

A. Eva Buckner - **Evaluation of the In2Care Mosquito Trap against *Culex quinquefasciatus* mosquitoes under semi-field conditions**

a. In2Care Trap

- i. *Aedes albopictus* and *Ae aegypti* are difficult to control using traditional measures
 1. Adulticide resistance is documented worldwide
 2. Larval habitats are cryptic
 3. Skip ovipositing – a few eggs laid at a multiple of sites
- ii. In2Care trap contains pyriproxyfen (PPF) and an entomopathogenic fungus
- iii. Mosquitoes entering trap pick up both
 1. Spread PPF to other larval sites
 2. Die from fungus
- iv. Trap evaluation - JAMCA, 33(3):193-199, 2017
 1. Trap attractiveness
 2. PPF autodissemination
 3. Adulticidal impacts
- v. Field trial -JAMCA, 37(4):000-000, 2021 (not yet published)
 1. How can the trap fit into operational mosquito control?
 2. Can the trap replace conventional treatment?
 3. Difference between treatments was significant for eggs and larvae.

b. Does the trap work for *Culex quinquefasciatus*?

- i. Trap was reported to be attractive to quins
- ii. Quins lay egg rafts – no skip ovipositing
 1. More selective in choosing an oviposition site
 2. May visit several potential sites before ovipositing
- iii. Demonstrated to disseminate lethal doses of PPF in lab
- iv. Results
 1. Attractiveness
 - a. Mean % rafts laid in trap vs flowerpot
 - b. Significantly more egg rafts laid in trap
 2. PPF autodissemination
 - a. Emergence inhibition
 - b. Significantly higher than control
 - c. Also saw pupicidal effects
 3. Effect of spores on adult survivorship
 - a. No significance difference in adult survivorship between treatment and control
 - b. Potential issues with results

- i. Low adult recapture rate
 - ii. Low temperature issues
 - c. Forced exposure showed that treatment replicates had significantly lower survivorship compared to controls
 - v. In2Care trap may be an effective control tool against quincs, but field trials are needed
- B. Kristin Reichardt - **Job Spotlight: Vector Surveillance Coordinator at Richmond County Mosquito Control**
 - a. What we are
 - i. Mosquito Control program
 - ii. Part of County Public Health
 - iii. Part of the State Public Health system
 - b. IMM program
 - c. Both tick and mosquito surveillance
 - i. Arboviral testing
 - ii. Pathogen surveillance
 - iii. Insecticide resistance testing
 - d. Partnering with:
 - i. Emory – tick pathogen testing
 - ii. UGA – mosquito testing
- C. Bobby Moulis - **Chatham County Mosquito Control Overview**
 - a. Coastal county
 - b. 3 river systems drain inland areas
 - c. Dredge spoils
 - d. Mosquito species
 - i. 2 saltmarsh species
 - ii. 41 freshwater species
 - iii. 4 species make up the majority of the trap catch
 - 1. *Cx nigripalpus*
 - 2. *Oc taeniorhynchus*
 - 3.
 - e. Complaints
 - i. Call office
 - ii. QAlert system
 - f. Rave Alert
 - i. Notification of spray missions
 - ii. Other
 - g. Renovations
 - i. Automated storm shutters
 - ii. Interactive eMap replaced the paper map with push pins
 - h. Units
 - i. ULV ground treatments
 - 1. Used to use resmethrin
 - 2. Transitioning to deltamethrin

- ii. Helicopter spraying
 - 1. Larvicide
 - a. Altosand
 - b. Mixed on site
 - 2. ULV adulticide (~98%)
- iii. Surveillance
 - 1. Traps
 - a. CDC light traps
 - b. Gravid traps – vital to WNV monitoring
 - c. Exit trap (sentinel chicken cages)
 - 2. Sentinel chickens
- iv. Ground larviciding

D. Nancy Hinkle - **Georgia is a Spider Wonderland**

- a. More than 800 species in Georgia
- b. Commonly found in homes
 - i. Southern house spider
 - 1. Color varies
 - 2. Robust legs
 - 3. With legs spread, about the size of a dime
 - 4. Never in a web
 - ii. American house spider
 - 1. Globous abdomen
 - 2. Almost always found in web
 - 3. Cobweb type web
 - iii. Long-bodied cellar spider
 - 1. Spends a lot of time in web
 - 2. Long legs
 - 3. Goes into paroxysms of vibrating when disturbed
- c. Hunting spiders
 - i. Fishing spider
 - 1. Long legs
 - 2. Jesus spider – can walk on water
 - 3. One of the larger spiders in Georgia
 - ii. Wolf spider
 - 1. Often carry spiderlings
 - 2. Active hunters
 - iii. Jumping spiders
 - 1. Large eyes
 - 2. Can have elaborate colorations
- d. Orb Weavers
 - i. Arrow-shaped microthema
 - ii. Arrowhead spider
 - iii. Spined microthema
 - iv. Yellow marbled orb weaver

- v. Green orb weaver
 - vi. Barn spider – very common in October in the SE US
 - vii. Orchard spider
 - viii. Golden silk spider - coastal
 - ix. Golden garden spider
 - x. Joro spider
 - 1. First seen in Georgia in 2013
 - 2. Found off I-85
 - 3. Probably came in on ships
 - 4. Asian spider
 - 5. Produces golden silk
 - e. Funnel web spiders
 - f. Spiders are beneficial as free pest control
- E. Dean Nick Place – **UGA College of Agricultural and Environmental Sciences**
 - a. Missions
 - i. Research
 - 1. Integrative precision agriculture
 - a. Agriculture and technology
 - b. UGA is a top 25 university for IPA internationally
 - c. Partners with the College of Engineering and Franklin College
 - 2. Poultry science - #1 program in the country
 - 3. Plant science
 - 4. Regenerative bioscience
 - a. traumatic brain injury
 - b. Stroke
 - 5. Carbon farming and ecosystem health
 - 6. Food safety and technology
 - 7. Nexus of food and health
 - ii. Teaching
 - iii. Extension Outreach
 - 1. 2020 – 66% increase in digital media distribution
 - 2. 35,000 site visits completed
 - b. Size and Scope
 - i. >2700 people at college
 - ii. One of the larger colleges at UGA
 - c. Academics
 - i. 1400 undergrads
 - ii. 700 grad students
 - d. Scholarships
 - i. \$830,000
 - ii. \$43,000 for undergrad research
 - iii. 92% employment/grad school rate
 - e. Related jobs

- i. 59,400 jobs annually
 - ii. 2.3% growth
 - f. New UGA program
 - i. Rural scholars program – recruit and retain high quality rural students
 - ii. 4 students admitted this Fall
 - iii. \$7,000 in scholarships
 - g. Critical challenges in Agriculture
 - i. Population growth
 - ii. Food systems
 - iii. Water issues
 - iv. Labor
 - v. Pests and Diseases
 - vi. Food system literacy
 - vii. Public outreach
- F. Industry Spotlight
 - a. Denny Crockett - CoDiagnostics
 - i. Molecular diagnostics
 - 1. Mainly PCR tests
 - 2. Many different areas
 - 3. Worldwide distribution
 - ii. Affordable PCR equipment for arboviral testing
 - 1. VectorSmart NA West Multiplex tests
 - a. WNV
 - b. SLE
 - c. WEE
 - 2. VectorSmart NA East Multiplex tests
 - a. WNV
 - b. SLE
 - c. EEE
 - 3. VectorSmart Multiplex tests
 - a. ZIKV
 - b. DEN
 - iii. Working on a test for sentinel chickens and TBDs
 - iv. Easy to read results
 - v. Provide training
 - b. Steve Molnar – Target Specialty Products
 - i. Wide range of larvicide products
 - 1. New product – Sumilarv (PPF)
 - 2. Bti
 - 3. Altosid
 - ii. Adulticides
 - 1. Partnership with Bayer
 - 2. Variety of products
 - iii. Equipment

- 1. Paired up with Leading Edge – drones
 - 2. A variety of other equipment
 - iv. Wide range of services
- c. Jason Conrad – Vesperis
 - i. Formally UNIVAR
 - ii. Carry same products
 - iii. Sole source provider for In2Care trap
- G. Natasha Agramonte - **Update on the DeKalb County**
 - a. What does a County Public Health Entomologist do?
 - i. Mosquito surveillance
 - ii. Rodent issues
 - iii. Bed bugs
 - b. Seasonal staff
 - c. WNV Surveillance
 - i. Use tackle box gravid traps
 - ii. Hay infusion attractant
 - iii. Set at multiple sites once a week
 - d. Other WNV surveillance tools
 - i. Dead birds
 - ii. Door-to-door educational outreach
 - iii. Investigate mosquito complaints
 - 1. Larvicide
 - 2. Education
 - iv. Can issue a notice of violation or citation if needed
 - v. Larviciding
 - 1. Storm drains
 - 2. Catchment basins
 - 3. Others based on need
 - vi. Nuisance pool complaints
 - e. Other Issues
 - i. Hotels – bed bug complaints
 - 1. Inspection of room and adjacent rooms
 - 2. Education
 - ii. Rodents in apartments
 - iii. Restaurants
 - 1. Roaches
 - 2. Rodents
 - 3. Flies
 - iv. Rabies
- H. Kelly Deutsch - **The Importance of Surveillance**
 - a. Why?
 - i. Limited resources
 - ii. Knowledge is power
 - iii. Need to define the problem

1. How many species?
2. Which are disease vectors?
3. Are the economically important?
4. Which are the biggest nuisance species?
- iv. How do you get into surveillance
 1. Start small – are there mosquitoes present
 2. Establish a baseline
 3. Prevalence in a specific area
 4. understanding population trends
 5. Determining vector abundance and distribution
 6. Justifying your treatment choices
 7. Determining if what you are doing is actually effective
- v. Consider the habitat
- vi. Consider the weather and tidal data
- vii. Look at surveillance history
- b. These data will help to justify your program and your budget!
- c. Use your surveillance data
 - i. Determine treatment strategies
 - ii. Determine the best traps to use
- I. Janemarie Hennebelle - **There's a New Tick in Town**
 - a. Asian Longhorned tick was found in Georgia in mid-September
 - b. 17 US State to report the tick
 - c. About the tick
 - i. Presence confirmed by the USDA in 2017, but probably arrived prior to 2010
 - ii. Native to SE Asia
 - iii. Reproduces by parthenogenesis – large, concentrated infestations
 - iv. Vector
 1. Parasites
 - a. Theileria
 - b. Babesia
 2. Bacteria
 - a. Borrelia
 - b. Anaplasma
 - c. and others
 3. Viruses
 - a. Powassan
 - b. Khasan
 - c. and others
 - d. Impact on animal health
 - i. Affects growth
 - ii. Causes stress
 - iii. Decreased production
 - iv. Exsanguination and death

- e. Surveillance
 - i. Passive surveillance system
 - 1. NVSL tick kit
 - 2. Sent to Veterinarians throughout Georgia
 - 3. Collaborations with UGA, DNR, and DPH
 - ii. Situation in Georgia
 - 1. Unusual infestation on cow in Pickens County reported
 - a. Local DVM calls GDA
 - b. Treated as a Foreign Animal Disease Investigation
 - 2. Area VMO assigned to investigate
 - a. Site visit
 - b. Collect samples
 - 3. Farm is quarantined
 - 4. Herd plan developed
 - a. Index herd ~70 head
 - b. Treated with 10% permethrin
 - c. Environmental control recommendations
 - i. Bush hog or mow pastures and fields
 - ii. limit livestock access to moist areas
 - iii. Treatment of the environment is tricky
 - 5. Visit adjacent areas
 - 6. Treat cattle where there is potential contact
 - iii. Current situation
 - 1. Only found in Pickens County to date
 - 2. Found on:
 - a. Cattle
 - b. Cat
 - c. Opossum
 - iv. What's next?
 - 1. Share Information with stakeholders
 - 2. Printed material
 - 3. Webinars
 - 4. Outreach/Education
 - 5. Continued active surveillance in Pickens County
 - f. This will likely continue to spread in Georgia
- J. Ture Carlson – **Releasing Mosquitoes**
 - a. Carver Village
 - i. Established in 1948 for people of color
 - ii. Release of mosquitoes in mid-50s
 - 1. Was permission asked?
 - 2. Were the mosquitoes infected?
 - a. Yes
 - i. Malaria – wrong mosquito for malaria
 - ii. Yellow fever??

- b. No – reported by Army
- b. Military operations
 - i. Weaponizing mosquitoes
 - ii. What needs to be done
 - 1. Rear a lot of mosquitoes
 - 2. Infect them
 - iii. Operation Big Buzz
 - 1. May 1955
 - 2. ~1 million *Aedes aegypti*
 - a. Loading tests
 - b. Storage tests
 - c. Release tests
 - i. E-14 munitions
 - ii. Dropped by airplane
 - iii. Dispersed up to 2,000 feet
 - d. Simulated attack
 - e. No exact location mention, just rural Georgia
 - iv. Operation Drop Kick
 - 1. 1956
 - a. 600,000 *Ae aegypti* released at Avon Park, FL
 - b. Released by airplane
 - 2. 1958
 - a. Second drop
 - b. Used helicopters
 - v. Operation Magic Sword
 - 1. http://sonmi.weebly.com/uploads/2/4/7/4/24749526/night_train_-_test_64-5_1964.pdf
 - 2. Large operation
 - vi. Mark-Recapture study
 - 1. Near Savannah in 1954
 - a. 2 million radioactive *Oc taeniorhynchus* released
 - b. Oatland Island
 - 2. 428 recaptured, one 20 miles from the release site
 - 3. Many of these types of studies have been done
 - vii. Releasing mosquitoes for control
 - 1. Wolbachia-infected mosquitoes
 - a. Lower population – primary use
 - b. Limit virus transmission
 - c. First release was in 1967 in Burma
 - 2. GM mosquitoes
 - a. Much more recent technique
 - b. Oxitec – RIDL
 - i. Started in 2009
 - ii. 5 releases currently

- iii. 2 planned releases
- c. Target Malaria – gene drive
- d. Older techniques
 - i. 1968 – sterile hybrid due to genetic incompatibility
 - ii. Releases made starting in 1959 - Irradiated mosquitoes
 - iii. Chemosterilized mosquitoes

Oct 21, 2021

Session 2

- A. Brantley Russell & Connie Rodgers - **Georgia Pest Control Association: Benefits of Membership (www.GPCA.org)**
 - a. Brantley Russell – current president
 - b. Connie Rodgers – executive direct
 - c. History
 - i. Started in 1950
 - ii. Currently have 725+ members
 - iii. Advocate for pest control licensing
 - d. Membership benefits
 - i. Learning opportunities
 - ii. Be a voice for the industry
 - iii. Networking
 - iv. Credibility – being an approved member increases your credibility with consumers
 - e. Education
 - i. Test preparation
 - ii. 4 major conferences per year
 - iii. Roadshows throughout the State
 - iv. Regional training offering CEUs
 - v. Train the trainer program
 - vi. Now offer virtual training with CEUs
 - f. Referrals – website refers to member companies based on zip code
 - g. Information
 - i. BugBytes, e-newsletter
 - ii. PR Corner
 - iii. Publish changes and alerts
 - h. Networking
 - i. Leadership course
 - ii. Help shape policy by participating in committees
 - iii. Marketing materials to help boost local presence
 - i. Giving to the community

- i. Pest Vets – raise money for the Veterans Empowerment Organization to benefit homeless veterans and their families
 - ii. Hands United – assists pest control technicians, PCO, and their families where there is need
 - iii. Scholarships
 - 1. Burnett Scholarship – provides for higher education for pest control families
 - 2. Russell Scholarship – for college students, to encourage the study of entomology and pest control sciences
 - j. Summary
 - i. Provide tools for pest control
 - ii. Active in community
 - iii. Make sure pest control maintains high standards
- B. Rick Anglian - **Update on the Fulton County Mosquito Control Program**
 - a. Program runs April-October
 - b. Services offered
 - i. Larvicide storm drains – 12,217 treated
 - ii. Backpack treatments
 - 1. Based on complaints
 - 2. Investigated, tip and toss, educate, treat
 - 3. 39 treatments administered
 - 4. First year for ULV treatments
 - iii. Placed surveillance traps
 - 1. Started in July
 - 2. 14-15 Gravid traps placed weekly
 - 3. 2 CDC light traps placed weekly
 - 4. Tested in-house
 - iv. Testing
 - 1. 11 WNV+ at 10 locations
 - 2. Tip and toss campaign within a ¼ mile of positive sites
 - 3. Treated or retreated area catch basins
 - 4. ULV application
 - a. ½ mile radius for 4 weeks
 - b. Got some citizen pushback
 - c. Started a notification system
 - c. Applications are mapped using GIS
- C. Larry Motes (Central Life Sciences) – **Bridging the Gap Between Pest Control Operators and Public Health Officials**
 - a. Goals
 - i. Better understand our role in vector control
 - ii. Build bridges between PCOs, LCOs, Public Health, Mosquito Control, and beekeepers
 - iii. Increase our knowledge
 - b. Ticks

- i. TickSafety.com
 - ii. Most common ticks in Georgia
 - 1. *Dermacentor variabilis*
 - a. High grasses around homes
 - b. Interesting trend – increase in pet ownership due to Covid-19
 - c. Diseases
 - i. RMSF
 - ii. Tularemia
 - iii. Tick paralysis
 - 2. *Ixodes scapularis*
 - a. Wooded rural areas
 - b. Lyme Disease
 - 3. *Amblyomma americanum*
 - a. Upland edge habitat
 - b. Diseases
 - i. Alpha-Gal syndrome
 - ii. STARI
 - iii. How to protect yourself
 - 1. DEET
 - 2. Permethrin-treated clothing
 - 3. IPM
 - a. Keep grass low and dry
 - b. Keep pets on flea and tick control
 - c. Market trend – more yard treatments
 - 4. Problem areas (Shultz and Jordan)
 - a. Leaf and compost piles
 - b. Stacked wood
 - c. Bird feeders
 - d. Damp tall grass and shrubs
- c. Mosquitoes
 - i. How to control mosquitoes
 - 1. For a commercial enterprise, money drives decision making
 - 2. Barrier sprays
 - a. Strengths
 - i. Good return on investment
 - ii. Assists public health control
 - b. Weaknesses
 - i. Applicator education
 - ii. Bee kills
 - c. Need to be aware of chemical trespass issues
 - d. Don't spray blooming plants
 - e. Trend – Beecheck technology
 - 3. Google Maps is your friend

- 4. Treat the source
 - 5. Educate the public
 - 6. Trend – drone use increasing
 - ii. Trends toward a PCO-friendly format for control products
 - iii. Educational materials
 - iv. Mosquito-awareness.com
- D. Elmer Gray - **Larvicide Active Ingredients and Their Role in Integrated Mosquito Management**
- a. IMM techniques have been used in mosquito control long before they were acknowledged
 - b. Parts of IMM
 - i. Education
 - 1. Public
 - 2. Workers
 - ii. Source reduction
 - iii. Surveillance – knowledge is power
 - iv. Larviciding – requires effort and resources
 - v. Adulticiding
 - 1. Communication is essential
 - 2. Pesticide resistance
 - 3. Non-target issues
 - c. Best case is all the steps are used, but this isn't always possible
 - d. Product vendors are important sources of information and education
 - e. Advantages of larviciding
 - i. Larvae are concentrated in a defined area
 - ii. Larvae are accessible...usually
 - iii. Larvae are susceptible
 - iv. Larviciding is proactive
 - v. Larviciding is more acceptable to the public
 - vi. Larviciding reduces risk to pollinators
 - f. Choosing a larvicide
 - i. Wide variety of formulations
 - ii. 4 types of active ingredients with very different modes of action*
 - 1. IGR -absorbed and ingested, larvae and pupae do not die immediately
 - a. (S)-methoprene is a natural juvenile hormone first identified in 1967
 - b. Pyriproxyfen – newer reduced risk pesticide (EPA) currently registered in Georgia
 - 2. Microbial based – must be ingested
 - a. Bti
 - i. Discovered in 1976 in Israel
 - ii. Endotoxins are activated by dipteran larvae with high gut pH

- iii. No resistance has been seen
 - b. *Bacillus sphaericus*
 - i. Isolated in 1964 in California
 - ii. Some recycling is seen in the environment
 - c. Combination formulations are available
 - 3. Surface oils – physical barrier
 - a. Effective pupacide
 - b. Effectiveness limited to larvae and pupae that breathe at the water surface
 - 4. Spinosad – Biological neurotoxin
 - a. Discovered in 1982 and extracted from sample in 1986
 - b. Identified as reduced risk by EPA
 - c. Approved for use in organic production
 - iii. Chose formulation and active ingredient based on habitat and mosquito population present
 - iv. Product rotation remains an important aspect of mosquito control
- E. Steph Bellman – **Emerging Tickborne Disease: A Study of Heartland Virus in Georgia**
- Ticks**
- a. Tickborne diseases are an increasing burden in the US
 - b. Heartland Virus
 - i. Discovered in Missouri in 2009
 - ii. Presentation similar to Ehrlichia
 - 1. Treated with doxycycline
 - 2. Treatment did not work
 - 3. No treatment except supportive therapy
 - 4. Disease can be severe
 - iii. Heartland is not notifiable to the CDC
 - 1. More than 50 cases have been reported to date
 - 2. Probably underreported
 - iv. RNA virus
 - v. Onset May-September
 - vi. Has been found in lone star ticks but is similar to a virus transmitted by Asian longhorned ticks
 - vii. Transmission cycle - https://www.researchgate.net/figure/Proposed-transmission-model-for-the-Heartland-virus-Proposed-transmission-cycle-for-HRTV_fig3_327658745
 - c. Heartland virus in Georgia
 - i. serological data from white tailed deer from 2001
 - ii. Human case reported in 2005
 - iii. Emory Study
 - 1. Sampling
 - a. 2018 – flag sampling at 26 sites near seropositive deer and human case locations
 - b. Sites were narrowed down to 2 sites in 2019

- c. Sampling occurred between April to October
 - i. Adults active from April through June
 - ii. Nymphs most active from May through October
 - iii. Larvae active late summer
 - d. Sampling was done approx. weekly
 - 2. Ticks collected
 - a. Primarily *Amblyomma americanum* at all stages
 - b. A few other common species were found
 - 3. PCR were run for Heartland and Bourbon viruses
 - a. 3 HRTV+ pools were detected
 - b. MIR=0.46 per 1000 in 2019
 - c. No Bourbon virus was detected
 - 4. Did genomic and phylogenetics on the 3 positive pools
 - 5. Conclusions
 - a. 2 positive pools in April suggest overwintering of HRTV
 - b. Intend to continue surveillance
 - c. Currently collaborating with Richmond County
- F. Dan Suiter – **Structural Entomology at UGA**
 - a. Regulated by a different office at GDA than commercial
 - i. <http://agr.georgia.gov/structural.aspx>
 - ii. All structural applicators must be licensed
 - iii. 3 basic categories
 - b. Center for Urban Agriculture resources
 - i. Getting the Best of Pests webinars
 - 1. CEUs for a number of States
 - 2. Audience
 - a. Commercial and private applicators
 - b. PCOs
 - ii. Webinar recordings housed at GTBOP.com under archives
 - 1. 50 recordings
 - 2. 11 that provide 1 hour of CEU credit in CAT 41
 - 3. Must watch at a County Extension agents office (1-800-ASK-UGA1)
 - iii. In Person trainings
 - 1. Bed bugs
 - 2. Home pest control
 - 3. Termites
 - c. What else is going on in Griffin?
 - i. Joro spider “invasion”
 - ii. “Murder” hornets
 - iii. Fire ant control
 - 1. Baiting around a mound when it is cool
 - 2. Mound treatment
 - iv. Two new ant pests
 - 1. Asian needle ant

- a. First found in Decatur in 1984
 - b. Recent population explosion
 - c. Nests in and under yard debris
- 2. Tawny crazy ant
 - a. No mating flights
 - b. Multiple queens
 - c. First found in Albany in 2013
 - d. Currently only found in south Georgia
 - e. Hasn't been reported

G. Industry Spotlight

- a. ADAPCO – Trey English
 - i. New learning platform – ADAPCO Vector Lab (AVL)
 - 1. Multimedia videos
 - 2. Self-paced
 - 3. Online
 - 4. Can earn CEUs
 - 5. Inexpensive
 - ii. Trainings have been in person in the past
 - iii. Sign up on MyADAPCO.com
 - iv. Courses available
 - 1. **Mosquito Biology** – Classification, morphology, life cycle, and common mosquitoes found in the U.S.
 - 2. **Mosquito Surveillance** – Trap types and methods.
 - 3. **Pesticide Safety and Understanding the Label** – What is a hazard, handling pesticides safely, PPE, and reading the label.
 - 4. **Mosquito Identification** – Using a taxonomic key and identifying larval and adult mosquitoes.
 - v. 1 CEU credit per course
- b. AMGUARD – Derek Wright
 - i. New branding for AMVAC
 - ii. Non-crop mosquito and vector portion
 - iii. Primarily Trumpet and Dibrom for aerial applications
 - iv. Stewardship updates
 - 1. New labels
 - 2. Available at AMGUARD site or ADAPCO site
- c. Vector Disease Control International - Broox Boze
 - i. www.vdci.net
 - ii. Full-service mosquito control company
 - iii. Primarily known for aerial applications
 - iv. Added drones to fleet in 2020
 - 1. Liquid application system
 - 2. Granular application system
 - v. Drone webinar Oct 28, 2021

H. Rosmarie Kelly – Mosquito Surveillance in the Time of COVID

- I. Caroline Efstathion – Practical Bottle Bioassay Techniques
 - a. Broad entomological/microbial/molecular background
 - b. Currently VDCI Southeast Regional Director
 - c. Resistance monitoring
 - i. Ways to mitigate
 - 1. IMM
 - 2. Detection and monitoring
 - 3. Management of resistant populations
 - ii. Strategies
 - 1. Lowest effective dose
 - 2. Less frequent application
 - 3. Rotate chemicals
 - 4. Use chemicals with different modes of actions when larviciding and adulticiding
 - 5. Localized treatments vs areawide
 - iii. Bottle bioassays
 - 1. Provide a baseline
 - 2. Detect resistance early
 - 3. Continuous monitoring
 - 4. How practical is it?
 - a. What are your goals/questions?
 - i. Where is there insecticide resistance?
 - ii. Are chemicals in use still effective?
 - iii. What chemicals will be most effective in an emergency?
 - iv. Monitoring
 - b. What species?
 - i. Pest vs vector
 - ii. How easy are eggs or larvae to collect in large enough numbers to test?
 - iii. Ability to blood feed susceptible strains for calibration
 - iv. Lab reared vs wild caught
 - 1. Lab reared
 - a. Time consuming
 - b. Need space and equipment
 - c. Require care
 - 2. Wild caught
 - a. Mixed species
 - b. Mixed ages
 - c. Mixed physiological states
 - d. No way to calibrate

- ii. Bottle Bioassay kits available for free
 - iii. Lab space
 - iv. Enough time and people to collect eggs or larvae
 - d. Budget
 - e. Personnel
 - f. Chemicals
 - g. Time available for testing
- 5. Using the data
 - a. Places to test include:
 - i. Areas of disease concern
 - ii. How often area is sprayed
 - iii. Population numbers
 - iv. Flight range
 - b. Needs to be done routinely
 - c. Develop written protocols
 - i. Base on the CDC protocols
 - ii. Provides consistency
 - d. Active ingredient vs formulated product
 - i. Formulated product can mask signs of resistance development
 - ii. Field efficacy trials help determine if formulated product is failing
 - e. Have a plan for using your results and adjusting your IMM program

Business Meeting

- A. Reading of minutes
- B. Treasurer's report ~\$32600
- C. Officer elections
 - a. President: Laura Peaty
 - b. VP: Tiffany Nguyen
 - c. Secretary-Treasurer: Misty McKanna
 - d. Directors
 - i. 1-Year: Doug Nelson
 - ii. 2-Year: Caroline Efstathion
 - iii. 3-Year: Natasha Agramonte
 - e. Sustaining Board Member: Jason Conrad
 - f. Past President: Allen Hillman
 - g. Public Health Liaison: Rosmarie Kelly
 - h. Extension Liaison: Elmer Gray
- D. Presentation of Past President award