
Illinois Mosquito & Vector Control Association

NEWS



LETTER

Volume 12

Number 1

Summer/Fall 2002

**MARK YOUR CALENDARS
NOVEMBER 14-15, 2002
THE 48TH ANNUAL MEETING IN SPRINGFIELD!
CROWNE PLAZA HOTEL**

ARE YOU INTERESTED IN –

**HOW PUBLIC HEALTH, MOSQUITO ABATEMENT DISTRICTS, AND
COMMERCIAL MOSQUITO CONTROL RESPONDED TO
WEST NILE VIRUS IN ILLINOIS?**

**THE RESULTS OF RESEARCH ON VECTORS AND BIRD HOSTS AT
THE ILLINOIS NATURAL HISTORY SURVEY AND UNIVERSITY OF ILLINOIS?**

PLANS FOR WNV IN 2003?

**IF THE ANSWER IS “YES”, THEN PLAN TO ATTEND
THE ANNUAL MEETING OF THE IMVCA IN SPRINGFIELD.**

Ed Adler, vice-president and program chairman.

Emergency Mosquito Control Rule

Because of West Nile virus activity in Illinois, two local agencies and IDPH requested that the IL. Dept. of Agriculture file an emergency rule to allow the use of three mosquito larvicides by local officials after a 1-hour training course by a licensed mosquito control applicator. Altosid briquets (2 formulations) and Bti briquets can be used for the treatment of catch basins, flooded roadside ditches and other small water impoundments that produce the primary vector of West Nile virus (the house mosquito, *Culex*

pipiens) and other mosquitoes that may be vectors of diseases. Please consult pesticide labels for complete application instructions. Please note the following:

1. The rule is effective August 14, 2002 through October 30, 2002.
2. For more information about the rule, contact the IL. Dept. of Agriculture (IDA) via the Pesticide Hotline (1-800-641-3934).



Reasons for establishing a mosquito/vector management program

by Richard Lampman and Robert Novak

1. **Human Health and Welfare.** Reducing resident's anxiety and risk of arboviral diseases.
2. **Domestic Animal Health.** Protecting economic investment (particularly with equines, sensitive farm animals, zoo specimens, etc.).
3. **Wildlife Health.** Although corvids are the most sensitive to WNV, morbidity and mortality extends to a wide range of native birds (including some protected species).
4. **Secondary Mosquito and Arboviral Benefits.** An abatement program directed toward vectors also tends to impact transmission of other pathogens transmitted by these species and may reduce the population of other mosquito species, especially those in the same habitats. Furthermore, the surveillance component of an abatement program is a means for detecting newly introduced vectors and arboviruses.
6. **Promotes/Maintains Tourism.** Media reports of arboviral transmission in an area can adversely impact tourism.
7. **Control and Supervision of Pesticide Usage and Monitoring Treatment Efficacy.** MADs also provide for the proper use of pesticides from selection and formulation to application. In many states, applicators require specific licensing. Treatment coupled to surveillance is the basis for IPM.
8. **Public Relations Enhanced.** A MAD keeps the public informed and serves as a centralized agency/group for receiving and responding to complaints. It is usually able to justify to the public the measures taken, produce pamphlets for homeowner control of mosquitoes, respond

to ineffective "gimmicks" and urban legends, and counter media-generated hysteria.

9. **Ecological and Environmentally Sound Larval Management.** The use of relatively specific biological larvicides, source reduction, water management, and the use of predators are only available to preventive and pro-active programs. Furthermore, some actions, if undertaken without knowledgeable supervision, can have negative impacts.

Adulticiding may be the cheapest method for mosquito control, but, as a sole control method, has several severe limitations. Adulticiding is only a short-term solution; it's sensitive to timing of application; it can impact beneficials and non-target organisms; it generally requires repeated use; and misuse or overuse can promote insecticide resistance. Furthermore, adulticiding often attempts to interrupt the transmission cycle after it has reached epidemic proportions (too little, too late). Adulticiding as the only control method is not recommended by federal and state environmental protection agencies or vector-related groups like the AMCA. In conjunction with other management and surveillance techniques, it can be an important component.

10. **Coordination of area-wide mosquito management activities.** Arboviral transmission is sensitive to a wide range of biological, environmental, and ecological conditions. Vector abatement programs are able to adapt their surveillance and control options for changing levels of risk.

11. **A mosquito management program provides a long-term commitment to vector-borne and nuisance problems.** In general, MADs establish a low cost, long-term management, whereas short-term emergency treatments generally require non-budgeted (often high cost) funds.

DISTRICT AND ALLIED AGENCY ORAL REPORTS

Many IMVCA members have requested that the oral reports at the annual meeting be accompanied by a 1-page handout, covering the type of pesticides and amounts used, the areas treated, as well as any important observations made during the field season. These would be collected by the Sec.-Treas. and included in the next Newsletter (with possible editing for space limitations). We would like to limit the oral reports to 10-15 minutes per agency.



**Supplemental Guidelines for Control of Adult Mosquitoes
(From IDPH; Amended 8/20/02)**

At the request of the Illinois Department of Agriculture, IDPH has provided additional guidelines for control of adult mosquitoes by Ultra-low Volume (ULV) application by truck-mounted units. If you have questions about regulations related to mosquito control, please contact the **IL. Dept. of Agriculture Pesticide Hot Line (1-800-641-3934)**.

Apply Aerosols for Adult Mosquito Control at Dusk to Midnight

Applications of adulticides from truck-mounted units in residential areas should begin no earlier than sunset and end by midnight to 1 A.M. Feeding and flight activity of female mosquitoes are concentrated within three hours after sunset; thus, adulticiding after 1 A.M. has limited effectiveness. However, there is a limited amount of mosquito activity at dawn, so early morning (5 A.M. to 6:30 A.M.) fogging may be an alternative in parks where heavy use by the public prevents adulticiding during the evening.

Ground adulticiding in residential areas during daylight hours (7 A.M. to dusk) is ineffective because mosquitoes have retreated to protected harborages, such as dense vegetation or sewers and culverts. In addition, most of the insecticide is carried upward by thermal currents produced by heated pavement and does not reach the targeted areas. The activities of people in residential areas during daylight hours increase the probability that humans will be sprayed. *Daylight fogging in residential areas is of little value and is an inappropriate use of insecticide.*

Proper Environmental Conditions for Control of Adult Mosquitoes with ULV.

Temperature -- Ground adulticiding should not be conducted if the temperature is below about 60 F or above about 85 F. Most species of mosquitoes are inactive at temperatures below 60 F and will not fly into open areas where they can be sprayed. If evening temperatures exceed about 85 F, thermal updrafts will carry the insecticide up into the atmosphere away from the target area. Consult label directions and manufacturer's recommendations for proper temperature recommendations.

Wind speed -- Adulticiding should be conducted only when wind speed is low, usually about 5 to 10 mph. When adulticides are sprayed on windy days, turbulence makes a uniform spray pattern difficult to achieve. This results in poor control.

Proper Calibration of ULV Spraying Units is Critical for Effective Mosquito Control

For adulticiding to be effective, droplets of insecticide must strike the mosquitoes. Droplets that are too small will not affect the active mosquito, while large droplets will rapidly settle out of the air before they strike the mosquitoes. Consequently, the droplet size must stay within a specific range to achieve maximum control. Applicators should consult the pesticide label and the operating instructions for the ULV unit so that the machine can be calibrated properly to produce the correct droplet size. ULV spray units should be calibrated no less than once per season, and more often if equipment is used often. Applicators should note that certain insecticide labels require that records of droplet-size calibrations be available for inspection by the insecticide manufacturer. *Spraying for adult mosquitoes with uncalibrated ULV units is ineffective; it also gives the public the mistaken impression that they have been protected against disease-carrying mosquitoes.*

Barrier Spraying of Vegetation for Control of Adult Mosquitoes

"Barrier" treatments for mosquito adults are applied on vegetation as liquids with hand-held spray equipment using insecticides that produce residual control for several days. This method takes advantage of the behavior of adult mosquitoes, which is to rest in dense vegetation during the daylight hours. This technique can be used near homes or recreational areas near mosquito producing habitats where larviciding is not practical. The residual insecticides applied to the vegetation along property borders can provide control of adult mosquitoes for one to two weeks. (Barrier spraying is usually done with a backpack unit.)

Note: When pesticides are used, it is always the pesticide applicator's responsibility, by law, to read and follow all current label directions for the specific pesticide being used. **If any information in these recommendations disagrees with the pesticide label, the label instructions MUST BE FOLLOWED.**



Illinois Mosquito & Vector Control Association

P.O. BOX 1655 SOUTH HOLLAND, IL. 60473 708-333-3135

A final comment: In IDPH's viewpoint, larviciding and other source reduction efforts are still the priority for local mosquito control programs. Adult mosquito control spraying is **ONLY** a supplement to those measures.

IT IS TIME TO THINK OF NOMINATIONS FOR IMVCA OFFICERS AND THE EXECUTIVE COMMITTEE.

From the by-laws -- "Nominations by the Nominating Committee shall be posted in writing by the Nominating Committee prior to the closing time of the opening session of the annual meeting. The Nominating committee shall also receive and post during the first session of the annual meeting, nominations made in writing and signed by the designated representative of at least three (3) Voting Members, for any elective office in this Association. Nominations may not be made in any other manner." If more than one nomination exists for a position, a majority vote (by voting members) wins. As approved last year, the Vice-president automatically ascends to the position of President.

Mosquito Jokes

What is the favorite sport of mosquitoes? Skin-diving.

Why is the mosquito afraid of the computer? Because of the World Wide Web.

What is the difference between a fly and a mosquito?

A mosquito can fly, but a fly can't mosquito.

Why do mosquitoes go to the dentist on a regular basis? To improve their bite.

HUMAN –TO-HUMAN WEST NILE VIRUS TRANSMISSION

Evidence is building to support the case that WNV can be transmitted via organ transplant or blood transfusion. Three of the 4 people who received organs from a single donor with asymptomatic WNV are now WNV-positive. It is unlikely that all 3 became infected from mosquito bites, especially as one of the patients was hospitalized for longer than the normal 3-14 day WNV incubation period. The organ donor was critically injured in an automobile accident and received blood and blood products donated by more than 60 people. Because the government has been concerned about the theoretical risk of transmitting West Nile virus through blood transfusions, about two weeks ago health officials reminded blood banks to adhere to their usual standards to reject would-be donors who had a fever or an infection. Health officials have reassured the public about the relative safety of the blood supply. In a Sept 2 NY Times article, CDC and FDA officials were reported to have calculated the risk of transmitting WNV through blood transfusions in the range of 1 to 2 cases per 10,000 transfusions.

UNIVERSITY OF ILLINOIS STUDENT STUDIES CROW BEHAVIOR AND INTERACTION WITH MOSQUITOES

Sarah Yaremych, a graduate student in NRES at the UI, is working with Drs. Dick Warner and Bob Novak on a study of the interaction of crows and mosquitoes and the flight behavior of sick crows. So far her research has shown that about 33% of the crows she radiocollared contracted West Nile virus and died. Crow flight range became limited within the last few days of the crow's life.

WEST NILE VIRUS HITS RAPTORS IN ILLINOIS AND OHIO

In the last 2 weeks, almost every wildlife rehab center in Illinois and Ohio has experienced unheard of admissions of Great Horned Owls, Red-tail hawks, Coopers hawks and other raptor species. The Great Horned Owls have head tremors and some display paralysis of the legs. Many die quickly, within 48 hours, though a few seem to recover. Most are found standing or lying on the ground, unaware of their surroundings.



EDITORIAL

Why Does Illinois Have a High Transmission Rate of West Nile Virus?

by Richard Lampman, Nina Krasavin, Patrick Halbig, Adam Ringia,
Marshall van de Wyngaerde, Hyun-Young Koo, and Robert Novak

Unlike the focal transmission of West Nile virus in the eastern US, transmission in Illinois (positive animal, mosquito, or human cases) was detected throughout the state in 2002, although Cook County was undeniably the hardest hit in terms of human cases. By the first week of September, Illinois ranked the second highest in human cases (165) in the United States, including nine deaths. Of the 709 crows and blue jays tested, 439 (62%) were positive for WNV; the first bird tested positive on 15 May 2002. Sixty-two horses were laboratory positive during the period 19 July to 23 August from 18 counties. Almost 400 mosquito pools (batches) tested positive and, in some areas, the weekly positive pool prevalence rate was 50% or greater.

The present WNV outbreak resembles that of St. Louis encephalitis virus in the mid-1970s, where Illinois had the largest number of cases in the east-central states. From 1964 to 1998, the CDC reported 695 SLE cases in Illinois; 581 of those were from 1975. About 1500 SLE cases occurred in IL, IN, and OH since 1964; whereas nearby northern, western, and southern states like Wisconsin, Iowa, Missouri, and Arkansas only reported 187 human cases during the same time period.

“Why does Illinois tend to have greater infection rates in mosquitoes, birds, and humans than other states?”

The Centers for Disease Control and Prevention suggest that risk to arboviral diseases can be estimated by measuring several key factors. These include mosquito population indices, virus infection rates in mosquitoes, increasing transmission in amplifying hosts, evidence of arbovirus in incidental hosts (like horses), rainfall and temperature data which influence the extrinsic incubation period as well as the life cycle of the vector, time of the year, and the abundance and proximity of susceptible humans. Although the question cannot be fully answered without knowing the specifics of WNV transmission cycles in the different states, it is possible to address why the risk factors, as outlined by the CDC, tend to favor outbreaks in Illinois.

1. *Seasonal abundance of major vector species.* WNV was isolated from 4 mosquito species in Illinois, including *Culex restuans*, *Culex pipiens*, *Aedes vexans*, and *Anopheles punctipennis*. Although the relative importance of these species is not clear, the data from gravid traps suggest infected *Culex restuans* and *Culex pipiens* were abundant in transmission areas. *Culex restuans* is active

early in the season, relatively long-lived, and displays a bird-feeding fidelity. These factors make this species a prime suspect for amplifying WNV and SLEV among birds. The mid-May detection of WNV-infected crows in Illinois corresponded to the activity period of *Cx. restuans*, which probably represents the initial amplification of WNV in a variety of bird species. The appearance of *Cx. pipiens* and its increase in abundance starting in about mid-July appears to coincide with the onset of human cases. Blood meals collected early in the season from the *Cx. pipiens* complex in the central US were from birds; however, in July and August, one third of the bloodmeals were from non-avian species, suggesting a shift in a bird to mammal feeding ratio. Unlike most nuisance mosquitoes, the abundance of these *Culex* species is not directly tied to rainfall. Although early season rains create an abundance of habitat for *Culex* species, especially in clogged drainage ditches and flooded grassy areas, during prolonged dry periods the primary larval habitats are often found in containers near houses, around animal water troughs, and waste lagoons. Thus, lack of rain causes a reduction in biting mosquitoes, but not necessarily in the vector *Culex* species. In fact, dry periods may promote a closer association of mosquitoes and humans and domesticated animals. *Culex* species are frequently associated with birdbaths, waste tires, pools, flower pots, buckets, tarps, or any container holding water for a period of 5-7 days. One important mosquito source in cities is the catchbasin. The early season detection of WNV transmission may also be related to the maintenance of WNV in overwintering *Culex*.

2. *Major human population centers with numerous vector and reservoir host habitats.* The human population ranges from 0.4/ km² in rural areas in southern Illinois to almost 3 million in Chicago. Nine metropolitan areas account for about 80% of the entire state's population, with the majority concentrated in Chicago and surrounding suburbs. The abundance of human cases of WNV encephalitis partially reflects the demographics within the state. Furthermore, Chicago and the suburbs throughout Cook County have an abundance of refuges, conservation areas, and parks, which serve as breeding habitat for numerous resident bird and mosquito species. Additionally, there is evidence that overwintering *Culex* species may maintain the virus in temperate areas, resulting in early season transmission. Overwintering *Culex* species are frequently abundant in stormwater tunnels in urban areas. Therefore, in Illinois, there is a close proximity of humans to potential amplification and overwintering centers of WNV.



3. *Migratory movement of birds into Illinois.* The Mississippi River floodplain represents one of the greatest areas of biodiversity in the United States and serves as a major migratory bird flyway. In addition, the north-south orientation of the Mississippi River provides a migration corridor for birds, bats, and other organisms. About 40% of North American waterfowl and shorebirds use the Mississippi flyway. Due to presence of the Mississippi, Illinois, Ohio, and Wabash Rivers, Illinois is also an important migration corridor for a variety of waterfowl. The state has the potential for being the major gateway for the annual dispersal of WNV with infected migratory birds into and out of the upper and central plains states and southern and Gulf Coast states.

4. *Crow population.* Illinois has one of the largest crow wintering sites in the U.S. Although crows are important for detecting WNV transmission, it is possible that these birds serve a role in the amplification of the virus in *Culex* and other vector species. Recent data suggests that as crows get sick from WNV infection they tend to move less, making them a susceptible target for a mosquito bloodmeal. Crow flight behavior may be responsible for short-distance spread of WNV. American crows breed and winter throughout Illinois, with major centers in northeastern, east-central, and southern Illinois. Estimates of wintering crows have been as high as 4.8 million birds; one roost located at in east-central Illinois has been estimated to contain 800,000 and 1,200,000 wintering crows. Crows banded in east-central Illinois have been recovered as far away as southeastern Ontario.

5. *Latitudinal differences in the state promote early mosquito activity.* The state has distinct north-south gradients in temperature, rainfall, vegetation patterns, topography, human population density, and land-use that could influence transmission dynamics within the state. Illinois is a relatively long state (620-km) between 37° and 42.5° northern latitude. Average annual precipitation is greater in southern Illinois by almost 250 mm, average winter and summer temperatures are 6 ° C and 2° C higher in the south, respectively. Wetlands cover about 2.6% of the state (0.37 m ha) and are key habitats for *Anopheles*, *Aedes*, *Psorophora*, and some *Culex* species, particularly *Cx. salinarius*. In general, mosquito activity starts 2-3 weeks earlier in southern Illinois as compared to northern Illinois, although some cold weather species like *Ochlerotatus canadensis* and *Culex restuans* can be found in April through early June in central and northern sites.

6. *Active human, bird, and mosquito surveillance programs.* The high number of human cases and bird, horse and mosquito positives are, at least partially, due to the fact that several agencies within the state are conducting surveillance or vector and host related research. Human cases are monitored and confirmed by the Illinois Department of Public Health, horses by Illinois Department of Agriculture and the Veterinary Diagnostic Laboratory of the University of Illinois, and WNV

detection in mosquitoes and antibody detection in birds is conducted at the Illinois Natural History Survey. Furthermore, most of the mosquito abatement districts within Illinois are either conducting their own tests for WNV or send samples to INHS for testing or confirmation. Hence there is a rapid detection of WNV in vector and reservoir species collected over a broad area of the state. Using a molecular detection method (Taqman), the Medical Entomology Program has found that the commonly used VecTest underestimates the positive pool rate by 30-50%. The VecTest may have considerable utility for MADs, despite this underestimate of pool prevalence rate. For example, mouth and cloacal swabs of sick or dead birds and blood sera have shown positive WNV results. However, positive results in non-mosquitoes should be considered preliminary and need to be confirmed by an alternative detection method. **The false positive and false negative rates on non-mosquito specimens are unknown.**

7. *Possible involvement of bridge vectors.* In NY, *Culex salinarius*, an opportunistic feeder, was implicated as a vector to humans and possibly horses. One reason a bridge species is suspected for WNV is the late season transmission of WNV to horses. Typically, *Culex restuans* and *Cx. pipiens* enter a reproductive diapause in September as daylight decreases below 12 hours. *Culex salinarius* is also found in Illinois, although its distribution and abundance is largely unknown. *Aedes albopictus* has been collected in about 20 counties of Illinois, with the greatest concentration in the southern one-quarter of the state. This day biting mosquito is an efficient vector of WNV and SLEV in laboratory studies and has been implicated as a potential vector of WNV in Maryland.

8. *Optimal environmental conditions in 2002 for abundance of vector species.* Early season rains in April and May created an abundance of mosquito habitats. Prolonged periods of low rainfall in July and early August shifted *Culex* habitat abundance to urban areas. The mild early temperatures in March through April promoted the emergence of *Culex* species from their overwinter quarters. The detection of WNV in *Culex*, *Aedes*, and *Anopheles* species by mid-July suggests a high level of amplification occurred, which is also supported by the widespread report of WNV crows, bluejays, raptor (owl and hawk) illnesses and death. Dry ice baited traps collected hundreds of mosquitoes in June and early July throughout Illinois, but, as the prolonged dry period continued, the abundance of mosquitoes in these traps declined. In contrast, the gravid traps showed an increase in activity during late July and early August (from 20-50 mosquitoes early in the season to 100-200 mosquitoes per trap per night). So the vector mosquito population increased substantially in late July and August.

Annual Meeting Pre-Registration Form

Due November 4, 2001

Meeting is on November 14th afternoon and 15th morning.

Mail with check to:
 Rosemarie Climpson, Sec. Treas. IMVCA
 P.O. Box 1655
 South Holland, IL 60473
 708-333-3135

Pre-registration:	\$60 per person	\$ _____
Membership:	\$10 per person (if not already paid)	\$ _____
Spouse:	\$25	\$ _____
Student:	\$20	\$ _____
TOTAL		\$ _____

Registration at the door of the conference is \$10 extra per category (e.g. \$70 per person, \$35 per spouse, \$30 per student). *So get your pre-registration in and save money!* Registration covers admittance to talks on Nov. 14th and 15th, banquet, hospitality hour, and all other activities provided.

Name and Work Affiliation: _____

(As will appear on conference badge)

Name of Spouse, if attending: _____

Address: (use address you want membership materials, Newsletter, announcements, etc. sent to)

_____ Business or Apt. #

_____ Number and Street

_____ City, State, Zip Code

Work phone: _____ Home phone: _____

MAKE YOUR HOTEL RESERVATIONS EARLY TO GET THE SPECIAL RATE

Crowne Plaza Hotel
 3000 South Dirksen Pkwy
 SPRINGFIELD, IL 62703
 Local Phone: 1-217-529-7777
 Reservations: 8005892769

(Mention the IMVCA or say "mosquito group" to jog their memory).

Exhibitor's Registration Form - Due October 21, 2001

Meeting is on November 14th afternoon and 15th morning.

Please mail with check by Oct 21st to:

Rosemarie Climpson, IMVCA

P.O. Box 1655

South Holland, IL 60473

708-333-3135

Pre-registration:	\$60 per person	\$_____
Membership:	\$10 per person (if not already paid)	\$_____
Exhibitor Table:	\$50 per table	\$_____
Donation to Society:		\$_____
TOTAL		\$_____

Registration covers admittance to talks on Nov. 14th and 15th, banquet, hospitality hour, and all other activities provided.

Name and Work Affiliation:

(As will appear on conference badge)

Address:

_____ Business

_____ Other AddressInfo

_____ Number and Street

_____ City, State, Zip Code

Work phone: _____