population levels, and future collection matters. Councilmember Yanno raised the point that resistance knowledge could reduce the costs of applying ineffective insecticides. Ms. Clark emphasized the need for the mosquito control programs and even counties without

programs to submit data to Dr. Buckner, while understanding the difficulties the small counties face. The labor-intensive and difficult task of collecting mosquito eggs was also discussed.

USDA Insecticide Resistance: Chair Brown next introduced Alden Estep of the USDA Center for Medical Agricultural and Veterinary Entomology. Mr. Estep gave an overview of insecticide resistance, how the USDA uses that information, and, what is still needed to be done (See *Attachment 5*). He discussed genetic resistance, “famous knockdown resistance”, KDR resistance, that is coming in insects in agriculture and public health insects. Resistance may be different in intensity in areas with lower treatment, however, they all show resistance. Mr. Estep gave an example of a mosquito control program noticing a resistance mutation evolving, which set the stage for a second more resistant mutation. The mosquito control program stopped using pyrethroids, and because they still had susceptible alleles in their populations, they started to see a drop off in resistance levels. This showed resistance is not static. There is a need to develop data to allow comparison of now versus prior years. He acknowledged Dr. Buckner’s work in this area and reiterated that more is necessary. Mr. Estep then went over his resistance work with Anastasia Mosquito Control. A brief discussion ensued, with the need for baseline data in Florida emphasized.

FMCA - Prioritization of Research: Chair Brown introduced Dr. Ruide Xue of the Anastasia Mosquito Control District. Dr. Xue discussed the Florida Mosquito Control Association’s Prioritization of Research (See *Attachment 6*). There were no questions for Dr. Xue.

Chair Brown then gave the Council members the opportunity to review and/or revise their Research Prioritization ballots while giving the group another brief break of ten minutes.

RESEARCH SELECTION PRIORITIZATION

Upon return from the break, Chair Brown asked if Coordinator Lisa Brown needed additional time to re-tabulate the prioritization scores. As no Council members revised their ballots, no extra time was required.

Chair Brown explained to those attending that the ballots had been collected via email prior to the meeting, with all except one being returned. A brief discussion on the ballot results ensued, including a request for applied research in the future.

As there was no further discussion, Chair Brown called for a motion to approve the 2021-2022 research priorities. Councilmember Schermerhorn so moved, which was seconded by Councilmember Yanno. Upon a call to vote, Research Priorities for 2021-2022 were unanimously approved (See *Attachment 7*).

After the approval, the question of funding the current fiscal year had been allocated, and if there was a potential for a funding shortage due to COVID-19 was broached by Councilmember Yanno. Chair Brown deferred to Ms. Clark who assured him that it is statutory and has been allocated. As far as the pending 2021-2022 fiscal year, she said that the process will go forward as usual, and work within the budgetary allocation.

COUNCILMEMBER COMMENTS, ISSUES AND OTHER MATTERS

Councilmember Rey re-raised the vacant Council position and asked how to nominate someone. Chair Brown reiterated that Ms. Clark has the procedural guidelines and to email her and Coordinator Lisa Brown. Ms. Clark will work with the Commissioner’s office on an appointment.

Dr. Xue asked if the research grant process could be opened up to allow mosquito control programs to apply. Ms. Clark replied that it is currently restricted to state universities, and that she would have to look in to whether or how to open up to applied research by mosquito control programs.

There were no other issues brought up by council members.

GENERAL PUBLIC COMMENTS

There were no public comments.

FUTURE MEETINGS

Chair Brown hopes that by September 2021 the Council will be able to meet in person, but in an abundance of caution, the May 2021 meeting will again be virtual. The proposed dates in May are the 4th, 11th, and 18th. She asked for any conflicts or preferences.

There was minimal discussion, so Chair Brown called for a motion to hold the next scheduled meeting virtually on May 18, 2021, via Go-To-Meeting. Councilmember Dominy so moved and was seconded by Councilmember Clauson. Upon a call to vote, the date of May 18, 2021, was unanimously approved.

Chair Brown then mentioned holding the September 2021 meeting at Beach Mosquito Control District in the event that in-person meeting will be viable at that time. She told Council members to email Coord. Lisa Brown any other suggestions for locations which will be discussed at the May meeting.

REVIEW OF THE MEETING'S ACTION ITEMS

Chair Brown reviewed the meeting's action items:

- o Environmental Interest Council member
- o Subcommittee members voted upon by Council? (M. Clark)
- o Subcommittee chair approved by Council? (M. Clark)
- o Council members on subcommittees/Sunshine Law? (M. Clark)
- o Recognize Doug Carlson (A. Brown/L. Brown)
- o Mark Latham recognized? (A. Brown/L. Brown)
- o DOH/DEP MOU – Councilmember Blackmore, Singleton, Walker (M. Clark)
- o Revisions to Reviewer Document (M. Clark/C. Gill/D. Kline)
- o Can research grants can be opened up to mosquito control Districts (M. Clark)
- o Oxitec Update requested (A. Brown/M. Clark)

ADJOURNMENT

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

The meeting was adjourned at 1:24 pm.

ATTACHMENTS

- 01 Revisions to the Process Document for Reviewers
- 02 Costs Per Priority Submitted For Funding
- 03 Displacement of *Aedes albopictus* by *Aedes aegypti* in Gainesville
- 04 FMEL Insecticide Resistance
- 05 USDA Insecticide Resistance
- 06 FMCA - Prioritization of Research
- 07 Research Priorities for 2021-2022

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.

FLORIDA COORDINATING COUNCIL ON MOSQUITO CONTROL

RESEARCH PROPOSAL REVIEW AND SELECTION PROCESS

Revised
Month, Day, 2020

Formatted: Title

Contents

Introduction 3

Purpose 3

Guidelines for Proposal Submission 4

Proposal Format..... 4

Request for Proposals Timeline 5

FCCMC Research Priorities..... 6

FCCMC Research Proposal Review and Selection Process..... 7

Procedures for Proposal Review 7

FCCMC Research Selection Subcommittee Appointment Overview 7

Proposal Review Process 7

FDACS Sample Cost Analysis Form..... 12

Introduction

This document provides established procedures and guidance to the Florida Coordinating Council on Mosquito Control's (FCCMC), Research Selection ~~Committee~~Subcommittee 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 (~~DACS~~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 ~~Districts~~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 Month day, 2020.

Commented [GC1]: Date to be updated once final approval is given

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)

Commented [CM2]: New: added because not all PI's tie the research to the priorities.

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 state of the problem and relevant other research that bears on the problem.
Provide references of preliminary work bearing on the problem 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 that 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.

Commented [CM3]: Page number may change based on final document

ENVIRONMENT (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

Project title, role, dates, total cost, objectives, link (if any) to current proposal

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

<u>Procedure Action</u>	<u>Date / Deadline¹</u>
<u>Request for project proposals (RFP) sent to institutions (hard copy)</u>	<u>February 15th</u>
<u>Project proposal deadline for submission (email)</u>	<u>April 15th</u>
<u>FDACS sends proposals for review to RSS Chair (email)</u>	<u>April 16th</u>
<u>RSS Peer review deadline. Reviews and score sheets sent to FDACS (email)</u>	<u>May 30th</u>
<u>Contracts issued to PIs awarded funding (dependent on appropriated funds)</u>	<u>July 1st</u>

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

FCCMC Research Priorities

Commented [CM4]: Priorities will be listed in order determined during the Research Prioritization Exercise.

Research Funding Prioritization Exercise Results

January xx, 20xx

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

FCCMC Research Proposal Review and Selection Process

Goal: To provide a peer review that is 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. In addition, this document outlines the proper format for individuals submitting research proposals for review.

Commented [CM5]: Section was reorganized to easily move through the entire submission and review process.

Methods/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 (Table 1).
- 2) **Submit RFP to FDACS:** Refer to letter to researchers submitted along with this document. Researchers must follow guidelines established and listed above.

Commented [CM6]: This was rewritten and moved to the introduction and is now the Purpose of the document.

Commented [CM7]: To be updated in final review.

Commented [CM8]: This will be deleted.

FCCMC Research Selection Subcommittee Appointment Overview

- 1) **Selection of Committee Membership:** The membership of the ~~RSC~~ 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 ~~Research Selection Committeesubcommittee (RSC)~~ of 6 to 8 members (not including a Chairperson).
 - b) Select a Chair person ~~for the Committee~~ responsible for guiding ~~the Committee~~ stimulating discussion, distributing review materials, compiling evaluation scores, communications with ~~committeeRSS~~ members, but does not act as one of the peer reviewers conducting evaluations or making actual selections of proposals.

Formatted: No bullets or numbering

Proposal Review Process

- 1) **FDACS Submission to RSS:** FDACS sends all proposals, submitted within the established deadline, to the Chairperson for his/her initial review and dissemination to RSS members.
- 1)2) **Responsibilities-Initial Review byof the RSCRSS 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. ~~CommitteeSubcommittee~~ members must review each proposal independently.
 - a) Chair provides reviewers with a conflict of interest form ~~for completion and requests for feedback-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 ~~the~~ 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 ~~to be considered for review that address the high priority topics-~~
- ii) **Group 2:** Proposals ~~may be reviewed (questionable) that address midrange priority topics-~~
- iii) **Group 3:** Proposals ~~will not receive a further consideration due to low priority score that address low priority topics-~~

~~2) **Initiating the RFP:** DACS 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 Table 1. Guidelines delineated in the *FCCMC Research Proposal Review and Selection Process* document contain instructions to principal investigators (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, DACS and FMCA is provided with the letter requesting proposal submissions from competing universities and colleges. Principal investigators must provide DACS with their research proposal via email in .PDF format in accordance with the established deadline (Table 1).~~

Table 1. Timeline for Request for Proposals.

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
DACS sends proposals for review to RSC Chair (email)	April 16 th
RSC Peer review deadline. Reviews and score sheets sent to DACS (email)	May 30 th
Contracts issued to PIs awarded funding (dependent on appropriated funds)	July 1 st

¹—Dates listed in Table 1 are proposed target dates for the actions listed.

2)3) **The Review Process:** DACS sends all proposals, submitted within the established deadline, to the Chairperson for his/her initial review and dissemination to RSC members. Once grouped as outlined in Proposal Review Process, Section 2(b), the Chairperson sends all proposals in an email to each RSCRSS 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 ~~and placed into group 1.~~

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) Proposals that were not reviewed (Group 2 or 3) will receive a short email communication/letter from the Chair indicating that their proposal was not considered by the review committee and a brief reason explaining why. This decision in no way reflects future priority considerations.~~

~~d) 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.~~

~~e) Each reviewer is required to submit 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. The electronic scoring sheets are required to be sent in Microsoft Word format or something compatible with Microsoft Word to the Chair once their review is completed.~~

~~f) The Chair convenes a conference (meeting by in person or teleconference) to discuss proposals and scoring.~~

~~g) **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 ~~on the basis of~~ based on a clearly divergent score on the part of 1 or 2 reviewers.

Commented [CM9]: This section was removed because FDACS communicates to all researchers whether their individual projects were funded or not.

- 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 ~~1-page~~ written justification for their score. 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 yeas voting to drop the score in contention from the overall scoring of the proposal. Passing the motion requires a super majority of the ~~committee~~ RSS including a vote by the Chairperson. Defeating the motion requires 3 nay votes.

~~h)g)~~ All ~~G~~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)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 ~~committee~~ RSS members agree the rankings are the optimal use of the funds.

~~3)4)~~ **DACS/FDACS Review and Acceptance of Proposals Recommended for Funding:** Subsequent to the review process, the Chair will provide DACS/FDACS with the recommended proposals for funding, ~~and~~ 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 ~~(Word)~~ 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).

NOTE: To ensure reviewer anonymity, DACS 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.

- a) DACS/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, DACS/FDACS must discuss these changes with the RSS Chair prior to a 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 primary investigator for each proposal will receive a short email communication/letter from FDACS indicating whether their proposal was chosen for funding or not 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.**

~~4)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 3-4 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.

Commented [GC10]: New: This is an overview that FDACS already receives each year from the Chair. This text is being included here to make it formal.

- d) Continuance of funding for a multiyear proposal is contingent on annual legislative appropriations.

GUIDELINES FOR PROPOSAL SUBMISSION

All proposals submitted 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 Table 1.

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

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

ABSTRACT (maximum 350 words)

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 state of the problem and relevant other research that bears on the problem.

Provide references of preliminary work bearing on the problem 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 that 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 DACS Example Budget Form below.

Example Budget Form **FDACS Sample Cost Analysis Form**

Commented [CM11]: For ease, this was pulled from the process flow and is now located at the end.

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

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

Cost Elements: The proposed budget must be broken down by the following cost elements; salaries, fringe benefits, equipment, utilities, 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 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.

ENVIRONMENT (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

Project title, role, dates, total cost, objectives, link (if any) to current proposal

Previous Publications (give career total of peer reviewed publications)

List 5 most recent publications relevant to the proposal.

Previous DACS funding and resulting publications

List previous DACS 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

2020-2021 Research Grants		Priorities of ALL Submitted Proposals n=16	# of Proposals	Priority Rank	Priorities of Funded Proposals n=5	# of Proposals	Priority Rank	# Proposals n=7	Estimated Funding per Priority
# of Proposals	18**	Disease- Surveillance/Control/Risk Prediction	8	3	Pesticide- Non-target effects: chronic or acute	4	1	5	\$134,623.92
\$ Range of proposals submitted	\$61,641 - 181,684	Pesticide- Efficacy/ Resistance	6	2	Pesticide- Efficacy/ Resistance	2	2	2	\$37,092.25
# Funded	7**	Mosquito Ecology/Biology/Population Dynamics	6	5	Mosquito Ecology/Biology/Population Dynamics	2	5	2	\$31,330.75
\$ Range of proposals funded	\$61,641 - 90,451	Domestic Mosquito Control	6	7	Mosquito Surveillance/Trapping Systems	2	4c	2	\$31,330.75
Total \$ amount funded	\$508,921	Pesticide- Non-target effects: chronic or acute	5	1	Disease- Surveillance/Control/Risk Prediction	1	3	1	\$15,920.50
# Not funded	11	Emerging Pathogens	5	4a	Emerging Pathogens	1	4a	1	\$15,920.50
# of Universities/Colleges	5	Mosquito Surveillance	4	4c	Domestic Mosquito Control	1	7	3	\$37,394.77
Representation of Universities/College	UF, UCF,USF,FIU,FMAU	Environmental Residue Monitoring	1	4b	Non-Pesticide Control / Products	1	8b	1	\$16,430.50
		Application - Larvicides	1	8a	Environmental Residue Monitoring	0	4b	0	\$0.00
		Non-Pesticide Control / Products	1	8b	Pesticide- New Products	0	6	1	\$9,045.10
		Public Education/Risk Communication	1	10	Application - Larvicides	0	8a	0	\$0.00
		Pesticide- New Products	0	6	Application- adulticide	0	9	2	\$20,964.27
		Application- adulticide	0	9	Public Education/Risk Communication	0	10	0	\$0.00
		Storm water	0	11b	Application- Residual Vegetative Barriers	0	12	1	\$9,045.10
		Attractants/ Repellents	0	11a	Attractants/ Repellents	0	11a	1	\$9,045.10
		Application- Residual Vegetative Barriers	0	12	Storm water	0	11b	0	\$0.00

Highest Priority

Second Priority

Third Priority

Mid Range Priorities (4-7)

Lowest Priorities (8-12)

Highest Priority

Second Priority

Third Priority

Mid Range Priorities (4-7)

Lowest Priorities (8-12)

Highest Priority

Second Priority

Third Priority

Mid Range Priorities (4-7)

Lowest Priorities (8-12)

Field Evidence of Displacement of *Aedes albopictus* by *Ae. aegypti* in Downtown Gainesville, Florida

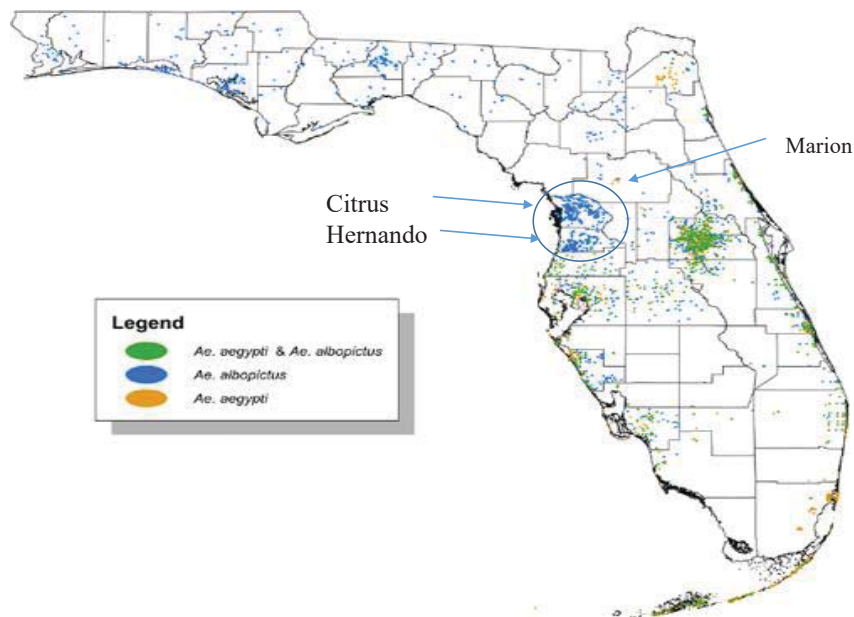
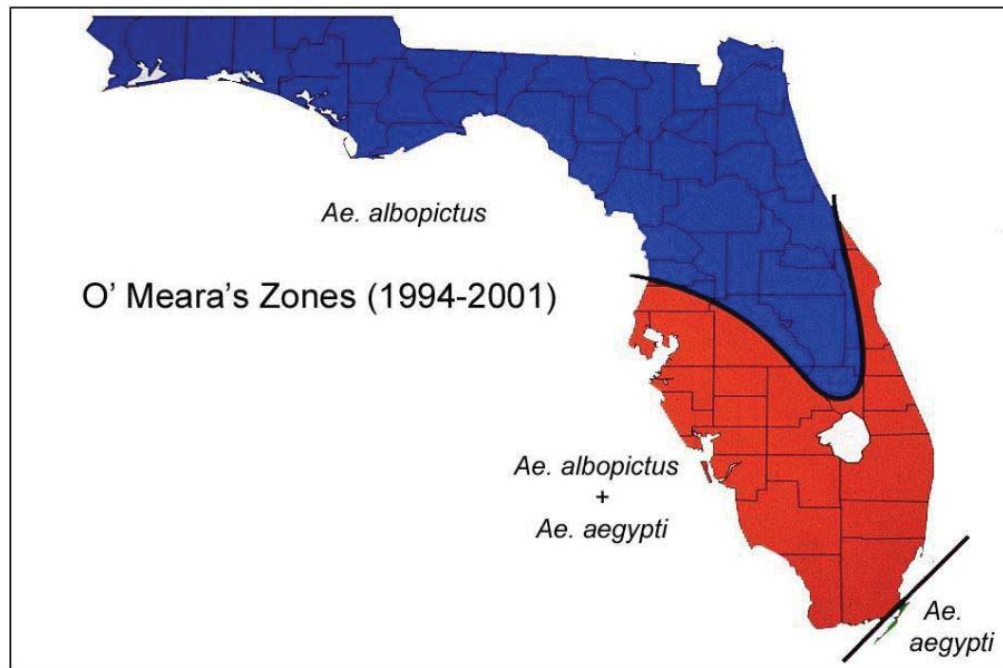


Peter Jiang, Ph.D.
Gainesville Mosquito Control
405 NW 39th Ave, Gainesville FL 32609

Background

- Prior to the introduction of *Aedes albopictus*, *Aedes aegypti* is widely distributed throughout the tropical and sub-tropical regions of the United States, occurring in every county in Florida;
- *Ae. albopictus* was detected in both Duval and Escambia counties in Florida in 1986, and within 6 years had spread to all 67 counties in the state;
- *Ae. albopictus* established and expanded its range, it caused rapid population declines of *Ae. aegypti*, to the point of extirpation in most areas except the extreme south of Florida

General *Aedes aegypti* and *Aedes albopictus* Distribution



Estimated distribution of *Aedes aegypti* and *Aedes albopictus* in Florida (Journal of Vector Ecology 44 by Parker et al 2019)

Ae. albopictus and *Ae. aegypti* in Gainesville

- A similar competitive displacement trend occurred in the city of Gainesville, FL. *Aedes albopictus* was first discovered in Alachua County in October of 1988;
- *Aedes aegypti* and *Ae. albopictus* lived in sympatry for several years, after which *Ae. albopictus* became the dominant species by May of 1990. The last known record of *Ae. aegypti* in Gainesville was collected in May of 1993;
- In November of 2019, several 4th instar *Ae. aegypti* larvae were found in a residential area, known as the Pleasant Street Historic District (PSHD), near downtown Gainesville after 26-year absence.

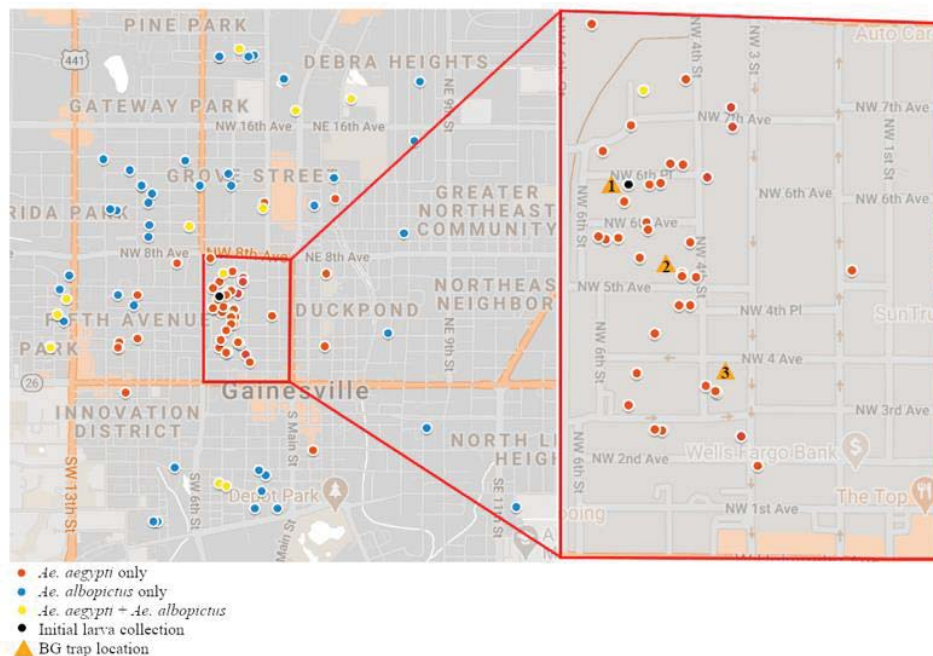


Fig. 1. Map of Pleasant Street Historic District (inset) and surrounding areas showing *Aedes aegypti* and *Aedes albopictus* larval samples collected during November 2019 to November 2020.

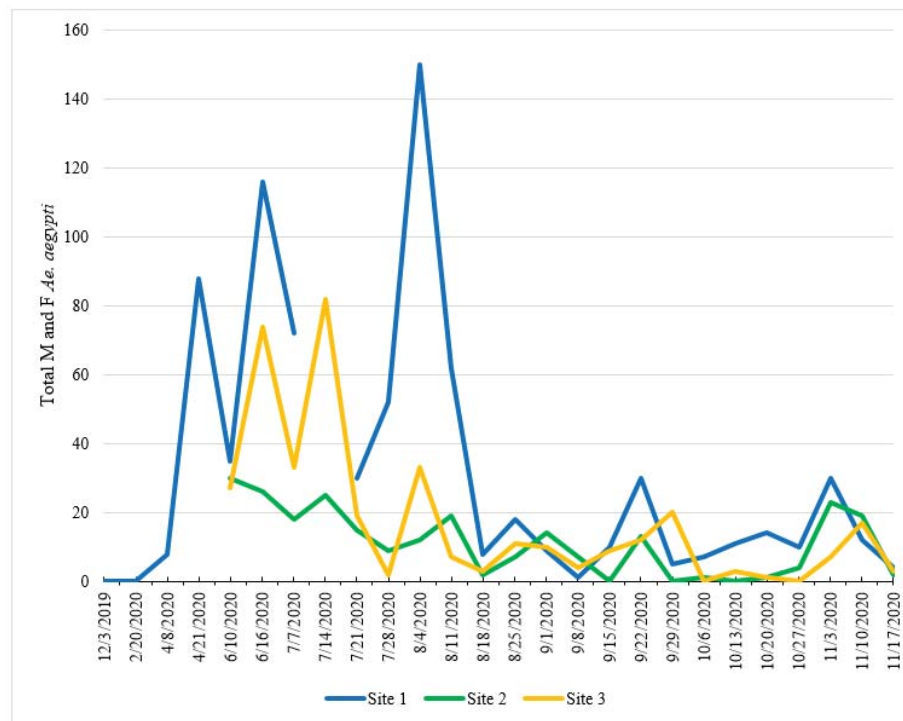


Fig. 2. Total number of male and female *Aedes aegypti* mosquitoes collected by BGS traps by date in the Pleasant Street Historic District.

- Results of this investigation suggest that *Ae. aegypti* has outcompeted *Ae. albopictus* within the PSHD, and is actively dispersing to adjacent neighborhoods;
- There appears to be a westward movement of *Ae. aegypti* from the PSHD, likely due to the density of houses and people within those neighborhoods;
- Survey showed that *Ae. aegypti* is resurging in North-central area such as Citrus, Lake, Marion, Hernando Counties.

Insecticide resistance in Florida's domestic arbovirus vectors

Eva Buckner, PhD

Assistant Professor and State Extension Specialist

UF/IFAS Florida Medical Entomology Laboratory

Vero Beach, FL



1

DOMESTIC MOSQUITOES IN FLORIDA



- ***Aedes albopictus*, *Aedes aegypti**, *Culex quinquefasciatus****
 - Live in close association with humans
 - Important arbovirus vectors
 - *Resistant to multiple insecticides



2

Locally acquired human arbovirus infections in Florida in 2020

- WNV:
 - 86 human infections
 - 50 symptomatic
 - 60 in **Miami-Dade County***
 - 7 in **Broward County***
 - 7 in Collier County
 - 5 in **Palm Beach County***
 - 1 in Bay, Charlotte, **Hillsborough***, Lee, Manatee, Martin, and **Suwannee*** Counties
- Dengue
 - 71 human infections
 - 67 in Monroe County
 - 4 in **Miami-Dade County***

***Mosquito control programs without insecticide resistance testing**



3

AE AEGYPTI % MORTALITY AT 2 HR FOR ETOFENPROX

County	Site	% Mortality at 2 hours
Brevard	Viera	4
Pinellas	Tarpon Springs	5
Miami-Dade	Homestead	5
Miami-Dade	Miami Beach	6
Miami-Dade	Wynwood	8
Volusia	Port Orange	17
Broward	34th Ave	23
Broward	Farragut	30
Palm Beach	Mounts	34
Volusia	Alice	35
Broward	Shalimar	51
Volusia	Holly Hill	54
Miami-Dade	Flager	69
Miami-Dade	Little River	83
Monroe	Overseas	86

4

AE AEGYPTI % MORTALITY AT 2 HR FOR SUMITHRIN

County	Site	% Mortality at 2 hours
Brevard	Viera	23
Volusia	Port Orange	36
Broward	34th Ave	70
Broward	Farragut	73
Pinellas	Tarpon Springs	76
Volusia	Holly Hill	81
Miami-Dade	Miami Beach	83
Broward	Shalimar	87
Palm Beach	Mounts	88
Miami-Dade	Wynwood	89
Monroe	Overseas	90
Miami-Dade	Homestead	90
Miami-Dade	Little River	95
Volusia	Alice	95
Seminole	Casselberry	97
Miami-Dade	Flager	98

5

CX QUINQUEFASCIATUS % MORTALITY AT 2 HR FOR MALATHION

County	Site	% Mortality at 2 hours
Bay	Cox Grade	96
Bay	Gulf	88
Bay	Hutchinson	99
Bay	Nautilus	100
Citrus	10th	95
Citrus	Rose	100
Hernando	Spring Hill	98
Indian River	Vista Royal	96
Lake	Leesburg	97
Lake	Tavares	93
Martin	Hobe Sound	100
Miami-Dade	355th ST	98
Miami-Dade	Pinecrest	89
Monroe	Key West	97
Palm Beach	Sysco	88
Pinellas	Oldsmar	100
Pinellas	Saturn Ave	95
Polk	Durrance	100
Polk	Main St	100
Seminole	Cameron	100
Seminole	Cascade	99
Seminole	Center	100
Volusia	Museum	80

6

CX QUINQUEFASCIATUS % MORTALITY AT 2 HR FOR DELTAMETHRIN

County	Site	% Mortality at 2 hours
St. Lucie	Fairwinds	0
Seminole	Winding Pine	1
Miami-Dade	Miami	5
Monroe	Key West	6
Miami-Dade	Miami Beach	10
Seminole	Center	12
Volusia	Museum	14
Bay	Gulf	16
Martin	Hobe Sound	20
Miami-Dade	Pinecrest	20
Brevard	Viera	21
Pinellas	Oldsmar	23
Miami-Dade	355th ST	25
Citrus	10th	30
Lake	Leesburg	32
Indian River	Vista Royal	35
Bay	Cox Grade	40
Hernando	Spring Hill	54
Palm Beach	Clint Moore	58
Pinellas	Saturn Ave	59
Palm Beach	Sysco	60
Polk	Durrance	63
Indian River	Winter Beach	76
Miami-Dade	Wynwood	77
Citrus	Rose	78
Bay	Hutchinson	84
Bay	Nautilus	84
Palm Beach	Delaware	87

7

MIAMI-DADE PINECREST CX QUINQUEFASCIATUS POPULATION

Insecticide tested	Pinecrest <i>Cx. quinquefasciatus</i> % mortality at diagnostic time	Pinecrest <i>Cx. quinquefasciatus</i> % mortality at 2 hours
Permethrin	20%	71%
Malathion	89%	89%
Etofenprox	3%	36%
Deltamethrin	7%	20%
Naled	76 %	100%

- **Population-specific adulticide recommendations**
 - Naled best choice for adulticide for WNV outbreak
 - Malathion good second option
 - Permethrin best performing pyrethroid

8

How many of these 2020 Florida cases could have been prevented by having local insecticide resistance data before local transmission began?

- WNV:
 - 86 human infections
 - 50 symptomatic
 - 60 in Miami-Dade County
 - 7 in Broward County
 - 7 in Collier County
 - 5 in Palm Beach County
 - 1 in Bay, Charlotte, Hillsborough, Lee, Manatee, Martin, and Suwannee Counties
- Dengue
 - 71 human infections
 - 67 in Monroe County
 - 4 in Miami-Dade County



9

Acknowledgements

- Dr. Barry Alto, Co-PI
- Dr. Roxanne Connelly and Dr. Casey Crockett
- Funding provided by the Florida Department of Health grant CODQJ and CDC
- Mosquito control programs provided mosquito eggs
- Current & former lab members assisted project: Daviela Ramirez, Ana Romero-Weaver, Natalie Kendzierski, Sierra Schluep, Amy Hallock, Ashley Page, Shawna Bellamy, and Rebecca Zimler

Questions?



10

USDA



Insecticide Resistance in FL: *What we know, how we use it, and what we still need to do*

ALDEN ESTEP

RESEARCH ENTOMOLOGIST, MOSQUITO &
FLY RESEARCH UNIT

USDA ARS CENTER FOR MEDICAL
AGRICULTURAL AND VETERINARY
ENTOMOLOGY

GAINESVILLE, FL

FLORIDA COORDINATING COUNCIL ON
MOSQUITO CONTROL MEETING

19JAN2021



The opinions expressed in this presentation reflect those of the author and do not represent an official position or recommendation of the USDA, the DoD, any State/ Local/ District governmental unit, or any corporation. USDA is an equal opportunity employer.



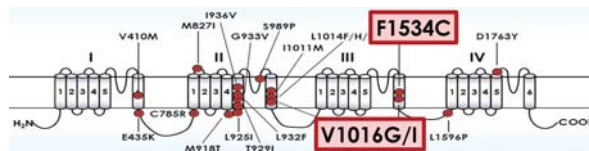
Mention of commercial products are not intended as an endorsement for use or non-use.

Insecticide resistance in FL:

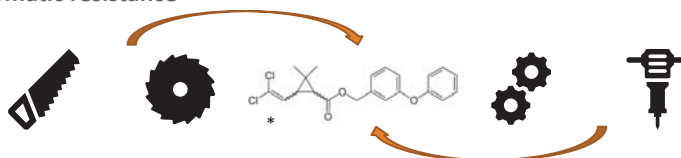
The knowledge baseline

Phenotypic resistance is a combination of mechanisms

- Genetic resistance



- Enzymatic resistance



- Cuticular permeability
- Behavioral actions
- Unknown mechanisms

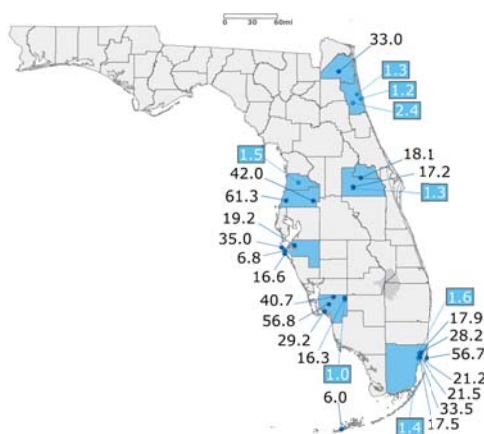
Serious concerns from programs & govt about resistance leading to operational failures

<https://commons.wikimedia.org/w/index.php?curid=1343194>

Insecticide resistance in FL:

The knowledge baseline

Resistance is not “one size fits all”



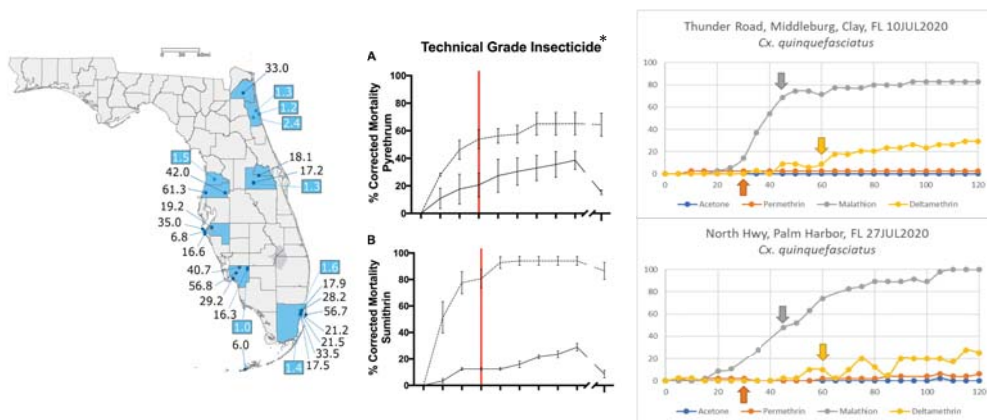
- Location differences
- Species differences
- Differences in the contributions from underlying mechanisms
- Differences in resistance intensity

*Estep et al. 2018 <https://journals.plos.org/plosntds/article?id=10.1371/journal.pntd.0006544>

Insecticide
resistance in
FL:

The
knowledge
baseline

Resistance to pyrethroids should be considered the
standard condition in *Aedes aegypti* and *Culex
quinquefasciatus*



Demonstrated resistance to one pyrethroid implies
resistance to all pyrethroids!

*Lucas et al 2020 <https://doi.org/10.2987/19-6850.1>

Insecticide
resistance in
FL:

The
knowledge
baseline

Resistance is not static and changes over time

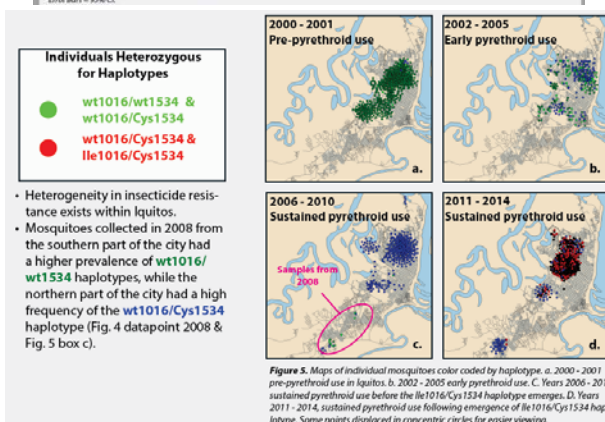
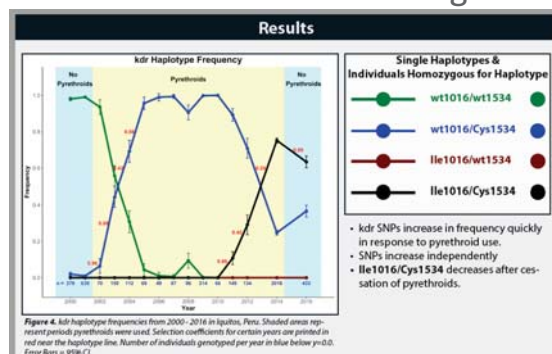


Figure 5. Maps of individual mosquitoes color coded by haplotype. a. 2000 - 2001 pre-pyrethroid use in Iquitos. b. 2002 - 2005 early pyrethroid use. c. Years 2006 - 2010 sustained pyrethroid use before the Ile1016/Cys1534 haplotype emerges. d. Years 2011 - 2014, sustained pyrethroid use following emergence of Ile1016/Cys1534 haplotype. Some points displaced in concentric circles for easier viewing.

*https://research.ncsu.edu/ges/files/2017/11/Jen-Baltazar-Poster_ESA_2017.pdf

Are mosquito
control operations
driving resistance?

Probably not!

Geospatial analysis of IICC frequency
had a negative correlation with
pyrethroid use by control programs

Research | Open Access | Published: 11 May 2020

Spatial variation in the frequency of knockdown resistance genotypes in Florida *Aedes aegypti* populations

Stephanie J. Mundis  Alden S. Estep, Christy M. Waits & Sadie J. Ryan 

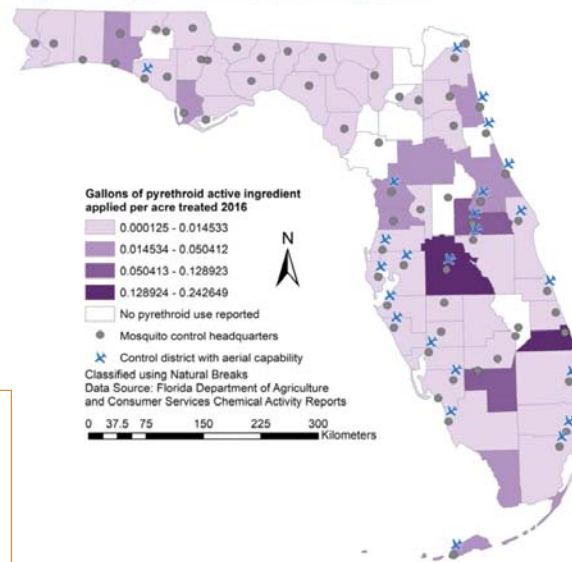
Parasites & Vectors **13**, Article number: 241 (2020) | [Cite this article](#)

536 Accesses | 1 Citations | 10 Altmetric | [Metrics](#)

Vegetation density, distance from roads, and pyrethroid-use by vector control districts were consistently significant predictors of knockdown resistance genotype frequency in the top-performing beta regression models, although pyrethroid use surprisingly was negatively associated with resistance.

Fig. 1

From: Spatial variation in the frequency of knockdown resistance genotypes in Florida *Aedes aegypti* populations



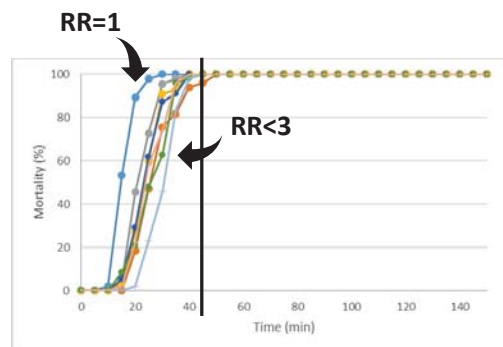
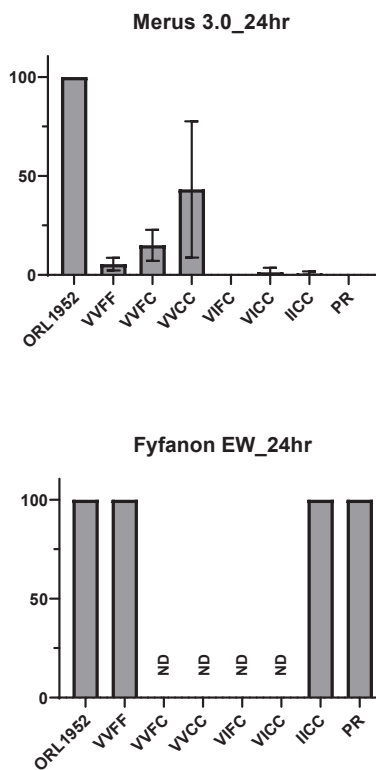
What does this
mean
operationally

Mortality with common adulticides

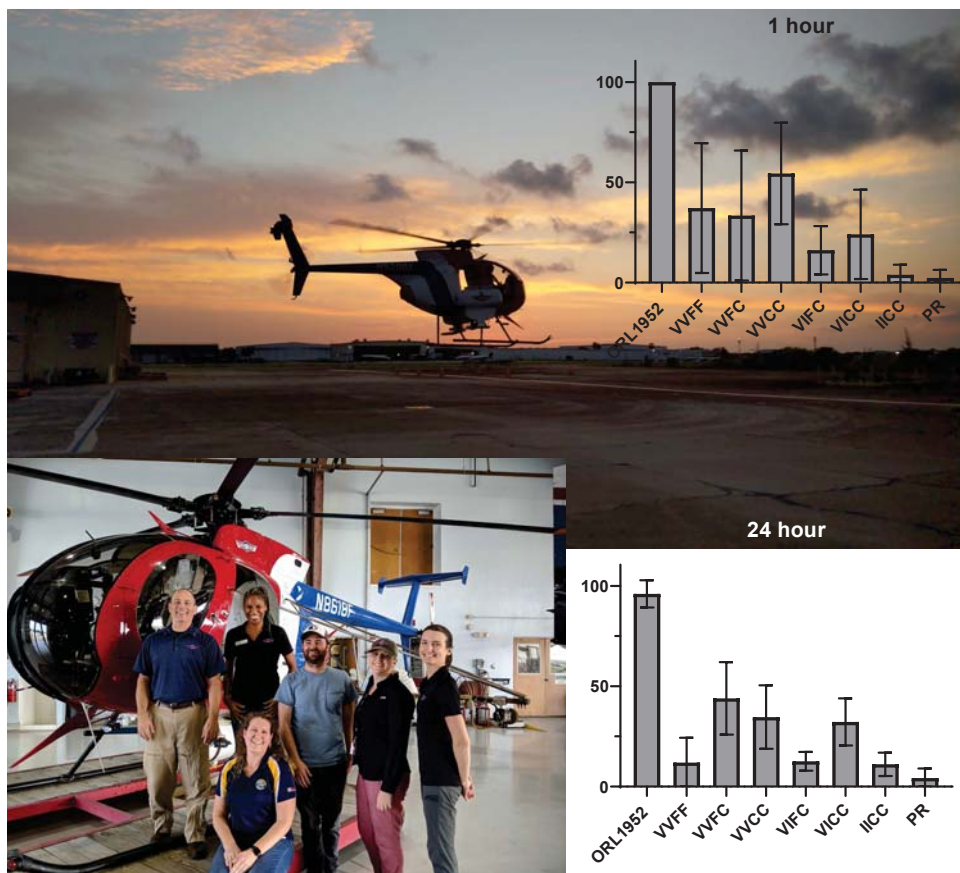
Unsynergized product has extremely limited usefulness

Synergist helps but only against moderate *kdr*

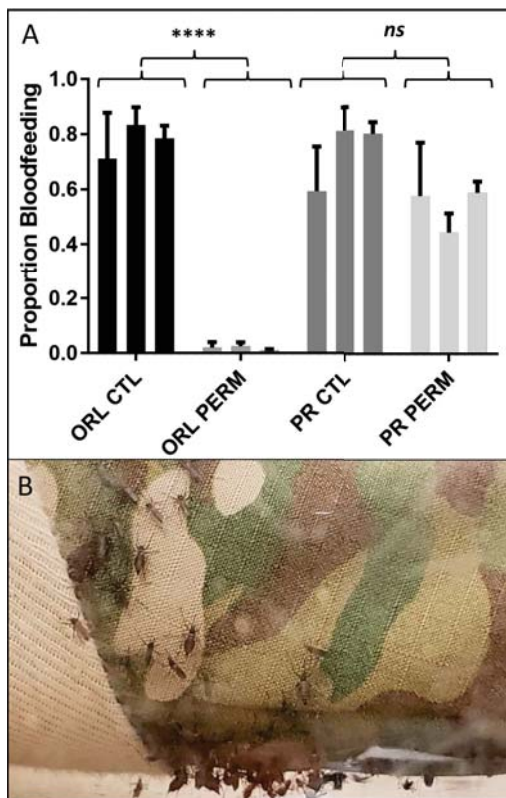
OPs work.



CDC bottle bioassay malathion @ 400µg/bottle



Aerial spray confirms the failure of unsynergized pyrethroids



JAMCA 2020;36(2):127-130. doi:10.2987/19-6906.1

Resistance results in complete failure of permethrin treated textiles



What about other species that are a problem in my area?

Large and small MCPs ask this question
State-wide *Cx. quinquefasciatus* testing is underway
Requests for *Cx. nigripalpus*, *Ae. taeniorhynchus*, *Mansonia*



Meet resistance testing needs of the smaller MCPs

Few have the personnel/resources to conduct regular testing
Centralized testing is more efficient/more productive
Programs are happy to submit samples



Develop the resistance baseline for FL species so MCPs can be more effective

Be able to track increasing resistance over time
Generate info so effective treatment can occur for disease outbreak



Mechanisms underlying IR

Ae. aegypti vs. *Cx. quinquefasciatus*
Synergists
OPs
Other methods

What do we still need to know?

Where do we go from here?



Questions?

Thanks:

27 FL Mosquito Control Programs

FMEL

UF Medical Geography

USDA CMAVE

FDACS

Jimmy Becnel

Neil Sanscrainte

2021 FMCA RESEARCH PRIORITY SUGGESTION

1. Diseases surveillance
2. Operational development (screening and evaluation) of new classes & formulations of adulticides and larvicides
3. Behavior and ecology of container-inhabiting mosquitoes
4. New technology for surveillance and trapping systems
5. Statewide surveillance of insecticide resistance

FCCMC 2021-2022 Research Topic Funding Prioritization

Research Topic	Rank	Total
Disease - Surveillance / Control / Risk Prediction	1	53
Emerging Pathogens	2a*	51
Mosquito Ecology / Biology / Population Dynamics	2b*	51
Pesticide - Efficacy / Resistance	3	50
Mosquito Surveillance / Trapping Systems	4	49
Pesticide - New Products	5	46
Non Pesticide Control / Products	6	45
Domestic Mosquito Control	7	44
Application - Larvicides	8a*	42
Pesticide - Non-target effects: chronic or acute	8b*	42
Environmental Residue Monitoring	9	41
Application - Adulticides	10a*	38
Public Education / Risk Communication	10b*	38
Attractants / Repellants	11	35
Application - Residual Vegetative Barriers	12a*	29
Storm Water	12b*	29

*If a tie - a/b alphabetical

Approved during the January 19, 2021,
Florida Coordinating Council on Mosquito Control meeting