Illinois Mosquito & Vector Control Association

N E W S L E T T E R

September 2003

PUT IT ON YOUR CALENDAR!
49th Annual Meeting of the IMVCA
Peoria, Illinois
Hotel Pere Marquette
November 20-21, 2003

FAREWELL MESSAGE FROM THE IMVCA PRESIDENT

(The following statement represents the views of Ed Alder and not necessarily the Board or membership)

I have been asked to write a presidential message to bring up some points I feel rather strongly about. I think the IMVCA needs to be more. As it is now, we have an annual meeting with about 100 people attending and we have a board of directors that meet more or less once every two to three months. Most of them are from only 4 areas of the state. We need to reach out to more people and get them involved. There are more local health departments that are responsible for public health vector issues than there are MADs, and as such they should be exposed to the expertise that the MADs bring to the table.

That expertise is varied. There are really two issues here. One, the nuisance mosquitoes, which are the bane of MADs and two, the vector mosquitoes, which carry disease agents. My feeling is to make recommendations for a standard of practice for vector control utilizing the same materials and methods for each area. Nuisance control would remain the territory of the MADs but vector control should have a unified attack mode.

My recommendation for this unified attack would be to larvicide all catchbasins with sumps in an area. Ask the public to get rid of standing water on their property and spray larvicide in ponds and roadside ditches. Next, set up light and gravid traps to monitor mosquito abundance and diversity and use the VecTest to quickly test for the presence of SLE, WNV, or EEE. And, lastly, use a trigger for adult spraying, like once one of the traps is positive on two consecutive trap nights. This spraying should be localized and traps should be continuously used and pre- and post-spraying results compared using infection rate as the standard.

My last point is that all members should be given the vote so that we get better input and hopefully individual input. It has been argued that if we did allow all members to vote that one entity could flood the vote with their point of view. I suppose this could happen, but as it stands the many are being led by the few. It would not be much worse.

To close, it is an honor to be the President of this organization. It would be more of an honor if we were really an all of Illinois mosquito and vector control association.

Ed Adler, President IMVCA, Chicago Department of Public Health, Retired

Ed Adler retired from the CDPH this year and has moved to Tuscon, Arizona. Ed has continued to attend the Executive Board meetings and will finish his duties by presiding at the annual meeting in Peoria. Let's all wish Ed good luck.

What is Mosquito IPM? Excerpt from Washington State Law (RCW 17.15.010)

An integrated pest management program for mosquitoes should include:
1) Minimization of mosquito breeding sites,
2) Monitoring mosquito population abundance and incidence of disease agents,
3) Establishing targeted densities of the mosquitoes based on the best available health, public safety, economic and aesthetic thresholds,
4) Treating mosquitoes to reduce abundance below targeted thresholds using strategies that may include biological, cultural, mechanical, and chemical control methods and that must consider human health, ecological impact, feasibility, and cost effectiveness, and
5) Evaluating the effects and efficacy of pest treatments

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49th Annual meeting of IMVCA will be at the Pere Marquette on November 20 and 21. Room rates are $80.00 and should be reserved before Oct. 23 by calling 309-637-6500.

Don Oemick, Vice-President IMVCA, has worked hard to get a great program together and, we all know he picks the best banquet meals. Thanks, Don!

THE VICE-PRESIDENT WANTS TO HEAR FROM YOU-

How do you want to see the annual meeting changed or not changed? Do you want a technical section dealing with mosquito collection, control, and arbovirus surveillance, as well as a section with speakers covering informative and/or current issues dealing with biology or behavior of vectors or hosts? Is a website for IMVCA important? Would most have access? Should we provide an increased stipend to the Secretary-Treasurer if that person develops and maintains a website? Let Don know what you think by emailing him at doemick@nwmadil.com *Don likes email, so just drop him a line to say hello.*

EDITORIAL ARTICLE
WHAT HAPPENED (is happening) TO WEST NILE VIRUS IN 2003?

By Richard Lampman And Robert Novak

West Nile virus (WNV) went west with a vengeance in 2003, continuing the pattern, made evident last year in the Midwest, of showing up late in the season one year only to be followed by severe outbreaks the next year. About one-half of the human cases so far are from Colorado and, if you add to those the cases from South Dakota, Nebraska, and Texas, you have about three-fourths of all the human cases to date. The big four from last year, Illinois, Michigan, Indiana, and Ohio have only reported a small fraction of the total nationwide cases, only about 40 as of this writing. This amazing drop in Midwestern cases is bound to spur a lot of debate, especially about the future significance of WNV in states like Illinois. There are going to be a lot of pundits (including the authors) in November and December telling you what they think happened this year, but you should keep in mind that the reasons for the absence of an outbreak can be just as complicated as the reasons for an outbreak. Numerous environmental, ecological, and biological variables have to occur in concordance within a regional focus for the arbovirus to amplify to the point of outbreak to mammals. The manner in which these critical factors regulate transmission is poorly defined for most arboviruses, thus our understanding of the cyclic nature of outbreaks is at best limited and often anecdotal. And everyone should keept in mind that the absence of human cases does not mean the absence of transmission. The Medical Entomology Program at the Illinois Natural History Survey verifies many of the WNV tests conducted on mosquitoes within the state, so we are in a unique situation of seeing where transmission is occurring and at what magnitude. In one sense, the introduction of WNV into North America has provided an unprecedented opportunity to learn more about the transmission of flaviviruses in order to optimize vector management.

Some people are going to say, " I told you so. WNV is like St. Louis encephalitis virus (SLEV), which shows up 1-2 years then disappears for a decade or more." Unfortunately, the evidence is still against a sudden disappearance of WNV. For example, Pennsylvania, which first saw WNV activity in 2000, is having one of its worst WNV years. Infected mosquitoes and birds are being detected over a broader area and at greater magnitude than 2001 and 2002. In fact, nationwide WNV transmission in 2003 is on a greater pace than 2002. Screening of the blood supply has detected hundreds of infected donors, mostly in the Central Plains and western states. So, perhaps we should rephrase our basic question and ask, "What happened to WNV in Illinois (and the Midwest) in 2003? Why was there such a lower transmission rate in our area?" Below is a list of factors that could have impacted transmission in 2003. We've primarily focused on central Illinois, but we'd like to know which of these factors relate to your area, so think about it for the annual meeting.

It is important to note, that the year is not over with yet, and there is still time for transmission to mammals.

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Factors that influence an outbreak include–

1. Environmental conditions. Temperature and rainfall influence vector, host, and pathogen development and relative abundance. The 2002 and 2003 seasons differed substantially in several meteorological aspects in our area. 2002 had several significant early spring rains followed by a summer drought lasting almost 30 days and then again in late August. The dry, warm period corresponded to an increase in positive pools of Culex in our area. Dry, hot periods probably have multiple effects on WNV transmission. The lack of rain may result in fewer natural habitats and a tendency for mosquitoes to use urban containers. Drought may also bring bird hosts into urban areas for water and food. Temperature can easily influence the development rate of mosquitoes and the pathogen incubation periods. In 2003, the first sustained dry period did not occur until mid-August and was punctuated by a long rainy Labor Day. The numbers of positive Culex pools were just beginning to increase in late August. Although human cases are low in Illinois, infected mosquitoes are still being widely reported in many counties and the season is not over yet. Cooler temperatures and more frequent rain may have shifted the peak to later in the season.

2. Seroprevalence of reservoir hosts and incidental hosts. This is an important factor because the loss of susceptible reservoir hosts reduces the potential for transmission, at least locally, and high seroprevalence in humans means fewer clinical cases, even in areas with considerable transmission. Our initial results in 2003 indicated a high seroprevalence in many avian species; however, we know little about the human population seroprevalence. Once host seroprevalence reaches a point where contact with a susceptible reservoir is unlikely, then transmission declines due to the lack of viremic host production. Furthermore, if transmission is low near the end of the season, then the number of infected overwintering vectors may be too low to reinitiate transmission in that area next year (necessitating a reintroduction). What are these thresholds? What percentage of the bird reservoirs has to be immune to crash a cycle? These are research questions that still being addressed.

3. Visibility of transmission. With the loss of sentinels, like crows and blue jays, transmission becomes hidden in an area. As most cases are asymptomatic, this means there is little evidence of the outbreak until the magnitude of transmission reaches the level of detection in live birds, infected mosquitoes, or horses and humans (and then it's usually too late for most management interventions). Although crow numbers were low early in the season in our area, after the breeding period there was a rebound and CU still seems to have these sentinels (we started to pick up several WNV positive crows and bluejays in August). In areas where crows were decimated, it is hard to judge the magnitude of transmission without intense surveillance of mosquitoes. Furthermore, a lack of human cases doesn't mean a lack of transmission, because other factors can be involved (like vector control, use of repellents, immunity status, change in outdoor activity, etc.). For example, many of the mosquito abatement districts had phenomenally high infection rates in mosquitoes in August 2002, yet they had distinctly different numbers of human cases. We can only conjecture that some ecological or environmental factors were responsible for regional differences.

4. Survivorship, abundance, and biting rate of infected vectors and/or immigration rates of viremic hosts. The first three factors determine the potential for transmission. An older age structure of the vector population with increased survivorship typically means more infected individuals. Initiation of the transmission cycles relies on overwintering or introduction of the virus in an area. Shifts in biting behavior for various reason increase the potential for amplification and transmission to mammals. Overwintering Culex restuans appeared earlier in 2003 than 2002 in Champaign-Urbana, suggesting the potential for numerous local initiation points; however, cooler temperatures appeared to hinder the mid-summer Cx. pipiens population increase. The number of infected pools didn't start to increase until late August. We are still detecting positive mosquitoes throughout our area, although at a lower rate than last year.

5. Vector control. The major concept of vector control is to locally reduce vector populations. Adult control is usually reserved for situations when infected adult mosquitoes are detected, despite the best larval management efforts. Unfortunately, measuring the impact of adult control is difficult and it requires an active pre- and post-treatment monitoring program. For larval control, it can often be shown that sites are no longer productive; however, if, gravid traps continue to collect hundreds of Culex, then you know you have missed some important habitats. For example, if you treat all the catchbasins, but gravid trap catch remains high, then you missed important larval production sites. One of the key aspects of vector management is a constant updating ground surveillance maps for larval sites and targeting areas with the greatest vector productivity. Adulticides provide a rapid, but short-term knockdown of adult mosquitoes and they have to be carefully timed.

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6. Public awareness, avoidance and repellents. An alerted public may reduce transmission by avoiding mosquito bites and reducing home larval habitats. However, the impact of these measures on disease transmission is hard to measure. It is generally accepted that the more exposure an individual has to mosquitoes the greater the risk.

7. Changes in virulence or antigenic properties of the virus or susceptibility of hosts to infection. Viruses undergo rapid replication and mutations could change various properties. Depending upon selection pressure and mixing of breeding populations, resistance genes might spread rapidly in hosts within a hot transmission area.

Some aspects of WNV remain unanswered and surveillance has generated many new questions. For example, the continuing detection of WNV in non-Culex species, especially Ae. vexans, suggests the possibility of a hidden mammal cycle. Also, does the sporadic presence of Cx. tarsalis and Cx. salinarius in Illinois play a role in transmission? We are a long way from a complete understanding of West Nile virus transmission, but, hopefully, we are learning more each year and refining our strategies.

Q. What has 6 legs, but is not an insect?
A. An immature tick (no credit for a spider with two legs torn off)

HINTS TO THE SUCCESSFUL COLLECTION OF GRAVID CULEX

1. The infusion should have a potent raw manure smell when stirred. The best infusion we've tested in our lab is grass clippings, which are allowed to ferment (infuse) for 3-4 days in buckets or drums of water. Three to four handfuls of grass wrapped in cheesecloth for every 5 gallons of water appear to be adequate to attract numerous Culex for 5-9 days. Some areas make up 55 gallon drum solutions and just add water and new grass every other week to replenish them. Our gravid traps tend to fluctuate between 20-50 Culex early in the season to 200-500 later in the season. If you're catching more Culex in a light or dry ice trap than a gravid trap, something is wrong.
2. Replace infusions every week or reinfuse with grass and add water weekly. Infusion activity changes through time and collection records may reflect fluctuations in attraction rather than vector abundance. We collect from gravid traps for 1 or 2 consecutive days every 4-6 days per site.
3. Place gravid traps in an area with plenty of resting sites for mosquitoes. It should be well-shaded all day and have overhanging vegetation or protecting structure. A well-placed gravid trap is hard to see.
4. Generally, when light trap or dry ice trap catch increases, gravid traps range from low to moderate catches. When LT or CO2 traps decline, gravid traps tend to increase to moderate or high catches. Gravid traps also tend to capture other mosquito species, especially Ae. albopictus. Other species seem to get trapped sporadically and often include males leading us to believe they were captured while searching for water to drink or a microhabitat with high humidity.
5. Although dry ice and gravid traps have different Culex species biases, they do collect both Cx. restuans and Cx. pipiens. The main difference is in the number of mosquitoes that have had a blood meal.
6. Egg rafts in the bucket suggest an oviposition pheromone may be increasing response to that bucket. Gravid traps tend to have few egg rafts when set up properly. If the airflow over the water surface keeps the mosquito moving, they tend to get sucked up into the nets before ovipositing. Position your collection tube and plug into battery. Fill to within an inch of the base of collection tube. You should see all the bubbles move to under the tube. If they don't then you don't have enough airflow in the tube. Also, most of the trap motors will operate if you plug the leads into the wrong poles, so check that red is pos and black is neg (otherwise you're blowing the mosquitoes away from the trap).
7. Routinely check fans in gravid traps. Check battery.

The President of the IMVCA submitted an amendment to the IMVCA Constitution and Bylaws such that all members, having paid their annual dues, should have the right to vote in the business meeting. This requires substantial rewriting of both documents because voting members are discussed throughout them. A change in voting member definition also eliminates the dues charged to voting associations. Please let your voting representative know your feelings on this issue, so a vote can be taken at the business meeting. The proposed change will state--
"All mention in the Constitution and Bylaws referring to voting members should include all members who have paid their dues."

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ANOTHER AMMENDMENT

At the IMVCA Executive Board Meeting, an amendment to the Constitution and Bylaws was presented to change the fiscal year of the organization from July 1 to the calendar year. The change was to allow an overlap between the new Secretary-Treasurer, Nina Krasavin, and Rosemarie Climpson, in order to provide ample time to transfer duties, records, and monies after the November 2003 Annual Meeting. It was also noted that sending dues notices after the major mosquito season might get more attention than sending them in July when most mosquito professionals are busy.
Voting members will vote at the business meeting on—
"The fiscal year of the IMVCA will be from January 1 to December 31, starting January 1, 2004."

HINTS ON IDENTIFICATION OF Culex

We've looked at 1000s of Culex in the lab and the following is our recommended procedure--

When training staff to id, be sure to mix Cs. inornata, Cx. erraticus and Cx. tarsalis among Aedes canadensis, Cx. restuans and Cx. pipiens to see how they get rough separated. Often Culex erraticus and Cx. tarsalis are separated as Ochlerotatus/Aedes species and Culiseta get lumped with the Cx. pipiens and Cx. restuans. You have to get separators to form good search images for these species.

First sort mosquitoes by shape of tip of abdomen. Scale shape and color on wings will separate Culiseta (legs and costal vein with mix of black and white scales) and Coquilletitdia (legs banded and wing scales broad, mixed dark and white). To verify as Culiseta look at underside of wing for bristles (hairs) near base of wing at subcostal vein. Look at legs and proboscis for banding patterns to separate Cx. tarsalis (distinct band on proboscis). If legs are unbanded, look at size and color of body. If small and black, look at scales behind eyes; broad ovals are found with Cx. erraticus. If specimens are small, proboscis extends past abdomen, and they have metallic colored scales, consider Uranotaenia. If regular size, but range from black to brown, look for dingy to white stripes basally across abdominal segments. If stripes are hard to see or thin (but scales are present) look under scope. If all scales are dingy yellow and stripes are very thin, then consider Cx. salinarius. Look at segment VII for dingy white basal and apical scales; Cx. salinarius tends to have darker brown bodies and lateral abdominal scale spots that are less white than in Cx. pipiens and Cx. restuans.

If abdominal stripes distinctly present, look at thorax. If setae are present on thorax look for two pale colored spots which is found on Cx. restuans. If no spots are present, but setae are present, then look for coarseness and appearance of setae (coarse, curved bronze collored setae are present on Cx. pipiens and Cx. salinarius; finer, less reflective setae are on Cx. restuans). If setae are coarse, look at pattern of stripes on abdomen. Cx. pipiens pattern has a central bulge and a constriction laterally, where they meet white side patches. Cx. restuans tends to have a broad stripe without constriction. Unfortunately, the striping pattern in Cx. restuans and Cx. pipiens is not adequate by itself to separate the species unless they are at the extremes – we've seen considerable overlap in abdominal patterns- and females (especially gravids) often lack abdominal scales making them appear like one or the other. This is when we label them as Culex (subgenus Culex).

When you run across strange looking Culex or any mosquito, put 2-3 specimens (if you have them) in centrifuge tubes and ship to INHS for identification. We've seen some odd specimens recently; two heads, two abdomens, rotated abdomens, totally mite covered specimens, and even a few that we have only tentatively identified because they appear so atypical in scaling pattern. Keep in mind that variation does exist within a species.

SUBMITTED ARTICLE

A BRIEF ANALYSIS OF CALCULATING INFECTION RATES IN MOSQUITO POOLS.

By Weidong Gu, Richard Lampman, and Robert Novak, Medical Entomology Program,
Illinois Natural History Survey

Arboviral surveillance programs often pool adult mosquitoes of a particular species from gravid, light, or carbon dioxide traps in order to estimate pathogen infection rates in an area. Although true infection rate could be estimated by testing individual mosquitoes, pooling specimens is preferred because 1) detection of an infected mosquito is usually a rare event, 2) the number of specimens that need to be tested can be high depending upon trap type, and 3) diagnostic tests tend to be relatively expensive. Without group testing, monitoring for arboviruses would be cost prohibitive in most cases.

The most common method of estimating infection rate for arboviruses like St. Louis encephalitis virus (SLEV) and West Nile virus (WNV) has been the minimum infection rate (MIR), which is calculated by dividing the number of positive mosquito pools by the total number of mosquitoes in all pools and multiplying that number by 1,000. The resulting value is a MINIMUM estimate of infection rate because it assumes only one positive mosquito per positive pool. Although calculating and interpreting an MIR value would appear to be straightforward, there is considerable confusion in the literature. For example, some suggest MIR should only be calculated in this manner when the all the pools are of equal size. -In cases where pool sizes are unequal, which is probably more common than not, several researchers suggest an alternative maximum likelihood method. What has escaped the attention of many is that values calculated by this alternative method are actually infection rates rather than MIRs.

By definition, the use of MIR is limited by the assumption of only one positive mosquito per positive pool and ignores relevance of pool size and infection rates. With this limitation, it is easy to see that MIR is only informative when infection rate is both low and/or pool sizes are small. Any temporal comparison of MIRs in an area or between areas has the potential for being inaccurate, especially if it is known that infection rate varied through time or between sites. As infection rate increases, the assumption of only one positive mosquito per positive pool becomes problematic, thus the true infection rate increasingly departs from MIR. Additionally, the MIR value is essentially "capped" based on the pool size (e.g., if 20 pools of 50 mosquitoes each were all positive the highest MIR value possible would 20/1000). Any large difference in infection rate between collection periods or sites makes the MIR value practically meaningless as a tool for comparing infection rate estimates. Furthermore, some researchers have stated that it is not appropriate to calculate an MIR unless there are at least 1000 total mosquitoes in all the pools, assuming the pools are not greater than 50 mosquitoes. Based upon this standard, it would be very difficult to compare infection rates on two dates at one site without multiple traps within a small area.

To overcome the shortcomings associated with use of MIR, we developed a computer program (MLE-IR) to estimate infection rates based on maximum likelihood methods. MLE-IR is an executable program and compiled to be run on most PCs (no MAC program is available). As an example of application of MLE-IR to a real-world data, in Cook County in 2002 many of the MADs went from a low rate of positive West Nile virus pools (less than 5-10%) in early July to a phenomenally high WNV-positive pool rate (greater than 75%) in August. Furthermore, the percentage of positive pools in late August and September varied considerably between MADs in Cook County. Therefore, calculating and comparing MIRs within or between districts through time introduces considerable error underestimating the actual change in infection rate. Analysis of subgenus Culex pools from Chicago, gratefully supplied by the City of Chicago Public Health Department and Clarke Environmental Mosquito Control, using MLE-IR showed that MIR was 2-3 times lower than maximum likelihood estimates (MLE) in August, whereas both methods gave about the same infection rate estimate earlier in the season. At one point, 60 out of 1000 Culex mosquitoes were estimated to be positive for WNV, whereas MIR estimated only about 20 positives out of 1000.

"Why has MIR become so widely used if it has so many limitations and potential problems?" This is one of those questions that is both easy and difficult to address. The maximum likelihood method is a statistical method that usually involves iterative calculations requiring a computer program. The CDC is attempting to overcome part of these limitations by providing a macro Excel program for calculating MLE and confidence intervals (Biggerstaff, Brad J. PooledInfRate: a Microsoft® Excel Add-In to compute prevalence estimates from pooled samples. Centers for Disease Control and Prevention, Fort Collins, CO, U.S.A., 2003). A clear recommendation of the relative value of the two methods and their limitations is only partially addressed by this document, thus leaving the final decision up to the end-user. We strongly recommend use of MLE rather than MIR in arbovirus surveillance programs.

One of the greatest difficulties we encountered when analyzing the data per collection site in 2002 for collaborating MADs was that all of the samples from

some sites were positive for an entire month. The absence of any negative pools makes it impossible to estimate infection rate. Operationally, we propose that any agency monitoring infection in mosquitoes should include a set of varied pool sizes once they start detecting over 30% of the pools positive by VecTest. Alternatively, in August take at least one set of mosquitoes per site per collection period and divide them into pools with different sizes (5, 10, 20, and 30 mosquitoes). Remember, no program can estimate infection rate if all pools are positive.

The compiled program, MLE-IR along with a sample data set, can be provided upon request to any of the authors at the Medical Entomology Program
.

Check out the IDPH Website http://www.idph.state.il.us/envhealth/wnvsurveillance_data_03.htm

The following struck me when I compared 2002 and 2003 data from the IDPH surveillance reports--
In 2002, crows and blue jays with West Nile virus were detected before the collection of WNV-positive mosquitoes, in some cases by weeks, in Cook, DuPage, and Champaign Counties. However, in 2003, WNV-positive mosquito pools preceded detection of positive birds in all three counties. Was this due to the loss of sentinel birds or was it an indication of enhanced mosquito surveillance? The answer is probably a combination of both. The one thing we can say is that without sentinel hosts like corvids, finding transmission foci becomes problematic, reminiscent of St. Louis encephalitis virus. As sentinels decrease there must be an increase in active mosquito and arbovirus surveillance program to take their place. This year the rate of positive Culex pools is two times the number of WNV-positive birds, whereas they were equal last year.

ARE YOU REPORTING YOUR MOSQUITO TEST RESULTS TO IDPH? THE SURVEILLANCE SYSTEM ONLY WORKS IF YOU GET INVOLVED.

ROSEMARIE CLIMPSON RETIRES FROM THE IMVCA

Rosemarie has been active in the IMVCA for over 40 years as Secretary-Treasurer and a member of the association. She has been the keeper of the records longer than most have been members. Please take time at Registration this year to thank her for decades of service.

NOTES FROM THE IMVCA BOARD MEETING IN SEPTEMBER 2003

I attend the board meeting as the Newsletter Editor; not able to vote, make a motion, or even second one. Sounds pathetic, but, I'll tell you the truth, as long as they let me talk I enjoy going. The membership never sees these discussions, which is a shame because the Executive Board is an active one and I guarantee that every viewpoint known to humankind gets represented. These meetings generally last 4-5 hours, including a brief lunch, and most members usually have a long ride home. So, I thought the Newsletter should present regular updates on topics discussed at the Board meeting and invite opinions.

Ed Adler sparked a lively debate by challenging the IMVCA to do more and the Board met that challenge, in my opinion. The new Secretary-Treasurer, Nina Krasavin, wants to get all financial records on a computer spreadsheet and institute an association credit card to keep account of expenditures. Don Oemick is taking steps to get the IMVCA on-line with the guidance of Mike Szyska, which will allow timely updates to be posted for members. Hank Lawicki is following up on two applications for IMVCA scholarships, in order to promote student interest in medical entomology. Jack Swanson is researching the IMVCA official mosquito management policy for presentation in a future Newsletter. Bill Schneck is gearing up to get sponsors and donations for prizes for the Annual Meeting. Rosemarie informed the Board that the finances of the association are sound and membership increased last year. Even our temporary substitute, Sam Davis, got into the spirit and volunteered the absent Barb O'Meara for every committee assignment and elected office available (just kiddin' Barb).

Mosquito-borne disease has once again become a major concern with the advent of West Nile virus, which is similar to what happened to the association almost 30 years ago with the outbreak of SLE in Illinois. The IMVCA is facing a time with great

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opportunities. The relevance of the association has never been greater and its main goal remains to bring together different groups with a common interest in the management of vector and mosquito species in Illinois.

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Annual Meeting Pre-Registration Form
Due November 1, 2003

Meeting is on November 20th afternoon and 21st 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, 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: _____ Email: _____