



Skeeter Scanner

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While Midland County crews are completing treatment to as many *A. vexans* sites as they can get to (Midland County received over four inches of rain in the first part of June), I sit here reflecting about what pearls of wisdom I could offer to the MMCA membership. Other than, thank God I don't live in Ludington with all their recent rain; I will pass on what we tell our crews to keep them inspired as they trudge through the breeding sites. Larviciding is the invisible part of mosquito control but the most important part. When you stop and figure the number of mosquitoes that can be produced by an acre of breeding site it brings the importance home. At the risk of being a participant in Dr. Wilmot's "Liars Figure and Figures Lie" club, I offer these figures up to you for your consideration. At 2 mosquitoes/dip and 5 dips/square foot there would be 10 mosquitoes for each square foot of habitat. When you multiply that by the 43,560 square feet in an acre it would produce approximately 1/2 million mosquitoes. In my opinion this figure is a very conservative estimate, and the general public is unaware of how much control is being done because they often do not see the treatment occurring or the mosquitoes in the water. Providing the public with this figure helps them understand how much we are accomplishing. I know that I am preaching to the choir but I hope that the choir will sing the praises of integrated mosquito control and continue to educate the public to the fact that our industry is much more than a ULV truck going down the road.



Work continues on developing the 2009 conference in Ann Arbor. Please contact Joyce McLaughlin at (989) 687-5044 if you have a presentation that would be of interest to the membership. A site visit was made to Amway Grand Plaza Hotel to select meeting rooms for the 25th annual conference set for February 2-3, 2011. The hotel will be placing MMCA in two very nice meeting rooms and the rest of the hotel certainly lives up to its name. Negotiations continue with several items still needing to be worked out but the room rate that they are offering conference attendees is extremely reasonable. It should be an exciting time as MMCA celebrates its 25th meeting, mark your calendar now for both meetings.

MMCA has been accepted as a partner with AMCA into the EPA's Pesticide Environmental Stewardship Program (PESP). The Board has directed the Scientific Committee to work on the project and develop a form to gather information that will be needed from MMCA members for the report.

Charles Dinsmore

Geneticists Trace the Evolution of St. Louis Encephalitis

Before West Nile virus arrived in this country, we had (and still have) a home-grown relative of this pathogen. An epidemic of unknown origin exploded around St. Louis, Missouri in the autumn of 1933, a disease that is now known to be transmitted by mosquitoes from birds to people. Now, a new analysis of the genome of St. Louis encephalitis completed at the Sackler Institute for Comparative Genomics at the American Museum of Natural History (AMNH) is shedding light on the evolution of this virus.

Under the direction of Susan Perkins, Assistant Curator of Microbial Genomics, postdoctoral fellows Gregory Baillie, Sergios-Orestis Kolokotronis, and Eric Waltari sequenced the entire genetic code of 23 strains of the virus that cause St. Louis encephalitis, all from the genus *Flavivirus*. Previous research had found that recombination (the cutting and pasting of strands of genetic material, in this case RNA) explained the evolution of this virus, but these studies sequenced just a single gene of the virus.

Because the whole-genome approach turned a microscope on the entire set of instructions for St. Louis encephalitis, the AMNH researchers were able to determine that a single mutation in the coding for an envelope protein rather than recombination most likely caused changes that made the virus pathogenic to humans. "Recombination is important for disease; it makes novel proteins or genes that the immune system has never seen before," explains Perkins. "But in this case, it was population dynamics combined with slight changes in the form of point mutations that have been important in the evolution of this virus."

Genetic analysis also allowed Perkins and colleagues to trace the evolutionary path of the *Flavivirus* virus. They determined that the older, less derived strains, or more ancestral strains, are from South America. The North American and Haitian strains were passed from common bird hosts such as finches, robins, blue jays, and doves into humans by the *Culex* mosquito after the virus exploded into a new continent. To time this event, researchers again turned to the genomic code: by determining the rate of mutation in the virus, Perkins found that the division between the

South and North American strains happened about 116 years ago. "St. Louis encephalitis is a perfect storm between infected bird hosts coming into a new area and the mosquito vectors transferring the virus to humans," says Perkins. "It is the North American version of West Nile."

St. Louis encephalitis is currently found throughout the United States, and according to the Centers for Disease Control, there were 4,651 cases between 1964 and 2005. Symptoms range from a mild headache to high fever and tremors. Mortality is between 5% and 30% and is higher among the elderly.

Clinical Trial for Pre-pandemic Influenza Vaccination - Japan

The Ministry of Health, Labor and Welfare in Japan (MHLW) has announced that it would organize a clinical trial for pre-pandemic influenza vaccines against H5N1 on 6400 volunteers to further make sure of its safety and effectiveness which had already been tested for a smaller number and been approved by the national regulatory authority. The 6400 volunteers will include quarantine officers, health care workers and emergency response workers.

MHLW will consider expanding pre-pandemic vaccination to wider prioritized targets, up to 10 million, if the trial proves its safety and effectiveness. It would also consider increasing its stock of pre-pandemic vaccines in addition to the current 20 million stockpiles of Vietnam, Indonesia and Anhui [China] strains as bulks.

Discovery to Hasten New Malaria Treatments, Vaccines for Children

April 25 was World Malaria Day 2008 and despite the grim statistics out of Africa, there's cause for celebration. Florida State University (FSU) biologists have discovered an autoimmune-like response in blood drawn from malaria-infected African children that helps to explain why existing DNA-based anti-malaria vaccines have repeatedly failed to protect them.

The groundbreaking study is expected to better inform and speed the development of new treatments and vaccines that effectively target the unique

medical needs of malaria's smallest, most vulnerable victims.

FSU's research which focused on children in remote Nigerian villages who were younger than 6 and infected with *Plasmodium falciparum*, the most virulent form of the malarial parasite has shed much-needed light on heretofore poorly understood remnants of white blood cells that have long been known to circulate in malaria victims' blood but were thought to be debris.

Researchers from FSU's Department of Biological Science were the first to observe that the white blood cell remnants actually are Neutrophil Extracellular Traps or "NETs" that both capture malaria parasites and engender unique, often deadly responses in the immune systems of very young children. As a result, they are far more likely to develop severe, coma-inducing malaria and die than are adults who may carry higher levels of the parasite but have survived repeated infections.

Those findings are described in the February 2008 edition of the journal *Malaria*. The paper was co-authored by FSU Associate Professor Tom Keller, Professor Ken Roux and graduate research assistant Pallavi Tawde and led by Keller's then-doctoral student Virginia Baker, now an assistant professor at Chipola College in Marianna, Fla.

The FSU news has emerged amid worsening data on malaria's human and economic costs. Described 4,700 years ago in ancient Chinese medical writings and by the Greek physician Hippocrates in the 4th-century B.C., malaria today still sickens and kills more children in Africa (where more than 90 percent of all cases of malaria occur) than almost any other cause.

To better understand why children are so sensitive and to look for clues to why adults become resistant to malaria infection, the FSU researchers measured the levels of cytokine molecules that are released in response to infection and circulate in the blood stream to function as signals in the immune system both before and after the children were treated with an effective anti-malarial drug.

"We also took a fresh look at some unusual white blood cells that appeared to have exploded in the

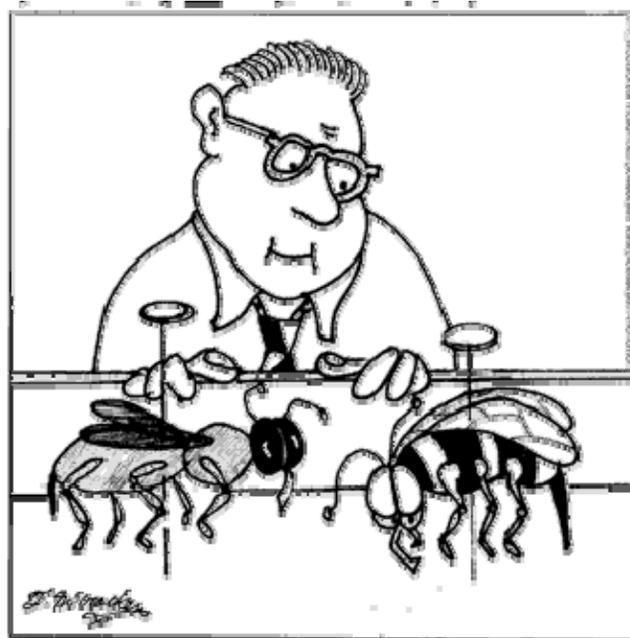
children's blood smears," Keller said. "Although scientists had observed these structures for years in malaria-infected blood samples, they remained very poorly understood.

"From our interpretations of the existing literature, we suspected that an autoimmune-like response may have contributed to the severity of malaria in young children," he said. "Nevertheless, we were completely surprised to find that the strange white blood cell structures characterized by previous researchers as artifacts or an extraordinary response to other types of infections were in fact circulating 'NETs' of DNA, which form as a result of the immune system's response to malaria."

Consequently, said Baker, protocols designed to treat the accompanying autoimmune-like response will be more effective in preventing severe malaria in young children than treatments directed only at clearing the parasites.

The 2008 paper, "Cytokine-associated Neutrophil Extracellular traps and antinuclear antibodies in *Plasmodium falciparum* infected children under six years of age," is accessible online at: www.malariajournal.com/articles/browse.asp.

A grant from the World Health Mission funded the FSU study, which included the distribution of insecticide-treated mosquito nets and anti-malarial drugs to Nigerian villages.



"This is the last time I go to an acupuncturist for my back problems."

Pauli and Margo Ficaj Donate to Mosquito Control Education

Julia Ficaj daughter of Pauli and Margo Ficaj died of acute encephalitis 3 years ago, in June 2005. Although mosquito borne encephalitis was not confirmed, their daughter had received several mosquito bites in the time before the onset of her encephalitis. In her memory the Ficaj family has proposed donating to the MMCA, the funds to be used to promote Mosquito Control Education.

Baby Julia

We don't think of you as gone away,
we think of you as living.
Although your death feels like a senseless loss,
your purpose is revealed in your giving.

You give through the changed actions
of those whose lives you've touched,
through the lives of all those parents who tell us
that your story affected them so much,
that they now never neglect to apply mosquito spray
before sending their own beloved children
out in the great outdoors to play.

Life holds so many facets
this Earth is only one.
When He made you an Angel,
your mission had begun.
We don't think of you as gone away,
we think of you as living.
We find peace in knowing you're in trusted hands
and in the evidence of your giving.

Scientists Look for Better Way to Keep Bugs at Bay

Researchers have identified seven possibilities for the next generation of mosquito repellent, some of which may work several times longer than the current standard-bearer, DEET. The next step: safety testing to make sure they're not harmful.

While the new repellents aren't likely to be available commercially for a few years, early tests on cloth were promising, with some chemicals repelling mosquitoes for as long as 73 days and many working for 40 to 50 days, compared to an average of 17.5 days with DEET, according to a study in today's

edition of Proceedings of the National Academy of Sciences.

Several of the new chemicals "were just phenomenal," said Ulrich R. Bernier, a research chemist at the Agriculture Department's mosquito and fly research unit in Gainesville, Fl. "I was so surprised."

Bernier, a co-author of the study, said he regularly receives new repellents from people and he ends up writing them back to say they don't work.

In this case, researchers funded by the Defense Department set out to determine what makes repellents work, and then to use that information in finding more effective ways to chase away disease-carrying insects, Bernier explained in a telephone interview.

"We thought, can we do a better job of designing repellents?" Bernier said.

Using USDA data on hundreds of chemicals collected over 50 years, researchers led by Alan R. Katritzky of the University of Florida rated chemicals from "1" to "5" on ability to repel insects, and then focused on what the most effective ones, the 5s had in common.

Focusing on a type of chemical known as N-acylpiperidines, they narrowed the study down to 34 molecules, 23 that had never been tested before and 11 that had, Bernier explained.

From those, the 10 most effective were narrowed down to seven, with eliminations based on concerns about toxicity and high cost to produce.

The tests were done on cloth treated with the chemicals and then placed on the arms of volunteers.

This summer, safety tests will begin on the seven, Bernier said, to make sure they are safe to use directly on the skin.

While the military is paying for the research, any success is expected to benefit the general public too.

The current standard for repellents, DEET (N,N-diethyl-meta-toluamide), was also originally developed for military use in 1946 and was registered for use on civilians in 1957.

MMCA Board of Directors Meeting
June 12, 2008
Meeting Highlights

MMCA received a letter from Marguerite Weiss, one of the winners of the 2007 Kenley Farrel memorial Scholarship, thanking us for honoring her with the scholarship.

The treasurer reported that there was a net loss from the 2008 conference; discussion ensued regarding changes that might be made to make the conference break even. Some suggestions were: increasing the exhibitor's fee and/or registration fee, reducing the banquet costs, and possibly reducing the one-day registration fee to draw more members. It was mentioned that there will be a finance committee meeting scheduled for fall. It was also discussed that the money in the Scudder Fund was collecting extremely low interest rates. It was decided to move the money to a local CD in hopes of earning a higher interest rate.

The Secretary reported that we received a thank you letter from the Michigan Environmental Health Association for setting up the MMCA display booth and providing information to their conference attendees.

A mailing was sent to all past members who had not renewed for this year, including 13 industry members. We have received 11 membership renewals. AllPro Vector Group has joined as an industry member and will be added to our website. MMCA has renewed our AMCA sustaining membership for 2008.

Joyce McLaughlin, 2009 conference chair, has asked for ideas for entertainment and presentations for next years conference, anyone who has comments can call her at: (989) 687-5044. Bill Wallace from Tuscola Mosquito Control is the Chair for the 2010 conference, they are looking at the Little River Casino in Manistee as a possible site. Mary McCarry, Chairman for the 25th Anniversary Conference in 2011, passed out copies of the contract with the Amway Grand, site for our 2011 conference.

Margo Ficaj has proposed donating money to the MMCA in memory of her daughter Julia who died of acute encephalitis in June of 2005. Discussion was held regarding the best use of this donation, it was suggested that it be used for something focusing on Mosquito Control Education at the elementary school level. Mr. Dinsmore will contact Mrs. Ficaj and get her opinion on its best use.

Reports on the PESP and Michigan Municipal League will be covered at the next meeting, which will be held on August 14, 2008.

Congratulations to Kevin Taylor,
from Pestalto Environmental Health Services, Inc., Guelph, Ontario
Kevin is the winner of the Free Registration to the 2009 MMCA Conference in Ann Arbor, MI

Pesticide Management and Disposal; Standards for Pesticide Containers and Containment

EPA has posted a corrected version of Pesticide Registration Notice 2007-4, Labeling Revisions Required by the Final Rule "Pesticide Management and Disposal; Standards for Pesticide Containers and Containment" to the web. The Agency made some editorial corrections, including an amendment to the label language in Appendix B of the PR Notice to accurately repeat what is required by the container and containment regulations. The PR Notices are available at: http://www.epa.gov/PR_Notices/pr2007-4.pdf.

AN AMERICA WITHOUT MOSQUITO CONTROL

- **More human/public health issues from mosquito-borne diseases**
 - Malaria – As late as 1934 there were 125,566 cases in the US. Without mosquito control, malaria might reestablish from tourism and immigration.
 - Yellow fever – Summer outbreaks in coastal cities along Gulf Coast and Atlantic seaboard north to Boston, into upper Mississippi River valley throughout the 19th century.
 - Dengue fever – Current problems along Texas border, powder keg awaiting movement northward from the Caribbean.
 - Encephalitis viruses – Over 27,000 cases from 1999-2007; more than 11,000 cases of neuroinvasive disease causing permanent disability; over 1,000 fatalities.
 - Rift Valley Fever and Chikungunya virus are currently spreading to Europe and elsewhere. Species of mosquitoes that transmit these diseases are commonly found in the United States.
- **A lower quality-of-life due to annoyance caused by sheer number of mosquitoes**
 - Documented cases of caribou in Alaska being asphyxiated from inhalation of mosquitoes.
 - Native Americans historically moving from lowland areas on the eastern seaboard to inland mountains to escape mosquitoes.
 - A female mosquito can produce over 400 million progeny in a single season even if only 25% of each generation survives.
 - Traps set in the outskirts of the Everglades and barrier islands have recorded nightly catches in pounds. One pound of mosquitoes = 1,095,440 mosquitoes.
 - Landing rates of over 100/min are commonly recorded in salt marshes and areas bordering rice fields prior to control operations and 500/minute in the Everglades.
 - Parents having to console a 6-year-old's attempts to fall asleep when he has 30 fresh mosquito bites from playing in the backyard for 15 minutes earlier this evening.
 - People having to stay indoors on glorious, warm, balmy evenings; constantly lathering up with sticky repellents; or wearing long-sleeves and long pants during hot weather.
- **Increased impacts to domestic animals/wildlife**
 - Horses – Over 25,000 horses dead from Eastern Equine Encephalitis (EEE), Western Equine Encephalitis, and West Nile Virus (WNV) 2000-2007
 - Dogs – Canine heartworm transmitted by *Culex* mosquitoes
 - Large Birds (ostriches, emus, etc.) and zoo species potentially killed by EEE and WNV
 - Endangered species – EEE killed 7 of 39 whooping cranes in Maryland in 1984.
 - WNV impacts on endangered species and avian niches in ecosystems: Florida Scrub-Jay, California Condor, Whooping Cranes and various raptor species.
- **Devastating economic problems and impacts on local economies**
 - Tourist destinations are in some of the nation's worst mosquito habitat along coastlines and in state/national parks.
 - Outdoor recreation (hiking, camping, etc.) usually occurs in prime mosquito habitat. The diaries of Lewis and Clarke have numerous references to the excruciating problems mosquitoes caused in pristine wilderness habitat.
 - Reduced attendance at outdoor events such as ball games, car races, picnics, fireworks displays, reunions, concerts, parades, graduation or wedding ceremonies, drive-in movies, etc. as unchecked mosquito numbers make these activities increasingly uncomfortable.
 - Higher beef and dairy prices. Studies show that the annoyance of large mosquito populations significantly lower beef production and dairy output.
 - Development of prime real estate in many areas will be inhibited – without mosquito control many people would **not** be living where they presently do!
 - Equity and land values would plummet in many areas if modern-day mosquito control was to disappear.

Double Trouble with Insecticide-resistant Mosquitoes

Mosquitoes harboring two insecticide-resistance genes have been found to survive unexpectedly well in an insecticide-free environment where carrying such genes would normally be expected to be a burden. This results from the genes interacting with one another to the advantage of the host *Culex quinquefasciatus* mosquitoes and to the detriment of pest management strategies affecting human health.

The research team, led by Dr. Vincent Corbel and colleagues from the University Montpellier II, Genetics and Evolution of Infectious Diseases, and The Research Institute for Development (RID) in France compared the survival rates or evolutionary fitness of one strain of the mosquito that carried two resistance genes (ace-1R and KdrR) for two different insecticides to mosquitoes that only had one insecticide-resistance gene, a French research team discovered that the survival cost of having both genes was far lower than the cost of having just ace-1R.

"We know from evolutionary theory that mutations such as these are likely to be costly to their owners in environments where they have not been selected for" explained Dr. Corbel. "We've found that in *Culex quinquefasciatus* the cost of having the ace-1R mutation in the absence of insecticides is counterbalanced when the mosquito also has the KdrR mutation. Mosquitoes with both mutations will also be harder to control as they are resistant to two different types of insecticide."

The authors also found evidence that resistance alleles interact with one another in the presence of insecticides. For instance, synergism (that is, a more than an additive effect) in toxicity was observed when a pyrethroid insecticide and a carbamate insecticide were applied simultaneously to the strain sharing both mutations (the insecticide had a greater activity and more of the mosquitoes died), whereas antagonism (that is, a less than an additive effect) was noted with *Culex* mosquitoes carrying only ace-1R.

Resistance to so-called xenobiotics (antibiotics, insecticides and herbicides) is a problem affecting the control of organisms of medical or economic

importance. In *Culex quinquefasciatus* insecticide resistance mutations interacted to positively and negatively influence the mosquitoes' fitness. Costs were associated with both resistance genes in an insecticide-free environment. The KdrR form of the gene, or allele, however, compensated for the costs associated with the ace-1R allele, suggesting that mosquitoes with both genes in the wild could be more prevalent. Females with both alleles were more likely to mature than those with just the ace-1R mutation."

"It is important to identify genetic interactions such as this and how they influence the fitness of multiply resistant organisms in order to better structure management strategies" says Dr Corbel. "We have found in this case that resistance genes do interact and even compensate. We will have to be very careful in how we use insecticides in future as our results have major implications for pest and health management."

Pyrethrins Reclassified in EPA Health Assessment Review

The Cancer Assessment Review Committee of the U.S. Environmental Protection Agency (EPA) has issued its finding that pyrethrins, which are naturally occurring insecticides found in the flowers of chrysanthemum species grown in Africa and Australia, are unlikely to cause cancer in humans at doses to which people are likely to be exposed.

"This is an important conclusion and a positive finding," said David Carlson, McLaughlin Gormley King (MGK) Company, Technical Chair of the Pyrethrin Steering Committee/Joint Venture.

EPA had relied on lifetime feeding studies in rats, a standard procedure for assessing potential human health effects, in an earlier evaluation. In these studies, rats are fed much higher doses than humans would ever likely ingest, even in high exposure situations. Based on these studies, in the past the EPA concluded that there might be human health effects under specific, although unlikely, circumstances. It reversed this position, however, based on new scientific evidence showing that the mode of action by which pyrethrins affect rats is not applicable to humans at the dose levels at which humans would be exposed.



News From Around The Districts

SAGINAW

The first two months of the mosquito season have been almost ideal in keeping mosquito populations low. Predominately cool temperatures along with rainfall coming at convenient intervals has resulted in little standing water thus significantly suppressing mosquito populations in most areas except for the most rural areas of the County. The cool temperatures have also affected some of our control operations. In May and early June we had to shut down early many nights when temperatures dropped below 55 F and we didn't begin our first treatment of catch basins by moped until 11 days later than last year.

This spring we conducted a 5 week study on the efficacy of truck based ULV adulecting in rural areas with various insecticides and documented significant reduction in mosquito populations compared to untreated areas. Once we have time to completely analyze the data we will have established some baseline information for future comparisons of insecticides and application technologies. We plan to share this information at next year's MMCA meeting.

Our Education Department will again be busy this summer by participating in the following Saginaw County Parks activities: Children's Fun Day; Touch a Truck Day; and two Pond Life Study programs. Additional summer activities will include Birds, Bugs (that's us), Butterflies, and Blooms at the Saginaw Children's Zoo, St. Charles Library Bug Day, Saginaw Farmers Market, and numerous day care presentations.

Our agency hosted its yearly blood drive on June 25th with approximately 30 employees signing up to donate.

Our third and final tire drive of the season will be held the week of July 21st-25th; to date we have collected and disposed of 11,934 tires for the summer.

MIDLAND

It has been a busy mosquito control season thus far but the cool temperatures kept adult mosquito flight activity down somewhat during the peak of the spring *Aedes* emergence so we have not had too much of a nuisance problem to date. If the rains of June continue into July we could start to have problems with the summer floodwater species. So far things have been pleasantly quiet on the West Nile virus front. With the loss of federal and state support, we are seeing significant reductions in surveillance activities. We can only hope that those who are conducting surveillance will report any activity noted so the rest of us can make use of all available information.

Midland County's transition from malathion to permethrin for ULV adulecting seems to be going well. Field tests have shown very good efficacy for all three materials being tested against spring *Aedes* species in wooded areas. We will conduct caged-mosquito trials against *Culex* species in more open areas later this summer. Speaking of this summer, we will be asking the residents of Midland County to approve another five years of funding for our program during the primary election in August of this year.

It is not too early to begin planning for the MMCA Conference 2009 in Ann Arbor. If you are working on anything new or observe anything of interest, plan to write it down and share it with us as part of the program or take a picture for the photo salon. Please contact Tom Wilmot if you have any suggestions/requests for program presentations.

Mosquito season is here and Bay County Mosquito Control is doing its best to Fight the Bite! The annual spring woodland-pool treatment program marked the beginning of BCMC's mosquito control season. Control efforts included aerial spraying (35,256 acres) using one helicopter (Clarke Mosquito Control) and two fixed-wing aircraft (Reed's Fly-On Farming), with the focus on areas near cities, towns and large developments. As successful as the operation was (over 95% mortality of monitored larvae), we're still seeing spring Aedes adults (probably through mid-July) and they can be particularly troublesome in wooded areas affecting local residents.

Throughout the warm weather months, BCMC will be busy treating larval or adult mosquitoes originating from woodlots, floodplains, freshwater wetlands, grassy fields, wet meadows, roadside ditches, ponds, catch basins, as well as containers. We've already treated ditches county-wide twice in June due to two significant rain events and been back in woodlots treating Aedes vexans larvae. Catch basin treatment is also being repeated for the second time this season. The first treatment took place at the end of May. Surprisingly, the number of complaint calls hasn't increased as expected (knock on wood)!

Two training sessions were held for both new and returning seasonal staff members to prepare them to test with the MDA as certified technicians. Most started working by early May and will be with us until the end of August.

Public education efforts continued with information distributed regarding artificial containers and basic homeowner control techniques. Presentations were given at Kolb Elementary School, MacGregor Elementary School, and two summer daycares – Fremont Center and Center Plaza Daycare.

We continue to monitor for West Nile virus this season by testing American Crows, Blue Jays, and mosquitoes in-house using the VecTest kit and by submitting bird bloods and mosquitoes to Dr. Walker's lab at MSU. Through June 26, we have tested four Blue Jays; all tested negative for WNV. Furthermore, we have tested nine Culex species mosquito pools for WNV and all were negative.

A few other items of interest: the first of two tire drives was held June 6-7 with 2,642 tires collected; Justin has been busy this spring installing nine more GPS units in pick-ups; Jake Britton of Clarke Mosquito Control visited on May 8 to check the MMD's of ULV machines for our entire fleet (thanks again, Jake); a new Grizzly ULV machine was purchased this year and is working out great; the County has given us the green light on jazzing up our website so changes are coming!

We have been holding our breath all of May and June watching most soaking rain storms just brushing by. So far we have had about normal rainfall this past June-about 3 1/2 inches. Mosquito numbers are below normal to date. There still is quite a bit of summer left and anything could happen.

We plan on at least two catch basin treatments this summer (maybe three) and we are adulticiding the urban areas about every two-three weeks to reduce Culex mosquitoes.

We are quite pleased with our new purchase of an AIMS in measuring droplet size. This has saved us a lot of time and effort and is also much more accurate.

Monitoring for West Nile Virus (WNV) in corvids and mosquitoes has been negative to date.

We wish all a near mosquito-free, safe summer!

MMCA joins AMCA as a partner in the EPA's Pesticide Environmental Stewardship Program (PESP)

EPA established PESP in 1994 as a voluntary partnership program to reduce pesticide risk and announced the first six PESP Partners. In 1995, EPA added a Supporter category to allow organizations that train, educate, or influence pesticide users to participate in PESP and, thereby, be recognized for their contributions to reducing pesticide risk.



By joining PESP, organizations pledge that environmental stewardship is an integral part of pest management, and they commit to working toward innovative practices that reduce risk to human health and the environment.

In addition to promoting the use of biopesticides, PESP advocates the adoption of [integrated pest management](#) (IPM) programs or practices. IPM is the coordinated use of pest and environmental information with available pest control methods to prevent unacceptable levels of pest damage by the most economical means and with the least possible hazard to people, property, and the environment.

As a partner with the AMCA, MMCA will be providing data to AMCA to include in their Annual Report for the PESP.



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Summer