

Buzz Words



The Newsletter of the Florida Mosquito Control Association
Nov/Dec 2003

Volume 3, Issue Number 6

Upcoming Events

FMCA 2004 Fly-In

January 13 – 15, 2004

www.floridamosquito.org

Look inside this issue of *Buzz Words* for more details

FMCA 2004 Dodd Short Courses

January 26 – 30, 2004

Agenda on-line at www.floridamosquito.org

Celebrating 20 Years of Dodd: 1984-2004

Special events and surprises galore!

8th Annual Meeting of the Southeast Regional Public Health Pest
and Vector Management Conference

February 9 – 11, 2004

www.pherec.org

FMEL Advanced Mosquito Identification and Certification Workshop
March 8 – 19, 2004

Florida Medical Entomology Laboratory, Vero Beach, FL

<http://mosquito.ifas.ufl.edu> : Registration form inside this issue of *Buzz Words*

FMCA News

Meet the FMCA officers for 2004:

President: Kellie Etherson
President-Elect: Doug Carlson
Vice-President: Ed Fussell
Immediate Past President: Dr. George O'Meara
Executive Director: Shelly Redovan
Northwest Region: Wayne Gale
Northeast Region: John Boone
Southwest Region: Dr. Jeff Stivers
Southeast Region: Dr. Larry Hribar
Member-at-Large: Dr. Frank Van Essen
Industry Member: Frank Clarke
Commissioner' Section: Beth Bowen

There will not be a Spring Meeting for FMCA for 2004. The meeting has been cancelled in order to take full advantage of Legislative Days in Tallahassee. More information will be in the next issue of *Buzz Words*.

FMCA Awards Committee News

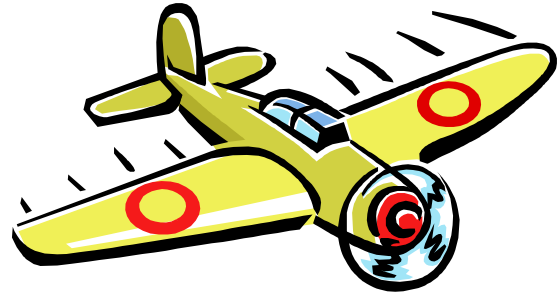
Congratulations to the 2003 FMCA Award Winners. Recipients were recognized for their contributions to mosquito control at the Fall 2003 FMCA Annual Meeting in Miami, FL.

Provost Award: Jim Robinson, Pasco County Mosquito Control District
Stutz Memorial Award: Don Hogan, Collier Mosquito Control District
Merit Award: Kellie Etherson, City of Gainesville Mosquito Control
Merit Award: Shelly Redovan, Lee County Mosquito Control District
Yarberry Award: Mike Sherman, Indian River Mosquito Control District
Presidential Citation: Dr. Richard Darsie, Florida Medical Entomology Laboratory

Photographs of the 2003 FMCA Award Winners are on Page 9 of this newsletter.

T. Wainright Miller Scholarship

The winner of the FMCA'S T. Wainright Miller Scholarship is Mai Vo from University of North Florida. She presented some of her research at the Fall 2003 FMCA Annual Meeting in Miami in a presentation titled "Arbovirus-Mosquito Gut-Level Interactions." Congratulations to Ms. Vo.



FMCA Fly-in 2004

Registration is now open for the January 13 – 15, 2004, Aerial Short Course Class sponsored by the Florida Mosquito Control Association Aerial Training Committee. Mr. Mark Latham is chairman of this Committee and will be the moderator for the short course. His telephone number is 941-722-3720. A copy of the registration form and more information can soon be obtained by going to the following web sites: www.lcmcd.org and www.floridamosquito.org. If you need to have an agenda or registration form faxed to you, please contact Shelly Redovan at 239-694-2174. The registration form should be completed and faxed to 239-693-5011 (ASAP), so that space might be reserved for you. Hotel reservations should be arranged for yourself and others, since this is the winter season and rooms go very quickly. Arrangements for your aircraft should be handled through Mr. Latham's office. The registration fee of \$100 per attendee should be paid at the door. This class will be a follow up to the class of 2003.

From the Editors of *Wing Beats*

Wing Beats is looking for interesting field-related or technical articles about mosquitoes, mosquito control, and related topics. The articles are usually 1 – 4 pages in length (including graphics and figures). A considerable amount of applied research, equipment modifications, and application technique changes are being conducted at mosquito control programs, universities, and military installations throughout the world that would be of interest to the Wing Beats audience. We encourage you to consider publishing in Wing Beats. Please send articles to: Marin Brouillard, Editor-in-Chief, Collier Mosquito Control District, 600 North Road, Naples, FL 34104 or Marin@collier-mosquito.org

FMCA Committee Assignments for 2004:

Standing Committees:

Awards:

Chair: Stephen Sickerman
Mark Latham
Dr. Roxanne Rutledge-
Connelly
Dr. Eric Schreiber

By-Laws:

Chair: Bob Betts
Dr. Richard Levy
Robert Frommer

Exhibits:

Chair: Jim Burgess
Frank Clarke
Bill Reynolds

Finance:

Chair: Doug Carlson
Bob Betts
Frank Clarke
Ed Fussell
Dennis Moore
Dr. Eric Schreiber
Richard Smith

Legislative:

Co-Chair: Gene Baker
Co-Chair: Doug Carlson
John Beidler
Ed Fussell
Ed Hunter
William Opp
Jim Robinson
Dr. John Smith
Jonas Stewart
Dr. Walter Tabachnick
George Wichterman

Local Arrangements:

Chair: Kellie Etherson
Co-Chair: Shelly Redovan
Tom Breaud
Doug Carlson
Eric Elbert

Membership:

Chair: Kellie Etherson
Shelly Redovan

Nominating:

Chair: Dr. George O'Meara
William Opp
Allen Wooldridge

Fall Program 2004:

Chair: Doug Carlson
Ed Fussell

Spring Program 2004:

Chair: NA

Projections/AV:

Chair: Kim Feagley
George Heinlein
Tom Floore

Research Advisory:

Chair: Ed Fussell
Dr. Dan Kline/USDA
T. Wayne Gale/Tom
Loyless/DACS
Dr. John Smith/PHEREC
Dr. Walter Tabachnick/FMEL
Tom Breaud (2002-2005)
Alex Cordero (2004-2007)
Dr. Jonathan Hornby (2004-
07)
Mark Latham (2003-06)
Dr. Richard Levy (2004-07)
Dr. Eric Schreiber (2002-05)

Resolutions:

Chair: Dr. George O'Meara
Dr. Jim Brown
Robert Ward

Education Coordination:

Chair: Kellie Etherson
Dr. Jim Cilek
Dennis Moore
Dr. Eric Schreiber
Jonas Stewart

ECC SUBCOMMITTEES:

Aerial Training:

Chair – Mark Latham
William Opp
Jim Robinson
Allen Wooldridge

Technical Bulletins:

Chair: Dr. Jim Cilek, Editor-in-
Chief
John Beidler
Dr. Jon Day

Dodd Short Courses:

Co-Chair: Kellie Etherson
Co-Chair: Dr. Eric Schreiber
Bob Betts
Janice Broda
Dr. Jim Cilek
Dr. David Dame
Kim Feagley
Tom Floore

Tom Loyless
Dennis Moore
Dr. George O'Meara
Shelly Redovan
Jim Robinson
Dr. Roxanne Rutledge-
Connelly
Stephen Sickerman
Jennifer Simpson

Public Information:

Chair: Neil Wilkinson
Brian Murphy
Kellie Etherson
Jonas Stewart

Buzz Words Newsletter:

Dr. Roxanne Rutledge-
Connelly, Editor-in-Chief

Wing Beats Magazine:

Marin Brouillard, Editor-in-
Chief
Dr. David Dame, Associate Ed.
Lt. Commander Eric Hoffman,
Associate Ed.
Tom Wilmot, Associate Ed.

Editorial Review Board:

Dr. David Dame
Kellie Etherson
Dr. Phil Lounibos
Dr. Robert Lowrie
Bill Reynolds
Dr. John Smith
James Webb

Historical:

Chair: Dr. Gordon Patterson
(tentatively)- members to be
chosen by the Chair

Personnel Exchange:

Chair: Jim Robinson
Kellie Etherson

**Florida Mosquito Control
Handbook:**

Dr. Roxanne Rutledge-
Connelly, Managing Editor
Tom Loyless
Dr. Jack Petersen
Dr. Eric Schreiber

**Committee for Mosquito
Control:**

Chair: Gene Baker

From Florida DACS

The following courses are being offered at no charge at the Bureau of Entomology and Pest Control in Tallahassee. Material covered in each course is flexible and can be tailored to meet the specific needs of each participant. Our current course line-up includes:

-Mosquito Identification: A 2-day course covering larval and adult ID to the genus level, and ID of some of the more common Florida species. There will also be some field collecting (weather permitting!). 16 CEU's for full participation.

-Mosquito Collecting Methods: A 2-day course covering collection methods, identification of various mosquitoes, and recognizing various breeding habitats. This course is designed to show how to use various traps and the importance of trap placement. 16 CEU's for full participation.

-Preservation and Mounting Techniques: A 1-day course showing proper methods for collection, storage, preservation and mounting of insect specimens. Emphasis will be placed on mosquitoes but include techniques for other insects as well. 8 CEU's for full participation.

-VCMS (Vector Control Management Software) Training: Due to limited computer access there will be a maximum of 6 students / class. Instruction is tailored to the level of experience of those taking the course. 8 CEU's for full participation.

-Exam Review Session and Certification Exams: This is for people who are preparing to take the Core, Public Health, or Aerial exams. After the review session, students may take the exam. No CEU's are available for exam reviews.

-All courses (except VCMS) need 6-10 participants. Please contact the Bureau of Entomology and Pest Control if you need any additional information and to schedule your group for your course of choice.

Bureau of Entomology and Pest Control, Mosquito Control Section, (850) 922-7011, SUNCOM 291-7011

Tom Loyless: loylest@doacs.state.fl.us

Jennifer Simpson: simpsoj@doacs.state.fl.us

Angela Weeks-Samanie:
weeksa@doacs.state.fl.us

Mosquito Control Director Position Available

The Board of Commissioners of Citrus County Mosquito Control District is seeking applications for the position of Director. The applicant must have a minimum of a Bachelor's Degree in Entomology, Basic Sciences, Engineering, Pest Control or a closely related field with a minimum of four years work experience in Mosquito Control.

This position requires the applicant to have, or to be able to obtain, a Public Health Pest Control Certification, Director's Certification, and a current valid Florida driver's license.

Salary commensurate with applicants experience and ability. Mail or fax cover letter and resume to Citrus County Mosquito Control District. Applications will be taken until position is filled.

Citrus County Mosquito Control District
P. O. Box 153
Lecanto, FL 34460
phone: 352-527-7478
fax: 352-527-9567

Research Highlights

Shaman, J., J. F. Day, and M. Stieglitz. 2003. St. Louis encephalitis virus in wild birds during the 1990 South Florida epidemic: the importance of drought, wetting conditions, and the emergence of *Culex nigripalpus* (Diptera: Culicidae) to arboviral amplification and transmission. J. Med. Entomol. 40:547-554.

The effects of modeled water table depth and *Culex nigripalpus* abundance and emergence were used to build an empirical model of amplification and transmission of SLE virus in the avian population. Findings indicate 3 factors conspired to create the 1990 SLE epidemic: (1) a large population of susceptible wild birds; (2) severe springtime drought; and (3) continued rainfall and wetting of the land surface in the summer and early fall. The authors hypothesize that without the continued reproductive activity of the vector, brought about by excessive summer and fall wetness, the unprecedented SLE virus amplification and transmission to humans would not have been realized in 1990.

Research Highlights (cont'd)

Mukhopadhyay, S., B-S Kim, P. R. Chipman, M. G. Rossmann, and R. J. Kuhn. 10 Oct 2003. Virology: Structure of West Nile Virus. Science. 5643: 248.

With the use of cryo-electron microscopy and image reconstruction techniques, the authors determined a 17 Å resolution structure of WNV New York 99, the strain responsible for the outbreak in the U.S. The virus has icosahedral symmetry and is ~500Å in diameter; no surface projections or spikes.

efforts at source reduction, worker certification, public outreach and surveillance for mosquito-transmitted pathogens, including West Nile virus are ambitious, influential and broad in scope. As you know, PESP is strongly encouraging Members to adopt a quantitative system for end outcome measurement and your consistent efforts in this area are particularly appreciated.” (see AMCA website www.mosquito.org for full text).

Only 18, of the over 130 Partners in the PESP program, were selected for this recognition.

AMCA CHOSEN AS 2003 PESP CHAMPION!

Since the mid-1990's, the AMCA has been a "Partner" in the EPA's Pesticide Environmental Stewardship Program (PESP). The goal of this program is to promote the wise use of pesticides which results in reduced pesticide risk. In November 1999, the U.S. Environmental Protection Agency (EPA) awarded to the American Mosquito Control Association (AMCA) their *PESP Excellence Award "for pesticide risk reduction."* More recently in early October 2003, the EPA selected the AMCA as a *PESP Champion* for 2003.

The letter from J. Stephen Morrill, Acting Chief of the Environmental Stewardship Branch, Biopesticides and Pollution Prevention Division, states:

"We recognize the AMCA as demonstrating outstanding efforts towards risk reduction and exhibiting an extraordinary level of commitment to our common goals of protecting human health and the environment and promoting integrated pest management (IPM).....Your continued

For the past 5 years, the AMCA's PESP Working Group has offered to State and Regional mosquito control associations, the opportunity to become a "PESP Partner under the AMCA's auspices". To date, the following associations have taken advantage of this partnership opportunity:

Mosquito & Vector Control Association of California

Florida Mosquito Control Association

Louisiana Mosquito Control Association

New Jersey Mosquito Control Association

North Carolina Mosquito & Vector Control Association

Northeast Mosquito & Vector Control Association

Northwest Mosquito & Vector Control Association

The AMCA is currently investigating ways to expand this program to make more organizations eligible to participate. The AMCA (and the PESP Partners under its auspices) look forward to continuing to partner with the EPA to strive to reduce pesticide risk while protecting public health and comfort.

Peter DeChant, Chairman-PESP Working Group
Doug Carlson, Working Group Member
Doug Wassmer, Working Group Member

The quotable mosquito

If you think you are too small to be effective, you have never been in bed with a mosquito. Betty Reese

The best blood will at some time get into a fool or a mosquito. Benito Mussolini

As with mosquitoes, horseflies, and most bloodsucking parasites, Kenneth Starr was spawned in stagnant water. James Carville

It's not so much how busy you are, but why you are busy. The bee is praised; the mosquito is swatted. Marie O'Conner



Mosquito Identification and Certification Workshop March 8 – 19, 2004 Florida Medical Entomology Lab, Vero Beach, FL

This intensive 2-week course will provide training to experienced mosquito identifiers. The objective of the course will be to improve the students' ability to identify mosquito species. This will enable students to complete a comprehensive practical laboratory examination at the conclusion of the course. Upon successful completion of the examination students will be provided with a Florida DACS/FMEL Certification as a Certified Mosquito Identifier. Attending the course does not guarantee certification.

Dr. Richard Darsie, Jr. is an internationally renowned mosquito taxonomist and author of The Mosquitoes of North America North of Mexico. Dr. Darsie and other faculty from the FMEL and DACS will teach students how to properly prepare and store reference specimens and identify larvae and adult females of all North American genera and common species. The course content will not be limited to Florida fauna. Students should have a general knowledge of mosquito morphology and be familiar with binocular and compound microscopes and insect identification keys. If possible, students should bring mosquito adults and larvae from their own localities.

The course will be offered at the Florida Medical Entomology Lab, University of Florida, IFAS, in Vero Beach, FL. Dates are March 8 – 19, 2004. The class will be limited to the first 20 qualified applicants. The tuition is \$500.00, ***payable in advance***. Students are encouraged to bring a binocular and compound microscope and a copy of The Mosquitoes of North America North of Mexico.

Mosquito specimens will be available and each student will be furnished a take-home insect mounting and storage kit containing a Schmitt box, watchmaker's forceps, insect pins, labels, a pinning block and card points. Morning and mid-afternoon refreshments and an end-of-course dinner are included in the tuition. There will be a 4 hour guided canoe trip along the Indian River Lagoon during the morning of Saturday, March 13, 2004. Dr. Dick Baker will lead the group.

Students are eligible to stay at the FMEL Bunkhouse for \$15.00 a night. The Bunkhouse has showers, bathrooms, a coin-operated washer and dryer, a day room and limited cooking facilities. Students must provide their own linens, blankets, pillow and towels. A list of transportation and local lodging is included with this document.

To register for the course, please send a completed registration form to:

Dr. Roxanne Rutledge
FMEL
200 9th Street S.E.
Vero Beach, FL 32962

Applicants will receive a notice of acceptance within one week after applications arrive at FMEL.

For additional information on registration, contact Dr. Rutledge at 772-778-7200 ext. 158 (voice), 772-778-7204 (fax), or CRR@mail.ifas.ufl.edu. For additional information on the course content, contact Dr. Richard Darsie at 772-778-7200 ext. 137 (voice), 772-778-7205 (fax) or RFD@mail.ifas.ufl.edu.

Additionally, please include a resume indicating courses/training you have had in identifying mosquitoes and current job responsibilities related to identifying mosquitoes.

Mosquito Identification and Certification Workshop Registration Form

Student's Name _____

(First)

(Middle)

(Last)

Organization _____

Mailing Address _____

City _____ State _____ Zip _____

Telephone _____ Fax _____

Email _____

=====

I will bring a copy of _____ keys to the course.

I will bring other mosquito identification keys to the course.

I want to reserve a spot for the Indian River Lagoon canoe excursion on Saturday March 13, 2004.

I understand that tuition is due in advance of the course.

For Bunkhouse Residents:

I understand that I must provide my own sheets, pillows, blankets, and towels for use in the Bunkhouse.

I understand that the Bunkhouse is co-ed. There are 4 bunk beds per room, and a total of 6 rooms. Males and females will have separate rooms; however, all rooms are under one roof.

DO NOT include Bunkhouse fees in the check; those fees must be paid to the FMEL-UF before leaving Vero Beach. Checks or money orders (payable to University of Florida) are acceptable. Sorry, we cannot take cash or credit cards.

Florida Medical Entomology Lab has a bunkhouse that will sleep 20. In the event of co-ed lodgers, males and females will be assigned same-sex roommates. The rate is 15.00 per night. Guests must provide linens, towels, etc. Beds are all single bunk beds and will be filled on first-come first-serve basis. Please contact Dorene Kelleher at 772-778-7200 ext. 123 or DSK@mail.ifas.ufl.edu for reservations in the bunkhouse.

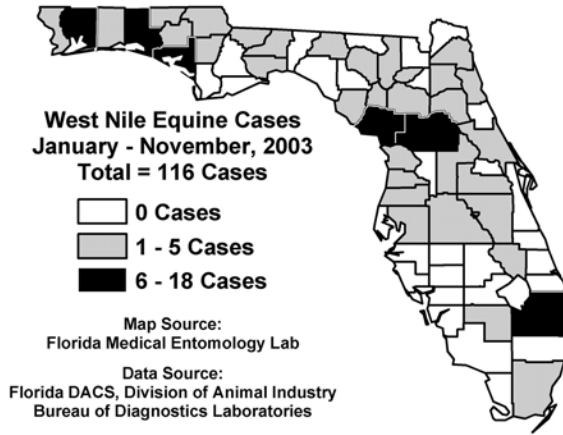
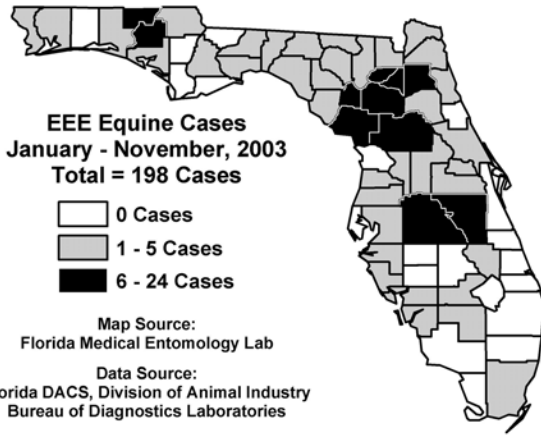
Local hotels listed below (there are no hotels within walking distance to the FMEL):

Mainland:

Comfort Inn	772-569-0900
Howard Johnson Express	772-567-5171
Hampton Inn	772-770-4299
Holiday Inn Express	772-567-2500
Best Western (Legends)	772-567-8321

Beachside

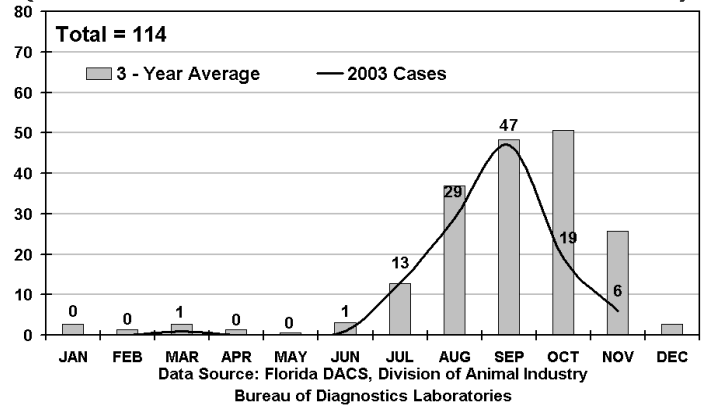
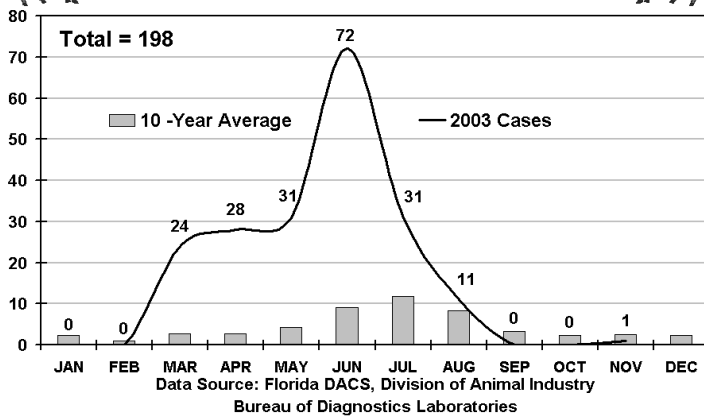
Holiday Inn	772-231-2300
Islander	772-231-4431
Vero Beach Hotel	772-231-5666
Riviera Inn	772-234-4112
Palm Court	772-231-2800
Vero Beach Inn	772-231-1600



EEE Equine Cases in Florida
January through November, 2003



EEE Equine Cases in Florida
January through November, 2003



Deadline for submissions to be included in the Jan/Feb 2004 issue of *Buzz Words* is January 23, 2004. Please send articles and change of address information to Dr. Roxanne Rutledge, Editor, FMEL, 200 9th Street S.E., Vero Beach, FL 32962; or buzzwords@ifas.ufl.edu

Happy Holidays from the staff of Buzz Words!!



Provost Award: Jim Robinson,
Pasco County Mosquito Control District (2nd from right)
Presidential Citation: Dr. Richard Darsie,
Florida Medical Entomology Laboratory (end-right)



Stutz Memorial Award: Don Hogan,
Collier Mosquito Control District

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Merit Award: Kellie Etherson,
City of Gainesville Mosquito Control



Merit Award: Shelly Redovan,
Lee County Mosquito Control District

2003 FMCA
AWARD
WINNERS!

Thanks to Jim Burgess and
Kellie Etherson for the photographs!



Yarberry Award: Mike Sherman,
Indian River Mosquito Control District



WEEK BY WEEK BY WEEK: WHY SENTINEL CHICKEN BLEEDING INTERVAL MATTERS

Because arbovirus surveillance in Florida is largely a locally funded enterprise, it is not surprising that specific practices employed for sentinel chicken surveillance also vary by county. This variation in specific methodology largely mirrors variation in local resources, both human and financial. It also depends on the local surveillance agency's understanding of how this activity benefits its local taxpayers (and whether these taxpayers appreciate it enough to continue supplying revenue!).

Some would argue that strict adherence to a detailed, state-wide protocol for use of sentinel chickens in arbovirus surveillance could improve the quality of the data. It is my view that county-to-county variation in such details as flock size, distribution, and chicken breed (to name only a few) is inevitable. However, biologic constraints are by definition inflexible, and a surveillance procedure that ignores or is ignorant of such constraints can fail dramatically. Worse, it can cause a surveillance program to fail insidiously, with operational activities naively proceeding with an incorrect evaluation of local transmission risk.

Historically, most Florida agencies have had weekly bleeding schedules that approximated one of the following: (1) bleed every bird in all flocks; (2) bleed all birds in half of the flocks, the remaining flocks being bled the following week; (3) bleed half of the birds in each flock one week, and the remaining half the next week. Variations (2) and (3) have typically been motivated by a need to conserve labor costs, or to use the same employees for other important activities. The difference in these practices is profound, as will be detailed later, due to the fact that each individual sentinel in (2) and (3) is sampled only biweekly. Inspection of weekly sentinel surveillance summaries prepared by the Florida Department of Health, Tampa Branch Laboratory, suggests that most agencies are now attempting to bleed each sentinel weekly, at least during the critical July-November period of peak flavivirus transmission. Nonetheless, many programs seem to suspend sampling for one or two weeks before resuming a regular schedule, perhaps accommodating vacations, illness, or holidays for surveillance personnel. As will be shown, these departures from weekly serum sampling can have serious consequences.

Each sentinel chicken serum sample tested by the Tampa Branch Laboratory is initially evaluated by two separate hemagglutination-inhibition (HAI) tests. One HAI test uses reagents to detect presence of antibodies specific to eastern equine encephalitis (EEE) virus, while the other HAI test is designed as a "screening" test to detect antibodies to native flavivirus group viruses, including St. Louis encephalitis (SLE) and West Nile (WN) viruses. HAI tests for EEE are relatively straight-forward, with presumptively positive samples being confirmed by a subsequent positive HAI antibody titer or by detection of neutralizing antibody specific to EEE virus using a separate serum neutralization-plaque reduction assay (SNPR). A positive HAI response in the test screening for flaviviruses has become problematic with the arrival of WN virus in Florida. Confirmation for flavivirus HAI-positive sera is initially attempted by testing with a more specific WN ELISA assay directed against IgM class antibodies. HAI-positive sera that yield inconclusive or negative IgM ELISA results must then be tested by the more demanding SNPR test to determine whether the sample is truly WN-positive, SLE-positive, or negative. The serologic assay for flaviviruses is further complicated by the observation that many serum samples in the HAI screening test for flaviviruses display a noticeable reaction that is less than required to meet criteria as "positive" on the lowest serum dilution (1:10), yet prove to contain WN antibodies detectable by IgM ELISA or SNPR test. The Tampa Branch Laboratory now routinely reports these HAI "Reactors" to surveillance partners and subjects them to further testing.

Editor's Note

Antibody: specialized serum protein produced by the immune system in response to an antigen, in an attempt to counteract the effects of the antigen; the presence of antibodies in the blood indicate exposure to a specific antigens.

IgM: the first class of antibodies synthesized in a primary immune response; triggers production of IgG.

IgG: the main class of antibodies produced toward the end of a primary immune response and in a secondary response.

The problematic serologic evaluation of potential flavivirus seroconversions in Florida is largely thought to be a result of exceptionally short-lived IgM class antibodies in chickens that have been infected with WN virus. Detectable WN IgM antibodies persist only a few days, rather than several weeks as with many other arboviruses. Unfortunately this has important implications for both the IgM ELISA and the HAI screening tests (HAI antibodies represent a mix of IgM and IgG class antibodies). [Are you thinking about bleeding schedules yet?]

With this background, an analysis of sentinel surveillance data from Indian River County in 2003 will illustrate why even short-term departure from a weekly bleeding schedule is ill-advised. Serologic profiles were compiled for all 40 Indian River sentinel chickens confirmed as WN seroconversions through early October 2003; each bird is bled weekly throughout the year. Individual seroconversions were classified not only by HAI response during the week of seroconversion, but by HAI response one week later. Results are summarized in the table below.

Confirmed WN-positives only, 01 May - 06 Oct 2003				
Initial HAI-titer	No. confirmed WN-positive	Week 2 HAI-titer		
		HAI = R or greater	HAI = Neg	No sample
R*	11	1	10 (91%)	0
1:10	14	4	8 (57%)	2
>1:10	15	12	3 (20%)	0
Total	40	17	21 (53%)	2

* R = Positive HAI reaction, but < 1:10

It is evident that 53% of the confirmed WN seroconversions had no HAI response one week after the week of initial detection! Similarly, in 2002 there was no detectable HAI response the week after the initial positive sample in 37% of 43 Indian River sentinels with confirmed WN seroconversions. There is no reason to believe that this phenomenon is unique to Indian River County sentinels.

What does this observation suggest is the expected consequence of ignoring a known biologic constraint.. the fleeting appearance of IgM antibodies after WN virus infection? In the worst case management scheme, in which sentinels are bled at biweekly intervals, the surveillance program will fail dramatically (and probably, unknowingly). Approximately half of the WN seroconversions will never be detected, since fleeting HAI titers may rise and fall without detection between serum samples. Even worse, those unrecognized WN-positive sentinels will remain silently in the flock, reducing the number of susceptible birds that might detect WN transmission at a later date. It is not inconceivable that the majority of chickens in some flocks could seroconvert without detection during a single week, making that flock unlikely to detect any serious transmission events later in the year.

Even in the "good 'ole days" (i.e., before we had a need to differentiate WN and SLE virus seroconversion), the advisability of weekly sentinel bleeding schedules was encouraged since it allowed more precise back-calculation of estimated dates of infective mosquito bites. That benefit still applies, and is essential for assessing the correspondence of vector blood-feeding peaks to sentinel infection for WN, SLE and EEE viruses alike. **The concern raised here is not with the occasional individual sentinel that has a serum week skipped (serum tubes do sometimes break!). Such events are not entirely avoidable. Rather the danger is that surveillance managers may inadvertently shift into sentinel management schemes that cannot yield reliable measures of virus transmission, and can erroneously suggest that risk of transmission to man is far less than is actually the case.**

Donald A. Shroyer, Ph.D. Medical Entomologist, Indian River Mosquito Control District, Vero Beach, FL

Great Move by the Indian River County Health Department and the Florida Department of Health, September 2003

On Wednesday, September 10, 2003 Jean Kline, County Health Department Administrator for the Indian River County Health Department (IRCHD), requested from the Florida Department of Health (FL DOH) that Indian River County be placed on Medical Alert for West Nile (WN) virus. This request was made despite the absence of WN-positive human cases in Indian River County, but in the presence of surveillance data that indicated an elevated risk of virus transmission.

On Tuesday, September 9 Dr. Donald Shroyer from the Indian River Mosquito Control District (IRMCD) had provided the IRCHD with his most recent arboviral surveillance data which showed:

1. Seven (of 8) IRMCD sentinel chicken sites with at least one WN-positive sentinel chicken.
2. Twenty-one confirmed WN-positive sentinel chickens in IRC.
3. Documentation of a substantial increase in blood feeding by *Culex nigripalpus* following heavy rainfall on September 2-4.

In his 9-9-03 correspondence to the IRCHD Shroyer stated, "Our surveillance system has given us all the "early warning" we can ever expect to see, and should not be ignored. A Medical Alert now would be both prudent, and readily justified. For this county in particular, it would be professional irresponsibility to wait for the appearance of a human case before acting."

Indian River County's request for a Medical Alert was denied because the FL DOH policy at that time was to reserve the issuance of a Medical Alert for counties with at least one confirmed WN case. Jean Kline then requested that FL DOH issue a Medical Advisory for IRC. This request was granted, making IRC the only Florida County in 2003 to be placed under a Medical Advisory.

The events in IRC during September 2003 served to highlight the problems encountered by having only a single alert level for arthropod-borne virus transmission risk to humans. In the months following September 2003, it became clear that IRC should not have been on Medical Alert. However, surveillance data leading up to early September clearly indicated that WN virus was present and was being actively transmitted within the County. To wait for a human case before issuing a warning was, in Shroyer's words, "professionally irresponsible." Issuing a Medical Advisory was a perfect compromise. It allowed the IRCHD to send out a blast fax which alerted all county physician groups (ER, walk-in clinics, neurology, and primary care physicians) to the possibility of human WN cases. The Medical Advisory also resulted in local press coverage about mosquitoes, WN virus, and disease transmission. Finally, by issuing a Medical Advisory, the IRCHD increased public awareness of WN virus transmission while leaving a Medical Alert intact for future use in the event of substantial WN virus transmission to the citizens of IRC.

A single alert status forces Florida into several undesirable positions as the Florida arboviral season progresses from the Maintenance Phase (January through March) to the Amplification Phase (April through June) and on to the Early Transmission Phase (July through September) when the bulk of human WN cases appear. Because of the sporadic nature of WN virus transmission during most years, single human cases are expected to occur over wide geographic areas from June through November. These sporadic cases are extremely difficult to predict in time and space and single human cases within a county often do not represent a significant increase of WN virus transmission to residents of that county. Therefore, elevating a county to Medical Alert status based on a single human case may be proper early in the year when that case represents the front end of a building epidemic. However, when transmission of WN virus is truly sporadic, the single human case may not represent a true increase in human risk. The risk of WN virus transmission in counties on Medical Alert with a single human case may be no different than the risk in adjacent counties without a case that are not on Medical Alert. Florida must develop a tiered arboviral response policy for 2004 that has built-in appropriate responses for Florida's public health professionals.

Three years of WN surveillance in Florida clearly indicate that a multi-tiered arboviral alert system is desperately needed. The risk of arboviral transmission in Florida is never zero. The risk is greatly reduced during the Florida dry season from mid-November through mid-May but Florida residents should always be advised to avoid mosquito bites. From mid-May through mid-November the risk of mosquito-borne virus transmission increases substantially. During some years environmental conditions will limit virus amplification and the risk of substantial numbers of human cases will remain low. During other years environmental conditions will favor viral amplification during the critical Amplification Phase (April-June) of the Florida arboviral cycle. During these years, the risk of a large number of human cases dramatically increases, necessitating the implementation of a multi-tiered alert system.

Collectively, Florida has an internationally recognized arboviral surveillance program that is based on excellent local surveillance programs. During the arboviral transmission season (mid-May through mid-November) risk must be evaluated and alerts issued on the local level. Many factors must be tracked to evaluate the risk of a significant level of arboviral transmission to humans within a given county. Some of the more important risk factors include:

1. Environmental conditions - especially rainfall and drought cycles throughout the year.
2. Vector populations - especially abundance, parity, blood feeding status, and oviposition behavior.
3. Avian amplification host populations - especially reproductive success during the major breeding season (April-July) and immunological status.
4. Arboviral transmission as measured by thoughtfully maintained sentinel chicken surveillance programs.

The assessment of arboviral epidemic risk begins in January by tracking all of the risk factors listed above.

The proximity of substantial numbers of arboviral-positive sentinel chickens to the Amplification Phase (April-June) of the Florida arboviral cycle will be one of the best indicators of a building epidemic. As the transmission season progresses and risk factors start to drop into place we may wish to consider the following tiered alert levels. The significance of the suggested tiered level is that it does not depend entirely on the appearance of human cases to establish a response policy. The following levels will be reached based on surveillance information that we would hope would precede the appearance of substantial numbers of human cases in Florida.

Level 1 (Background arboviral transmission): Detection of arbovirus nucleic acid or antibody in sentinel flocks, wild or domestic birds, mammals, or mosquitoes by a local surveillance program. The earlier in the year this occurs, the greater the concern. Responses to Level 1 risk would include: 1) maintain a well thought-out and designed local surveillance program. 2) Maintain vector control activities already in place. 3) Consider a local advisory about personal protection against biting arthropods. 4) Communicate with all local physicians (ER, walk-in clinics, neurology, and primary care physicians) about the possibility of human mosquito-borne arboviral cases.

Level 2 (Medical Advisory): Widespread regional detection of arbovirus nucleic acid or antibody in sentinel flocks, wild or domestic birds, mammals or mosquitoes. Arboviral detection may have a wide geographical distribution but will be focused in time. The earlier in the year this occurs, the greater the concern. A 10% increase in arboviral detection above background, especially early in the year may initiate a Level 2 response. Responses to Level 2 risk include: 1) Consideration of a FL DOH/County Health Department-declared Medical Advisory. 2) Increase the efforts associated with well thought-out and designed local surveillance programs. 3) Florida DACS may consider the need to issue a mosquito declaration in counties that need added mosquito control measures including a request for external resources to use in aerial adulticiding and larviciding activities. 4) Communicate with local physicians and media stressing the FL DOH's 5-D/1-S message.

Level 3 (Medical Alert): Detection of five or more Florida-acquired human arboviral cases per week and/or a 40% increase in arboviral detection above background, especially early in the year. Responses to Level 3 risk include: 1) Consideration of a FL DOH/County Health Department-declared Medical Alert. 2) Maintain increased well thought-out and designed local surveillance programs. 3) Florida DACS and local vector control programs may consider increased aerial adulticiding and larviciding based on the likely

impact of these activities on focused high risk vector populations and larval habitats. 4) Communicate increased concern to local physicians and media stressing the importance of mosquito avoidance.

Level 4 (Medical Emergency): Detection of a geographically widespread but temporarily focused distribution of human arboviral cases at a level of 20 cases per week and/or a 50% increase in arboviral detection above background, especially during June and July. There may be as many as 50 new cases reported each day. Responses to Level 4 risk include: 1) Consideration of a FL DOH/County Health Department-declared Medical Emergency. 2) Maintain well thought-out and designed local surveillance programs, although under a Level 4 scenario the value of increased surveillance is greatly reduced except in areas where substantial numbers on human cases have not been reported. 3) Establish an Emergency Operation Center (EOC). 4) Coordinate requests for vector control assistance through the EOC. 5) Maximize adult mosquito control efforts in high-risk areas including retirement centers, hospitals, and adult communities. 5) Coordinate the dissemination of public information through the EOC. 6) Cancel outdoor nighttime events. 7) Close local, state and federal parks and recreation areas to nighttime events and overnight camping.

In all likelihood most of our Florida summers will be spent at Response Level 1. We know, however, that there is great potential for the occurrence of widespread arboviral epidemics throughout Florida. If Florida ever experiences the level of WN virus transmission reported in Colorado during the summer of 2003 there will be 10,000 human cases reported throughout the state. Duval County will report 1,400 cases; Orange County 1,700; Hillsborough County 2,000; Pinellas County 1,700 and Palm Beach County 2,100. Every summer in Florida we should plan for a Level 1 arboviral risk response, but we should be capable of implementing a Level 4 response when local surveillance data indicate a substantial increase in human risk.

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