



# Skeeter Scanner

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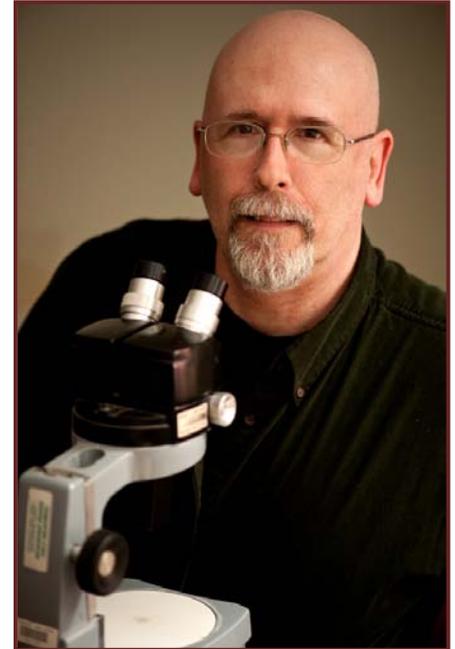
The dogmas of the quiet past are inadequate to the stormy present. The occasion is piled high with difficulty, and we must rise with the occasion. As our case is new, so we must think anew and act anew. -- Abraham Lincoln.

The winter has come to an end and the wondering of what this season will bring is beginning. We are often asked if this will be a bad year for mosquitoes. The best answer I have is the more rain we get the more mosquitoes we have. Left out are important details like, will there be disease? Will all our rain come in three days? We operate in an unpredictable business that can lead to many unpredictable challenges, ah, interesting times in an interesting business.

This interesting business is the reason for our association's existence. Ideas, experiences and solutions from members are important resources. Often, just discussing past experiences is valuable. Coming together, making contacts, sharing ideas, offering perspectives and cursing *Aedes vexans* is a major purpose of the MMCA.

Just like the business of our predecessors things are changing. There are new questions to be asked, new dilemmas to face. We are seeing changes from the regulatory landscape to the literally changing landscape. We are seeing new climates, new species and new regulations in our industry. As an association we need to look into our crystal balls the best we can and navigate through and around these changes. Where do we want to go and what do we want to become?

This mosquito control business is a collaborative one; new ideas are needed to build on our traditional methods. Let the MMCA board members know what you need from an association, what can we do to improve? Is there enough training material, does the website work, do the speakers give good information, do our training classes give the necessary training, do you want more network time, or more credit opportunities? We will not meet every request, but improvements begin with ideas and suggestions, leading to discussion. Where are we going? When will we leave? It will be interesting.



Douglas Allen

## Don Newson Passes



Harold Don Newson, 88, of Traverse City, passed away peacefully at home on Thursday, Feb. 7, 2013, with members of his loving family at his side. Don was born July 11, 1924, in Salt Lake City, Utah, to Frederick and Alfrie (Sadler) Newson.

In 1942 he graduated from high school and enrolled at the University of Utah. After two years of study he was drafted in the army, where he remained until his discharge in 1946. He then resumed his college studies, and earned Bachelor of Arts and Master of Science degrees from the University of Utah and a Ph.D. from the University of Maryland.

During the Korean War he was recalled to active duty and chose to remain in the army where he could continue his career as a medical entomologist. During his military career he did research at Walter Reed Army Institute of Research in Washington, D.C., Japan and Germany, and served in U.S. Army Medical Research and Development Command, then ended his military service as medical entomologist consultant in the Office of Surgeon General. He attained the rank of colonel in 1966 and was awarded the Legion of Merit upon his retirement in June 1970. His army duty took him to many countries: Malaya, North Borneo (now part of Indonesia), Thailand, Korea, Vietnam and Panama.

In July 1970 Don started his second career at Michigan State University as a professor in the entomology department. He spent 19 enjoyable

years teaching, guiding his graduate students and continuing research. He improved the quality of life for many by helping to prevent parasitic and mosquito borne diseases; he was a consultant to the Saginaw-Bay Mosquito Control Commission and participated in a large multi-departmental field study in Sudan funded by National Institute of Health.

Don was a member of numerous professional organizations and committees, often serving as chairman or board member. He also edited professional publications and authored many scientific papers. He was a member of the academic honorary societies Phi Kappa Phi and Sigma Xi.

Don was a very unassuming and modest man with a great sense of humor, an officer and a true gentleman always. He will be greatly missed.

### **Mosquitoes Ignore Repellent Deet after First Exposure**

Deet works the first time, but for some hours afterwards it loses its power. The widely used insect repellent Deet appears to be losing its effectiveness against mosquitoes, scientists say.

Researchers from the London School of Hygiene and Tropical Medicine say mosquitoes are first deterred by the substance, but then later ignore it. They say more research is needed to find alternatives to Deet, which was first developed by the US military. The research was carried out on *Aedes aegypti*, a species of mosquito that spreads dengue and yellow fever.

The findings are **published in the journal *Plos One***. Dr James Logan from the London School of Hygiene and Tropical Medicine, said: "The more we can understand about how repellents work and how mosquitoes detect them, the better we can work out ways to get around the problem when they do become resistant to repellents."

Deet - or N,N-diethyl-meta-toluamide - is one of the most widely used active ingredients in insect repellents. It was developed by the US military, following its experience of jungle warfare during World War II.

For many years, it was not clear exactly how the chemical worked, but recent research suggests that insects simply do not like the smell. However, there are concerns that some mosquitoes are growing resistant to it.

To find out more, researchers from the London School of Hygiene and Tropical Medicine took some *A. aegypti* mosquitoes in the laboratory, and tempted them with a human arm covered in Deet. As expected, the repellent put the insects off their potential meal. However, a few hours later when the same mosquitoes were offered a chance to dine again, the researchers found that the Deet was less effective.

To investigate why this might be happening, the researchers attached electrodes to the insects' antenna. Dr Logan explained: "We were able to record the response of the receptors on the antenna to Deet, and what we found was the mosquitoes were no longer as sensitive to the chemical, so they weren't picking it up as well."

"There is something about being exposed to the chemical that first time that changes their olfactory system - changes their sense of smell - and their ability to smell Deet, which makes it less effective."

Earlier research by the same team found that genetic changes to the same species of mosquito can make them immune to Deet, although it was not clear if there were any mosquitoes like this in the wild.

Dr Logan said it was vital to understand both these permanent genetic and temporary olfactory changes that were taking place.

He said: "Mosquitoes are very good at evolving very very quickly."

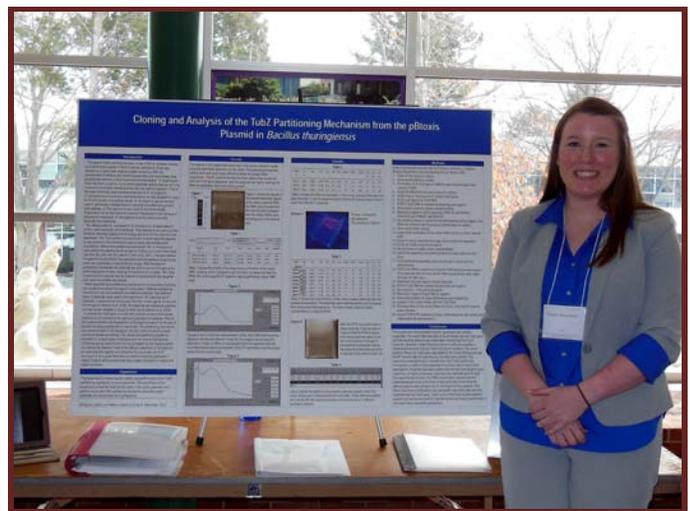
He stressed that the findings should not stop people from using Deet in high risk areas, but that they would help scientists who are trying to find new versions that could be effective.

To follow up on the study, the researchers now plan to find out how long the effect lasts after the initial exposure to the chemical.

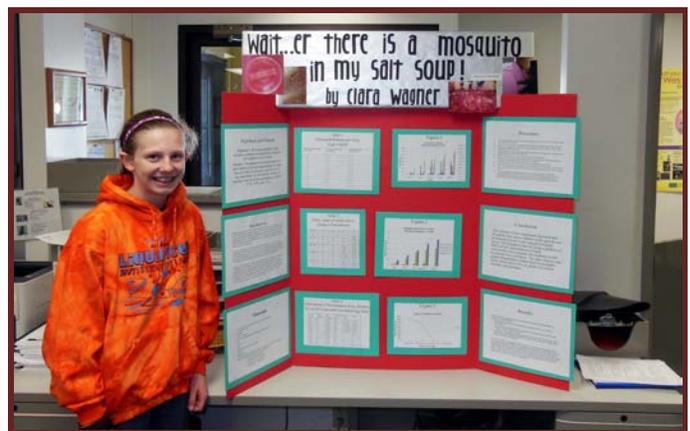
The team would also like to study the effect in other mosquitoes, including the species that transmit malaria.

## Great Lakes Bay Regional Science and Technology Fair

For the second year MMCA has sponsored an award in the Great Lakes Bay Region Science and Technology Fair held at Delta College. Students from the entire Great Lakes Bay Region are eligible to enter their projects for judging. Mary McCarry and Margaret Breasbois selected this year's winner. High School Senior, Emily Macomber's project was titled: **Cloning and Analysis of the TubZ Partitioning Mechanism from the pBtoxis Plasmid in *Bacillus thuringiensis*.**



Continuing with the Science Fair Theme – we would like to congratulate Clara Wagner on her 6<sup>th</sup> grade science fair project on the effect of salt on mosquito larval growth. We would like to thank Lee Mitchell for providing her with *Aedes aegypti* eggs for her project.



## New Malaria-Transmitting Mosquito Discovered in Kenya

Scientists warn of risk that bed nets and insecticides could fail to fully protect the population.

A potentially dangerous new malaria-transmitting mosquito has been discovered in Kenya by scientists from the London School of Hygiene & Tropical Medicine. This species, which has never been implicated in the transmission of malaria before, poses a threat because it bites humans at times when they are not protected by current malaria control techniques.

The commonly caught *Anopheles* mosquitoes that transmit malaria in Africa generally prefer to rest indoors and feed on humans at night. This led to the development of programmes to stop the spread of malaria such as spraying insecticide in homes and issuing bed nets for people to sleep under. However, this mosquito was found to be active outdoors and bite people earlier in the evening soon after sunset.

Lead author [Jennifer Stevenson](#), Research Fellow at the London School of Hygiene & Tropical Medicine, said: “We observed that many mosquitoes we caught, including those infected with malaria, did not physically resemble other known malaria mosquitoes. Analysis indicated that their DNA differed from sequences available for known malaria-transmitting mosquitoes in Africa.

“These unidentified mosquitoes are potentially dangerous because they are outdoor-active and early-biting, and so may evade the current indoor-based interventions to control mosquitoes. In this way, they may prevent the complete suppression of malaria transmission in the area.”

The study outlines how researchers set up indoor and outdoor mosquito traps in a village in Kisii in the highlands of western Kenya, an area with seasonal and unstable malaria transmission. Over 65% of mosquitoes caught were outdoors, the majority before 10:30pm. 348 mosquitoes were identified using DNA sequencing techniques of

which over 40% were found to be of this unidentified species. Five mosquitoes of this species were carrying malaria parasites and two had fed on humans.



Kenyan at risk of the disease.

[Jo Lines](#), Leader in Malaria Control and Vector Biology at the London School of Hygiene & Tropical Medicine and former coordinator for the World Health Organization’s Global Malaria Programme, said: “These findings remind us that the basic biology of malaria transmission is subtle and complex: there are still plenty of gaps in our knowledge, and local variations that we do not understand. We do not yet know what these unidentified specimens are, or whether they are acting as vectors on a wider scale, but in the study area they are clearly playing a major and previously unsuspected role.

“The practical implication for malaria control programmes is that there is no substitute for careful monitoring of mosquito populations. In order to be effective, such monitoring must be carried out by specialist experts who have the skills to recognize and investigate unexpected entomological observations.”

The researchers added that as these mosquitoes have so far been seen only in one location in Kenya, it is essential that tourists still protect themselves with a mosquito net treated with a long-lasting insecticidal treatment whilst travelling.

The research was carried out in collaboration with the [Kenya Medical Research Institute](#) under the Malaria Transmission Consortium, funded by the [Bill and Melinda Gates Foundation](#). The findings are reported in *Emerging Infectious Diseases*.

# Michigan Mosquito Control Association 27<sup>th</sup> Annual Conference Bay City, Michigan



# William J. Lechel, II Memorial Scholarship Student Paper Competition Winner

"Genetic and environmental influences contribute to host-seeking variation of *Ixodes scapularis* nymphs in the eastern United States"

**Isis M. Kuczaj**, Department of Fisheries and Wildlife Sciences, Michigan State University

Isis has completed an undergraduate degree at Edinboro University of Pennsylvania, and came to Michigan State University in the fall of 2009. She is interested in how vector behavior can influence disease dynamics.



## Michigan Mosquito Control Association

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## The Eliminate Dengue Project

The Eliminate Dengue project is an international collaboration, pioneered by an Australian led research team that has the potential to provide a real solution to reduce the global burden of dengue fever.

Currently, there are no specific treatments or effective vaccines to fight dengue fever; therefore, disease monitoring and mosquito control programs are the only methods available for dengue prevention.

The goal of the Eliminate Dengue project is to stop the *Aedes aegypti* mosquito from transmitting the virus from person to person. Our method of control is *Wolbachia*, a natural bacterium that has been identified by scientists in up to 70 percent of the world's different insect species, including many mosquitoes that bite but don't harm people.

Members of the project team have been carrying out research into *Wolbachia* since the 1980s. Early work demonstrated that one particular strain of the bacterium, *Wolbachia pipentis* (wMelPop) had a life-shortening effect in adult fruit flies (*Drosophila* sp.). This was of huge interest to the Eliminate Dengue project because only older female *Aedes aegypti* mosquitoes transmit the dengue virus, and the question was asked; "If *Wolbachia* was introduced into the *Aedes aegypti* would it reduce the mosquito's life span and stop the spread of Dengue?"

Over a three year period scientists in laboratories at The University of Queensland introduced the *Wolbachia* from the fruit flies into *Aedes aegypti* mosquitoes. During the course of studying these mosquitoes an exciting discovery was made. When the mosquitoes carried the *Wolbachia* bacterium they could no longer support the growth of the dengue virus. The *Wolbachia* was acting like a mosquito vaccine that blocked the virus, leaving the mosquito unable to transmit dengue to another person.

Over an eight month period The Commonwealth Scientific and Industrial Research Organization (CSIRO), Australia's national science agency, undertook its own social and environmental risk

analysis of the project. CSIRO wanted to understand all the concerns the community and other national and international scientific advisors might have. The analysis considered 50 different potential hazards from harm to the environment to impact on the business economy. The final assessment rated the research method as negligible risk, the lowest rating possible.

Experiments have also been carried out to see if *Wolbachia* can be transferred to humans and shown that this does not occur. Members of the project team have received hundreds of thousands of bites from *Wolbachia* infected mosquitoes over a four year period. We have also undertaken experiments with a range of natural mosquito predators such as spiders, geckos, fish and crustaceans and shown that *Wolbachia* is not transferred to these organisms through eating *Wolbachia-Aedes aegypti*

Based on successful laboratory work we are now ready to begin the next stage of our research with open field tests in identified communities in Australia and Vietnam where *Aedes aegypti* are commonly found and where dengue fever has occurred. This will allow us to find the best way to introduce *Wolbachia* into wild mosquito populations. To move to open field testing the Australian Pesticides and Veterinary Medicines Authority (APVMA) an Australian Government authority has undertaken additional risk assessment together with the Australian Government's Department of Environment and Heritage and the APVMA has issued regulatory approval for field trials to be undertaken in north Queensland. Field trials will begin this wet season and involve an initial series of experiments where we will release the *Wolbachia-Aedes aegypti*. These mosquitoes will mate with wild mosquitoes and *Wolbachia* will spread into the wild mosquito population. Our experiments will determine how best to establish *Wolbachia* into a wild mosquito population. Before field trials begin we will reduce natural mosquito numbers.

If all our field-testing proves positive we hope to be able to roll out a new approach to dengue control that will dramatically improve the lives of millions of people living in dengue-affected regions throughout the world.



# News From Around The Districts

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## SAGINAW

Interviews for seasonal employment were completed in February and early March with our annual training session being held on March 22-23<sup>rd</sup>. As it was last year, our staffing has been very fluid with seasonal employees changing their minds, getting different jobs, or they just stopped communicating with our office. Our first large group of seasonal employees is scheduled to report to work on Monday, April 29<sup>th</sup>. This year we have more new employees than in any other year.

Unlike last year, this spring has been very slow to warm up. As of March 25<sup>th</sup> the woodland vernal pools are still frozen solid and snow piles are still abundant as you drive around the county. Normally we find our first larvae around March 22<sup>nd</sup> so it looks like this year their arrival will be a couple of weeks late. Historically, our latest aerial larviciding was in 2003 when we started on April 28<sup>th</sup>.

Our Education Coordinator has already scheduled 195 classroom presentations at 52 schools. This year's Mosquito Abatement Challenge is a poster contest with the theme being "How we made our neighborhood mosquito-free" All 3<sup>rd</sup>, 4<sup>th</sup>, and 5<sup>th</sup> grade students in Saginaw County are eligible to participate in the contest. Winners will receive their awards and recognition at the May Saginaw County Board of Commissioner's meeting.

This summer we are going to continue our evaluations of water-based ULV permethrin formulation by having three vehicles use this product exclusively. Costs are now comparable with oil-based formulations and there is good reason to believe that in the near future water-based products will be less expensive than oil-based products. In addition, some of our research will include looking at the efficacy of the larvicide Mosquiron; looking at a liquid *Bti/Bs* formulation in catch basins; and a new CDC mosquito trap lure called TrapTech.

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Once more unto the breach, dear friends.

At this time last year the cherry blossoms had burst (and were about to freeze) and development of spring mosquito larvae was several weeks ahead of schedule. So far, thankfully, this looks like a more typical spring and we can take our time getting into spring treatment program mode. Here in Midland County we have just about completed recruitment of seasonal employees and are now ready to get them trained for MDARD certification. The returning crew will be glad to see that our three new pickups are all loaded and ready to go.

## MIDLAND

Basic operations in Midland County should proceed much the same as in the past few years. We plan to conduct field trials of Mosquiron larvicide and maybe another material or two and will continue to be on the lookout for possible tolerance to materials already in use. After that, we just try to respond to whatever Mother Nature throws our way. We hope for a West Nile virus season much more like we saw in 2010 or 2011 than what we had to endure last year in Michigan.

A continuing challenge for our program this year is the restriction of control operations on State-owned land. We don't have any State parks or game reserves, but current management plans are very restrictive of operations in our recreation area, campground and even forest land. We will continue to work with the MDNR to make our case for slightly greater treatment options.

The onset of 2011 human WNV cases came 2 days later than in 2012. The current 185 cases is the highest number of cases reported for this time of year since the 2002 West Nile virus outbreak.

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What a difference a year makes – the atypical March of 2012 has given way to a cold, snowy March 2013 that puts us back on track for a more “normal” treatment season. No more record-breaking warmth, which is a good thing for fruit growers in Michigan, but a return to cold if not downright frigid temperatures. As we write this article we’re nearing the end of March and have yet to get out for any larval sampling. We just have too much ice and snow cover and the latest indications are that the weather pattern will continue to favor colder storms that bring snow to the Midwest into early April. Well, time will certainly tell.

Since announcing that applications were being accepted for seasonal employment in early February, we have collected quite a few. Interviews took place from early to late March and most positions are full. In fact, over half of employees from last season are actually returning. This has been the trend for the past several years. The current economy keeps experienced staff returning to us, and we like that!

In January we applied for a Michigan DEQ Scrap Tire Cleanup Grant and we’re hoping to hear back on that soon. February had us attending the MMCA 27<sup>th</sup> annual conference here in Bay City. We were pleased that at least some folks took advantage of the field day portion of the conference and came over to our facility to see the tools of the trade as they were displayed by Bay, Midland, Saginaw, and Tuscola County mosquito control districts. The 2013 Program Plan was compiled in February, followed by hosting the Mid-Michigan Technical Advisory Committee meeting on March 6. The comprehensive community outreach program plan was submitted to MDA, and we’ve been working on other community outreach documents as we gear up for the season.

Control material bids were opened in January with prices seeing slight changes compared to 2012. The fixed wing aerial contract was renewed with Earl’s Spray Service for a one-year extension and for economic reasons, we have decided to use strictly fixed-wing applicators for 2013 and eliminate the helicopter service. We are also working on quotes for the scrap tire drive.

Staff continue to update training materials, attend customer service presentations, outreach to elementary schools, watch AMCA webinars, revamp presentations that will soon be broadcast on our local Bay 3-TV, order supplies, continue with maintenance projects, and send announcements to media and government offices in preparation for the upcoming season. Office staff is busy sending and receiving no spray, medical, and long-driveway notices as well as myriad other duties.

Looking forward to a successful 2013 season and hoping for steady, but small rain events without a deluge!

At this point, it appears the mosquito season may begin a bit more gently than last year. Of course, all of that could change with one good warm spell, but our technicians are set to report on April 1, come heat or high water. Two consecutive seasons of below average mosquito activity make us wonder if this year will be payback.

We saw a sharp decline in employment applications this spring, forcing us to contemplate another go ‘round of interviews/training. Like to think it’s because people are finding full-time jobs, but that may be misplaced optimism. At any rate, we’ll have enough of a crew to get things started.....treating standing water left by a winter that seemed to last forever.

Our pesticide orders are placed, and our fleet is being roused. The phones are starting to ring, as people are asking to be placed on the Long Drive Program. Others are already scheduling yard treatment for special events.....another sign that thoughts are moving toward summer activities. We are anxious to get started! Hope it’s a good year for our industry.

Find a sunny day in late spring, look into a vernal pool and you may see this type of scene.

Mosquito larvae grazing on leaf litter, hanging at the water surface soaking up the sun.

Amongst the larvae one can often see the oddly undulating, nearly transparent creature called the Fairy Shrimp. Fairy Shrimp hatch in the same type of habitat as our spring Aedes, they just don't emerge as bloodsucking pests, nor are they affected by our treatment methods.



Next time out in the spring forest, note the diversity in the aquatic habitats. The mosquitoes in this photo are *Aedes stimulans* in a typical spring woodlot. What a target for larviciding.



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**SPRING**