

Lessons of the West Nile Virus Response

After five years, what have we learned?

By Shawnee Hoover and Jay Feldman

It was the Tuesday after Labor Day September 1999 and an urgent call came into the Beyond Pesticides office from NBC-TV. The reporter wanted to know what we thought about New York City's response to the West Nile virus (WNV) outbreak. Would we be willing to debate a city public health official? The pesticide spray planes had taken to the air and spray trucks to the streets and the city's residents were being doused with malathion, a controversial neurotoxic pesticide. A quiet storm fell over the environmental and public health community as people wondered whether this was a reasonable use of a toxic pesticide. The death of three people that weekend was attributed to the virus.

Misleading hazard information

Immediately, Beyond Pesticides raised concerns about exposing the entire population to pesticides, while also recognizing the public health threat of the virus and need to respond. We issued warnings for people to stay out of the spray, bring toys inside, close windows, and turn off air conditioners. We disclosed what the scientific literature says about the hazards of malathion.

In speaking only to the public's fear of the virus, Mayor Rudolph Giuliani rejected the hazards of spraying, saying, "There's no point in not spraying, because there's no harm in spraying. So even if we're overdoing it, there's no risk to anyone in overdoing it." The mayor's statement represented to Beyond Pesticides and local environmentalists a long road ahead in countering misleading messages about the public health threat of pesticide exposure and the viability of alternatives.

Putting WNV in perspective

As information filtered out over the following months, it became clear that WNV, although a serious concern, was not the apocalypse it was portrayed to be. Studies emerging from the epicenter of the New York City borough of Queens showed that less than 12 percent, or 134, of the estimated 1,200 people infected with the virus displayed symptoms. For the elderly

or infirm, rates of serious illness were higher.¹ The Centers for Disease Control (CDC) would soon conclude that roughly 80 to 90 percent of those bitten by an infected mosquito will not show symptoms, 20 percent will exhibit mild flu-like symptoms, and less than one percent will experience serious illness.² Those estimates still hold today.

An irony quickly materialized. The same people who were at highest risk for the worst disease symptoms, the elderly and people with compromised immune and nervous systems, were also at highest health risk from exposure to pesticides. It was also discovered that the mayor had no money budgeted for the city's integrated pest management (IPM) mosquito management program, allowing mosquito breeding sites to proliferate unchecked. However, people continued to die and by the time mosquito season ended in October the number of deaths was up to seven.

Outraged by the city's negligence in exposing the public to hazardous pesticides and having no effective mosquito management plan, the No Spray Coalition, a group of local organizations and activists, filed a lawsuit, joined by Beyond Pesticides, that cited violations of the Clean Water Act and spray drift.³ A mass die-off of Long Island Sound lobsters in 1999 after the spraying for WNV prompted fishermen to sue the city for damages.⁴ Both cases are still before the court today.



Shifting away from toxic sprays

The next season brought with it examples of some localities applying basic IPM principles and trying to limit broadcast spraying, such as Nassau County, NY that had abandoned its spray-now-ask-questions-later approach. After tense meetings and a court challenge, receptive managers began to dialogue with community groups and embraced the idea of cur-

tailoring spraying techniques in favor of prevention, monitoring, and targeted spraying, only if necessary.

Noted entomologist David Pimentel, PhD of Cornell University and others raised doubts about the effectiveness of mosquito sprays, warning that 99 percent of the spray from a truck would fail to hit the target adult mosquito. It quickly became clear that

prevention and personal protection was key. The CDC concluded that, "Adulticiding, the application of chemicals to kill adult mosquitoes by ground or aerial applications, is usually the least efficient mosquito control technique."⁵ In addition, decision makers were informed that mosquitoes develop resistance to pesticides, which undermines the spray approach.

WNV in the second year had made its way to 13 states up and down the east coast. The experience of New York continued to play itself out. Communities and health care providers in Connecticut organized around the hazards of pesticide spraying and helped state officials adopt a WNV plan with a tiered structure that restricted broadcast spraying.

Beyond Pesticides published its *Public Health Mosquito Management Strategy* and built grassroots alliances, and in 2003 formed the national *Alliance for Informed Mosquito Management* (AIMM) with 40 organizations and activists representing 24 states and growing. Its mission is to advocate for the adoption of safer, preventive and least toxic methods of managing mosquitoes and the threats of mosquito-borne diseases. (See page 21).

Bright spots

Over the years, a number of localities have instituted preventive mosquito management and experienced fewer human cases of WNV as well as little or no public exposure to pesticides. In 2002, Washington, D.C. designed a WNV response plan focused on prevention (larval control), elimination of breeding sites, and public education. D.C. had to vigorously defend its policy against opposing neighboring states and a fearful public. WNV cases in D.C. dropped from 34 in 2002 to 3 in 2003 and the District emerged as a model.

In 2003, the City Council of Lyndhurst, Ohio adopted landmark legislation that banned all spraying for WNV. In an insightful and informed ordinance, the city officially recognized the hazards of pesticides and the lack of efficacy associated with spraying, and simply prohibited spraying. Without spraying, the rates of WNV illness did not skyrocket, as some had predicted. In fact, WNV illness was less common in Lyndhurst than in other parts of Cuyahoga County.

Continuing problems

Today, members of AIMM continue to receive reports and witness firsthand poor mosquito management practices. Across the country Beyond Pesticides gets reports of truck spraying or fogging in the presence of children, people being sprayed while in parks or outside their homes, and weekly scheduled sprays with little mind to the actual presence of the virus, time of day or cold weather conditions that render the sprays worthless. Spraying over waterways, which can harm fish and other aquatic

species, continues despite label prohibitions. Perhaps worst of all, applicators often disregard designated no-spray zones, resulting in tainted organic crops, mass bee kills, and exposure of vulnerable residents who opted out of the spray program.

Too many mosquito managers nationwide are still refusing to bring their management methods up to date. In 2004, people in parts of Colorado, Virginia and Texas reported aerial spraying of naled (Dibrom), the only adulticide whose label reads, "Do not breathe vapor or spray mist. Causes irreversible eye and skin damage," and is listed as a Class 1, highly toxic pesticide by the U.S. Environmental Protection Agency (EPA). Others in Kentucky and parts of Ohio and Illinois faced the spraying of chlorpyrifos (Mosquitomist) in residential neighborhoods, despite the withdrawal of the product from the residential use market due to its excessive risks to children.

Misinformation about the safety of the pesticides or the deadliness of WNV is also still rampant. Little has changed since the U.S. Government Accountability Office (GAO), the watchdog arm of Congress, concluded in 1997 that, "The general public receives limited and misleading information on pesticide hazards" and is misled on pesticide safety by statements characterizing pesticides as "safe" or "harmless."⁶

Local officials from South Dakota to Texas, Illinois to California, are constantly quoted in the press with pesticide safety claims that are illegal for manufacturers or distributors.

Phrases like "safe as table salt" and "made from chrysanthemums" mislead the public and inflame tensions with health advocates. A recent quote from the Harris County, Texas director of mosquito control about naled illustrates this point: "All insecticides are toxic," he said. "If you stick your head in a barrel there'll be an impact, but not otherwise."⁷

What do we know about the pesticides typically used

The truth is people do get sick from ultra low volume (ULV) mosquito sprays. In New York in 2000, more people got sick from the pesticide spraying than from the virus. In 2003, the CDC reviewed poisoning reports due to WNV spraying from the only nine states in the country that collect such data (two of which did not spray for WNV), and found 262 cases. Advocates of spraying use this as evidence that the sprays do not harm enough people. Almost 75 percent of the reported poisonings were due mostly to malathion. The majority of cases resulted in respiratory (66%) and neurological (61%) reactions.⁸

Pesticide poisonings in the U.S. are not well tracked and are commonly misdiagnosed, unreported, and severely underestimated. Physicians receive little training on identifying



poisonings and even when correctly diagnosed, rarely are they reported to authorities. EPA recognizes that poisonings are underreported and that the lack of national data on the extent of pesticide illnesses is a problem.⁹ It is therefore wholly imprudent for public officials to dismiss the hazards of broadcast spraying and the need for safer practices simply because pesticide poisonings are not making headlines.

Organophosphates (OPs), which include malathion (Fyfanon), naled (Dibrom) and chlorpyrifos (Mosquitomist), are in the highest toxicity class of pesticides. They work by inhibiting the acetylcholinesterase (AChE) enzyme and can affect the central nervous, cardiovascular and respiratory systems. OP fly and mosquito sprays have been repeatedly cited for causing acute illness in both humans and wildlife. In one case, mosquito spraying near a ballfield drifted in the air and resulted in the hospitalization of 37 ballplayers, ages 15 and 16, and spectators suffering from dizziness, nausea, abdominal cramps and other symptoms of OP poisoning. Another case of spraying led to the death of 2,000 fish on the banks of Staten Island.¹⁰

Acute poisoning from synthetic pyrethroids, such as sumithrin (Anvil) or resmethrin (Scourge), is not as common as it is with OPs, though it can trigger asthma and other respiratory reactions. On the other hand, studies have linked pyrethroids to chronic illnesses such as endocrine disruption, cancer and birth defects.¹⁰ EPA does not currently assess endocrine disruption potential of chemicals, although required to by law.

Studies show endocrine disruptors in very small doses, such as those in ultra low volume (ULV) mosquito sprays, can cause neurological, developmental and reproductive health problems in both humans and animals. This rules out the “dose makes the poison” argument for the safety of ULV pesticides and warrants greater precautionary approaches.

The next chapter

The WNV story is a microcosm of the larger pest management challenge. As we have seen over the years, when WNV hits,

from New York in 1999 to Arizona in 2004, panic ensues and the response is usually to rely on broadcast pesticide spraying – not just once but continually – rather than quickly going into a preventive mode, eliminating breeding sites and addressing the roots of the problem.

Public officials assume that because pesticides are readily available and registered by EPA they are safe. People are not always warned against exposure and not notified when they may be sprayed. Vulnerable population groups are disregarded, applicators often not well protected, and voices of opposition from informed residents and public interest groups are ignored. Mosquito control has been synonymous with spray trucks and pesticides for more than 50 years and, as a result, much of the public expects and demands spraying.

But that is not the whole story. Pesticide spraying for WNV has also been a catalyst in raising awareness among community members of the hazards of pesticides and their pervasiveness in our lives. Many individuals across the country have been moved to action. They have educated themselves and others and have forced a change in their community – not just in mosquito management, but in other areas of community pest management. At the same time, many local decision makers – mayors, city council members, health officials and mosquito managers – have pursued a safe and effective plan in the face of the difficult WNV challenge. They have rejected broadcast spraying for prevention, rejected unilateral action for public involvement, and rejected toxic pesticides for non-toxic alternatives and practices.

These officials, like their community activist counterparts, are to be commended for not only protecting the public from WNV and exposure to pesticides, but also for effecting a cultural shift that rejects toxic pesticide use and embraces integrated pest management. This shift sets an important tone and approach that can be used throughout communities – safely and sustainably managing our schools, parks, libraries, hospitals, rights-of-way, public buildings, and public lands.

Endnotes

- 1 New York City Health Department. 2001. West Nile Virus Surveillance and Control: An Update for Health Care Providers. <http://www.nyc.gov/html/doh/pdf/chi/chi20-2.pdf>. (accessed 11/03/04)
- 2 Centers for Disease Control and Prevention (CDC). 2004. What you need to know. http://www.cdc.gov/ncidod/dvbid/westnile/WNV_factSheet.htm (accessed 7/02/04)
- 3 The lawsuit, *No Spray Coalition, Beyond Pesticides, et al. v. the City of New York* was filed in July 2000 in the U.S. District Court of New York where it remains today. Environmentalists charged the city with unlawful discharge of toxic chemicals into and over air, land and waters in violation of the Clean Water Act, the Resource Conservation and Recovery Act, and the Federal Insecticide, Fungicide and Rodenticide Act. Previous court decisions have since narrowed the lawsuit down to just the Clean Water Act.
- 4 Fox, et al. v. Cheminova, Inc., et al., U.S. District Court For The Eastern District of New York. <http://www.lawjvf.com/JVFHome/JVFCases/pdf/fox.pdf>.
- 5 CDC. 2001. Epidemic/Epizootic West Nile Virus in the U.S. <http://www.cdc.gov/ncidod/dvbid/westnile/resources/WNVguidelines2001.pdf> (accessed 7/01/04)
- 6 GAO. 1997. Nonagricultural Pesticides: Risks and Regulation. GAO/RCED-86-97.
- 7 “Aerial spraying to fight mosquitoes in selected areas.” Houston Chronicle. 8/04/04.
- 8 CDC. 2003. “Surveillance for Acute Insecticide-Related Illness Associated with Mosquito-Control Efforts - Nine States, 1999-2002.” www.cdc.gov/mmwr/preview/mmwrhtml/mm5227a1.htm (accessed 9/15/04)
- 9 GAO. 2001. Information on Pesticide Illness and Reporting Systems. GAO-01-501T.
- 10 See Beyond Pesticides ChemWatch Pesticide Fact Sheets and WNV fact sheets. www.beyondpesticides.org
- 11 Vera Go, J., et al. 1999. “Estrogenic Potential of Certain Pyrethroid Compounds in the MCF-7 Human Breast Carcinoma Cell Line.” *Enviro. Health Perspectives* 107(3); Alavanja, M.C.R., et al. 2003. “Use of agricultural pesticides and prostate cancer risk in the agricultural health study cohort.” *Am. J of Epidemiology* 157: 800-814.