

# MAMCA NEWSLETTER

The Official Mid-Atlantic Mosquito Control Association Newsletter

Summer 2019

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## President's Message

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Summer is here, and with it brought higher than average temperatures over most, if not all of the Mid-Atlantic region. This has brought dry conditions which has in turn given us a small reprieve from a busy spring.

Though many of us are in a dry spell currently, states are continuing to do resistance testing for both larvicides and adulticides, research continues on the new species of tick in the area, and a few cases of West Nile and Eastern equine encephalitis have started appearing in the region.

I have received updates from South Carolina and their progress in planning the upcoming MAMCA meeting. The details that I have learned have definitely piqued my interest, but I know they are still looking to add additional speakers. For those interested in presenting, make sure to contact our Vice President Robert Cartner ([rcartner@bcgov.net](mailto:rcartner@bcgov.net)) for information.

The Mid-Atlantic region is also home to numerous state meetings, please be sure to check out page 3 for more info on upcoming training opportunities.

If you are interested in getting involved in MAMCA as a Board member or otherwise, please reach out to us for more information. We are always looking for volunteers to keep our Association moving forward and to help mosquito control programs across the region.



*Tim DuBois – MAMCA President*

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# 45<sup>TH</sup> ANNUAL MAMCA & 47<sup>TH</sup> ANNUAL SCMCA MEETING

February 19-21, 2020 - Hilton Greenville - Greenville, South Carolina



Mark your calendars and plan to attend the upcoming joint meeting of the Mid-Atlantic and South Carolina Mosquito Control Associations. The meeting will be held at the Hilton in Greenville, SC.

The Mid-Atlantic Mosquito Control Association (MAMCA) is a non-profit, professional organization founded in 1975. The membership consists primarily of local/state/federal government officials, industry, and research/academic members from the nine-member states of Delaware, Georgia, Maryland, North Carolina, Pennsylvania, South Carolina, Tennessee, Virginia and West Virginia.

The MAMCA meeting site rotates among the member states. South Carolina was one of the founding members of the MAMCA and will be the host state for the 2020 meeting.

MAMCA Officers/Board Members: Vice President, Robert Cartner, newly elected SC Director, Special Davison, and Historian, Sue Ferguson; along with SCMCA Board Members, are hard at work to ensure an interesting and enjoyable conference. More details will be available soon through each organizations' newsletters and websites: <https://www.mamca.org> and [www.scmca.net](http://www.scmca.net). For local information about Greenville, SC go to <https://www.visitgreenville.com/>.

Y'all come to Greenville in 2020 for some Southern hospitality!

## Upcoming Meetings and Important Events

<u>Meeting</u>	<u>Location</u>	<u>Dates</u>
SOVE Conference <i>Society for Vector Ecology</i>	San Juan, Puerto Rico	Sept. 22 - Sept. 26, 2019
PestWorld 2019 <i>National Pest Management Association</i>	San Deigo, CA	Oct. 15 - Oct. 18, 2019
GMCA Annual Meeting <i>Georgia Mosquito Control Association</i>	Cordele, GA	Oct. 16 - Oct. 18, 2019
Entomology 2019 <i>Entomological Society of America</i>	St. Louis, MO	Nov. 17 - Nov. 20, 2019
FMCA Annual Meeting <i>Florida Mosquito Control Association</i>	St. Augustine, FL	Nov. 17 - Nov. 20, 2019
NMCA Annual Meeting <i>Northeast Mosquito Control Association</i>	Milford, MA	Dec. 9 - Dec. 11, 2019
NCMVCA Annual Meeting <i>North Carolina Mosquito and Vector Control Association</i>	Carolina Beach, NC	Dec. 10 - Dec. 12, 2019
VMCA Annual Meeting <i>Virginia Mosquito Control Association</i>	Virginia Beach, VA	Jan. 28 - Jan. 30, 2020
MAMCA Annual Meeting <i>Mid-Atlantic Mosquito Control Association</i>	Greenville, SC	Feb. 19 - Feb. 21, 2020
AMCA Annual Meeting <i>American Mosquito Control Association</i>	Portland, OR	Mar. 16 - Mar. 20, 2020



# MAMCA MERCHANDISE

Represent the Association with new merchandise this year! Please reach out to Tim DuBois @ [duboist@portsmouthva.gov](mailto:duboist@portsmouthva.gov) for orders.

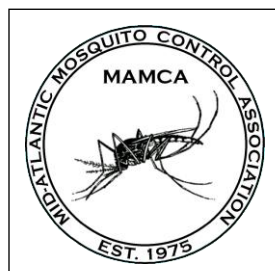
Gildan Soft Jersey Performance Short Sleeve Tee - \$15



Pint Glass with Dual Logo/Design - \$ 5



MAMCA Cut-Out Logo Decal - \$2



# News in the Region

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## Delaware

The 2018 Delaware mosquito season was in many ways a record breaking year as far as adult abundance, aerial adulticide acreage, rainfall amounts and frequency, and public service requests. However, it has been a tale of two cities when comparing the 2018 and 2019 Delaware mosquito control seasons. The comparisons seemingly stop after similar rainfall amounts from May through July.

In 2018 there were frequent rainfall events, some occurring over ten consecutive days which not only led to high accumulations overtime but also inhibited our ability to effectively aerial larvicide large coastal areas.... leading to high adult emergences and an adult control response.

While the 2019 season has seen similar rainfall amounts, these rain events have been less frequent but much more intense. But luckily for us, with many of these rainfall events the inundated breeding habitats have dried down before any adult emergence, limiting the need for a mosquito control response. It will certainly be interesting to see if these rainfall patterns persist throughout the rest of the summer.

As I am writing this, we are finishing up our post analysis of an aerial adulticide efficacy cage test trial of Duet HD, and will have more news on this on our next MAMCA Newsletter state update.

*Submitted By: Shaun McIntire*



Earlier this summer, our environmental scientist Matthew Esposito snapped a photo of the moment a Damselfly captured its meal; an *Aedes sollicitans*.

## Georgia

It is crazy weather and a slow start to the mosquito season here in Georgia. We are currently working on doing surveillance in all our 159 counties - 61 counties have sent data so far - as well as increasing our ability to test mosquitoes for viral diseases. The Georgia Mosquito Control Association is busy working on the agenda for our annual meeting in Oct (16-18). The meeting will be held in Cordele, GA at the Lake Blackshear Resort, a big change from our usual meeting site in Athens at UGA. It is taking a bit of extra work to find speakers for this meeting as we won't have UGA to draw on, but we hope to pick up some new and interesting speakers from Alabama and south Georgia.

*Submitted by: Dr. Rosmarie Kelly*

## Maryland

The Maryland Department of Agriculture's Mosquito Control Section has witnessed a typical year for 2019 season, meaning a wet spring followed by a dry mid-summer. This gives way to a positive outlook after 2018's atypical year, in which most of the east coast experienced a significantly increased demand for services. Currently, July's few rainfall events are not significant enough to pool for long periods of time. Intense heat is keeping mosquito populations repressed and citizens are retreating indoors. Populations of daytime biting species such as *Aedes* and *Psorophora*, are not being detected through surveillance as much as night time species, like *Culex* and *Anopheles*. With limited mosquito breeding and people staying inside, phone complaints are significantly lower compared to 2018.

MDA's Mosquito Control Section has expanded its arboviral surveillance program. Typically, CDC light traps are utilized to collect mosquito samples which are then sent to the Maryland Department of Health for testing for the presence of WNV, EEE and other arboviruses. So far this year the surveillance program has expanded to include six gravid traps with several more to be implemented very soon. These traps specifically target blood-fed *Culex* mosquitoes which may increase the ability to detect infected mosquitoes and initiate a control response.

In addition to increasing the number of adult *Culex* mosquitoes that can be captured and tested for the presence of an arbovirus, these gravid traps are also being used to collect *Culex* egg rafts which will be sent to Cornell University so that resistance testing can be completed. This resistance testing is funded through a grant from the CDC to determine if resistance to synthetic pyrethroids is prevalent in *Culex* populations in Maryland.

The Western Shore of Maryland (West of the Chesapeake Bay) is, for the second year in a row, finding "unusual" mosquito species caught in surveillance traps. As of July 22<sup>nd</sup>, one *Aedes aegypti* was found in Prince George's County. *Aedes dupreei* may have been found as well but awaits confirmed identification.

*Submitted by: Kyle Brinson*

## North Carolina

The 2018 season, thanks to Hurricane Florence, was mild and wet...very wet. New Hanover County (Wilmington) recorded the wettest year since 1848 with over 111 inches of precipitation. This year began wet and mild until May when things went into a dry down with the spring leaves draw. NC then went from a dry down to a week of steady rains followed by parched conditions with New Hanover County experiencing one of the driest mid-summers anyone can remember. Brunswick County, south of New Hanover, reports healthy trap counts while the rest of the coastal plain indicates very low trap numbers and with Rocky Mount indicating one trap had a single skeeter.

NC DHHS has been actively allotting monies to what could be considered second tier counties that were hit hard by the Hurricane last September. Those monies have been well spent to expand surveillance and control efforts. Some examples of money well spent is a drone capable of delivering 34 pounds of granular larvicide in a single 8-minute run and procurements of forced air blowers that can deliver liquid larvicide to well past 300 feet. There has been a strong investment in new age traps that are linked by cell signal to provide near real time data from remote areas, surely expediting control decisions.

Human mosquito-borne disease counts are normal to below normal for this time of year. It is important to note that non-neuroinvasive WNV cases are currently not reported so we may not be picking up early infections.

*Culex* counts were increasing prior to a solid week of rain followed by significant dry down.

DHHS is funding 14 counties and one city – (Rocky Mount) at approximately \$180,000 this year. Split into \$16,000 or \$2,000 awards. In return those that are funded must set a minimum number of mosquito traps monthly, and enter data into MosquitoNet along with a few other requirements. North Carolina is beginning a statewide “shared viewing” of live BG Counter data amongst counties.

Statewide insect resistance testing of *Ae. albopictus* is in its third year with IR testing broadening to include *Ae. triseriatus* and *Culex spp.* These efforts are spearheaded by Dr. Stephanie Richards who is a member of the “universities partnership”. The partnership is a collaboration between Western Carolina University (WCU)(Dr. Brian Byrd), NC State University (NCSU)(Dr. Michael Reiskind), and East Carolina University (ECU)(Dr. Stephanie Richards). Dr. Richards, Dr. Byrd, and Ms. White (ECU) conducted a hands on IR training workshop (funded by CDC Southeastern Regional Center for Excellence for Vector Borne Diseases) at ECU in February 2019 that was attended by mosquito control personnel from both NC and SC.

The NCMVCA legislative chair position was vacated in February due to illness. That void was filled by Ms. Meredith Spence Beaulieu a NSF Graduate Research Fellow, PhD Candidate of the Department of Entomology and Plant Pathology at NCSU. She is a student of Dr. Reiskind. She, along with Ms. Avian White, a doctoral student at ECU now represents a second layer of the University partnership. Their primary goals thus far are to enhance public health vector control in the state by working with and enlightening legislators of the SMASH Act as well as to stimulate an interest in multi-county districts in sparsely populated regions, where a lack of funding/staffing exists, to provide surveillance-based mosquito control. One caveat there is the need to update aerial application statutes that lag way behind neighboring states. Currently there is no enabling legislation to allow for any form of aerial abatement until a county or region has been declared a disaster area.

*Submitted By: Joe Andrews*

## Pennsylvania

Pennsylvania collected its first positive West Nile virus mosquito pool on June 20<sup>th</sup>. This is the latest the first positive has been collected in the last 13 seasons. The total number of pools and specimens are both lower than they have been in previous years. There are 28 positive mosquito pools to date, all from *Culex spp.* There are no reported bird, equine, or human cases. County programs have received training and have been conducting pesticide resistance testing. They will be running these assays one time per year going forward.

The statewide Mosquito Academy was held in McKean County on May 22-23. It was attended by 30 newly hired county employees. Participants were trained in larval and adult mosquito surveillance, larval habitat recognition, adult and larval control techniques, and tick surveillance. An industry standard cage trial was also performed. There was a good mix of classroom education as well as practical, in the field demonstrations.

The weekly nymphal *Ixodes scapularis* survey is continuing throughout Pennsylvania. To date, there have been a total of 647 nymphs collected. In total there have been 1,644 *Ixodes scapularis* collected. In conjunction with the surveys, the following species have also been collected: 310 *Dermacentor variabilis*, 14 *Amblyomma americanum*, 2 *Haemaphysalis leporispalustris*, and 218 *Haemaphysalis longicornis*. The longhorn tick has been found in the southeastern part of the state only.

*Submitted By: Christian Boyer*

## South Carolina

The South Carolina Mosquito Control Association (SCMCA) held their annual Summer Workshop June 12<sup>th</sup> in Pinopolis, SC. Attendees learned about basic mosquito identification, pesticide handling safety, proper surveillance techniques, utilizing GIS (Geographic Information System) and database software, and drone applications in mosquito operations. As usual, the workshop was well attended with over 100 professionals showing up.

SCMCA will not be holding an annual meeting in November of 2019, but will be co-sponsoring a joint meeting with MAMCA, February 19-21, 2020, in Greenville, SC.

Spring mosquito populations in SC were low due to dry conditions, but a rainy June and July have made up for the slim spring populations in some locations. The upstate region of SC has had a mild mosquito season so far with most control entities reporting low mosquito complaints. The Midlands region has seen three West Nile virus (WNV) positive mosquito samples and the PeeDee region has had two horses test positive for Eastern equine encephalitis (EEE). The Lowcountry/Coastal region has seen an increase in mosquito populations following the dry spring with service requests for June and July exceeding 2018.

The South Carolina Department of Health and Environmental Control (SCDHEC) has begun its search to fill the role of the Rabies Prevention/Vector Specialist Team Lead position previously held by Travis Shealy. Applications for this position were accepted July 18th through July 27th. There have been over 84 cases of animal rabies in South Carolina this year.



# News in the Region

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## South Carolina (cont.)

Charleston County Mosquito Control (CCMC) conducted a one-day educational Citizens Awareness Program (CAP) in conjunction with National Mosquito Control Awareness Week (NMCAW). CCMC team members went door-to-door providing educational materials and talking to residents. Informational materials were also distributed to residents through local libraries and the Parks and Recreation Department.

Beaufort County Mosquito Control (BMC) finished its annual treatment of county catch-basins in late May, with over 22,000 catch basins treated with extended release larvicide tablets. BMC continues to tweak its helicopter-mounted, multispectral imaging system for mapping mosquito-breeding habitats.

The City of North Myrtle Beach in Horry County reports that this has been a smooth year and they are seeing below average numbers in their landing rates and trap collections. They purchased a 10,000 sq. ft. building and built a new lab and offices. They also purchased “Field Seeker” software to track ULV trucks and surveillance activity and three new mosquito sprayers, two of which replaced old sprayers.

*Submitted By: Special Davison & Robert Cartner*

## Virginia

### ***Southeastern Virginia***

Hampton is seeing higher numbers of *Ae. albopictus*. Total species count thus far (7/24/19) is 34,676, which is slightly increased from last year’s count of 32,862 at this time. We have ramped up our treatment of stormwater system and have seen consistently low numbers of *Cx. pipiens*. Hampton has conducted a significant amount of public outreach this season. A city-wide Tip ‘N Toss campaign is currently taking place. Our crews have gone door to door in susceptible neighborhoods doors with Tip ‘N Toss literature. We conducted an informational program on local Hampton television (channel 47), which plays periodically, and have conducted interviews on local news channels as well.

Testing for Suffolk has yielded, 6 WNV+ pools (5 *Cx. pip/res* and 1 *Cs. melanura*) and 3 EEEV+ pools (*Cs. melanura*) So far everything seems to be contained in the downtown area so no threats to our neighbors as of yet.

Chesapeake has been doing a lot of pesticide efficacy testing, both adulticides with bottle bioassays and larvicides WSP & block trials. Our mosquito numbers overall are lower than years past especially *Cs melanura* and *Cx pipiens* populations. We have no positive chickens and only 2 WNV+ Vector tests with *Cx pipiens*. We are also running bottle bioassays again this summer (*Cx pipiens* and *Ae albopictus*).

The 2019 season in Portsmouth started off with heavier amounts of rain and plenty of mosquitoes to go with it. July brought with it extreme heat and very little rain which has dried up most standing water in the city. Trap counts are low at the moment, and our main focus during this time has been training and outreach. Portsmouth will start to test in August, so no results as of yet.

Langley has trapped 3,686 total mosquitoes so far this year which is significantly lower than last year. We have sent 300 *Ae albopictus* to Wright-Patterson AFB in Ohio to be tested for arboviruses which is much higher than last year. No virus-positive mosquitoes to date.

# News in the Region

## Virginia (cont.)

York has seen low trap numbers with *Ps. ferox* and *Cx. pipiens* being the most prominent at 22,713. We have had no positive pools for West Nile Virus to date. York County has been busy with its outreach, and conducted its 2<sup>nd</sup> Bug Fest in June. Attendance reached almost 500 and we even had Dr. Holly Gaff and her tick lab join the outreach efforts.



Left: Dr. Holly Gaff and company joins York County's 2<sup>nd</sup> Annual Bug Fest.

Right: Chesapeake studies pesticide efficacy in house for both larvicides (shown) and adulticides.

## ***Central Virginia***

The County of Henrico, VA is experiencing a very slow start to the 2019 WNV season. *Cx. pipiens* numbers are up this season to date, but no WNV positive mosquito pools have been detected.

## ***Northern Virginia***

The Fairfax County Health Department reports the following numbers of *Culex spp.* collected and tested from gravid traps from epiweek 20 thru 29 in the 2019 season: 40,034 *Culex spp.* collected and tested in 1,272 pools with a total of 9 WNV positives. Compared to the same time period in 2018 (one of the most active WNV years on record), *Culex spp.* abundance from weeks 20 thru 29 is down 37%, number of pools tested is down 33%, and the number of positive mosquito pools is down 93%. This is on-par with our expectations, as infection rates usually stay relatively low following years with very high infection rates like those seen in 2018.

Prince William County, VA is experiencing a light season compared to the record setting years of 2017 and 2018. No West Nile Virus positive mosquito pools have been collected to date and overall mosquito populations are very low. Our total number of mosquitoes collected on the season is 38% lower than the 5-year average, with 35,954 females, with our *Cx. pip/res* populations 35% lower, with 14,311 females. Despite lowering thresholds for testing at the start of the season, the numbers of mosquito pools and the number of individuals tested are also trending 37% and 37% lower than the 5-year average, respectively.

Submitted By: Elizabeth Hodson

# News in the Region

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## West Virginia

There have been no detected human cases of West Nile infection or La Crosse encephalitis in West Virginia from January 1-July 19, 2019. West Virginia reported four travel-related dengue cases and one malaria case in the state.

During the period May 28 to July 19, the West Virginia Department of Health & Human Resources Mosquito Surveillance Program initiated adult mosquito surveillance at 30 localities in 12 counties: Cabell, Doddridge, Fayette, Kanawha, Marion, Monongalia, Nicholas, Ohio, Raleigh, Taylor, Wayne, and Wood counties. West Nile virus, La Crosse virus, St. Louis encephalitis virus, and Zika virus have not been detected in the mosquito populations.

West Virginia is hosting the 24<sup>th</sup> World Scout Jamboree from July 22 – August 2, 2019 at the Summit Bechtel Family National Scout Reserve in Mount Hope, West Virginia. The World Scout Jamboree is anticipated to be one of the largest mass gatherings in the State's history with over 43,000 scouts from 138 counties.

Additionally, Summit Bechtel will be open to day visitors, increasing the number of people on the reserve to approximately 50,000. The event is expected to bring an increased number of visitors to Fayette, Raleigh, and surrounding counties. The Bureau for Public Health is working with the World Scout Jamboree to track and monitor reports of illness, injury, and disease. Larvicide was applied to mosquito breeding sties at Summit Bechtel before the World Scout Jamboree event. The Mosquito Surveillance Program increased mosquito surveillance and arboviral testing of mosquito samples near Summit Bechtel and surrounding Fayette county. Participants of the World Scout Jamboree will also submit ticks encountered at Summit Bechtel to the state public health entomologist.

The Asian longhorned tick, *Haemaphysalis longicornis*, is active in northern West Virginia. We have received Asian longhorned ticks from companion animals in Barbour (1), Hardy (13), Marion (2), and Upshur (1) counties. *Haemaphysalis longicornis* has been previously recorded in these counties. Local health departments are increasing tick surveillance activities to monitor for *H. longicornis*, including tick surveillance at county fairs and collecting tick samples from local farmers. As of July 19, there have been 288 Lyme disease cases, three spotted fever rickettsiosis cases, and one case of ehrlichiosis.

*Submitted by: Eric Dotseth*



## CALL FOR NEWSLETTER ARTICLES

The need for sharing information and collaborating with different states and jurisdictions is at an all-time high. This newsletter and others like it need articles to help readers have access to ideas and contacts to further their programs. Articles can be from any facet of mosquito, tick or other pest control operations. Please send any articles, pictures, or news to Tim DuBois at [duboist@portsmouthva.gov](mailto:duboist@portsmouthva.gov) to submit for the next newsletter!

# Suffolk Mosquito Control Activities and Outreach

Suffolk Mosquito Control participated in several events so far this year. Below are some of the opportunities that they used as a means of public outreach and education.

## Rain Barrel Workshop

The Rain Barrel Workshop took place on April 20, 2019. For this event, people sign up and come to create a rain barrel to use for watering plants, gardens, and other places that could use a bit of water during the dry season. Mosquito Control was on hand with information, brochures, and mosquito dunks to help attendees cut down on the population of mosquitoes that could potentially breed in rain barrels.



## Touch-A-Truck

The Touch-A-Truck event was held at the North Suffolk Library on May 21, 2019 through the Suffolk Public Works Department. There were several large pieces of equipment: a front-end loader, dump truck, and a truck from Traffic Engineering. The kids would put on a hard hat and then would sit in and on the equipment, blow the horn and pretend to be driving. Mosquito Control was on hand with examples of mosquitoes, also non-mosquito look-alikes, and a couple breeding chambers of larvae. The kids' really liked looking and asking questions about the mosquitoes and mosquito control.



## National Mosquito Control Awareness Week

National Mosquito Control Awareness Week was observed the week of June 23-29<sup>th</sup>. Suffolk Mosquito Control celebrated the week by setting up displays at all three of the libraries in Suffolk with information on how to reduce the population of mosquitoes. There was also a brief explanation of what mosquito control does with pictures of the technicians along with the tools of the trade: dippers, whirl-pak bags, applying pesticides, biologists setting traps, identifying mosquitoes and mosquito testing.



*Submitted by: Ann Herring  
Suffolk Mosquito Control*

## Rowland E. Dorer Award

The Mid-Atlantic Mosquito Control Association (MAMCA) has one major award, the Rowland E. Dorer Award. This award honors R.E. Dorer of Virginia, one of the founding members of the association who always emphasized the need for a strong regional association. He was the first president of MAMCA and was the first recipient of the Rowland E. Dorer Award, although posthumously. The criteria for the Rowland E. Dorer Award are as follows:

- Nominees for the award should be selected based on their exceptional contributions, of whatever type, to mosquito control in the Mid-Atlantic region.
- The nominee must be a member in good standing of the MAMCA.
- Nominees are to be submitted to the MAMCA Awards Committee in writing with justification. Written nominations should include a cover letter from the individual(s) making the nomination and a resume/CV of the nominee's background/career/accomplishments in MAMCA and mosquito control. At least three (3) accompanying letters of support are requested.

A maximum of one award per year will be given. From the Procedures Manual: "The Awards Committee is reminded that they do not have to present an award every year. If the nominations are inadequately prepared, in the opinion of the Committee, or if the nominations lack the substance and tradition of past award recipients, it is imperative that the Committee wait."

Please think of those MAMCA members that are deserving of the Association's highest honor and submit a written nomination and accompanying documents to the MAMCA Awards Committee, c/o Sue Ferguson, fergussc@bellsouth.net, **by Monday, November 18, 2019**. Any questions regarding the award may also be directed to Sue at the email address listed.

### List of the Rowland E. Dorer Award Recipients

1987 - Rowland E. Dorer	2007 - Bruce A. Harrison
1989 - Larry E. Kase	2008 - William H. Meredith
1991 - Max M. Askey	2009 - Gene R. Payne
1992 - T. Oscar Fultz, Jr.	2011 - Nolan H. Newton
1994 - Martin J. Shockley	2012 - Jorge R. Arias
1995 - L.A. Williams, Jr.	2013 - Joseph Conlon
1997 - William J. Zawicki	2014 - Charlie Pate
1998 - Chester J. Stachecki, Jr.	2015 - Jeffrey L. Heusel
1999 - Richard C. Axtell	2017 - Dennis A. Salmen
2004 - Sue C. Ferguson	2019 - Joe Strickhouser

## **Mosquito Training for Pest Managers Online Course**

### **Titles of modules:**

1. Mosquito Identification
2. Mosquito Biology
3. Mosquito Monitoring & Surveillance
4. Mosquito Space Spraying
5. Mosquito Residual Spraying
6. Integrated Mosquito Management
7. Mosquito Larvicides
8. Mosquito PPE
9. Mosquito Laws & Regulations
10. Reading Mosquito Labels
11. Final Review

### **Time needed to complete each module:**

Approximately 20 – 30 minutes per module. Each module has a 10 question exam at the end that must be passed with a grade of greater than 75% in order to go on to the next module.

### **Module instructors:**

The course was created with input by Drs. Faith Oi, Phil Koehler, Rebecca Baldwin, John Diaz, and Saqib Mukhtar of UF/IFAS and Paul Mitola of FDACS.

<https://ifas-mosquitoceus.catalog.instructure.com/>

This course is an introduction to mosquitoes and mosquito control for employees in the urban pest management industry. Students will learn to identify and understand the mosquitoes of major importance in the urban environment, their life cycles, the general methods of control, personal protective equipment required for safe insecticide application, and the laws and regulations governing mosquito control for the urban pest management industry.

# MAMCA Sustaining Members

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Bayer Environmental Science



# Mid-Atlantic Mosquito Control Association Officers and Board Members

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