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of the Florida Mosquito Control Association

THE I'M ONE PROGRAM

An Official Publication of the

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THE AMERICAN MOSQUITO CONTROL ASSOCIATION

Volume 19, Number 1

Spring 2008


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Spring 2008
Volume 19
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About the Cover: The "I'm One" Program logo was designed by graphic artists Asher Johnson and Erick Warner, on behalf of Central Life Sciences. See Joe Conlon's article on page 37 for details and to learn how you can become involved.

Florida Mosquito Control Association • PO Box 358630 • Gainesville, FL 32635-8630

Subscriptions: *Wing Beats* is sent free of charge to anyone within the continental United States Subscriptions are available for the cost of first class postage to any foreign address at the following rates: Europe, UK and Australia US$20; Canada, US$6; South America US$10 Make checks and purchase orders payable to the Florida Mosquito Control Association

Correspondence: Address all correspondence regarding *Wing Beats* to the Editor-in-Chief, Stephen Sickerman, South Walton County Mosquito Control District, PO Box 1130, Santa Rosa Beach, FL 32459 Readers are invited to submit articles related to mosquito and biting fly biology and control, or letters to the Managing Editor, Jack Petersen There is no charge if your article or letter is printed Photographers and artists are invited to submit color transparencies, high quality original artwork or artwork in electronic format for possible use in the magazine or on the cover; $100 will be paid for each cover photo Businesses are invited to place advertisements through the Director of Advertising, Dennis Moore

printed by Boyd Brothers, Inc, 425 East 15th Street, PO Box 18, Panama City, FL 32402-0018

Nothing But Nets by Jack Petersen
Wing Beats Managing Editor

Manuel Lluberas wrote a provocative article in the last issue of ***Wing Beats***, "Nothing But Net Only Works in Basketball" [Vol. 18, No. 4]. Lluberas makes some excellent points.

Lluberas' article introduced me to the **Nothing But Nets** campaign. In case you are not familiar with this United Nations effort, here is the basic plan. The United Nations Foundation has been working with the UN for many years fighting malaria. But it was a ***Sports Illustrated*** columnist, Rick Reilly, who wrote about malaria that really got the ball rolling. Taking full advantage of Reilly's notoriety, Ted Turner, the President of the UN Foundation, has built a consortium of high-profile supporters of the campaign.

For a more complete story, go to the **Nothing But Nets** web site at http://NothingButNets.net.

In this issue we publish an article "Nigeria: DDT and Malaria" by Dr Ndubuisi Edeoga, a young Nigerian doctor currently working in New York City, who argues for increased use of DDT. He makes excellent arguments similar to those proposed by Dr Lluberas — and by Dr Don Roberts at the Annual Meeting of the American Mosquito Control Association, March 2008, Sparks, NV. An organization on the front lines of the struggle to reconsider DDT as an important tool in malaria control is **Africa Fighting Malaria**. To learn more about this worthwhile organization, go to http://www.fightingmalaria.org.

It is our opinion the both bed nets and indoor residual spraying have an important role to play if malaria in Africa is to be effectively managed. Surveillance data, prompt disease diagnosis, and effective treatment, as both Drs Edeoga and Lluberas effectively argue, are the foundation of successful campaigns. Zambia's National Malaria Control program is a noteworthy example.

We would like to hear more from our readers on this subject. Malaria is the number one mosquito transmitted disease globally. Malaria research and control programs deserve better coverage in ***Wing Beats***. Please e-mail manuscripts to the Managing Editor at drjack3@hotmail.com.

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Nigeria: DDT and Malaria by Ndubuisi Edeoga

Every Nigerian doctor remembers the phrase from medical school "common things occur commonly" ... always think of malaria!

The burden of malaria on the Nigerian population is self-evident. At a recent event, our Minister of State for Health was quoted as saying that 110 million Nigerians are active malaria patients. Don't ask where he got his data – he does not say.

The Roll Back Malaria Partnership was launched with pomp by African heads of state in Abuja in 2000, where they came up with the **Abuja Declaration**. Despite the initial razzmatazz, many have described this as a failing health initiative. Many reasons have been suggested. One recent one is most poignant, by Mark Grabowsky in an article in ***Nature*** (451: 1051–1052, 27 Feb 2008), one of the preeminent journals in the scientific community. Grabowsky says disease surveillance is the secret weapon behind the successes in polio and measles control, powering funding and informing decisions. But no such systematic surveillance data exists for malaria. He might just have a point! Without high quality data to show progress, it is most difficult to focus energy ... you cannot manage what you cannot measure!

Jeffrey D Sachs, in his book ***The End of Poverty: Economic Possibilities for Our Time*** [Penguin USA 2005], raised the profile of malaria, saying "one issue that has been tragically neglected for decades now is malaria, a disease that kills up to 3 million people every year. It's a disease that could be controlled quite dramatically and easily if we just put in the effort." He attributes extreme poverty in malaria endemic regions of the world mostly to malaria. Though we believe that it will rank behind a whole series of other self-inflicted causes in Nigeria, it definitely is one that can be solved.

Over the years DDT has gone through the waves of love and derision in public opinion. In the 1950s and 1960s, DDT was used across southern Europe and in Africa until the late 1970s. At the same time, DDT was being used across the world as a farming pesticide. But widespread spraying was eventually shown to kill fish and threaten birds. DDT became a "pariah" chemical. But NO studies ever proved that it also damaged human health, yet it was widely believed to do so and was banned.

Now, however, some African governments are beginning to judge that the ecological risks posed by public health use of DDT do not compare with the danger of malaria getting a deadlier grip. The bottom line is in the last 50 years of intense study no causal relationship between DDT and harm to human health has been documented. Now the pendulum has swung again: DDT is back in fashion! Some have called it a renaissance.

Maybe sometime in the future we will come to understand the forces that led to its ban in the

first place and share with them the burden of death inflicted.

WHO has recently changed its policy governing malaria control and now endorses use of indoor residual spraying of insecticides (IRS) as a primary means of malaria control, to include use of DDT. Additionally the US Agency for International Development has changed its policy on use of IRS and DDT funding for countries to use DDT. Presently DDT use in the South African Malaria control program is showing amazing results. Dramatic reductions in malaria cases are being recorded and maintained. Many countries in Africa have reinstated the use of indoor spraying with DDT as the mainstay of their anti-malaria programs. These enormous changes in policy should not be ignored by the Nigerian Health Ministry. We expect our country to show leadership in the use of DDT in responding to malaria.

As we reposition to achieve the Millennium development Goals, I take us back to Mr Sachs' book, where he says that "there are certain places on the planet that, because of various circumstances - geographical isolation, burden of disease, climate, or soil - these countries just can't quite get started. So it's a matter of helping them get started, whether to grow more food or to fight malaria or to handle recurring droughts. Then, once they're on the first rung of the ladder of development, they'll start climbing just like the rest of the world."

I suggest Nigeria is NOT one of those places. We have what it takes ... but we need the will. In 2006 the WHO gave the country $180 million in interest free loans to fund malaria programs. None of this was for DDT.

Hopefully this will change.

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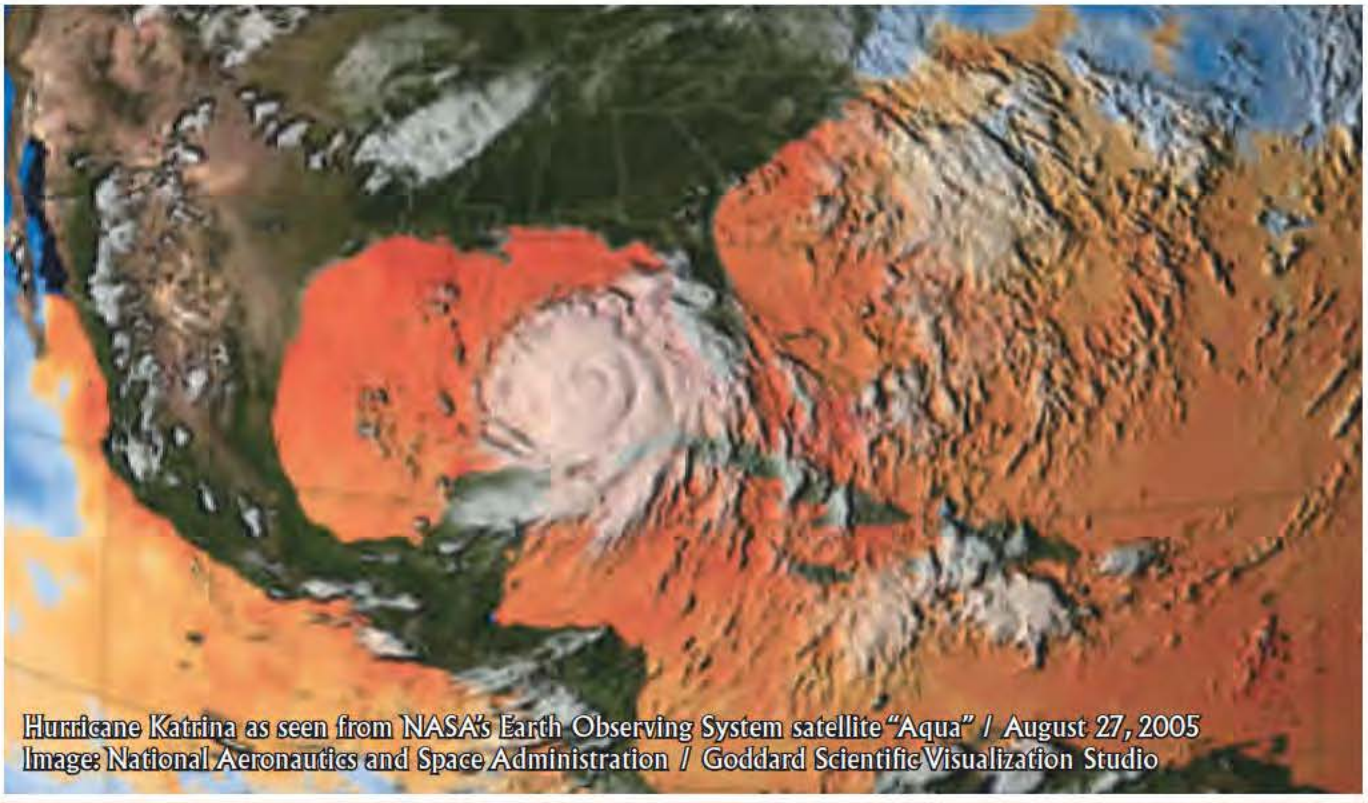
The Coming Storm by Rosemarie Kelly

Like many states, Georgia is vulnerable to tornadoes, hurricanes, flooding, and other natural and man-made disasters that can and have caused severe disruption of essential human services and severe damage to public roads, utilities, buildings, parks, and other facilities. Mosquito populations following water-related disasters can increase to a level that they become a public health risk, making the restoration of vital services to the citizens of the affected area both difficult and dangerous. Additionally, several mosquito-borne viruses circulate in Georgia each year that are capable of causing disease in humans and other animals. The most common mosquito-borne viruses in Georgia include West Nile virus, eastern equine encephalitis virus, and LaCrosse encephalitis virus. Saint Louis encephalitis virus has also been detected in Georgia in the past.

Because disaster events increase mosquito production sites and human exposure, the risk of infection with one of these mosquito-borne viruses could increase after a natural or man-made disaster. For example, after a hurricane, houses may be only marginally livable, and without power, windows would be wide open allowing mosquitoes access to the house. Recovery workers would be exposed to mosquitoes as they worked. And, even without the issue of disease transmission, increased numbers of mosquitoes biting would still constitute a public health problem. Recent studies done in hurricane-damaged areas indicate that natural disasters do increase mosquito density and that it is important that there be a rapid response capacity able to quickly and effectively reduce mosquito densities.

The potential for increased arboviral disease risk has not been realized, but this may in part be due to the impact of extensive control efforts following recent hurricanes.

In July 1994, tropical storm Alberto brought heavy rains to parts of Alabama, Florida, and Georgia. In south Georgia, rivers rose 44 feet above flood stage,



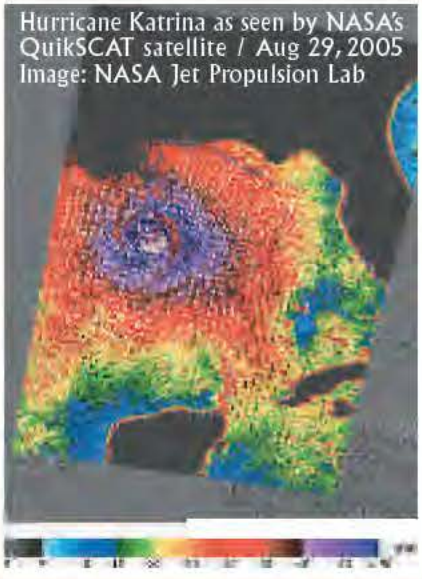
Hurricane Katrina as seen from NASA's Earth Observing System satellite "Aqua" / August 27, 2005
Image: National Aeronautics and Space Administration / Goddard Scientific Visualization Studio

muddy water covered 10,000 square miles, and 31 lives were lost. In the wake of the July flooding, affected communities urgently sought Federal support for mosquito control activities. Because Georgia agencies had no means of assessing the need for mosquito control, the US Public Health Service (PHS) provided vector control experts to evaluate the mosquito populations in affected areas. Although mosquito populations had increased, no significant increases in mosquito-borne diseases were detected.

The PHS decided not to initiate widespread spraying projects, despite an increase in nuisance mosquitoes, reflecting concern for larger environmental issues such as the effect of spraying on honeybee businesses and fish farms in the flooded area. Eventually, limited spraying for nuisance mosquitoes was carried out by the state in several communities. This experience demonstrated the need for careful evaluation of the effect of specific disaster response activities on the community as a whole.

In "Lessons from the Georgia Floods" in the Nov/Dec 1995 Public Health Reports, two major points were made regarding vector control. First, there was no capacity for emergency mosquito surveillance and no awareness of mosquito control resources within Georgia. Second, early planning to deal with environmental concerns would have minimized non-target impacts while allowing the control needed to deal with the intense nuisance mosquito problem.

In 2005, the Georgia Department of Human Resources, Division of Public Health, using funds provided through a cooperative agreement with the Centers for Disease Control and Prevention, purchased a 16-foot 2,486-lb trailer and equipment to support surveillance of vector species and nuisance mosquitoes. The objective: to determine the scope of the public health-related mosquito problem, both vector species and the nuisance problem. This is important, as nuisance species can become a public health issue when numbers are high enough that



Hurricane Katrina as seen by NASA's QuikSCAT satellite / Aug 29, 2005
Image: NASA Jet Propulsion Lab

normal daily life is not comfortably possible. Project priorities were defined as: immediate on-site response, contact local authorities, contact control agencies, collect data, pool mosquitoes and send for testing, provide data to CDC, and provide control.

I wish I could take credit for the idea to put together an emergency mosquito control response plan for Georgia, complete with surveillance trailer, but, I can't. The idea that a plan would be a good thing came from conversations with many of my colleagues who have been through hurricanes and their associated mosquito problems and have worked hard to prepare for the next event. The idea for the trailer came from Dr Bob Wirtz from the CDC. He wasn't able to find funding to get a surveillance trailer for the CDC in Georgia, so I offered to ask the Division of Public Health to consider the need. The timing was perfect, as this request was made just after the 'Year of Hurricanes' in Florida and Emergency Management was looking into ways in which to prepare for the possibility of a similar event in Georgia.

Because the trailer was custom-made, it was possible to design it in such a way that it could not only be used to bring equipment to an area but could also be used as an on-site office. Equipment purchased for the trailer include a generator, backpack spray equipment, both gravid and CDC light traps with extra nets and batteries, battery chargers, larvae collecting equipment, a backpack aspirator, dry ice containers, microscopes and lights, and supplies needed to sort, ID, and pool mosquitoes while maintaining a cold chain. Additional equipment is needed, but for now the funding source has run dry.

Purchasing a trailer and equipment is just the first step towards creating an emergency vector control plan. A vector control plan is developed as a means to: 1) clearly identify that a health and safety issue exists based on specific criteria developed in consultation with specialists from the CDC; 2) clearly establish a cut-off date

Hurricane Katrina as seen from NASA's Earth Observing System satellite "Terra" / August 26, 2005
Photo: National Aeronautics and Space Administration / Jeff Schmaltz

for such funding based on information from CDC; and 3) establish a process for requesting reimbursement of eligible costs when a water-related disaster occurs. Our first step in this process was to develop a protocol for using the emergency mosquito surveillance trailer.

Nothing is done in government without protocols. The protocol for the use of this trailer, which is still in draft form, was modeled after protocols for the loaning of equipment during large-scale forest fires and on the Georgia County Board of Commissioners Emergency and Disaster Mutual Aid Agreement. This trailer, as the protocol is currently written, is available for emergency mosquito surveillance as well as for training and educational purposes. It is available to states outside of Georgia as long as they have a mutual aid agreement with Georgia. Several issues are cur-

rently causing difficulty with the use of the trailer, the most problematic one being that because this is a trailer it needs to be hooked up to a vehicle (or Prime Mover) in order to be taken anywhere and used. Determining what vehicles can be used (personal, government, etc) and where a vehicle can be obtained have been very hard questions to get answered. It is never easy breaking new ground, no matter what ground needs to be broken.

We are also working on developing a list of stakeholders who will need to have some say in whatever emergency vector control plan is developed. We are planning a meeting with the Georgia Emergency Management Agency (GEMA). GEMA's mandate to provide public assistance, including mutual aid, coordination of financial assistance for state of emergencies and Presidential declarations, makes it the perfect lead agency for deployment of the emergency mosquito surveillance trailer. We have met with various vendors who provide emergency mosquito control in an effort to learn what we need to include in any emergency vector control plan. We have had the good fortune to work with the Public Health Pest Management Section of the North Carolina Department of Environment and Natural Resources who have dealt with hurricanes in the past and have developed their own emergency vector surveillance plan. We are developing spray block maps and have discussed the merits of a contingency control contract.

Our goal is to have a working plan in place by the 2008 hurricane season. Unfortunately, as I am sure you all know, it is hard to get things moving until there is an emergency, and then it is too late.

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Measuring Droplets in a Cold Fog by Graham Matthews

This article presents a comparison of different measuring techniques and provides information on the use of a hot wire droplet measurement system.

Droplet size is crucially important, especially when using space sprays with a very low concentration of insecticide. If droplets are too large they sediment too quickly and leave a deposit on a non-target surface.

Droplets that are too small can stay airborne longer, but may have insufficient dose to kill a flying insect. In the control of mosquitoes with space treatments, the trend has been to use cold fogs with droplets smaller than 30 µm. Small changes in the droplet size distribution could significantly impact the efficacy of the application. The application equipment therefore should be checked regularly to ensure that the appropriate droplet spectrum is being produced.

Figure 1: Cold fog from the Starlet directed at laser beam with the DC-III sensor in spray cloud.

Figure 2: Close-up of the DC-III probe held in the spray cloud.

Table 1. Examples of the results from Matthews and White (2002)

Nozzle	Liquid	Dilution in water	Flow rate (ml/min)	$Dv_{0.5}$ Malvern	$Dv_{0.5}$ DC-III
Starlet	Aqua-Reslin	1:1	21	17.4	16.5
	Aqua-Reslin	1:9	44	20.8	25.5
	Water	-	75	20.7	21.5
	Water *	-	260	29.8	34.5
Electrafan 12**	Water	-	44	79.9	76.2
Leco HD	Aqua-Reslin	1:9	c600	22.0	29.1

* restrictor plate removed to increase flow and simulate situation with larger equipment.

** with rotary nozzle.

Modern droplet sizing uses laser technology, but the instrumentation is not portable so it is used primarily in the laboratory or workshop. Field calibrations are typically conducted via the waved slide technique. Another technique not quite as widespread is a hot wire anemometer developed by the US military and commercialized by KLD Laboratories as the DC-III. These two field measurement devices were compared by JR Brown *et al.* in 1993. The comparison showed that there was a high degree of correlation between the two, with the slide wave selective for larger drops and the DC-III selective for smaller drops.

A comparison has been done between the DC-III and a Malvern 2600 laser light diffraction system (Matthews and White 2002) which provides further insight into precision between laboratory and field analysis methodologies.

A Spraytec (Motan) Starlet electrically operated cold fogger providing 32 m^3/h air at 0.34 bar pressure was used with or without a No. 74 nozzle restrictor. Samples were taken at 75 cm from the nozzle where air velocity was about 5 m/s. Other nozzles were used to obtain sprays with larger droplets. The results showed that the DC-III, which has two settings, (oil and water), gave the best agreement with the oil setting.

For droplets below 100 µm, the DC-III and the Malvern 2600 provided similar results. The system of sampling droplets by each method is different, so the results will never be exactly the same, due to the inherent variability of sampling methodologies. The results from this comparison, however, show that the hot wire system provides an appropriate portable tool for checking the droplet spectrum obtained with cold foggers.

Figure 3: The droplet size distribution output is displayed on a laptop computer screen.

Figure 4: The DC-III portable droplet counter.

Figure 5: The DC-III probes are stored in a special box.

It should be stressed, that when using the equipment, great care is needed in handling the probe to avoid breakage; the sensor uses a 5 µm diameter platinum wire. Secondly, the sprayer needs to be operated, prior to sampling, for a short period to remove loose, hard particles that can break the sensor. An extension pole or stand can be used to place the probe in the spray and eliminate the need for the user to hold the probe. The sensor has to be carefully cleaned after each measurement according to the manufacturer's instructions (e.g. a 50% acetone / 50% xylene solution and rinsed with distilled water) and re-calibrated by the manufacturer once a year. The probe must be handled very gently without touching the wire ring or sensing wire, and must be stored and transported in its original packing material. The air stream should be tested prior to sampling, as the probe requires an air flow of 5 - 7 m/s.

PROCEDURE FOR CHECKING DROPLET SIZE FROM A COLD FOGGER

1. Set up the DC-III and laptop computer loaded with DC-III software and connect probe as indicated in manual.

2. On computer screen set the maximum sampling time (e.g. 30 seconds) and / or maximum number of droplets to be counted (e.g. 1000) and the type of liquid being applied through the cold fogger. For water-based products, use the oil setting.

3. Probe is held away from cold fogger nozzle so that air velocity at

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Figure 6: Spray droplets glow red as they pass through the laser beam.

the probe is 5-7 m/s and probe is perpendicular to the spray nozzle and centered in the spray.

4. Take replicate readings.

Recommended probe distances are based on ULV manufacturer:

MANUFACTURER	DISTANCE
LECO	4 to 6 feet
BEECOMIST	6 in to 1 ft
LONDON FOG	6 feet

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How to Keep Trap Collections Dry During Rains
by Jorge R Arias

One of the problems we have had in the past dealing with mosquito trapping is the rain. Trap catches, particularly from CDC or other portable trap, will get wet if it rains. Rain soaks the net, collecting cup and all the insects that have been collected, resulting in lost samples.

To solve this problem, we have delved into the realm of "high tech." Our solution is as follows. Take a newspaper plastic bag (or similar) and cut out the bottom so that you have a hollow plastic tube. Many newspaper companies will either donate the bags or part with them for a reasonable price. Place one end of the plastic bag over the trap housing, securing it with a rubber band; see Figure 1. After you place the collecting cup on the trap, slide the bag down over the mesh and collection cup; see Figure 2. Since the bag fits loosely over the mesh support and cup, it does not create resistance that could impede the trap from functioning. When you collect the trap in the field, all you have to do is lift the plastic bag up to the trap housing and remove the collection bag. The material will remain dry even though it rains. When you store the trap, leave the bag on for re use the next time you set the trap; see Figure 3.

Since the bags are re usable, you only need as many bags as you have traps, plus some allowance for damage, during the season. We use the plastic bags every time we use the traps, whether there is prediction of rain or not. This is because the weather forecast in our area is totally unreliable. Also, the use of the plastic bag on a daily basis will compensate for any interference it may cause in trapping.

Figure 2

Figure 1

Figure 3

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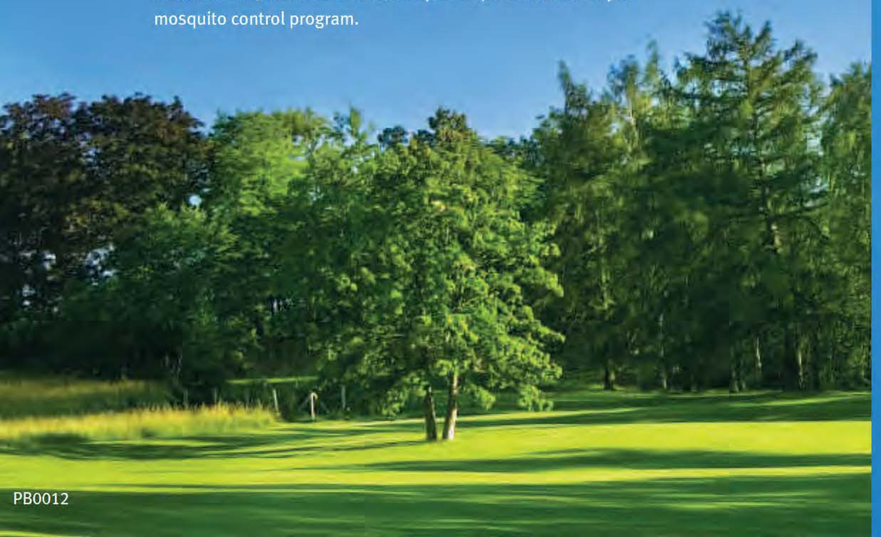

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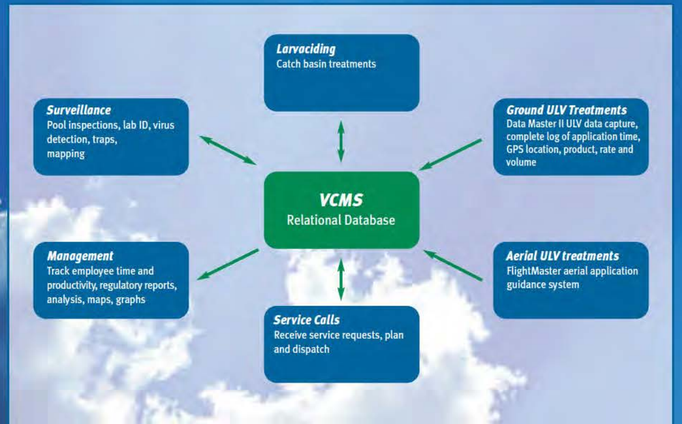

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by Timothy D Deschamps

CMMCP file photo Figure 1

Wetlands restoration and ditch maintenance are integral parts of the Integrated Pest Management Program performed by the Central Massachusetts Mosquito Control Project (CMMCP).

CMMCP currently works in 39 cities and towns in Massachusetts, and last year alone cleaned over 145,000 feet of ditches. One of our projects that had not quite performed to our expectations due to continued streambank failure is the subject of this article.

At the subject site, located in Natick, MA, we cleaned the ditch system for the first time in 1993 using a low ground pressure excavator; see Figure 1.

Work crews were out several times since that time as part of our stream maintenance program using hand tools to keep the system free from obstructions. By 2004 the downstream section had degraded again to a point where it breached its banks and flooded over the resident's driveway; see Figure 2.

Each time the excavator was called to action, the downstream area required removal of accumulated silt due to the failure of the streambank up-stream. In our work in this system, we did not touch the 75 foot area closest to the culvert mouth due to concerns from the homeowner that he would lose additional sections of his lawn. This bank had failed due to poor slope (1:1) and increased pressure from people and yard maintenance personnel; see Figure 3.

In an effort to correct this problem and as a long term solution, Northeast Environmental Solutions (NES) [http://www.northeastenvironmentalsolutions.com] was contacted to give their opinion on the site and to see if a solution

Photo by Francis Lynch Figure 2

could be worked out.

NES, based in Amherst, MA, provides erosion control, sediment control, vegetated substrates and customized materials delivery to their customers using the newest and most efficient technologies available to them; see Figure 4.

At the request of CMMCP Wetland Project Coordinator Amanda Hope, Ed Severance from NES came out to the project area in early 2007 and gave us a site evaluation and a cost proposal. As a state agency, CMMCP does not usually subcontract any of our services, but this type of program was new for us and the CMMCP Commission voted to cost share this project with homeowner as a pilot program, in the hopes CMMCP personnel might be able to do similar work like this in the future.

NES required two days to do this work, and in early May the weather forecast for the next few days would be perfect.

The compost to be used was made from recycled organic materials and completely inert, free of unwanted seeds and was guaranteed against invasive weed intrusion. The pneumatic, injection system used by NES had a very low impact on the area, since the injection operation was controlled using a remote system, and the only equipment necessary for installation was a technician carrying the hose. The truck that transported the compost was specially designed, and had a moving floor that carried the compost (or other material, such as mulch stone) into an auger system that was then forced into the hose using high pressure air; see Figure 5.

Photo by Timothy Deschamps Figure 3

Photo by Timothy Deschamps Figure 4

Photo by Timothy Deschamps Figure 5

Photo by Timothy Deschamps

Figure 6

This truck could be refilled during the project to allow constant operation, and was parked up to several hundred feet from the restoration site.

The first order of business was to create a stable platform for the compost socks. A layer of gravel was blown into the streambank; see Figure 6.

After the gravel was leveled, wooden stakes were pounded into the embankment to further anchor the compost socks; see Figure 7.

A layer of geogrid was placed on the streambank; see Figure 8. Then the first sock was filled with the gravel mixture; see Figure 9.

Photo by Timothy Deschamps

Figure 7

Photo by Timothy Deschamps

Figure 8

Photo by Timothy Deschamps Figure 9

Photo by Timothy Deschamps Figure 10

Photo by Timothy Deschamps Figure 11

The remainder of the socks were then filled with the compost mixture, and the top layers would also have grass seed mixed in.

Filling the socks required the sock to be placed over the spray hose, using an adapter at the bottom of the hose to stretch out the sock to the correct diameter of about twelve inches. Then a knot was tied at the end of the sock. As the truck delivered the compost to the sock, the hose was pulled back; see Figure 10.

Once the first sock was in place, it was flattened slightly, and the geogrid was pulled up over the sock and anchored in the streambank with large wire staples.

The remainder of the socks, now filled with compost, could be placed over this foundation, with a slight taper to the back. As each new sock was placed, compost was used as a backfill to create a flat, stable surface for the next sock; see Figure 11.

After two layers, one side of the geogrid was wrapped around the socks, and the final sock would have the top of the geogrid wrapped over it and secured with the wire staples; see Figure 12.

A compost/seed mixture used in the final socks was sprayed on top to blend in the repair with the existing surface.

One side of the streambank required 3 full socks, with another one running half way down; the total height was about four feet. The other side required two full socks, with one running about three-quarters the distance, for a total height about 2 and a half feet; see Figure 13.

NES claimed that over a period of about 10 years the geogrid and sock casing would break down by the sun's ultraviolet radiation. By then, however, the streambank would become stable.

After about ten hours of work, the job was completed. The only thing to do then was to monitor the site and determine if it would be a viable long term solution. The site was visited twice a month until August 2007, and then once a month thereafter.

Photo by Timothy Deschamps Figure 12

Massachusetts went though a rather lengthy period of drought last summer, and one failure noted was a lack of germination of the grass seed, especially in the sock face. It was also necessary to place a barrier around the area for a short time to alert the grounds crews to stay away and let the area stabilize. NES reseeded the site two times, in June and October, and in October noted a small area of undercutting that was fixed using a few stones from the area. The second seed mixture used was a rice cut grass which was recommended by NES. The site has now filled in nicely, with the sock faces the only areas left to be reseeded. Other options for the sock face included wetland plants, such as red stem dogwood.

We are confident that this work will be a long term solution to a problem area, and will not require maintenance to such a degree as in the past.

The author would like to acknowledge the following: CMMCP Board of Commission; Francis Lynch, homeowner; Amanda Hope, CMMCP Wetland Project Coordinator; Ed Severance and crew, Northeast Environmental Solutions.

Photo by Timothy Deschamps Figure 13

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Overview of Mosquito Research Programs at the USDA ARS Center for Medical, Agricultural & Veterinary Entomology

by Kenneth J Linthicum, Sandra Allan, Donald R Barnard, James J Becnel, Ulrich R Bernier, David A Carlson, Gary G Clark, Chris J Geden, Jerome A Hogsette & Daniel L Kline

HISTORY

During World War II, the United States Department of Agriculture (USDA) cooperated with the US Department of Defense to establish a research laboratory in Orlando, FL. The mission of the laboratory was to develop technologies for the protection of military personnel against insect vectors of disease. In 1951, the laboratory was named the Insects Affecting Man and Animals Research Laboratory. In 1961, the Secretaries of Defense and Agriculture signed a memorandum of understanding to continue the research program under USDA funding. In 1963, the lab moved into new federal facilities located on the campus of the University of Florida in Gainesville. The laboratory's name was changed to Medical and Veterinary Entomology Research Laboratory in 1990 and Center for Medical, Agricultural, and Veterinary Entomology (CMAVE) in 1996. Annual base funding for the Center exceeds $13 million at present.

MISSION

The mission of CMAVE is to conduct research on insects of agricultural, medical and veterinary importance with the goal of achieving control of pest species through environmentally compatible approaches. CMAVE consists of four Research Units: Behavior and Biocontrol, Chemistry, Imported Fire Ants and Household Insects, and Mosquito and Fly.

The mosquito-related mission of the laboratory is to develop novel technologies for detection and population monitoring, repellents for the protection of humans and animals from biting and filth-breeding flies, and effective chemical, biological, and genetic control technologies, as well as integrated management strategies for insects and arthropods of medical and veterinary importance. The mission is in support of a wide range of stakeholders, including the Departments of Agriculture, Health and Human Services, Homeland Security, and Defense, livestock commodity groups, farmers, individuals, and companion animals. The work often provides information that will not only protect these interests in the United States, but also overseas. The medical and veterinary entomology staff of CMAVE consists of 15 permanent scientists, 6 postdoctoral and/or visiting scientists, and approximately 50 technical and support personnel. The laboratory facility is modern and well equipped and comprises approximately 60,000 square feet of space.

STAFF

Mosquito-related research at the laboratory is undertaken by ten permanent, full-time research scientists, two full-time support scientists, and four temporary postdoctoral scientists.

BUDGET

The allocation of base funding is defined by the numbers of permanent, full-time research scientist positions. At present, approximately $3,700,000 per year is committed to research involving mosquitoes. Base funds are received via the agriculture appropriation approved yearly by the US Congress. Current total extramural funding in support of mosquito research is more than $1,500,000 (from Department of Defense, and industry sources).

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Room rates will be $119 / $129 Bayfront per night. Please specify the "Florida Mosquito Control Association Annual Meeting" when you book your room. For reservations call 1-800-644-2650 and visit the FMCA website for more information at www.floridamosquito.org.

You are invited to submit a title for a paper to be presented at the 2008 80th Annual Fall Meeting of the Florida Mosquito Control Association, to be held at the Bay Point Resort Marriott, 4200 Marriott Drive, Bay Point, FL from November 16-19, 2008. Go to the FMCA website http://www.floridamosquito.org and click the Fall meeting link for the Call for Papers form. Type the title, author(s), organization(s), and address(es) exactly the way they are to appear on the program. If more than one author is listed, place an asterisk after the name of the author who is to present the paper. Send this form to Dennis Moore, Pasco County Mosquito Control District, 2308 Marathon Road, Odessa, FL, 33556; e-mail: dmoore@pascomosquito.org; telephone: 727.376.4568; fax: 727.376.4704. Please submit your paper as soon as possible so there is time to plan and organize the program.

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RESEARCH OVERVIEW AND MAJOR CONTRIBUTIONS

CMAVE accomplishments derive from multi-disciplinary team research and a wide range of cooperative efforts. Scientists interact with colleagues and with animal and public health agencies and organizations worldwide. Cooperators include the US Department of Defense, the World Health Organization, the Food and Agriculture Organization, the International Atomic Energy Agency, the Animal and Plant Health Inspection Service, the Centers for Disease Control and Prevention, the Food and Drug Administration, the Environmental Protection Agency, the Tennessee Valley Authority, various universities, local and state mosquito control programs, sister ARS laboratories, and industry. CMAVE has an outstanding record of chemical control research accomplishments.

Research accomplishments of the scientists concerned with mosquito research are documented in approximately 2,500 publications in scientific journals, conference proceedings, books, book chapters, handbooks, and patents.

Major research accomplishments related to biodegradable pesticides and personal protection chemicals include:

- The development of DEET, the principal active ingredient in most insect repellents
- The development of the ultra low volume (ULV) method of insecticide application for use in mosquito control
- The development of a clothing treatment for personal protection against biting arthropods

Major research accomplishments related to the Biologically Based Research Program included developing new biologically based control strategies for mosquitoes, house flies and stable flies. Development of new biological pesticides and/or control strategies for vector and pest flies becomes increasingly important as human populations grow and new and exotic disease agents appear. Alternative control methods are also needed to combat high levels of insecticide resistance in flies that affect animal production and well being. Such strategies can help prevent contamination of the environment with chemical pesticides that threaten man and contribute to a decline in biodiversity.

Examples of new technologies under development by unit scientists are:

- Discovery of a new baculovirus to combat mosquito larvae in agricultural wastewater
- Development of a protozoan parasite for control of the "yellow fever" mosquito, *Aedes aegypti*
- Development of a new nematode parasite for mosquito control
- Discovery of a new parasitic wasp for control of house flies and stable flies
- Improvement of the quality of commercially produced wasps for fly control
- Development of new traps to prevent fly immigration into neighborhoods around farms
- Discovery of chemicals that cloak humans (make them "invisible") from mosquito detection
- Development, evaluation and validation of the biological efficacy of permethrin-treated USMC uniforms

Major research accomplishments of the Surveillance and Ecology of Mosquito, Biting and Filth Breeding Insects Program are directed at meeting public and animal health and military needs for low-cost, attractant-based detection systems that determine the presence and abundance of nuisance flies and vectors, and for the development of faster, less expensive, more specific and sensitive methods to detect vectors that may be carrying endemic or exotic animal or human pathogens. There is a critical need to develop a GIS-based system that integrates these detection methods with knowledge of the target insect's biology and environmental factors for accurate disease risk assessment.

Examples of new technologies under development by unit scientists are:

- Discovery of new attractants for house flies, *Aedes aegypti*, and mosquitoes that transmit malaria.
- Discovery of environmental factors that attract or repel mosquitoes during oviposition.
- Elucidation of dispersal patterns, breeding habits and host attractions of horn flies, house flies, stable flies, and mosquitoes.
- Development of marking systems to study dispersal patterns

of mosquitoes.

- Development of a new generation of CO_2 and/or heat producing mosquito traps for improved surveillance and population management of selected mosquito species.

- Identification of octenol as an important mosquito attractant and cooperation with private industry to develop readily available lures for mosquito surveillance programs.

- Understanding the role of species biology and population genetics in the transmission of arboviruses.

- Development of species-specific traps that are lightweight, inexpensive, low maintenance, and which are surrogates for individual human or livestock bait.

- Identification and synthesis of host specific and oviposition attractants and adapt for use in traps or bait stations.

- Design and model testing of a geographic information system (GIS) technology and remote sensing to predict the ideal placement of traps for vector and fly surveillance, and assess risk of disease transmission.

- Investigation of the neural and sensory ultrastructure of ticks and Diptera.

- Development of measurements of electrophysiological activation for use in selecting vector attractants and repellents.

The Deployed War-Fighter Protection (DWFP) Program is a Department of Defense-sponsored research program administered by the Armed Forces Pest Management Board (AFPMB). It is tasked with the development and testing of management tools for pest and vector species that transmit diseases to the deployed war-fighters. New and improved materials and methods for pesticide delivery are needed by the armed forces to prevent diseases that threaten deployed troops. Research at CMAVE involves the discovery, evaluation, development, and optimization of: 1) new pesticides effective against mosquitoes and flies; 2) new personal protection products effective in preventing mosquito and fly bites; and 3) new application and personal protection methodologies and strategies.

Recent accomplishments include:

- Re-evaluation of old chemistries for their effect on mosquitoes.

- Development of new pesticides using molecular biology techniques to pinpoint target physiological process in insects.

- Development of spatial repellent delivery field kits to be used by war-fighters.

- Testing of spatial repellents for use in military tents.

- Development of barrier-spray strategies for use by deployed troops.

- Selection of more efficient fly traps for use in arid conditions where US troops are deployed.

Future research is being directed at the following:

- The discovery and development of new biological, behavioral, physiological, genetic, and chemical regulating mechanisms that can be used for mosquito control.

- The validation of recently discovered biological, chemical, and genetic mosquito control technologies in large-scale, area-wide management programs targeted at natural populations of mosquitoes.

- Scientific, economic, and sociologically sound analyses of the costs of mosquito control in relation to benefits accruing to the public (improved quality of life) and animal / public health (disease vector abatement) worldwide.

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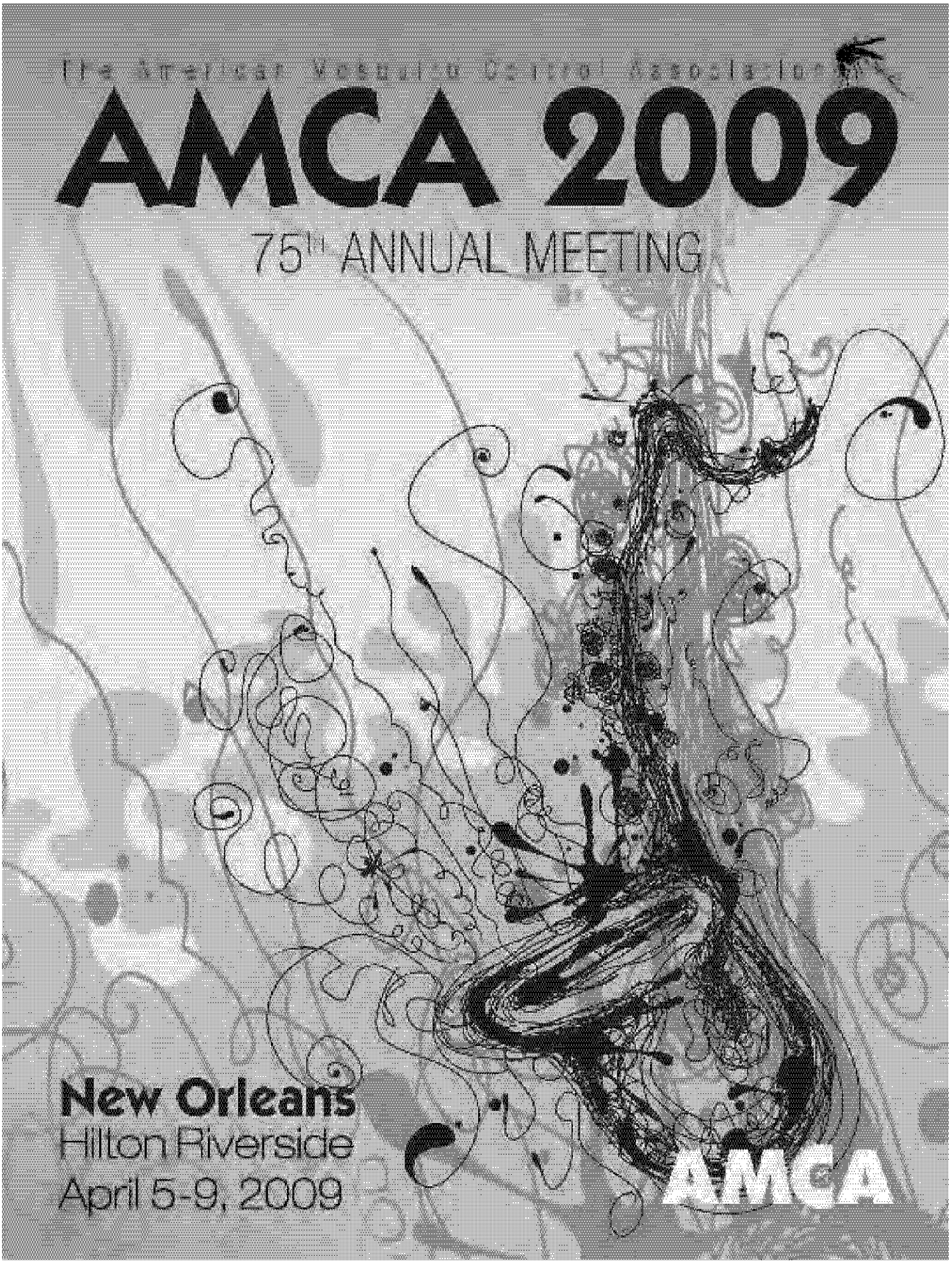
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From Where I Sit: Notes from the AMCA Technical Advisor by Joe Conlon

FROM WHERE I SIT....

In anticipation of the challenges an increasingly aggressive anti-pesticide agenda may present this year to vector-borne disease control, the AMCA Public Relations Committee reviewed our strategies for countering (or pre-empting) their message. After considerable reflection, the committee agreed that the toll exacted by vector-borne disease needs a human face in order to engender greater support for acceptable control strategies from constituents. To this end, Central Life Sciences, with Mark Newberg as the guiding force, has developed a 30-second Public Service Announcement (PSA) video entitled "I'm One," that places the impact of West Nile virus in a human perspective, utilizing actual WNv victims to dramatize the disease's impact on their lives. This PSA will be part of a nationwide public relations program designed to:

1. Highlight the importance of prevention and control methodologies by directing consumers and media to the AMCA web-site.

2. Educate the public.

3. Rally survivor organizations with a single, unified message.

The "I'm One" program is multi-faceted and consists of the PSA, revisions of the AMCA consumer-facing website and Media Toolkit, formation of a Survivor Support Council, and a national media relations outreach initiative. The audiences we are targeting consist of consumers, the media, public health officials and AMCA members.

At the recent AMCA annual meeting in Reno, Mark Newberg explained our marketing strategy during the plenary session kicking off the "I'm One" program. In addition, a booth at the meeting was manned by professional marketing personnel from Fleishman-Hillard International Communications and provided information on how to launch the program and maintain effective public relations in local markets. Tool-kit folders, consisting of media outreach instructions, PSA DVDs, talking points, and press release templates were distributed to attendees who visited the booth. It was heartening to see the rapidity with which the media packets were snatched up by attendees eager to augment their PR arsenals. Although we had determined that broadcast-quality DVDs were the most likely format that television stations would use, we've recently had reports of stations that prefer Beta format. We are currently discussing whether we will expend the resources to have the PSA reproduced in Beta. I'll keep you posted.

During Mosquito Awareness Week (June 22-28), a concerted effort will be made to pitch the PSA to large, strategically-important media markets throughout the United States. Fleishman-Hillard personnel will be doing the actual pitching in order to maximize media response. Criteria for market selection included: incidence of West Nile virus, opposition to mosquito abatement, relevant local-market media, and existence of key opinion leaders in the market.

Markets selected were Chicago, Detroit, Cleveland, Washington DC/north Virginia, Baltimore, Atlanta, Los Angeles, San Francisco/Oakland/San Jose, Portland, Seattle, and Denver. I would certainly encourage all of you to reproduce the PSA locally to the maximum extent to optimize its distribution during Mosquito Awareness Week and the various county festivals during the year.

Alas, it has become increasingly evident that the Member Toolkit, as currently configured on the AMCA website, does not meet the needs of members accessing it seeking assistance for their communications programs. The Toolkit was meant to provide templates and fact sheets for district's various communications needs. Unfortunately, the website software did not allow the user to download individual documents in order to modify them for local needs, resulting in a large (70 Mb) and unwieldy download containing several different file formats. In order to make it more user-friendly, I've prioritized all of the files and deleted unnecessary documents. Association Headquarters is reconfiguring

the AMCA web software to make the Toolkit files capable of being individually downloaded, modified and saved on remote computers. The end product will consist of various fact sheets and/or links to sites with fact sheets and contact information (congressional, supportive websites, etc), instructions on how to contact media, key messaging, template op-eds, letters to the editor, and letters of support which can be tailored for key legislative officials.

The AMCA consumer-facing web-site requires some alterations, too, to make it more user-friendly to consumers looking for information on West Nile virus control. Although the final look has yet to be determined, we'll be consolidating WNv issues, tips on protection and prevention and the PSA in a large link on the home page. We'll also post links to survivor outreach pages with recent vector-borne disease news and any upcoming events involving survivor groups. The key here is to make information for the consumer no more than two keystrokes away from the website.

Along the same line, we'll attempt to increase media interest in the AMCA by clearly highlighting a media materials section on the homepage containing fact sheets and news releases. Here again, navigability is key – the easier it is to locate information, the more the media will use it. Our goal is to ensure that AMCA assumes a leading role on WNv in the mind of both print and broadcast media.

There are various survivor groups, the emotive aspect of whose message can appeal to groups historically susceptible to emotional appeals. These groups constitute a resource that we've begun to utilize as a basis of support for our operations. Many of you who have attended our Washington Legislative Conferences in the past may remember Wendy Station and, more recently, Kimberly King, who have related their stories to the attendees. Theirs is a powerful message that goes far beyond mere statistics and graphically portrays the very real suffering of those who have had loved ones suffer from vector-borne disease.

There are several legitimate survivor groups in North America, but they tend to operate in small, relatively proprietary sectors. In order to coalesce and leverage their messages for optimal effect, we propose to organize a West Nile virus / Encephalitis Survivor Advisory Council. Makeup of the council would be fully vetted to ensure legitimacy and maximize effect. The formation of a council of survivor groups would serve to unify local groups at national level with a single message in addition to providing a venue to utilize these groups to disseminate information to their constituents and the public at large.

In light of Dr Lyle Peterson's personal experience with West Nile disease, he was my first choice as a credible participant and he has graciously agreed to assist in any way possible. A great deal of additional discussion regarding the makeup and charter of this group needs to occur in order to ensure its success over the long term. The AMCA will keep you posted on its progress.

I'm perfectly aware that the "I'm One" program and its components may not meet all member's needs or expectations at the outset. Its national scope necessitated our formulaic approach, irrespective of regional peculiarities. Nonetheless, I believe there is enough flexibility built into the program that districts can tailor its message to their own constituencies. The fundamental message is that the experience of mosquito-borne disease is a very personal and horrifying one for those involved. As mosquito control professionals, we are dedicated to preventing these diseases where possible and we need feel no compunction about doing so.

Dr Richard Pollack of Harvard once stated (and I'm paraphrasing here) that we deal in probabilities of disease, whereas the anti-pesticide activists deal in possibilities of harm. This goes to the heart of the matter. The very real suffering of those so dramatically illustrated in the "I'm One" PSA should put those possibilities/probabilities in their true perspective, for, at its most elemental, the abeyance of this suffering is the fundamental reason we do what we do.

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